
Lancashire analysis of the NCMP dataset 2010-11

Full report August 2012

Intelligence for Healthy Lancashire (JSNA)

NHS **NHS** **NHS** **NHS** **NHS**
Central Lancashire East Lancashire North Lancashire Blackburn with Darwen Blackpool



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Background and methodology

The National Child Measurement Programme is a statutory function required by the Department of Health and commissioned by the Primary Care Trusts (PCTs). During each academic year, the NCMP measures the height and weight of children in reception and year six. The resultant dataset provides a measure of the levels of childhood underweight, healthy weight, overweight and obesity and informs the actions that need to be taken in respect of children's healthy weight. During 2009, the Lancashire Joint Strategic Needs Assessment (JSNA) team was approached by the Lancashire Healthy Weight Leads with a request to support a Lancashire-wide analysis of the NCMP data. This paper is the results of that exercise and follows on from the two previous analysis reports published in 2010 and 2011 using the 2007-08, 2008-09 and 2009-10 datasets, as provided by Blackburn with Darwen, Blackpool and Central, East and North Lancashire PCTs.

How do we measure healthy weight?

The most common method of measuring healthy weight is the Body Mass Index (BMI). BMI is calculated by dividing a person's weight measurement (in kilograms) by the square of their height (in metres). In children and adolescents BMI varies with age, height and gender for this reason, the BMI score for children and adolescents is related to the UK 1990 BMI growth reference charts in order to determine a child's weight status.¹ NCMP data is presented in four categories which are summarised in table 1 below.

Table 1: Child and adolescent weight categories

Underweight	Healthy weight	Overweight	Very overweight (Doctors call this clinically obese)
If your child is on the 2 nd percentile or lower («M2ndkgs» kg [«M2ndvalue»] or less)	If your child is from above the 2 nd to the 91 st percentile («M2ndkgs» - «M91stkgs» kg [«M2ndvalue» - «M91stvalue»])	If your child is from above the 91 st to the 98 th percentile («M91stkgs» - «M98thkgs» kg [«M91stvalue» - «M98thvalue»])	If your child is above the 98 th percentile («M98thkgs» kg [«M98thvalue»] or heavier).
Many underweight children are perfectly healthy. But sometimes being underweight can be a sign of health problems.	Children of a healthy weight are more likely to grow into healthy adults. To keep growing healthily into adulthood, it is important that children eat well and are active.	Children who are overweight often continue to be overweight as adults and this can result in long term health problems including high blood pressure, heart	Being very overweight can cause diseases like cancer, type 2 diabetes and heart disease, and some of these can begin in childhood.

¹ Department of Health, 2011. Obesity General Information. [online] Available at: <http://www.dh.gov.uk/en/PublicHealth/Obesity/DH_078098> [Accessed 24 January 2012].

		disease, type 2 diabetes and cancer.	
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Why childhood obesity is an important issue

Childhood obesity is a national and global issue reaching epidemic levels. The prevalence of obesity has more than doubled in the last 25 years in the UK. If we do not act now, by 2050 Britain could be a mainly obese society².

In Lancashire, almost a quarter of reception year children were overweight or obese during 2010/11. This increased to almost a third of year six children being overweight or obese.

The following sections have been taken mainly from the government documents: 'Healthy weight, healthy lives: a toolkit for developing local strategies, 2008'³ and 'Healthy lives, healthy people: a call to action on obesity in England, 2011'⁴; other references are separately listed.

Overweight and obesity are terms used to describe increasing degrees of excess body fatness. Excess weight is caused by an energy imbalance between what is consumed and what is used by the body. The aim now is to increase healthy weight in the population rather than to focus on reducing obesity. This will make sure that overweight and underweight are not overlooked. There are four identified influences on body weight: human biology (e.g. genetics and metabolism), culture and individual psychology (behaviour – eating and physical activity habits), the food environment and the physical environment. Government strategy now aims not only to influence individual healthy lifestyle choices, but to target prevention through supportive environmental change. There is also greater emphasis on the psychosocial aspects of weight management.

² Department for Business Innovation and Skills, 2007. *Foresight – Tackling Obesity: Future Choices – Project Report*. [online] Available at: <http://webarchive.nationalarchives.gov.uk/+/http://www.bis.gov.uk/foresight/our-work/projects/current-projects/tackling-obesity/reports-and-publications> [Accessed 25 July 2012]

³ Department of Health, 2008. *Healthy weight, healthy lives: a toolkit for developing local strategies*. [online] Available at: http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/DH_088968 [Accessed 24 January 2012]

⁴ Department of Health, 2011. *Healthy lives, healthy people: a call to action on obesity in England*. [online] Available at

The most important consequence of childhood obesity is its persistence into adulthood and the early appearance of obesity-related disorders and diseases normally associated with middle age, such as hypertension and type two diabetes. Studies have shown that the higher a child's BMI and the older the child, the more likely they will be an overweight or obese adult - obesity at age six leads to more than 50% chance of being obese as an adult⁵.

Furthermore, research has demonstrated that the children of obese parents have a greater risk of becoming overweight or obese adults, increasing the likelihood of developing such health problems later in life. Children with at least one obese parent are at least three times more likely to be obese than those with no obese parents⁵. Focus has now shifted to a life stage approach including adults as an influence on children as part of a family.

In childhood, overweight and obesity are known to have a significant impact on psychological wellbeing, with many children developing a negative self-image, lowered self-esteem and a higher risk of depression. In addition, almost all obese children have experiences of teasing, social exclusion, discrimination and prejudice. In one study, it was shown that children as young as six years demonstrated negative perceptions in their obese peers.

The costs of obesity are likely to grow significantly in the next few decades. Apart from the personal costs there are significant health and social care costs associated with the treatment of obesity and its consequences as well as the costs to the wider economy arising from chronic ill health.

In 2007, the total annual direct health costs of overweight and obesity to the NHS were estimated to be £17.4 billion, with obesity alone accounting for £2.3 billion. The wider costs to the economy were estimated to be a further £15.8 billion. By 2050 the direct healthcare costs are predicted to have increased to £22.9 billion, of which obesity alone will account for £7.1 billion. The greatest cost increase is in the wider costs, which will have trebled to £49.9 billion.

New national ambitions

The government has laid down some new ambitions to reduce healthy weight across England. These are:

http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_130401 [Accessed 01 August 2012]

⁵ Whitaker R, Wright J, Pepe M, Seidel K, Dietz W. Predicting obesity in young adulthood from childhood and parental obesity. *N Eng J Med* 1997; 337:869-873

- A sustained downward trend in the level of excess weight in children by 2020
- A downward trend in the level of excess weight averaged across all adults by 2020

The Draft Public Health Outcomes Framework has two proposed outcome indicators on healthy weight prevalence in children and adults and the National Quality Board is developing a set of quality standards on the treatment of adult and child obesity.

Deprivation

Deprivation, as measured by the Index of Multiple Deprivation 2010⁶, has strong links with childhood weight. Large inequalities have been found at the national level with children in the most deprived areas being nearly twice as likely to be obese than those in the least deprived areas.

Ethnicity

There is no straightforward relationship between obesity and ethnicity, with a complex interplay of factors affecting health in minority ethnic communities in the UK. Different ethnic groups have different physiological responses to fat storage. Nationally, NCMP data shows that obesity appears to be increasing for Bangladeshi boys⁷.

Urban and rural

The National Obesity Observatory's 2006/07⁸ and 2007/08⁹ reports showed that variation in child obesity prevalence between urban and rural areas can possibly be explained by differences in the degree of deprivation and the ethnic mix in such areas.

Analysis by Mosaic Group

Mosaic is a household classification tool, which provides detailed understanding of the demographics, lifestyles and behaviours of citizens. One of the key strengths of the tool is that it provides an understanding of how individuals think and behave and how to

⁶ Communities and Local Government:

<http://www.communities.gov.uk/publications/corporate/statistics/indices2010>

⁷ National Obesity Observatory (NOO), 2011. *Obesity and ethnicity*. [online] NOO. Available at: http://www.noo.org.uk/NOO_pub/briefing_papers [Accessed 25 July 2012]

⁸ National Obesity Observatory (NOO), 2008. *National Child Measurement Programme: Detailed Analysis of the 2006/07 National Dataset* [online] NOO. Available at:

http://www.noo.org.uk/uploads/doc168_2_NOO_NCMP_report230608.pdf [Accessed 31 July 2012]

⁹ National Obesity Observatory (NOO), 2008. *National Child Measurement Programme: Detailed Analysis of the 2006/07 National Dataset* [online] NOO. Available at:

http://www.noo.org.uk/uploads/doc168_2_noo_NCMPreport1_110509.pdf [Accessed 31/07/2012]

communicate successfully with these population groups. As such, it provides a useful tool for understanding our populations and designing successful interventions for them.

Using the tool, the population is classified into the following groups based upon postcode:

- A – Residents of isolated rural communities
- B – Residents of small and mid-sized towns with strong local roots
- C – Wealthy people living in the most sought after neighbourhoods
- D – Successful professionals living in suburban or semi-rural homes
- E – Middle income families living in moderate suburban semis
- F – Couples with young children in comfortable modern housing
- G – Young well-educated city dwellers
- H – Couples and young singles in small modern starter homes
- I – Lower income workers in urban terraces in often diverse areas
- J – Owner occupiers in older-style housing in ex-industrial areas
- K – Residents with sufficient incomes in right-to-buy-social housing
- L – Active elderly people living in pleasant retirement locations
- M – Elderly people reliant on state support
- N – Young people renting flats in high density social housing
- O – Families in low-rise social housing with high levels of benefit need
- U - Unclassified

Although Mosaic relates primarily to adults, it can be used to analyse any data where the postcode is included as a field. In both school years in Lancashire, almost half of all children measured are classed as being in either of three groups:

- Group I, lower income workers in urban terraces in often diverse areas
- Group E, middle income families living in moderate suburban semis

- Group J, owner occupiers in older-style housing in ex-industrial areas

Considerations of analysis

Data set

PCTs provided the data they uploaded to the Department of Health rather than waiting for the dataset that is returned having been through its cleansing processes. The use of this as a preferred dataset is for several reasons:

1. In uploading the data a large number of validation checks are made so the data set is believed to be of very good quality.
2. The data is available much sooner – in September rather than December, which is felt to be much more useful to commissioners and other decision makers.
3. The PCTs check the original data uploaded against the data received and have found minimal differences.
4. Postcodes are not provided in the final dataset returned by the Department of Health, which would prevent some of the analysis being conducted.

Geography

The NCMP data set measures all children who attend schools within the boundaries of the PCT. However, some children will attend schools who reside outside the boundary. The analysis used here focuses on those children who reside within the Lancashire-14 area (the 12 Lancashire county districts plus the two unitary authorities Blackburn with Darwen and Blackpool) and sometimes the Lancashire-12 area (the county council footprint) rather than those who attend schools in those areas. Throughout this document the two Lancashire areas are referred to as Lancashire-12 (or L-12) and Lancashire-14 (or L-14). The analysis of schools is the only exclusion to this. Here the population attending the school is measured, regardless of their residential address.

This method has been chosen to enable a focus on the children over whom different organisations may have some influence through policies or services. Schools have the ability to intervene and influence all those children who attend their schools, regardless of where they live. They will therefore be interested in the analysis of their full population. However, district and unitary councils, the county council, PCTs and other geographically focused services will be able to intervene and influence (mostly) those children who reside within their geographical boundaries. The national analysis of the NCMP data measures the

children attending school within an area, rather than children residing in an area, which leads to some differences between the local and national analyses. The table below highlights these, and the majority of the differences are very small. Some of the differences will also be accounted for by the use of the uploaded data, rather than the cleansed data. The largest difference is in the Ribble Valley where there may be some cross-boundary school attendance in year six between Ribble Valley and the Craven district in North Yorkshire.

Table 2 - Differences between nationally and locally calculated prevalence

Area	Underweight prevalence (%)				Overweight prevalence (%)				Obese prevalence (%)			
	Reception		Year six		Reception		Year six		Reception		Year six	
	Nat	Local	Nat	Local	Nat	Local	Nat	Local	Nat	Local	Nat	Local
Lancashire-12	0.8	0.8	1.4	1.5	14.1	14.0	14.1	14.1	9.2	9.1	17.7	17.7
BwD	2.1	2.4	3.3	3.7	11.6	11.8	13.0	13.2	9.9	10.0	18.7	18.6
Blackpool	x	0.2	1.0	1.0	14.5	14.1	12.5	12.5	9.5	9.6	19.8	19.8
Burnley	1.1	1.1	0.8	1.1	15.3	15.1	14.9	14.8	11.0	10.8	20.3	20.2
Chorley	x	0.5	1.0	1.3	14.4	14.2	13.9	13.3	7.1	7.0	17.1	16.8
Fylde	x	0.5	2.3	2.3	14.3	14.1	17.2	16.5	8.2	8.0	16.0	15.8
Hyndburn	1.5	1.4	2.1	2.5	11.5	11.9	12.1	12.1	10.3	10.0	18.7	18.3
Lancaster	0.7	0.8	1.1	1.1	16.3	16.2	13.0	13.1	10.6	10.7	16.2	16.2
Pendle	0.9	1.0	2.1	2.4	13.9	14.1	13.5	13.9	9.8	9.8	17.2	17.0
Preston	2.0	1.7	2.6	2.4	11.4	11.3	13.6	13.7	8.6	8.4	18.6	18.5
Ribble Valley	x	0.2	0.9	1.0	16.0	16.3	14.2	13.8	7.8	7.9	12.2	13.8
Rossendale	x	0.1	0.9	1.0	14.3	13.6	15.2	15.5	10.7	10.5	16.5	16.8
South Ribble	0.5	0.4	1.0	1.2	12.6	12.9	13.2	13.6	8.4	8.1	16.2	16.1
West Lancs	x	0.3	x	0.4	16.5	16.7	15.2	15.1	10.8	10.4	21.5	21.7
Wyre	x	0.5	1.1	1.1	13.8	14.4	15.1	15.6	7.0	6.6	18.5	18.8

Notes:
x – data is suppressed. Nat stands for national calculated data, which is based upon the school address.
Local stands for locally calculated data, which is based upon the residential address of the pupil.
Source: NCMP 2010-11

Statistical significance

The analysis focuses on the levels of statistical significance rather than solely focusing on the absolute prevalence values. Confidence intervals are calculated with prevalence rates to account for natural fluctuations that occur within populations at different geographies and also from year to year. Only differences which occur outside of these confidence intervals are highlighted as these are considered to be true differences in the prevalence of overweight and obesity in children.

The majority of the analysis refers to overweight and obese as one group. This is to ensure that the results provide the greatest level of significance possible, but also reflects the general belief that early intervention is most appropriate so tackling overweight is the best way to tackle obesity.

To maximise the levels of significance, where the number of children measured is less than five, the numbers have been suppressed.

Analysis results

When reviewing the results of this analysis it is important to note that:

- Whilst data may show that a district or school may not be significantly different to the national average in statistical terms, hot spots for overweight and obesity will exist within each district. Please see our InstantAtlas report for details of overweight and obesity hotspots for small areas:

http://www.lancashire.gov.uk/office_of_the_chief_executive/lancashireprofile/ia/nationalchildmeasurementprogramme/atlas.html

- The national average for overweight and obesity is high so healthy weight should remain a priority area of work for everyone.

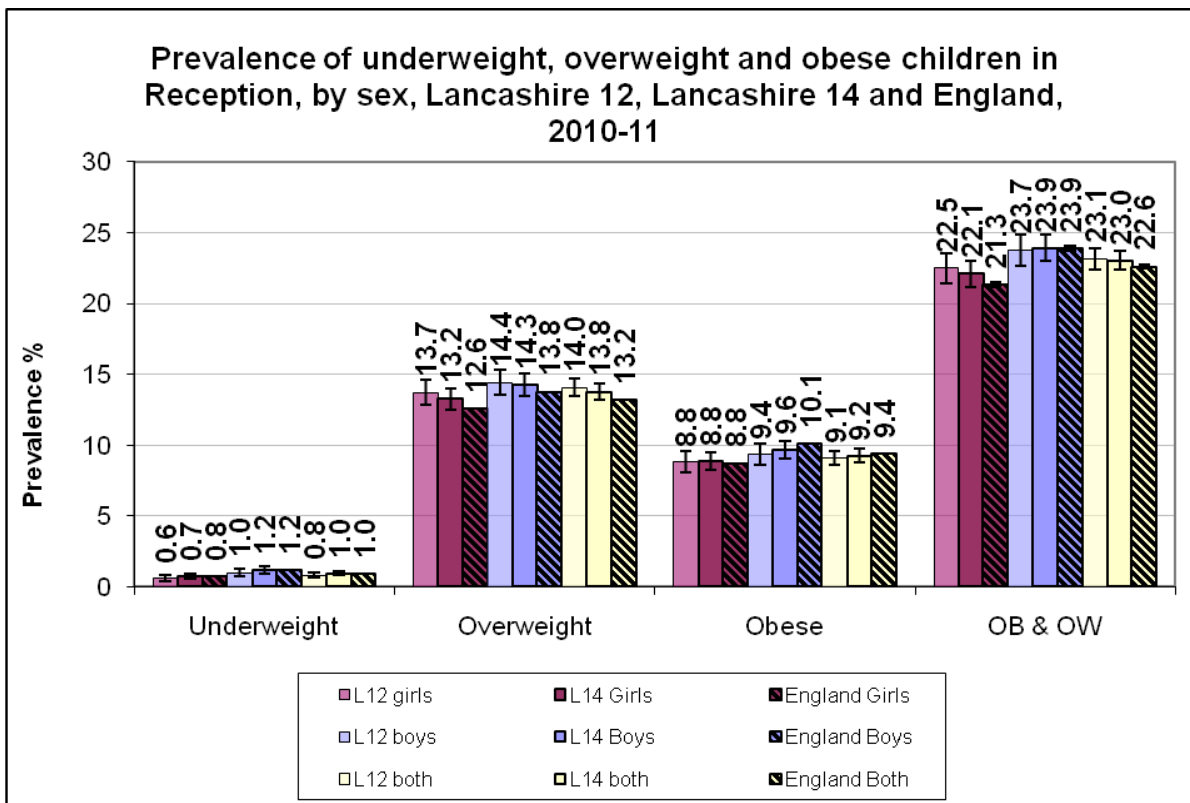
Gender analysis

According to the 2010-11 dataset, in the Lancashire-14 area overweight is more common in reception year than obesity – 14% of children are overweight and 9% obese in this cohort. 23% of reception age children are recorded as overweight and obese.

Nationally, boys are statistically more likely to be overweight than girls in reception year. In Lancashire however, this trend is not reflected and there is no statistical difference between the prevalence of overweight and obesity between boys and girls in reception year. Neither is there any statistical difference locally between boys and girls in terms of underweight prevalence (another variance from the national results). 22% of girls were overweight and obese in the 2010-11 reception class compared to 24% of boys.

Prevalence of underweight and obesity in reception year for both sexes is in line with the national prevalence. Overweight prevalence in reception year however is significantly higher in the Lancashire-14 area than nationally. This is mainly attributable to higher females prevalence within the Lancashire-12 area.

Figure 1 underweight, overweight and obesity in reception year



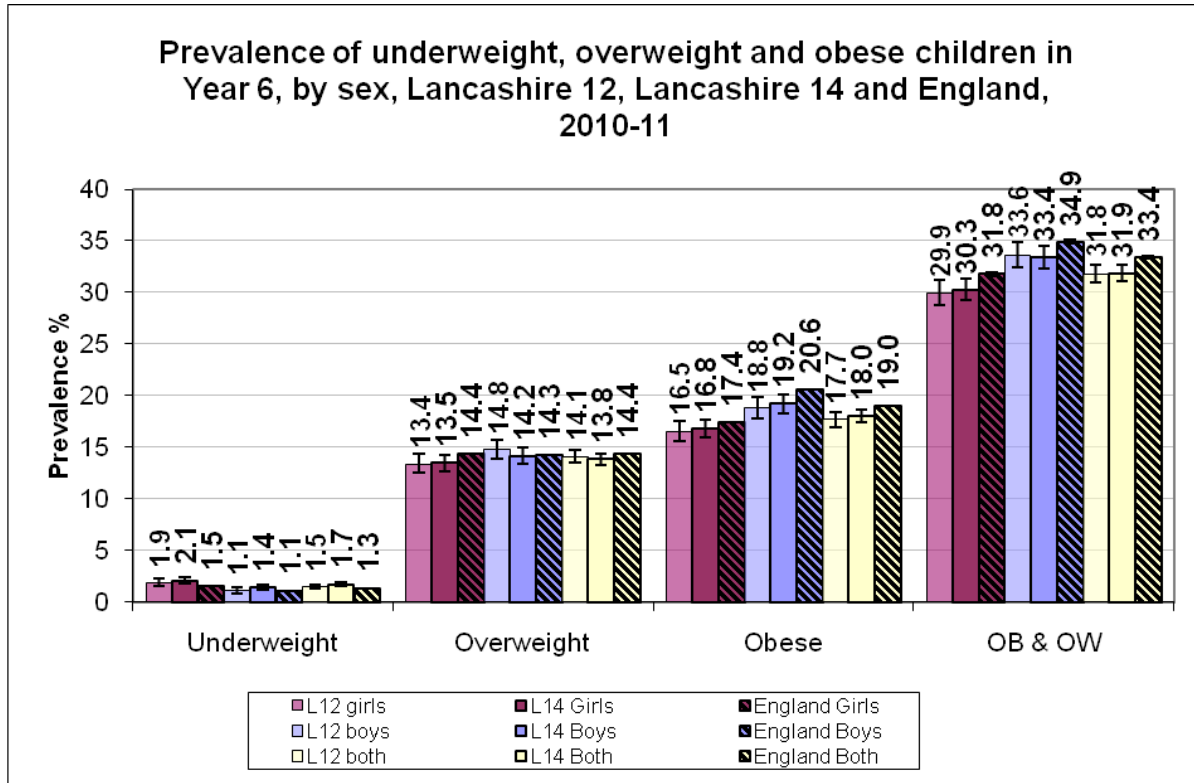
The prevalence of overweight and obesity is significantly greater in year six than in reception year, rising from almost a quarter (23%) of all children in Lancashire-14 to nearly a third (32%). Obese is now significantly more common than overweight, 18% versus 14%. If we consider the rates in year six against the rates in reception year we can see the different patterns between the two years of school children. In reception and year six, overweight prevalence was 14% whereas obesity is much more prevalent in year six than in reception year, 18% versus 9%. Although this is not the same cohort of children this is still a remarkable difference in rates and indicates a population pattern of obesity increasing with age.

