GIG CYMRU NHS WALES
Iechyd Cyhoeddus Cymru
Public Health Wales

Child Measurement Programme for Wales 2013/2014

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Foreword

It gives me great pleasure to introduce the third Annual Report of the Child Measurement Programme for Wales for 2013-14.

I'm grateful to all the families across Wales who have allowed their children take part in this important piece of work, and to our friends in the health boards who have supported the programme. This great team effort has provided us with the most reliable and up-to-date information about child growth in Wales.

This report is important because it tells us the scale of the challenge we must overcome. Children who are obese can experience social and emotional problems. Obesity in childhood often persists into adult life, leading to related health problems like type 2 diabetes, liver disease, higher rates of heart disease, and some cancers.

The evidence on what we can do to take on this challenge is clear. Isolated one-off actions aimed at combating obesity will not bring about the big and sustained change we need. Obesity is a complex problem requiring solutions that are coordinated across society.

We need a 'systems approach' to tackling obesity. We need solutions that work across a big and complex network of factors. These factors include our politics, our culture, and our environment. They include people's socio-economic circumstances and social influences, the media, individual and group behaviours, and psychology.

Public Health Wales has recognised the need to adopt a systems approach in our Strategic Plan for 2015/18. Our plan has seven priorities, and the first two will be crucial to addressing childhood obesity:

- *adopting and implementing a multi agency systems approach to achieving significant improvements in our public's health*
- *working across sectors to improve the health of our children in their early years*

Public Health Wales is working closely with our partners to take on the challenge of childhood obesity. Getting good information on child measurement is an important part of this work because we can identify trends and patterns in child growth over time.

I hope you find this year's report as informative as I have.

Tracey Cooper

Chief Executive Public Health Wales

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Figures & Tables

Child Measurement Programme for Wales 2013/2014

Abbreviations

ABUHB	Aneurin Bevan University Health Board
ABMUHB	Abertawe Bro Morgannwg University Health Board
BCUHB	Betsi Cadwaladr University Health Board
BME	Black and minority ethnic
BMI	Body mass index
C&VUHB	Cardiff and Vale University Health Board
CCHD	Community Child Health Database
CDC	Center for Disease Control (USA)
CI	Confidence interval
CMP	Child Measurement Programme for Wales
CTUHB	Cwm Taf University Health Board
HDUHB	Hywel Dda University Health Board
IOTF	International Obesity Task Force
LHB	Local Health Board
LSOA	Lower Super Output Area
MSOA	Middle Super Output Area
NCCHD	National Community Child Health Database
NCMP	National Child Measurement Programme England
NHS	National Health Service
NICE	National Institute of Health and Clinical Excellence
NWIS	NHS Wales Informatics Service
ONS	Office for National Statistics
PTHB	Powys Teaching Health Board
SOA	Super Output Areas
THB	Teaching Health Board
UHB	University Health Board
UK90	Growth reference system used in the Child Measurement Programme
WHO	World Health Organisation
WIMD	Welsh Index of Multiple Deprivation

Child growth in Wales

Children aged 4-5 2013/2014

Healthy weight
72.7%

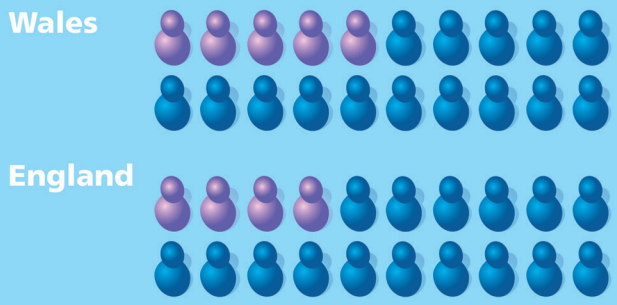
Overweight
14.6%

Obese
11.8%

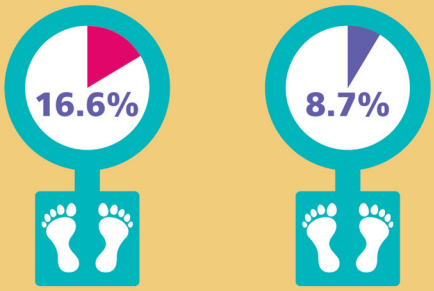
Underweight
0.8%

Unhealthy Body Mass Index (BMI)

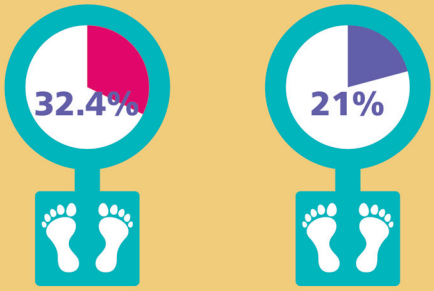
More than 1 in 4 children in Wales has a Body Mass Index classified as overweight or obese, compared to 1 in 5 in England.



1 in 6 children living in Merthyr Tydfil are obese, compared to just 1 in 12 children living in the Vale of Glamorgan.



Nearly a third of children in Anglesey are overweight or obese compared to just over 1 in 5 children in the Vale of Glamorgan.



There is no significant difference in obesity prevalence between children living in very rural areas and children living in towns and cities in Wales.

1

Summary and key messages

This third report of the Child Measurement Programme (CMP) for Wales contains the findings of the programme of child measurements carried out in primary schools in Wales during the academic year 2013/14, with children attending reception class.

Key messages

- Participation rates increased to 90.8% in 2013/14 from 84.3% in 2012/13. 30,669 of the 33,794 children eligible for inclusion in the programme took part. Their measurements have been included in the analysis for this report. 51% of the children were boys and 49% were girls
- Nearly three quarters of the children measured (72.7%) had a body mass index (BMI) classified as being of a healthy weight. This is a small change since last year but it is not statistically significant
- The prevalence of those overweight or obese in Wales in reception year (26%) was significantly higher than that for England (23%). It was also significantly higher in Wales than in any of the individual English regions where the highest prevalence was 24%
- This is the first year that the Child Measurement Programme has explored whether there is a difference in weight categories between urban and rural areas. The analysis found no statistically significant difference in growth between children living in cities or large towns and children living in more rural communities
- One in six children (16.6%) living in Merthyr Tydfil is obese, compared with just 1 in 12 children (8.7%) living in the Vale of Glamorgan
- Nearly 1 in 3 children in Anglesey (32.4%) is overweight or obese compared to just over 1 in 5 children in the Vale of Glamorgan (21%)
- There was a strong relationship between levels of obesity and deprivation – 28.5% of children living in the most deprived areas of Wales were overweight or obese, compared to 22.2% in the least deprived areas. For obesity alone, 13.5% of children in the most deprived areas were obese, compared to 9.8% in the least deprived areas. However prevalence of both obesity, and 'overweight or obese' appears to have increased slightly in the least deprived areas but decreased in the most deprived areas.

2 Introduction

This is a report containing the findings of the third year of the Child Measurement Programme for Wales. The programme was carried out in line with standards and guidance agreed during 2012 which were revised in 2014. The data which this report is based upon was released as Official Statistics.

2.1 Who gets measured?

The measurements were carried out during the 2013/14 school year with children who were both resident and attending school in Wales. Information has been included in the analysis if the children were in the reception year age group in 2013/14 – that is they had a birthday between 1st September 2008 and 31st August 2009 and their parents had not opted them out of the programme. Measurements on a very small number of children meeting this criteria were excluded for reasons discussed elsewhere in the report.

2.2 How are the results analysed?

Children were assigned to categories based on their body mass index (BMI), taking into account their gender and exact age when they were measured. The prevalence categories in the CMP are:

- Underweight
- Healthy weight
- Overweight or obese
- Overweight but not obese
- Obese.

Results in the report are expressed as the proportion of children within each category. Comparisons are then made looking at time periods; where children live; gender; ethnicity; whether the children live in urban or rural areas; and whether the results are (statistically) significant or not. Statistical significance is assessed using confidence intervals (CIs). If the number of children in any one category is less than five the result has been suppressed to avoid the possibility of identifying individual children. More explanation about confidence intervals, suppression and other methods used in the analysis is given in Appendix 1. Because the height of children is measured accurately and recorded, children of lower than expected height may also be identified through the programme.

Information in the report is presented at a national, local authority and health board level. This year for the first time some information is also available at Middle super output area (MSOA) level. An MSOA is an area smaller than a local authority, usually containing a population of around 7,000 people, and the information is available for the first time this year because CMP data from the last three years has been combined. Maps showing information at MSOA level for the whole of Wales are within the report. For maps showing prevalence of 'overweight or obese' at MSOA level for each of the health boards, please see Appendix 5.

2.3 Is it a screening or surveillance programme?

The Child Measurement Programme is a population surveillance programme, and is not aimed at screening for individual children who may benefit from an intervention. Results for an individual child are therefore not routinely supplied to parents unless they request them. However staff involved in taking the measurements of children are expected to take appropriate action should they identify concerns, whether their concern relates to children who are obese, underweight, of lower than expected height or have any other health issue. During 2014 additional guidance about identification and follow up of children of low height[1] (also known as 'short stature') was circulated by Public Health Wales.

2.4 Why have a surveillance programme?

Obesity is a major public health challenge and it will not be resolved by the health service alone. Well planned 'active' transport systems, advertising, education, the availability of affordable healthy food, and opportunities for physical activity all have a part to play. In order for government, local authorities and health services to be able to plan the wider environmental changes as well as plan the appropriate intervention services needed to address the challenge, accurate information is needed about child growth. Changes in growth patterns over time will identify what progress is being made in addressing childhood obesity.

2.5 The challenge of obesity

The Welsh Health Survey in 2013[2] found that 22% of adults in Wales were obese, and a further 36% were overweight but not obese. However the Welsh Health Survey and other population surveys such as the Health Behaviour in School-aged Children only measure a comparatively small sample of the population, rely on self-reported measures, and are less robust than accurately measuring almost the whole population of interest as is done in large surveillance programmes such as the Child Measurement Programme.

Obese children can experience adverse health and social consequences during childhood, but they are also more likely to be obese in adulthood[3]. Obesity increases an individual's likelihood of developing chronic diseases. These include type 2 diabetes, high blood pressure, heart disease, osteoarthritis, liver disease and some types of cancer.

Researchers have found an association between child obesity and obesity within the family – a report from the Millennium Cohort Study specific to children in Wales[4] stated that "having an obese mother increases the risk of a child being overweight or obese by 18 percentage points at age 5". The paper suggests the cause may be genetic in part, but may also be about similarity between the diet and activity within the family. The same study also suggested that not being breastfed and/or weaning before the age of three months increased the probability of a child becoming obese between the ages of three and five.

A second report[5] using measurements from the same study but taken at age 11 found that the association between the weight of children and the weight status of their mothers persisted, and that children of obese mothers had the highest levels of overweight and obesity at age 11. The children in the Millennium Cohort were measured at ages 3, 5, 7 and 11 and the report suggested that 44% of that cohort changed their weight status at least once during the time they were being followed up, with 4% being consistently overweight and 1% being consistently obese. However only 51% were neither overweight nor obese at any of the measurements.

There are direct costs to health services arising from obesity – the Welsh Government published a report[6] in 2011 which concluded that *"Obesity is estimated to cost the NHS in Wales over £73 million, which increases to nearly £86 million if obese and overweight people are included ..... between .....*

£1.4 million and £1.65 million spent each week treating diseases resulting from obesity and amounting to between £25 and £29 per person in Wales".

The National Institute for Health and Care Excellence[7] (NICE) recommends *"a community-wide, multi-agency approach to promoting a healthy weight and preventing and managing obesity"* which includes as a component *"family-based, multi-component lifestyle weight management services for children and young people".*

Similarly an editorial in the Lancet journal[8] focused on the need for a 'joined-up' approach, encompassing all areas of life *"children are ..... exposed to whatever environment we create for them, and while it is important to have child-specific interventions and actions, societal change as a whole is also required".* The Lancet also specifically mentioned the need to *"accurately monitor and evaluate basic population weight data".*

It will take the joint efforts of society and not just the NHS to address the challenges posed by an increasingly obesogenic society.

3 About the Child Measurement Programme

The Child Measurement Programme consists of a central programme office within the Health Intelligence Division of Public Health Wales, with input from staff across the NHS in Wales. School health teams in local health boards (LHBs) are responsible for communication with schools, parents and children and for carrying out the measurements. Local child health records teams are responsible for ensuring all the information is entered onto the Community Child Health Database (CCHD) using the correct software module. The Public Health Wales Observatory analysts receive the information in an anonymised download from the NHS Wales Informatics Service (NWIS) who maintain the CCHD and process the data before passing it on to the analysts. The Observatory Analytical Team prepare the data for use by staff in the programme office in the annual report. The process is supported by the Child Measurement Programme Advisory Group, which is a multi agency group including representatives from local health boards, education, the Voluntary sector and Welsh Government. It was established in 2014.

3.1 Aims

This is the third full year that the Child Measurement Programme has been in place. As already stated, the CMP was established in 2011 as a surveillance programme, aimed at giving an accurate picture of the growth of children in Wales. The results may be used for surveillance, planning of health and preventative services, monitoring or evaluation purposes or research. It is not a programme aimed at screening individuals, however health professionals who are carrying out the measurements and who identify any health concerns about a child would be expected to respond to those concerns in line with their own professional codes of practice and with locally agreed protocols and pathways.

3.2 Child Measurement Programme Standards and Guidelines

Measurements taken for the CMP have been carried out in line with the Child Measurement Programme Standards and Guidelines[9] which were agreed by the Child Measurement Programme Steering Group and Board in 2012. These were revised in 2014 and endorsed by the new Child Measurement Programme Advisory Group[10]. The Standards and Guidelines are designed to facilitate a standardised way in which children are measured, and results recorded and analysed so that the results will be seen as robust, comprehensive and comparable across Wales and over time.

The Child Measurement Programme Standards and Guidelines are available on the CMP website in both Welsh and English.

They contain information for local health teams including:

- how measurements should be carried out
- how equipment used in taking the measurements should be maintained and calibrated
- staff training
- recording and communication of results
- children not included in the programme
- assurance and audit.

During 2014 a CMP e-learning package was developed for use by NHS staff working in local health boards. This is designed to be used in conjunction with the staff training video also launched in 2014.

3.3 History of the programme in Wales

Prior to the introduction of the Child Measurement Programme in Wales a feasibility study was carried out. This was published in 2009[11], and the full programme began in 2011/12, although this was seen as a 'transitional year' as the full standards and guidance governing the programme were not agreed until 2012, nor was the specific CMP software module of the Community Child Health Database available during the first year.

The programme was established following Directions[12] issued by the Minister for Health and Social Services in the National Assembly for Wales. These came into force in August 2011. The programme is governed by the Welsh Government's Child Measurement Programme (Wales) Regulations[13], and coordinated by Public Health Wales, supported by the NHS Wales Informatics Service (NWIS). The CMP is delivered by the seven health boards in Wales, with Public Health Wales having responsibility for oversight, data-analysis and reporting.

Initially a steering group and board were established to oversee the inception of the programme, and these groups met regularly between 2011 and 2014. In 2014 these were replaced by a single group – the Child Measurement Programme Advisory Group, which has a remit for the provision of oversight and strategic direction to the programme team responsible for the Child Measurement Programme in Wales.

The 2012/13 report published in 2014 provided analysis looking at the ethnicity of the children. That is repeated again this year, and the programme is further extended by providing analysis of child growth between children living in the countryside or in towns and cities in Wales, and by providing analysis at a level smaller than local authority. This analysis which is at Middle super output area (MSOA) level, is available through combining the results for the three years that the programme has now been in place.

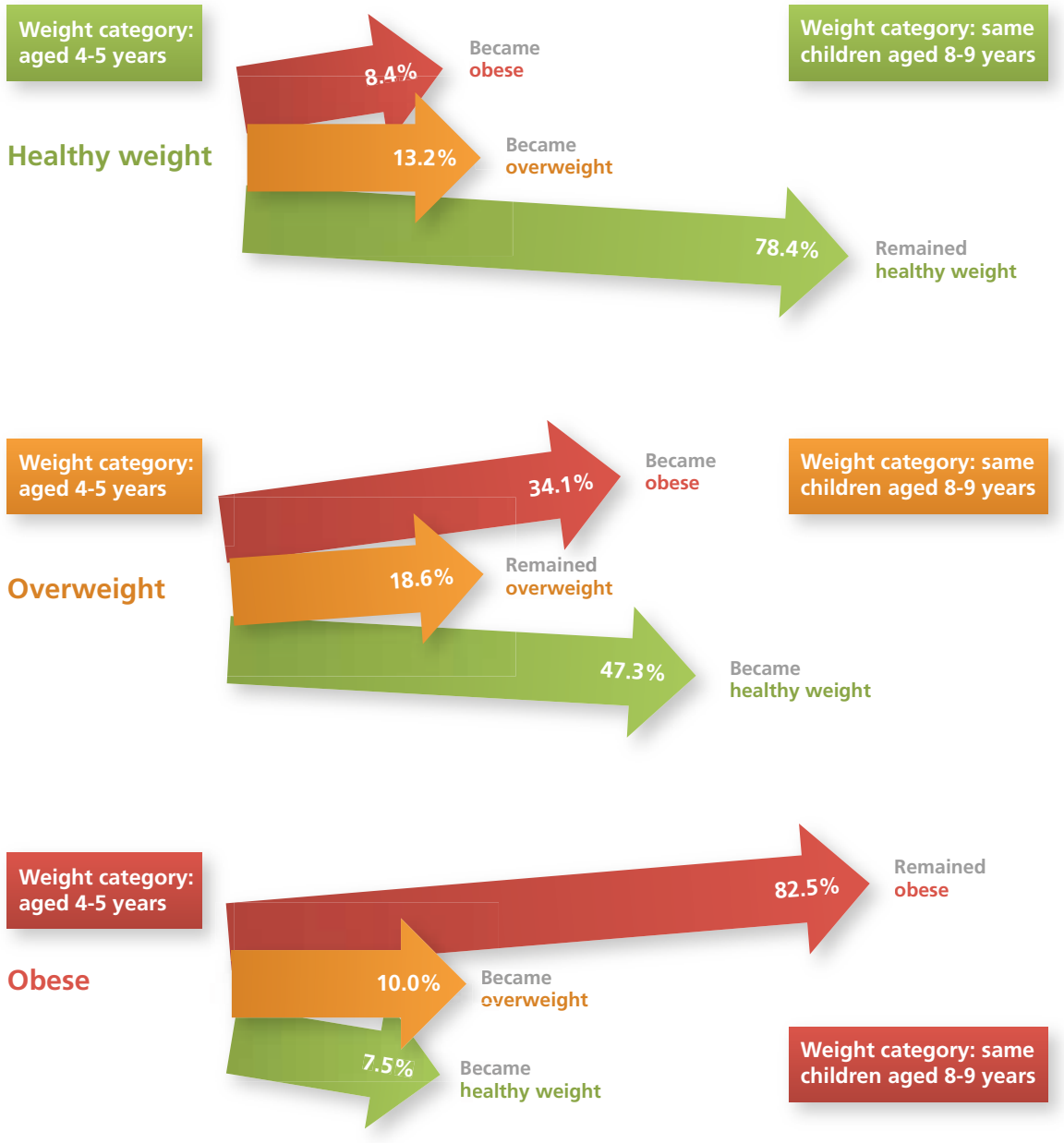
3.4 Extending the Child Measurement Programme

The 2009 feasibility study included analysis of measurements taken in children in the year 4 age group as well as in reception year. In 2012/13 a further feasibility study commissioned by Welsh Government was carried out in year 4 in Cwm Taf Health Board, and the results were published in March 2015[14].

The pilot study found that overall 20.4% of year 4 children in Cwm Taf in 2012/13 were categorised as obese. Meanwhile 13.9% of children in reception year in Cwm Taf in 2012/13 had been categorised as obese. Of note is that 954 of the children in the pilot study had also been measured in the feasibility study carried out in 2009. Through linking the records it was found that whereas 120 of this original cohort had been found to be obese in 2009, by 2013 this had increased to 212 children. The movement of children across categories between the two time periods is shown in figure 1.

Figure 1 Proportion of children moving across weight categories between 2008/9 and 2012/13 (data linkage)

Produced by Public Health Wales Observatory, using CMP data (NWIS)



It is worth noting that most of the children categorised as overweight at age 4 to 5 in 2009 had either achieved a healthy weight or remained overweight but not become obese by the time of the second study. This is similar to existing research[15] from the Millennium Cohort which examined weight changes in children between the ages of 3 and 5, where 46% of children who were overweight at the age of 3 had achieved a healthy weight by the age of 5.

However only 7.5% of the children who were categorised as obese in 2009 had achieved a healthy weight by the time they were aged 8 to 9 in 2013.

The 2011 Welsh Government Regulations allow for the extension of the CMP to children in Year 4, however the study also found that extending the programme would incur significant costs and a decision on extending the programme has not yet been made.

3.5 Factors affecting the Child Measurement Programme in 2013/14

There were several factors which impacted upon the Child Measurement Programme in 2013/14. Briefly there were issues in the following areas:

- 48% of children born in 2008/9 with an ethnicity recorded on the Community Child Health Database (CCHD) were recorded using a coding system that was discontinued in 2002, suggesting that they may have been classified using codes from their birth mother's health records, rather than being assigned their own codes. There are two main problems arising from use of the pre-2002 coding in the CMP:
  - Children do not always share their mother's ethnicity and should always be assigned their own ethnicity based on both parents' ethnic origin
  - The pre-2002 coding system did not have coding available for children of mixed heritage and it is unknown how these children were coded
- A large (505 records) discrepancy was found between the number of reception year children participating in the annual school census and the number recorded on the Community Child Health Database in Hywel Dda University Health Board. The effect of any discrepancy is difficult to estimate
- Lower than expected participation (78.5%) in Cardiff and Vale University Health Board, attributed to local staffing issues, specifically in Cardiff where participation fell to 75% from 89% in 2012/13.

Participation rates have risen in all health board areas except Cardiff and Vale, and overall participation has increased. However because Cardiff has the single largest number of children in Wales eligible to participate in the CMP (4,229 out of a total of 33,794 or 12.5%) this will impact upon the overall participation rate for Wales, and could affect some of the results in various categories.

It is difficult to establish whether a fall in participation rates significantly impacts on weight category prevalence figures. However work done[16] in the National Child Measurement Programme (NCMP) for England over a number of years suggests that while a change in participation rates can lead to a small underestimation of true obesity prevalence for children in Year 6 in England (suggesting children with a higher BMI may be more likely to be opted out in that year group), it had a negligible impact upon the reception year figures in the English programme.

Results

4

4.1 Participation

Participation in the Child Measurement Programme increased to 90.8% this year. The participation rate increased in all LHB areas except Cardiff and Vale University Health Board where it fell from 89.7% last year to 78.5% this year. Using information from the Community Child Health Database (CCHD) 33,794 children were assessed as being eligible for inclusion in the Child Measurement Programme in Wales in 2013/14. Of these children, valid measurements were obtained for 30,669.

Children regarded as eligible for inclusion were all born between 1st September 2008 and 31st August 2009, attending school in Wales and resident in Wales. 51.3% were boys, 48.7% girls. The count of eligible children, known as the denominator, is taken from the Community Child Health Database (CCHD) in July each year.

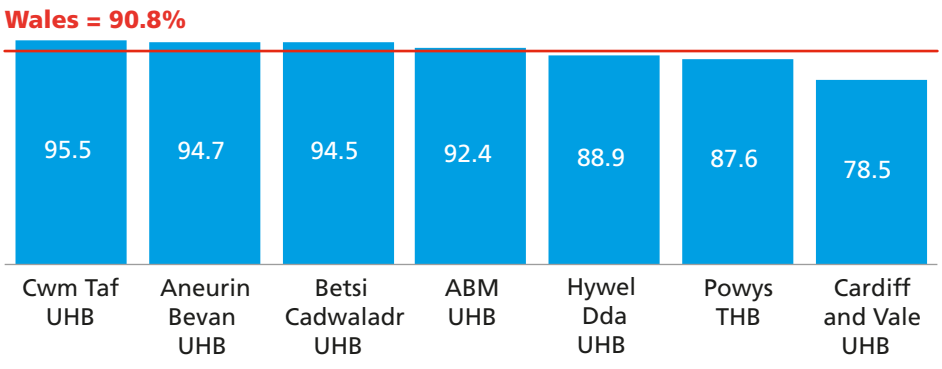
Table 1 Participation in the Child Measurement Programme for Wales since 2011/12

Produced by Public Health Wales Observatory, using CMP data (NWIS)

	2011/12	2012/13	2013/14
Children participating/ eligible	29,409/33,272	29,238/34,679	30,669/33,794
Percentage	88.4%	84.3%	90.8%

Figure 2 Proportion of children aged 4 to 5 years participating in a child measurement programme, Wales and health boards

Produced by Public Health Wales Observatory, using CMP data (NWIS)



The CCHD also records the number of children whose parents chose to opt them out of the programme and in 2013/14 there were 98 children (0.3%) recorded as having been opted out. This is a fall from 2012/13 when 286 children were recorded as having been opted out. Accurate measurements could not be obtained on a further eight children this year, and reasons for this could include children with a health condition that prevented them from standing up straight, or children wearing plaster casts.

In January every year in Wales a national schools census is carried out. In 2014 the census showed that a total of 34,905 children were reported to be attending a reception year class in Wales. 51.3% were boys and 48.7% were girls.The schools census includes children attending school in Wales but resident in England and their measurements are not included in the Child Measurement Programme, which could explain some of the difference between the number counted in the census and the number of children eligible for inclusion in the CMP. However the biggest discrepancy was in Hywel Dda UHB where the schools census recorded 505 more children than the child health database. This issue is currently being investigated to try to ensure no recurrence next year.

As can be seen from figures 2 and 3, participation in some health boards/local authorities is higher than in others. In some health boards it became apparent that measurements had been taken but had been entered on the incorrect module of the community child health database. Fortunately this was identified during the summer of 2014 and steps were taken to rectify the issue before the measurements were downloaded from the Child Health database, and these measurements were therefore included in the CMP. In 2013/14, Cardiff and Vale University Health Board reported significant staff absence impacted on their ability to carry out measurements for the Child Measurement Programme.

