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Iechyd Cyhoeddus Cymru
Public Health Wales

Child Measurement Programme for Wales

Report 2011/12

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Foreword

How a child grows and develops during the early years of life lays the foundations for future health and well-being. A child's growth affects their psychological and emotional well-being and can also have a substantial impact on their physical health both in childhood and in later life. Although a majority of children are a healthy weight starting school, one in eight of our children are obese, and it is children from the most deprived areas who are most likely to be obese.

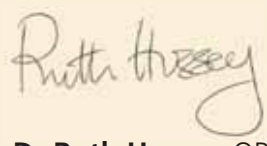
Ensuring children have the right experiences and environment to grow healthily starts from the very earliest time, even before conception, including through early feeding experiences, opportunities for play, and pre-school environments.

We have made some steps forward in Wales, such as Flying Start, Change4Life and the Welsh Network of Healthy School Schemes which has now extended to pre-school settings; as well as working at the UK level on issues such as front-of-pack food labelling. The Welsh Government is committed to support healthy growth and reduce obesity through a range of actions, particularly on the root causes, such as poverty

Legislation, such as the Healthy Eating in Schools Measure and the Active Travel Bill, is also important. Responses to the recent consultation on the need for a Public Health Bill raised a range of themes related to obesity, and these are being considered to inform the next steps.

As always, there is more that can be done. We need to ensure that health is integrated in all policies and that local community programmes support lifestyles conducive to good health. The information in this report should be used to drive sustainable and community-wide action across the whole public sector, by a range of professionals, for example in education, leisure and health, and through voluntary, private and community sectors, including Communities First teams.

I welcome this first report on the growth of children at school entry across Wales. Surveillance, monitoring and evaluation are critical to support effective action for healthy child growth and to reduce childhood obesity. This report provides information from which we can monitor our progress as a nation and more locally, into the future. Together, we must work for a healthy, active and resilient community in Wales where all children have the best start in life.



Dr Ruth Hussey OBE

Chief Medical Officer for Wales

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Tables and Figures

Abbreviations

BMI	Body mass index
CCH2000	Community Child Health 2000 System
CI	Confidence interval
CMP	Child Measurement Programme for Wales
COSI	Childhood Obesity Surveillance Initiative, World Health Organisation, Europe
LSOA	Lower super output area
NCCHD	National Community Child Health Database
NWIS	NHS Wales Informatics Service
RCPH	Royal College of Paediatrics and Child Health
SAIL	Secure Anonymised Information Linkage (Databank)
SACN	Scientific Advisory Committee on Nutrition
WIMD	Welsh Index of Multiple Deprivation

Summary

This is the first report of the Child Measurement Programme for Wales. The report provides high level findings from the measurement of children in reception year (age four to five) during the academic year 2011/12.

Prevalence is described by key categories, including underweight, healthy weight, overweight but not obese, and obese. These categories are based on body mass index thresholds, taking account of age and gender.

Of the 33,272 eligible children, 29,409 (88.4%) participated in the programme. There was geographical variation in participation; however, there was no clear relationship between participation and deprivation.

Key messages

- Seven out of ten children (71.2%) aged four to five during 2011/12 had a body mass index centile classified as healthy weight.
- One in eight children (12.5%) was obese. The prevalence of obesity was highest in Merthyr Tydfil (16.2%), and lowest in Monmouthshire (9.0%), and the Vale of Glamorgan (9.6%)
- Nearly three out of ten children (28.2%) were classed as overweight or obese. This prevalence was highest in Merthyr Tydfil (33.8%) and Rhondda Cynon Taf (31.5%) and lowest in Monmouthshire (22.0%)
- The prevalence of obesity increased substantially with increasing deprivation, from 9.4 per cent in the least deprived fifth of Wales to 14.3 per cent in the most deprived fifth. There was little association between deprivation and the prevalence of those classed as overweight but not obese.
- The prevalence of healthy weight was higher in girls (72.4%) than boys (70.0%).
- The prevalence of those overweight or obese in reception year in Wales (28%) was higher than that for England (23%); it was also higher than the English region with the highest prevalence, the North East of England (25%).
- Among the children measured, 171 (0.6%) were classed as underweight, and 158 (0.5%) were classed as having a height below the 0.4th centile.
- The Child Measurement Programme has developed standardised approaches to measuring and recording information on the height and weight of children aged four to five across Wales.
- This first report of the Child Measurement Programme represents a transitional year of data collection, as standardisation was incomplete during this year. This may have an impact on data quality which is expected to be resolved in future years; it is most likely to affect reported participation and withdrawal rates as well as findings in areas where participation is low.

Introduction

1

This is the first report of the Child Measurement Programme for Wales. The report provides high level findings from the measurement of children in reception year (age four to five) during the academic year 2011/12.

This report describes prevalence by key categories including underweight, healthy weight, overweight but not obese, and obese. These categories are based on body mass index (BMI) thresholds taking account of age and gender (see section 3.4); height <0.4th centile is also described.

The World Health Organisation describes childhood obesity as one of the most serious public health challenges of the 21st century, with international prevalence increasing at an alarming rate (World Health Organisation, 2012). The health effects of childhood obesity range from immediate psychological and emotional effects to longer term consequences of adult obesity with higher risk of morbidity, disability and premature mortality in adulthood (Public Health England). In addition, adverse physical effects of obesity, such as type 2 diabetes, are now increasingly being seen in childhood (Public Health England).

Prevalence of childhood obesity in Wales has been a cause for particular concern (Welsh Government, 2010). The 2012 Welsh Health Survey reported 34 per cent of children aged two to 15 years were estimated to be overweight or obese in Wales, including 19 per cent obese (Welsh Government, 2013). Prevalence of those overweight or obese among 15 year olds compares poorly with some other areas in Europe (Currie et al, 2013). Prior to the Child Measurement Programme there has been no standardised measured prevalence of child growth or obesity which can be reported below the Wales level or that refers to a specific age group of children[1].

This first year of data collection represents a transitional year in which it is recognised that not all standards were met in full. This may have an impact on data quality, particularly in relation to reported participation. This is discussed further in section 3.1. It is intended that data from the Child Measurement Programme for 2012/13 will be published as official statistics.

1 The Welsh Health Survey includes a measured sample of children from across Wales aged between two and 15.

2 The Child Measurement Programme for Wales

2.1 Purpose of the Child Measurement Programme

The Child Measurement Programme seeks to describe population prevalence of underweight, overweight and obesity, at national and local authority levels. It is also intended to allow anonymised population level information to be used for surveillance, research, monitoring or audit purposes and planning of health services. It is not a screening programme for individual children; nonetheless, any professional with concerns over the health of individual children should address these in line with good clinical practice.

Identifying secular trends in these measures, and variation within Wales, is essential to inform policy and service development. The information is intended to be used by health boards, local authorities, Directors of Public Health, Welsh Government and others to help develop and target services and create environments that will support children to grow healthily. In addition, future years' data will allow a greater understanding as to whether efforts to ensure children experience a healthy growth and a healthy weight at age four to five have been successful.

The data available through the Child Measurement Programme can be used to support in-depth analyses to understand both the causes and consequences of childhood obesity in Wales. This may include utilising other fields within the National Community Child Health Database (NCCHD) which is held by the NHS Wales Informatics Service (NWIS). It is anticipated that the data can be linked to other databases, such as through the Secure Anonymised Information Linkage (SAIL) Databank (Lyons, et al., 2009). Where interventions are planned and recorded prospectively there is potential to use these data to understand the effectiveness of these interventions.

2.2 Establishment of the Child Measurement Programme

The Child Measurement Programme was established following Directions issued by the then Minister for Health and Social Services which came into force in August 2011 (Welsh Government, 2011a). It is governed by the Child Measurement Programme (Wales) Regulations (Welsh Government, 2011b). The programme is coordinated by Public Health Wales, supported by NWIS and delivered by the seven health boards in Wales.

The programme was established following a study assessing the feasibility of measuring all children in reception year and year four to identify trends in childhood heights and weights (National Public Health Service for

Wales, 2009). The then Minister for Health and Social Services accepted the report and its recommendations.

2.3 Developing a standardised approach

Prior to the implementation of the Child Measurement Programme, school nursing services routinely measured children's height and weight as part of a school entry health check, but the way this was done varied across Wales. For example, there was variation in the age at measurement, quality of equipment and levels of training of staff involved. Data were entered in differing ways in the Community Child Health 2000 System (CCH2000) so it could not be collated nationally. The Child Measurement Programme for Wales has established a standardised approach to ensure that the way reception year children are weighed and measured is consistent across Wales.

The standardised approach of the Child Measurement Programme includes:

- Development and publication of standards for the programme (2011/12 and 2012/13), outlining what is expected as part of the programme
- Development and publication of national guidelines for the programme (2011/12 and 2012/13) with further detail, methods and guidance. These are designed for local adaptation to integrate with the health board's own guidance and procedures
- Development and delivery of training for all school nursing and child health administrative staff supporting the programme
- Providing scales and stadiometers (height measures) meeting the Child Measurement Programme standards[2]
- Commissioning a new, secure module for the child health system, CCH2000. This was developed and delivered by NWIS and made available from September 2012. This includes standard schedule forms and data entry screens
- Development and dissemination of supporting materials for parents and professionals

All health boards now measure reception year children, using an opt-out approach in accordance with the Child Measurement Programme (Wales) Regulations (Welsh Government, 2011b).

Further planned enhancements to the Child Measurement Programme include:

- Developing automated results letters for parents, obtained directly from the CCH2000 system
- Developing local reports, such as named results lists for each school ordered by BMI centile for school nurses, and local statistical reports on participation or BMI centile categories
- Piloting the extension of the Child Measurement Programme to year 4 (eight to nine year old children), enabling the comparison with other parts of Europe who participate in the World Health Organisation Childhood Obesity Surveillance Initiative, COSI.
- Producing videos on the Child Measurement Programme and measuring technique for staff, children and parents
- Considering the standardisation of a referral pathway for children newly identified as being of short stature (height of less than the 0.4th centile)

A multi-agency Steering Group with representation from a range of relevant stakeholders and specialists advises the programme, and the programme reports to the Child Measurement Programme Board (Appendix A).

2 Limited provision to supplement health board facilities.

2.4 The measurement process

All parents are offered the opportunity to opt out of the programme in advance of measurement, through provision of bilingual written material. Children are not included in the Child Measurement Programme if they are unwilling or unable to participate, e.g. unable to stand unaided on a scale, or if parents withdraw them from the programme. These circumstances are described in the Child Measurement Programme standards (Public Health Wales, 2012a) guidelines (Public Health Wales, 2012b).

Arrangements for measuring children are managed by a relevant healthcare professional, which in most cases will be the school nurse team lead.

As a minimum, parents will receive feedback on their child's results if they ask for it. However, some areas provide information about the measurements to all parents. At present this process is manual. The programme is exploring ways of providing information in a standard way to parents who wish to receive it.

3 Methods

3.1 Transitional year 2011/2012

The Child Measurement Programme was implemented in reception year across Wales for the first time during the 2011/12 academic year. As the programme was under development during this period, this first year is regarded as a transitional year.

Not in place for this transitional year, but now established for subsequent years, are:

- Finalised versions of standards and guidelines
- Training of all staff
- A dedicated data collection system (Child Measurement Programme module within the CCH2000)

There were two notable data collection issues during this transitional year:

- Due to staff recruitment issues, it was agreed that some children in the Powys Teaching Health Board area would be measured and their data recorded at the beginning of the following academic year (2012/13).
- Not all data from Flintshire are included. Due to a local issue, some data were not entered into systems in time. This has had an impact on the reported participation for Flintshire (see section 4.1).

The absence of the Child Measurement Programme module coupled with the lack of a national standard for school codes used within the CCH2000, greatly complicated the task of ensuring that all those, and only those, children in Welsh schools were included. This may have had an impact on participation rates reported. Reported withdrawal rates may also be affected by the lack of a dedicated data collection system.

3.2 The 2011/12 Child Measurement Programme cohort

The 2011/12 cohort included all children resident in Wales, born between 1 September 2006 and 31 August 2007 and who were attending a school in Wales, including maintained and independent schools. These children were identified through local child health system reports supplemented by school lists.

3.3 Data collection

All measures were taken during academic year 2011/12 (with the exception of Powys, see section 3.1).

Height and weight measurements were recorded to the nearest 0.1 kg and 0.1 cm respectively. Child health staff entered these data and other relevant related information, e.g. day of the measurement or withdrawal, from paper records into the health board's local child health information system, CCH2000. Entry within one month of measurement was recommended.

Each year, relevant information from each of the local child health systems is uploaded into the central NCCHD, held by NWIS. This data for the 2011/12 cohort, including the height and weight measurements collected for the Child Measurement Programme for Wales, was extracted for analysis for this report.

The information stored on the local CCH2000 systems forms part of a child's health record. Clinical staff involved in a child's care have access to their results in accordance with local information governance protocols.

3.4 Analysis

3.4.1 Inclusion and exclusion of records

Records from the 2011/12 cohort were considered eligible for inclusion (denominator for proportion participating) if the child's:

- Date of birth was between 1 September 2006 and 31 August 2007 inclusive
- Residence was in Wales
- Gender was stated
- School code was included, unless stated as not a Welsh school within the descriptive text field (see section 3.1)

Records were included as measured (numerator for proportion participating) if, in addition, they:

- Had both a height and weight measurement that were taken in a school
- Did not have an extreme height or weight measurement (+/- seven standard deviations, or <10kg for extreme low weight measure)
- Did not indicate consent withdrawn from participation in programme, i.e. 'W' or 'N' within the height consent field
- Had measurements taken during the 2011/12 school year (with the exception of Powys, see section 3.1)

3.4.2 Body mass index categorisation

The BMI was calculated as weight in kilograms/height in metres squared (kg/m^2). Prevalence rates were calculated by assigning each record to an age and sex-specific BMI centile via transformed BMI z-scores using the British 1990 growth reference (UK90), from the method proposed by Cole et al (1995).