Gender differences are now present with boys in Lancashire-14 significantly more likely to be overweight and obese than girls. This reflects the national pattern. However, the Lancashire-14 prevalence of overweight and obesity amongst year six boys is still significantly lower than the national rate.

At the other end of the spectrum, the prevalence of underweight in year six is significantly higher than in reception year and this is entirely due to a higher prevalence amongst girls. The prevalence of underweight amongst girls in year six is significantly higher than that of boys. This also mirrors the national picture.

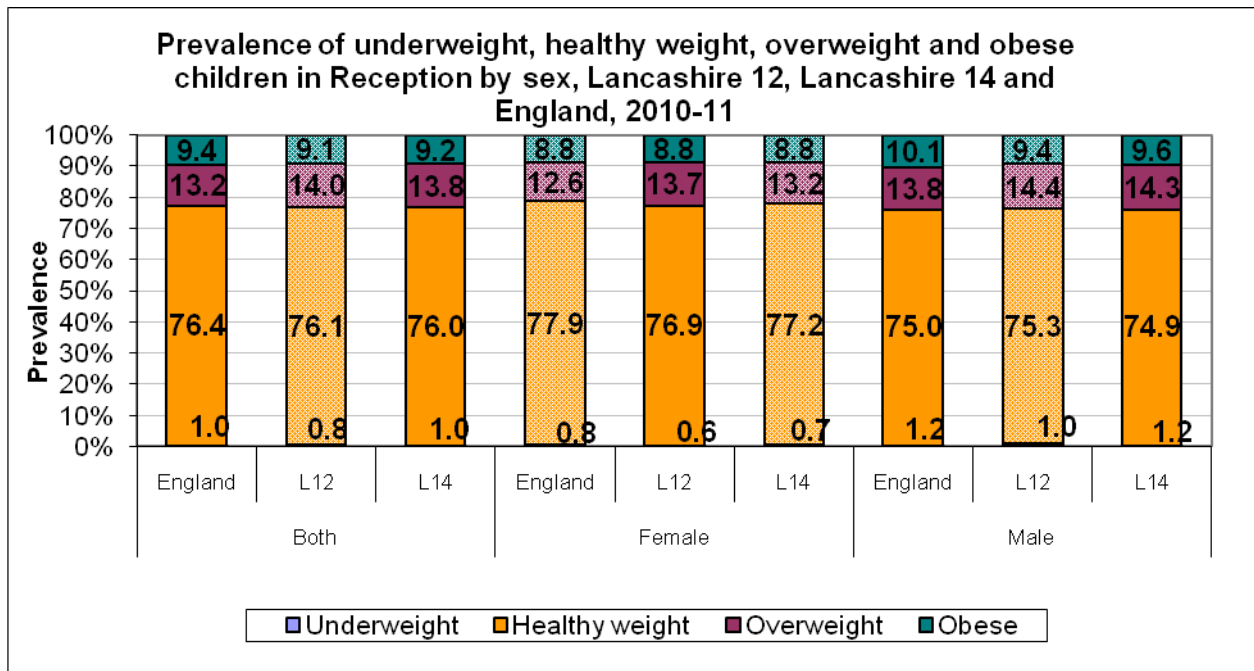
Compared to the national average, year six children in Lancashire-14 are significantly more likely to be underweight than their national counterparts, Lancashire-14 boys in year six are significantly less likely to be obese, and girls are significantly less likely to be overweight than nationally.

Figure 2 - underweight, overweight and obesity in year six



The graph below highlights that healthy weight prevalence in reception year in Lancashire-14 is in line with national prevalence.

Figure 3 – reception BMI category by gender

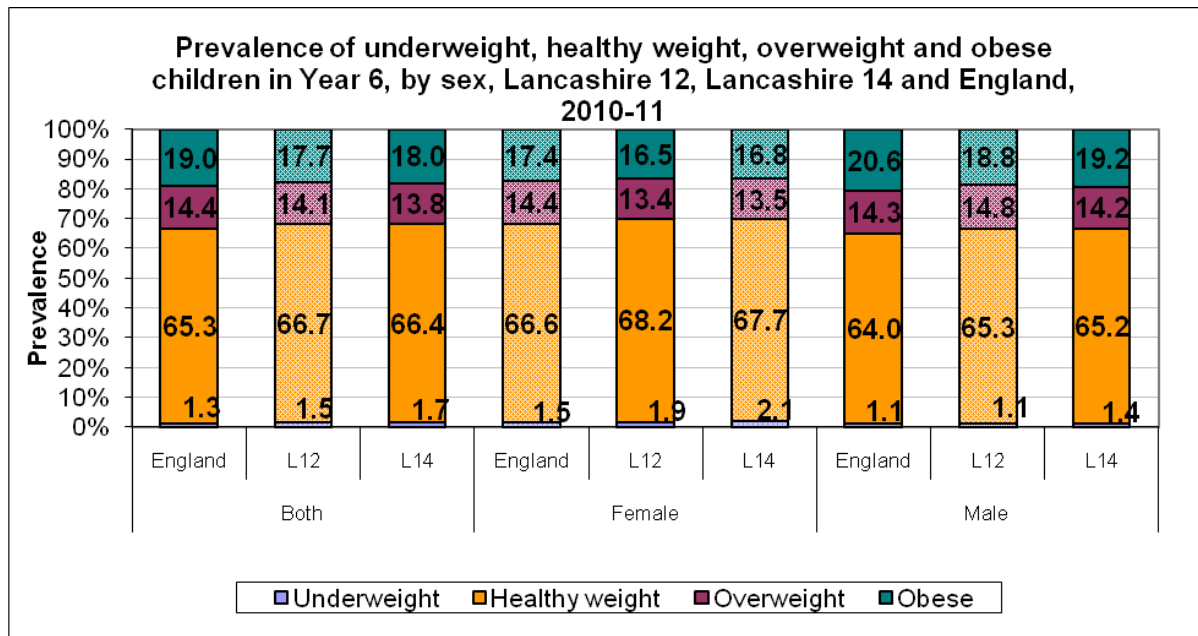


The only statistically significant result is that:

- Reception children in Lancashire-12 and Lancashire-14 are more likely to be overweight than their national counterparts. When broken down by gender the result is only statistically higher for the girls.

The chart below shows the breakdown of BMI category in year six.

Figure 4 – year six BMI category by gender



The following results are statistically significant:

- Year six children in Lancashire-12 and Lancashire-14 are more likely to be underweight than nationally.

- Year six children in Lancashire-12 and Lancashire-14 are less likely to be obese and more likely to be healthy weight than nationally.
- Year six girls in Lancashire-12 and Lancashire-14 are less likely to be overweight than nationally.

Key findings:

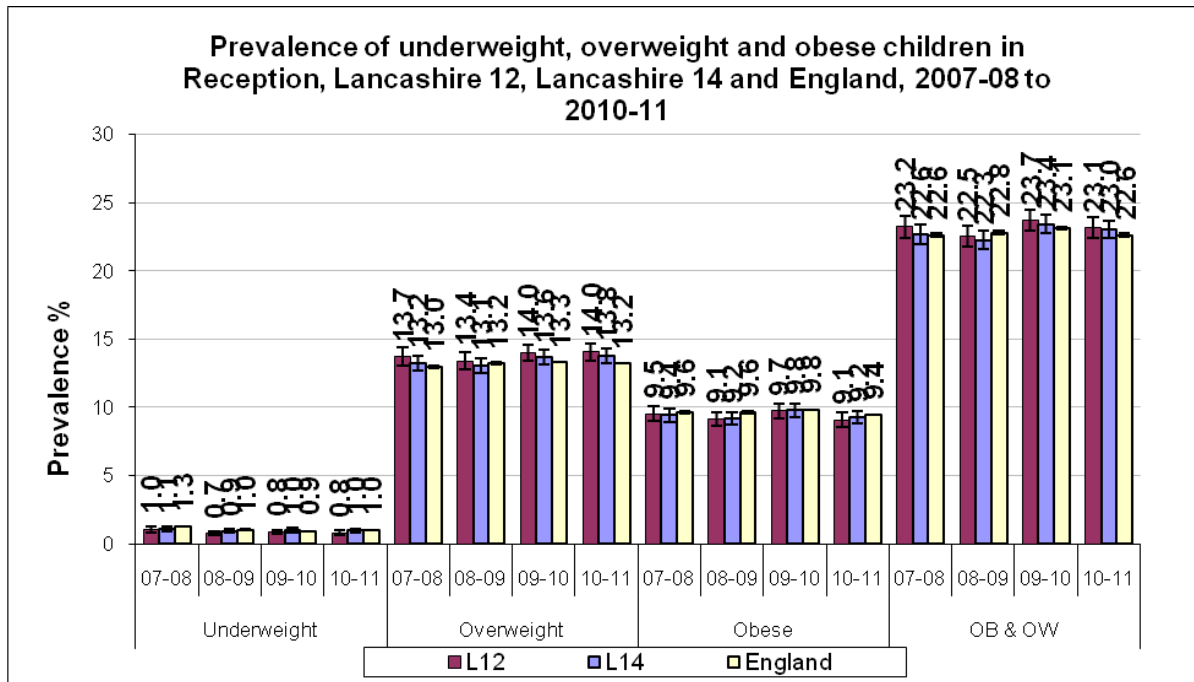
- Almost a quarter (23%) of reception year children were overweight or obese in Lancashire-14 during 2010-11. In year six the rate was almost a third (32%).
- Boys in Lancashire-14 were significantly more likely than girls to be overweight or obese in year six (33% versus 30%).
- In Lancashire-14, less than 2% of children are underweight in both years. Girls are significantly more likely to be underweight in year six than boys.
- In Lancashire-14, reception age children are more likely to be overweight than obese (14% versus 9%), whereas in year six this trend is reversed as obesity is more prevalent than overweight (18% versus 14%).
- Year six children in Lancashire-12 and Lancashire-14 are significantly more likely to be underweight than nationally. Year six girls in Lancashire-12 and Lancashire-14 are less likely to be overweight than nationally.

Time series analysis

Nationally, children in reception year are significantly more likely to be overweight in 2010-11 than in 2007-08 in statistical terms. In year six, they are now significantly more likely to be obese than in 2007-08. They are also significantly *less* likely to be underweight in both school years.

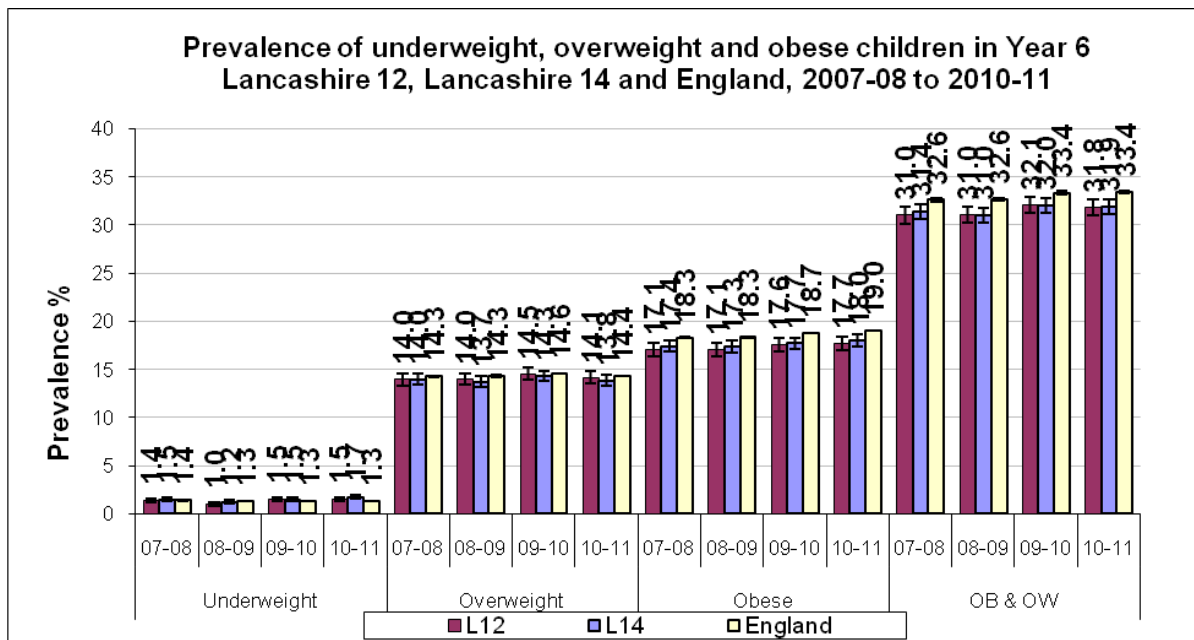
In Lancashire-14 there have been no significant changes in the levels of underweight, overweight or obesity between 2007-08 and 2010-11 in reception or year six. This consistency could be taken as a sign of success in halting the rise in overweight and obesity locally.

Figure 4 – reception year underweight, overweight and obesity over time, 2007-08 to 2010-11



Year six prevalence of obesity in Lancashire-12 and Lancashire-14 was statistically lower than the national prevalence in 2007-08, 2008-09, 2009-10 and 2010-11. Whilst this is a positive, it is important to keep sight of the fact that over 17% of year six children were measured to be obese in all four academic years.

Figure 5 - year six underweight, overweight and obesity over time, 2007-08 to 2010-11



Lancashire-12 and Lancashire-14 also had higher than national prevalence of healthy weight in year six children found locally in all four academic years, in terms of statistical significance.

Table 3 - reception and year six healthy weight prevalence by district over time, 2007-08 to 2010-11

Healthy weight prevalence Area	07-08						08-09						09-10					
	Reception			Year six			Reception			Year six			Reception			Year six		
	%	LCL	UCL	%	%	LCL	UCL	%	%	LCL	UCL	%	%	LCL	UCL	%	%	LCL
Eng	76.2	76.0	76.3	66.0	65.9	66.1	76.2	76.1	76.3	66.1	65.9	66.2	76.0	76.0	76.0	65.4	65.4	65.4
Lancashire-14	76.3	75.6	77.0	67.1	66.3	67.9	76.8	76.1	77.5	67.7	67.0	68.5	75.6	75.0	76.3	66.5	65.8	67.3
Lancashire-12	75.8	74.9	76.6	67.6	66.7	68.5	76.8	76.0	77.5	68.0	67.1	68.8	75.5	74.7	76.2	66.5	65.6	67.3
Blackburn with Darwen	78.5	76.5	80.3	65.3	62.9	67.6	77.9	75.9	79.7	66.2	63.9	68.4	75.7	73.8	77.6	66.9	64.6	69.0
Blackpool	77.4	75.1	79.5	65.5	63.2	67.8	76.1	73.9	78.1	67.7	65.3	70.0	76.9	74.8	79.0	66.5	64.1	68.8
Burnley	75.5	72.6	78.2	69.1	66.0	72.1	73.4	70.6	76.0	65.9	62.9	68.8	75.1	72.5	77.5	62.5	59.5	65.5
Chorley	77.2	74.4	79.7	67.6	64.5	70.5	78.5	76.0	80.8	68.1	65.2	70.9	75.5	72.9	78.0	67.4	64.4	70.2
Fylde	79.4	75.9	82.5	66.8	63.2	70.2	77.5	73.8	80.8	72.9	69.3	76.2	80.1	77.0	82.9	68.8	65.2	72.2
Hyndburn	79.0	75.9	81.9	65.4	61.9	68.8	74.9	72.2	77.6	62.7	59.5	65.7	74.9	72.1	77.4	65.6	62.5	68.5
Lancaster	73.9	71.4	76.2	68.0	65.3	70.5	73.8	71.2	76.2	71.3	68.7	73.8	72.9	70.3	75.3	66.0	63.3	68.5
Pendle	74.9	72.0	77.6	67.0	63.8	70.1	77.5	74.8	79.9	69.7	66.7	72.5	75.2	72.5	77.7	66.5	63.5	69.4
Preston	73.7	71.0	76.2	68.4	65.8	70.8	79.1	76.8	81.2	67.6	65.1	70.0	76.2	73.9	78.3	67.4	64.9	69.9
Ribble Valley	79.3	75.4	82.8	66.0	61.7	70.1	77.7	73.6	81.2	70.0	66.2	73.6	75.5	71.7	78.9	72.3	68.4	76.0
Rosendale	72.7	69.1	76.0	71.1	67.3	74.6	75.3	71.9	78.4	65.5	61.9	69.0	73.8	70.5	76.8	63.9	60.3	67.4
South Ribble	75.6	72.7	78.2	68.4	65.5	71.2	79.9	77.5	82.1	66.7	63.8	69.4	76.7	74.1	79.1	67.4	64.6	70.0
West Lancashire	72.5	69.6	75.3	66.3	63.4	69.0	76.5	73.8	79.0	66.9	64.0	69.7	73.4	70.7	76.0	66.1	63.2	68.8
Wyre	79.8	77.1	82.3	66.5	63.6	69.4	77.0	74.2	79.6	69.6	66.6	72.5	77.9	75.1	80.4	66.0	62.9	68.9

The following results are statistically significant:

- Between 2007-08 and 2010-11, national healthy weight prevalence increased in reception year and decreased in year six..

Appendix B gives a breakdown of underweight, overweight and obesity prevalence by district for the four academic years. The following district time-series results were statistically significant:

- In reception year the prevalence of underweight in Pendle has decreased between 2007-08 and 2010-11.
- Over the same period healthy weight prevalence increased for reception year children in Preston.

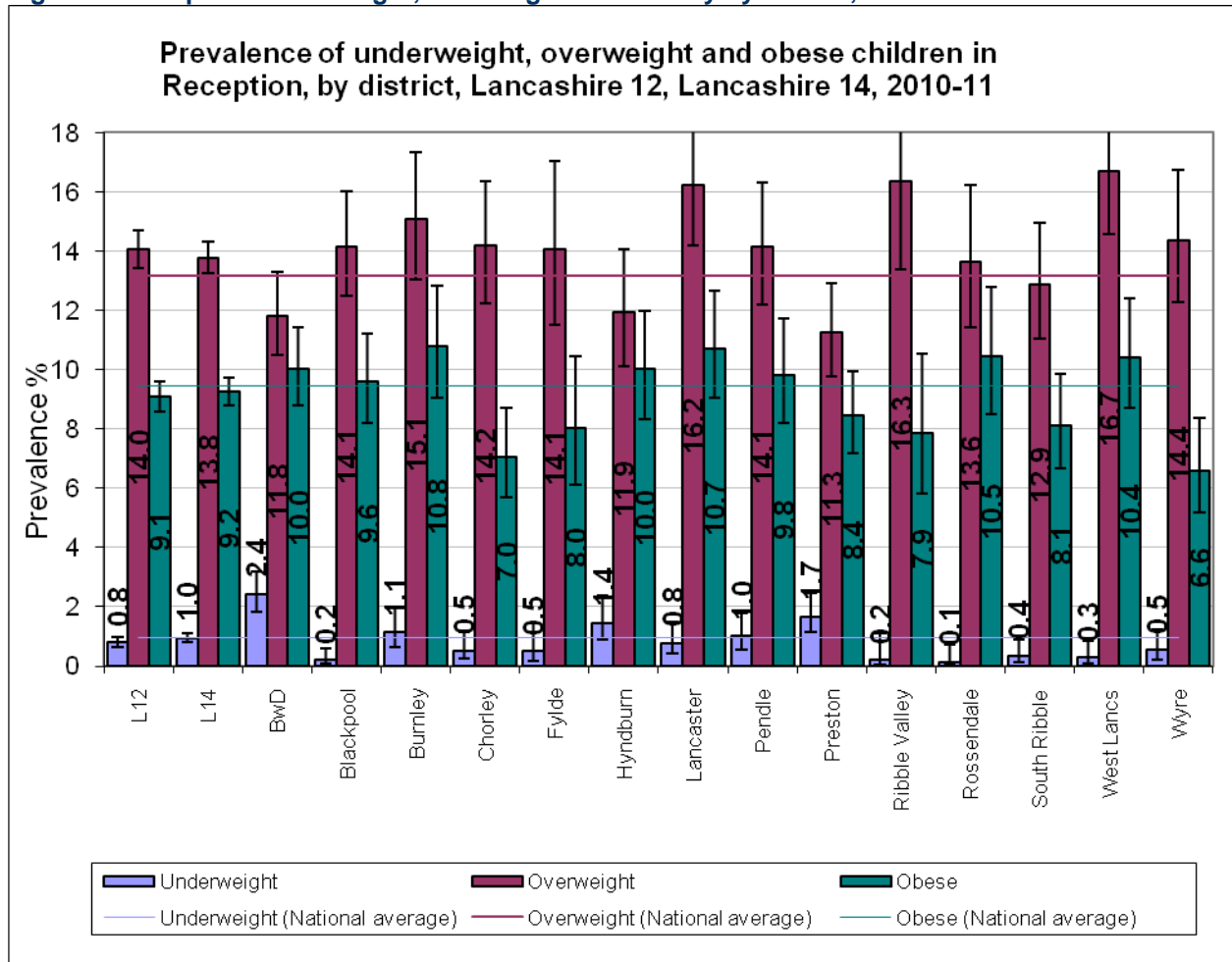
Key findings:

- Rates of underweight, overweight and obesity in Lancashire-12 and Lancashire-14 have stayed fairly consistent between 2007-08 and 2010-11.
- Healthy weight prevalence for year six children in Lancashire-12 and Lancashire-14 has been statistically significantly higher than the national average for four consecutive years.