Figure 3 **Proportion of children aged 4 to 5 years participating in a child measurement programme, Wales and local authorities**

Produced by Public Health Wales Observatory, using CMP data (NWIS)

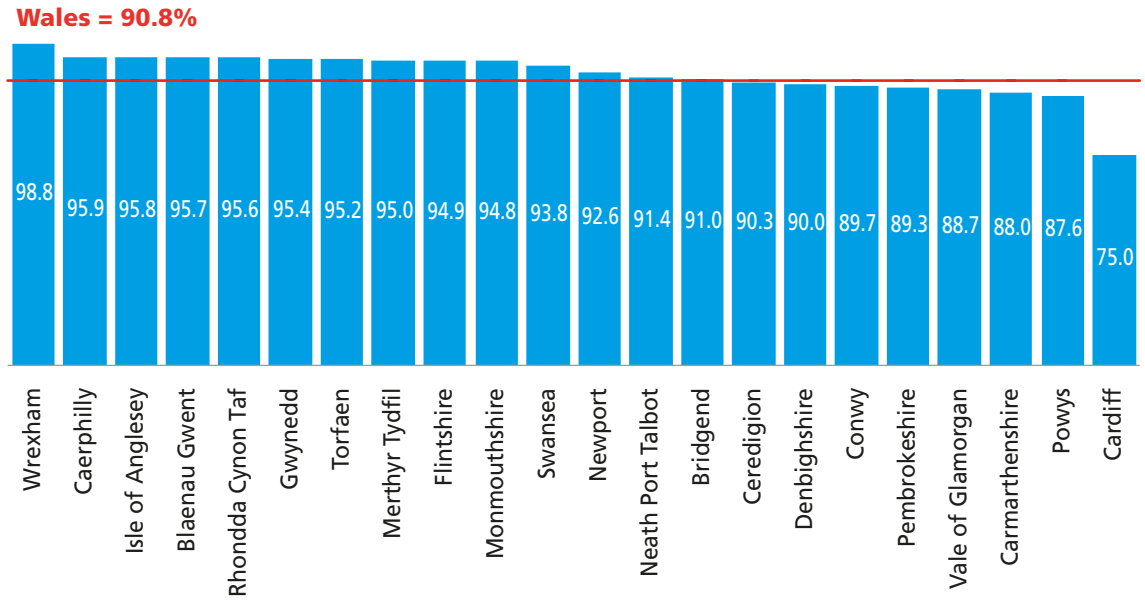
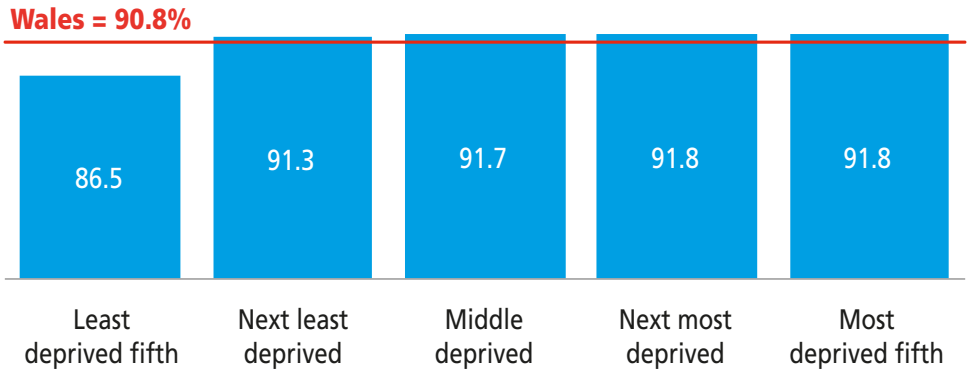
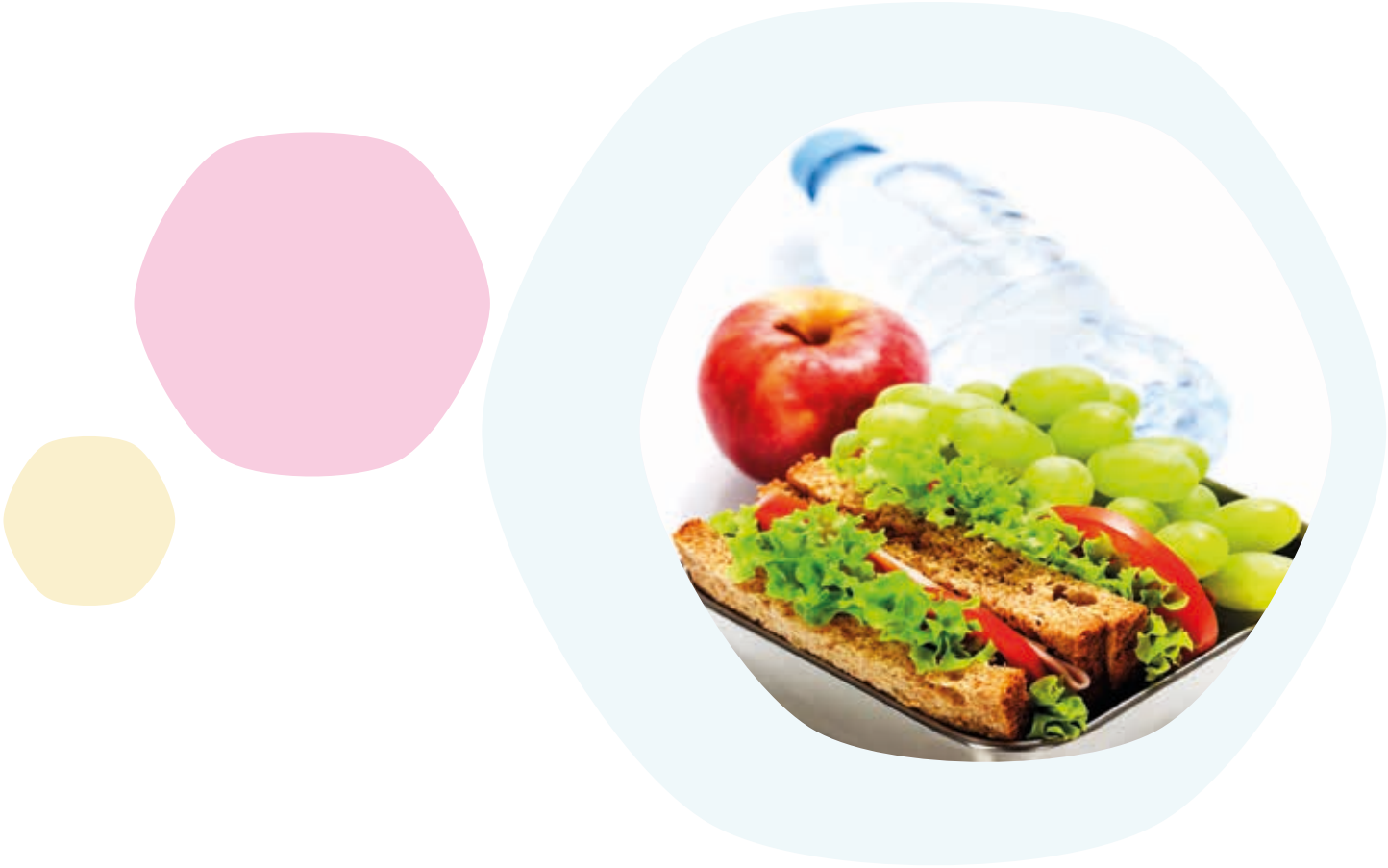


Figure 4 **Proportion of children aged 4 to 5 years participating in a child measurement programme, Welsh Index of Multiple Deprivation quintiles**

Produced by Public Health Wales Observatory, using CMP data (NWIS)



From figure 4 it appears that children living in the least deprived area of Wales were less likely than children living in the more deprived areas to particpate. This contrasts with the picture last year, wheere the largest proportion of children measured were living in the least deprived area. As can be seen from the participation table in Appendix 3, participation rates analysed by deprivation could have been impacted by low participation in Cardiff and Vale University Health Board. There are a large number of children living within Cardiff and Vale UHB, and of the 382 least deprived areas across all of Wales, 104 (27%) of these fall within the Cardiff and Vale UHB area[17].



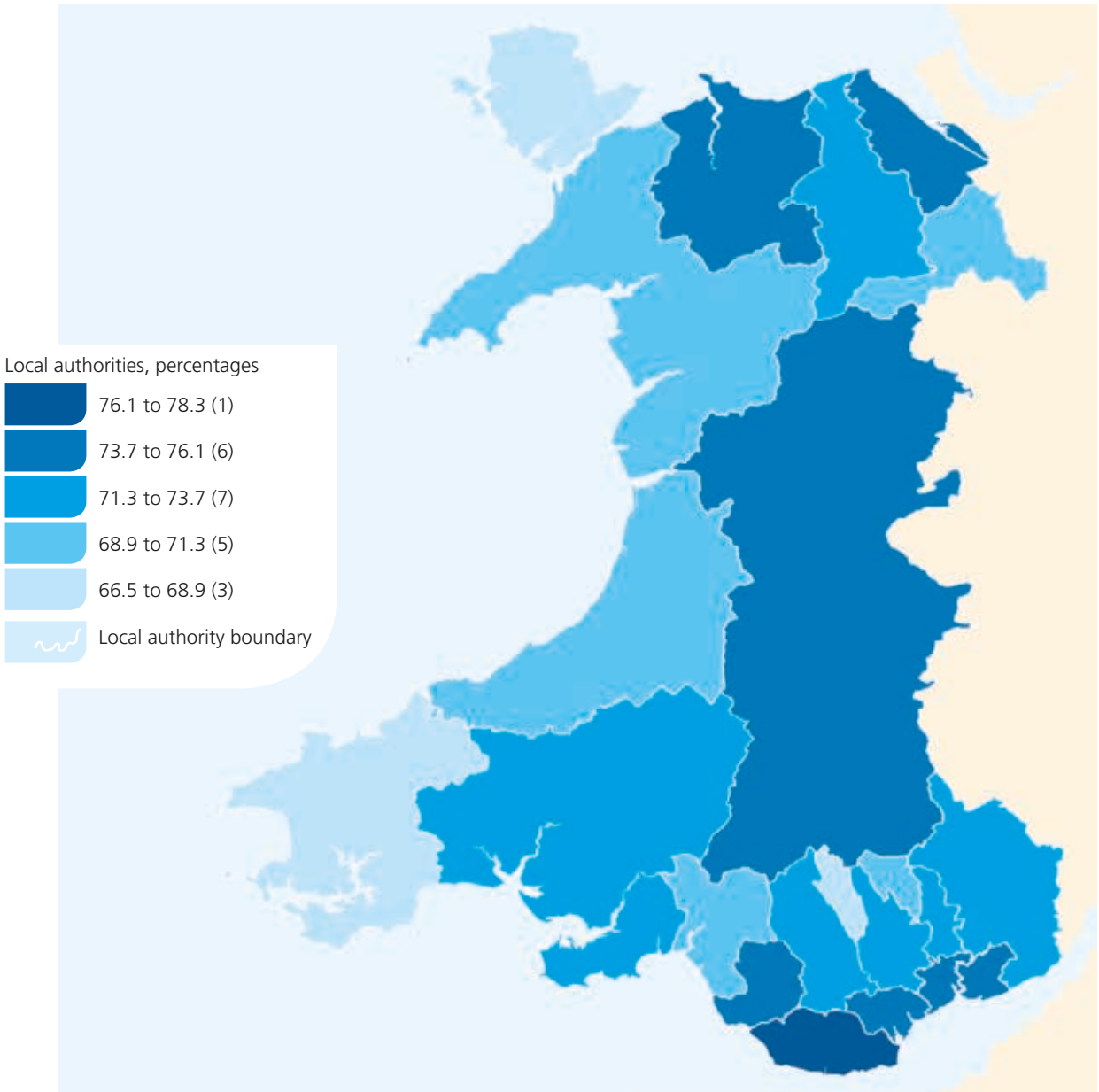
4.2 Healthy weight

Appendix 1 gives a full explanation of how children are classified by BMI, however in brief, child measurements in the CMP in Wales are classified as below:

- Underweight: BMI less than but not including the second centile
- Healthy weight: BMI second centile up to but not including the 85th centile
- Overweight but not obese: BMI 85th centile up to but not including the 95th centile
- Obese: 95th centile and above.

The majority of children in reception year who both live in and attend school in Wales are of a healthy weight – 72.7% but this has fallen slightly – it was 73.2% in 2012/13. However the fall is not significant.
The prevalence of healthy weight varies across the country as can be seen in figure 5.

Figure 5• Proportion of children who are a healthy weight, 2013/14, children aged 4 to 5 years



• Exact values are used to determine the ranges, and hence membership, of groups within maps. However, in the legend those ranges are shown to one decimal place only. Therefore, whilst the top of one range appears to overlap with the bottom of the following range within the legend, each exact value could only fall within a single exact range and group.

At any level below national level, the information on children of a healthy weight is usually combined with information about children who are underweight. This is because only a very small number of children are underweight at either health board or local authority level, and there is a risk that individual children could be identified, so combining the numbers who are healthy weight with those who are underweight reduces the risk of disclosure.

So while information can be given on the map in figure 5, showing prevalence just of healthy weight as a range at local authority level, for more comprehensive information at health board or local authority level the information is combined with information about prevalence of underweight. This is contained in figures 6 and 7.

Figure 6 **Proportion of children aged 4 to 5 years who are a healthy weight or underweight, Wales and health boards**

Produced by Public Health Wales Observatory, using CMP data (NWIS)

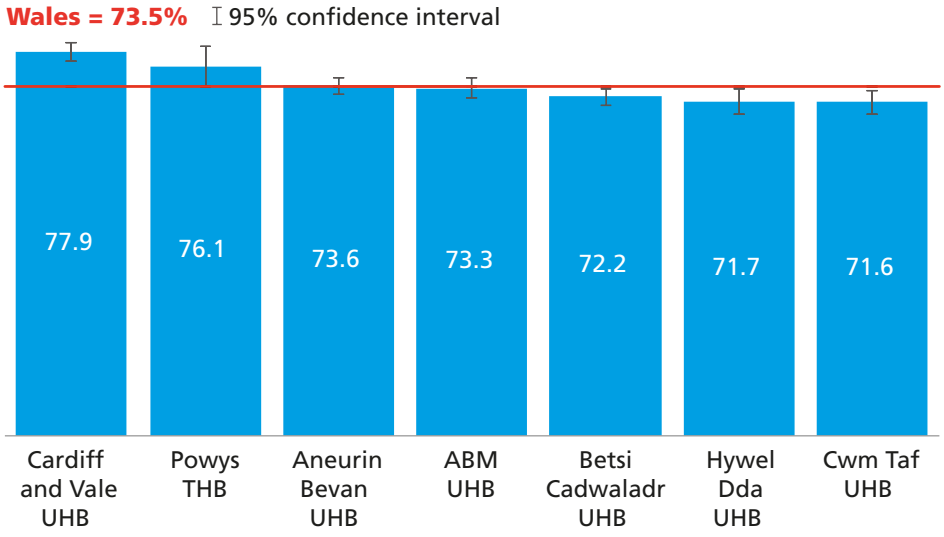


Figure 7 **Proportion of children aged 4 to 5 years, who are a healthy weight or underweight, Child Measurement Programme, Wales and local authorities, 2013/14**

Produced by Public Health Wales Observatory, using CMP data (NWIS)

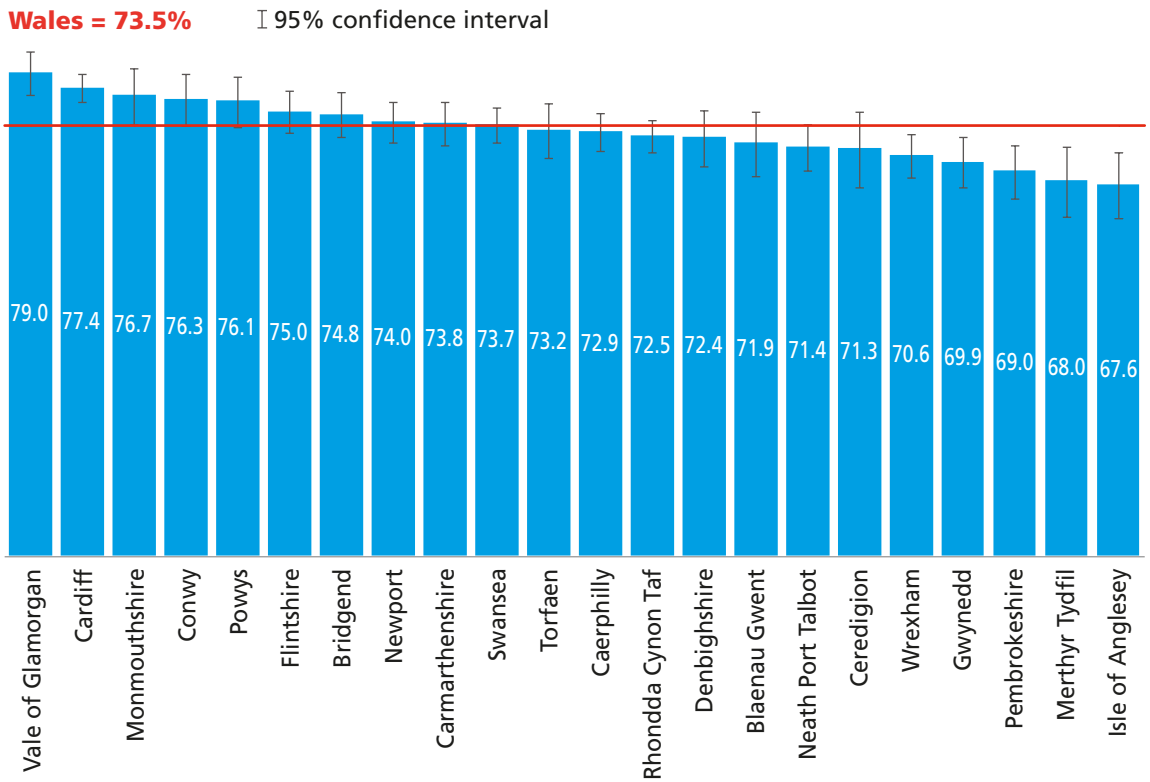


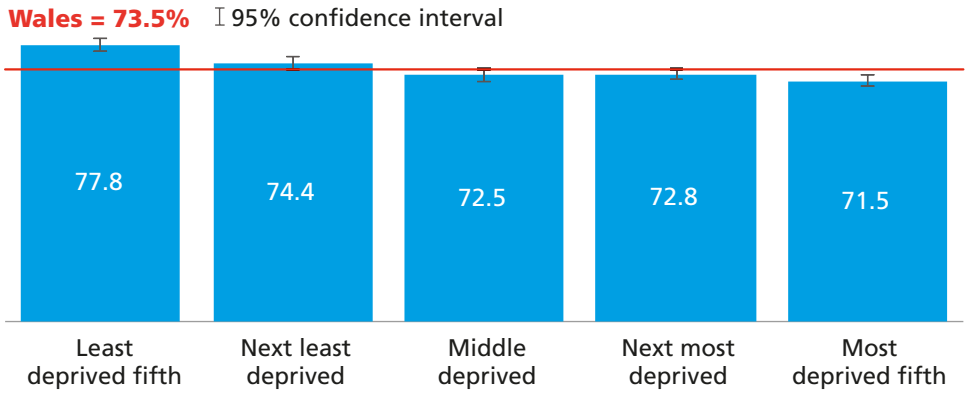
Figure 7 shows that the recorded prevalence of healthy weight and underweight is highest in the Vale of Glamorgan, and second highest in the Cardiff area. However the lower than expected participation rate in Cardiff could have impacted upon this figure which was 75.7% in 2012/13, when it had the seventh highest prevalence of healthy/underweight children. Prevalence rates also appear to have fallen in Ceredigion, which had the third highest prevalence (77.4%) of healthy/underweight children the previous year and now has the sixth lowest prevalence. However unlike Cardiff, the actual number and proportion of children measured in Ceredigion in both years is very similar*. As more information is gathered over the years as part of the Child Measurement Programme, it will be possible to see if changes such as these are part of a sustained trend in an area, or not.

The prevalence of healthy weight/underweight was also analysed by level of deprivation, using the Welsh Index of Multiple Deprivation 2014 (figure 8). Children living in the most deprived fifth of areas (quintile) across Wales are significantly less likely than children living in either of the two least deprived fifths to be in the healthy weight/underweight category.

* In Ceredigion 562 children were measured in 2012/13, which was 91.4% of those eligible, and 543 children were measured in 2013/14 or 90.3% of those eligible.

Figure 8 Proportion of children aged 4 to 5 years who are a healthy weight or underweight, Welsh Index of Multiple Deprivation quintiles

Produced by Public Health Wales Observatory, using CMP data (NWIS) and WIMD 2014 (WG)



An explanation of analysis by deprivation is given in Appendix 1. The areas of deprivation are spread across Wales although are more concentrated in some areas, specifically in south Wales.

4.3 Underweight

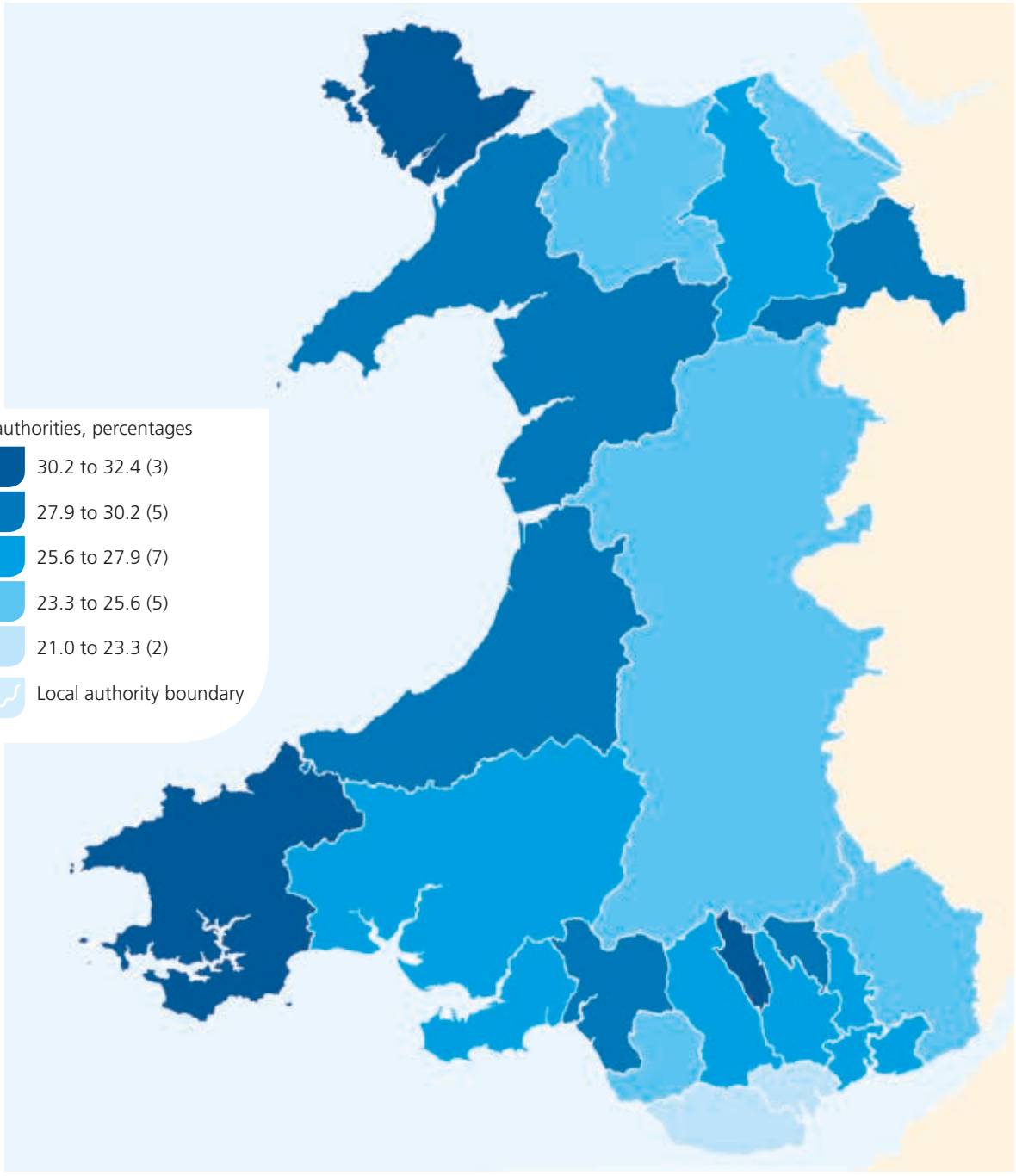
As stated previously, because of the small numbers of children who are classified as being underweight, the underweight and healthy weight categories have been combined to avoid the potential identification of individual children who are deemed to be underweight. Information for prevalence of underweight may be available at Health Board level, and occasionally at Local Authority level (see tables in Appendix 3), however when broken down further by gender the information may only be presented at a national level.

From the information that it is possible to make available, recorded prevalence of underweight was 0.8% across Wales – 1.0% in boys and 0.6% in girls. A larger number of children fell into the underweight category this year than last (248:179) but the change is not statistically significant. If the numbers continue to increase it may be possible to present a more in-depth analysis in future.

The highest proportion of underweight children out of all the local authority areas was in Cardiff, where 2.1% (n=66) of children were in the underweight category. The prevalence proportion across the other 21 local authority areas varied from 0.3% to 1.1%. The Cardiff figure is not significantly different to the prevalence of underweight in 2012/13 and it is not clear why Cardiff has the largest proportion of children in Wales deemed to be underweight. However as in 2012/13, Cardiff is the area in Wales with the largest black and minority ethnic (BME) population in Wales and it is possible that this could have impacted on this result. More information about variation by ethnic origin in weight category prevalence is given in section 4.8.

4.4 Overweight or obese

Figure 9 Proportion of children who are overweight or obese, 2013/14 children aged 4 to 5 years



The majority of reception year children in Wales who were measured for the CMP were of a healthy weight. However 26.5% were either overweight or obese. This is a slight increase from the average of 26.2% in 2012/13, but the increase is not statistically significant.

From figures 9 and 10, five local authority areas have significantly higher prevalence of 'overweight or obese' than the Wales average of 26.5%. These are the Isle of Anglesey, Merthyr Tydfil, Pembrokeshire, Gwynedd and Wrexham. Both Cardiff and the Vale of Glamorgan have significantly lower prevalence than the Wales average.

Figure 10 Proportion of children aged 4 to 5 years who are overweight or obese, Wales and local authorities

Produced by Public Health Wales Observatory, using CMP data (NWIS)

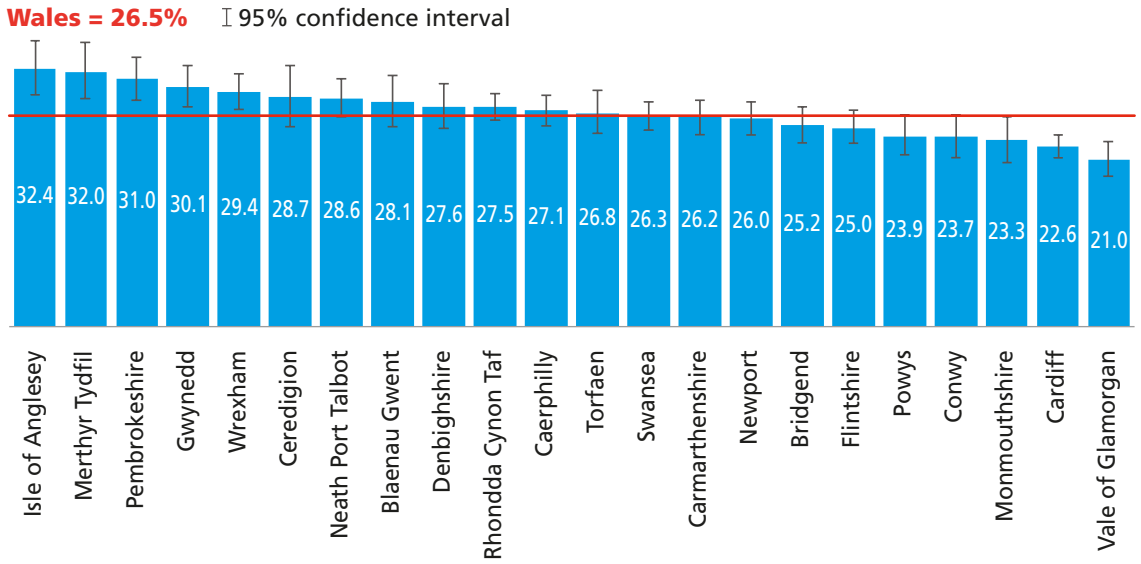


Figure 11 Proportion of children aged 4 to 5 years who are overweight or obese, Wales and health boards

Produced by Public Health Wales Observatory, using CMP data (NWIS)

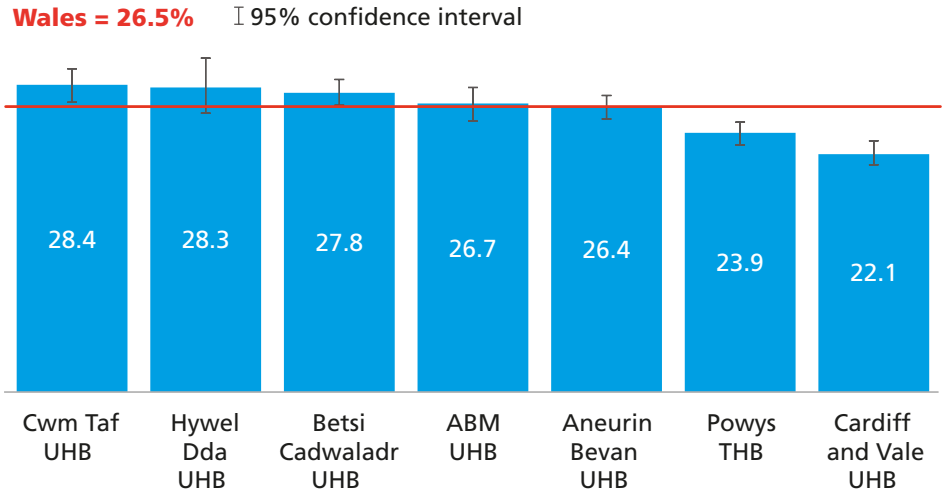
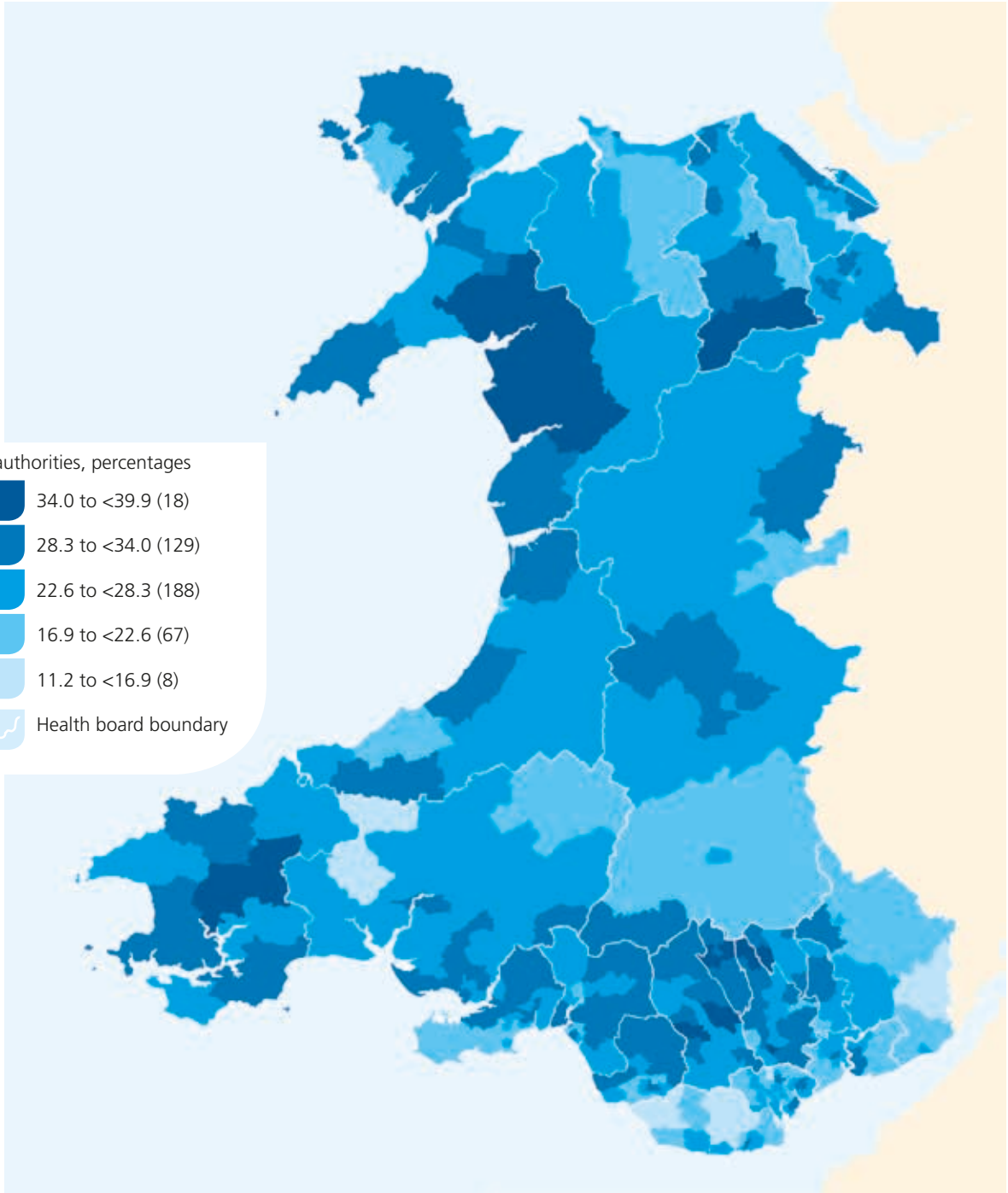


Figure 11 shows the information at local health board level. Both Powys THB and Cardiff and Vale UHB have lower than average prevalence of 'overweight or obese'. In Cardiff and Vale University Health Board this figure has fallen from 23.7% last year to 22.1% this year. However as suggested earlier this figure may not be wholly reliable as the lower participation rates in Cardiff could have had an impact upon prevalence across the BMI categories.