The zanthro function in STATA was used to calculate BMI z-scores according to the UK90 and utilising age in days, together with gender and the BMI value (Vidmar et al, 2004). The BMI z-scores are used to determine the BMI centile in order to assign each record to one of the following weight categories:

- Underweight: less than but not including 2nd centile
- Healthy weight: 2nd centile up to but not including 85th centile
- Overweight but not obese: 85th centile up to and not including 95th centile
- Obese: 95th centile and above

This use of these thresholds is in accordance with the recommendations of the Scientific Advisory Committee on Nutrition and the Royal College of Paediatrics and Child Health (SACN, RCPH, 2012).

3.4.3 Geographies and deprivation

Children were allocated to their geographical area of residence, not to the geographical area in which their school is situated.

Prevalence of BMI categories are shown by deprivation fifth. Deprivation fifths are derived from the Welsh Index of Multiple Deprivation (WIMD) (Welsh Government, 2011c) by categorising every lower super output area (LSOA) in Wales into one of five groups, ranging from the least to the most deprived.

3.4.4 Confidence intervals and statistical significance

Confidence intervals (CIs) are indications of the natural variation that would be expected around a rate and they should be considered when assessing or interpreting the rate. The size of the CI is dependent on the size of the population from which the events came and the degree of confidence required. Generally speaking, rates based on small populations are likely to have wider CIs. Conversely, rates based on large populations are likely to have narrower CIs. In this report, 95 per cent CIs were calculated using a method proposed by Wilson et al as described by Altman (2000, p 46).

A statistically significant finding suggests that the difference between two values might not be due to chance. In this publication, statistical significance is evaluated by the comparison of the 95% CIs of given values in lieu of a statistical test for significance. If CIs do not overlap then the value was considered to be statistically significantly different. Deeming a local value as statistically significant suggests that there is only 5% chance of it being so different to the Wales average due to natural variation alone. The phrase 'similar to' is used within the report when values were not statistically significantly different.

3.4.5 Small number suppression

Small numbers (zero to four) have been suppressed to avoid potential identification of individuals. Suppression of complementary cells has also been performed where suppressed small numbers could otherwise be derived from totals.

Results

4.1 Participation

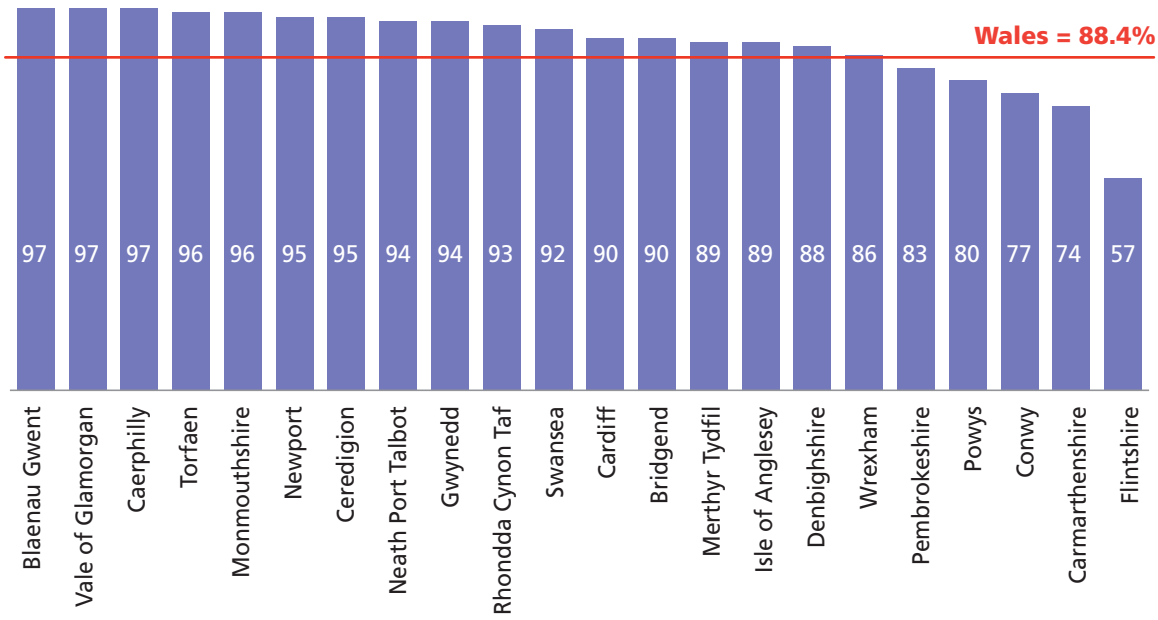
Of the 33,272 eligible children aged four to five, 29,409 (88.4%) participated in the programme (had valid measures which were included in the analyses).

In six of 22 local authority areas over 95 per cent of eligible children participated; participation was particularly high within Aneurin Bevan Health Board area and also in the Vale of Glamorgan (Figure 1). Participation was over 90 per cent in 13 local authority areas and over 85 per cent in 17 local authority areas (Figure 1).

Participation was particularly low in Flintshire (57%), where there was a known issue with local data capture (see section 3.1). Participation in Carmarthenshire, Conwy, Powys and Pembrokeshire was below 85 per cent. Participation was similar for boys and girls (88% in both). There was no clear association between deprivation and participation; although, participation was slightly higher in the most and least deprived fifths (90% in both) than in the middle three deprivation fifths (87-88%).

Just under 500 children were withdrawn from the programme (1.5%) (Appendix B; see also section 3.1).

Figure 1 Participation within the Child Measurement Programme, children aged 4-5. 2011/12*



Produced by Public Health Wales Observatory, using CMP data (NWIS). *Participation reflects final data included in the analysis; there were known issues with inclusion of data from Flintshire

Due to issues associated with the transitional year of reporting for the programme, the values for participation and withdrawal are less reliable than expected in future years. The official school census figures for the number of children in reception year in Wales in January 2012 was 34,423 (Welsh Government, 2012), which is 1,151 higher than the number of children identified as eligible under the programme. However, the school census would include pupils who were not resident in Wales. If the school census figure were the true number eligible, then participation would be 85.4%.

For the first year of a full population based national data collection participation was high. In contrast, during the first year of data collection of the National Child Measurement Programme, England (2005/6), 57 per cent of reception year children participated (Crowther, Dinsdale, Rutter, & Kyffin, 2006). This increased to 78 per cent by 2006/7 (National Obesity Observatory, 2013).

Participation may have an impact on the prevalence of each BMI category reported. This is particularly the case if children from particular BMI categories have a higher probability of inclusion or exclusion than others (bias). The finding that there was no clear pattern between participation and deprivation suggests that bias may not be a major factor in relation to participation. Nonetheless, findings for those areas with lower inclusion of data, and Flintshire in particular, should be interpreted with caution.

The National Child Measurement Programme, England, has now reported on seven years data collection in both reception year and year six. Participation during 2011/12 (94% for reception year) was the highest achieved to date (National Obesity Observatory, 2013, p.5). This suggests that as the Child Measurement Programme develops there should be opportunities to increase participation.

4.2 Overview of key body mass index centile categories

The distributions of height, weight and BMI are shown in Appendix C. There is a symmetrical distribution for height and a skewed distribution for weight and BMI, in line with what has been previously described in Wales (National Public Health Service for Wales, 2009).

Statistical note 1: Overweight and obesity in this report relate to epidemiological rather than clinical thresholds. Clinical thresholds for overweight and obesity in children are set to higher centile points, these are described in the guidelines accompanying the programme (Public Health Wales, 2012b). The 1990 UK centile thresholds are used in this report and should not be compared with figures derived using other thresholds, such as in the heights and weights feasibility study report.

Statistical note 2: In order to suppress small numbers, the underweight and healthy weight categories have been merged when presenting this information at geographies lower than Wales. Overall prevalence of underweight is 0.6 per cent and was less than two per cent in all local authority areas.

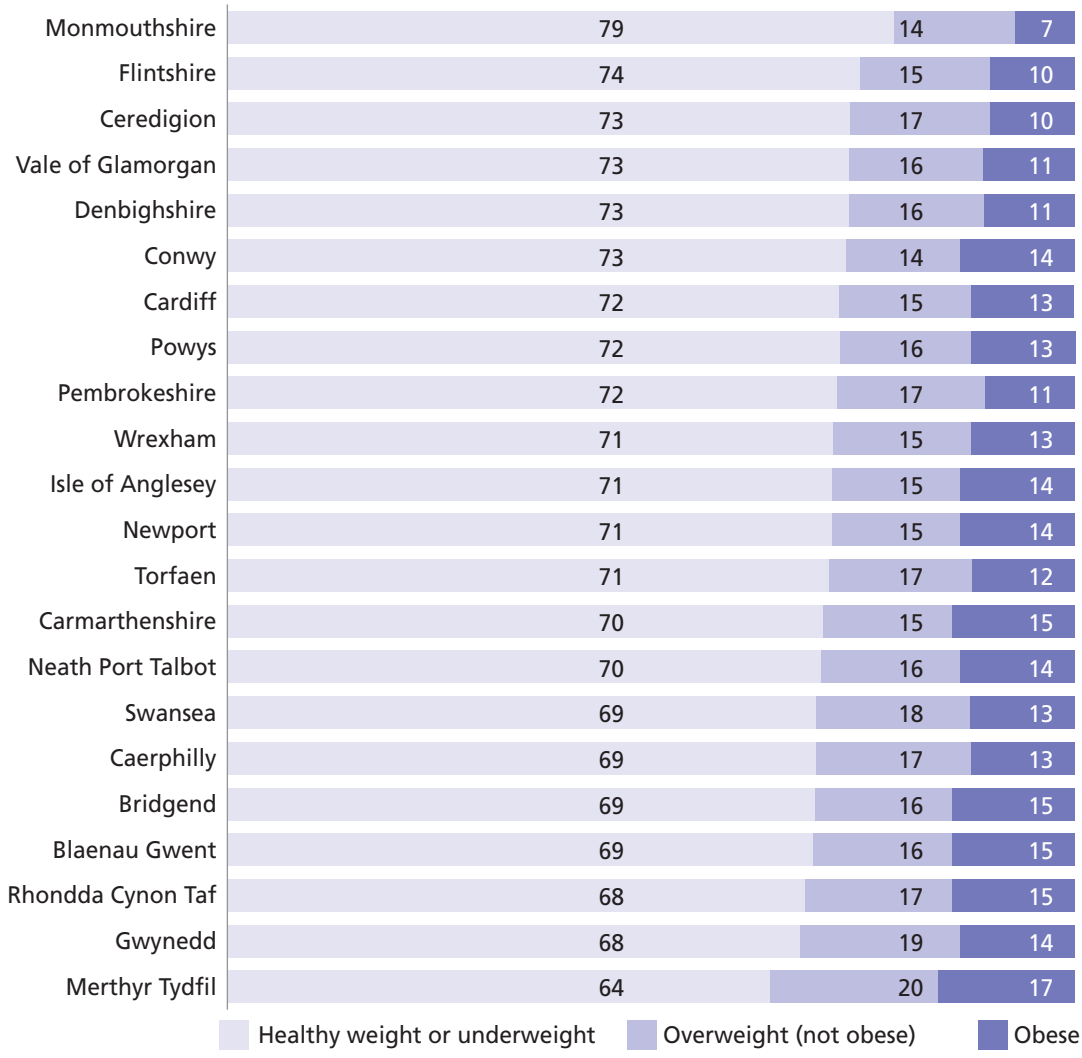
Table 1, Figure 2 and Figure 3 provide an overview of key BMI centile categories by gender for Wales and for local authorities. These findings are discussed in more detail in the relevant sections of the results.