District analysis

District level analysis highlights wide variations in the prevalence of overweight and obesity in reception year children during 2010-11. In line with the national and Lancashire patterns, overweight is more common than obesity in all districts, although the difference is not statistically significant in all cases. In reception year, the lowest levels of overweight are found in Preston where 11% of children are overweight. The highest prevalence is found in West Lancashire where 17% of reception year children were measured to be overweight. Prevalence of obesity ranges from 7% in Chorley and Wyre to 11% in Burnley, Lancaster and Rossendale. Underweight is similarly varied, ranging from 0.1% of reception children in Rossendale to 2.4% in Blackburn with Darwen.

Figure 6 - reception underweight, overweight and obesity by district, 2010-11



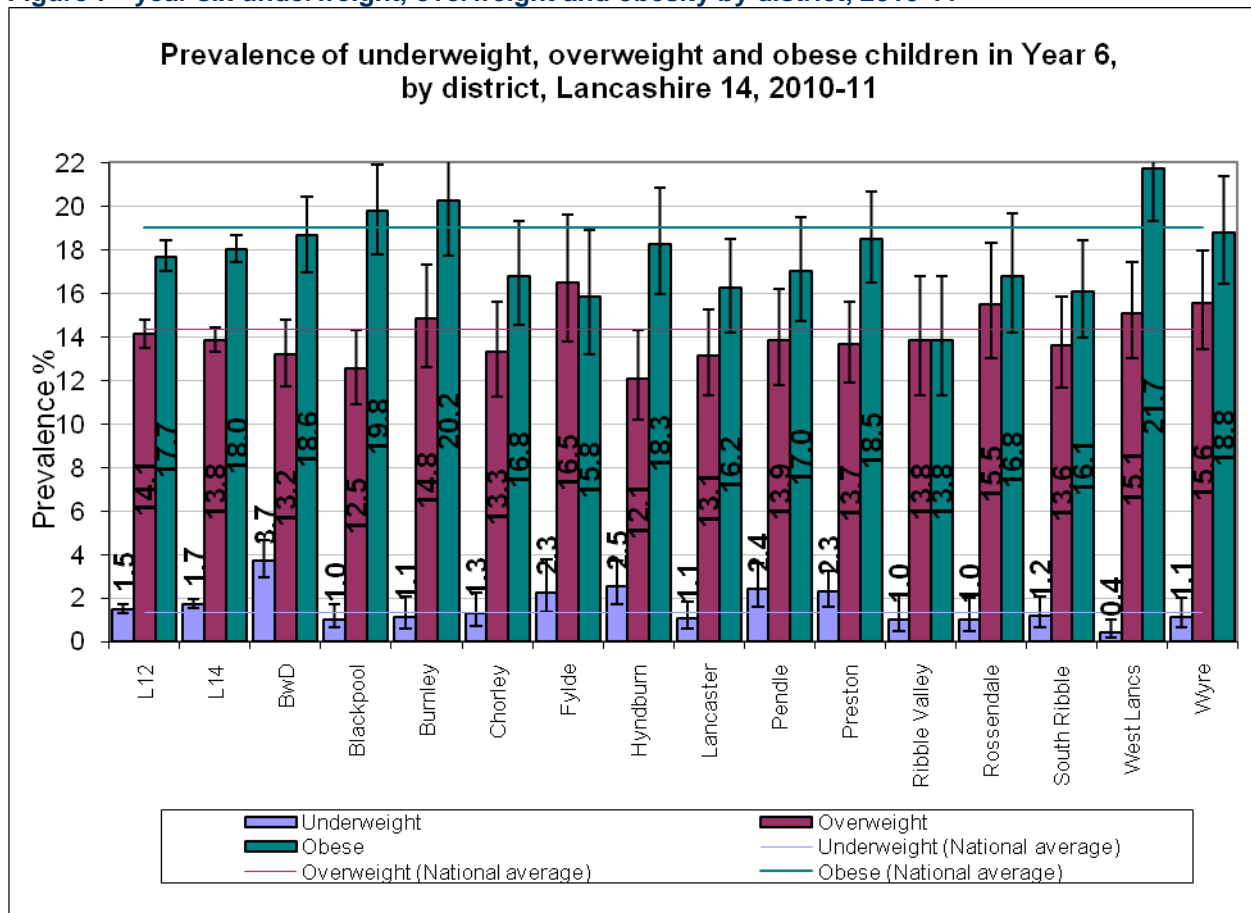
The following results were found to be statistically significant in reception year in 2010-11:

- The prevalence of underweight in Blackburn with Darwen, and Preston is above the national and L14 averages.
- The prevalence of underweight in Blackpool and Rossendale is below the national and L14 averages.
- The prevalence of underweight in South Ribble and West Lancashire is below the national average.
- The prevalence of overweight in West Lancashire is above the national and L14 averages.
- The prevalence of overweight in both Lancashire footprints, Lancaster and Ribble Valley is above the national average.
- The prevalence of overweight in Preston is lower than the national and L14 averages.

- The prevalence of obesity in Chorley and Wyre is below the national and L14 averages.

The general trend for obesity to become more prevalent than overweight in year six is present at the district level in 2010-11. Rates of overweight in year six range from 12% in Hyndburn to 17% in Fylde. Rates of obesity in year six range from 14% in Ribble Valley to 22% in West Lancashire. Underweight prevalence ranges from 0.4% in West Lancashire to 3.7% in Blackburn with Darwen.

Figure 7 - year six underweight, overweight and obesity by district, 2010-11



The following results for year six children are statistically significant for 2010-11:

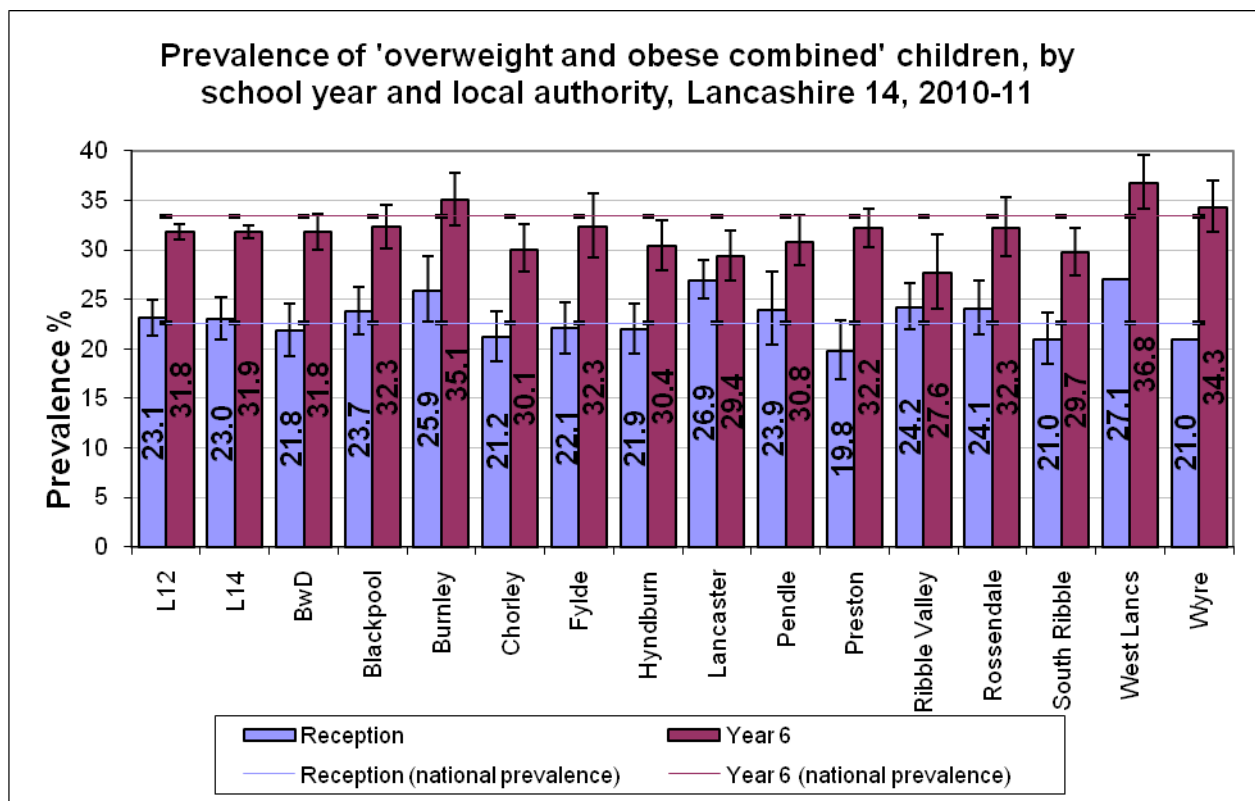
- The prevalence of underweight in Blackburn with Darwen is above the national and L14 averages.
- The prevalence of underweight in L14, Fylde, Hyndburn, Pendle and Preston is above the national average.
- The prevalence of underweight in West Lancashire is below the national and L14 averages.
- The prevalence of overweight in Blackpool and Hyndburn is lower than the national average.

- The prevalence of obesity in West Lancashire is above the national and L14 averages.
- The prevalence of obesity in Ribble Valley is below the national and L14 averages.
- The prevalence of obesity in both Lancashire footprints, Fylde, Lancaster and South Ribble is below the national average.

Grouping overweight and obese into one category gives a greater degree of statistical significance to the results due to the larger numbers involved. Obesity and overweight is more common in year six than reception year in every district except Lancaster and Ribble Valley where the increase is not statistically significant. There is a wide variation by district; less than a fifth of reception age children in Preston are overweight and obese compared to more than a quarter in Burnley, Lancaster and West Lancashire.

There is also wide variation for year six children at district level with 28% being overweight and obese in Ribble Valley compared to more than a third of children in Burnley, West Lancashire and Wyre.

Figure 8 - overweight and obesity by district and school year, 2010-11



The following results were found to be statistically significant:

- Prevalence of reception year overweight and obesity in Burnley, Lancaster and West Lancashire is above the national average.
- Prevalence of reception year overweight and obesity in Preston is below the national average.
- Prevalence of year six overweight and obesity in West Lancashire is above the national average.
- Prevalence of year six overweight and obesity in both Lancashire footprints, Chorley, Lancaster, Ribble Valley and South Ribble is below the national average.

Again, we have pooled the data for districts for 2008-09, 2009-10 and 2010-11 to give more robust results. The traffic light table below shows the districts which were found to have statistically significantly higher or lower prevalence of overweight, obesity or overweight and obese combined compared to the national average during 2008-09 to 2010-11.

Table 4 - district hotspots by BMI category 2008-09 to 2010-11

District	Reception			Year six		
	Overweight	Obese	OW & OB	Overweight	Obese	OW & OB
Blackburn with Darwen	Sig. lower	Not sig. diff	Sig. lower	Sig. lower	Not sig. diff	Sig. lower
Blackpool	Not sig. diff	Not sig. diff	Not sig. diff	Sig. lower	Not sig. diff	Not sig. diff
Burnley	Sig. higher	Not sig. diff	Sig. higher	Not sig. diff	Not sig. diff	Not sig. diff
Chorley	Not sig. diff	Sig. lower	Not sig. diff	Not sig. diff	Sig. lower	Sig. lower
Fylde	Not sig. diff	Sig. lower	Not sig. diff	Not sig. diff	Sig. lower	Sig. lower
Hyndburn	Not sig. diff	Sig. higher	Not sig. diff	Not sig. diff	Not sig. diff	Not sig. diff
Lancaster	Sig. higher	Sig. higher	Sig. higher	Not sig. diff	Sig. lower	Sig. lower
Pendle	Not sig. diff	Not sig. diff	Not sig. diff	Not sig. diff	Sig. lower	Sig. lower
Preston	Sig. lower	Sig. lower	Sig. lower	Not sig. diff	Not sig. diff	Sig. lower
Ribble Valley	Not sig. diff	Not sig. diff	Not sig. diff	Not sig. diff	Sig. lower	Sig. lower
Rossendale	Sig. higher	Not sig. diff	Sig. higher	Not sig. diff	Not sig. diff	Not sig. diff
South Ribble	Not sig. diff	Sig. lower	Sig. lower	Not sig. diff	Sig. lower	Sig. lower
West Lancashire	Sig. higher	Sig. higher	Sig. higher	Not sig. diff	Not sig. diff	Not sig. diff
Wyre	Not sig. diff	Sig. lower	Not sig. diff	Not sig. diff	Not sig. diff	Not sig. diff

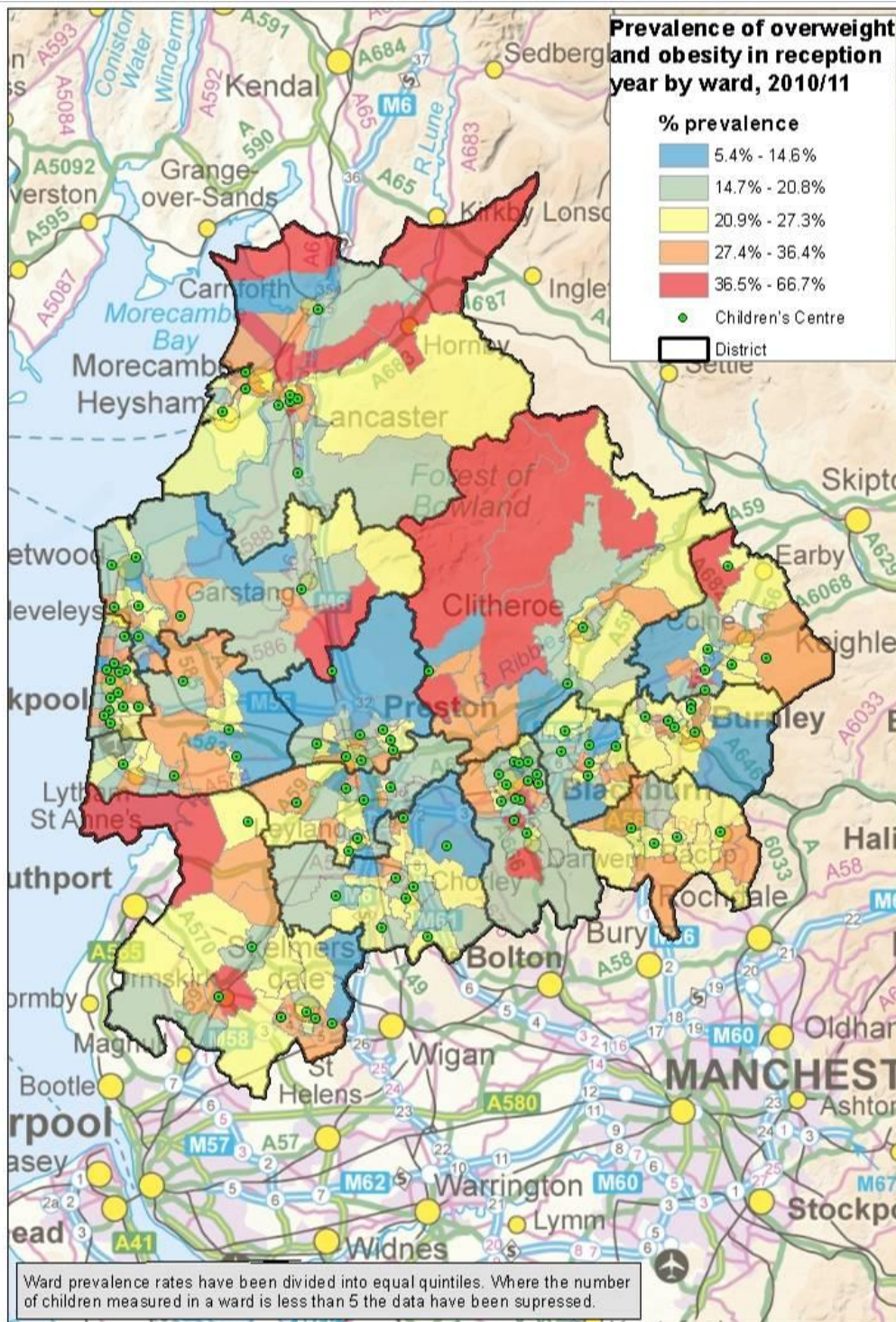
Ward level analysis

The map below shows the ward level rates of overweight and obese children in reception year in 2010-11 and highlights the location of children's centres across Lancashire-14. The areas highlighted in red are those where 36.5% or more of children were measured to be overweight or obese. These red areas represent prevalence rates in the highest 20% within Lancashire-14. What is immediately apparent is the number of areas with high prevalence of overweight and obesity and

limited access to children's centres. Another striking point is how many rural areas appear to have high overweight and obesity prevalence.

Appendix C is a separate document containing district maps with a key to ward names for reference.

Map 1 - Prevalence of overweight and obese children in reception year by ward, 2010-11

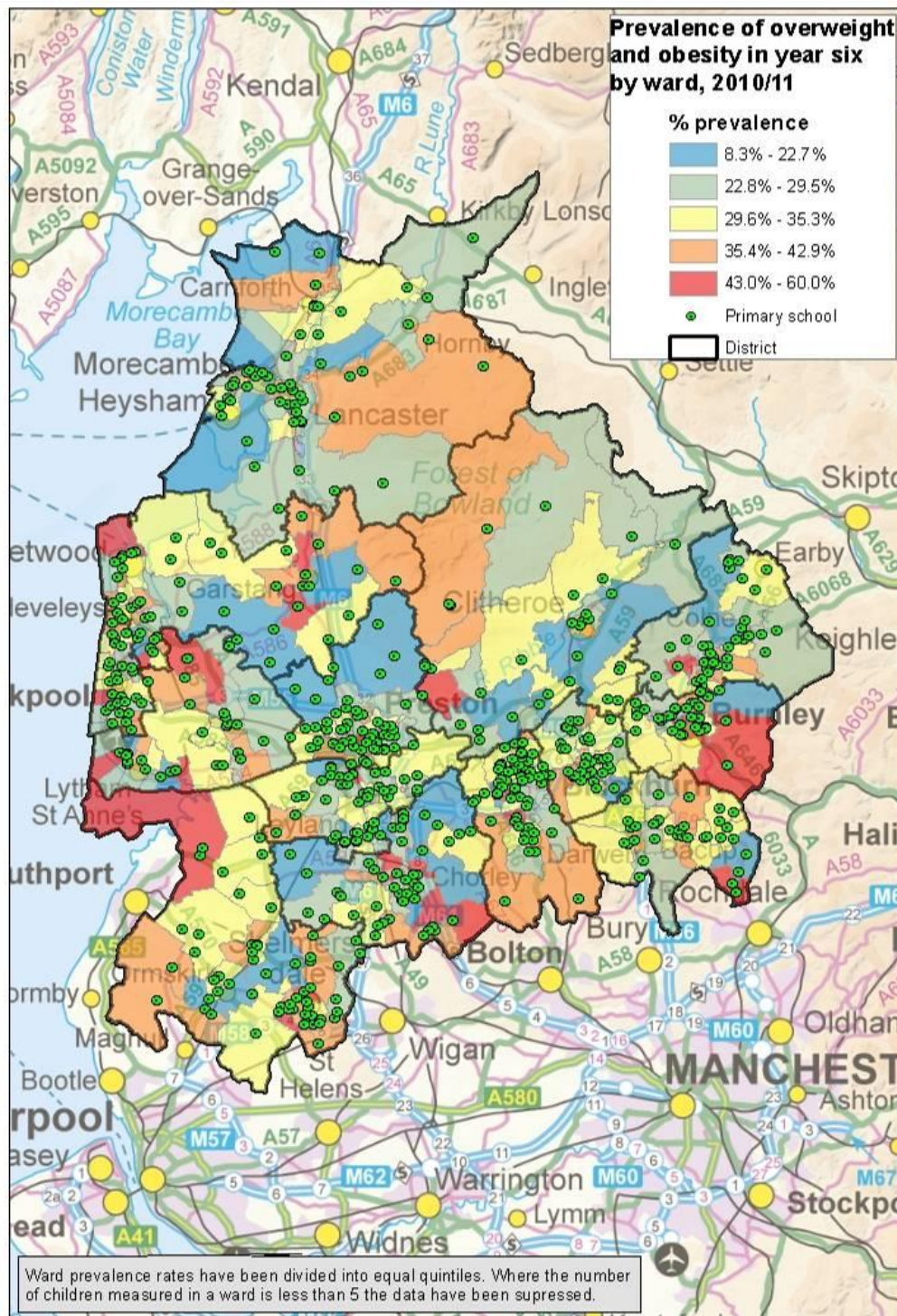


Produced by the Lancashire JSNA team, January 2012 using data from the National Child Measurement Programme 2010/11.

The map below shows ward level prevalence of overweight and obesity in year six in 2010-11. The areas highlighted in red are those where 43.0% or more of children were measured to be overweight and obese. Again, this represents prevalence rates in the top 20% in Lancashire-14.

The map also pinpoints primary schools across the area. Again many rural areas have high overweight and obesity prevalence.