As the programme has been in place since 2011/12, it is now in its third year. Data from the three years the programme has been running was combined to provide information at a lower level than local authority. This is at Middle super output area (MSOA) level and is displayed on the map in figure 12. Maps displaying this information for each of the individual health boards are contained in Appendix 5. It is possible to see from figure 12 that even in areas such as Powys where overall prevalence of 'overweight or obese' is low, there are pockets where prevalence appears to be more concentrated.

Figure 12 **Proportion of children who are overweight or obese, 3 years combined data, 2011/12, 2012/13 and 2013/14, children aged 4 to 5 years by MSOA**



Again, as for prevalence of healthy weight, the proportion of children classified as being 'overweight or obese' varies by local authority, health board area and deprivation. Figures 13, 14 and 15 show prevalence of 'overweight or obese' by deprivation level for all children, and for boys and girls in Wales.

As figure 13 shows, the prevalence of 'overweight or obese' in all children is significantly higher in the most deprived area of Wales, compared to the least deprived areas. The same is true of prevalence in both boys (figure 14) and girls (figure 15), with a difference of about 6% in prevalence of 'overweight or obese' for children, boys and girls between the most and least deprived areas.

Figure 13 Proportion of children aged 4 to 5 years who are overweight or obese, Welsh Index of Multiple Deprivation quintiles

Produced by Public Health Wales Observatory, using CMP data (NWIS) and WIMD 2014 (WG)

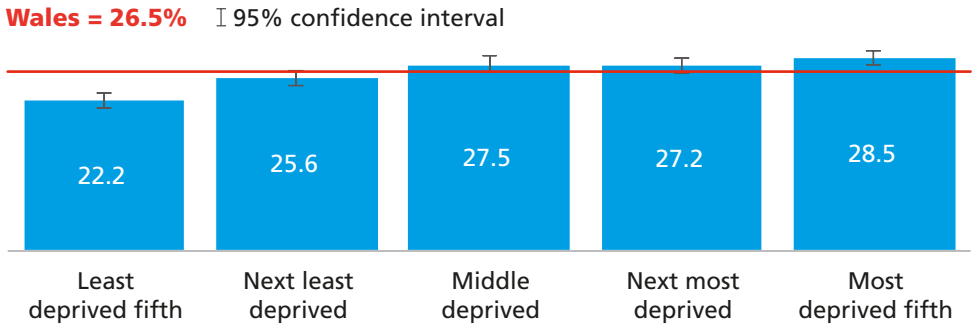


Figure 14 Proportion of boys aged 4 to 5 years who are overweight or obese, Welsh Index of Multiple Deprivation quintiles

Produced by Public Health Wales Observatory, using CMP data (NWIS) and WIMD 2014 (WG)

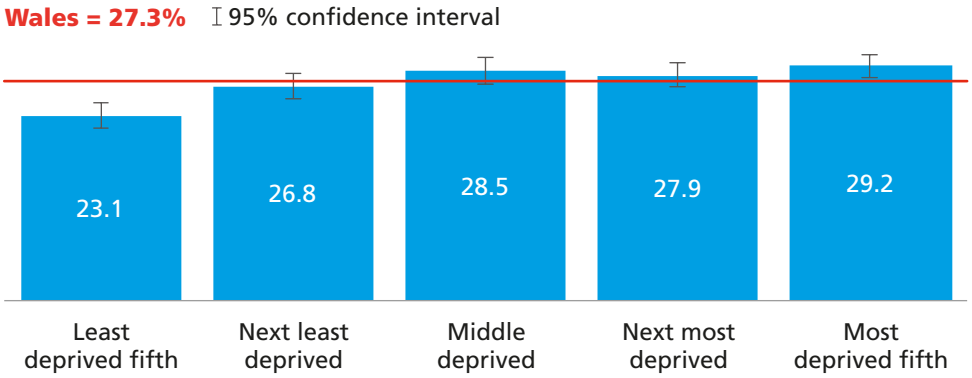


Figure 15 **Proportion of girls aged 4 to 5 years who are overweight or obese, Welsh Index of Multiple Deprivation quintiles**

Produced by Public Health Wales Observatory, using CMP data (NWIS) and WIMD 2014 (WG)

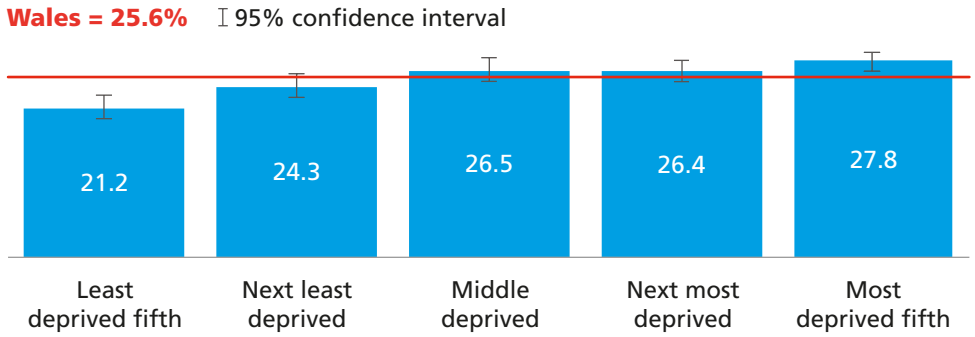
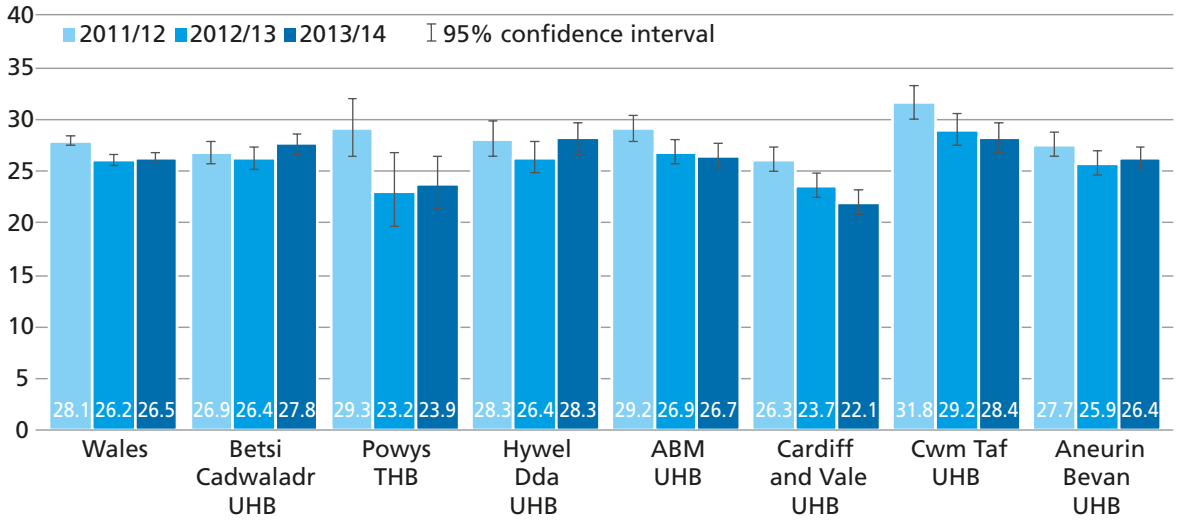


Figure 16 **Proportion of children aged 4 to 5 years who are overweight or obese, Wales and health boards, Child Measurement Programme for Wales, 2011/12, 2012/13 and 2013/14**

Produced by Public Health Wales Observatory, using CMP data (NWIS)

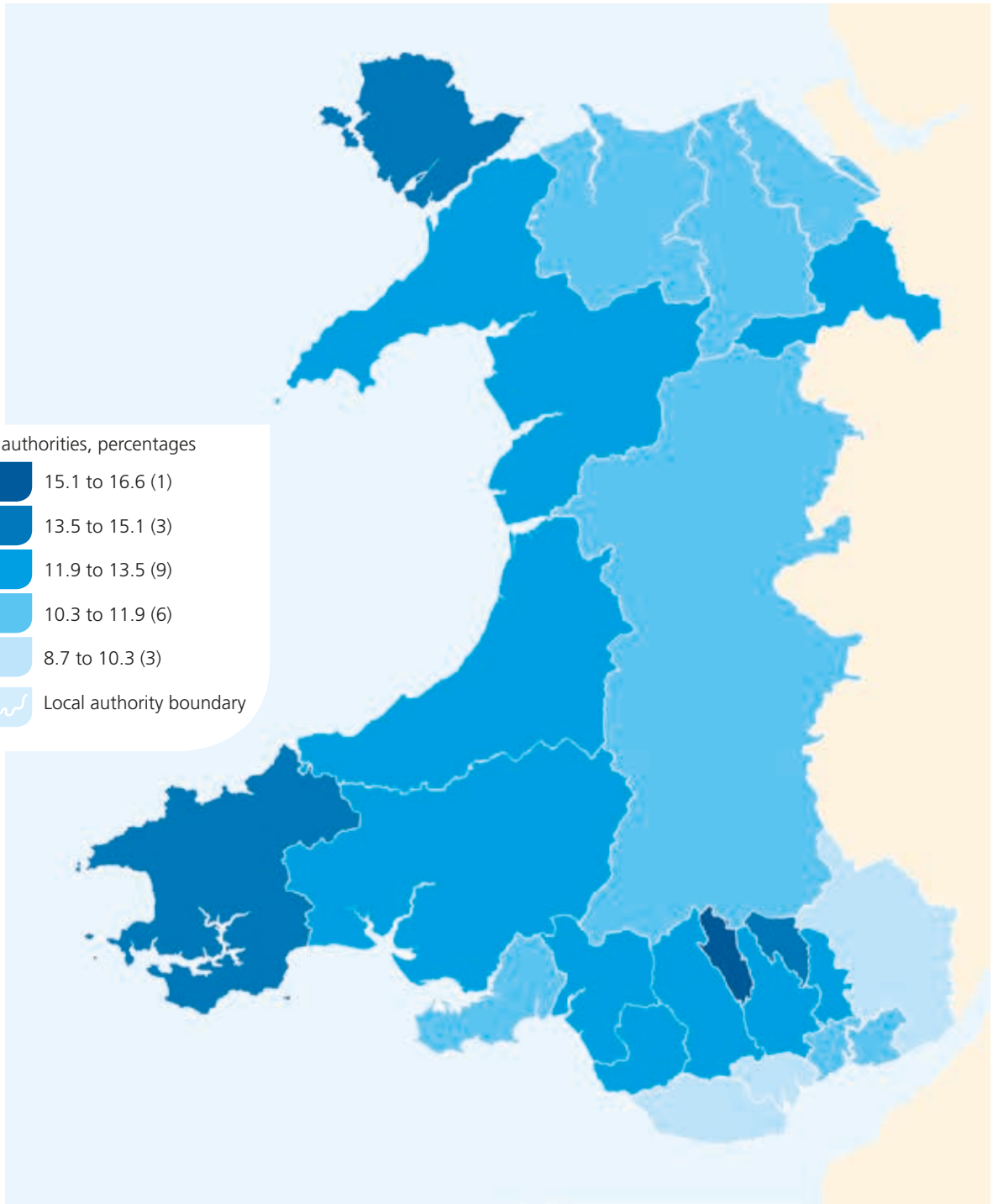


In figure 16 the changes in prevalence of 'overweight or obese' are shown over the three years the CMP has been in place. At an all Wales level the small fall since 2011/12 appears to be statistically significant. It also appears to be significant in Abertawe Bro Morgannwg, Cardiff and Vale and Cwm Taf Health Boards, but not in the remaining four health boards. However as already discussed in section 3.3, 2011/12 was a transitional year, and the changes between this year (2013/14) and last (2012/13) are not significant at any level.

4.5 Obesity

From figure 1 in section 3.4, it can be seen that children in Wales classified as obese are much more likely than children classified as overweight or healthy weight to remain in that classification between the ages of 5 and 9. 82.5% of the children with a BMI classified as obese at age 4 or 5, still had a BMI in the obese category by the time they were measured at age 8 or 9. So it is of concern that more than one in ten (11.8%) children measured for the CMP in 2013/14 had a BMI that was classified as obese. Again, prevalence of obesity varies by local authority (figures 17 and 18), health board (figure 19) and deprivation quintile (figure 21).

Figure 17 Proportion of children who are obese, 2013/14, children aged 4 to 5 years

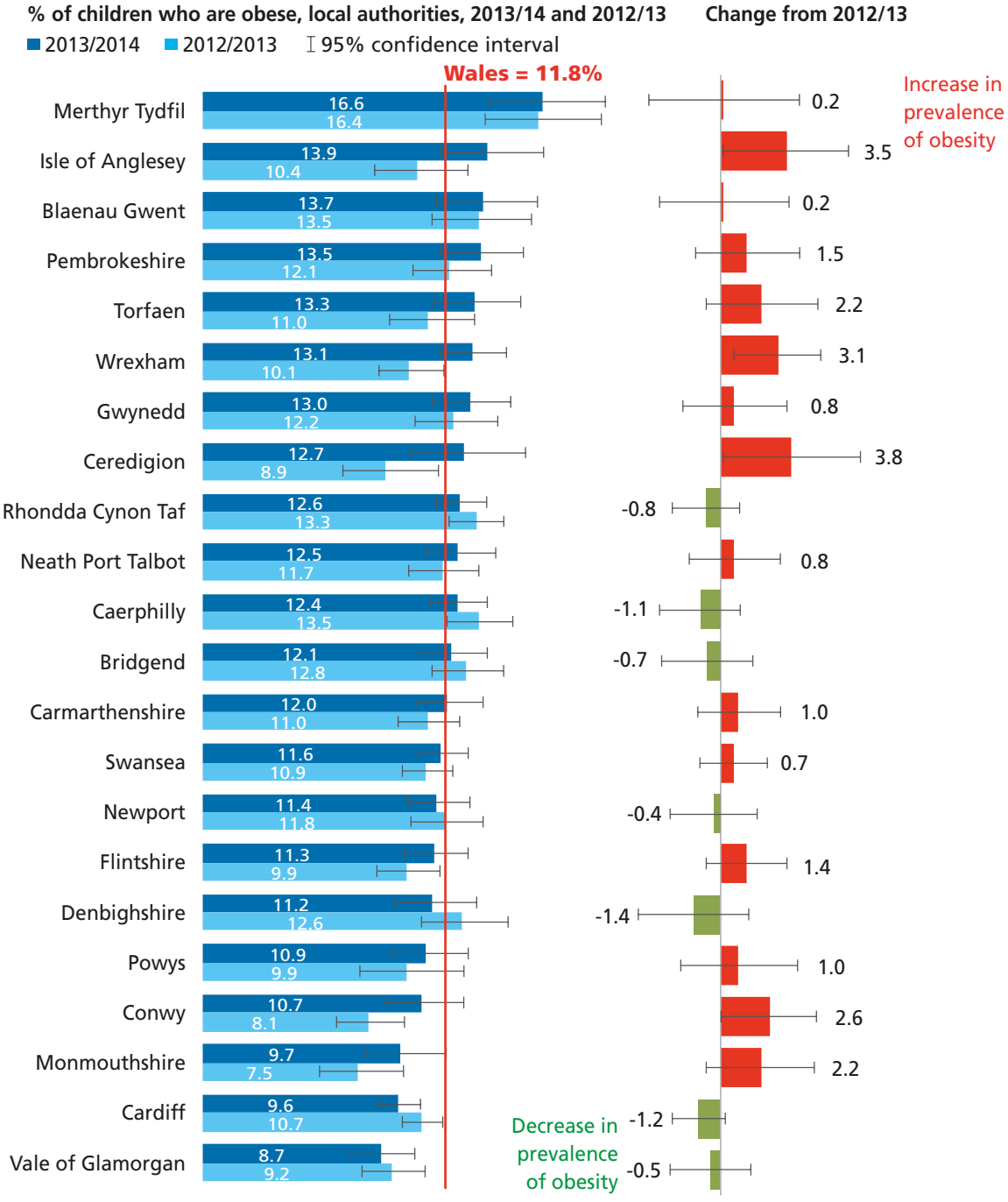


From figure 18 it can be seen that obesity prevalence varies across the country from 8.7% in the Vale of Glamorgan to 16.6% in Merthyr Tydfil. Obesity prevalence is significantly higher than the national average of 11.8% in Merthyr Tydfil, and significantly lower than the national average in both Cardiff and the Vale of Glamorgan.

Figure 18 also shows the change in obesity prevalence between 2012/13 and 2013/14 which in some places appears to have increased and in others appears to have decreased. However the actual count of children in each category is small and the changes between the two years should not be regarded as statistically significant.

Figure 18 **Proportion of children aged 4 to 5 years who are obese, Wales and local authorities, 2012/13 and 2013/14, showing changes between the two years**

Produced by Public Health Wales Observatory, using CMP data (NWIS)



As figure 19 shows, at a health board level the difference between obesity prevalence and the Welsh national average is only significant for Cardiff and Vale UHB where it is lower, and Cwm Taf UHB where it is higher.

Greater prevalence of obesity is associated with deprivation, and figure 20 shows the analysis of results by deprivation fifths. Children living in the areas of least deprivation are significantly less likely to be obese than children living in the areas with greatest deprivation, and the obesity prevalence is also significantly lower in the least deprived area than the national average. The converse is true for children living in the areas which experience the most deprivation, with 13.5% of children age 4 to 5 being classified as obese, which is significantly above the average prevalence of obesity for Wales.

Figure 19 Proportion of children aged 4 to 5 years who are obese, Wales and health boards

Produced by Public Health Wales Observatory, using CMP data (NWIS)

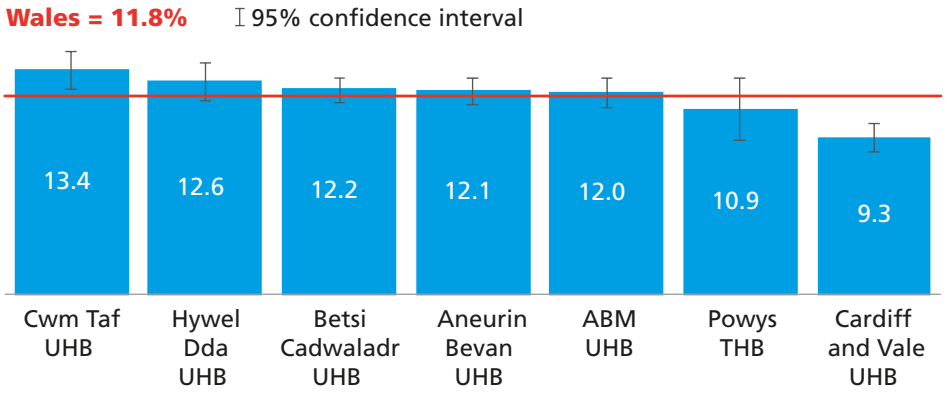
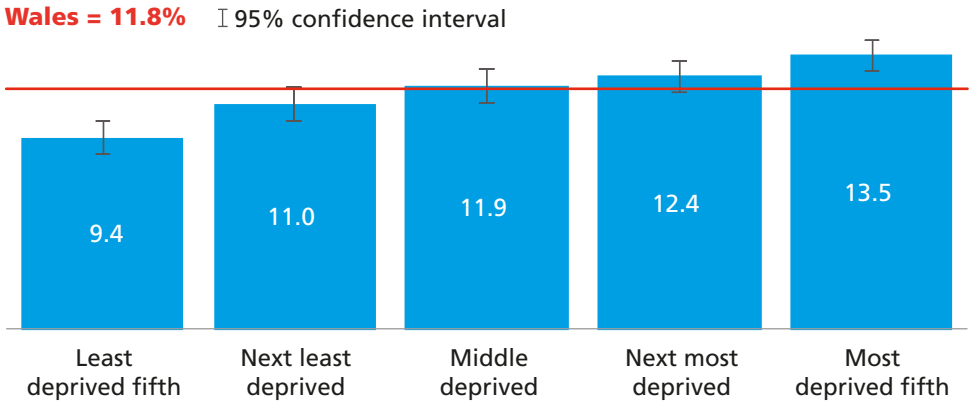


Figure 20 Proportion of children aged 4 to 5 years who are obese, Welsh Index of Multiple Deprivation quintiles

Produced by Public Health Wales Observatory, using CMP data (NWIS) and WIMD 2014 (WG)

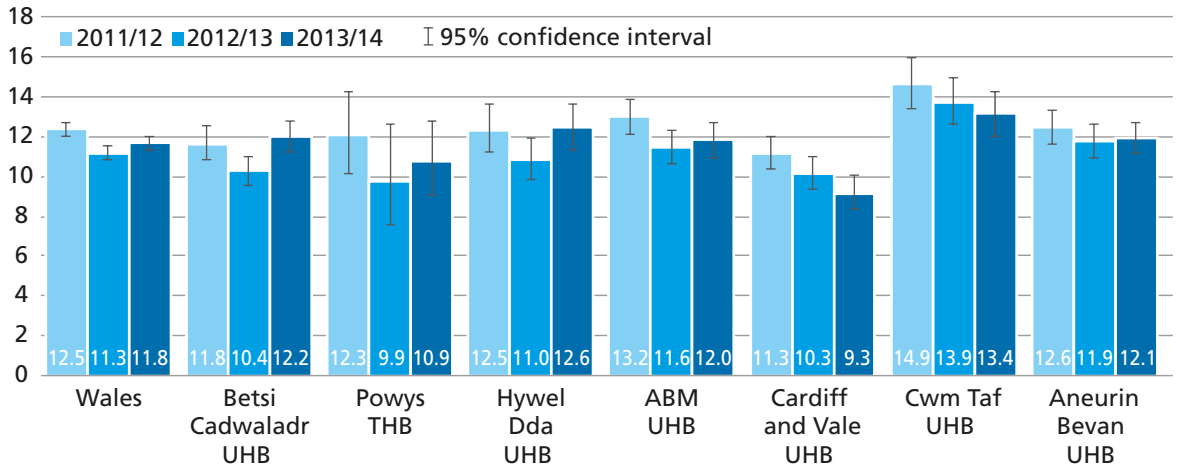


Looking at changes in prevalence across the three years (figure 21) the Child Measurement Programme has been in place, while it appears that there has been a decrease in obesity prevalence since 2011/12 in most Health Board areas this is only statistically significant at an all Wales level, and in Cardiff and Vale UHB. However because of the low participation in Cardiff and Vale already discussed, this latter figure should be viewed with caution.

It should also be noted that the standards and guidance for the Child Measurement Programme were adopted in 2012 and were therefore not in place for the 2011/12 programme, which was described as a transitional year. So any apparent changes in weight category prevalence across all three years should be viewed with caution as full standardisation of measurement taking and recording was not in place. Full standardisation of the programme has only been in place for 2012/13 and 2013/14. Further, trends will only become apparent with the availability of data for several years.

Figure 21 **Proportion of children aged 4 to 5 years who are obese, Wales and health boards, Child Measurement Programme for Wales, 2011/12, 2012/13 and 2013/14**

Produced by Public Health Wales Observatory, using CMP data (NWIS)



4.6 Comparison with previous years (2011/12 and 2012/13)

There has already been some information given in previous sections about apparent changes in prevalence categories across the three years the programme has been in place.

Figure 22 brings together the changes at an all-Wales level for three of the main prevalence categories. Last year's report suggested changes that were of significance in the prevalence of all three categories between 2011/12 and 2012/13. However none of the changes between 2012/13 and this year (2013/14) can be described as being statistically significant.

Figure 22 Children aged 4 to 5 years by weight category, Wales, Child Measurement Programme for Wales, comparison 2011/12, 2012/13 and 2013/14

Produced by Public Health Wales Observatory, using CMP data (NWIS)

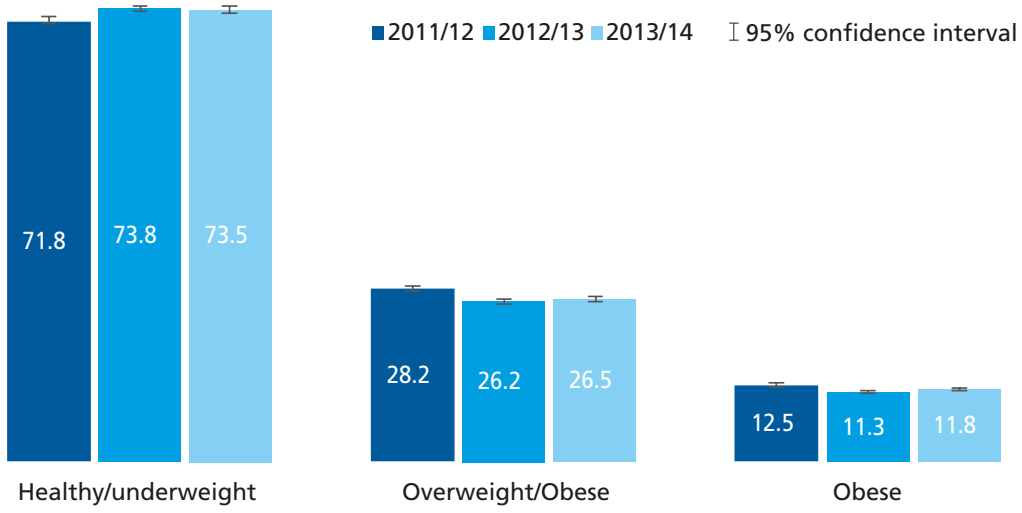


Figure 23 Proportion of children aged 4 to 5 years who are overweight or obese, most and least deprived fifth in Wales, Child Measurement Programme for Wales, 2011/12, 2012/13 and 2013/14

Produced by Public Health Wales Observatory, using CMP data (NWIS) and WIMD 2014 (WG)

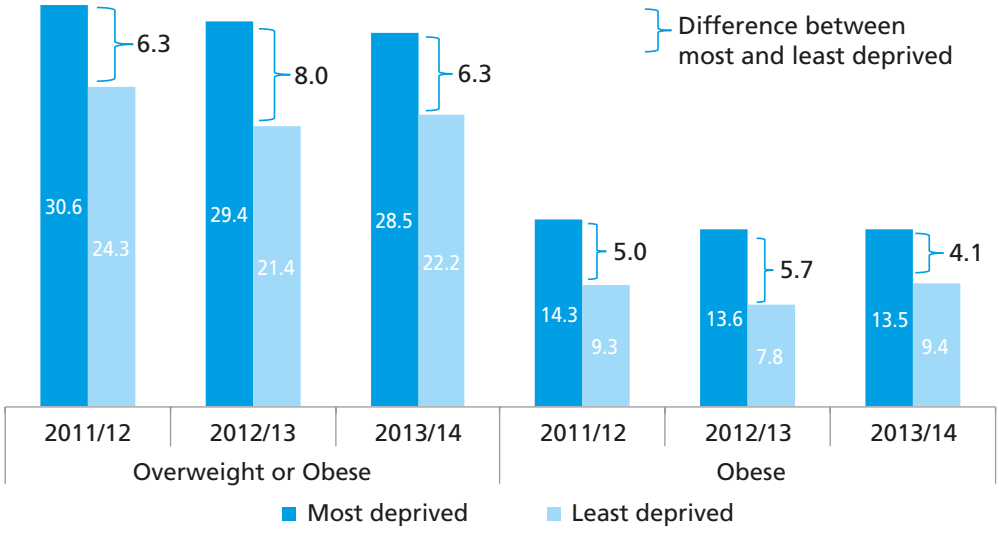


Figure 23 shows the changes between the most and least deprived fifth of areas for the 'overweight or obese' and obese categories. Last year we reported that the absolute gap in prevalence between the least and most deprived areas had increased between 2011/12 and 2012/13. As can be seen from figure 23 this has decreased between 2012/13 and 2013/14, and the change is statistically significant for the obesity prevalence category. The information shown in figure 23 for all children is available in separate charts for boys and for girls in Appendix 5.