Table 1 Prevalence of underweight, healthy weight, overweight but not obese, and obese, children aged 4-5 years, Wales, 2011/12

	Children		Boys		Girls	
	%	(95% CI)*	%	(95% CI)*	%	(95% CI)*
Underweight	**0.6**	(0.5, 0.7)	**0.7**	(0.6, 0.8)	**0.5**	(0.4, 0.6)
Healthy weight	**71.2**	(70.7, 71.7)	**70.0**	(69.3, 70.8)	**72.4**	(71.7, 73.2)
Overweight but not obese	**15.7**	(15.2, 16.1)	**16.3**	(15.7, 16.9)	**15.0**	(14.5, 15.6)
Obese	**12.5**	(12.2, 12.9)	**13.0**	(12.5, 13.6)	**12.1**	(11.5, 12.6)

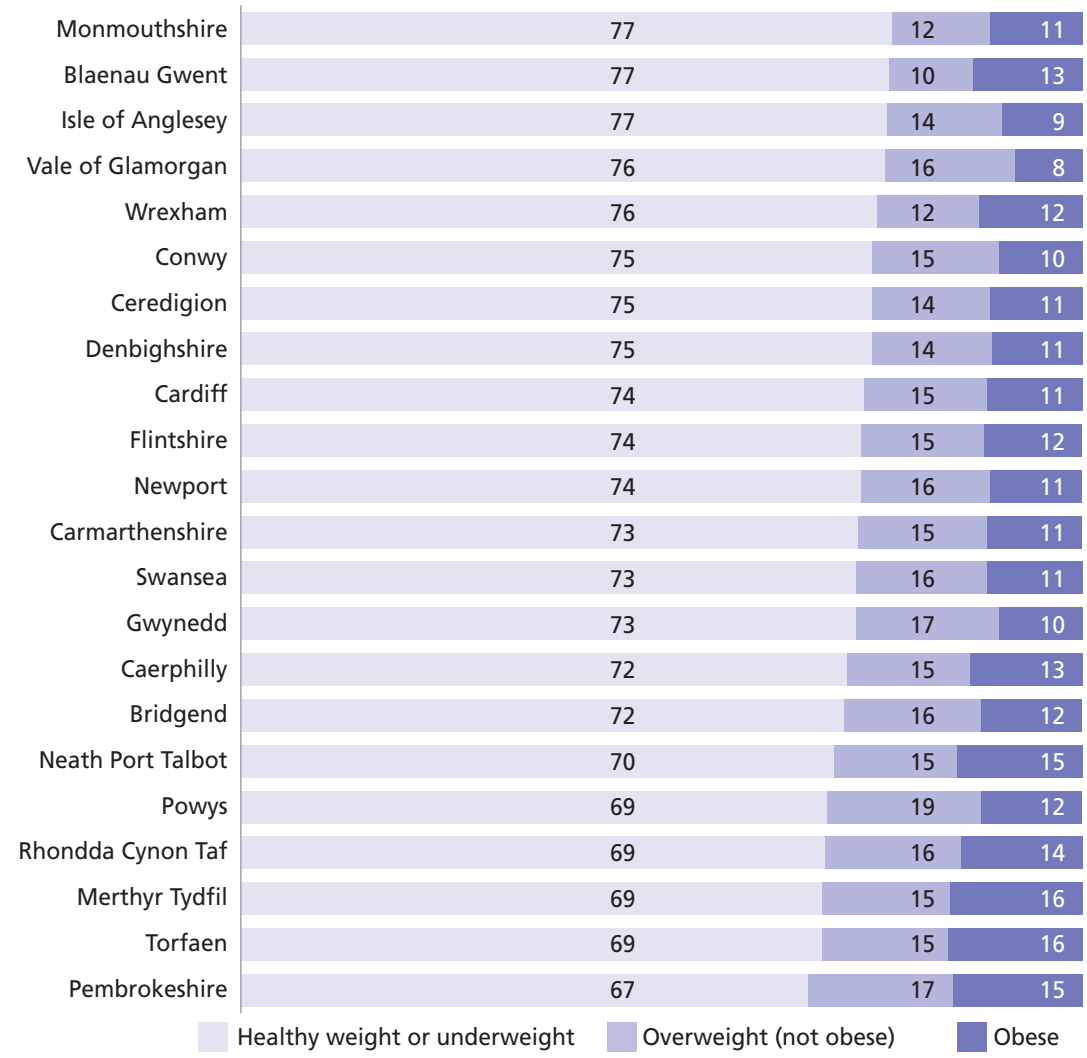
* 95% confidence interval. Produced by Public Health Wales Observatory, using CMP data (NWIS)

Figure 2 BMI centile category, boys aged 4-5 years, percentage by local authority, 2011/12



Produced by Public Health Wales Observatory, using CMP data (NWIS). Figures may not sum to 100 due to rounding.

Figure 3 BMI centile category, girls aged 4-5 years, percentage by local authority, 2011/12



Produced by Public Health Wales Observatory, using CMP data (NWIS). Figures may not sum to 100 due to rounding.

The measurements collated through the Child Measurement Programme comprise the first nationally measured data set for an age group of children across Wales. Although this reflects a transitional year of data collection, the height and weight data included remain the most reliable data collected to date for a single age group of children covering the whole of Wales. It is the first source of such data that can describe geographical patterns within Wales.

The findings in this report relate to children who are just entering primary school level, and particularly reflect the experiences and exposure of the early years of life. Experience from Wales and elsewhere suggests that prevalence of obesity may be higher in older age groups (National Public Health Service for Wales, 2009; Health and Social Care Information Centre, 2012; Mandalia, 2012).

In this transitional year, not all aspects of standardisation were implemented in full (section 3.1). In addition, there were delayed measurements in Powys and missing data from Flintshire (section 3.1). Although these could have an impact on the findings, it is likely that the greatest effect would be on reported participation and withdrawal rates (due to a lack of a standard Child Measurement Programme form) and the impact of low participation, particularly in Flintshire.

4.3 Prevalence of healthy weight

Among children aged four to five during 2011/12, 71.2 per cent had a BMI centile classified as healthy weight.

Prevalence of healthy weight was higher in children from the least deprived (74.9%) than children in the most deprived areas (68.7%). This difference is statistically significant (Table 2).

Table 2 Prevalence of healthy weight by deprivation fifth, children aged 4-5 years, 2011/12

	n	%	(95% CI)*
Least deprived fifth	3,932	74.9	(73.7, 76.0)
Next least deprived	3,733	72.5	(71.3, 73.7)
Middle deprived	3,838	70.9	(69.7, 72.1)
Next most deprived	4,355	70.4	(69.2, 71.5)
Most deprived fifth	5,086	68.7	(67.6, 69.7)
Wales	**20,944**	**71.2**	(70.7, 71.7)

* 95% confidence interval.
Produced by Public Health Wales Observatory, using CMP data (NWIS)

Prevalence of healthy weight was slightly higher in girls (72.4%) than boys (70.0%); this pattern was seen among children from both the most and least deprived areas (Appendix B).

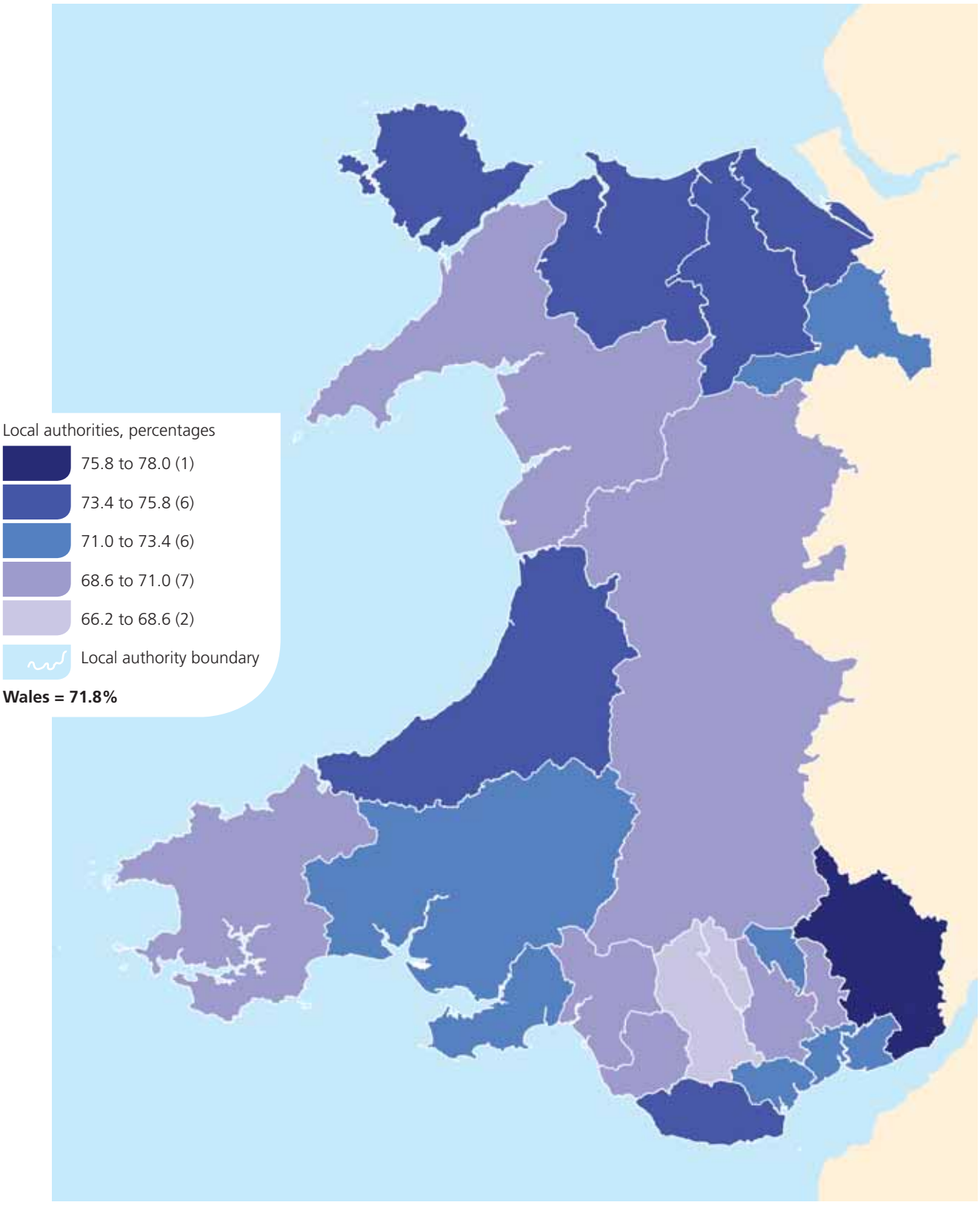
It has not been possible this year to publish figures for healthy weight in all local authority areas (Appendix B)[3]; however, a map showing broad patterns of healthy weight at a local level is included in Appendix D.

When healthy weight is considered with underweight as a single category, to avoid disclosure due to the small numbers of underweight children, the highest prevalence was in Monmouthshire (78.0%) and the Vale of Glamorgan (74.7%) and lowest in Merthyr Tydfil (66.2%) and Rhondda Cynon Taf (68.5%). Prevalence in other local authorities was similar to the Wales prevalence (Figure 4, Figure 5, Appendix B).

Prevalence of healthy weight and underweight as a single category was highest among boys in Monmouthshire (78.6%) and lowest in Merthyr Tydfil (63.9%). Among girls it was lowest in Pembrokeshire (67.5%) and Rhondda Cynon Taf (69.2%), with prevalence among girls in other local authorities being similar to the Wales prevalence for girls (Appendix B).

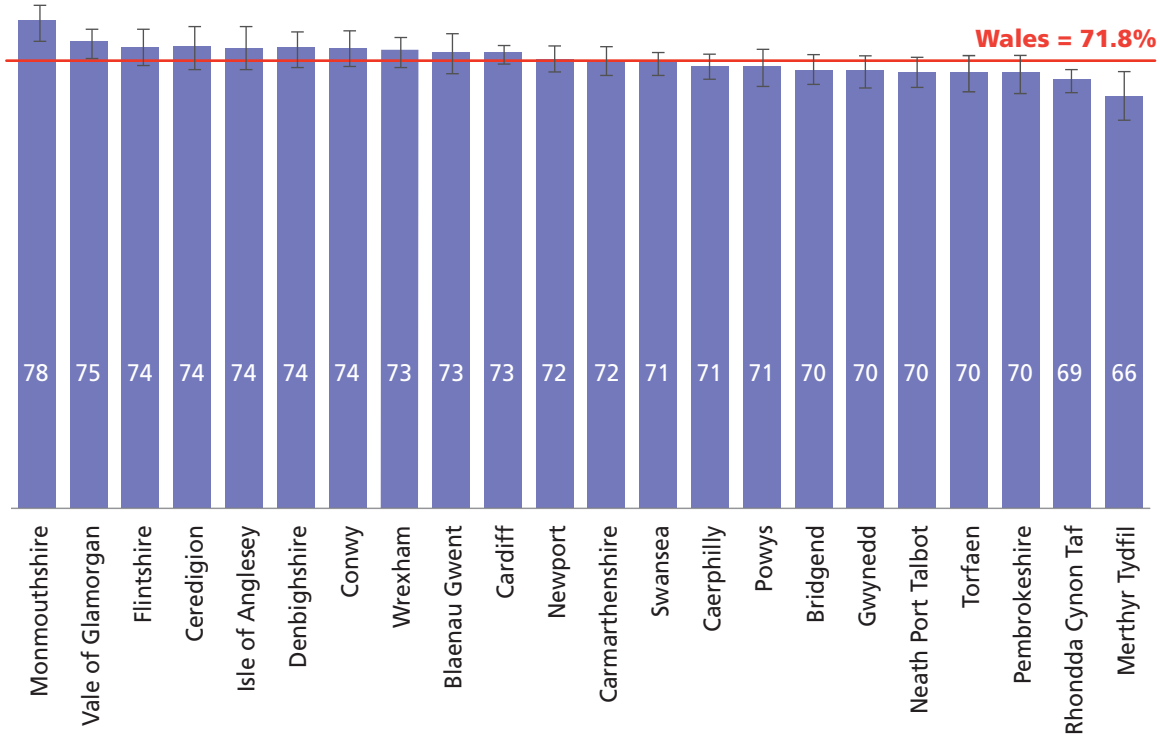
3 To avoid disclosure of small numbers of underweight children there has been secondary suppression of healthy weight for a number of local authority/health board areas.

Figure 4 Prevalence of healthy weight and underweight combined, children aged 4-5 years, local authority map, 2011/12



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

Figure 5 Prevalence of healthy weight and underweight combined, children aged 4-5 years, local authority chart, 2011/12



Produced by Public Health Wales Observatory, using CMP data

The prevalence of healthy weight among children can be seen as a desired goal at a population level, particularly when considering health improvement initiatives. Although this report provides population level data, it does not attempt to describe the multitude of factors that contribute to achieving a healthy weight for a particular child, community or population group.

The category of healthy weight and underweight combined is used to describe local patterns to avoid small number disclosure. As underweight is less than two per cent in all local authority areas this can be considered a proxy for healthy weight. The actual healthy weight figures are available for 12 local authority areas and five health board areas (Appendix B). It is hoped that in the future, detail can be provided for other areas by combining several years of data.