Map 2 - Prevalence of overweight and obese children in year six by ward, 2010-11

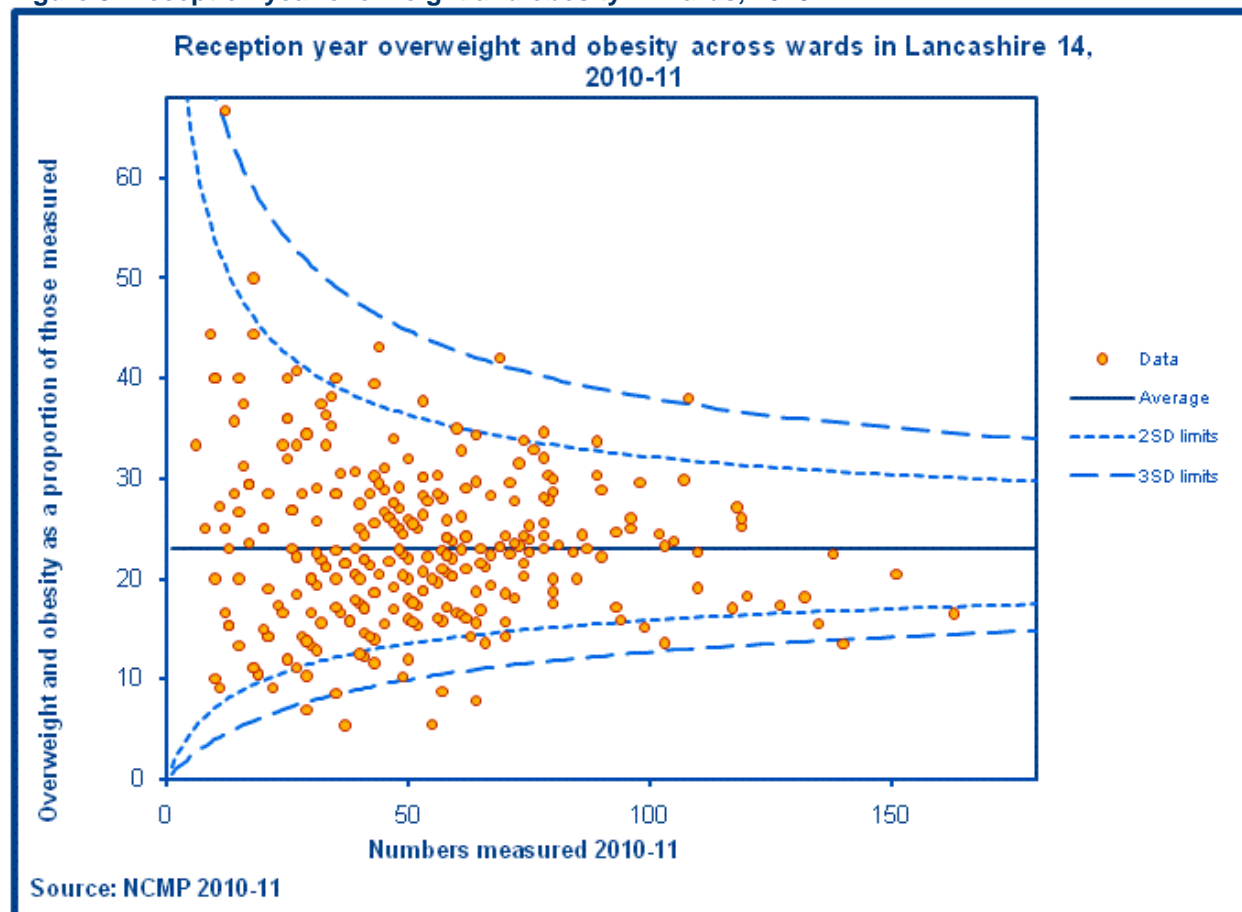


Produced by the Lancashire JSNA team, January 2012 using data from the National Child Measurement Programme 2010/11.

District level maps are available in appendix A.

Ward level analysis must always be used with caution as the small numbers involved can mean that the prevalence rates vary widely and are subject to large margins of error. The funnel plot below shows ward level overweight and obesity prevalence in reception year in 2010-11.

Figure 9 - reception year overweight and obesity in wards, 2010-11



The table below highlights the wards with prevalence rates significantly different to the Lancashire-14 average in 2010-11. Only ten wards are found to have high rates of overweight and obesity in reception year: Earcroft, Ewood, Higher Croft and Whitehall in Blackburn with Darwen; Bank Hall in Burnley; Silverdale and Upper Lune Valley in Lancaster; Brierfield and Craven in Pendle; and Scott in West Lancashire.

Table 5 - reception overweight and obesity significant wards, 2010-11

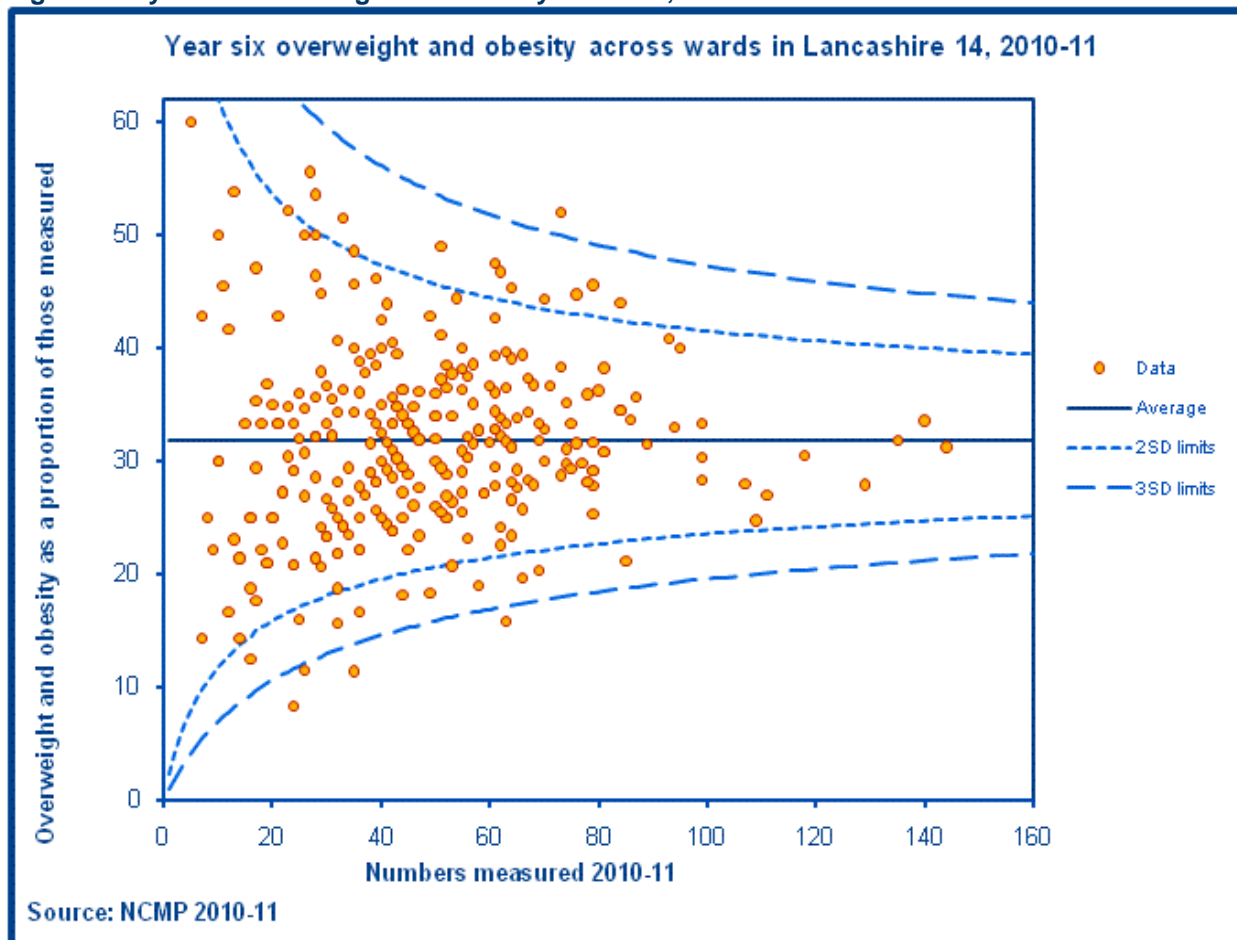
LA name	Ward Name	% Prevalence of overweight and obese	Number measured	Significance level
Lancaster	Upper Lune Valley	66.7	12	High (0.001)
Lancaster	Silverdale	50.0	18	High (0.025)
Blackburn with Darwen	Earcroft	43.2	44	High (0.025)
Pendle	Brierfield	42.0	69	High (0.001)
Blackburn with Darwen	Whitehall	40.0	35	High (0.025)
West Lancashire	Scott	39.5	43	High (0.025)
Blackburn with Darwen	Higher Croft	38.0	108	High (0.001)
Pendle	Craven	37.7	53	High (0.025)
Burnley	Bank Hall	34.6	78	High (0.025)

LA name	Ward Name	% Prevalence of overweight and obese	Number measured	Significance level
Blackburn with Darwen	Ewood	33.7	89	High (0.025)
Blackburn with Darwen	Audley	16.6	163	Low (0.025)
Blackburn with Darwen	Bastwell	15.6	135	Low (0.025)
Blackburn with Darwen	Little Harwood	15.2	99	Low (0.025)
Hyndburn	Altham	14.3	70	Low (0.025)
Pendle	Clover Hill	14.3	63	Low (0.025)
Blackpool	Warbreck	13.6	66	Low (0.025)
Pendle	Bradley	13.6	103	Low (0.025)
Blackburn with Darwen	Shear Brow	13.6	140	Low (0.001)
Preston	Preston Rural East	12.5	40	Low (0.025)
Chorley	Wheelton and Withnell	12.2	41	Low (0.025)
Hyndburn	Immanuel	12.0	50	Low (0.025)
Wyre	Mount	11.6	43	Low (0.025)
Fylde	Freckleton East	11.1	27	Low (0.025)
South Ribble	Whitefield	10.3	29	Low (0.025)
South Ribble	Walton-le-Dale	10.2	49	Low (0.025)
South Ribble	Leyland St Mary's	9.1	22	Low (0.025)
Chorley	Euxton North	8.8	57	Low (0.001)
Wyre	Breck	8.6	35	Low (0.025)
Preston	Preston Rural North	7.8	64	Low (0.001)
Wyre	Carleton	6.9	29	Low (0.001)
Preston	Sharoe Green	5.5	55	Low (0.001)
Preston	College	5.4	37	Low (0.001)

High (0.001) significance means that the rate is statistically significant to 99% confidence levels indicating it is highly unlikely that the high prevalence can be explained by natural variation in the population. High (0.025) indicates the rate is statistically significant to 95% confidence levels. Although not as robust as 99%, the results are still unlikely to be reflecting natural variation in the population.

The funnel plot below shows the prevalence of overweight and obesity in year six in Lancashire wards in 2010-11.

Figure 10 - year six overweight and obesity in wards, 2010-11



The following table lists the wards with prevalence of overweight and obesity which was significantly different from the Lancashire average in 2010-11. Only 13 wards have significantly high rates: Earcroft and Ewood in Blackburn with Darwen; Bloomfield in Blackpool; Bank Hall and Rosehill with Burnley Wood in Burnley; Chorley North East in Chorley; Ashton in Preston; Ashurst, North Meols and Skelmersdale South in West Lancashire; and High Cross, Pharos and Warren in Wyre.

Table 6 - year six overweight and obesity significant wards, 2010-11

LA name	Ward name	% Prevalence of overweight and obese	Number measured	Significance level
Wyre	High Cross	55.6	27	High (0.025)
West Lancashire	North Meols	53.6	28	High (0.025)
West Lancashire	Skelmersdale South	52.1	73	High (0.001)
Preston	Ashton	51.5	33	High (0.025)
Wyre	Pharos	49.0	51	High (0.025)
Blackburn with Darwen	Earcroft	48.6	35	High (0.025)
Burnley	Rosehill with Burnley Wood	47.5	61	High (0.025)
Chorley	Chorley North East	46.8	62	High (0.025)
West Lancashire	Ashurst	45.6	79	High (0.025)
Burnley	Bank Hall	45.3	64	High (0.025)
Blackpool	Bloomfield	44.7	76	High (0.025)
Wyre	Warren	44.3	70	High (0.025)

Blackburn with Darwen	Ewood	44.0	84	High (0.025)
Hyndburn	Spring Hill	21.2	85	Low (0.025)
Hyndburn	Baxenden	20.8	53	Low (0.025)
Blackburn with Darwen	Meadowhead	20.3	69	Low (0.025)
Chorley	Chorley South East	19.7	66	Low (0.025)
Preston	Preston Rural North	19.0	58	Low (0.025)
Pendle	Craven	18.4	49	Low (0.025)
Chorley	Clayton-le-Woods West and Cuerden	18.2	44	Low (0.025)
Ribble Valley	Whalley	16.7	36	Low (0.025)
Ribble Valley	Clayton-le-Dale with Ramsgreave	16.0	25	Low (0.025)
Burnley	Briercliffe	15.9	63	Low (0.001)
Ribble Valley	Edisford and Low Moor	15.6	32	Low (0.025)
Chorley	Brindle and Hoghton	12.5	16	Low (0.025)
Lancaster	Bare	11.5	26	Low (0.001)
Wyre	Carleton	11.4	35	Low (0.001)
Wyre	Calder	8.3	24	Low (0.001)

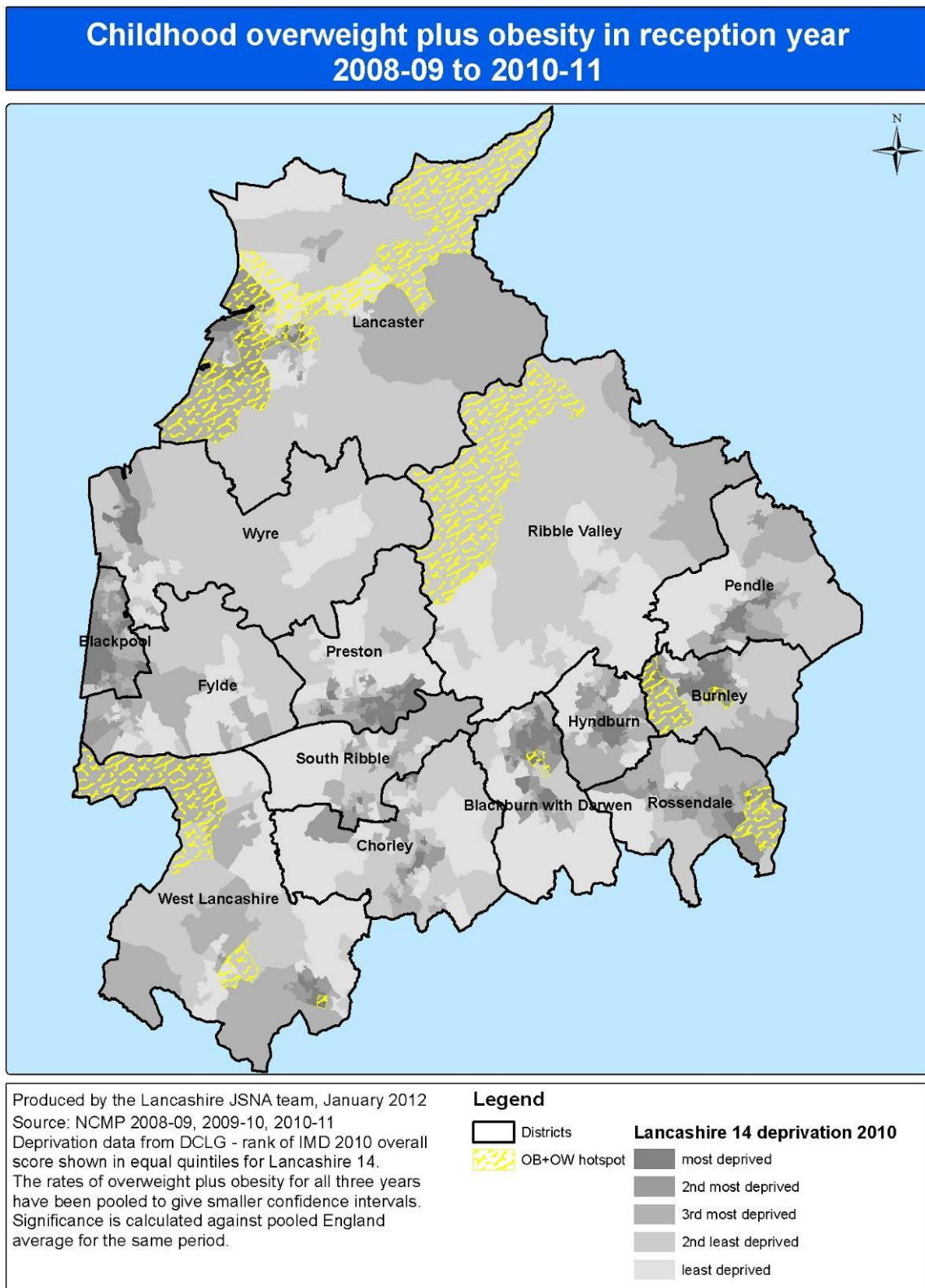
High (0.001) significance means that the rate is statistically significant to 99% confidence levels indicating it is highly unlikely that the high prevalence can be explained by natural variation in the population. High (0.025) indicates the rate is statistically significant to 95% confidence levels. Although not as robust as 99%, the results are still unlikely to be reflecting natural variation in the population.

Making comparisons over time for ward rates can be difficult due to the small numbers involved, which can lead to large confidence intervals. In order to improve the levels of significance we pooled the data for 2008-09, 2010-11 in order to identify wards with significantly high or low prevalence of overweight and obesity throughout the entire period.

The map below shows the wards that are hotspots according to the reception year combined overweight and obesity rates for the period from 2008-09 to 2010-11. A hotspot ward is defined as one where the prevalence was statistically significantly higher than the national average between 2008-09 and 2010-11.

Internal deprivation quintiles (for Lancashire-14) have been used as a background to highlight the known links between deprivation and obesity (see the next section for further discussion).

Map 3 - Year six overweight and obesity hotspots, 2008-09 to 2010-11



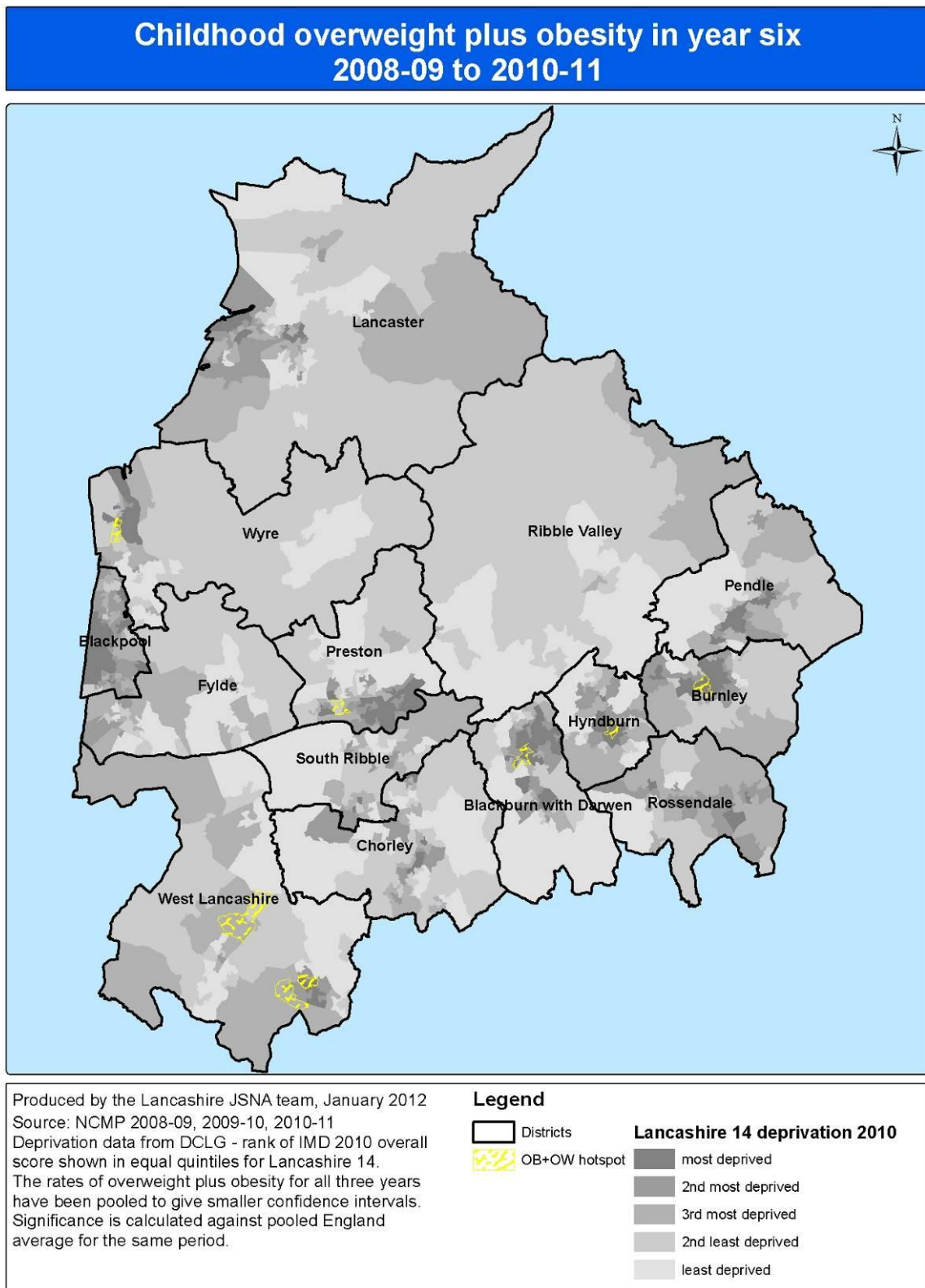
The reception year hotspot wards for overweight and obesity between 2008-09 and 2010-11 are shown in the table below.