Figures 24 and 25 show the absolute changes in the 'overweight or obese' category for local authorities and health boards since last year where it appears that prevalence has fallen in some areas but risen in others. Again caution should be taken when drawing conclusions as the change is not significant at an all Wales level, nor for any of the health boards. The increase in prevalence is statistically significant for only one of the 22 local authority areas – Wrexham.

Figure 24 **Percentage change of children aged 4 to 5 years who are obese or overweight, Wales and local authorities, Child Measurement Programme for Wales, comparison 2012/13 and 2013/14**

Produced by Public Health Wales Observatory, using CMP data (NWIS)

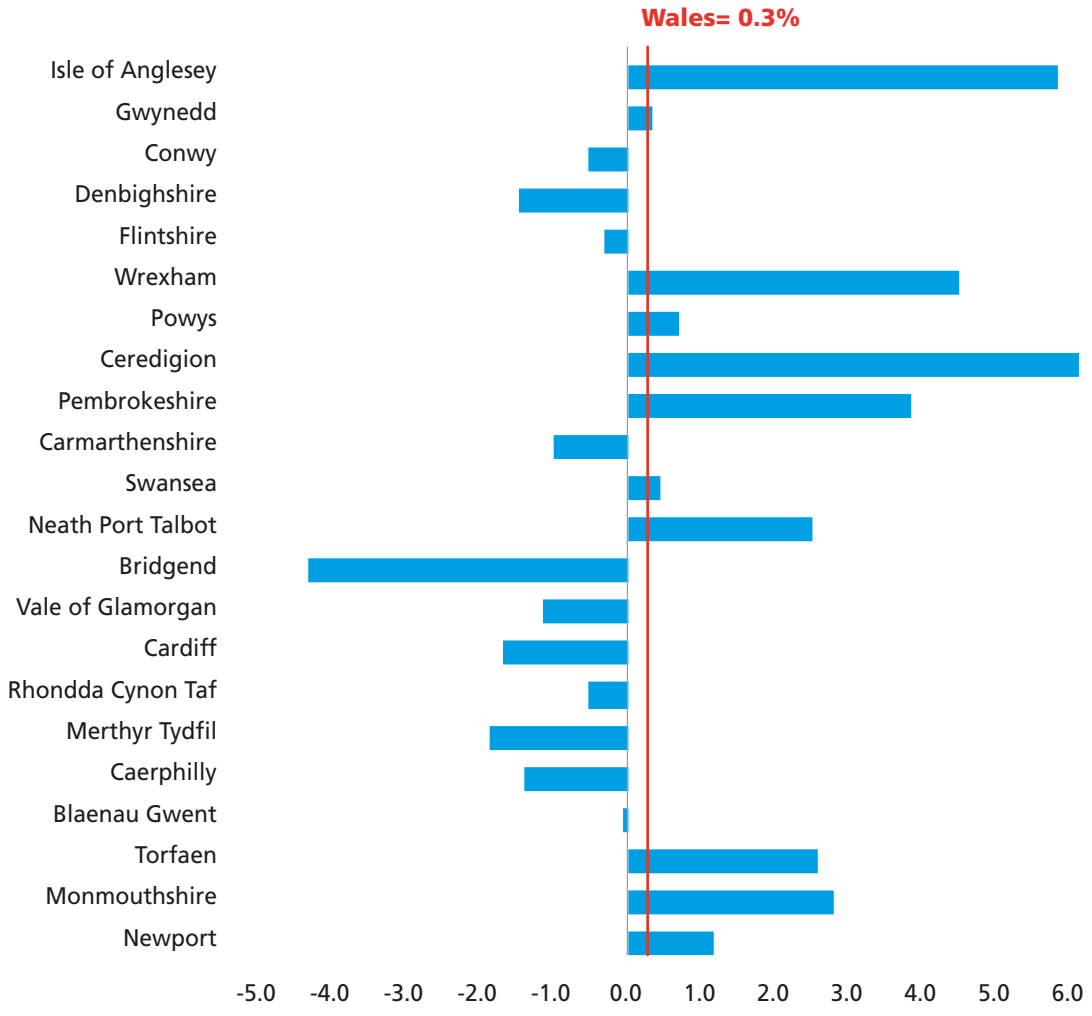
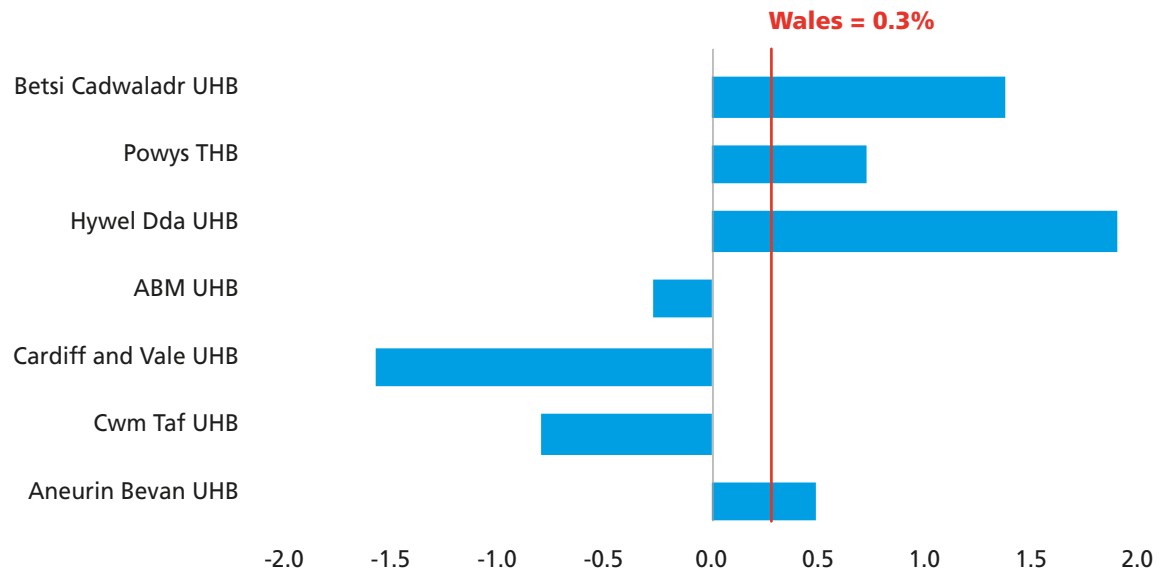


Figure 25 Percentage change of children aged 4 to 5 years who are obese or overweight, Wales and health boards, Child Measurement Programme for Wales, comparison 2012/13 and 2013/14

Produced by Public Health Wales Observatory, using CMP data (NWIS)



4.7 Gender

There are differences in weight prevalence between boys and girls in the reception year age group. In 2013/14, 27.3% of boys and 25.6% of girls were found to be overweight or obese in Wales, and the difference can be described as significant at a national level. As can be seen in table 2 below, the only category which could not be described as significantly different is prevalence of obesity alone.

Table 2 All Wales weight prevalence categories by gender#

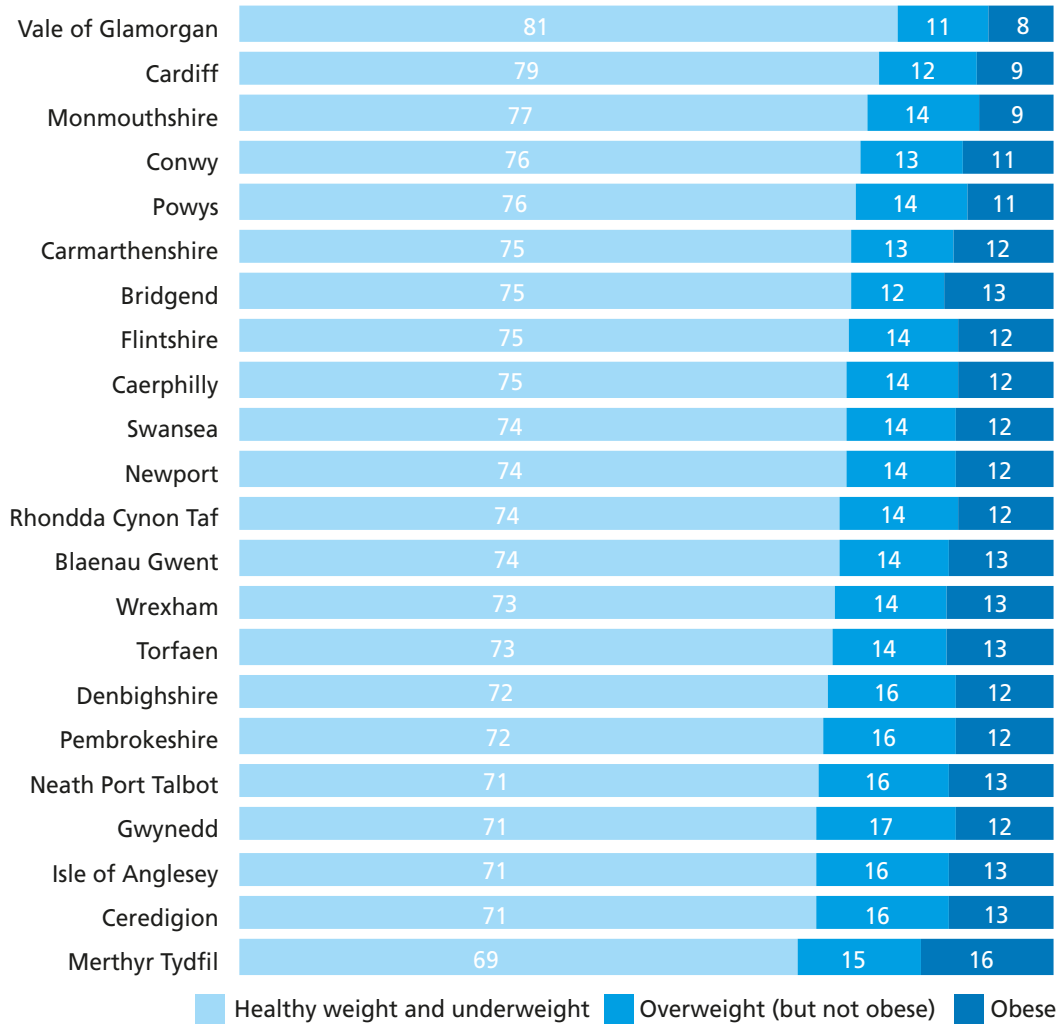
Produced by Public Health Wales Observatory, using CMP data (NWIS)

	% Healthy or underweight	% Overweight or obese	% Under-weight	% Healthy weight	% Overweight not obese	% Obese
Girls	74.4 *(73.7-75.1)*	25.6 *(24.9-26.3)*	0.6 *(0.5-0.7)*	73.9 *(73.2-74.6)*	13.8 *(13.3-14.4)*	11.7 *(11.2-12.2)*
Boys	72.7 *(72.0-73.4)*	27.3 *(26.6-28.0)*	1.0 *(0.9-1.2)*	71.6 *(70.9-72.3)*	15.4 *(14.8-15.9)*	12.0 *(11.5-12.5)*

Upper and lower confidence limits in brackets

Figure 26 **Weight category amongst girls aged 4 to 5 years, percentage by local authority**

Produced by Public Health Wales Observatory, using CMP data (NWIS)

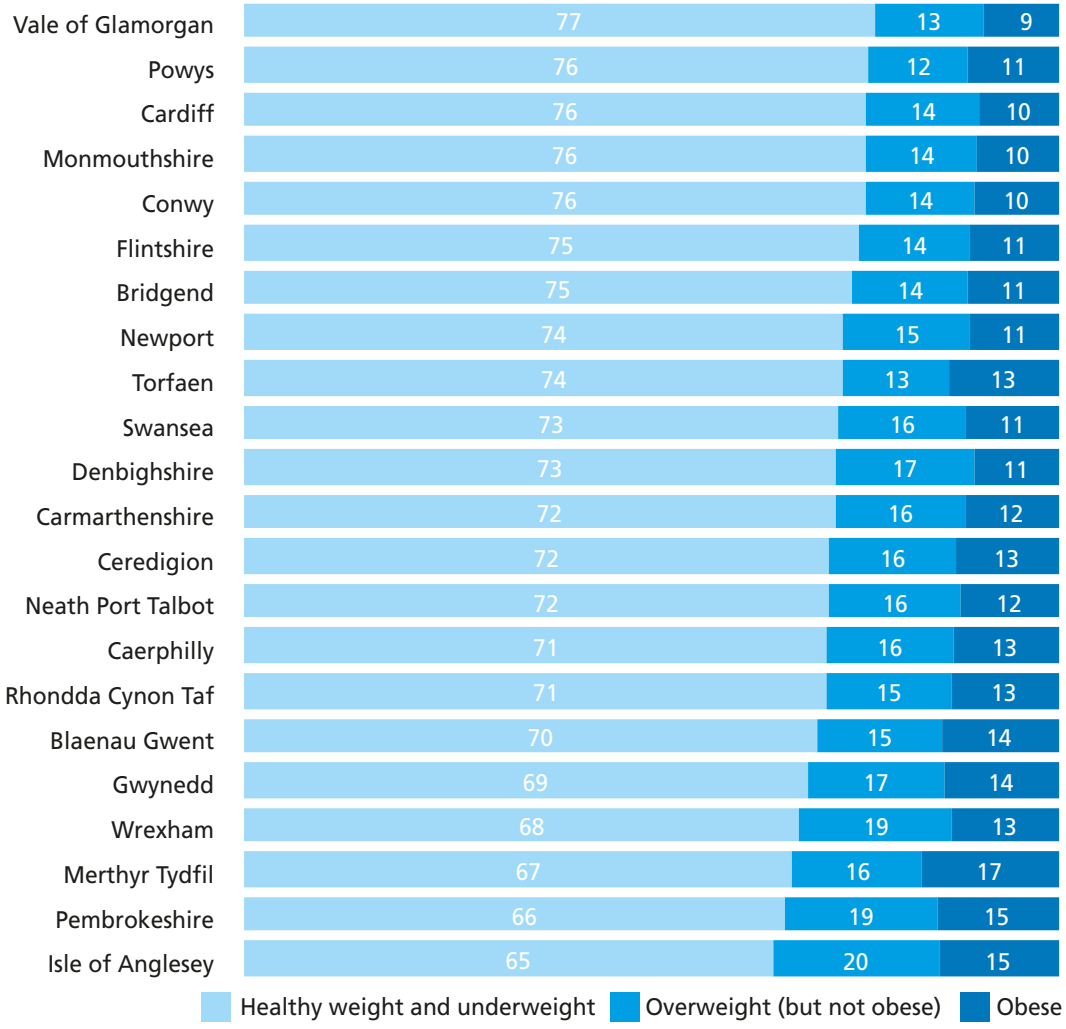


Figures 26 and 27 show the recorded prevalence for three of the main weight prevalence categories split by gender across the local authority areas.

At a local authority level, while there appears to be differences in the prevalence of overweight and obesity between boys and girls, it is not a statistically significant difference between the genders.

Figure 27 Weight category amongst boys aged 4 to 5 years, percentage by local authority, Child Measurment Programme for Wales, 2013/14

Produced by Public Health Wales Observatory, using CMP data (NWIS)



4.8 Ethnicity

Analysis of child BMI category by ethnicity is possible within the CMP. However because recording of ethnicity is not complete on the Community Child Health Database any results should be viewed with a degree of caution. More information about the recording of ethnicity can be found in Appendix 1.

11% of children had their ethnicity recorded as unknown (figure 28), meanwhile 48% of the child records were coded for ethnicity using a coding system that was replaced in 2002, so before the cohort of children were born. This suggests that the codes used to record the child's ethnicity may have been taken from their birth mothers' records, and not all children will share the ethnicity of their mothers.

Of the records using pre-2002 codes 21% are recorded as 'unknown', whereas only 2% of the post-2002 codes are 'unknown'. Further, the pre-2002 coding system did not include a specific code for children of mixed race, so it is not known which codes were used to record such children, and it could be that these were recorded as 'other' which would affect the category which post-2002 includes children of Chinese origin.

Figure 28 Ethnicity data from the Child Measurement Programme for Wales, children aged 4 to 5 years, 2013/14

Produced by Public Health Wales Observatory, using CMP data (NWIS)

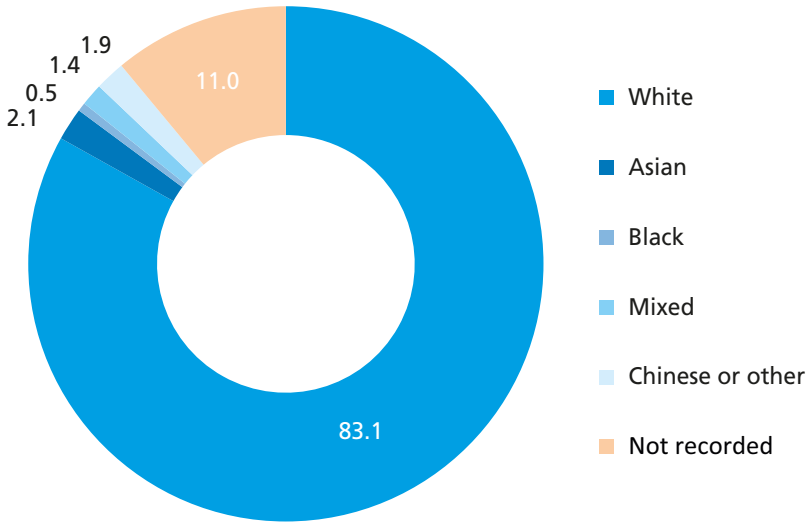


Table 3 Key data from the Child Measurement Programme for Wales, children aged 4 to 5 years

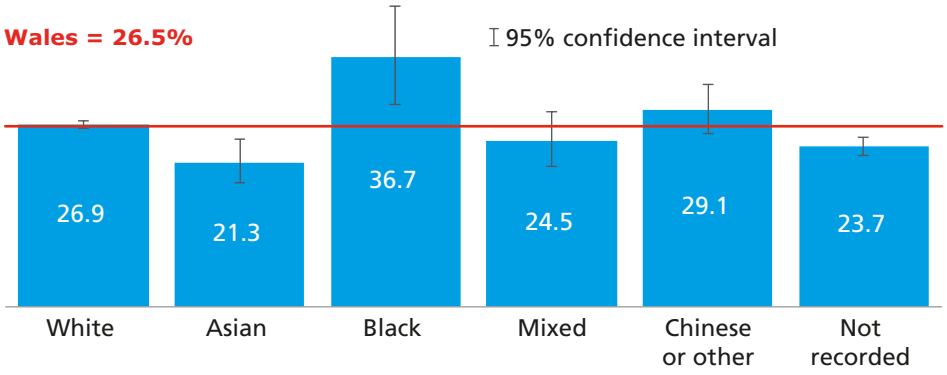
Produced by Public Health Wales Observatory, using CMP data (NWIS)

Ethnicity	All Measured		
	N	%	(95% CI)¥
White	25,486	83.1	*(82.7-83.5)*
Asian	629	2.1	*(1.9-2.2)*
Black	166	0.5	*(0.5-0.6)*
Mixed	429	1.4	*(1.3-1.5)*
Chinese or other	578	1.9	*(1.7-2.0)*
Not recorded	3,381	11.0	*(10.7-11.4)*

¥ 95% confidence interval

Figure 29 Proportion of children aged 4 to 5 years who are overweight or obese, ethnic groups

Produced by Public Health Wales Observatory, using CMP data (NWIS)



With the caveats outlined above, there is some information available. 1,802 children (5.9%) included in the study were recorded as having an ethnic origin other than white. As can be seen from figure 29, children of black origin appear to be significantly more likely than white or Asian children to be overweight or obese.

A study[18] from England published in the British Medical Journal in 2014 found that *"After adjusting for deprivation and other sociodemographic characteristics, black and Asian children were three times more likely to have an obesogenic lifestyle than white children"*. While this appears that this may hold true in Wales for children of black origin, this does not appear to be the case for children of Asian origin who are significantly less likely to have a weight classified as obese or overweight than either the Welsh average, or children of black or white origin. Again this could be down to the recording issues mentioned, or to the small number of children in each category in Wales.

The National Child Measurement Programme in England contains a much larger number of measurements on children of Asian origin than the CMP. And while in the English NCMP in 2013/14, prevalence of obesity (but not overweight) was higher in children of Asian origin than in white children, prevalence of underweight was 3.6% in Asian children compared to 0.6% in white children. It is possible that this could explain the higher prevalence of underweight children in Cardiff but a much more detailed study would be needed to confirm this.

4.9 Urban/rural analysis

This year, being the third year the CMP has run in Wales, it is possible to provide more in-depth information about different aspects of child growth. For example information is available on child growth depending on whether children live in towns and cities or in more or very rural areas. The analysis is done by combining results for all three years the CMP has been in place, and assigning each child's results to an urban, 'less sparse' rural or 'sparse' rural classification based on the child's postcode of residence. More information about how areas are classified can be found in Appendix 1.

71% of children measured in 2013/14 live in areas classified as urban, while 19.5% live in 'less sparse' rural areas in Wales and 9.5% of children live in 'sparse' rural areas. This latter category of areas are concentrated in three Health Boards – Betsi Cadwaladr, Hywel Dda and Powys.

There may be a perception that children living in more rural areas are 'healthier' and therefore would not experience the same prevalence of overweight or obesity as those living in urban areas. However as shown in figures 30 and 31 this is not the case in Wales.

If anything, children living in the most rural areas appear to have slightly higher prevalence of 'overweight or obese' (although lower obesity prevalence) but these differences in prevalence across the three categories are not statistically significant at a national level. However looking at children who live in 'sparse' rural areas in the three health boards where the sparse rural areas are situated, it appears that children in Betsi Cadwaladr UHB are significantly more likely to be overweight or obese than the average for Wales (figure 32).

Figure 30 **Proportion of children who are obese, Child Measurement Programme for Wales, 3 years combined data 2011/12, 2012/13 & 2013/14**

Produced by Public Health Wales Observatory, using CMP data (NWIS)

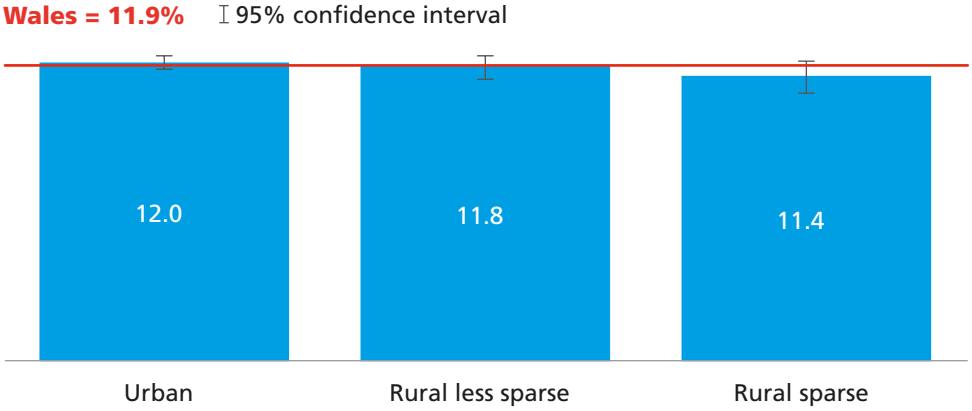
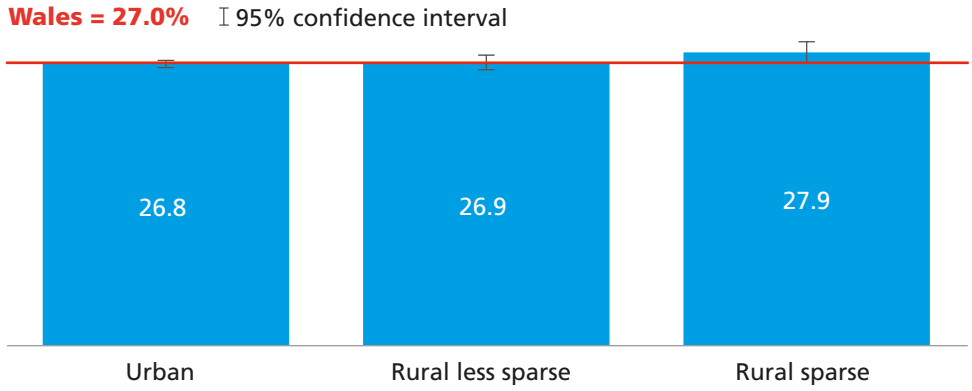


Figure 31 **Proportion of children who are overweight or obese, Child Measurement Programme for Wales, 3 years combined data 2011/12, 2012/13 & 2013/14**

Produced by Public Health Wales Observatory, using CMP data (NWIS)



When looked at by health board (figures 33 and 34), the health board area with the highest prevalence of 'overweight or obese', whether urban or rural is Cwm Taf UHB, while the area with the lowest prevalence is Cardiff and Vale UHB. This does not differ from the picture for overweight/obesity in Wales without the urban/rural breakdown, as given in figure 11.

Figure 32 Proportion of children living in a sparse rural area who are overweight or obese, Wales health boards, Child Measurement Programme for Wales, 3 years combined data 2011/12, 2012/13 & 2013/14

Produced by Public Health Wales Observatory, using CMP data (NWIS)

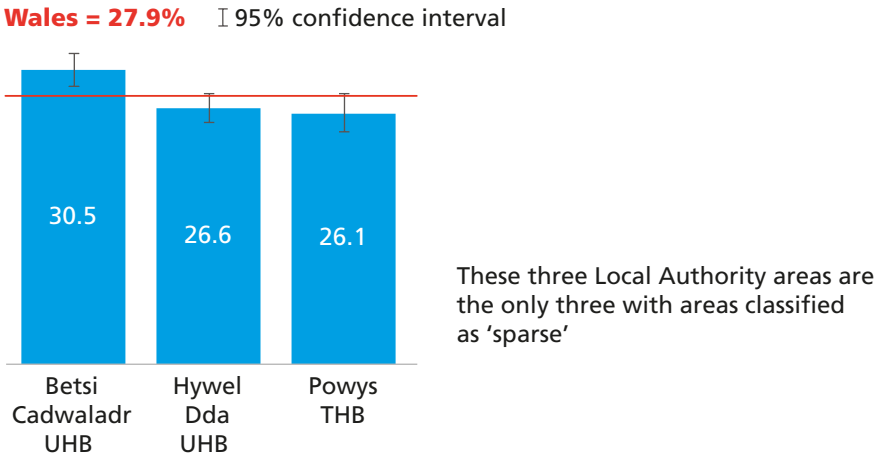


Figure 33 Proportion of children living in a less sparse rural area who are overweight or obese, Wales health boards, Child Measurement Programme for Wales, 3 years combined data 2011/12, 2012/13 & 2013/14

Produced by Public Health Wales Observatory, using CMP data (NWIS)

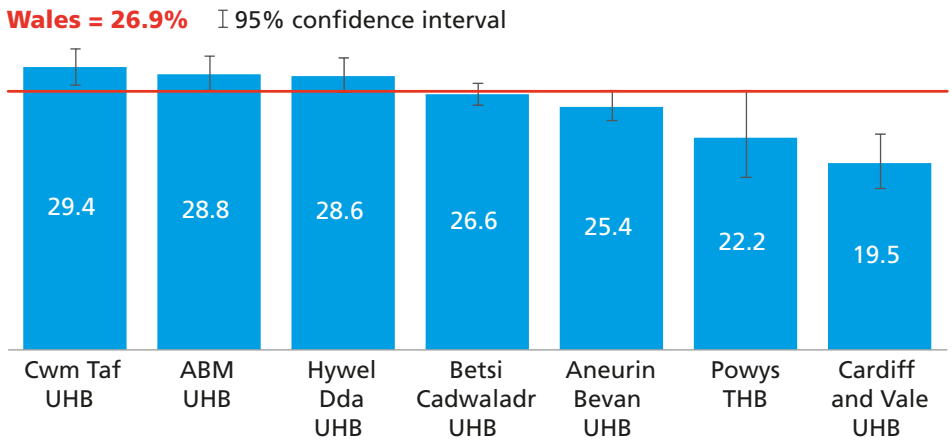
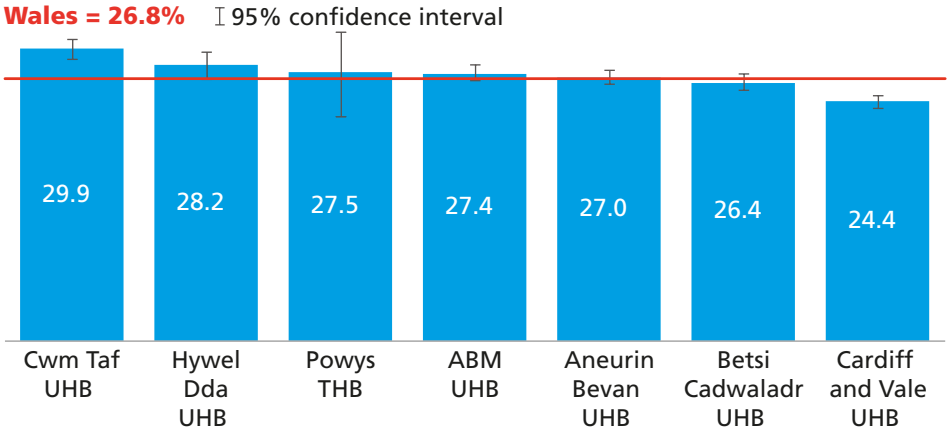


Figure 34 **Proportion of children living in an urban area who are overweight or obese, Wales health boards, Child Measurement Programme for Wales, 3 years combined data 2011/12, 2012/13 & 2013/14**

Produced by Public Health Wales Observatory, using CMP data (NWIS)



4.10 Low height

The Welsh government regulations allowing for the introduction of a child measurement programme in Wales allow for measurements of both height and weight.