All measured children either fall into the category of healthy weight and underweight combined, or overweight or obese combined (see section 4.4); for this reason, the patterns in these two categories directly reflect each other, but in reverse.

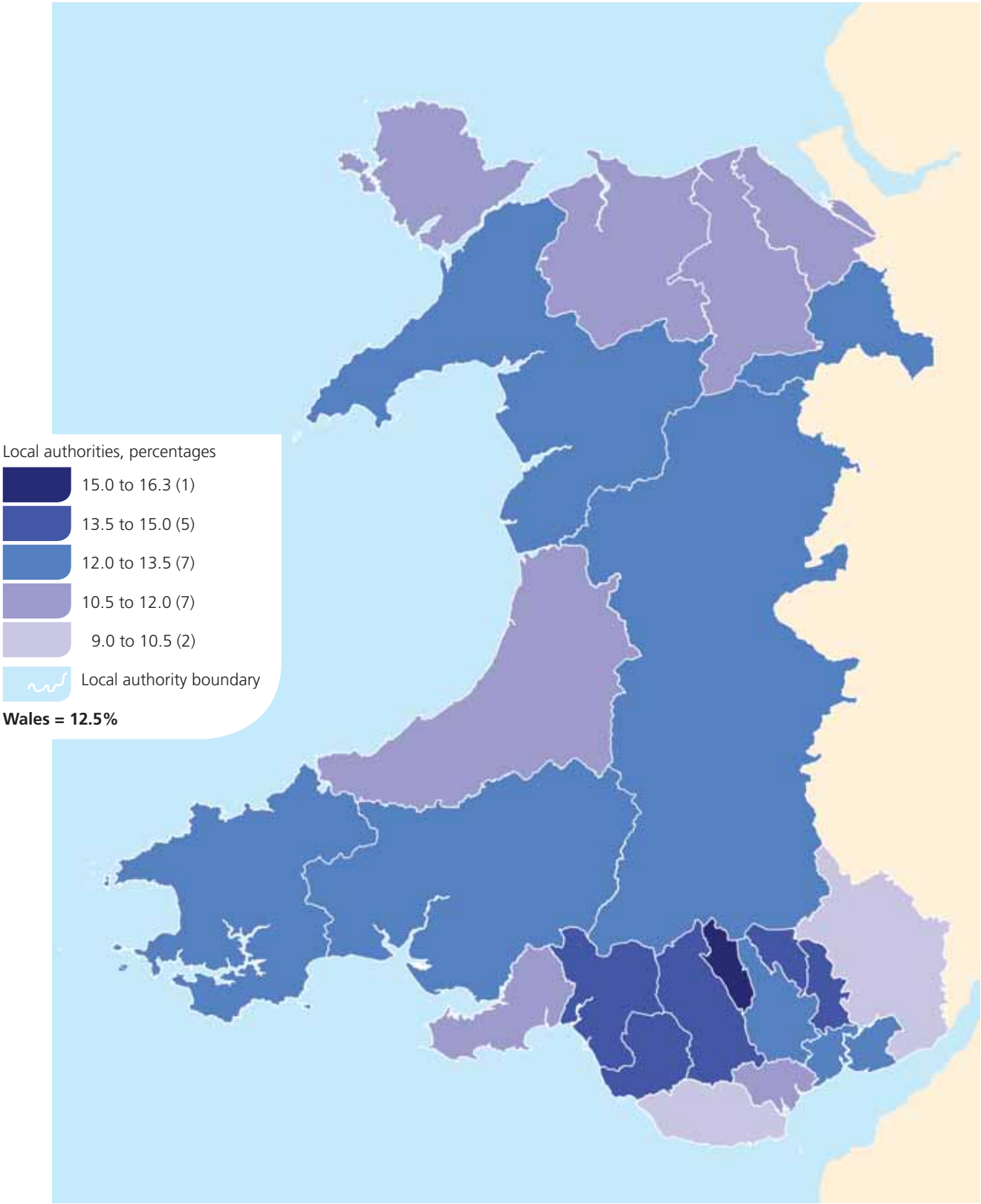
4.4 Prevalence of overweight and obesity

Prevalence of obesity

One in eight children was classed as obese (12.5%). Prevalence of obesity was highest in Merthyr Tydfil (16.2%), and lowest in Monmouthshire (9.0%) and the Vale of Glamorgan (9.6%). Other local authorities were similar to Wales (Figure 6; Figure 7).

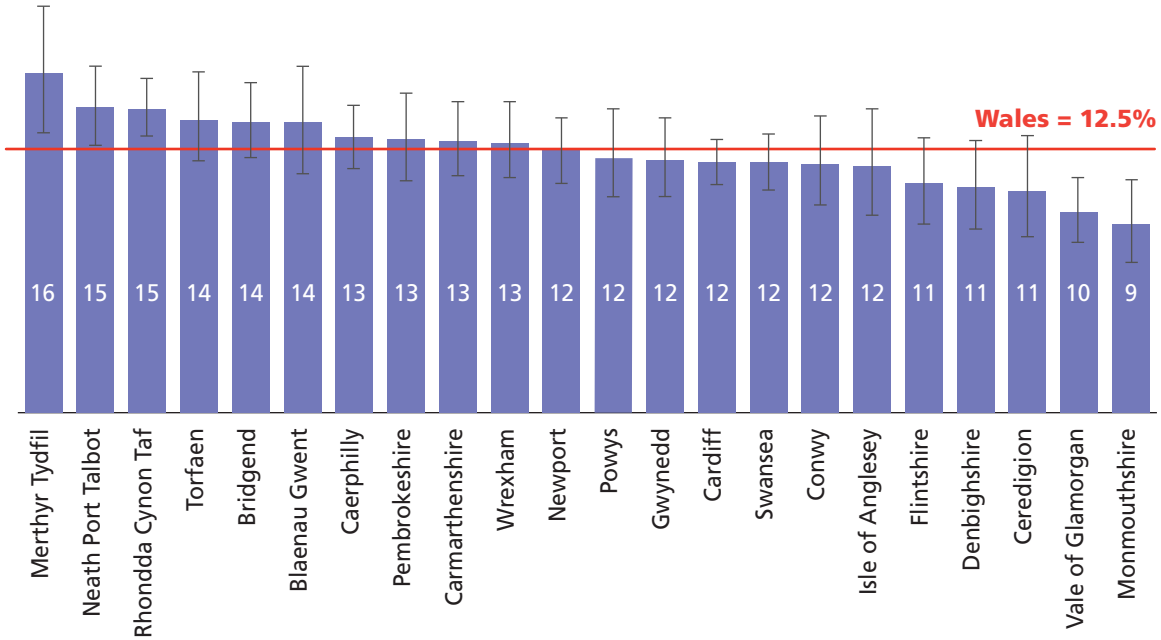
Prevalence of obesity increased with deprivation fifth. This had a steep gradient. The prevalence of obesity in the most deprived fifth was 14.3 per cent whereas that in the least deprived fifth was 9.4 per cent. This difference is statistically significant (Figure 8).

Figure 6 Prevalence of obesity, children aged 4-5 years, local authority map, 2011/12



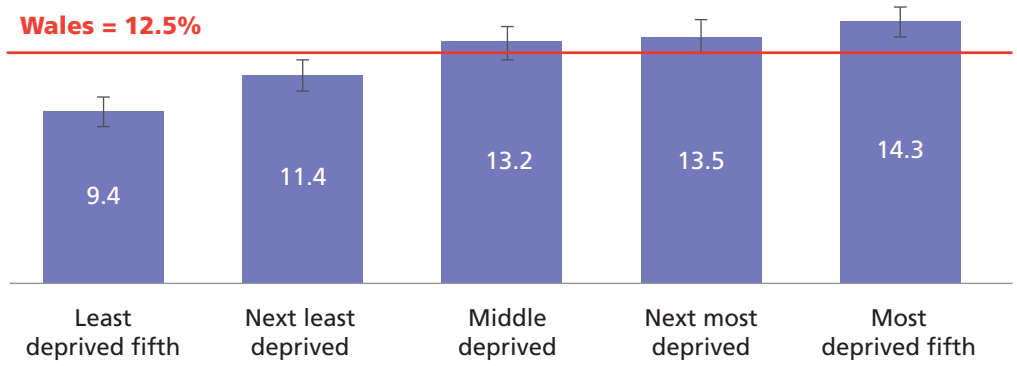
Produced by Public Health Wales Observatory, using CMP data (NWIS)

Figure 7 Prevalence of obesity, children aged 4-5 years, local authority chart, 2011/12



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

Figure 8 Prevalence of obesity by deprivation fifth, children aged 4-5 years, 2011/12



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

Prevalence of obesity was higher in boys (13.0%) than girls (12.1%) (Table 1); however, this difference was not statistically significant. Among boys the prevalence of obesity was lowest in Monmouthshire (7.1%); the prevalence in other local authorities was similar to Wales (Appendix B).

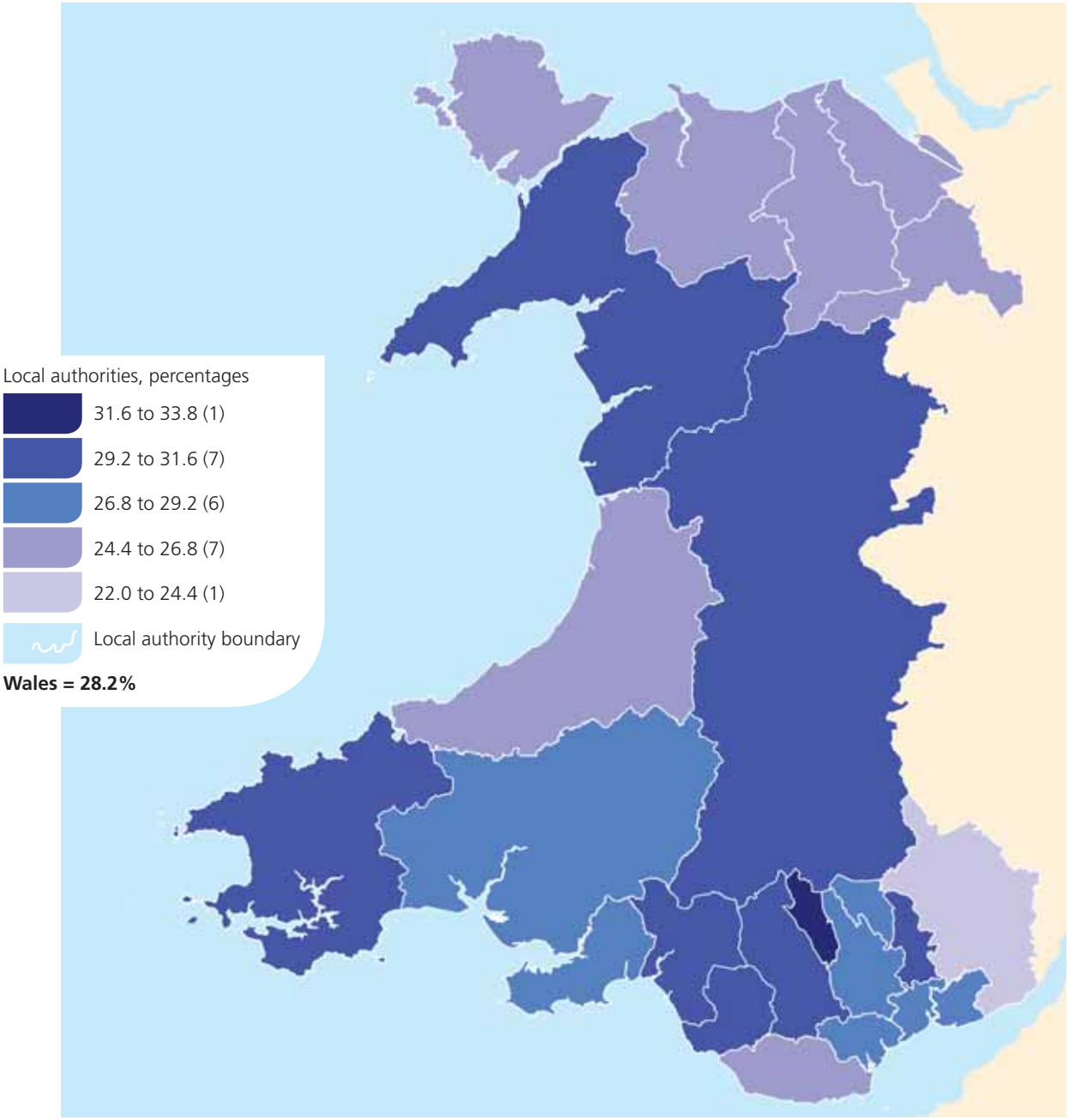
Among girls the prevalence of obesity was highest in Torfaen (16.0%) and lowest in the Vale of Glamorgan (8.0%); the prevalence in other local authorities among girls was similar to Wales. The prevalence of obesity among girls in Cwm Taf as a whole (14.6%) was also statistically significantly higher than the prevalence for girls in Wales as a whole (Appendix B).

Prevalence of those overweight or obese

Overall, 28.2 per cent of children were classed as overweight or obese. Prevalence of those overweight or obese was highest in Merthyr Tydfil (33.8%) and Rhondda Cynon Taf (31.5%); prevalence was lowest in Monmouthshire (22.0%). Prevalence of those overweight or obese was similar to Wales in other local authority areas (Figure 9, Figure 10).