Table 7 - reception overweight and obesity hotspot wards 2008-09 to 2010-11

District	Ward
Blackburn with Darwen	Higher Croft
Burnley	Hapton with Park
Burnley	Rosehill with Burnley Wood
Lancaster	Bare
Lancaster	Bulk
Lancaster	Halton-with-Aughton
Lancaster	Overton
Lancaster	Poulton
Lancaster	Skerton West
Lancaster	Slyne-with-Hest
Lancaster	Upper Lune Valley
Lancaster	Westgate
Ribble Valley	Chipping
Rosendale	Facit and Shawforth
Rosendale	Irwell
West Lancashire	Derby
West Lancashire	Moorside
West Lancashire	North Meols

The map below shows those wards which were hotspots for year six combined overweight and obesity (between 2008-09 and 2010-11). A hotspot ward is defined as one where the prevalence was statistically significantly higher than the national average between 2008-09 and 2010-11.

Map 4 - Reception year overweight and obesity hotspots, 2008-09 to 2010-11



The year six hotspot wards for overweight and obesity between 2008-09 and 2010-11 are shown in the table below.

Table 8- year six overweight and obesity hotspot wards 2008-09 to 2010-11

District	Ward
Blackburn with Darwen	Ewood
Burnley	Trinity
Hyndburn	Central
Preston	Ashton
West Lancashire	Birch Green
West Lancashire	Burscough West
West Lancashire	Skelmersdale South
Wyre	Park

Further maps which show the breakdown by BMI category can be found in the deprivation section of this report.

Key findings:

- Out of 301 wards, relatively few have statistically significant results during individual years highlighting the difficulties in attempting to make use of ward level data.
- Between 2008-09 and 2010-11 18 wards in Lancashire had significantly higher levels of overweight and obesity in reception year compared to the England average.
- During the same period, eight wards had significantly higher levels of overweight and obesity in year six compared to the England average.

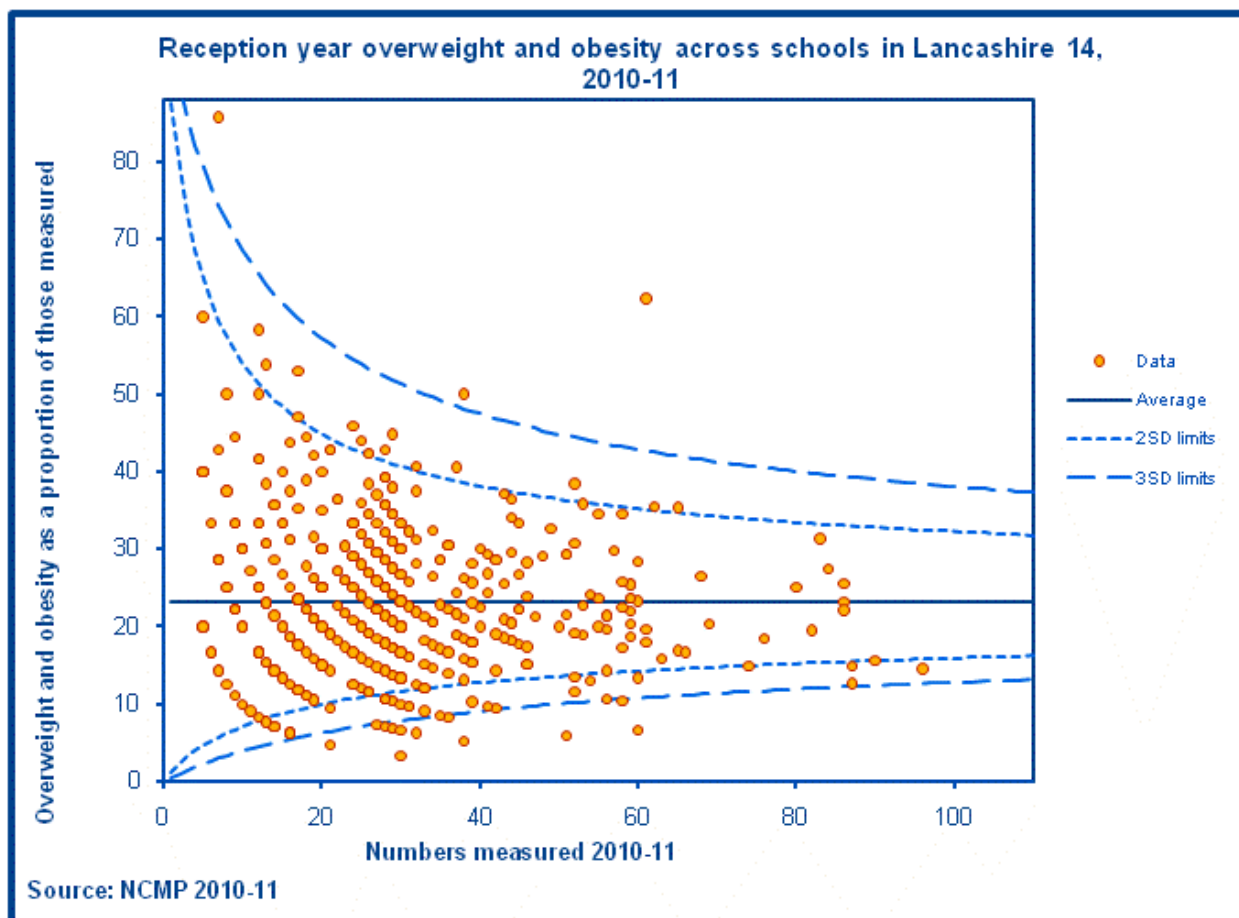
School level analysis

To analyse school level data we have created funnel plots. Funnel plots allow many points to be plotted simultaneously, with information about whether each point is significantly above or below the expected, or average, value for those points. In this case the charts will highlight the average as the Lancashire-14 value.

The control limits we looked at were 2 and 3 standard deviations (SD) from the average. These are the schools which lie at the far reaches of a normal distribution of data (those with significantly high or low prevalence of overweight and obesity compared to the average for all schools). Put another way, those which are 2SD from the average we can be 95% certain are statistically significantly higher or lower than we would expect. Those which are 3SD from the average are 99% certain to be significantly higher or lower than we would expect in statistical terms.

To make the analysis more meaningful, we have omitted any schools where the number of children measured was less than 5 as these have extremely wide confidence intervals.

Figure 11 - reception overweight and obesity in schools, 2010-11

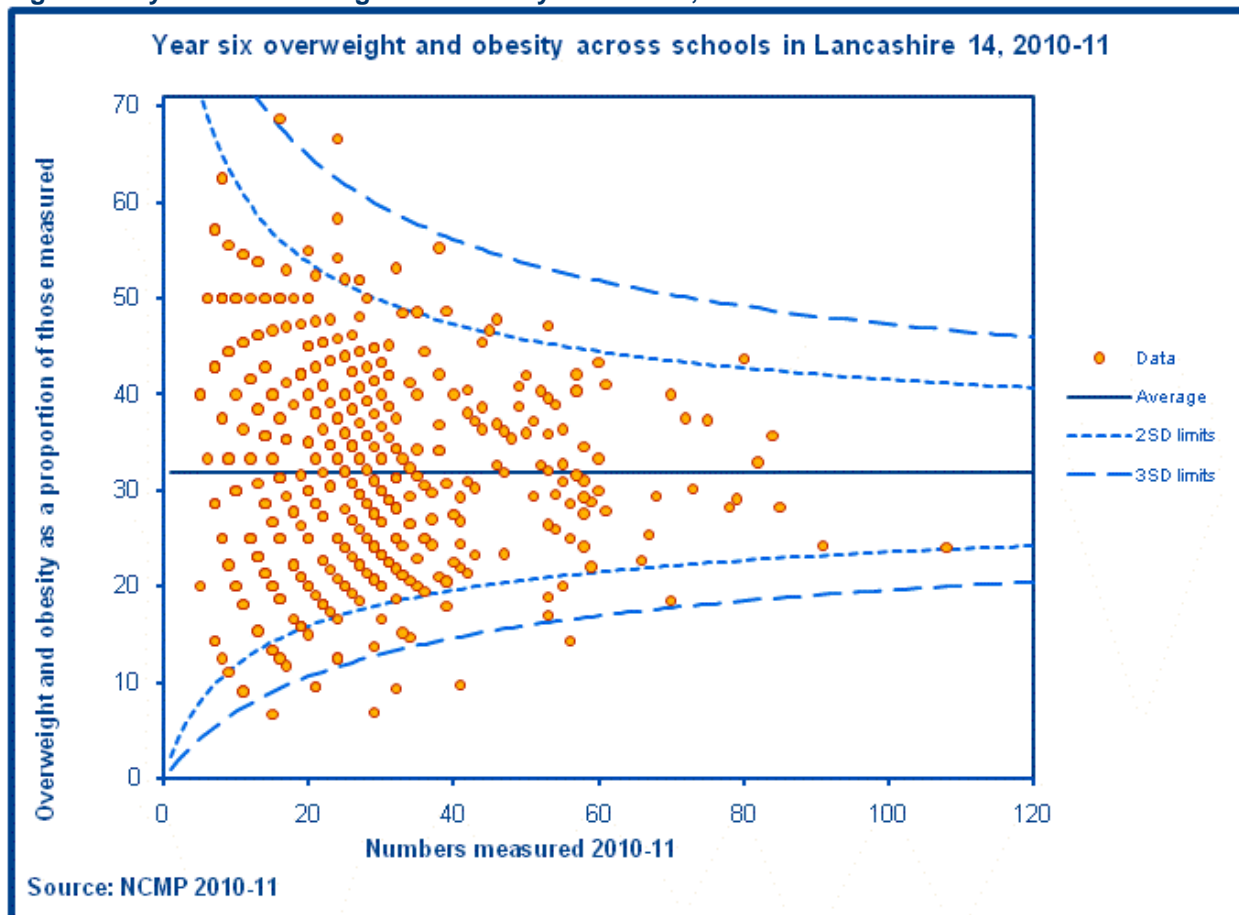


18 schools had a significantly high prevalence of overweight and obesity in reception year in 2010-11: two in Blackburn with Darwen, one in Blackpool, two in Burnley, one in Chorley, five in Lancaster, one in Pendle, one in Preston, two in Rossendale and three in West Lancashire.

At the other end of the scale 48 schools had a significantly low prevalence of overweight and obesity in reception year in 2010-11: eight in Blackburn with Darwen, three in Blackpool, five in Chorley, three in Fylde, four in Hyndburn, three in Lancaster, three in Pendle, eight in Preston, three in Rossendale, three in South Ribble and five in Wyre.

The funnel plot for prevalence of overweight and obesity in year six during 2010-11 is shown below.

Figure 12 - year six overweight and obesity in schools, 2010-11



16 schools had overweight and obesity prevalence significantly above the Lancashire-14 average in 2010-11: two in Blackburn with Darwen, one in Blackpool, one in Burnley, one in Chorley, one in Fylde, one in Lancaster, one in Pendle, two in Rossendale, five in West Lancashire and one in Wyre.

At the other end of the spectrum 29 schools had significantly low prevalence of overweight and obesity in year six in 2010-11 compared to the Lancashire-14 average: three in Blackburn with Darwen, two in Blackpool, one in Burnley, one in Chorley, four in Fylde, four in Hyndburn, four in Lancaster, one in Pendle, one in Preston, two in Rossendale, four in South Ribble, one in West Lancashire and one in Wyre.

None of the schools had significantly high rates of overweight and obesity in both reception and year six; five schools had significantly low rates in both school years: one in Blackburn with Darwen, one in Blackpool, one in Fylde, one in Lancaster and one in Pendle.

Further analysis has been completed to identify schools with significantly high or low prevalence of overweight and obesity between 2007-08 and 2010-11 and this is available upon request to professionals with a specific remit for health improvement in schools. Pooling the data for three years makes it more robust as it evens out any anomalies for individual years. It also increases the

observed numbers (the number of children measured) which in turn narrows the confidence intervals around the prevalence. This allows us to get a more accurate account of schools with persistently high prevalence.

Between 2007-08 and 2010-11 36 schools were found to have significantly high levels of overweight and obesity in reception year compared to the England average: three in Blackburn with Darwen, three in Blackpool, two in Burnley, one in Chorley, one in Hyndburn, ten in Lancaster, one in Pendle, four in Preston, one in Rossendale, one in South Ribble, six in West Lancashire and three in Wyre. At the other end of the scale 25 schools had significantly low levels of overweight and obesity in reception year: seven in Blackburn with Darwen, one in Chorley, two in Hyndburn, one in Lancaster, seven in Preston, one in Rossendale, three in South Ribble and three in Wyre.

During the same period 22 schools were found to have significantly high levels of overweight and obesity in year six compared to the England average: two in Blackpool, three in Burnley, one in Fylde, two in Hyndburn, one in Lancaster, one in Pendle, two in Preston, two in Rossendale, two in South Ribble, five in West Lancashire and one in Wyre. 38 schools had significantly low prevalence of overweight and obesity in year six between 2008-09 and 2010-11: four in Blackburn with Darwen, three in Blackpool, two in Chorley, one in Fylde, seven in Hyndburn, five in Lancaster, six in Pendle, one in Preston, one in Rossendale, four in South Ribble, one in West Lancashire and three in Wyre.

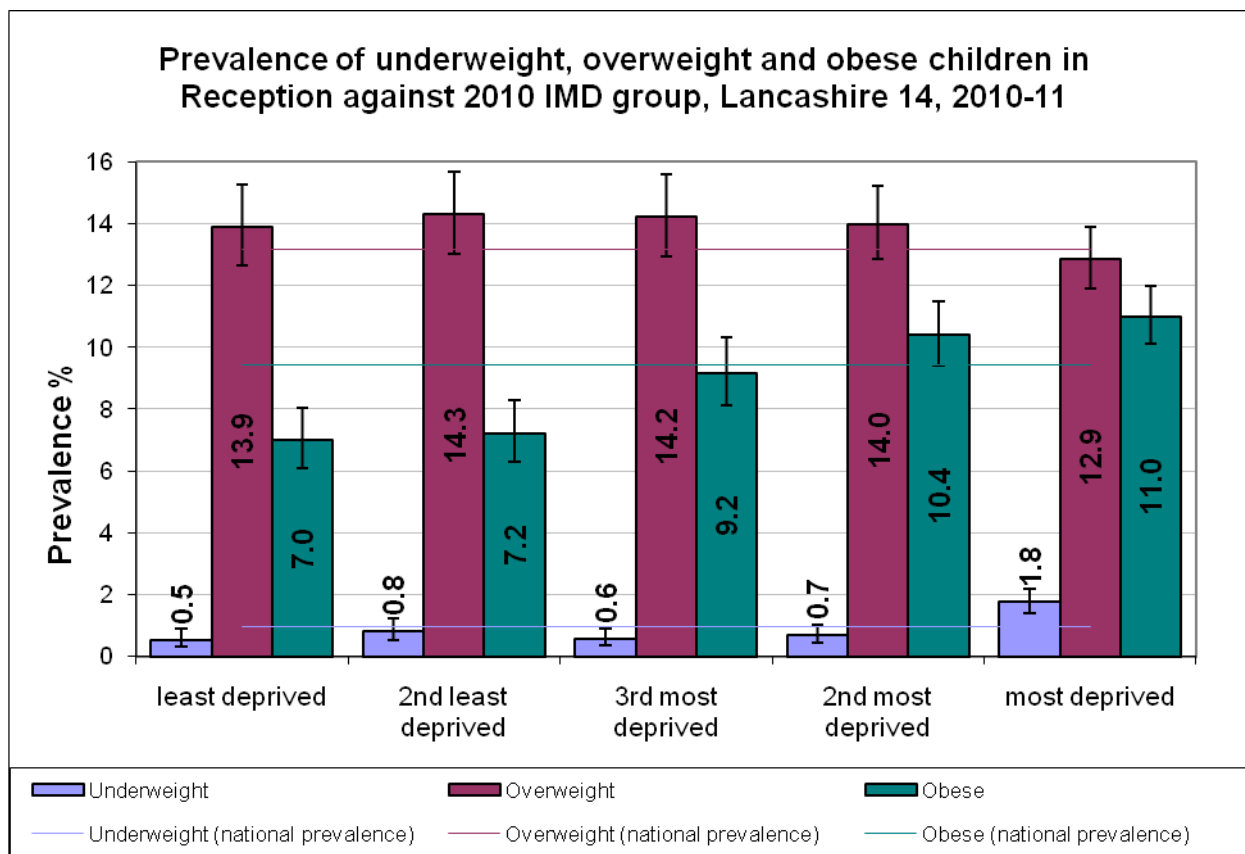
Please contact Annette McNeil, Teacher Adviser - Healthy Schools:
annette.mcneil@lancashire.gov.uk to obtain the full schools analysis.

Analysis by deprivation

The analysis by deprivation was conducted using internal deprivation quintiles. These quintiles split the Lancashire population into equal fifths based upon the deprivation ranking of their area from the Indices of Deprivation 2010. Using the national percentage ranking would lead to a greater proportion of the population in the most deprived quintile and a lower proportion in the least deprived quintile.

By using the local measure, rather than the national percentage ranking, we ensure an equal proportion of the population is contained in each quintile, leading to a more robust analysis. Underweight and obesity in reception year both demonstrate a strong social gradient and are much more likely in the most deprived parts of Lancashire-14. Overweight has a less clear relationship with deprivation. In general, reception age children in the most deprived parts of Lancashire are the most likely to be underweight or obese and the least likely to be overweight. This is an interesting relationship which highlights extremes of weight in the most deprived parts of the sub-region.

Figure 13 - reception underweight, overweight and obesity by deprivation quintile, 2010-11



The following results are statistically significant in reception year in 2010-11:

- Prevalence of underweight is higher in the most deprived parts of Lancashire-14 than in all other parts of Lancashire-14.
- The inequality gradient for reception year underweight between the most and least deprived parts of Lancashire-14 is 3.3. This means that reception age children in the most deprived parts of Lancashire are more than three times as likely to be underweight as those in the least deprived parts.
- Prevalence of obesity is higher in the most deprived parts of Lancashire than in the least and 2nd least deprived parts.
- Prevalence of obesity is higher in the 2nd most deprived parts of Lancashire-14 than in the least and 2nd least deprived parts.
- The inequality gradient for reception obesity between the most deprived and 2nd least deprived (as the area with the highest prevalence) parts of Lancashire-14 is 1.6. This

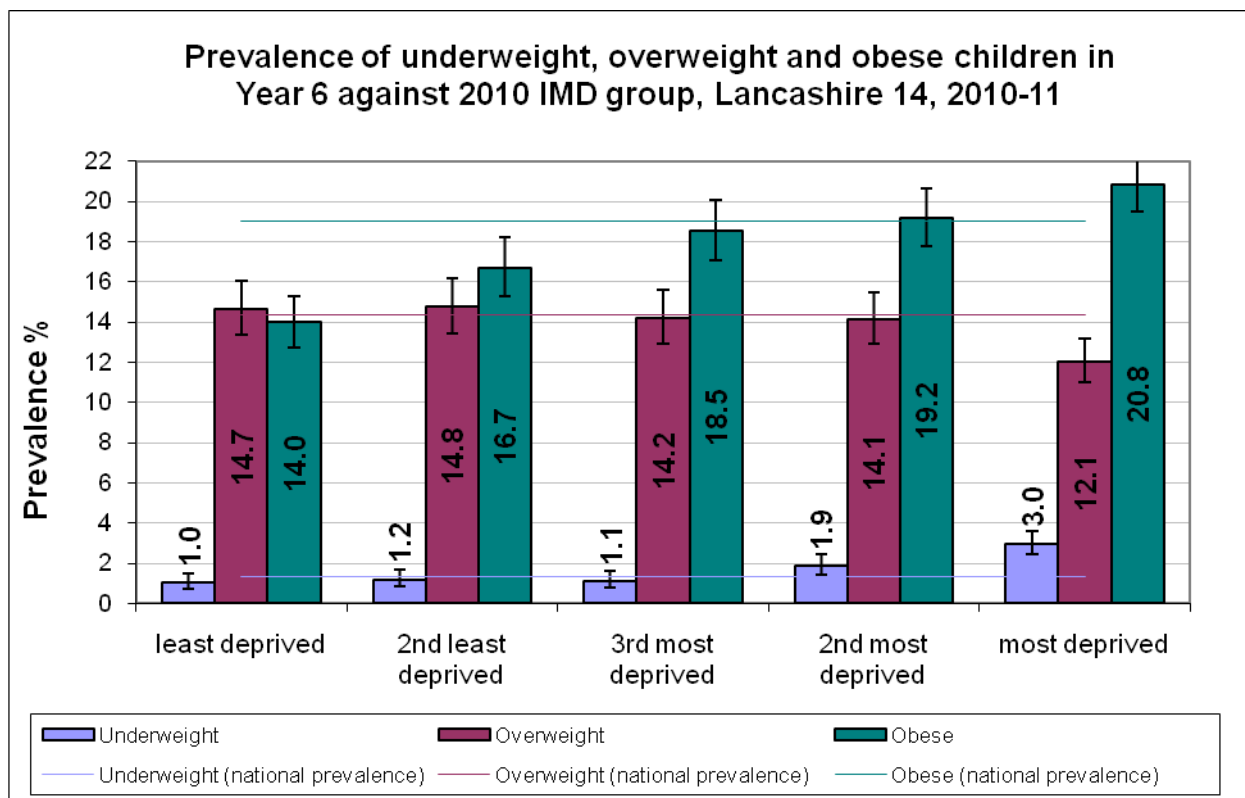
means that reception age children in the most deprived parts of Lancashire are 60% more likely to be obese than those in the 2nd least deprived parts.

- Prevalence of underweight is above the national average prevalence of underweight in the most deprived parts of Lancashire-14.
- Prevalence of underweight is below the national average prevalence of underweight in the least and 3rd most deprived parts of Lancashire-14.
- Prevalence of obesity is above the national average prevalence of obesity in the most deprived parts of Lancashire-14.
- Prevalence of obesity is below the national average prevalence of obesity in the least and 2nd least deprived parts of Lancashire-14.