Because the number of children of low height measured during the programme was small (137), a breakdown by geographical area is not given. However the prevalence of low height is similar across Wales. There were a few more girls identified than boys (70:67) but the difference was not statistically significant.

The UK National Screening Committee guidance on growth screening was last reviewed in 2006, and recommended[19] that *"children should have their height and weight measured at around the time of school entry and the 0.4 cut-off for height should be used to initiate referral".*

While the recommendation was never implemented in the form of a screening programme, and the CMP was established as a population surveillance and not an individual screening programme, it is recognised that clinical staff may identify new concerns during the measurement process, and have a professional obligation to act upon concerns.

New guidance was therefore developed and endorsed by the CMP advisory group in 2014, to give information to staff in school health teams who identify concerns about low height as part of the CMP measuring process. The aim of the guidance was to provide information about best practice in identification and follow up of children deemed to be of low height.

4.11 Comparisons with England

A national child measurement programme (NCMP) was commenced in England in 2006. This programme includes analysis of child measurements taken in both reception year and year 6. Initially the responsibility for this programme was with the NHS, however in April 2013 responsibility for a number of public health programmes and areas was transferred from the NHS to Local Authorities in England, and this included responsibilty for the NCMP.

Because measurements are taken in reception year in both England and Wales, it is possible to draw comparisons between the two sets of results. How BMI is assigned does differ a little between the two countries, specifically for the underweight category.

In England BMI prevalence rates are assigned as below[20].

- 'underweight' is defined as less than or equal to the 2nd centile
- 'overweight' is defined as greater than or equal to the 85th centile but less than the 95th centile
- 'obese' is defined as greater or equal to the 95th centile
- 'overweight and obese combined' is defined as greater than or equal to the 85th centile.

Meanwhile in Wales the classifications are:

- Underweight: less than but not including the second centile
- Healthy weight: second centile up to but not including the 85th centile
- Overweight but not obese: 85th centile up to but not including the 95th centile
- Obese: 95th centile and above.

Information is provided by region in England. The populations across the English regions vary in size, with some larger and some smaller than Wales. Figure 35 shows that participation in the CMP in Wales was a little lower than in all the regions in England except the South East.

Figure 35 Proportion of children aged 4 to 5 participating in a child measurement programme, Wales, England and English regions, 2013/14

Produced by Public Health Wales Observatory, using CMP data (NWIS) and NCMP data (HSCIC)

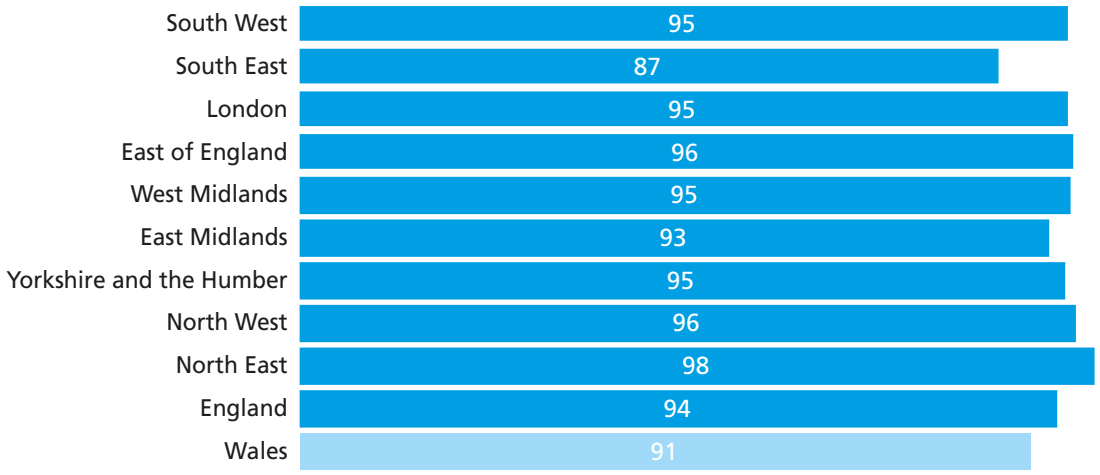


Figure 36 compares the results between England and Wales at a national level, for all children and then for boys and girls separately. This shows that both boys and girls in Wales have greater prevalence of 'overweight or obese' than those living in England.

Figure 37 compares the prevalence of 'overweight or obese' in Wales with prevalence by each of the nine regions of England, and again prevalence is higher in Wales than in any of the regions in England, and the difference is statistically significant.

Figure 36 **Proportion of children aged 4 to 5 years who are overweight or obese, Wales and England, Child Measurement Programme for Wales and the National Child Measurement Programme (England), 2013/14**

Produced by Public Health Wales Observatory, using CMP data (NWIS) and NCMP data (HSCIC)

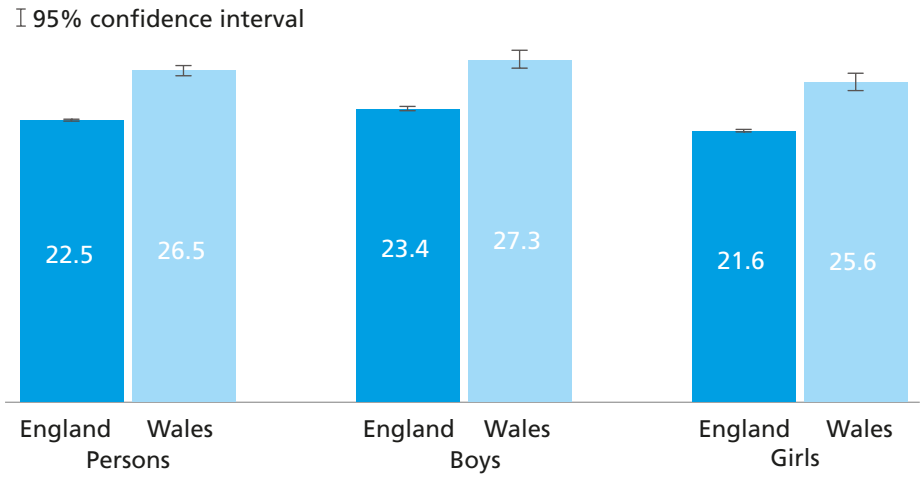
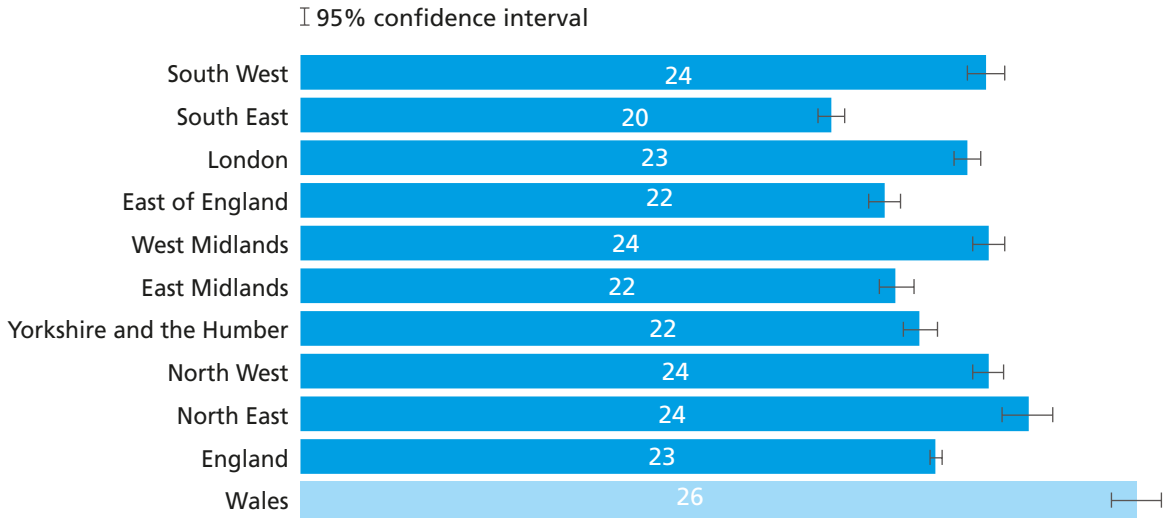


Figure 37 **Proportion of children aged 4 to 5 years who are overweight or obese, Wales, England and English regions, Child Measurement Programme for Wales and the National Child Measurement Programme (England), 2013/14**

Produced by Public Health Wales Observatory, using CMP data (NWIS) and NCMP data (HSCIC)



Appendix 1 Methods and technical information

This appendix gives information about the methods employed in analysing and interpreting information used to compile the CMP report. All measurements that were included were taken during the academic year 2013/14 in line with the Child Measurement Programme Standards and Guidance.

The measurement process

School Health teams across Wales have routinely weighed and measured children in the reception year age-group for many years. This was done as part of the traditional 'pre-school' check. With the introduction of the Child Measurement Programme in 2011/12 this measurement is now done in a standardised way, and all health professionals involved were given additional training to carry this out. Measurements of height and weight were recorded by school health teams to the nearest 0.1 kg and 0.1 cm respectively in order to establish an accurate BMI measurement.

During 2014 an online training package was also developed for NHS Wales to enable school nurses and others involved in the measuring process to refresh their knowledge and skills in undertaking the measurements.

BMI in adults

Once someone has reached adulthood (age 18+), the thresholds at which they are deemed to be of normal weight, under or overweight or obese remain the same. BMI is calculated by dividing a person's weight in kilograms by their height in metres squared (kg/m^2). The BMI thresholds for adults are as follows:

- BMI of less than 18.5 is deemed underweight
- BMI of 18.5 and above, but less than 25 is deemed normal weight
- BMI of 25 and above, but less than 30 is deemed overweight
- BMI of 30 and above, but less than 40 is deemed obese
- BMI of 40 or more is deemed morbidly obese.

Classifying a child's BMI

The classification of children's BMI differs from the classification of adult BMI as it changes as they grow older. It also differs between boys and girls as the rates at which the sexes grow differs.

In children the BMI is categorised using variable thresholds that alter depending on a child's age and sex. Each child's BMI is calculated and then assessed against a reference population or growth reference derived from the measurements of a large sample of children of the same age and sex. There are a number of different growth

reference scales available, but for this programme UK90 was selected.
The reference scale is divided into 100 units known as centiles (see Appendix 2 for a sample centile chart). Depending on where on this UK90 growth/centile chart each child is, measurements are assigned to one of the following categories:

- Underweight: less than but not including the second centile
- Healthy weight: second centile up to but not including the 85th centile
- Overweight but not obese: 85th centile up to but not including the 95th centile
- Obese: 95th centile and above.

There is no standard definition of morbid obesity in children in common use, as there is in adults. Different thresholds are used for clinical purposes rather than population surveillance purposes, i.e. NICE recommend clinical interventions for children with a BMI on or above the 91st centile[21] (rather than the 85th centile) as this is the threshold for obesity in clinical settings.

Prevalence rates were calculated using age and sex-specific BMI centiles, calculated using the British 1990 growth reference (UK90) from a method proposed by Cole et al[22]. The BMI was calculated using a method proposed by Keys et al[23]. The British 1990 growth reference (UK90) is also used in the National Child Measurement Programme for England. Measurements which informed UK90 were drawn from seven major studies of growth in the UK, and comprise measurements of over 30,000 children[24] and young people between 33 weeks of gestation and age 23 years. One criticism of this growth reference is that measurements of only a small number of children from ethnic minority backgrounds were available in the studies and these were not included, although there are known variations in growth patterns between children from different ethnic groups[25].

Other growth references used internationally include those developed by the World Health Organization (WHO), Center for Disease Control in the USA (CDC) and the International Obesity Task Force (IOTF). Comparisons between obesity prevalence across populations should only be made if the same growth reference has been used, as they do differ. The National Obesity Observatory in England have published a useful guide[26] which gives more information about each of the above growth references.

The distributions of height, weight and BMI are shown in Appendix 4. There is a symmetrical distribution for height and a skewed distribution for weight and BMI. This follows the pattern shown in the Child Measurement Programme report published in 2014.

Which records are included?

Records have been included in the Programme if they meet all of the following criteria:

- The location of residence can be determined
- The child is resident in Wales
- The school is located in Wales
- They were born in the period September 2008 - August 2009
- The child's sex is recorded.

Eligible records were included in the number measured, if they met all of the following criteria:

- The height measurement is recorded and is not an implausible measurement[Δ]
- The weight measurement is recorded and is not an implausible measurement[Δ]
- Consent has not been withdrawn
- The measurement was collected during the academic year 2013/14.

Small number suppression

When information is released in detail there is the risk that individuals could be identified even though their names, addresses or dates of birth have been removed. This risk is exacerbated if two or

Δ In some cases it was apparent that human error had resulted in the wrong figures being entered into the wrong fields. Although it appeared as if the height and weight measurements had been switched there was no way to confirm this so the measurements were not included.

more sources of data are compared or the data is describing uncommon events. When the data is describing events or information that only applies to very few people in the information set, or to people living in a small geographical area, people's identities can be protected by adding in safeguards such as 'small number suppression'.

In this report, small numbers between 0 and 4 have been suppressed to avoid potential identification of individuals. In this report, this mainly relates to children who were underweight or of low height. Suppression of related data has also been performed where suppressed numbers could have been derived from totals.

In order to avoid potentially identifying individual children in Local Authority or Health Board areas, the information about children who are seen as underweight is combined with children seen as being of healthy weight.

Confidence intervals and statistical significance

When looking at any statistical information it is important to assess the robustness of that information. In particular it is important to assess whether any difference may in fact be only the result of a chance effect. Two ways to support this assessment are:

- Calculation and use of confidence intervals (CIs)
- Carrying out a statistical test for significance.

Confidence intervals are indications of the natural variation that would be expected around proportion (e.g. percent obese) and they should be considered when assessing or interpreting that proportion. The size of the confidence interval depends upon the size of the sample being studied. Generally speaking, rates based on small samples are likely to have wider confidence intervals. Conversely, rates based on large samples are likely to have more narrow confidence intervals.

A simple, lay explanation of the 95% confidence interval is that we can be confident that the given value is within the range given for obesity prevalence (for example) 95% of the time. In this report the 95% CIs were calculated using a method proposed by Wilson et al as described by Altman et al[27] (2000). The level of confidence is not prescribed, but 95% confidence intervals are commonly used in public health and have been used for this report. 99% confidence intervals are also fairly commonly used in research.

Statistical significance helps assess how likely it is that a difference between two values may or may not be due to chance alone. A 'statistically significant' finding suggests that the difference between two values is not due to chance. For the purposes of the Child Measurement Programme in Wales, a difference is considered statistically significant if the 95% confidence intervals do not overlap rather than carrying out a specific statistical test for significance.

There is a caveat around using measurement data such as is collected for the CMP, and inferring statistical significance between proportions (in this case through the use of confidence intervals). The caveat is that in this report the difference between results is described as statistically significant if it appears unlikely that the difference could have occurred by chance alone. However, this can be misleading. Many different results were compared for this report, this is called multiple testing. Multiple testing increases the risk of inadvertently classifying a difference as being of statistical significance, when in reality the difference is due to chance (type I error). Similarly, a difference may inadvertently be classified as not statistically significant, when in fact there are important factors (other than chance) that contribute to the difference (type II error). This is most likely to occur when the numbers in the groups (e.g. number of children measured) are small.

Recording of ethnicity

The following codes had been used to record the ethnicity of children on the Community Child Health Database.

Some of the codes used were supposed to have been discontinued by the NHS in 2002 and all children in this Child Measurement Programme were born well after 2002. However some children were still classified according to the discontinued codes. The use of the pre-2002 codes therefore suggests that ethnicity was assigned to the children using the classification on the mother's records at the birth of the child. The pre-2002 codes did not include a specific code for children of mixed race and it is not known which code was assigned to these children.

Table 4 Recording of ethnicity

Codes A-Z used post 31st March 2002.	Codes 0-9 used pre 31st March 2002.
A = White British	0 = Caucasian
B = White Irish	1 = White
C = Other White Background	2 = Black (Caribbean)
D = Mixed White & Black Caribbean	3 = Black (African)
E = Mixed White & Black African	4 = Black (Other)
F = Mixed White & Asian	5 = Indian
G = Any Other Mixed Background	6 = Pakistani
H = Indian (Asian or British)	7 = Bangladeshi
J = Pakistani (Asian or British)	8 = Chinese
K = Bangladeshi (Asian or British)	9 = Other ethnic group
L = Any Other Asian Background	
M = Caribbean (Black or Black British)	
N = African (Black or Black British)	
P = Other (Black or Black British)	
R = Chinese	
S = Any Other Ethnic Group	

Super output areas (SOA)

Super output areas are a way of breaking down larger geographic areas (such as local authorities) in order to allow for reporting of small-area statistics. In Wales there are three tiers – lower, middle and upper. In this report of the CMP, information on the prevalence categories is provided for the first time at Middle super output area (MSOA) level.

Additionally this report provides analysis by rural/urban residence, and this is done using Lower super output areas (LSOA).
The average population for an MSOA is about 7,000, meanwhile the average population for a Lower super output area is about 1,600 people living in 650 households. LSOAs are designed to be socially homogenous, that is the types of homes are similar, as is tenure such as owner-occupied or social housing.

According to the Office for National Statistics[28] (ONS) there were 410 MSOAs and 1,909 LSOAs in Wales following a reorganisation in 2011, and population minimum and maximum thresholds for SOAs are given in Table 5 below.

Analysis by deprivation

Deprivation is assessed using the Welsh Index of Multiple Deprivation (WIMD) which was updated in 2014. The WIMD is the official measure of relative deprivation for small areas in Wales. This index is constructed by using a range of indicators to assign a deprivation rank to each of the 1,909 LSOAs in Wales. LSOAs are geographical areas which may vary in physical size but each LSOA in Wales contains about 1,600 people registered as living in that area. The WIMD is a way of identifying areas in the order of most to least deprived, but it does not provide a measure of the level of deprivation in an area, rather where an area is in relation to other areas in Wales.

There are pockets of deprivation across Wales, for example in 2014 the most deprived area in Wales was identified as being in Caerphilly, with an area in Rhyl West being the second most deprived. However deprivation is particularly concentrated in Merthyr Tydfil, Blaenau Gwent and Rhondda Cynon Taf. The only local authority with no areas ranked in the most deprived 20% (fifth) of areas in Wales is Monmouthshire.

Rural/urban classification

Classification of children into urban, 'less sparse' rural and 'sparse' rural areas was done in line with guidance from the Office for National Statistics, which can be found here:

http://www.ons.gov.uk/ons/guide-method/geography/products/area-classifications/2011-rural-urban/index.html

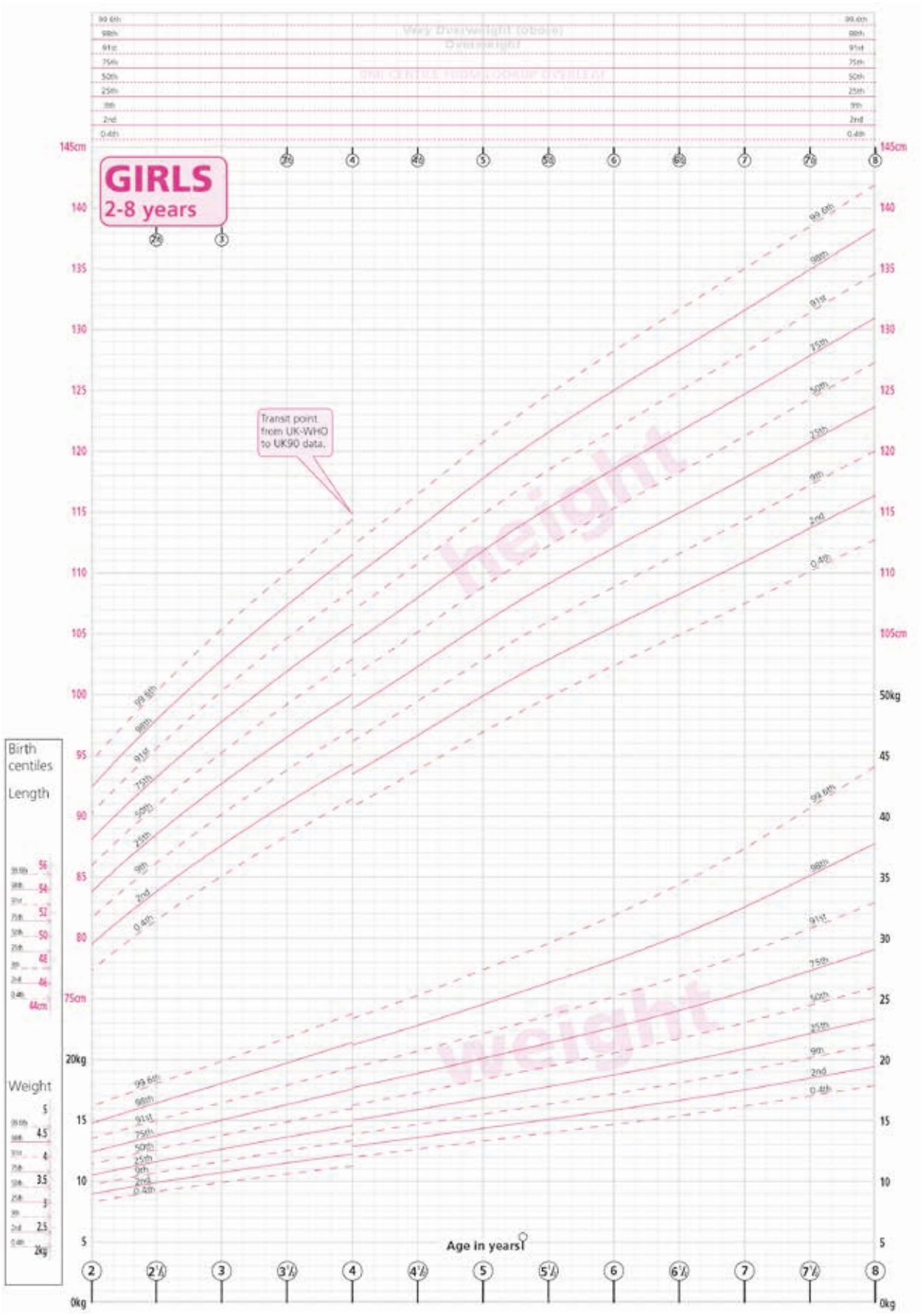
LSOAs are assigned a rural/urban classification based on population density. So towns with smaller populations may still be classified as rural rather than urban.

The NCMP in England chose to analyse their information by slightly different rural and urban classifications, also in line with ONS guidance. However, this means there cannot be a comparison with NCMP data by rural/urban classification.

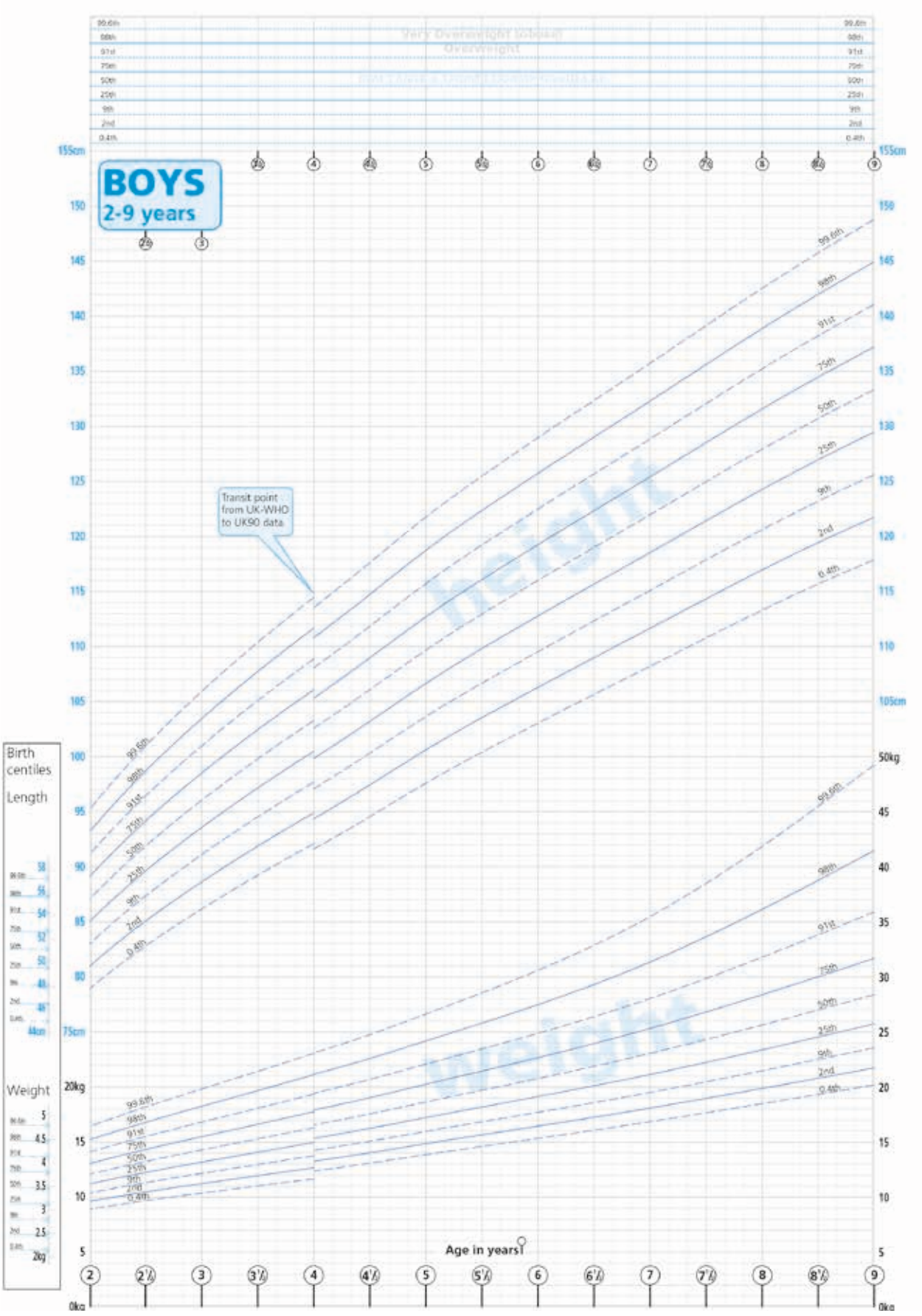
Table 5 Super output areas

Geography	Minimum population	Maximum population	Minimum number of households	Maximum number of households
LSOA	1,000	3,000	400	1,200
MSOA	5,000	15,000	2,000	6,000

Appendix 2 Sample centile charts



Appendix 2 Sample centile charts



Appendix 3 Reference Tables

Participation data from the Child Measurement Programme for Wales, children aged 4 to 5 years, 2013/14

	All				Boys				Girls			
	Eligible	Measured	Not Measured	% Participation	Eligible	Measured	Not Measured	% Participation	Eligible	Measured	Not Measured	% Participation
Wales	**33,794**	**30,669**	**3,125**	**90.8**	**17,332**	**15,736**	**1,596**	**90.8**	**16,462**	**14,933**	**1,529**	**90.7**
Least deprived fifth	5,885	5,088	797	86.5	3,033	2,629	404	86.7	2,852	2,459	393	86.2
Next least deprived	5,806	5,300	506	91.3	2,993	2,732	261	91.3	2,813	2,568	245	91.3
Middle deprived	6,442	5,909	533	91.7	3,252	2,990	262	91.9	3,190	2,919	271	91.5
Next most deprived	7,208	6,614	594	91.8	3,768	3,453	315	91.6	3,440	3,161	279	91.9
Most deprived fifth	8,453	7,758	695	91.8	4,286	3,932	354	91.7	4,167	3,826	341	91.8
Betsi Cadwaladr UHB	**7,476**	**7,063**	**413**	**94.5**	**3,831**	**3,602**	**229**	**94.0**	**3,645**	**3,461**	**184**	**95.0**
Isle of Anglesey	764	732	32	95.8	403	386	17	95.8	361	346	15	95.8
Gwynedd	1,241	1,184	57	95.4	645	607	38	94.1	596	577	19	96.8
Conwy	1,108	994	114	89.7	548	487	61	88.9	560	507	53	90.5
Denbighshire	1,030	927	103	90.0	517	466	51	90.1	513	461	52	89.9
Flintshire	1,713	1,626	87	94.9	870	821	49	94.4	843	805	38	95.5
Wrexham	1,620	1,600	20	98.8	848	835	13	98.5	772	765	7	99.1
Powys THB	**1,211**	**1,061**	**150**	**87.6**	**619**	**540**	**79**	**87.2**	**592**	**521**	**71**	**88.0**
Hywel Dda UHB	**3,571**	**3,173**	**398**	**88.9**	**1,776**	**1,584**	**192**	**89.2**	**1,795**	**1,589**	**206**	**88.5**
Ceredigion	601	543	58	90.3	295	269	26	91.2	306	274	32	89.5
Pembrokeshire	1,242	1,109	133	89.3	618	552	66	89.3	624	557	67	89.3
Carmarthenshire	1,728	1,521	207	88.0	863	763	100	88.4	865	758	107	87.6
ABM UHB	**5,648**	**5,217**	**431**	**92.4**	**2,963**	**2,726**	**237**	**92.0**	**2,685**	**2,491**	**194**	**92.8**
Swansea	2,553	2,395	158	93.8	1,327	1,244	83	93.7	1,226	1,151	75	93.9
Neath Port Talbot	1,536	1,404	132	91.4	791	717	74	90.6	745	687	58	92.2
Bridgend	1,559	1,418	141	91.0	845	765	80	90.5	714	653	61	91.5
Cardiff and Vale UHB	**5,694**	**4,472**	**1,222**	**78.5**	**2,903**	**2,311**	**592**	**79.6**	**2,791**	**2,161**	**630**	**77.4**
The Vale of Glamorgan	1,465	1,300	165	88.7	767	682	85	88.9	698	618	80	88.5
Cardiff	4,229	3,172	1,057	75.0	2,136	1,629	507	76.3	2,093	1,543	550	73.7
Cwm Taf UHB	**3,513**	**3,355**	**158**	**95.5**	**1,758**	**1,673**	**85**	**95.2**	**1,755**	**1,682**	**73**	**95.8**
Rhondda Cynon Taf	2,816	2,693	123	95.6	1,426	1,358	68	95.2	1,390	1,335	55	96.0
Merthyr Tydfil	697	662	35	95.0	332	315	17	94.9	365	347	18	95.1
Aneurn Bevan UHB	**6,681**	**6,328**	**353**	**94.7**	**3,482**	**3,300**	**182**	**94.8**	**3,199**	**3,028**	**171**	**94.7**
Caerphilly	2,127	2,039	88	95.9	1,101	1,063	38	96.5	1,026	976	50	95.1
Blaenau Gwent	772	739	33	95.7	408	387	21	94.9	364	352	12	96.7
Torfaen	1,052	1,002	50	95.2	557	529	28	95.0	495	473	22	95.6
Monmouthshire	872	827	45	94.8	443	417	26	94.1	429	410	19	95.6
Newport	1,858	1,721	137	92.6	973	904	69	92.9	885	817	68	92.3