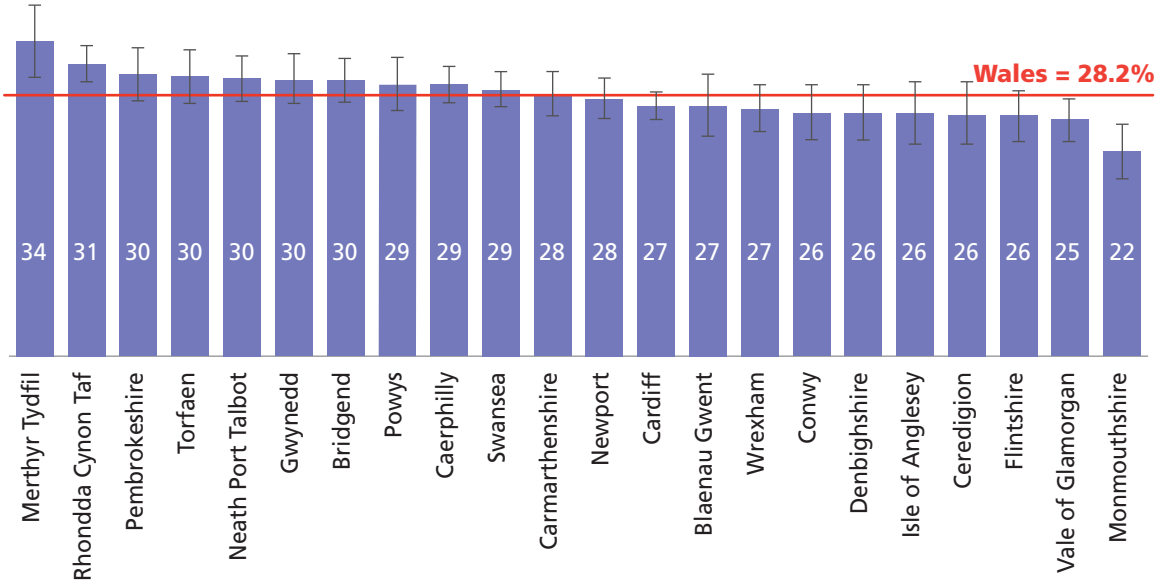
The prevalence of those overweight or obese increased with deprivation fifth. However, this gradient is not as steep as seen with obesity, and there is little gradient in relation to deprivation in those overweight but not obese. In the most deprived fifth of Wales, 30.7 per cent of children were overweight or obese compared with 24.4 per cent in the least deprived fifth (Figure 11). This difference is statistically significant.

Figure 9 Prevalence of those overweight or obese, children aged 4-5 years, local authority map, 2011/12



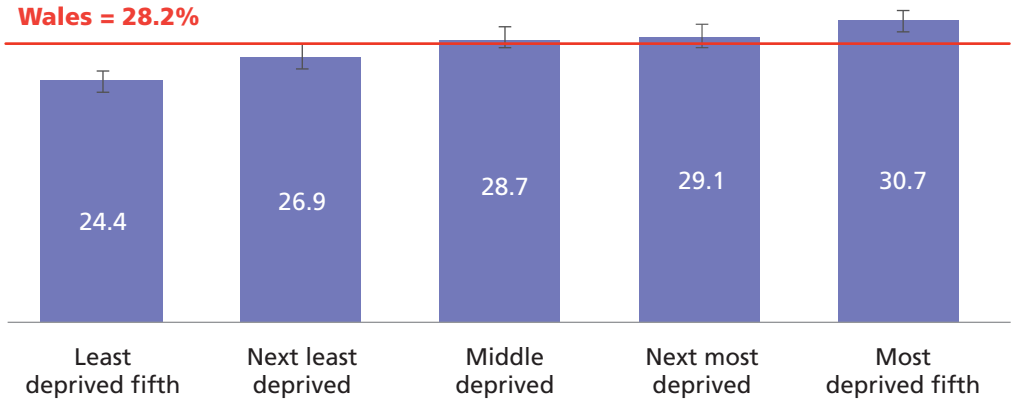
Produced by Public Health Wales Observatory, using CMP data (NWIS)

Figure 10 Prevalence of those overweight or obese, children aged 4-5 years, local authority chart, 2011/12



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

Figure 11 Prevalence of those overweight or obese by deprivation fifth, children aged 4-5 years, 2011/12



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

Prevalence of those overweight or obese was higher in boys (29.3%) than girls (27.1%) and this difference was statistically significant. This difference relates to higher prevalence of both obesity and those overweight but not obese (Appendix B). Among boys the prevalence of those overweight or obese was highest in Merthyr Tydfil (36.1%) and lowest in Monmouthshire (21.4%). The prevalence of those overweight or obese among boys in other local authority areas was similar to that in Wales as a whole. Among girls the prevalence of those overweight or obese was high in Pembrokeshire (32.5%) and Rhondda Cynon Taf (30.8%), with the prevalence in other local authorities similar to Wales[4].

4 Prevalence was 30.9% in both Torfaen and Merthyr Tydfil; however, this was not statistically significantly different from Wales in either case.

The prevalence of those overweight but not obese was similar to the Wales prevalence in all local authorities for all children and for boys. The prevalence of girls overweight but not obese was statistically significantly lower in Blaenau Gwent (10.1%) than Wales as a whole (15%); although the prevalence of obesity was similar at 12.8 per cent among girls in Blaenau Gwent compared with 12.1 per cent in Wales as a whole (Appendix B).

There was a marked relationship between deprivation and prevalence of obesity in Wales. This was evident in both genders and is consistent with findings from England (National Obesity Observatory, 2013). This relationship, however, is much less evident for those overweight but not obese, with no discernible relationship in girls between deprivation and prevalence of those overweight but not obese.

The geographical patterns of obesity and those overweight or obese do, by and large, reflect the association between overweight and obesity and deprivation. There are, however, some exceptions. Pembrokeshire had the highest prevalence of four to five year old girls who were overweight or obese; statistically significantly higher than the Wales prevalence. Blaenau Gwent had the second lowest prevalence of girls overweight or obese among the local authorities of Wales; although this was not statistically significantly different from the Wales prevalence. In both these instances the ranked position for boys overweight or obese is quite different.

Prevalence of those overweight or obese, among children aged two to 15 years[5] as a single group, has been described as 35 per cent and 34 per cent in 2011 and 2012 respectively (Welsh Health Survey, 2013). Prevalence of obesity in this age group was 19 per cent in 2011 and 2012. These levels are higher than described in the Child Measurement Programme age group. This is consistent with evidence from Wales and England that the prevalence of those overweight or obese is higher in older age groups than in the age group examined here (National Public Health Service for Wales, 2009; National Obesity Observatory, 2013; Mandalia, 2012).

4.5 Prevalence of underweight

There were 171 children aged four to five who were classed as underweight, giving a prevalence of 0.6 per cent. Prevalence was similar among boys and girls. Numbers are small, so it is not possible to describe geographical patterns; nonetheless, the prevalence of underweight was less than two per cent in all local authority areas. There was no identifiable pattern relating to deprivation (Appendix B).

The prevalence of underweight (0.6%) is slightly lower than the prevalence in reception year in England (0.9%) described by the National Child Measurement Programme (Health and Social Care Information Centre, 2012). As the threshold for underweight is based on the 2nd centile of the UK 1990 growth charts, this suggests the proportion of the population of this age group who are underweight has been declining in the UK. This is consistent with findings and analysis of BMI z-scores by the National Obesity Observatory (2013).

5 Using epidemiological thresholds based on the UK 1990 BMI centiles.

4.6 Height

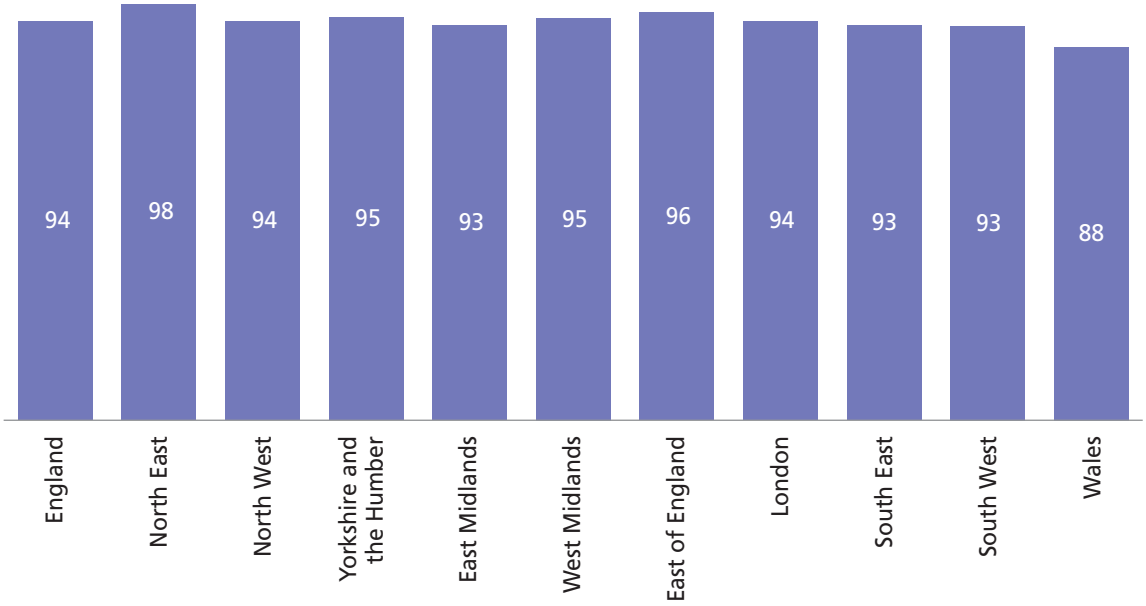
There were 158 children (0.5%) with a height that was less than the 0.4th centile. Prevalence was similar among boys and girls. Numbers are small, so it is not possible to describe geographical patterns; nonetheless, the prevalence of height of less than the 0.4th centile was less than two per cent in all local authority areas. Taking account of confidence intervals, it is not possible to draw conclusions on any relationship with deprivation (Appendix B).

A height at school entry of less than the 0.4th centile is the threshold recommended by the UK National Screening Committee for referral for assessment for short stature (UK National Screening Committee, 2006). The prevalence is very close to that described for the UK in 1990.

4.7 Comparison with the National Child Measurement Programme, England

During 2011/12 participation in reception year in English regions ranged from 93 per cent to 98 per cent; this is the highest participation to date in the English programme (National Obesity Observatory, 2013). This level of participation during the seventh year of data collection in England is higher than participation in this first year of data for Wales (Figure 12, see also 4.1).

Figure 12 Proportion of children aged 4-5 participating in a child measurement programme, Wales, England and English regions 2011/12



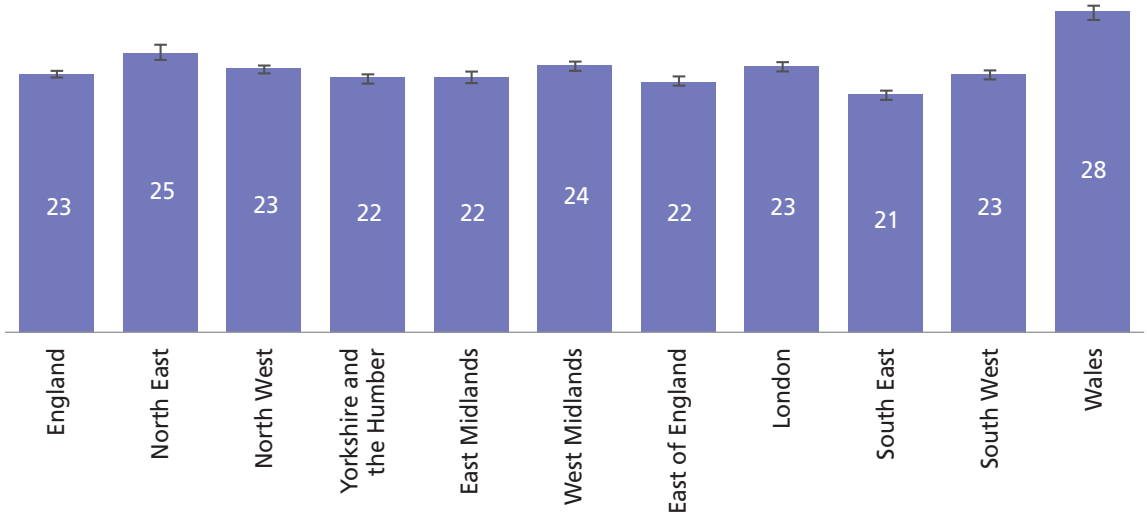
Produced by Public Health Wales Observatory, using CMP data (NWIS). CMP data (NWIS) and NCMP data (HSCIC).

The prevalence of children aged four to five who were overweight or obese varied from 21 per cent in the South East of England to 25 per cent in the North East of England. The prevalence in Wales was 28 per cent and this is statistically significantly higher than the prevalence in each region in England (Figure 13).

The prevalence of obesity among children aged four to five in England was 9.5 per cent; this varied from 8.3 per cent in the South East of England to 11.0 per cent in London. The prevalence in Wales was 12.5 per cent and this is statistically significantly higher than the prevalence in each of the regions in England (Health and Social Care Information Centre, 2012).

The prevalence of children aged four to five who were underweight in England was 0.9 per cent; this varied from 0.5 per cent in the South West and North East of England to 1.4 per cent in London. The prevalence in Wales was 0.6 per cent.

Figure 13 Prevalence of those overweight or obese, children aged 4-5, Wales, England and English regions, 2011/12



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

The Child Measurement Programme, Wales, and the National Child Measurement Programme, England, measure children in the same age group, using similar standards and use the same thresholds for overweight and obesity. This means that the figures should in general be comparable. Nonetheless, the fact that this is a transitional year of measurement in Wales and the difference in participation across the two countries may have an impact on comparability of these figures.