Underweight and obesity in year six shows another strong social gradient with those in the most deprived parts of Lancashire-14 most likely to be obese or underweight.

Overweight in year six has a broadly negative relationship with deprivation and is more common the further up the social scale we move.

Figure 14 - year six underweight, overweight and obesity by deprivation quintile, 2010-11



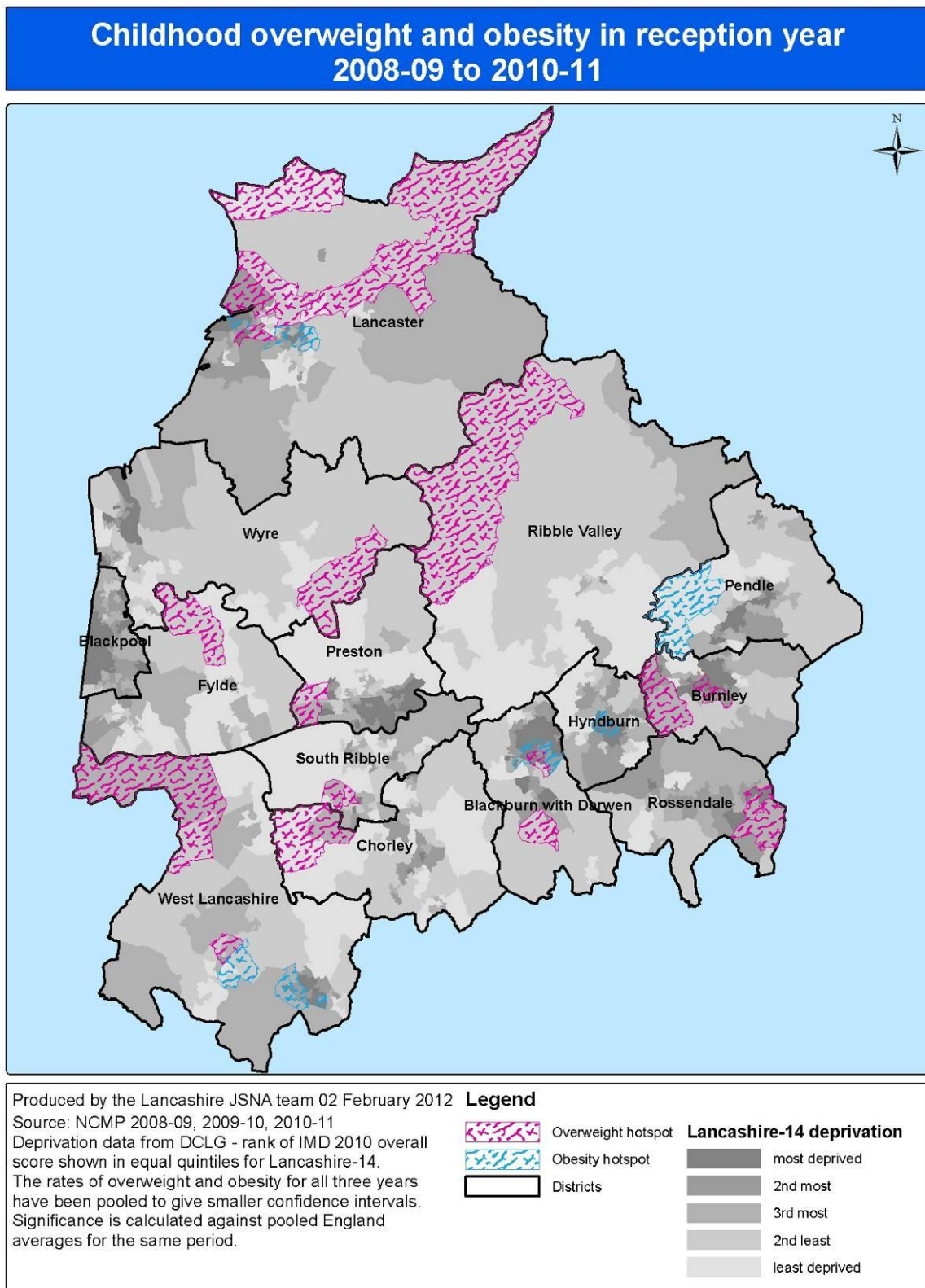
The following results are statistically significant in year six in 2010-11:

- Prevalence of underweight is higher in the most deprived parts of Lancashire-14 than in all other parts.
- The inequality gradient for year six underweight between the most and least deprived parts of Lancashire-14 is 2.9. This means that year six children living in the most deprived parts of Lancashire-14 are almost three times as likely to be underweight than those living in the least deprived parts.
- Prevalence of obesity is higher in the most deprived parts of Lancashire-14 than in the least and 2nd least deprived parts.
- The inequality gradient for year six obesity between the most and least deprived parts of Lancashire-14 is 1.5. This means that year six children living in the most deprived parts of Lancashire-14 are 50% more likely to be obese than those in the least deprived parts.
- Prevalence of underweight is above the national average prevalence of underweight in the most and 2nd most deprived parts of Lancashire-14.

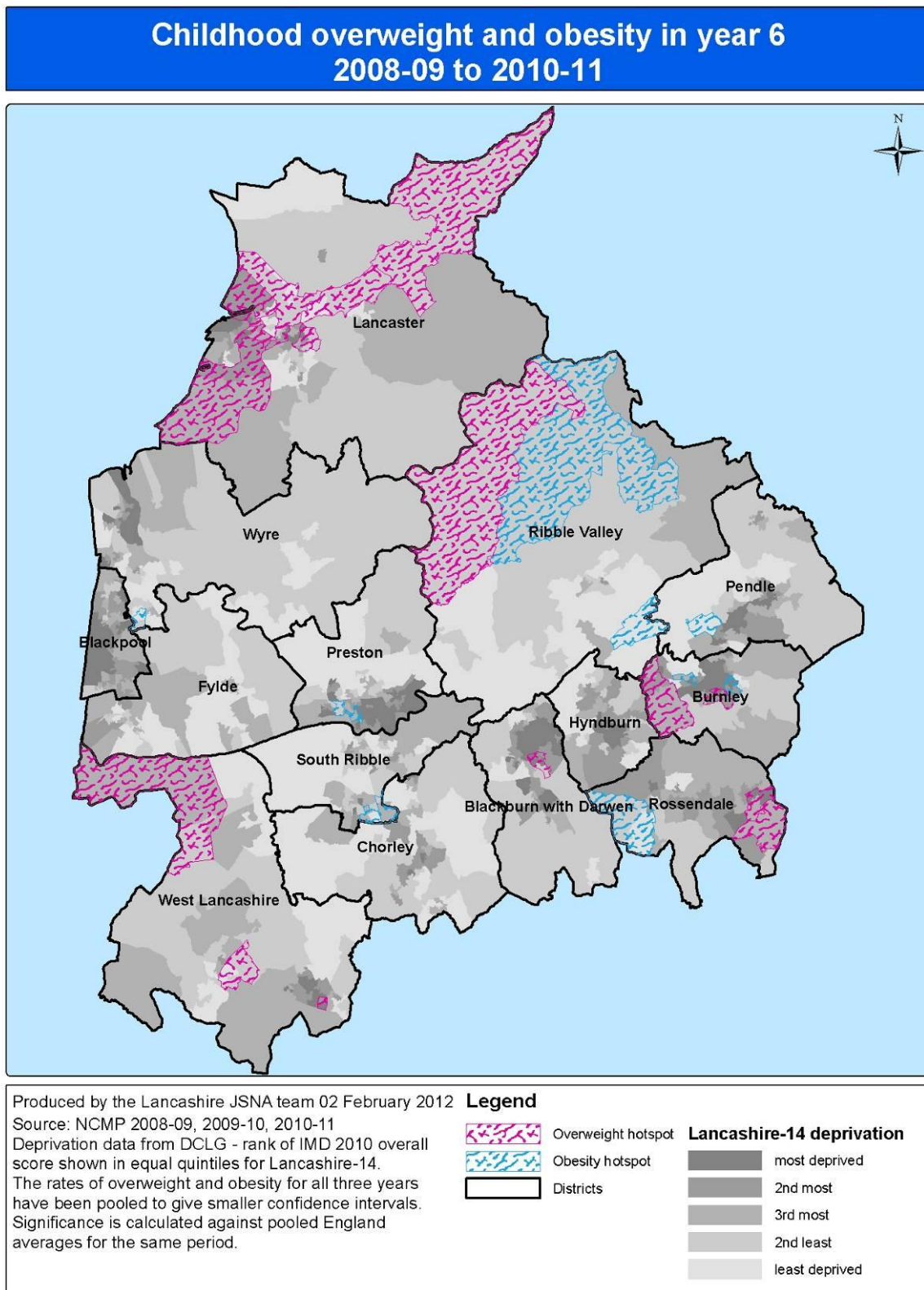
- Prevalence of overweight is lower in the most deprived parts of Lancashire-14 than in the least and 2nd least deprived parts.
- Prevalence of underweight is above the national average in the most and 2nd most deprived parts of Lancashire-14.
- Prevalence of overweight is below the national average prevalence of overweight in the most deprived parts of Lancashire-14.
- Prevalence of obesity is above the national average prevalence of obesity in the most deprived parts of Lancashire-14.
- Prevalence of obesity is below the national average prevalence of obesity in the least and 2nd least deprived parts of Lancashire-14.

In order to more clearly demonstrate the links that exist between BMI category and deprivation status we mapped overweight hotspots and obesity hotspots separately on the following maps. You can now see that in both reception and year six, overweight is more common in the more affluent areas whereas obesity is more common in the more deprived areas.

Map 5 – separate overweight and obesity hotspots, reception year, 2008-09 to 2010-11



Map 6 – separate overweight and obesity hotspots, year six, 2008-09 to 2010-11



The table below lists the hotspot wards for overweight and for obesity in reception year.

Table 9 - reception ward hotspots by BMI category

District	Ward	Hotspot type
Blackburn with Darwen	Ewood	Obese
Blackburn with Darwen	Higher Croft	Overweight
Blackburn with Darwen	Queen's Park	Obese
Blackburn with Darwen	Whitehall	Overweight
Burnley	Hapton with Park	Overweight
Burnley	Rosehill with Burnley Wood	Overweight
Burnley	Trinity	Overweight
Chorley	Lostock	Overweight
Fylde	Singleton and Greenhalgh	Overweight
Hyndburn	Central	Obese
Hyndburn	Church	Obese
Lancaster	Bare	Overweight
Lancaster	Bulk	Obese
Lancaster	Halton-with-Aughton	Overweight
Lancaster	Harbour	Obese
Lancaster	Silverdale	Overweight
Lancaster	Skerton West	Obese
Lancaster	Slyne-with-Hest	Overweight
Lancaster	Upper Lune Valley	Both
Lancaster	Westgate	Overweight
Pendle	Higham and Pendleside	Obese
Preston	Lea	Overweight
Ribble Valley	Chipping	Overweight
Rosendale	Facit and Shawforth	Overweight
Rosendale	Irwell	Overweight
South Ribble	Earnshaw Bridge	Overweight
South Ribble	Moss Side	Overweight
West Lancashire	Derby	Obese
West Lancashire	Moorside	Obese
West Lancashire	North Meols	Both
West Lancashire	Scott	Overweight
West Lancashire	Skelmersdale North	Obese
West Lancashire	Skelmersdale South	Obese
Wyre	Brock	Overweight

The table below lists the year six hotspots for overweight and obesity separately.

Table 10 - year six ward hotspots by BMI category

District	Ward	Hotspot type
Burnley	Brunshaw	Overweight
Burnley	Gannow	Overweight
Hyndburn	Central	Obese
Pendle	Bradley	Obese
Pendle	Old Laund Booth	Overweight

Preston	Ashton	Overweight
Preston	Moor Park	Obese
Preston	University	Overweight
Ribble Valley	Bowland, Newton and Slaidburn	Overweight
Ribble Valley	Sabden	Overweight
Rosendale	Helmshore	Overweight
South Ribble	Leyland St Ambrose	Overweight
South Ribble	Leyland St Mary's	Overweight
West Lancashire	Birch Green	Obese
West Lancashire	Burscough West	Obese
West Lancashire	Skelmersdale South	Obese
Wyre	High Cross	Overweight
Wyre	Park	Obese
Wyre	Rossall	Obese

Key findings:

- A link exists between deprivation (as measured by the English Indices of Deprivation 2010) and child obesity in both school years. Those in the most deprived parts of Lancashire-14 were 50% more likely to be obese than those in the least deprived parts in year six and 60% more likely to be obese than those in the least deprived parts in reception year.
- There is also a link between underweight and deprivation in both school years. Children living in the most deprived parts of Lancashire-14 were over three times as likely to be underweight as those in the least deprived parts in reception year and just under three times as likely to be underweight in year six.
- There is a link between lower levels of deprivation and higher levels of overweight in year six.
- Children in the most deprived areas of Lancashire-14 are less likely than those in the least deprived areas to be healthy weight in both school years and this is more pronounced in year six.
- There is a noticeable split in the 2008-09 to 2010-11 overweight and obesity hotspot areas with obesity being more common in deprived areas and overweight being more common in more affluent areas.

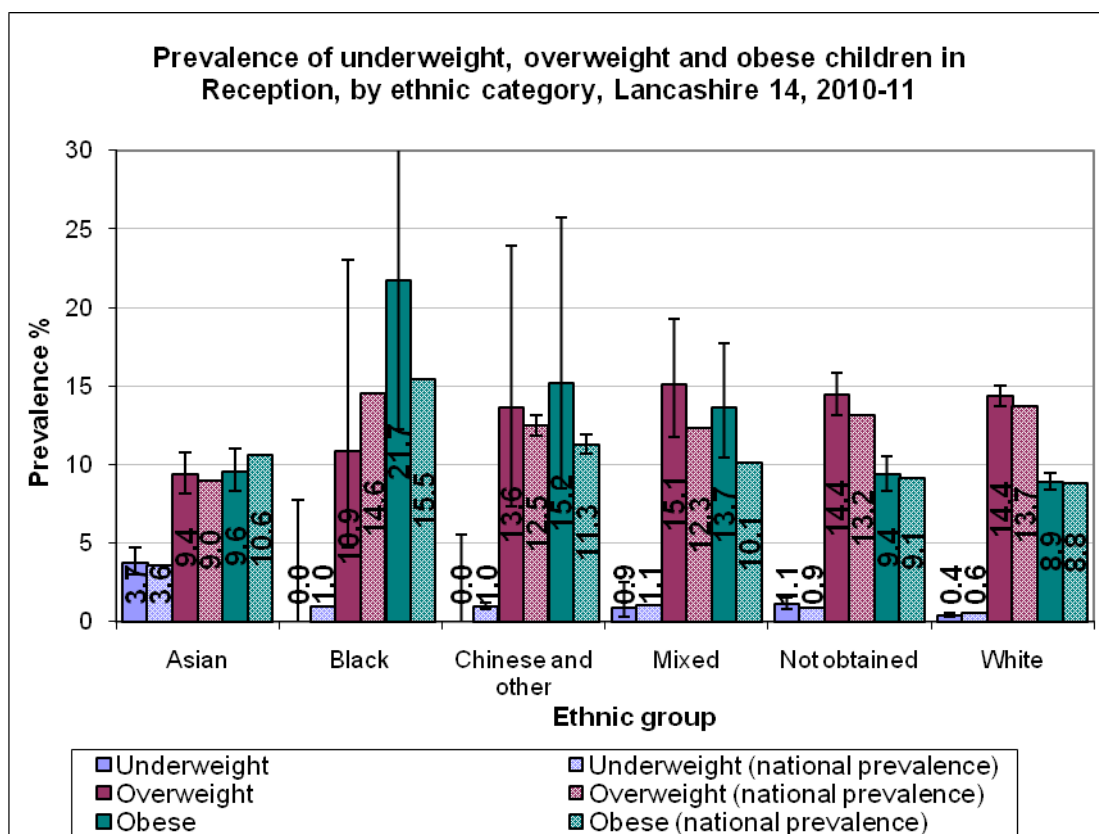
Ethnicity analysis

Rates of underweight, overweight and obesity in reception year vary by ethnic group. The only statistically significant differences in reception year between the Lancashire sub region and the

national rates are that children of mixed ethnicity are more likely to be obese and white children are less likely to be underweight than their national counterparts.

In Lancashire Asian children in reception year are significantly more likely than white children and children of mixed ethnicity to be underweight and the same is true nationally. They are also significantly *less* likely to be overweight than white and mixed ethnicity children and this too reflects the national trend. Black reception age children in Lancashire are significantly more likely to be obese than white or Asian children. Again this reflects the national picture.

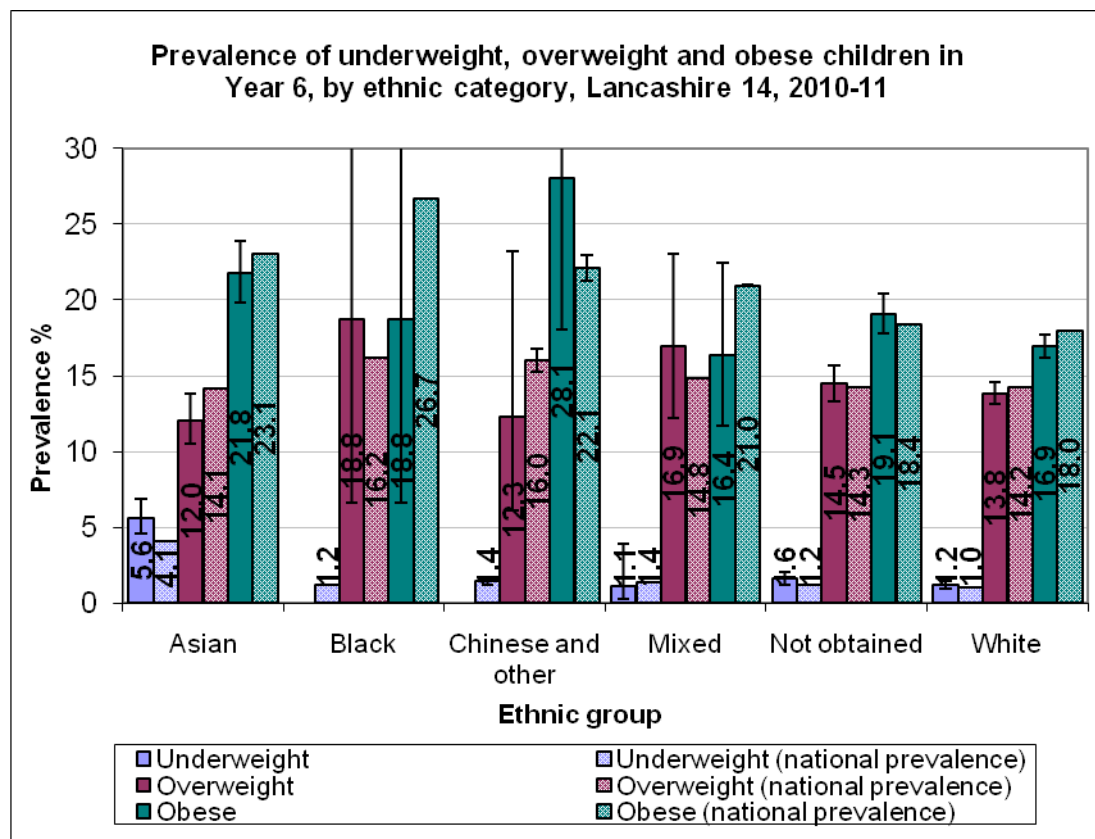
Figure 15 - reception underweight, overweight and obesity by ethnicity, 2010-11



Prevalence of underweight follows a similar pattern in year six as in reception year with Asian children in Lancashire-14 being significantly more likely to be underweight than white and mixed ethnicity children. They are also significantly more likely to be obese than white children.

Compared to their national counterparts, year six Asian children in Lancashire-14 are significantly less likely to be overweight and significantly more likely to be underweight. White year six children in the Lancashire sub region are significantly less likely to be obese than nationally.