Produced by Public Health Wales Observatory, using CMP data (NWIS), WIMD 2014 (WG)

Key data from the Child Measurement Programme for Wales, children aged 4 to 5 years, 2013/14

All Children	Healthy weight or underweight			Overweight or obese			Underweight			Healthy weight			Overweight not obese			Obese		
	n	%	(95% CI)[1]	n	%	(95% CI)[1]	n	%	(95% CI)[1]	n	%	(95% CI)[1]	n	%	(95% CI)[1]	n	%	(95% CI)[1]
Wales	**22,551**	**73.5**	*(73.0-74.0)*	**8,118**	**26.5**	*(26.0-27.0)*	**248**	**0.8**	*(0.7-0.9)*	**22,303**	**72.7**	*(72.2-73.2)*	**4,487**	**14.6**	*(14.2-15.0)*	**3,631**	**11.8**	*(11.5-12.2)*
Least deprived fifth	3,960	77.8	*(76.7-79.0)*	1,128	22.2	*(21.0-23.3)*	30	0.6	*(0.4-0.8)*	3,930	77.2	*(76.1-78.4)*	650	12.8	*(11.9-13.7)*	478	9.4	*(8.6-10.2)*
Next least deprived	3,945	74.4	*(73.2-75.6)*	1,355	25.6	*(24.4-26.8)*	44	0.8	*(0.6-1.1)*	3,901	73.6	*(72.4-74.8)*	771	14.5	*(13.6-15.5)*	584	11.0	*(10.2-11.9)*
Middle deprived	4,283	72.5	*(71.3-73.6)*	1,626	27.5	*(26.4-28.7)*	46	0.8	*(0.6-1.0)*	4,237	71.7	*(70.5-72.8)*	922	15.6	*(14.7-16.6)*	704	11.9	*(11.1-12.8)*
Next most deprived	4,814	72.8	*(71.7-73.8)*	1,800	27.2	*(26.2-28.3)*	62	0.9	*(0.7-1.2)*	4,752	71.8	*(70.8-72.9)*	980	14.8	*(14.0-15.7)*	820	12.4	*(11.6-13.2)*
Most deprived fifth	5,549	71.5	*(70.5-72.5)*	2,209	28.5	*(27.5-29.5)*	66	0.9	*(0.7-1.1)*	5,483	70.7	*(69.7-71.7)*	1,164	15.0	*(14.2-15.8)*	1,045	13.5	*(12.7-14.2)*
Betsi Cadwaladr UHB	**5,101**	**72.2**	*(71.2-73.3)*	**1,962**	**27.8**	*(26.7-28.8)*	**51**	**0.7**	*(0.5-0.9)*	**5,050**	**71.5**	*(70.4-72.5)*	**1,102**	**15.6**	*(14.8-16.5)*	**860**	**12.2**	*(11.4-13.0)*
Isle of Anglesey	495	67.6	*(64.1-70.9)*	237	32.4	*(29.1-35.9)*	8	1.1	*(0.6-2.1)*	487	66.5	*(63.0-69.9)*	135	18.4	*(15.8-21.4)*	102	13.9	*(11.6-16.6)*
Gwynedd	828	69.9	*(67.3-72.5)*	356	30.1	*(27.5-32.7)*	-	-	-	-	-	-	202	17.1	*(15.0-19.3)*	154	13.0	*(11.2-15.0)*
Conwy	758	76.3	*(73.5-78.8)*	236	23.7	*(21.2-26.5)*	11	1.1	*(0.6-2.0)*	747	75.2	*(72.4-77.7)*	130	13.1	*(11.1-15.3)*	106	10.7	*(8.9-12.7)*
Denbighshire	671	72.4	*(69.4-75.2)*	256	27.6	*(24.8-30.6)*	-	-	-	-	-	-	152	16.4	*(14.2-18.9)*	104	11.2	*(9.3-13.4)*
Flintshire	1,220	75.0	*(72.9-77.1)*	406	25.0	*(22.9-27.1)*	14	0.9	*(0.5-1.4)*	1,206	74.2	*(72.0-76.2)*	222	13.7	*(12.1-15.4)*	184	11.3	*(9.9-12.9)*
Wrexham	1,129	70.6	*(68.3-72.7)*	471	29.4	*(27.3-31.7)*	10	0.6	*(0.3-1.1)*	1,119	69.9	*(67.6-72.1)*	261	16.3	*(14.6-18.2)*	210	13.1	*(11.6-14.9)*
Powys THB	**807**	**76.1**	*(73.4-78.5)*	**254**	**23.9**	*(21.5-26.6)*	**10**	**0.9**	*(0.5-1.7)*	**797**	**75.1**	*(72.4-77.6)*	**138**	**13.0**	*(11.1-15.2)*	**116**	**10.9**	*(9.2-13.0)*
Hywel Dda UHB	**2,274**	**71.7**	*(70.1-73.2)*	**899**	**28.3**	*(26.8-29.9)*	**14**	**0.4**	*(0.3-0.7)*	**2,260**	**71.2**	*(69.6-72.8)*	**498**	**15.7**	*(14.5-17.0)*	**401**	**12.6**	*(11.5-13.8)*
Ceredigion	387	71.3	*(67.3-74.9)*	156	28.7	*(25.1-32.7)*	-	-	-	-	-	-	87	16.0	*(13.2-19.3)*	69	12.7	*(10.2-15.8)*
Pembrokeshire	765	69.0	*(66.2-71.6)*	344	31.0	*(28.4-33.8)*	-	-	-	-	-	-	194	17.5	*(15.4-19.8)*	150	13.5	*(11.6-15.7)*
Carmarthenshire	1,122	73.8	*(71.5-75.9)*	399	26.2	*(24.1-28.5)*	6	0.4	*(0.2-0.9)*	1,116	73.4	*(71.1-75.5)*	217	14.3	*(12.6-16.1)*	182	12.0	*(10.4-13.7)*
ABM UHB	**3,826**	**73.3**	*(72.1-74.5)*	**1,391**	**26.7**	*(25.5-27.9)*	**38**	**0.7**	*(0.5-1.0)*	**3,788**	**72.6**	*(71.4-73.8)*	**765**	**14.7**	*(13.7-15.6)*	**626**	**12.0**	*(11.1-12.9)*
Swansea	1,764	73.7	*(71.9-75.4)*	631	26.3	*(24.6-28.1)*	21	0.9	*(0.6-1.3)*	1,743	72.8	*(71.0-74.5)*	352	14.7	*(13.3-16.2)*	279	11.6	*(10.4-13.0)*
Neath Port Talbot	1,002	71.4	*(68.9-73.7)*	402	28.6	*(26.3-31.1)*	12	0.9	*(0.5-1.5)*	990	70.5	*(68.1-72.8)*	227	16.2	*(14.3-18.2)*	175	12.5	*(10.8-14.3)*
Bridgend	1,060	74.8	*(72.4-76.9)*	358	25.2	*(23.1-27.6)*	5	0.4	*(0.2-0.8)*	1,055	74.4	*(72.1-76.6)*	186	13.1	*(11.5-15.0)*	172	12.1	*(10.5-13.9)*
Cardiff and Vale UHB	**3,482**	**77.9**	*(76.6-79.1)*	**990**	**22.1**	*(20.9-23.4)*	**76**	**1.7**	*(1.4-2.1)*	**3,406**	**76.2**	*(74.9-77.4)*	**574**	**12.8**	*(11.9-13.8)*	**416**	**9.3**	*(8.5-10.2)*
The Vale of Glamorgan	1,027	79.0	*(76.7-81.1)*	273	21.0	*(18.9-23.3)*	10	0.8	*(0.4-1.4)*	1,017	78.2	*(75.9-80.4)*	160	12.3	*(10.6-14.2)*	113	8.7	*(7.3-10.3)*
Cardiff	2,455	77.4	*(75.9-78.8)*	717	22.6	*(21.2-24.1)*	66	2.1	*(1.6-2.6)*	2,389	75.3	*(73.8-76.8)*	414	13.1	*(11.9-14.3)*	303	9.6	*(8.6-10.6)*
Cwm Taf UHB	**2,403**	**71.6**	*(70.1-73.1)*	**952**	**28.4**	*(26.9-29.9)*	**17**	**0.5**	*(0.3-0.8)*	**2,386**	**71.1**	*(69.6-72.6)*	**504**	**15.0**	*(13.9-16.3)*	**448**	**13.4**	*(12.2-14.5)*
Rhondda Cynon Taf	1,953	72.5	*(70.8-74.2)*	740	27.5	*(25.8-29.2)*	-	-	-	-	-	-	402	14.9	*(13.6-16.3)*	338	12.6	*(11.4-13.9)*
Merthyr Tydfil	450	68.0	*(64.3-71.4)*	212	32.0	*(28.6-35.7)*	-	-	-	-	-	-	102	15.4	*(12.9-18.4)*	110	16.6	*(14.0-19.6)*
Aneurin Bevan UHB	**4,658**	**73.6**	*(72.5-74.7)*	**1,670**	**26.4**	*(25.3-27.5)*	**42**	**0.7**	*(0.5-0.9)*	**4,616**	**72.9**	*(71.8-74.0)*	**906**	**14.3**	*(13.5-15.2)*	**764**	**12.1**	*(11.3-12.9)*
Caerphilly	1,487	72.9	*(71.0-74.8)*	552	27.1	*(25.2-29.0)*	12	0.6	*(0.3-1.0)*	1,475	72.3	*(70.4-74.2)*	299	14.7	*(13.2-16.3)*	253	12.4	*(11.0-13.9)*
Blaenau Gwent	531	71.9	*(68.5-75.0)*	208	28.1	*(25.0-31.5)*	5	0.7	*(0.3-1.6)*	526	71.2	*(67.8-74.3)*	107	14.5	*(12.1-17.2)*	101	13.7	*(11.4-16.3)*
Torfaen	733	73.2	*(70.3-75.8)*	269	26.8	*(24.2-29.7)*	7	0.7	*(0.3-1.4)*	726	72.5	*(69.6-75.1)*	136	13.6	*(11.6-15.8)*	133	13.3	*(11.3-15.5)*
Monmouthshire	634	76.7	*(73.7-79.4)*	193	23.3	*(20.6-26.3)*	6	0.7	*(0.3-1.6)*	628	75.9	*(72.9-78.7)*	113	13.7	*(11.5-16.2)*	80	9.7	*(7.8-11.9)*
Newport	1,273	74.0	*(71.8-76.0)*	448	26.0	*(24.0-28.2)*	12	0.7	*(0.4-1.2)*	1,261	73.3	*(71.1-75.3)*	251	14.6	*(13.0-16.3)*	197	11.4	*(10.0-13.0)*

Produced by Public Health Wales Observatory, using CMP data (NWIS), WIMD 2014 (WG) [1] 95% confidence interval - To avoid disclosure small numbers (0-4) and some larger complementary numbers have been suppressed.

Key data from the Child Measurement Programme for Wales, boys aged 4 to 5 years, 2013/14

Boys	Healthy weight or underweight			Overweight or obese			Underweight			Healthy weight			Overweight not obese			Obese		
	n	%	(95% CI)[1]	n	%	(95% CI)[1]	n	%	(95% CI)[1]	n	%	(95% CI)[1]	n	%	(95% CI)[1]	n	%	(95% CI)[1]
Wales	**11,435**	**72.7**	*(72.0-73.4)*	**4,301**	**27.3**	*(26.6-28.0)*	**164**	**1.0**	*(0.9-1.2)*	**11,271**	**71.6**	*(70.9-72.3)*	**2,419**	**15.4**	*(14.8-15.9)*	**1,882**	**12.0**	*(11.5-12.5)*
Least deprived fifth	2,023	76.9	*(75.3-78.5)*	606	23.1	*(21.5-24.7)*	21	0.8	*(0.5-1.2)*	2,002	76.2	*(74.5-77.7)*	357	13.6	*(12.3-14.9)*	249	9.5	*(8.4-10.7)*
Next least deprived	2,001	73.2	*(71.6-74.9)*	731	26.8	*(25.1-28.4)*	37	1.4	*(1.0-1.9)*	1,964	71.9	*(70.2-73.5)*	428	15.7	*(14.4-17.1)*	303	11.1	*(10.0-12.3)*
Middle deprived	2,138	71.5	*(69.9-73.1)*	852	28.5	*(26.9-30.1)*	29	1.0	*(0.7-1.4)*	2,109	70.5	*(68.9-72.1)*	498	16.7	*(15.4-18.0)*	354	11.8	*(10.7-13.0)*
Next most deprived	2,488	72.1	*(70.5-73.5)*	965	27.9	*(26.5-29.5)*	36	1.0	*(0.8-1.4)*	2,452	71.0	*(69.5-72.5)*	523	15.1	*(14.0-16.4)*	442	12.8	*(11.7-14.0)*
Most deprived fifth	2,785	70.8	*(69.4-72.2)*	1,147	29.2	*(27.8-30.6)*	41	1.0	*(0.8-1.4)*	2,744	69.8	*(68.3-71.2)*	613	15.6	*(14.5-16.8)*	534	13.6	*(12.5-14.7)*
Betsi Cadwaladr UHB	**2,565**	**71.2**	*(69.7-72.7)*	**1,037**	**28.8**	*(27.3-30.3)*	**35**	**1.0**	*(0.7-1.3)*	**2,530**	**70.2**	*(68.7-71.7)*	**596**	**16.5**	*(15.4-17.8)*	**441**	**12.2**	*(11.2-13.4)*
Isle of Anglesey	250	64.8	*(59.9-69.4)*	136	35.2	*(30.6-40.1)*	-	-	-	-	-	-	79	20.5	*(16.7-24.8)*	57	14.8	*(11.6-18.7)*
Gwynedd	419	69.0	*(65.2-72.6)*	188	31.0	*(27.4-34.8)*	-	-	-	-	-	-	103	17.0	*(14.2-20.2)*	85	14.0	*(11.5-17.0)*
Conwy	371	76.2	*(72.2-79.7)*	116	23.8	*(20.3-27.8)*	5	1.0	*(0.4-2.4)*	366	75.2	*(71.1-78.8)*	66	13.6	*(10.8-16.9)*	50	10.3	*(7.9-13.3)*
Denbighshire	338	72.5	*(68.3-76.4)*	128	27.5	*(23.6-31.7)*	-	-	-	-	-	-	79	17.0	*(13.8-20.6)*	49	10.5	*(8.0-13.6)*
Flintshire	618	75.3	*(72.2-78.1)*	203	24.7	*(21.9-27.8)*	-	-	-	-	-	-	113	13.8	*(11.6-16.3)*	90	11.0	*(9.0-13.3)*
Wrexham	569	68.1	*(64.9-71.2)*	266	31.9	*(28.8-35.1)*	-	-	-	-	-	-	156	18.7	*(16.2-21.5)*	110	13.2	*(11.0-15.6)*
Powys THB	**413**	**76.5**	*(72.7-79.9)*	**127**	**23.5**	*(20.1-27.3)*	-	-	-	-	-	-	**67**	**12.4**	*(9.9-15.5)*	**60**	**11.1**	*(8.7-14.0)*
Hywel Dda UHB	**1,112**	**70.2**	*(67.9-72.4)*	**472**	**29.8**	*(27.6-32.1)*	-	-	-	-	-	-	**267**	**16.9**	*(15.1-18.8)*	**205**	**12.9**	*(11.4-14.7)*
Ceredigion	193	71.7	*(66.1-76.8)*	76	28.3	*(23.2-33.9)*	-	-	-	-	-	-	42	15.6	*(11.8-20.4)*	34	12.6	*(9.2-17.1)*
Pembrokeshire	366	66.3	*(62.3-70.1)*	186	33.7	*(29.9-37.7)*	-	-	-	-	-	-	103	18.7	*(15.6-22.1)*	83	15.0	*(12.3-18.3)*
Carmarthenshire	553	72.5	*(69.2-75.5)*	210	27.5	*(24.5-30.8)*	-	-	-	-	-	-	122	16.0	*(13.6-18.8)*	88	11.5	*(9.5-14.0)*
ABM UHB	**1,991**	**73.0**	*(71.3-74.7)*	**735**	**27.0**	*(25.3-28.7)*	**24**	**0.9**	*(0.6-1.3)*	**1,967**	**72.2**	*(70.4-73.8)*	**422**	**15.5**	*(14.2-16.9)*	**313**	**11.5**	*(10.3-12.7)*
Swansea	907	72.9	*(70.4-75.3)*	337	27.1	*(24.7-29.6)*	14	1.1	*(0.7-1.9)*	893	71.8	*(69.2-74.2)*	195	15.7	*(13.8-17.8)*	142	11.4	*(9.8-13.3)*
Neath Port Talbot	514	71.7	*(68.3-74.9)*	203	28.3	*(25.1-31.7)*	-	-	-	-	-	-	117	16.3	*(13.8-19.2)*	86	12.0	*(9.8-14.6)*
Bridgend	570	74.5	*(71.3-77.5)*	195	25.5	*(22.5-28.7)*	-	-	-	-	-	-	110	14.4	*(12.1-17.0)*	85	11.1	*(9.1-13.5)*
Cardiff and Vale UHB	**1,770**	**76.6**	*(74.8-78.3)*	**541**	**23.4**	*(21.7-25.2)*	**51**	**2.2**	*(1.7-2.9)*	**1,719**	**74.4**	*(72.6-76.1)*	**318**	**13.8**	*(12.4-15.2)*	**223**	**9.6**	*(8.5-10.9)*
The Vale of Glamorgan	527	77.3	*(74.0-80.3)*	155	22.7	*(19.7-26.0)*	-	-	-	-	-	-	91	13.3	*(11.0-16.1)*	64	9.4	*(7.4-11.8)*
Cardiff	1,243	76.3	*(74.2-78.3)*	386	23.7	*(21.7-25.8)*	-	-	-	-	-	-	227	13.9	*(12.3-15.7)*	159	9.8	*(8.4-11.3)*
Cwm Taf UHB	**1,181**	**70.6**	*(68.4-72.7)*	**492**	**29.4**	*(27.3-31.6)*	**9**	**0.5**	*(0.3-1.0)*	**1,172**	**70.1**	*(67.8-72.2)*	**259**	**15.5**	*(13.8-17.3)*	**233**	**13.9**	*(12.4-15.7)*
Rhondda Cynon Taf	969	71.4	*(68.9-73.7)*	389	28.6	*(26.3-31.1)*	-	-	-	-	-	-	209	15.4	*(13.6-17.4)*	180	13.3	*(11.6-15.2)*
Merthyr Tydfil	212	67.3	*(61.9-72.2)*	103	32.7	*(27.8-38.1)*	-	-	-	-	-	-	50	15.9	*(12.3-20.3)*	53	16.8	*(13.1-21.4)*
Aneurin Bevan UHB	**2,403**	**72.8**	*(71.3-74.3)*	**897**	**27.2**	*(25.7-28.7)*	**30**	**0.9**	*(0.6-1.3)*	**2,373**	**71.9**	*(70.4-73.4)*	**490**	**14.8**	*(13.7-16.1)*	**407**	**12.3**	*(11.3-13.5)*
Caerphilly	759	71.4	*(68.6-74.0)*	304	28.6	*(26.0-31.4)*	-	-	-	-	-	-	165	15.5	*(13.5-17.8)*	139	13.1	*(11.2-15.2)*
Blaenau Gwent	272	70.3	*(65.5-74.6)*	115	29.7	*(25.4-34.5)*	-	-	-	-	-	-	59	15.2	*(12.0-19.2)*	56	14.5	*(11.3-18.3)*
Torfaen	389	73.5	*(69.6-77.1)*	140	26.5	*(22.9-30.4)*	-	-	-	-	-	-	69	13.0	*(10.4-16.2)*	71	13.4	*(10.8-16.6)*
Monmouthshire	318	76.3	*(71.9-80.1)*	99	23.7	*(19.9-28.1)*	-	-	-	-	-	-	57	13.7	*(10.7-17.3)*	42	10.1	*(7.5-13.3)*
Newport	665	73.6	*(70.6-76.3)*	239	26.4	*(23.7-29.4)*	7	0.8	*(0.4-1.6)*	658	72.8	*(69.8-75.6)*	140	15.5	*(13.3-18.0)*	99	11.0	*(9.1-13.2)*

Produced by Public Health Wales Observatory, using CMP data (NWIS), WIMD 2014 (WG) [1] 95% confidence interval - To avoid disclosure small numbers (0-4) and some larger complementary numbers have been suppressed.

Key data from the Child Measurement Programme for Wales, girls aged 4 to 5 years, 2013/14

Girls	Healthy weight or underweight			Overweight or obese			Underweight			Healthy weight			Overweight not obese			Obese		
	n	%	(95% CI)[1]	n	%	(95% CI)[1]	n	%	(95% CI)[1]	n	%	(95% CI)[1]	n	%	(95% CI)[1]	n	%	(95% CI)[1]
Wales	**11,116**	**74.4**	*(73.7-75.1)*	**3,817**	**25.6**	*(24.9-26.3)*	**84**	**0.6**	*(0.5-0.7)*	**11,032**	**73.9**	*(73.2-74.6)*	**2,068**	**13.8**	*(13.3-14.4)*	**1,749**	**11.7**	*(11.2-12.2)*
Least deprived fifth	1,937	78.8	*(77.1-80.3)*	522	21.2	*(19.7-22.9)*	9	0.4	*(0.2-0.7)*	1,928	78.4	*(76.7-80.0)*	293	11.9	*(10.7-13.3)*	229	9.3	*(8.2-10.5)*
Next least deprived	1,944	75.7	*(74.0-77.3)*	624	24.3	*(22.7-26.0)*	7	0.3	*(0.1-0.6)*	1,937	75.4	*(73.7-77.1)*	343	13.4	*(12.1-14.7)*	281	10.9	*(9.8-12.2)*
Middle deprived	2,145	73.5	*(71.9-75.1)*	774	26.5	*(24.9-28.1)*	17	0.6	*(0.4-0.9)*	2,128	72.9	*(71.3-74.5)*	424	14.5	*(13.3-15.9)*	350	12.0	*(10.9-13.2)*
Next most deprived	2,326	73.6	*(72.0-75.1)*	835	26.4	*(24.9-28.0)*	26	0.8	*(0.6-1.2)*	2,300	72.8	*(71.2-74.3)*	457	14.5	*(13.3-15.7)*	378	12.0	*(10.9-13.1)*
Most deprived fifth	2,764	72.2	*(70.8-73.6)*	1,062	27.8	*(26.4-29.2)*	25	0.7	*(0.4-1.0)*	2,739	71.6	*(70.1-73.0)*	551	14.4	*(13.3-15.5)*	511	13.4	*(12.3-14.5)*
Betsi Cadwaladr UHB	**2,536**	**73.3**	*(71.8-74.7)*	**925**	**26.7**	*(25.3-28.2)*	**16**	**0.5**	*(0.3-0.7)*	**2,520**	**72.8**	*(71.3-74.3)*	**506**	**14.6**	*(13.5-15.8)*	**419**	**12.1**	*(11.1-13.2)*
Isle of Anglesey	245	70.8	*(65.8-75.4)*	101	29.2	*(24.6-34.2)*	-	-	-	-	-	-	56	16.2	*(12.7-20.4)*	45	13.0	*(9.9-17.0)*
Gwynedd	409	70.9	*(67.0-74.4)*	168	29.1	*(25.6-33.0)*	-	-	-	-	-	-	99	17.2	*(14.3-20.4)*	69	12.0	*(9.6-14.9)*
Conwy	387	76.3	*(72.4-79.8)*	120	23.7	*(20.2-27.6)*	6	1.2	*(0.5-2.6)*	381	75.1	*(71.2-78.7)*	64	12.6	*(10.0-15.8)*	56	11.0	*(8.6-14.1)*
Denbighshire	333	72.2	*(68.0-76.1)*	128	27.8	*(23.9-32.0)*	-	-	-	-	-	-	73	15.8	*(12.8-19.4)*	55	11.9	*(9.3-15.2)*
Flintshire	602	74.8	*(71.7-77.7)*	203	25.2	*(22.3-28.3)*	-	-	-	-	-	-	109	13.5	*(11.3-16.1)*	94	11.7	*(9.6-14.1)*
Wrexham	560	73.2	*(70.0-76.2)*	205	26.8	*(23.8-30.0)*	-	-	-	-	-	-	105	13.7	*(11.5-16.3)*	100	13.1	*(10.9-15.6)*
Powys THB	**394**	**75.6**	*(71.8-79.1)*	**127**	**24.4**	*(20.9-28.2)*	-	-	-	-	-	-	**71**	**13.6**	*(10.9-16.8)*	**56**	**10.7**	*(8.4-13.7)*
Hywel Dda UHB	**1,162**	**73.1**	*(70.9-75.2)*	**427**	**26.9**	*(24.8-29.1)*	-	-	-	-	-	-	**231**	**14.5**	*(12.9-16.4)*	**196**	**12.3**	*(10.8-14.0)*
Ceredigion	194	70.8	*(65.2-75.9)*	80	29.2	*(24.1-34.8)*	-	-	-	-	-	-	45	16.4	*(12.5-21.3)*	35	12.8	*(9.3-17.2)*
Pembrokeshire	399	71.6	*(67.8-75.2)*	158	28.4	*(24.8-32.2)*	-	-	-	-	-	-	91	16.3	*(13.5-19.6)*	67	12.0	*(9.6-15.0)*
Carmarthenshire	569	75.1	*(71.9-78.0)*	189	24.9	*(22.0-28.1)*	-	-	-	-	-	-	95	12.5	*(10.4-15.1)*	94	12.4	*(10.2-14.9)*
ABM UHB	**1,835**	**73.7**	*(71.9-75.4)*	**656**	**26.3**	*(24.6-28.1)*	**14**	**0.6**	*(0.3-0.9)*	**1,821**	**73.1**	*(71.3-74.8)*	**343**	**13.8**	*(12.5-15.2)*	**313**	**12.6**	*(11.3-13.9)*
Swansea	857	74.5	*(71.9-76.9)*	294	25.5	*(23.1-28.1)*	7	0.6	*(0.3-1.3)*	850	73.8	*(71.2-76.3)*	157	13.6	*(11.8-15.7)*	137	11.9	*(10.2-13.9)*
Neath Port Talbot	488	71.0	*(67.5-74.3)*	199	29.0	*(25.7-32.5)*	-	-	-	-	-	-	110	16.0	*(13.5-18.9)*	89	13.0	*(10.6-15.7)*
Bridgend	490	75.0	*(71.6-78.2)*	163	25.0	*(21.8-28.4)*	-	-	-	-	-	-	76	11.6	*(9.4-14.3)*	87	13.3	*(10.9-16.1)*
Cardiff and Vale UHB	**1,712**	**79.2**	*(77.5-80.9)*	**449**	**20.8**	*(19.1-22.5)*	**25**	**1.2**	*(0.8-1.7)*	**1,687**	**78.1**	*(76.3-79.8)*	**256**	**11.8**	*(10.6-13.3)*	**193**	**8.9**	*(7.8-10.2)*
The Vale of Glamorgan	500	80.9	*(77.6-83.8)*	118	19.1	*(16.2-22.4)*	-	-	-	-	-	-	69	11.2	*(8.9-13.9)*	49	7.9	*(6.0-10.3)*
Cardiff	1,212	78.5	*(76.4-80.5)*	331	21.5	*(19.5-23.6)*	-	-	-	-	-	-	187	12.1	*(10.6-13.8)*	144	9.3	*(8.0-10.9)*
Cwm Taf UHB	**1,222**	**72.7**	*(70.5-74.7)*	**460**	**27.3**	*(25.3-29.5)*	**8**	**0.5**	*(0.2-0.9)*	**1,214**	**72.2**	*(70.0-74.3)*	**245**	**14.6**	*(13.0-16.3)*	**215**	**12.8**	*(11.3-14.5)*
Rhondda Cynon Taf	984	73.7	*(71.3-76.0)*	351	26.3	*(24.0-28.7)*	-	-	-	-	-	-	193	14.5	*(12.7-16.4)*	158	11.8	*(10.2-13.7)*
Merthyr Tydfil	238	68.6	*(63.5-73.2)*	109	31.4	*(26.8-36.5)*	-	-	-	-	-	-	52	15.0	*(11.6-19.1)*	57	16.4	*(12.9-20.7)*
Aneurin Bevan UHB	**2,255**	**74.5**	*(72.9-76.0)*	**773**	**25.5**	*(24.0-27.1)*	**12**	**0.4**	*(0.2-0.7)*	**2,243**	**74.1**	*(72.5-75.6)*	**416**	**13.7**	*(12.6-15.0)*	**357**	**11.8**	*(10.7-13.0)*
Caerphilly	728	74.6	*(71.8-77.2)*	248	25.4	*(22.8-28.2)*	-	-	-	-	-	-	134	13.7	*(11.7-16.0)*	114	11.7	*(9.8-13.8)*
Blaenau Gwent	259	73.6	*(68.7-77.9)*	93	26.4	*(22.1-31.3)*	-	-	-	-	-	-	48	13.6	*(10.4-17.6)*	45	12.8	*(9.7-16.7)*
Torfaen	344	72.7	*(68.5-76.5)*	129	27.3	*(23.5-31.5)*	-	-	-	-	-	-	67	14.2	*(11.3-17.6)*	62	13.1	*(10.4-16.4)*
Monmouthshire	316	77.1	*(72.8-80.9)*	94	22.9	*(19.1-27.2)*	-	-	-	-	-	-	56	13.7	*(10.7-17.3)*	38	9.3	*(6.8-12.5)*
Newport	608	74.4	*(71.3-77.3)*	209	25.6	*(22.7-28.7)*	5	0.6	*(0.3-1.4)*	603	73.8	*(70.7-76.7)*	111	13.6	*(11.4-16.1)*	98	12.0	*(9.9-14.4)*

Produced by Public Health Wales Observatory, using CMP data (NWIS), WIMD (WG). [1] 95% confidence interval. - To avoid disclosure small numbers (0-4) and some larger complementary numbers have been suppressed.