Prevalence of overweight and obesity among children aged four to five are higher in Wales than any region in England. English prevalence data relates to location of school, rather than residence of child; however, this should have a negligible impact on the findings at regional level.

Although not directly comparable with this data, figures for 2011/12 are published for Scotland for primary 1 (NHS National Services Scotland, 2013). These children are typically one year older than children in the Child Measurement Programme for Wales. The same epidemiological thresholds are used for categorising the BMI data, though terminology is different. All health boards in Scotland participated during 2011/12, with approximately 92% of eligible children included.

	Scotland primary 1	Wales reception
Underweight:	1.2%	0.6%
Healthy weight:	76.9%	71.2%
Overweight not obese:	12.1%	15.7%
Obese:	9.8%	12.5%

These figures from Scotland closely match those from a sample of children (3,035) coming up to their sixth birthday (average age five years and ten months) taken during 2010/11. Of these, 22 per cent were overweight or obese, with 9 per cent obese (Parkes, Sweeting, & Wight, 2012)[6]. The representativeness of the sample and CIs associated with this Scottish study could however impact on the interpretation of the findings. This prevalence of overweight and obesity is close to the all England prevalence at age four to five and below those found in this programme. These data strongly suggest that at school entry children in Scotland are more likely to be a healthy weight and less likely to be overweight or obese than in Wales.

Areas for further study

This analysis suggests value in exploring some aspects of the data in more detail. In particular, an analysis of urban and rural prevalence in future reports.

There is also value of understanding childhood height and weight at an older school age group as previously advocated for Wales (National Public Health Service for Wales, 2009). A recent analysis of English data suggests that patterns in different age groups change in different ways over time for boys and girls (National Obesity Observatory, 2013). There is potential for understanding longitudinal patterns in growth and development within a single cohort. There is also the opportunity to compare findings with other surveillance systems, such as through the World Health Organisation Europe Childhood Obesity Surveillance Initiative, COSI.

6 Using epidemiological thresholds based on the UK 1990 BMI centiles.

Conclusions

5

- This first report of the Child Measurement Programme for Wales provides important data on child growth at age four to five.
- Prevalence of those overweight and obese appears to be higher than the most comparable figures across English regions or in Scotland.
- There is a clear association between deprivation and obesity among four to five year olds in Wales.
- This information can be used
  - as a baseline to monitor healthy growth for children of Wales at school entry into the future.
  - to help develop and target services for children and support healthy environments.
- There are opportunities for further more detailed analyses in the future as well as improving participation in the programme.

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Appendix A

Steering Group and Board Members

Child Measurement Programme Steering Group

Dr Ciarán Humphreys (chair)	Consultant in Public Health/Health Intelligence, Public Health Wales
Lucy Akhtar	Development Officer, Children in Wales
Susan Belfourd	Communications Officer, Public Health Wales
Sue Bowker	Head of Branch, Life Course Branch, Health Improvement Division, Department for Health and Social Services, Welsh Government
Rosalind Causey	Programme Manager, Child Measurement Programme, Public Health Wales
Beth Cossins	Principal Health Promotion Specialist, Carmarthenshire Local Public Health Team, Public Health Wales
Alison Cowell	Senior Nurse Manager, Child and Adolescent Health, Betsi Cadwaladr University Health Board
Gillian Davison	Applications Manager NHS Wales Informatics Service
Richard Edwards	Head Teacher, Association of Head Teachers
Anne Farr	School Health Nurse Team Leader, Pembrokeshire Division, Hywel Dda Health Board
Maggie Grayson	Personal Assistant & Senior Administration & Resource Officer, Child Measurement Programme, Public Health Wales
Debbie Harding	Child Health System Administration, Cwm Taf Health Board
Judith John	Consultant Dietician in Public Health, Public Health Wales
Susan Anne Jones	Lead Nurse School Health Nursing, Abertawe Bro Morgannwg University Health Board
Nathan Lester	Head of Observatory Analytical Team, Public Health Wales Observatory, Public Health Wales

Dr Shantini Paranjothy	Senior Clinical Lecturer, Cardiff University School of Medicine, Honorary Consultant in Public Health Medicine, Public Health Wales and Chair, National Community Child Health Database Expert Group
Ceri Rees*	CCH2000 Service Support Manager, NHS Wales Informatics Service
Louise Richards	Lead Specialist Analysis, NHS Wales Informatics Service
Chris Roberts	Research Lead for Health, Knowledge and Analytical Services, Department of Strategic Planning, Finance and Performance, Welsh Government
Dr Justin Warner	Consultant in Paediatric Endocrinology and Diabetes, Cardiff & Vale University Health Board and Honorary Senior Lecturer Cardiff University

Linda Bailey, Consultant in Public Health, Public Health Wales, has now joined the Child Measurement Programme Team and will be a member of this group in future.

* Hywel Williams, Senior Product Specialist (Community), NHS Wales Informatics Service, will be undertaking this role in future.

Former Steering Group Members

Dr Elvira Garcia	Locum Consultant in Public Health Medicine, Child Measurement Programme, Public Health Wales
Dr Khesh Sidhu	Consultant in Public Health Medicine, Child Measurement Programme, Public Health Wales
Dr Davida Hawkes	Consultant Paediatrician, Aneurin Bevan Health Board

Child Measurement Programme Board

Dr Judith Greenacre (chair)	Director of Health Intelligence, Public Health Wales
Sue Bowker	Head of Branch, Life Course Branch, Health Improvement Division, Department for Health and Social Services, Welsh Government
Carol Shillabeer	Director of Nursing, Powys Teaching Health Board

Appendix B Reference Tables

Participation in the Child Measurement Programme for Wales, children aged 4-5 years, 2011/12

All Children	All				Boys				Girls			
	Eligible	Measured	% Uptake	Withdrawn Consent	Eligible	Measured	% Uptake	Withdrawn Consent	Eligible	Measured	% Uptake	Withdrawn Consent
Wales	**33,272**	**29,409**	**88.4**	**497**	**17,010**	**15,010**	**88.2**	**239**	**16,262**	**14,399**	**88.5**	**258**
Least deprived fifth	5,840	5,253	89.9	74	2,951	2,643	89.6	42	2,889	2,610	90.3	32
Next least deprived	5,937	5,149	86.7	84	3,035	2,643	87.1	38	2,902	2,506	86.4	46
Middle deprived	6,202	5,415	87.3	69	3,157	2,748	87.0	34	3,045	2,667	87.6	35
Next most deprived	7,047	6,189	87.8	121	3,642	3,202	87.9	56	3,405	2,987	87.7	65
Most deprived fifth	8,246	7,403	89.8	149	4,225	3,774	89.3	69	4,021	3,629	90.3	80
Betsi Cadwaladr UHB	**7,405**	**5,912**	**79.8**	**205**	**3,788**	**3,045**	**80.4**	**94**	**3,617**	**2,867**	**79.3**	**111**
Isle of Anglesey	736	654	88.9	x	386	338	87.6	x	350	316	90.3	x
Gwynedd	1,258	1,185	94.2	x	640	604	94.4	x	618	581	94.0	x
Conwy	1,133	867	76.5	63	561	436	77.7	29	572	431	75.3	34
Denbighshire	1,016	890	87.6	22	545	480	88.1	10	471	410	87.0	12
Flintshire	1,694	962	56.8	50	852	482	56.6	26	842	480	57.0	24
Wrexham	1,568	1,354	86.4	69	804	705	87.7	28	764	649	84.9	41
Powys THB	**1,214**	**971**	**80.0**	x	**629**	**503**	**80.0**	x	**585**	**468**	**80.0**	x
Hywel Dda HB	**3,844**	**3,102**	**80.7**	x	**1,951**	**1,555**	**79.7**	x	**1,893**	**1,547**	**81.7**	x
Ceredigion	674	640	95.0	x	339	321	94.7	x	335	319	95.2	x
Pembrokeshire	1,240	1,025	82.7	x	621	502	80.8	x	619	523	84.5	x
Carmarthenshire	1,930	1,437	74.5	x	991	732	73.9	x	939	705	75.1	x
ABM UHB	**5,540**	**5,114**	**92.3**	**102**	**2,839**	**2,605**	**91.8**	**51**	**2,701**	**2,509**	**92.9**	**51**
Swansea	2,527	2,336	92.4	48	1,296	1,183	91.3	24	1,231	1,153	93.7	24
Neath Port Talbot	1,447	1,367	94.5	26	742	701	94.5	15	705	666	94.5	11
Bridgend	1,566	1,411	90.1	28	801	721	90.0	12	765	690	90.2	16
Cardiff and Vale UHB	**5,489**	**5,049**	**92.0**	**44**	**2,794**	**2,554**	**91.4**	**20**	**2,695**	**2,495**	**92.6**	**24**
The Vale of Glamorgan	1,423	1,381	97.0	15	730	706	96.7	7	693	675	97.4	8
Cardiff	4,066	3,668	90.2	29	2,064	1,848	89.5	13	2,002	1,820	90.9	16
Cwm Taf HB	**3,321**	**3,050**	**91.8**	**104**	**1,773**	**1,628**	**91.8**	**55**	**1,548**	**1,422**	**91.9**	**49**
Rhondda Cynon Taf	2,670	2,470	92.5	64	1,418	1,307	92.2	36	1,252	1,163	92.9	28
Merthyr Tydfil	651	580	89.1	40	355	321	90.4	19	296	259	87.5	21
Aneurin Bevan HB	**6,459**	**6,211**	**96.2**	**22**	**3,236**	**3,120**	**96.4**	**8**	**3,223**	**3,091**	**95.9**	**14**
Caerphilly	2,065	1,993	96.5	8	1,023	989	96.7	x	1,042	1,004	96.4	x
Blaenau Gwent	729	710	97.4	5	347	343	98.8	x	382	367	96.1	x
Torfaen	1,059	1,019	96.2	x	543	524	96.5	x	516	495	95.9	x
Monmouthshire	840	808	96.2	x	423	406	96.0	x	417	402	96.4	x
Newport	1,766	1,681	95.2	x	900	858	95.3	x	866	823	95.0	x

Produced by Public Health Wales Observatory, using CMP data (NWIS), WIMD (WG). x To avoid disclosure small numbers (0-4) and some larger complementary numbers have been suppressed.

Key data from the Child Measurement Programme for Wales, children aged 4-5 years, 2011/12