Figure 16 - year six underweight, overweight and obesity by ethnicity, 2010-11



Key findings:

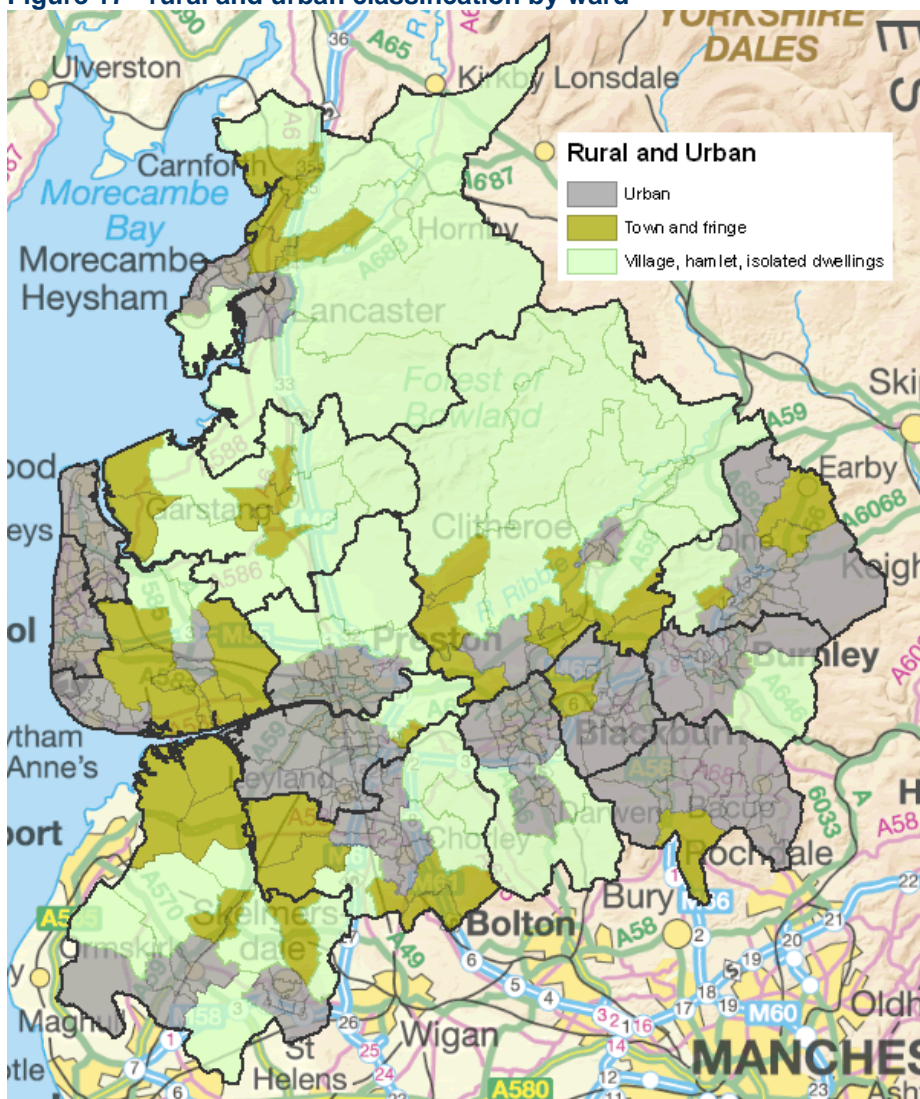
- Across Lancashire-14 Asian children in both schools years are significantly more likely than white and mixed ethnicity children to be underweight.
- Asian children in reception year are significantly less likely to be overweight than white and mixed ethnicity children across Lancashire-14.
- Black reception age children in Lancashire are significantly more likely to be obese than white or Asian children.
- In year six Asian children in Lancashire-14 are significantly more likely to be obese than white children.
- Mixed ethnicity children in Lancashire in reception year are significantly more likely to be obese than their national counterparts.
- Reception age white children in Lancashire are significantly less likely to be underweight than their national counterparts.

- Year six Asian children in Lancashire-14 are also significantly less likely to be overweight and more likely to be underweight than their national counterparts.
- White children in year six in Lancashire-14 are significantly less likely to be obese compared to nationally.

Rural and urban

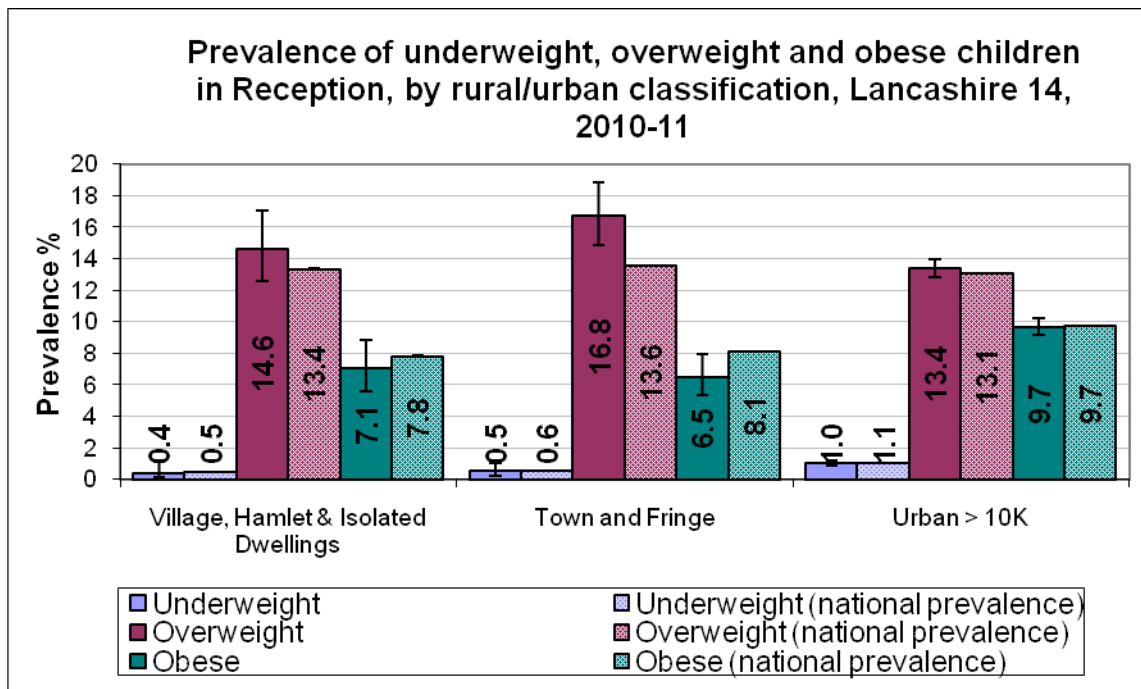
The Office for National Statistics defines areas into three categories of rural and urban. Urban areas are the most densely populated areas. Town and fringe are less densely populated but are not classed as being rural. They include areas such as Whalley, Garstang, Knott End and Earby.

Figure 17 - rural and urban classification by ward



Rural and urban prevalence of underweight, overweight and obesity are shown in the chart below for reception year. Reception age children in all area classifications are significantly more likely to be overweight than obese.

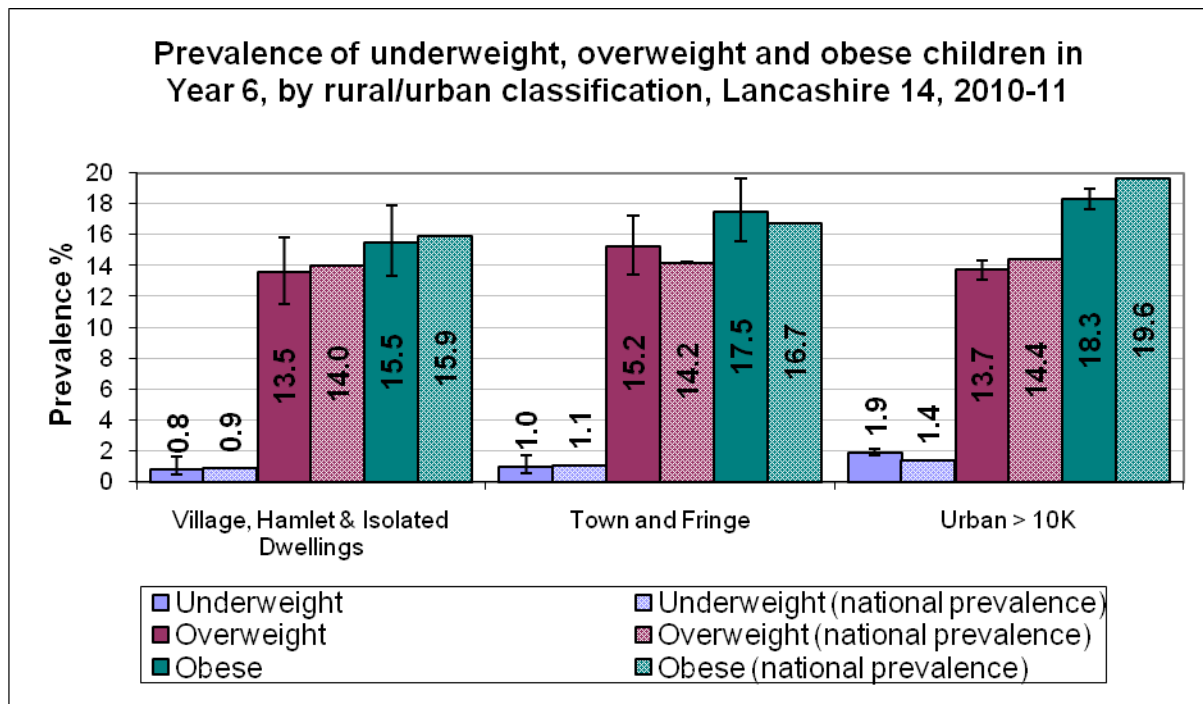
Figure 18 - reception underweight, overweight and obesity by rural/urban classification, 2010-11



In reception the only statistically significant differences compared to the national results are that Lancashire children living in town and fringe areas are more likely to be overweight and less likely to be obese than their national counterparts.

Rural and urban prevalence of underweight, overweight and obesity in 2010-11 are shown in the chart below for year six. Children in all areas are more likely to be obese than overweight but the result is only statistically significant for those children in densely populated urban areas (urban >10k).

Figure 19 - year six underweight, overweight and obesity by rural/urban classification, 2010-11



The following results are statistically significant:

- Year six children living in the most densely populated parts of Lancashire-14 are more likely to be underweight and less likely to be overweight or obese than their national counterparts.

Key findings:

- In Lancashire-14, reception age children in all area classifications are significantly more likely to be overweight than obese. They are also more likely to be overweight and less likely to be obese compared their national counterparts.
- Year six children in living in the most densely populated parts of Lancashire-14 are significantly more likely to be obese than overweigh although they are still significantly less likely to be overweight or obese than their national counterparts. They are also more likely to be underweight than their national counterparts.

Analysis by Mosaic Group

Mosaic is a household classification tool, which provides detailed understanding of the demographics, lifestyles and behaviours of citizens. One of the key strengths of the tool is that it provides an understanding of how individuals think and behave and how to communicate

successfully with these population groups. As such, it provides a useful tool for understanding our populations and designing successful interventions for them.

Using the tool, the population is classified into the following groups based upon postcode:

- A – Residents of isolated rural communities
- B – Residents of small and mid-sized towns with strong local roots
- C – Wealthy people living in the most sought after neighbourhoods
- D – Successful professionals living in suburban or semi-rural homes
- E – Middle income families living in moderate suburban semis
- F – Couples with young children in comfortable modern housing
- G – Young well-educated city dwellers
- H – Couples and young singles in small modern starter homes
- I – Lower income workers in urban terraces in often diverse areas
- J – Owner occupiers in older-style housing in ex-industrial areas
- K – Residents with sufficient incomes in right-to-buy-social housing
- L – Active elderly people living in pleasant retirement locations
- M – Elderly people reliant on state support
- N – Young people renting flats in high density social housing
- O – Families in low-rise social housing with high levels of benefit need
- U - Unclassified

Although Mosaic relates primarily to adults, it can be used to analyse any data where the postcode is included as a field. The charts below give a breakdown of reception and year six children in Lancashire-14 by Mosaic group in 2010-11. We can see that in both school years in Lancashire, almost half of all children measured are classed as being in either of three groups:

- Group I, lower income workers in urban terraces in often diverse areas

- Group E, middle income families living in moderate suburban semis
- Group J, owner occupiers in older-style housing in ex-industrial areas

Figure 20 - reception children by Mosaic group, 2010-11

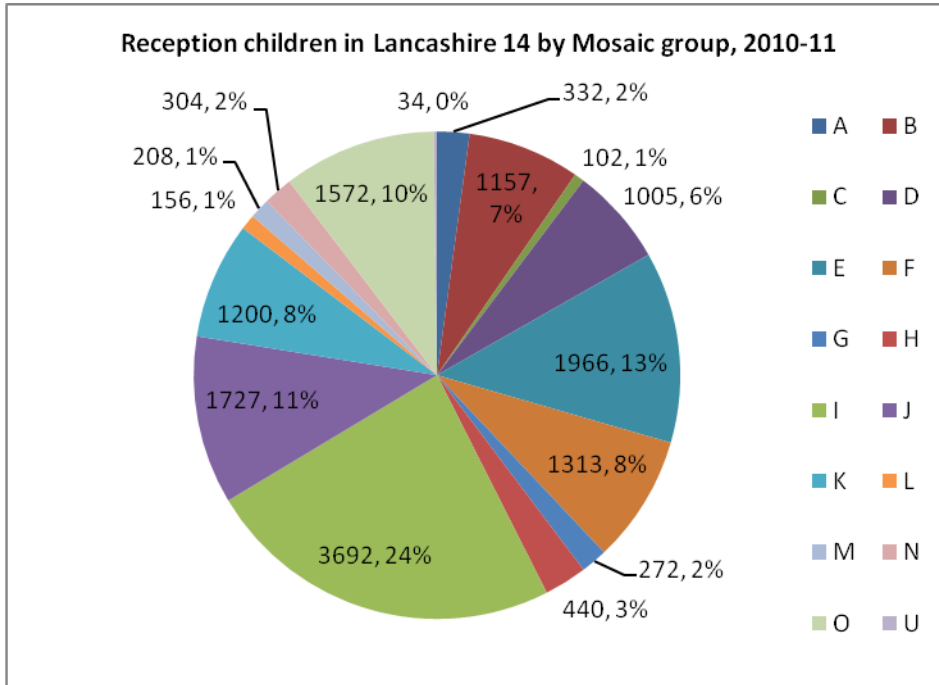
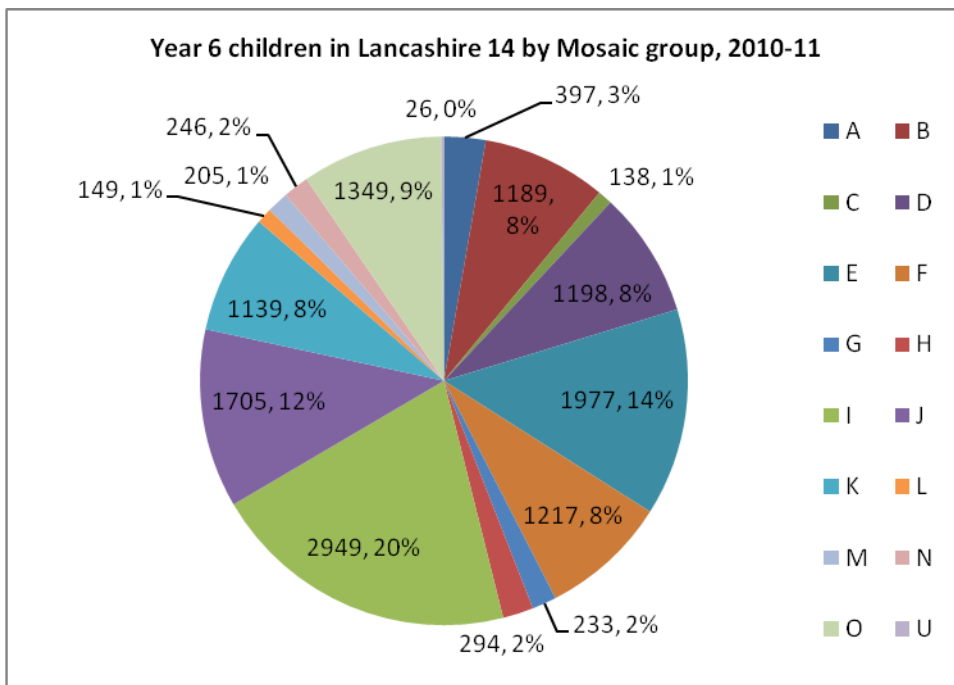
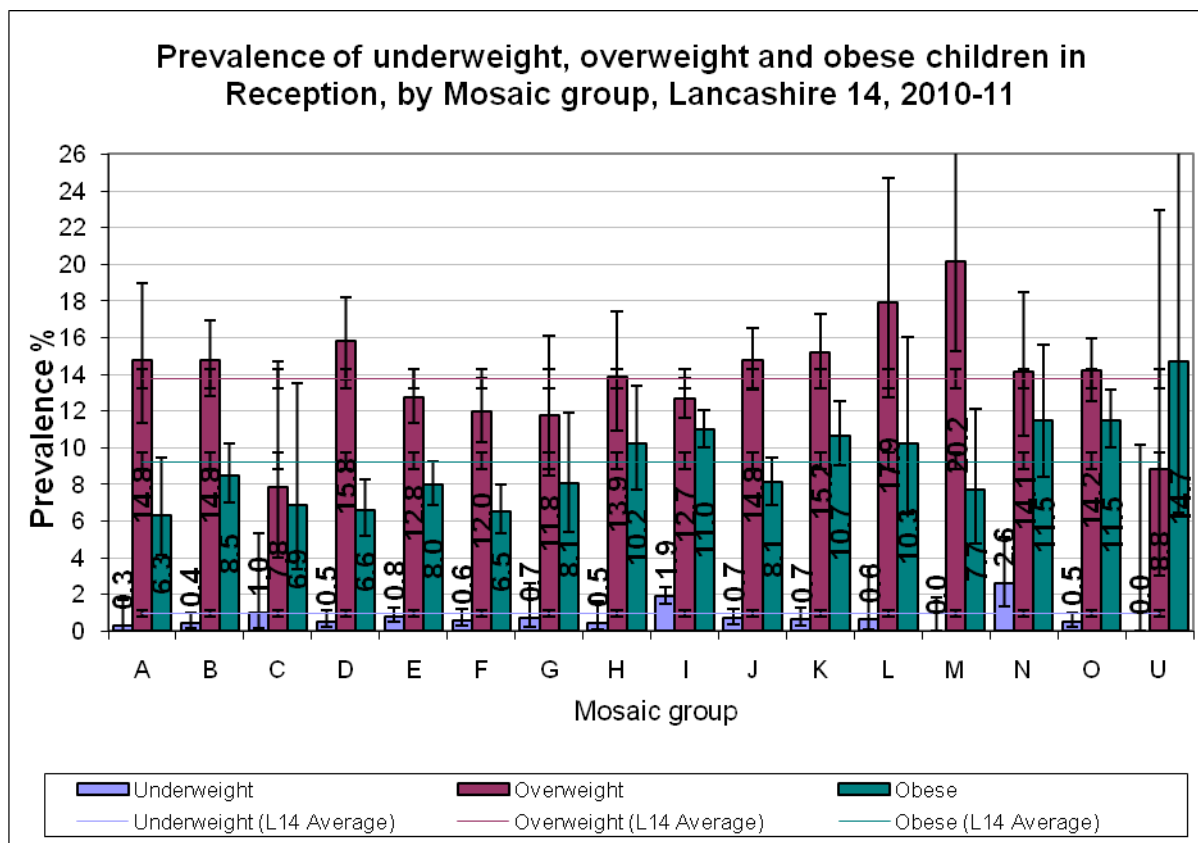


Figure 21 - year six children by Mosaic group, 2010-11



The chart below shows reception year prevalence of underweight, overweight and obesity amongst Mosaic groups in Lancashire-14 in 2010-11.

Figure 22 – reception underweight, overweight and obesity by Mosaic group, 2010-11

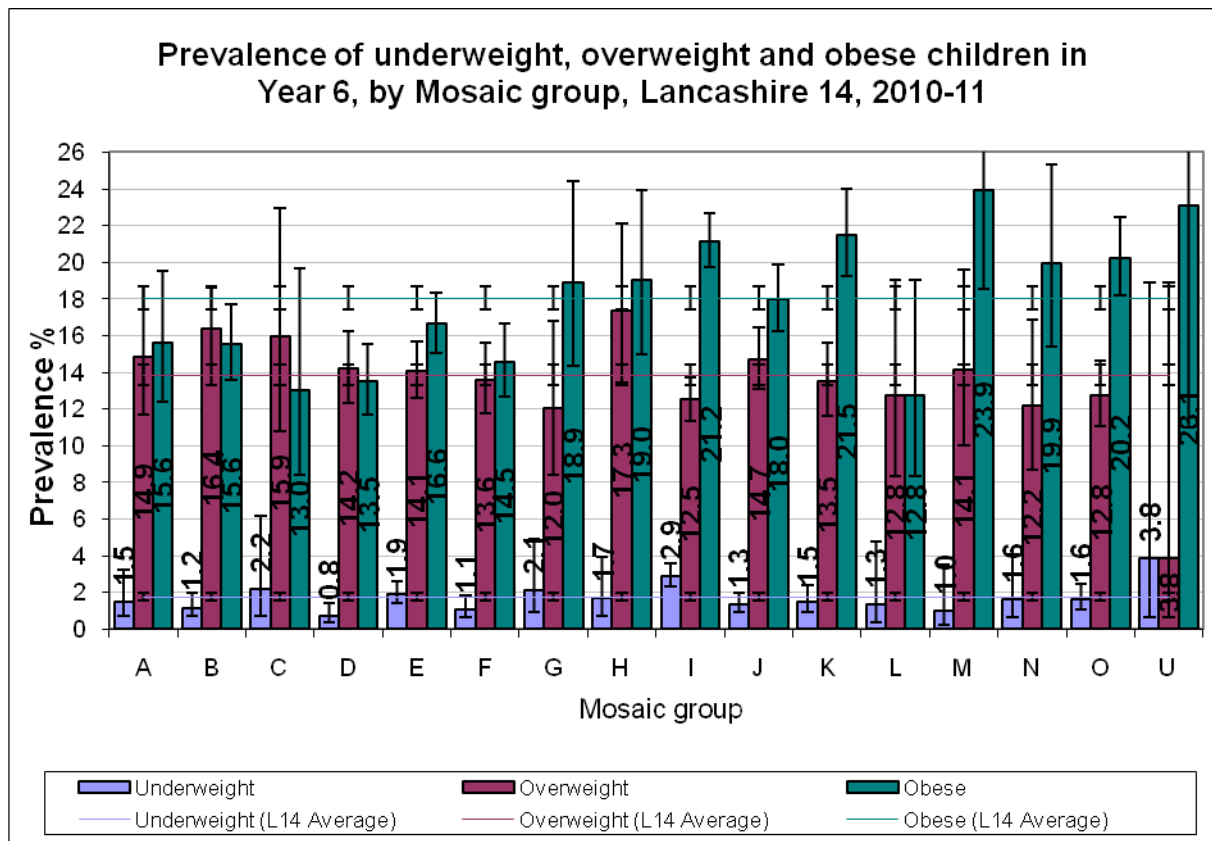


The following results are statistically significant in reception year in 2010-11:

- Group I, lower income workers in urban terraces in often diverse areas and group N, young people renting flats in high density social housing are more likely to be underweight than the Lancashire-14 average.
- Group M, elderly people reliant on state support are more likely to be overweight than the Lancashire-14 average.
- Group I, lower income workers in urban terraces in often diverse areas and group O, families in low-rise social housing with high levels of benefit need are more likely to be obese than the Lancashire-14 average.
- Group D, successful professionals living in suburban or semi-rural homes and group O, families in low-rise social housing with high levels of benefit need are less likely to be obese than the Lancashire-14 average.