Height data from the Child Measurement Programme for Wales, children aged 4 to 5 years, 2013/14

	All				Boys				Girls			
	Measured	Low height			Measured	Low height			Measured	Low height		
	N	n	%	(95% CI)[1]	N	n	%	(95% CI)[1]	N	n	%	(95% CI)[1]
Wales	**30,669**	**137**	**0.4**	*(0.4-0.5)*	**15,736**	**67**	**0.4**	*(0.3-0.5)*	**14,933**	**70**	**0.5**	*(0.4-0.6)*
Least deprived fifth	5,088	17	0.3	*(0.2-0.5)*	2,629	10	0.4	*(0.2-0.7)*	2,459	7	0.3	*(0.1-0.6)*
Next least deprived	5,300	17	0.3	*(0.2-0.5)*	2,732	7	0.3	*(0.1-0.5)*	2,568	10	0.4	*(0.2-0.7)*
Middle deprived	5,909	21	0.4	*(0.2-0.5)*	2,990	10	0.3	*(0.2-0.6)*	2,919	11	0.4	*(0.2-0.7)*
Next most deprived	6,614	24	0.4	*(0.2-0.5)*	3,453	14	0.4	*(0.2-0.7)*	3,161	10	0.3	*(0.2-0.6)*
Most deprived fifth	7,758	58	0.7	*(0.6-1.0)*	3,932	26	0.7	*(0.5-1.0)*	3,826	32	0.8	*(0.6-1.2)*
Betsi Cadwaladr UHB	**7,063**	**26**	**0.4**	*(0.3-0.5)*	**3,602**	**13**	**0.4**	*(0.2-0.6)*	**3,461**	**13**	**0.4**	*(0.2-0.6)*
Isle of Anglesey	732	5	0.7	*(0.3-1.6)*	386	-	-	-	346	-	-	-
Gwynedd	1,184	-	-	-	607	-	-	-	577	-	-	-
Conwy	994	-	-	-	487	-	-	-	507	-	-	-
Denbighshire	927	-	-	-	466	-	-	-	461	-	-	-
Flintshire	1,626	-	-	-	821	-	-	-	805	-	-	-
Wrexham	1,600	8	0.5	*(0.3-1.0)*	835	-	-	-	765	-	-	-
Powys THB	**1,061**	-	-	-	**540**	-	-	-	**521**	-	-	-
Hywel Dda UHB	**3,173**	-	-	-	**1,584**	-	-	-	**1,589**	-	-	-
Ceredigion	543	-	-	-	269	-	-	-	274	-	-	-
Pembrokeshire	1,109	-	-	-	552	-	-	-	557	-	-	-
Carmarthenshire	1,521	-	-	-	763	-	-	-	758	-	-	-
ABM UHB	**5,217**	**35**	**0.7**	*(0.5-0.9)*	**2,726**	**13**	**0.5**	*(0.3-0.8)*	**2,491**	**22**	**0.9**	*(0.6-1.3)*
Swansea	2,395	16	0.7	*(0.4-1.1)*	1,244	6	0.5	*(0.2-1.0)*	1,151	10	0.9	*(0.5-1.6)*
Neath Port Talbot	1,404	8	0.6	*(0.3-1.1)*	717	-	-	-	687	-	-	-
Bridgend	1,418	11	0.8	*(0.4-1.4)*	765	-	-	-	653	-	-	-
Cardiff and Vale UHB	**4,472**	**17**	**0.4**	*(0.2-0.6)*	**2,311**	**10**	**0.4**	*(0.2-0.8)*	**2,161**	**7**	**0.3**	*(0.2-0.7)*
The Vale of Glamorgan	1,300	7	0.5	*(0.3-1.1)*	682	-	-	-	618	-	-	-
Cardiff	3,172	10	0.3	*(0.2-0.6)*	1,629	-	-	-	1,543	-	-	-
Cwm Taf UHB	**3,355**	**19**	**0.6**	*(0.4-0.9)*	**1,673**	**9**	**0.5**	*(0.3-1.0)*	**1,682**	**10**	**0.6**	*(0.3-1.1)*
Rhondda Cynon Taf	2,693	14	0.5	*(0.3-0.9)*	1,358	-	-	-	1,335	-	-	-
Merthyr Tydfil	662	5	0.8	*(0.3-1.8)*	315	-	-	-	347	-	-	-
Aneurin Bevan UHB	**6,328**	**31**	**0.5**	*(0.3-0.7)*	**3,300**	**17**	**0.5**	*(0.3-0.8)*	**3,028**	**14**	**0.5**	*(0.3-0.8)*
Caerphilly	2,039	10	0.5	*(0.3-0.9)*	1,063	5	0.5	*(0.2-1.1)*	976	5	0.5	*(0.2-1.2)*
Blaenau Gwent	739	5	0.7	*(0.3-1.6)*	387	-	-	-	352	-	-	-
Torfaen	1,002	-	-	-	529	-	-	-	473	-	-	-
Monmouthshire	827	-	-	-	417	-	-	-	410	-	-	-
Newport	1,721	8	0.5	*(0.2-0.9)*	904	-	-	-	817	-	-	-

Produced by Public Health Wales Observatory, using CMP data (NWIS), WIMD 2014 (WG) [1] 95% confidence interval - To avoid disclosure small numbers (0-4) and some larger complementary numbers have been suppressed.

Appendix 4

Distribution of height, weight and body mass index

Distribution of weight and BMI in both boys and girls in the Child Measurement Programme is skewed to the right. Distribution of height shows a symmetrical pattern in boys and girls.

Figure 38 Weight distribution (kg) in boys aged 4 to 5 years, Child Measurement Programme, 2013/14

Produced by Public Health Wales Observatory, using CMP data (NWIS)

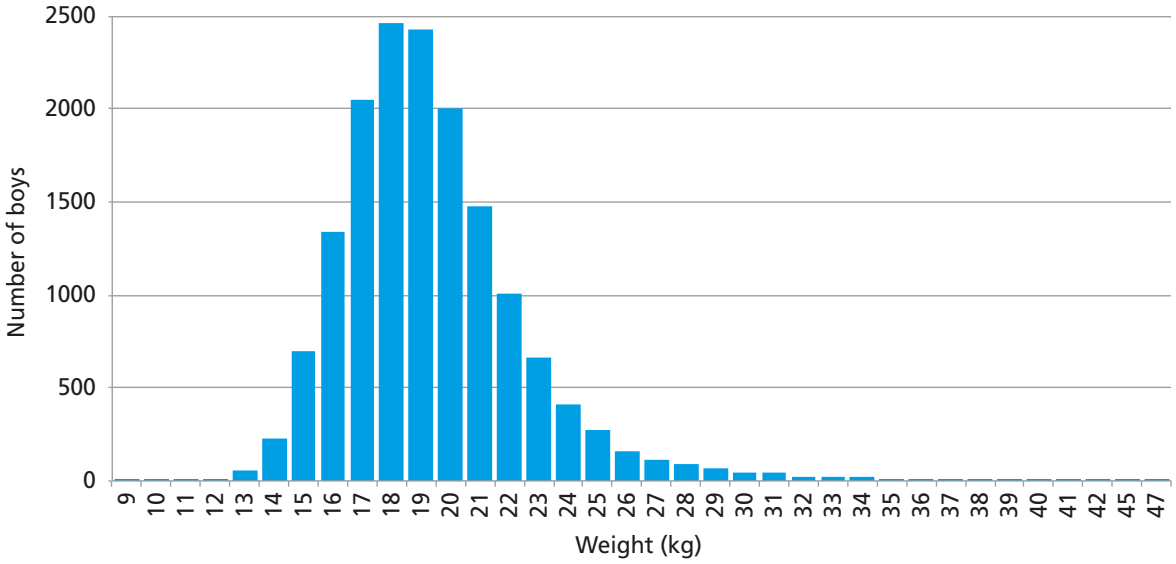


Figure 39 Weight distribution (kg) in girls aged 4 to 5 years, Child Measurement Programme, 2013/14

Produced by Public Health Wales Observatory, using CMP data (NWIS)

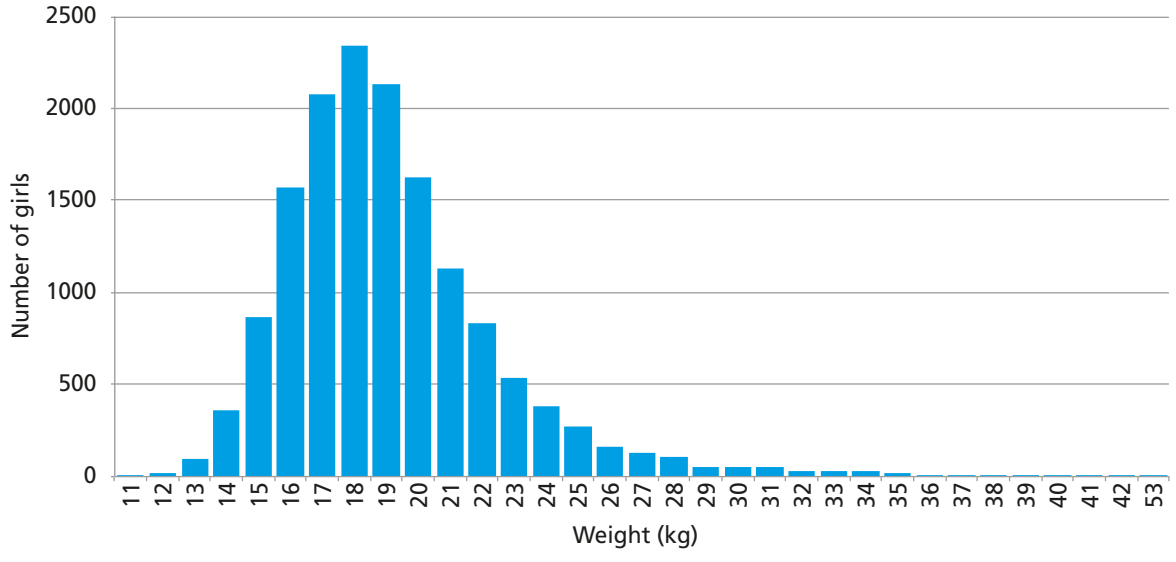


Figure 40 Height distribution (cm) in boys aged 4 to 5 years, Child Measurement Programme, 2013/14

Produced by Public Health Wales Observatory, using CMP data (NWIS)

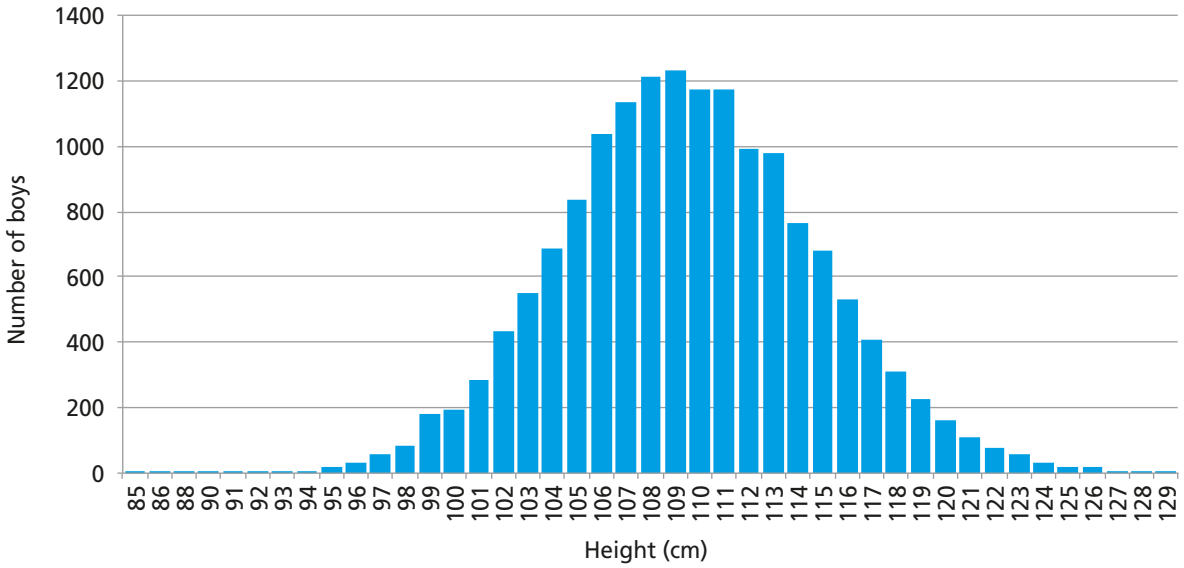


Figure 41 Height distribution (cm) in girls aged 4 to 5 years, Child Measurement Programme, 2013/14

Produced by Public Health Wales Observatory, using CMP data (NWIS)

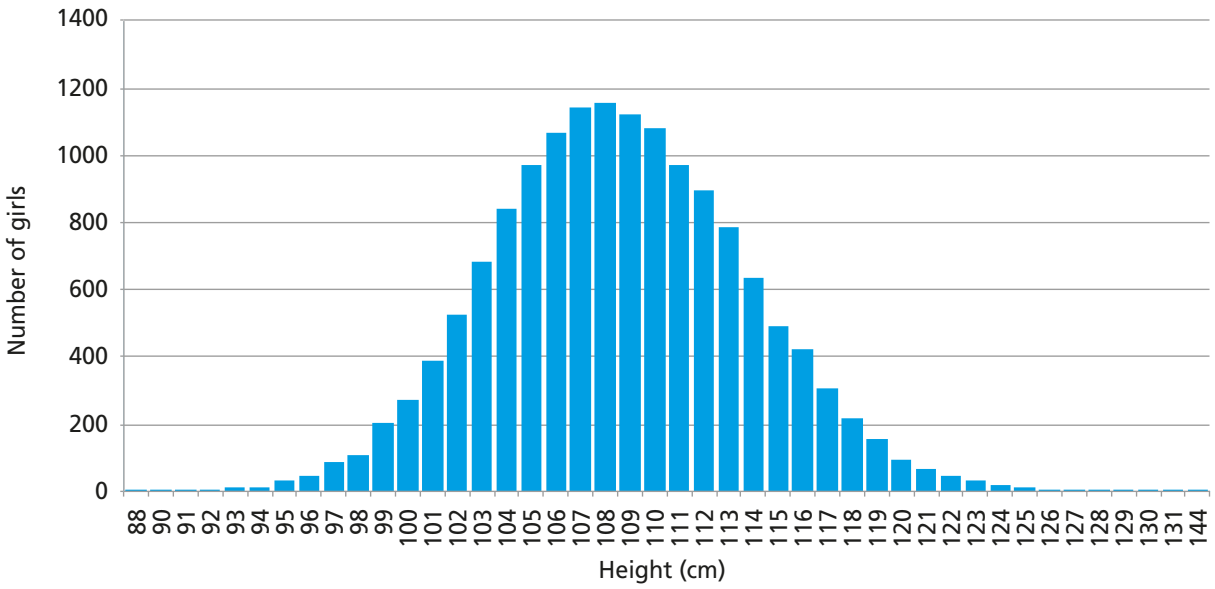


Figure 42 Body mass index (BMI) distribution in boys aged 4 to 5 years, Child Measurement Programme, 2013/14

Produced by Public Health Wales Observatory, using CMP data (NWIS)

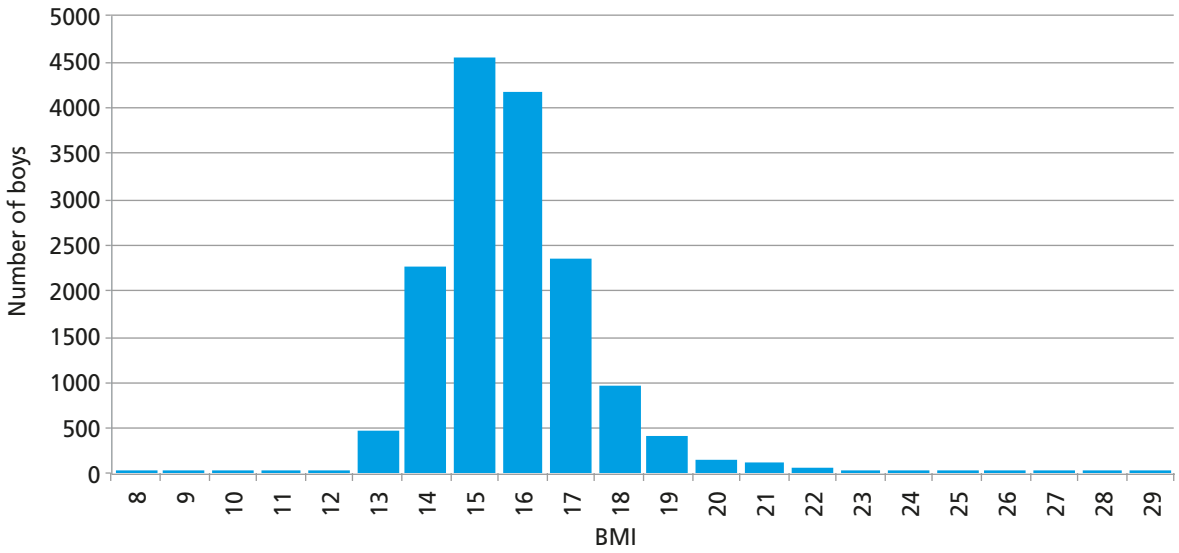
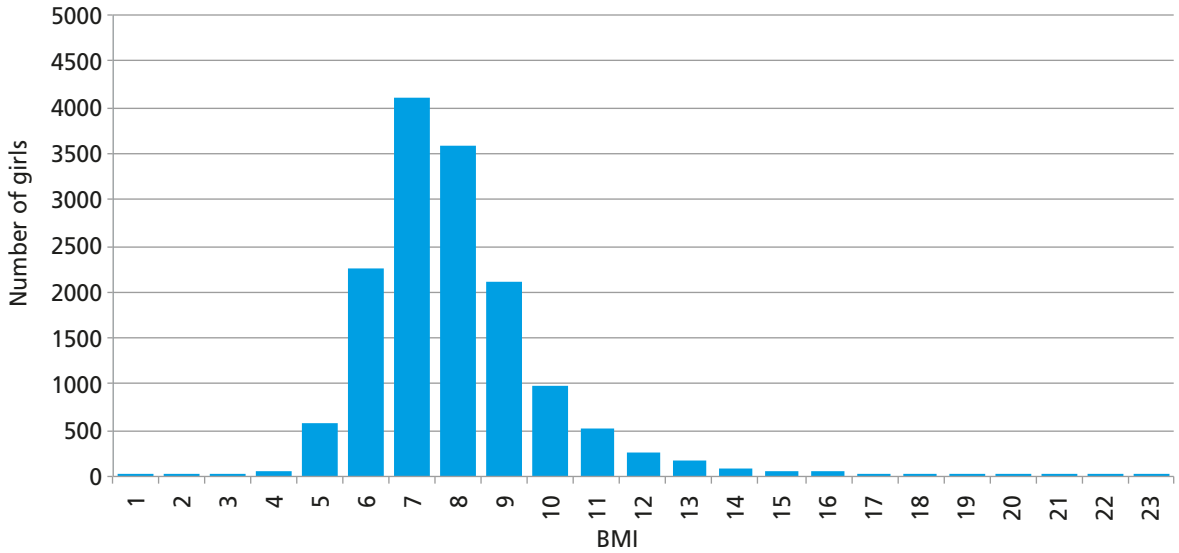


Figure 43 Body mass index (BMI) distribution in girls aged 4 to 5 years, Child Measurement Programme, 2013/14

Produced by Public Health Wales Observatory, using CMP data (NWIS)



Appendix 5 Additional maps and charts

Figure 44 **Proportion of children who are a healthy weight or underweight, 2013/14, children aged 4 to 5 years**

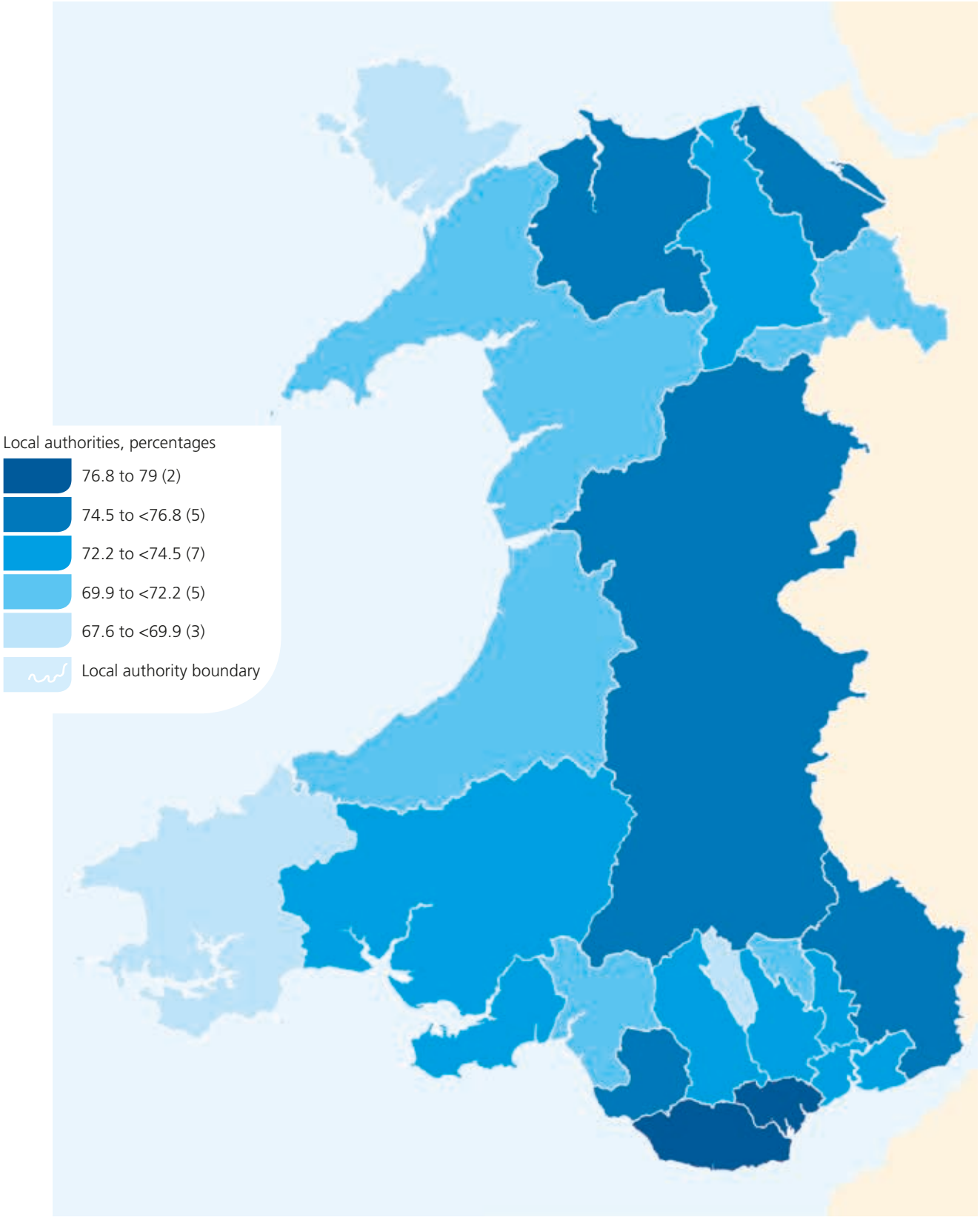


Figure 45 Proportion of girls aged 4 to 5 years who are overweight or obese, most and least deprived fifth in Wales, Child Measurement Programme Wales, 2011/12, 2012/13 and 2013/14

Produced by Public Health Wales Observatory, using CMP data (NWIS) and WIMD 2014 (WG)

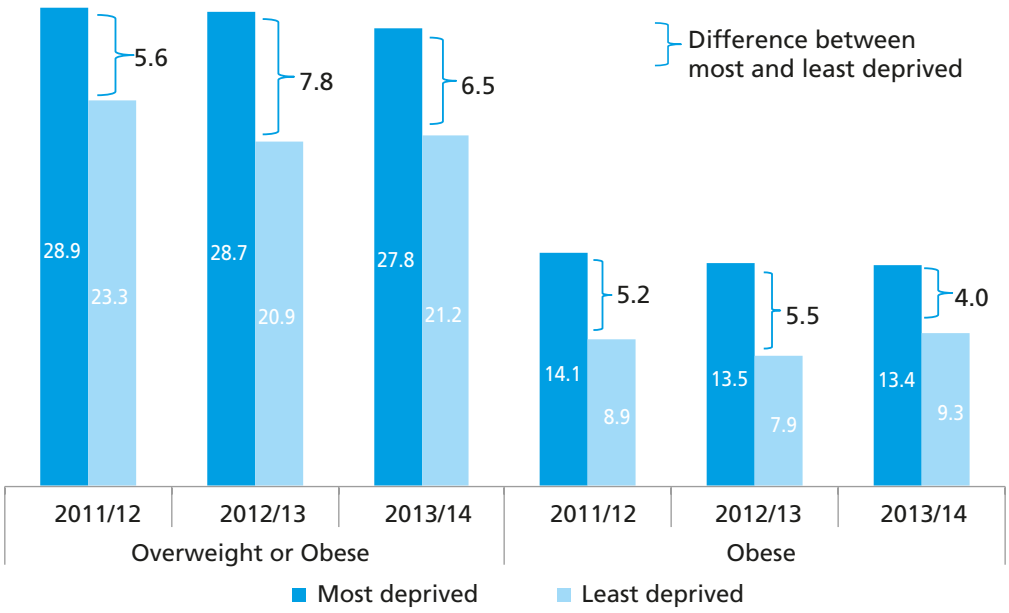


Figure 46 Proportion of boys aged 4 to 5 years who are overweight or obese, most and least deprived fifth in Wales, Child Measurement Programme Wales, 2011/12, 2012/13 and 2013/14

Produced by Public Health Wales Observatory, using CMP data (NWIS) and WIMD 2014 (WG)