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	**21,115**	**71.8**	(71.3,72.3)	**8,294**	**28.2**	(27.7,28.7)	**171**	**0.6**	(0.5,0.7)	**20,944**	**71.2**	(70.7,71.7)	**4,604**	**15.7**	(15.2,16.1)	**3,690**	**12.5**	(12.2,12.9)
Least deprived fifth	3,970	75.6	(74.4,76.7)	1,283	24.4	(23.3,25.6)	38	0.7	(0.5,1.0)	3,932	74.9	(73.7,76.0)	790	15.0	(14.1,16.0)	493	9.4	(8.6,10.2)
Next least deprived	3,764	73.1	(71.9,74.3)	1,385	26.9	(25.7,28.1)	31	0.6	(0.4,0.9)	3,733	72.5	(71.3,73.7)	798	15.5	(14.5,16.5)	587	11.4	(10.6,12.3)
Middle deprived	3,859	71.3	(70.0,72.5)	1,556	28.7	(27.5,30.0)	21	0.4	(0.3,0.6)	3,838	70.9	(69.7,72.1)	843	15.6	(14.6,16.6)	713	13.2	(12.3,14.1)
Next most deprived	4,389	70.9	(69.8,72.0)	1,800	29.1	(28.0,30.2)	34	0.5	(0.4,0.8)	4,355	70.4	(69.2,71.5)	963	15.6	(14.7,16.5)	837	13.5	(12.7,14.4)
Most deprived fifth	5,133	69.3	(68.3,70.4)	2,270	30.7	(29.6,31.7)	47	0.6	(0.5,0.8)	5,086	68.7	(67.6,69.7)	1,210	16.3	(15.5,17.2)	1,060	14.3	(13.5,15.1)
Betsi Cadwaladr UHB	**4,318**	**73.0**	(71.9,74.2)	**1,594**	**27.0**	(25.8,28.1)	**50**	**0.8**	(0.6,1.1)	**4,268**	**72.2**	(71.0,73.3)	**895**	**15.1**	(14.2,16.1)	**699**	**11.8**	(11.0,12.7)
Isle of Anglesey	483	73.9	(70.4,77.1)	171	26.1	(22.9,29.6)	x	x	x	x	x	x	94	14.4	(11.9,17.3)	77	11.8	(9.5,14.5)
Gwynedd	832	70.2	(67.5,72.7)	353	29.8	(27.3,32.5)	x	x	x	x	x	x	210	17.7	(15.7,20.0)	143	12.1	(10.3,14.0)
Conwy	640	73.8	(70.8,76.6)	227	26.2	(23.4,29.2)	10	1.2	(0.6,2.1)	630	72.7	(69.6,75.5)	124	14.3	(12.1,16.8)	103	11.9	(9.9,14.2)
Denbighshire	657	73.8	(70.8,76.6)	233	26.2	(23.4,29.2)	8	0.9	(0.5,1.8)	649	72.9	(69.9,75.7)	137	15.4	(13.2,17.9)	96	10.8	(8.9,13.0)
Flintshire	713	74.1	(71.3,76.8)	249	25.9	(23.2,28.7)	11	1.1	(0.6,2.0)	702	73.0	(70.1,75.7)	144	15.0	(12.9,17.4)	105	10.9	(9.1,13.0)
Wrexham	993	73.3	(70.9,75.6)	361	26.7	(24.4,29.1)	11	0.8	(0.5,1.4)	982	72.5	(70.1,74.8)	186	13.7	(12.0,15.7)	175	12.9	(11.2,14.8)
Powys THB	**687**	**70.8**	(67.8,73.5)	**284**	**29.2**	(26.5,32.2)	x	x	x	**x**	**x**	x	**165**	**17.0**	(14.8,19.5)	**119**	**12.3**	(10.3,14.5)
Hywel Dda HB	**2,220**	**71.6**	(70.0,73.1)	**882**	**28.4**	(26.9,30.0)	x	x	x	x	x	x	**493**	**15.9**	(14.6,17.2)	**389**	**12.5**	(11.4,13.8)
Ceredigion	474	74.1	(70.5,77.3)	166	25.9	(22.7,29.5)	x	x	x	x	x	x	98	15.3	(12.7,18.3)	68	10.6	(8.5,13.3)
Pembrokeshire	714	69.7	(66.8,72.4)	311	30.3	(27.6,33.2)	x	x	x	x	x	x	177	17.3	(15.1,19.7)	134	13.1	(11.1,15.3)
Carmarthenshire	1,032	71.8	(69.4,74.1)	405	28.2	(25.9,30.6)	5	0.3	(0.1,0.8)	1,027	71.5	(69.1,73.7)	218	15.2	(13.4,17.1)	187	13.0	(11.4,14.9)
ABM UHB	**3,615**	**70.7**	(69.4,71.9)	**1,499**	**29.3**	(28.1,30.6)	**17**	**0.3**	(0.2,0.5)	**3,598**	**70.4**	(69.1,71.6)	**825**	**16.1**	(15.1,17.2)	**674**	**13.2**	(12.3,14.1)
Swansea	1,665	71.3	(69.4,73.1)	671	28.7	(26.9,30.6)	10	0.4	(0.2,0.8)	1,655	70.8	(69.0,72.7)	392	16.8	(15.3,18.4)	279	11.9	(10.7,13.3)
Neath Port Talbot	958	70.1	(67.6,72.4)	409	29.9	(27.6,32.4)	x	x	x	x	x	x	210	15.4	(13.5,17.4)	199	14.6	(12.8,16.5)
Bridgend	992	70.3	(67.9,72.6)	419	29.7	(27.4,32.1)	x	x	x	x	x	x	223	15.8	(14.0,17.8)	196	13.9	(12.2,15.8)
Cardiff and Vale UHB	**3,709**	**73.5**	(72.2,74.7)	**1,340**	**26.5**	(25.3,27.8)	**46**	**0.9**	(0.7,1.2)	**3,663**	**72.5**	(71.3,73.8)	**769**	**15.2**	(14.3,16.2)	**571**	**11.3**	(10.5,12.2)
The Vale of Glamorgan	1,031	74.7	(72.3,76.9)	350	25.3	(23.1,27.7)	5	0.4	(0.2,0.8)	1,026	74.3	(71.9,76.5)	218	15.8	(14.0,17.8)	132	9.6	(8.1,11.2)
Cardiff	2,678	73.0	(71.5,74.4)	990	27.0	(25.6,28.5)	41	1.1	(0.8,1.5)	2,637	71.9	(70.4,73.3)	551	15.0	(13.9,16.2)	439	12.0	(11.0,13.1)
Cwm Taf HB	**2,077**	**68.1**	(66.4,69.7)	**973**	**31.9**	(30.3,33.6)	**14**	**0.5**	(0.3,0.8)	**2,063**	**67.6**	(66.0,69.3)	**520**	**17.0**	(15.8,18.4)	**453**	**14.9**	(13.6,16.2)
Rhondda Cynon Taf	1,693	68.5	(66.7,70.3)	777	31.5	(29.7,33.3)	9	0.4	(0.2,0.7)	1,684	68.2	(66.3,70.0)	418	16.9	(15.5,18.5)	359	14.5	(13.2,16.0)
Merthyr Tydfil	384	66.2	(62.3,69.9)	196	33.8	(30.1,37.7)	5	0.9	(0.4,2.0)	379	65.3	(61.4,69.1)	102	17.6	(14.7,20.9)	94	16.2	(13.4,19.4)
Aneurin Bevan HB	**4,489**	**72.3**	(71.1,73.4)	**1,722**	**27.7**	(26.6,28.9)	**30**	**0.5**	(0.3,0.7)	**4,459**	**71.8**	(70.7,72.9)	**937**	**15.1**	(14.2,16.0)	**785**	**12.6**	(11.8,13.5)
Caerphilly	1,412	70.8	(68.8,72.8)	581	29.2	(27.2,31.2)	12	0.6	(0.3,1.0)	1,400	70.2	(68.2,72.2)	319	16.0	(14.5,17.7)	262	13.1	(11.7,14.7)
Blaenau Gwent	519	73.1	(69.7,76.2)	191	26.9	(23.8,30.3)	x	x	x	x	x	x	93	13.1	(10.8,15.8)	98	13.8	(11.5,16.5)
Torfaen	713	70.0	(67.1,72.7)	306	30.0	(27.3,32.9)	x	x	x	x	x	x	163	16.0	(13.9,18.4)	143	14.0	(12.0,16.3)
Monmouthshire	630	78.0	(75.0,80.7)	178	22.0	(19.3,25.0)	x	x	x	x	x	x	105	13.0	(10.9,15.5)	73	9.0	(7.2,11.2)
Newport	1,215	72.3	(70.1,74.4)	466	27.7	(25.6,29.9)	12	0.7	(0.4,1.2)	1,203	71.6	(69.4,73.7)	257	15.3	(13.6,17.1)	209	12.4	(10.9,14.1)

Produced by Public Health Wales Observatory, using CMP data (NWIS), WIMD (WG). 1 95% confidence interval. x 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 4-5 years, 2011/12

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	**10,617**	**70.7**	(70.0,71.5)	**4,393**	**29.3**	(28.5,30.0)	**104**	**0.7**	(0.6,0.8)	**10,513**	**70.0**	(69.3,70.8)	**2,440**	**16.3**	(15.7,16.9)	**1,953**	**13.0**	(12.5,13.6)
Least deprived fifth	1,971	74.6	(72.9,76.2)	672	25.4	(23.8,27.1)	25	0.9	(0.6,1.4)	1,946	73.6	(71.9,75.3)	411	15.6	(14.2,17.0)	261	9.9	(8.8,11.1)
Next least deprived	1,943	73.5	(71.8,75.2)	700	26.5	(24.8,28.2)	20	0.8	(0.5,1.2)	1,923	72.8	(71.0,74.4)	400	15.1	(13.8,16.6)	300	11.4	(10.2,12.6)
Middle deprived	1,910	69.5	(67.8,71.2)	838	30.5	(28.8,32.2)	14	0.5	(0.3,0.9)	1,896	69.0	(67.2,70.7)	447	16.3	(14.9,17.7)	391	14.2	(13.0,15.6)
Next most deprived	2,233	69.7	(68.1,71.3)	969	30.3	(28.7,31.9)	20	0.6	(0.4,1.0)	2,213	69.1	(67.5,70.7)	512	16.0	(14.8,17.3)	457	14.3	(13.1,15.5)
Most deprived fifth	2,560	67.8	(66.3,69.3)	1,214	32.2	(30.7,33.7)	25	0.7	(0.4,1.0)	2,535	67.2	(65.7,68.7)	670	17.8	(16.6,19.0)	544	14.4	(13.3,15.6)
Betsi Cadwaladr UHB	**2,176**	**71.5**	(69.8,73.0)	**869**	**28.5**	(27.0,30.2)	**33**	**1.1**	(0.8,1.5)	**2,143**	**70.4**	(68.7,72.0)	**483**	**15.9**	(14.6,17.2)	**386**	**12.7**	(11.5,13.9)
Isle of Anglesey	240	71.0	(66.0,75.6)	98	29.0	(24.4,34.0)	x	x	x	x	x	x	51	15.1	(11.7,19.3)	47	13.9	(10.6,18.0)
Gwynedd	408	67.5	(63.7,71.2)	196	32.5	(28.8,36.3)	x	x	x	x	x	x	113	18.7	(15.8,22.0)	83	13.7	(11.2,16.7)
Conwy	317	72.7	(68.3,76.7)	119	27.3	(23.3,31.7)	x	x	x	x	x	x	59	13.5	(10.6,17.1)	60	13.8	(10.8,17.3)
Denbighshire	350	72.9	(68.8,76.7)	130	27.1	(23.3,31.2)	x	x	x	x	x	x	78	16.3	(13.2,19.8)	52	10.8	(8.4,13.9)
Flintshire	359	74.5	(70.4,78.2)	123	25.5	(21.8,29.6)	x	x	x	x	x	x	74	15.4	(12.4,18.8)	49	10.2	(7.8,13.2)
Wrexham	502	71.2	(67.8,74.4)	203	28.8	(25.6,32.2)	x	x	x	x	x	x	108	15.3	(12.8,18.2)	95	13.5	(11.2,16.2)
Powys THB	**362**	**72.0**	(67.9,75.7)	**141**	**28.0**	(24.3,32.1)	x	x	x	x	x	x	**78**	**15.5**	(12.6,18.9)	**63**	**12.5**	(9.9,15.7)
Hywel Dda HB	**1,110**	**71.4**	(69.1,73.6)	**445**	**28.6**	(26.4,30.9)	x	x	x	x	x	x	**249**	**16.0**	(14.3,17.9)	**196**	**12.6**	(11.0,14.3)
Ceredigion	235	73.2	(68.1,77.8)	86	26.8	(22.2,31.9)	x	x	x	x	x	x	53	16.5	(12.8,21.0)	33	10.3	(7.4,14.1)
Pembrokeshire	361	71.9	(67.8,75.7)	141	28.1	(24.3,32.2)	x	x	x	x	x	x	87	17.3	(14.3,20.9)	54	10.8	(8.3,13.8)
Carmarthenshire	514	70.2	(66.8,73.4)	218	29.8	(26.6,33.2)	x	x	x	x	x	x	109	14.9	(12.5,17.7)	109	14.9	(12.5,17.7)
ABM UHB	**1,809**	**69.4**	(67.6,71.2)	**796**	**30.6**	(28.8,32.4)	**12**	**0.5**	(0.3,0.8)	**1,797**	**69.0**	(67.2,70.7)	**437**	**16.8**	(15.4,18.3)	**359**	**13.8**	(12.5,15.2)
Swansea	822	69.5	(66.8,72.0)	361	30.5	(28.0,33.2)	x	x	x	x	x	x	213	18.0	(15.9,20.3)	148	12.5	(10.7,14.5)
Neath Port Talbot	489	69.8	(66.3,73.0)	212	30.2	(27.0,33.7)	x	x	x	x	x	x	111	15.8	(13.3,18.7)	101	14.4	(12.0,17.2)
Bridgend	498	69.1	(65.6,72.3)	223	30.9	(27.7,34.4)	x	x	x	x	x	x	113	15.7	(13.2,18.5)	110	15.3	(12.8,18.1)
Cardiff and Vale UHB	**1,845**	**72.2**	(70.5,73.9)	**709**	**27.8**	(26.1,29.5)	**23**	**0.9**	(0.6,1.3)	**1,822**	**71.3**	(69.6,73.1)	**398**	**15.6**	(14.2,17.0)	**311**	**12.2**	(11.0,13.5)
The Vale of Glamorgan	515	72.9	(69.6,76.1)	191	27.1	(23.9,30.4)	x	x	x	x	x	x	113	16.0	(13.5,18.9)	78	11.0	(8.9,13.6)
Cardiff	1,330	72.0	(69.9,74.0)	518	28.0	(26.0,30.1)	x	x	x	x	x	x	285	15.4	(13.8,17.1)	233	12.6	(11.2,14.2)
Cwm Taf HB	**1,093**	**67.1**	(64.8,69.4)	**535**	**32.9**	(30.6,35.2)	**9**	**0.6**	(0.3,1.0)	**1,084**	**66.6**	(64.3,68.8)	**290**	**17.8**	(16.0,19.7)	**245**	**15.0**	(13.4,16.9)
Rhondda Cynon Taf	888	67.9	(65.4,70.4)	419	32.1	(29.6,34.6)	x	x	x	x	x	x	227	17.4	(15.4,19.5)	192	14.7	(12.9,16.7)
Merthyr Tydfil	205	63.9	(58.5,68.9)	116	36.1	(31.1,41.5)	x	x	x	x	x	x	63	19.6	(15.7,24.3)	53	16.5	(12.8,21.0)
Aneurin Bevan HB	**2,222**	**71.2**	(69.6,72.8)	**898**	**28.8**	(27.2,30.4)	**19**	**0.6**	(0.4,0.9)	**2,203**	**70.6**	(69.0,72.2)	**505**	**16.2**	(14.9,17.5)	**393**	**12.6**	(11.5,13.8)
Caerphilly	687	69.5	(66.5,72.3)	302	30.5	(27.7,33.5)	x	x	x	x	x	x	173	17.5	(15.3,20.0)	129	13.0	(11.1,15.3)
Blaenau Gwent	236	68.8	(63.7,73.5)	107	31.2	(26.5,36.3)	x	x	x	x	x	x	56	16.3	(12.8,20.6)	51	14.9	(11.5,19.0)
Torfaen	371	70.8	(66.8,74.5)	153	29.2	(25.5,33.2)	x	x	x	x	x	x	89	17.0	(14.0,20.4)	64	12.2	(9.7,15.3)
Monmouthshire	319	78.6	(74.3,82.3)	87	21.4	(17.7,25.7)	x	x	x	x	x	x	58	14.3	(11.2,18.0)	29	7.1	(5.0,10.1)
Newport	609	71.0	(67.9,73.9)	249	29.0	(26.1,32.1)	7	0.8	(0.4,1.7)	602	70.2	(67.0,73.1)	129	15.0	(12.8,17.6)	120	14.0	(11.8,16.5)