The year six results for underweight, overweight and obese prevalence in 2010-11 are shown below.

Figure 23 - year six underweight, overweight and obesity by Mosaic group, 2010-11



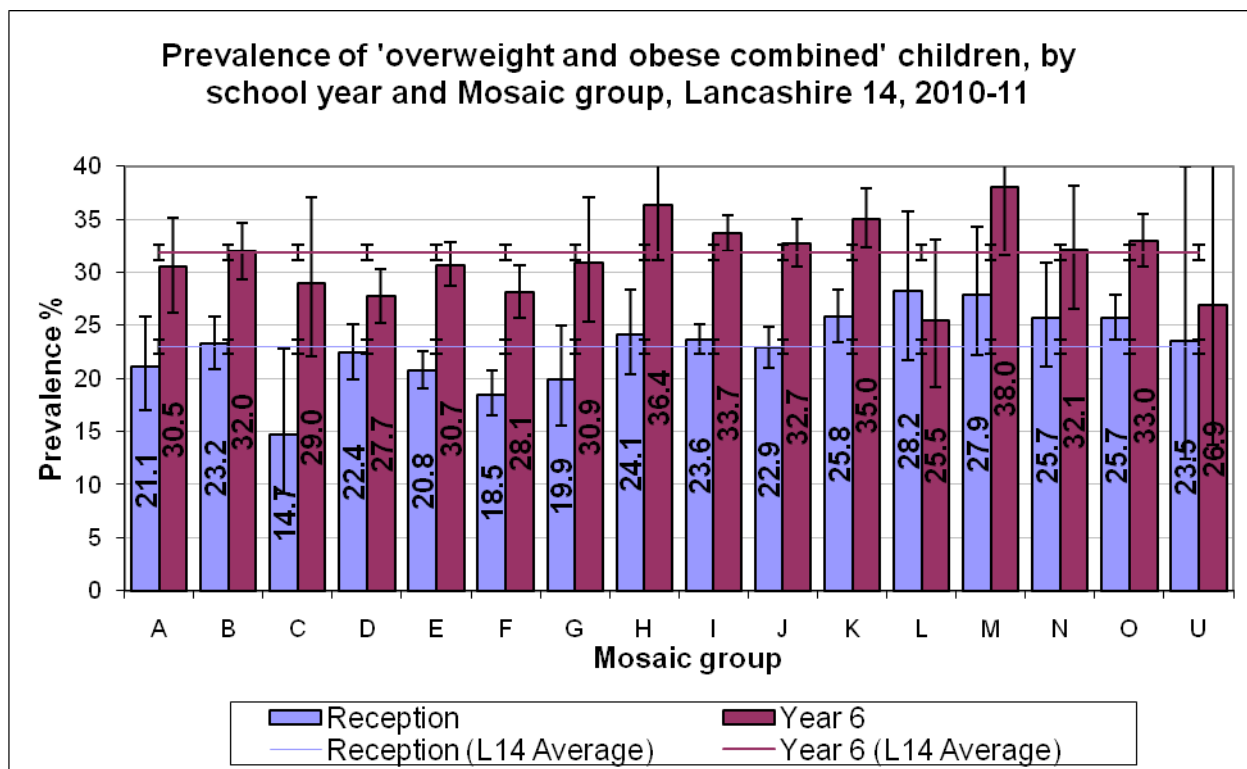
The following results were found to be statistically significant in year six in 2010-11:

- Group I, lower income workers in urban terraces in often diverse areas are more likely to be underweight than the Lancashire-14 average.
- Group D, successful professionals living in suburban or semi-rural homes are less likely to be underweight than the Lancashire-14 average
- Groups I, lower income workers in urban terraces in often diverse areas and group K, residents with sufficient incomes in right-to-buy-social housing are more likely to be obese than the Lancashire-14 average.
- Groups D, successful professionals living in suburban or semi-rural homes and F, couples with young children in comfortable modern housing are less likely to be obese than the Lancashire-14 average.

When we look at overweight and obesity as a single group, the following results are statistically significant in 2010-11:

- In reception year group F, couples with young children in comfortable modern housing are less likely to be overweight and obese than the Lancashire-14 average.
- In year six, groups D, successful professionals living in suburban or semi-rural homes, and F, couples with young children in comfortable modern housing, are less likely to be overweight and obese than the Lancashire-14 average.

Figure 24 - overweight and obese children by school year and Mosaic group, 2010-11



Most groups have significantly higher rates of overweight and obesity in year six than in reception year in 2010-11. These groups are probably the most appropriate for early intervention to prevent rises in the levels of overweight and obesity. Interactive maps of mosaic super-groups, groups and types by lower super output area in Lancashire-14 are available on the Lancashire Profile website: http://www.lancashire.gov.uk/office_of_the_chief_executive/lancashireprofile/ia/Mosaic_IA_LSOA/atlas.html

Experian have produced an interactive guide to Mosaic that contains details of how best to communicate with the different groups and types: <http://guides.business-strategies.co.uk/mosaicpublicsector2009/html/visualisation.htm?010122>

Analysis by healthy weight, healthy lives segmentation clusters

The Department of Health family clusters are developed for families with children aged 0-11. The family clusters were identified by the Department of Health as part of the original Change4Life

research, and are based on both in-depth qualitative research and large-scale quantitative research.

Each family cluster has unique attributes as to why they do or don't lead healthy lives and what messages might encourage them to change their behaviour.

A summary of the characteristics of the clusters is shown below.

Table 11 - Department of Health family clusters

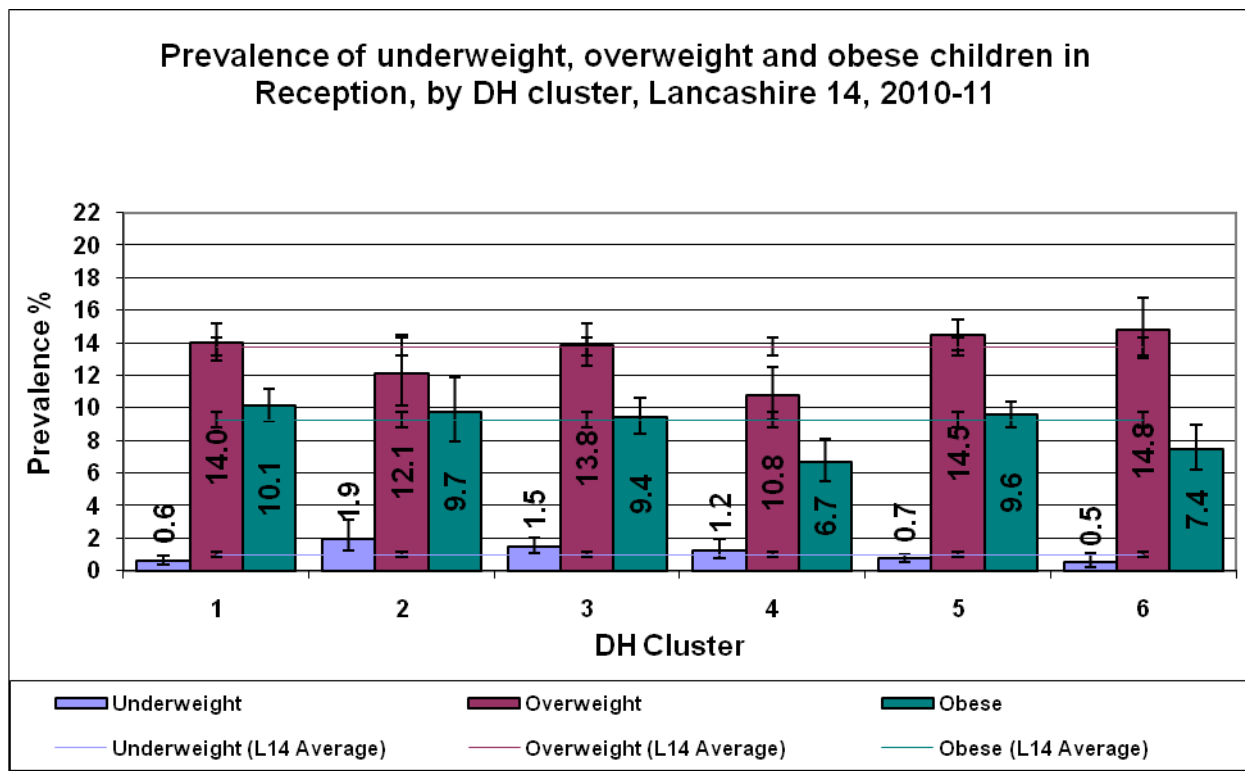
	Cluster 1:	Cluster 2:	Cluster 3:	Cluster 4:	Cluster 5:	Cluster 6:
Description	Struggling parents who lack confidence, knowledge, time and money	Younger parents who lack the knowledge and parenting skills to implement a healthy lifestyle	Affluent families, who enjoy indulgent food	Already living a healthy lifestyle	Strong family values and parenting skills but need to make changes to their diet and activity levels	Plenty of exercise but potentially too many bad foods
Family diet	Seek convenience, eat for comfort, struggle to cook healthily from scratch	Children fussy eaters, rely on convenience foods	Enjoy food, heavy snackers, parents watching weight	Strong interest in healthy diet	Strong parental control but diet rich in energy-dense foods and portion size an issue	Eating motivated by taste, diet includes both healthy and unhealthy foods
Physical activity	Seen as costly, time-consuming and not enjoyable. High levels of sedentary behaviour	No interest in increasing activity levels because perceive children to be active	Believe family is active, no barriers to child's activity except confidence	Family active although believe children not confident doing exercise	Know they need to do more: time, money, self-confidence seen as barriers	Activity levels are high, particularly among mothers
Weight status	Mothers obese and overweight	Families obese and overweight. Fail to recognise children's weight status	Families obese and overweight. Low recognition of children's weight status	Below average levels of obesity and overweight	Parental obesity levels above average, children below	Low family obesity levels but child overweight levels are a concern
Demographic	Low income, likely to be single parents	Young, single parents, low income	Affluent parents of all ages, households vary in size	Affluent older parents, larger families	Range of parental ages, single parent families	Average incomes, younger mothers, households vary in size
Intent to change	High, but fear of being judged and lack of confidence are powerful barriers	Currently low due to lack of knowledge, but willing to accept help once alerted to risks	Low intent to change and likely to deny that problems exist	Low intent to change but already leading a healthy lifestyle	Low intent on diet but significant intent to change on physical activity	Highest among the clusters for both diet and physical activity, so influencing them is not a priority
Potential task	Build confidence, increase knowledge and provide cheap convenient diet solutions	Increase understanding of risks of current lifestyle and develop parenting skills	Encourage recognition of problem and awareness of true exercise and snacking levels	Learn from successful techniques used by cluster	Focus on increasing activity levels and educate on portion size	Focus on providing cheap, convenient, healthy high energy foods to fuel active lifestyle

Key: Red = High risk, Amber = Medium risk, Green = Low risk

For further information on the clusters, please see Healthy Weight, Healthy Lives: Consumer insight summary available from the Department of Health Website (www.dh.gov.uk).

In reception year during 2010-11, all clusters had levels of underweight, overweight and obesity in line with the Lancashire-14 average except cluster 2, younger parents who lack the knowledge and parenting skills to implement a healthy lifestyle, who were significantly more likely to be underweight and cluster 4, those already living a healthy lifestyle, who were significantly less likely to be overweight or obese than the L14 average. Across all clusters overweight is more prevalent than obesity and the difference is statistically significant in all but cluster two, younger parents who lack the knowledge and parenting skills to implement a healthy lifestyle.

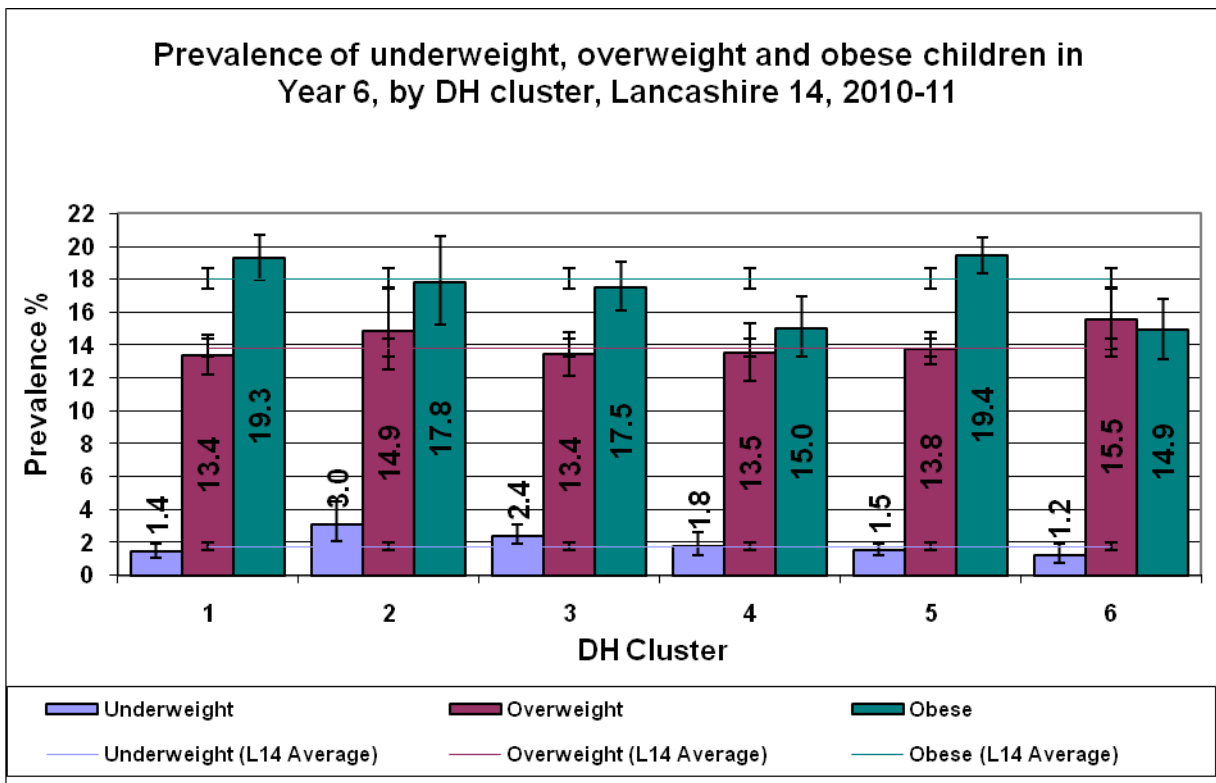
Figure 25 - reception underweight, overweight and obesity by DH cluster, 2010-11



In year six during 2010-11 all clusters had levels of underweight, overweight and obesity in line with the Lancashire-14 average except cluster 2, younger parents who lack the knowledge and parenting skills to implement a healthy lifestyle, who were again significantly more likely to be underweight and clusters 4, those already living a healthy lifestyle and 6, those who get plenty of exercise but potentially too many bad foods, who are significantly less likely to be obese than the Lancashire-14 average.

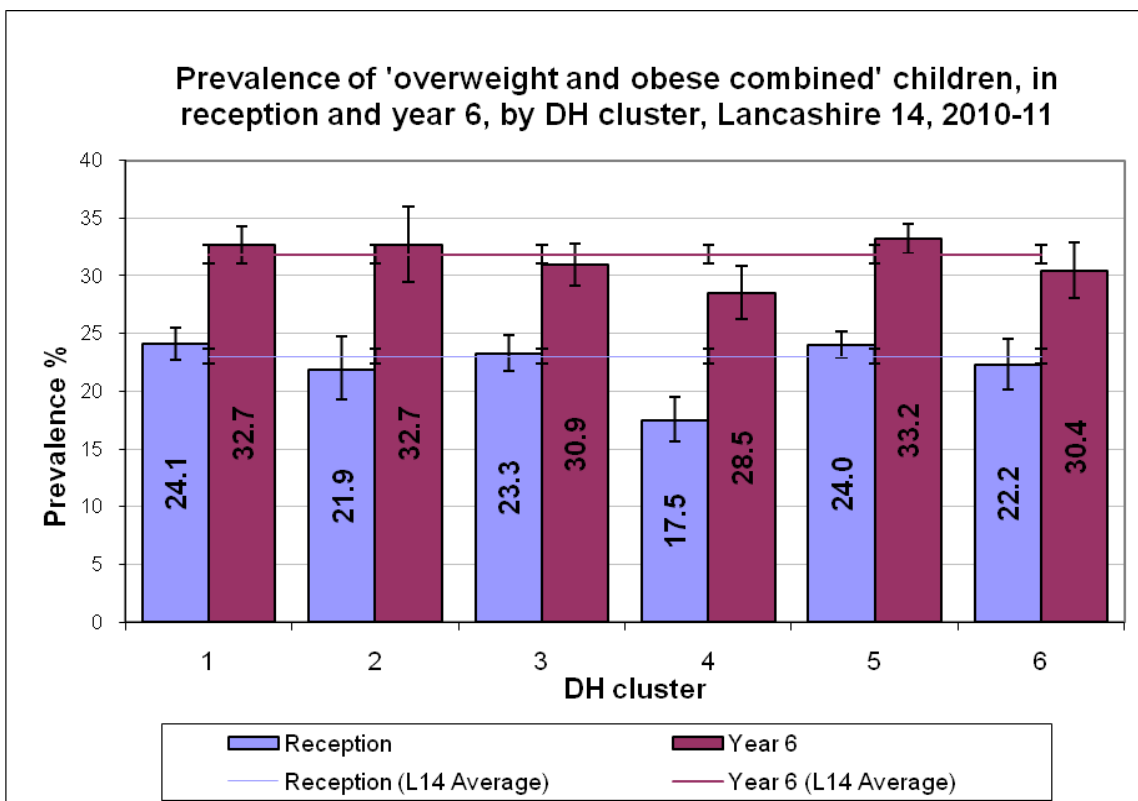
Children in year six were significantly more likely to be obese than overweight if they came from homes from clusters 1, struggling parents who lack confidence, knowledge, time and money, 3, affluent families, who enjoy indulgent food and 5, strong family values and parenting skills but need to make changes to their diet and activity levels.

Figure 26 - year six underweight, overweight and obesity by DH cluster, 2010-11



The graph below shows the combined prevalence of overweight and obesity in each school year in 2010-11.

Figure 27 - overweight and obesity by school year and DH cluster, 2010-11



The following result was statistically significant in 2010-11:

- In both school years, cluster four, already living a healthy lifestyle, were significantly less likely to be overweight and obese than the Lancashire-14 average.

Children are significantly more likely to be overweight or obese in year six than in reception year in all clusters according to the 2010-11 data. This strengthens the need to intervene earlier to reduce child obesity.

The document, the Change4Life family segments in Lancashire, contains communications plans for each of the clusters, which will aid the targeting of key messages and support. This document is available from the Lancashire JSNA team (email: jsna@lancashire.gov.uk).

Conclusions

As highlighted within the Foresight Obesity Report¹⁰, childhood obesity is complex and multifaceted. A diagram is available in the report that shows these complexities:

http://www.bis.gov.uk/assets/foresight/docs/obesity/obesity_final_part5.pdf

It is a national and global issue reaching epidemic levels. In Lancashire, almost a **quarter** of reception year children were overweight or obese during 2010/11. This increased to almost a **third** of year six children being overweight or obese.

It is important to note that underweight is a key issue for some areas pan-Lancashire and as such needs to be considered when determining pathways and interventions for healthy weight.

¹⁰ Department for Business Innovation and Skills, 2007. *Foresight – Tackling Obesities: Future Choices – Project Report*. [online] Available at:http://www.bis.gov.uk/assets/foresight/docs/obesity/obesity_final_part5.pdf [Accessed 25 July 2012]

Recommendations

No single intervention will be effective in achieving childhood healthy weight; a whole systems approach to address the causal pathways of underweight, overweight, and obesity will need to be taken.

Partnership working will be key to achieving healthy weight for children, young people and their families.

Headline recommendations include:

- Full district analysis of the NCMP data to be provided for each district Children and Young People's Trust
- Children and Young People's Trusts to adopt and retain healthy weight as a priority
- Developing integrated family weight management services and lifestyle programmes
- Delivery of healthy weight related parenting and early years programmes
- Assessment of BMI at 2 – 2.5 year health check
- Development of 0 -19 healthy weight care pathway integrated with adult services
- Promote and support breastfeeding initiation and maintenance
- Promote and support the UNICEF Baby Friendly Initiative
- Tackle the obesogenic environment i.e. fast food restriction policies, leisure, early years and education settings,
- Improve workplace health by promoting healthy workplaces
- Foster a workforce that is appropriately trained to support the healthy weight agenda including giving brief advice
- Encourage the workforce to 'make every contact count' - <http://walkgroveonline.com/healthchats>
- Deliver healthy lifestyle campaigns such as Change 4Life - www.nhs.uk/Change4Life
- Promote food education and cooking skills programmes

- Feedback NCMP results to schools
- Share NCMP data with wider partners in order that they can target their resources and interventions to where they are most needed
- Engage with clinical commissioning groups (CCGs) through their emerging structures
- Promote maternal healthy weight and pregnancy outcomes

Further information

If you would like any further information about this analysis or the NCMP programme please contact your local NCMP lead; these are listed below:

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