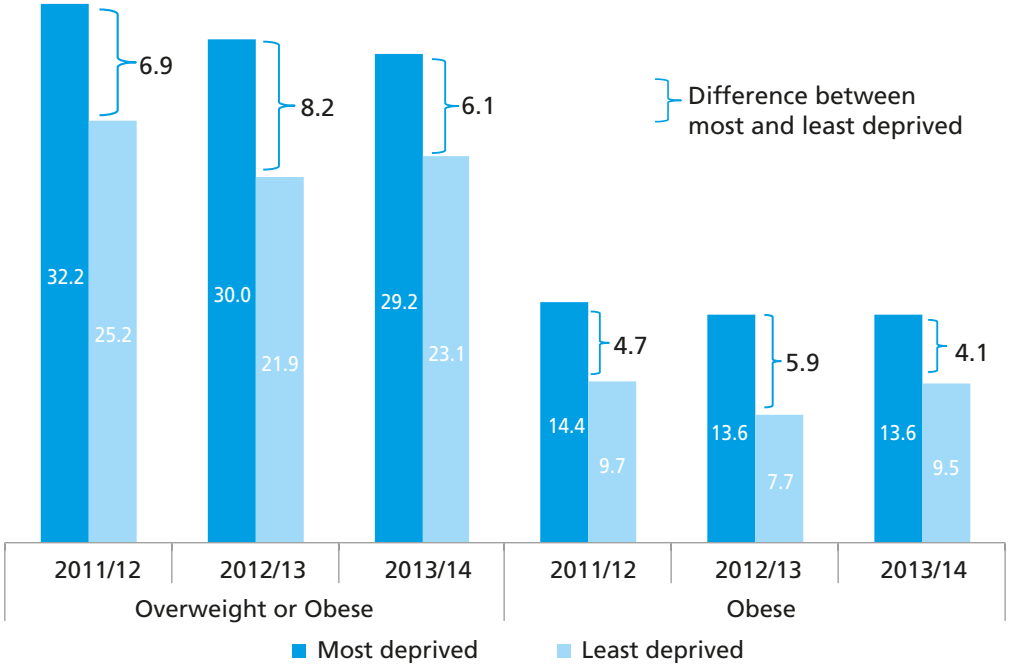
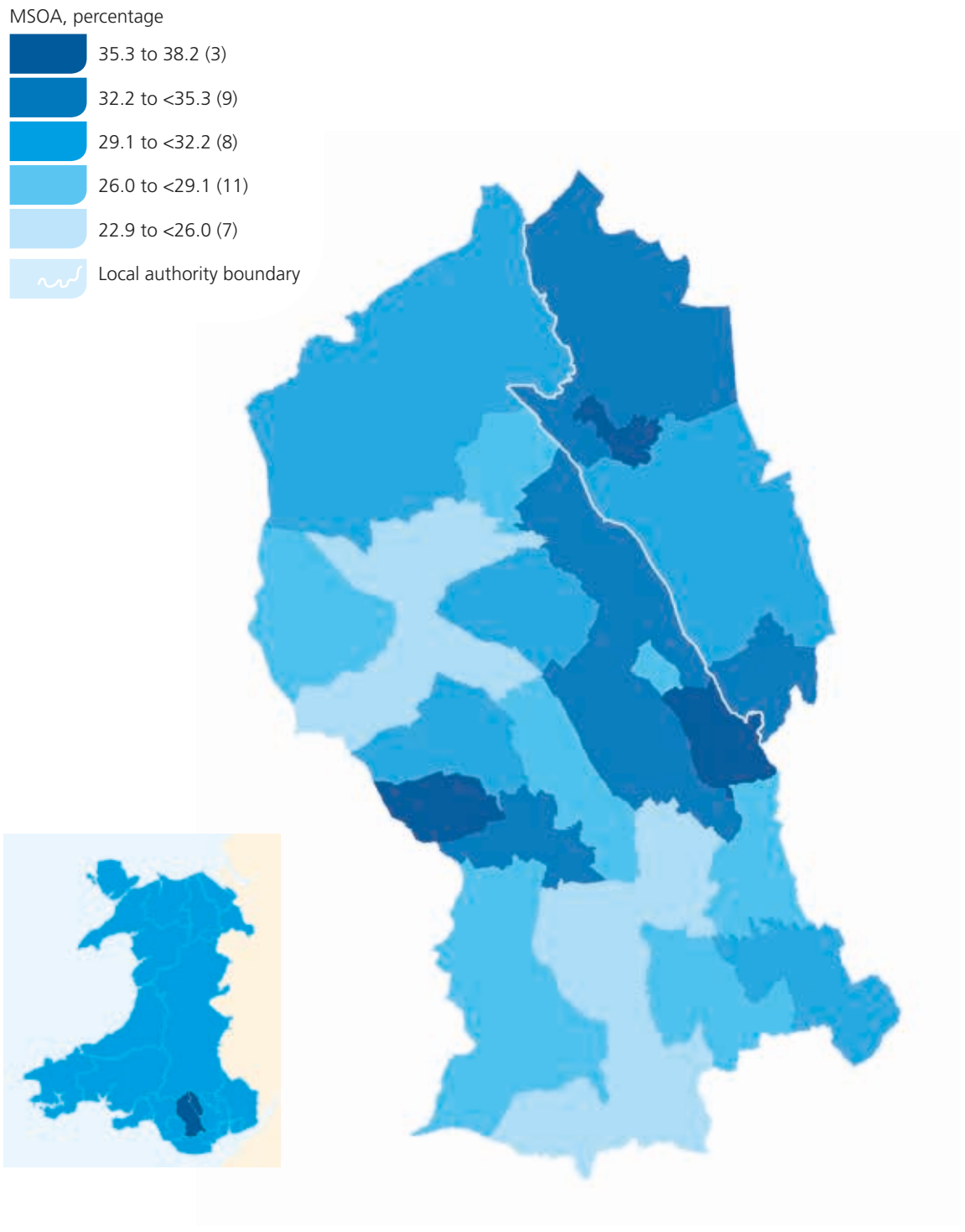


Figure 47 **Proportion of children who are overweight or obese, 3 years combined data, 2011/12, 2012/13 and 2013/14, children aged 4 to 5 years, Cwm Taf UHB**



Due to smaller sample sizes at Middle super output area level, caution should be taken when making comparisons between areas.
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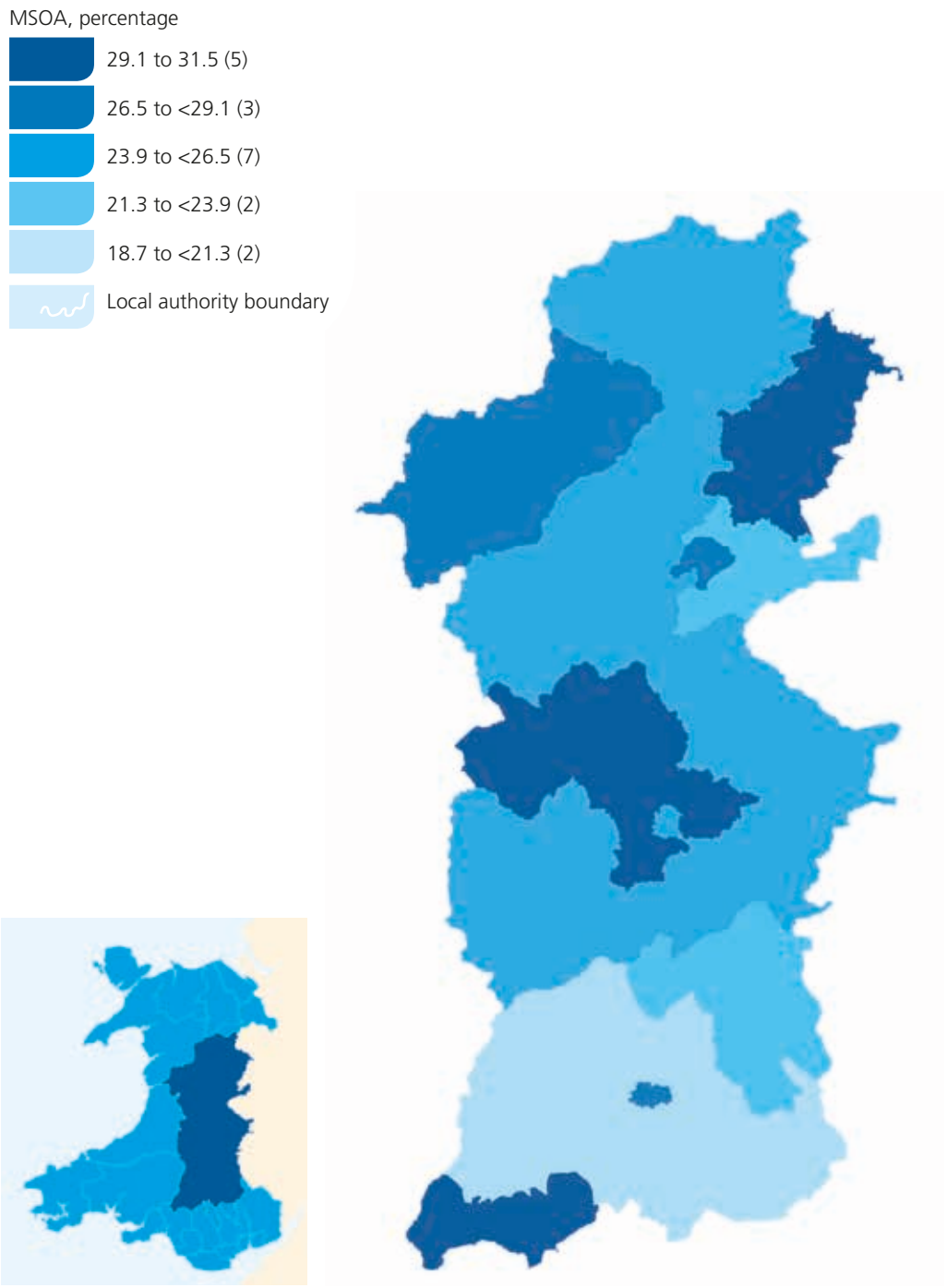
Figure 48 **Proportion of children who are overweight or obese, 3 years combined data, 2011/12, 2012/13 and 2013/14, children aged 4 to 5 years, Powys THB**



Due to smaller sample sizes at Middle super output area level, caution should be taken when making comparisons between areas.
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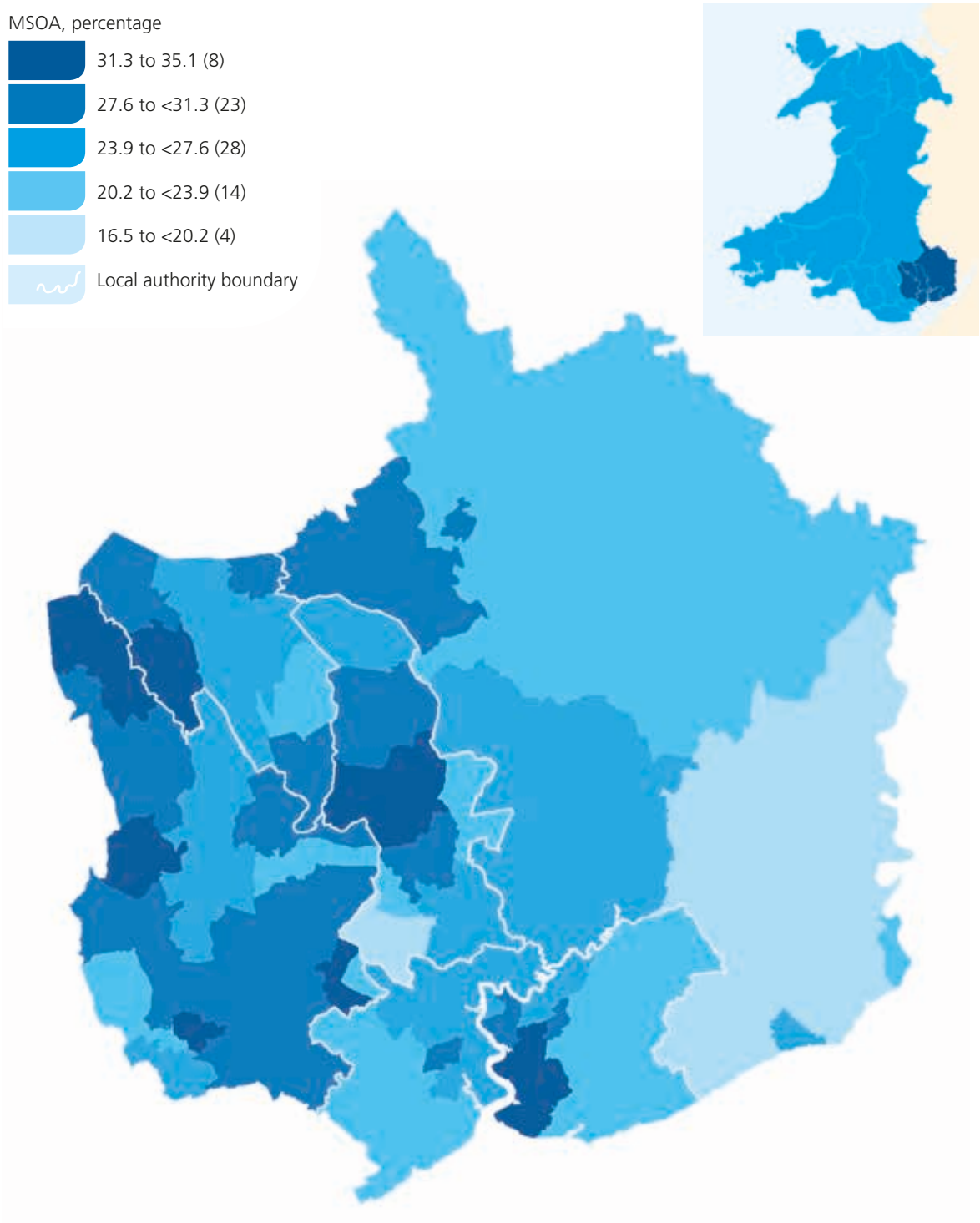
Figure 49 **Proportion of children who are overweight or obese, 3 years combined data, 2011/12, 2012/13 and 2013/14, children aged 4 to 5 years, Aneurin Bevan UHB**



Due to smaller sample sizes at Middle super output area level, caution should be taken when making comparisons between areas.
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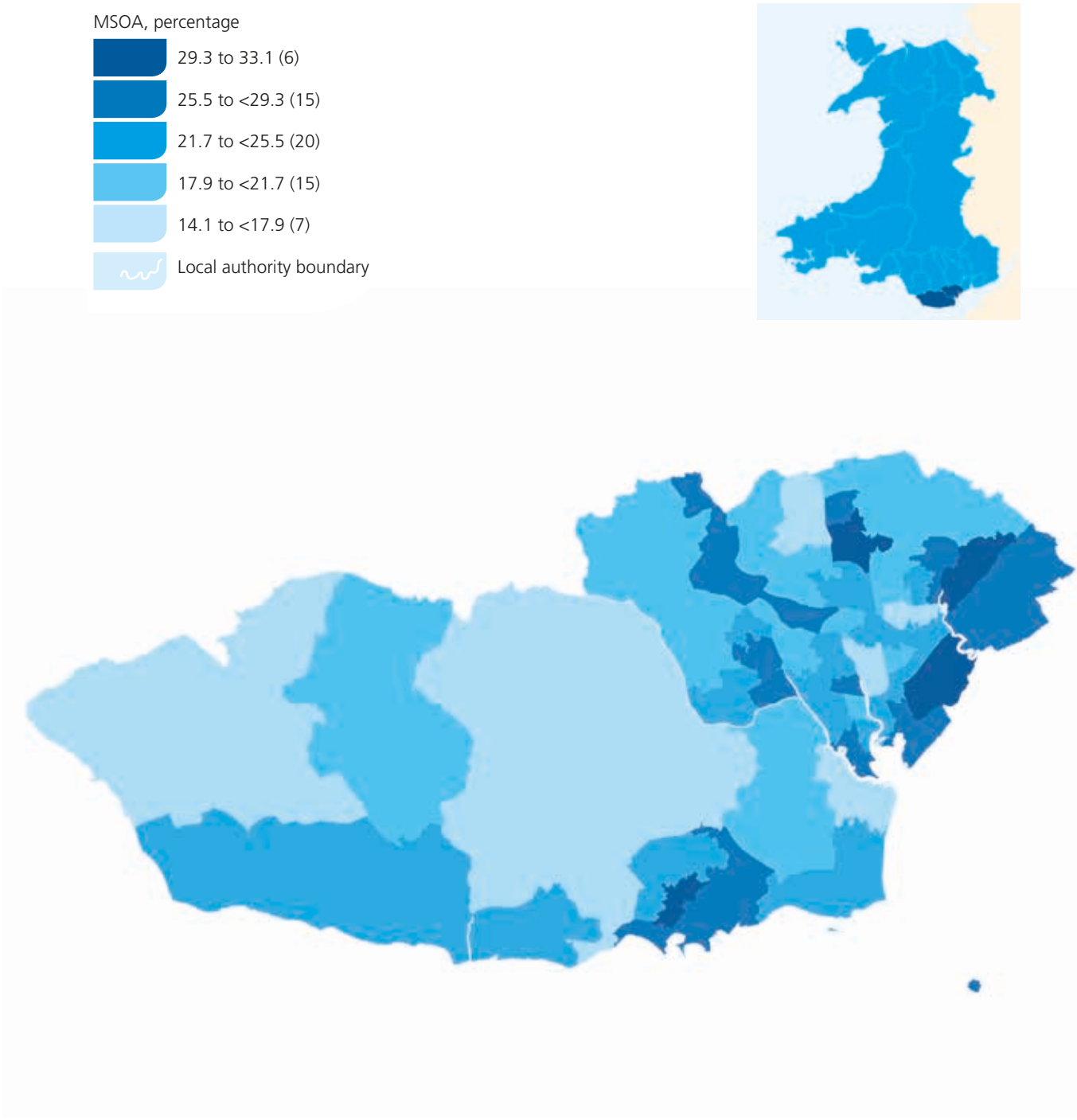
Figure 50 **Proportion of children who are overweight or obese, 3 years combined data, 2011/12, 2012/13 and 2013/14, children aged 4 to 5 years, Cardiff and Vale UHB**



Due to smaller sample sizes at Middle super output area level, caution should be taken when making comparisons between areas.
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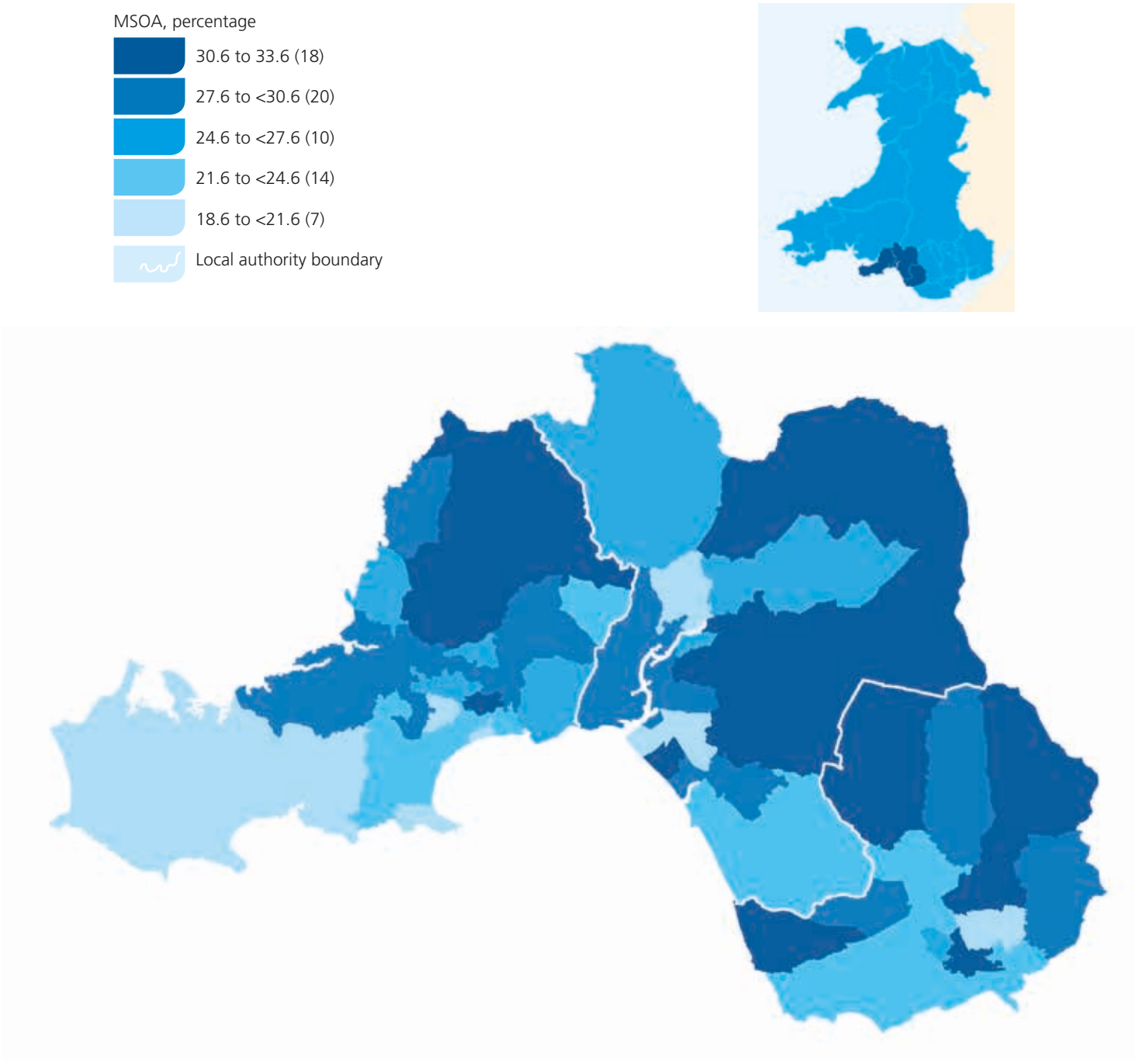
Figure 51 **Proportion of children who are overweight or obese, 3 years combined data, 2011/12, 2012/13 and 2013/14, children aged 4 to 5 years, Abertawe Bro Morgannwg UHB**



Due to smaller sample sizes at Middle super output area level, caution should be taken when making comparisons between areas.
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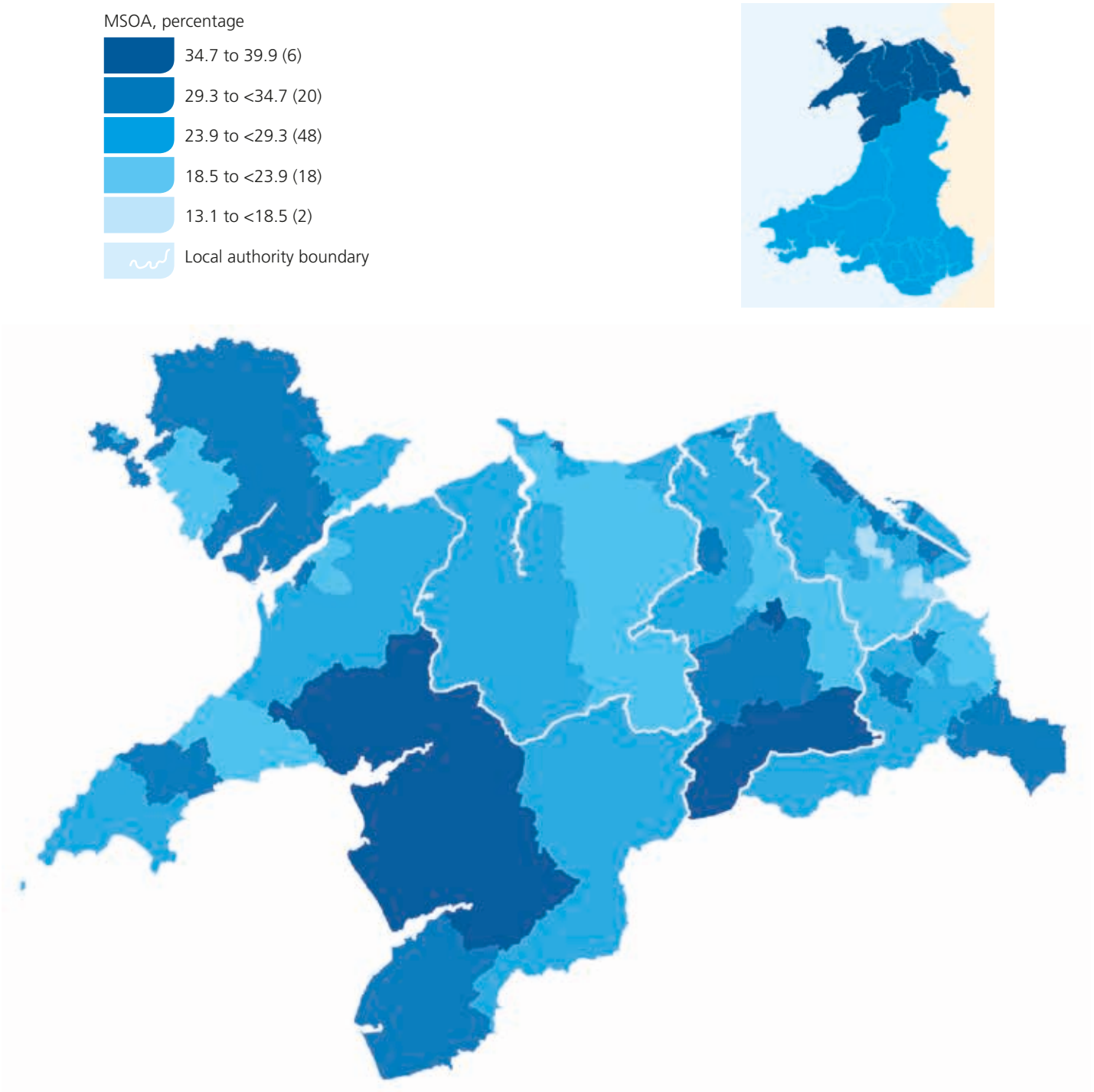
Figure 52 **Proportion of children who are overweight or obese, 3 years combined data, 2011/12, 2012/13 and 2013/14, children aged 4 to 5 years, Betsi Cadwaladr UHB**



Due to smaller sample sizes at Middle super output area level, caution should be taken when making comparisons between areas.
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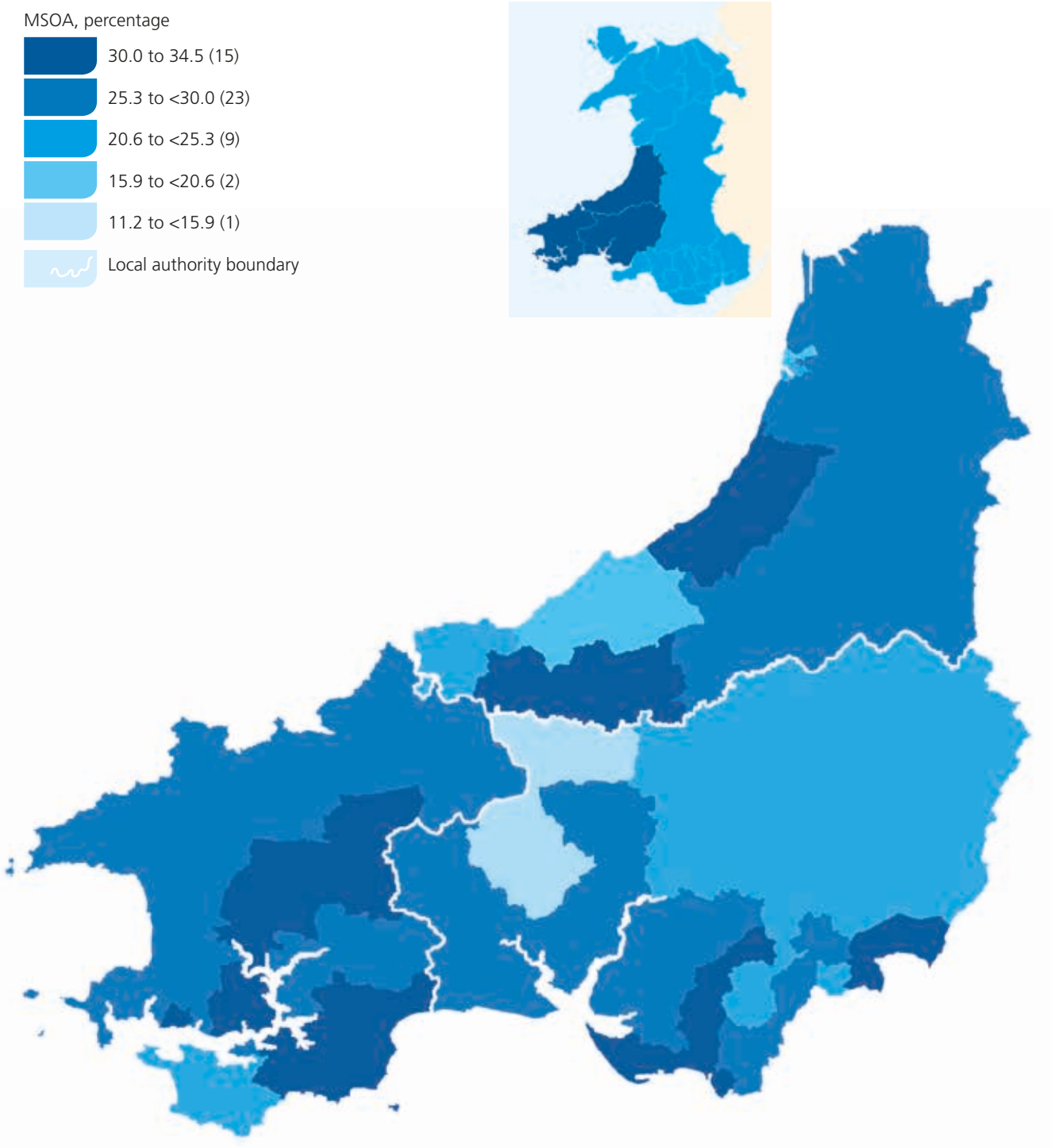
Figure 53 **Proportion of children who are overweight or obese, 3 years combined data, 2011/12, 2012/13 and 2013/14, children aged 4 to 5 years, Hywel Dda UHB**



Due to smaller sample sizes at Middle super output area level, caution should be taken when making comparisons between areas.
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