Produced by Public Health Wales Observatory, using CMP data (NWIS), WIMD (WG). 1 95% confidence interval. x 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 4-5 years, 2011/12

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	**10,498**	**72.9**	(72.2,73.6)	**3,901**	**27.1**	(26.4,27.8)	**67**	**0.5**	(0.4,0.6)	**10,431**	**72.4**	(71.7,73.2)	**2,164**	**15.0**	(14.5,15.6)	**1,737**	**12.1**	(11.5,12.6)
Least deprived fifth	1,999	76.6	(74.9,78.2)	611	23.4	(21.8,25.1)	13	0.5	(0.3,0.9)	1,986	76.1	(74.4,77.7)	379	14.5	(13.2,15.9)	232	8.9	(7.9,10.0)
Next least deprived	1,821	72.7	(70.9,74.4)	685	27.3	(25.6,29.1)	11	0.4	(0.2,0.8)	1,810	72.2	(70.4,73.9)	398	15.9	(14.5,17.4)	287	11.5	(10.3,12.8)
Middle deprived	1,949	73.1	(71.4,74.7)	718	26.9	(25.3,28.6)	7	0.3	(0.1,0.5)	1,942	72.8	(71.1,74.5)	396	14.8	(13.5,16.2)	322	12.1	(10.9,13.4)
Next most deprived	2,156	72.2	(70.5,73.8)	831	27.8	(26.2,29.5)	14	0.5	(0.3,0.8)	2,142	71.7	(70.1,73.3)	451	15.1	(13.9,16.4)	380	12.7	(11.6,14.0)
Most deprived fifth	2,573	70.9	(69.4,72.4)	1,056	29.1	(27.6,30.6)	22	0.6	(0.4,0.9)	2,551	70.3	(68.8,71.8)	540	14.9	(13.8,16.1)	516	14.2	(13.1,15.4)
Betsi Cadwaladr UHB	**2,142**	**74.7**	(73.1,76.3)	**725**	**25.3**	(23.7,26.9)	**17**	**0.6**	(0.4,0.9)	**2,125**	**74.1**	(72.5,75.7)	**412**	**14.4**	(13.1,15.7)	**313**	**10.9**	(9.8,12.1)
Isle of Anglesey	243	76.9	(71.9,81.2)	73	23.1	(18.8,28.1)	x	x	x	x	x	x	43	13.6	(10.3,17.8)	30	9.5	(6.7,13.2)
Gwynedd	424	73.0	(69.2,76.4)	157	27.0	(23.6,30.8)	x	x	x	x	x	x	97	16.7	(13.9,19.9)	60	10.3	(8.1,13.1)
Conwy	323	74.9	(70.6,78.8)	108	25.1	(21.2,29.4)	x	x	x	x	x	x	65	15.1	(12.0,18.8)	43	10.0	(7.5,13.2)
Denbighshire	307	74.9	(70.5,78.8)	103	25.1	(21.2,29.5)	x	x	x	x	x	x	59	14.4	(11.3,18.1)	44	10.7	(8.1,14.1)
Flintshire	354	73.8	(69.6,77.5)	126	26.3	(22.5,30.4)	x	x	x	x	x	x	70	14.6	(11.7,18.0)	56	11.7	(9.1,14.8)
Wrexham	491	75.7	(72.2,78.8)	158	24.3	(21.2,27.8)	x	x	x	x	x	x	78	12.0	(9.7,14.7)	80	12.3	(10.0,15.1)
Powys THB	**325**	**69.4**	(65.1,73.4)	**143**	**30.6**	(26.6,34.9)	**x**	**x**	x	**x**	**x**	x	**87**	**18.6**	(15.3,22.4)	**56**	**12.0**	(9.3,15.2)
Hywel Dda HB	**1,110**	**71.8**	(69.5,73.9)	**437**	**28.2**	(26.1,30.5)	x	x	x	x	x	x	**244**	**15.8**	(14.0,17.7)	**193**	**12.5**	(10.9,14.2)
Ceredigion	239	74.9	(69.9,79.4)	80	25.1	(20.6,30.1)	x	x	x	x	x	x	45	14.1	(10.7,18.4)	35	11.0	(8.0,14.9)
Pembrokeshire	353	67.5	(63.4,71.4)	170	32.5	(28.6,36.6)	x	x	x	x	x	x	90	17.2	(14.2,20.7)	80	15.3	(12.5,18.6)
Carmarthenshire	518	73.5	(70.1,76.6)	187	26.5	(23.4,29.9)	x	x	x	x	x	x	109	15.5	(13.0,18.3)	78	11.1	(9.0,13.6)
ABM UHB	**1,806**	**72.0**	(70.2,73.7)	**703**	**28.0**	(26.3,29.8)	**5**	**0.2**	(0.1,0.5)	**1,801**	**71.8**	(70.0,73.5)	**388**	**15.5**	(14.1,16.9)	**315**	**12.6**	(11.3,13.9)
Swansea	843	73.1	(70.5,75.6)	310	26.9	(24.4,29.5)	x	x	x	x	x	x	179	15.5	(13.5,17.7)	131	11.4	(9.7,13.3)
Neath Port Talbot	469	70.4	(66.8,73.8)	197	29.6	(26.2,33.2)	x	x	x	x	x	x	99	14.9	(12.4,17.8)	98	14.7	(12.2,17.6)
Bridgend	494	71.6	(68.1,74.8)	196	28.4	(25.2,31.9)	x	x	x	x	x	x	110	15.9	(13.4,18.9)	86	12.5	(10.2,15.1)
Cardiff and Vale UHB	**1,864**	**74.7**	(73.0,76.4)	**631**	**25.3**	(23.6,27.0)	**23**	**0.9**	(0.6,1.4)	**1,841**	**73.8**	(72.0,75.5)	**371**	**14.9**	(13.5,16.3)	**260**	**10.4**	(9.3,11.7)
The Vale of Glamorgan	516	76.4	(73.1,79.5)	159	23.6	(20.5,26.9)	x	x	x	x	x	x	105	15.6	(13.0,18.5)	54	8.0	(6.2,10.3)
Cardiff	1,348	74.1	(72.0,76.0)	472	25.9	(24.0,28.0)	x	x	x	x	x	x	266	14.6	(13.1,16.3)	206	11.3	(9.9,12.9)
Cwm Taf HB	**984**	**69.2**	(66.7,71.5)	**438**	**30.8**	(28.5,33.3)	**5**	**0.4**	(0.2,0.8)	**979**	**68.8**	(66.4,71.2)	**230**	**16.2**	(14.4,18.2)	**208**	**14.6**	(12.9,16.6)
Rhondda Cynon Taf	805	69.2	(66.5,71.8)	358	30.8	(28.2,33.5)	x	x	x	x	x	x	191	16.4	(14.4,18.7)	167	14.4	(12.5,16.5)
Merthyr Tydfil	179	69.1	(63.2,74.4)	80	30.9	(25.6,36.8)	x	x	x	x	x	x	39	15.1	(11.2,19.9)	41	15.8	(11.9,20.8)
Aneurin Bevan HB	**2,267**	**73.3**	(71.8,74.9)	**824**	**26.7**	(25.1,28.2)	**11**	**0.4**	(0.2,0.6)	**2,256**	**73.0**	(71.4,74.5)	**432**	**14.0**	(12.8,15.2)	**392**	**12.7**	(11.6,13.9)
Caerphilly	725	72.2	(69.4,74.9)	279	27.8	(25.1,30.6)	x	x	x	x	x	x	146	14.5	(12.5,16.9)	133	13.2	(11.3,15.5)
Blaenau Gwent	283	77.1	(72.5,81.1)	84	22.9	(18.9,27.5)	x	x	x	x	x	x	37	10.1	(7.4,13.6)	47	12.8	(9.8,16.6)
Torfaen	342	69.1	(64.9,73.0)	153	30.9	(27.0,35.1)	x	x	x	x	x	x	74	14.9	(12.1,18.4)	79	16.0	(13.0,19.4)
Monmouthshire	311	77.4	(73.0,81.2)	91	22.6	(18.8,27.0)	x	x	x	x	x	x	47	11.7	(8.9,15.2)	44	10.9	(8.3,14.4)
Newport	606	73.6	(70.5,76.5)	217	26.4	(23.5,29.5)	5	0.6	(0.3,1.4)	601	73.0	(69.9,75.9)	128	15.6	(13.2,18.2)	89	10.8	(8.9,13.1)

Produced by Public Health Wales Observatory, using CMP data (NWIS), WIMD (WG). 1 95% confidence interval. x 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 4-5 years, 2011/12

	All				Boys				Girls			
	Measured	height <0.4th centile			Measured	height <0.4th centile			Measured	height <0.4th centile		
	N	n	%	(95% CI)[1]	N	n	%	(95% CI)[1]	N	n	%	(95% CI)[1]
Wales	**29,409**	**158**	**0.5**	(0.5,0.6)	**15,010**	**79**	**0.5**	(0.4,0.7)	**14,399**	**79**	**0.5**	(0.4,0.7)
Least deprived fifth	5,253	21	0.4	(0.3,0.6)	2,643	11	0.4	(0.2,0.7)	2,610	10	0.4	(0.2,0.7)
Next least deprived	5,149	19	0.4	(0.2,0.6)	2,643	9	0.3	(0.2,0.6)	2,506	10	0.4	(0.2,0.7)
Middle deprived	5,415	23	0.4	(0.3,0.6)	2,748	15	0.5	(0.3,0.9)	2,667	8	0.3	(0.2,0.6)
Next most deprived	6,189	44	0.7	(0.5,1.0)	3,202	24	0.7	(0.5,1.1)	2,987	20	0.7	(0.4,1.0)
Most deprived fifth	7,403	51	0.7	(0.5,0.9)	3,774	20	0.5	(0.3,0.8)	3,629	31	0.9	(0.6,1.2)
Betsi Cadwaladr UHB	**5,912**	**35**	**0.6**	(0.4,0.8)	**3,045**	**20**	**0.7**	(0.4,1.0)	**2,867**	**15**	**0.5**	(0.3,0.9)
Isle of Anglesey	654	5	0.8	(0.3,1.8)	338	x	x	x	316	x	x	x
Gwynedd	1,185	9	0.8	(0.4,1.4)	604	x	x	x	581	x	x	x
Conwy	867	7	0.8	(0.4,1.7)	436	x	x	x	431	x	x	x
Denbighshire	890	x	x	x	480	x	x	x	410	x	x	x
Flintshire	962	x	x	x	482	x	x	x	480	x	x	x
Wrexham	1,354	6	0.4	(0.2,1.0)	705	x	x	x	649	x	x	x
Powys THB	**971**	x	x	x	**503**	x	x	x	**468**	x	x	x
Hywel Dda HB	**3,102**	x	x	x	**1,555**	x	x	x	**1,547**	x	x	x
Ceredigion	640	x	x	x	321	x	x	x	319	x	x	x
Pembrokeshire	1,025	x	x	x	502	x	x	x	523	x	x	x
Carmarthenshire	1,437	7	0.5	(0.2,1.0)	732	x	x	x	705	x	x	x
ABM UHB	**5,114**	**20**	**0.4**	(0.3,0.6)	**2,605**	**11**	**0.4**	(0.2,0.8)	**2,509**	**9**	**0.4**	(0.2,0.7)
Swansea	2,336	x	x	x	1,183	x	x	x	1,153	x	x	x
Neath Port Talbot	1,367	x	x	x	701	x	x	x	666	x	x	x
Bridgend	1,411	8	0.6	(0.3,1.1)	721	x	x	x	690	x	x	x
Cardiff and Vale UHB	**5,049**	**27**	**0.5**	(0.4,0.8)	**2,554**	**12**	**0.5**	(0.3,0.8)	**2,495**	**15**	**0.6**	(0.4,1.0)
The Vale of Glamorgan	1,381	8	0.6	(0.3,1.1)	706	x	x	x	675	x	x	x
Cardiff	3,668	19	0.5	(0.3,0.8)	1,848	x	x	x	1,820	x	x	x
Cwm Taf HB	**3,050**	**20**	**0.7**	(0.4,1.0)	**1,628**	**7**	**0.4**	(0.2,0.9)	**1,422**	**13**	**0.9**	(0.5,1.6)
Rhondda Cynon Taf	2,470	14	0.6	(0.3,0.9)	1,307	x	x	x	1,163	x	x	x
Merthyr Tydfil	580	6	1.0	(0.5,2.2)	321	x	x	x	259	x	x	x
Aneurin Bevan HB	**6,211**	**42**	**0.7**	(0.5,0.9)	**3,120**	**22**	**0.7**	(0.5,1.1)	**3,091**	**20**	**0.6**	(0.4,1.0)
Caerphilly	1,993	19	1.0	(0.6,1.5)	989	9	0.9	(0.5,1.7)	1,004	10	1.0	(0.5,1.8)
Blaenau Gwent	710	5	0.7	(0.3,1.6)	343	x	x	x	367	x	x	x
Torfaen	1,019	6	0.6	(0.3,1.3)	524	x	x	x	495	x	x	x
Monmouthshire	808	5	0.6	(0.3,1.4)	406	x	x	x	402	x	x	x
Newport	1,681	7	0.4	(0.2,0.9)	858	x	x	x	823	x	x	x

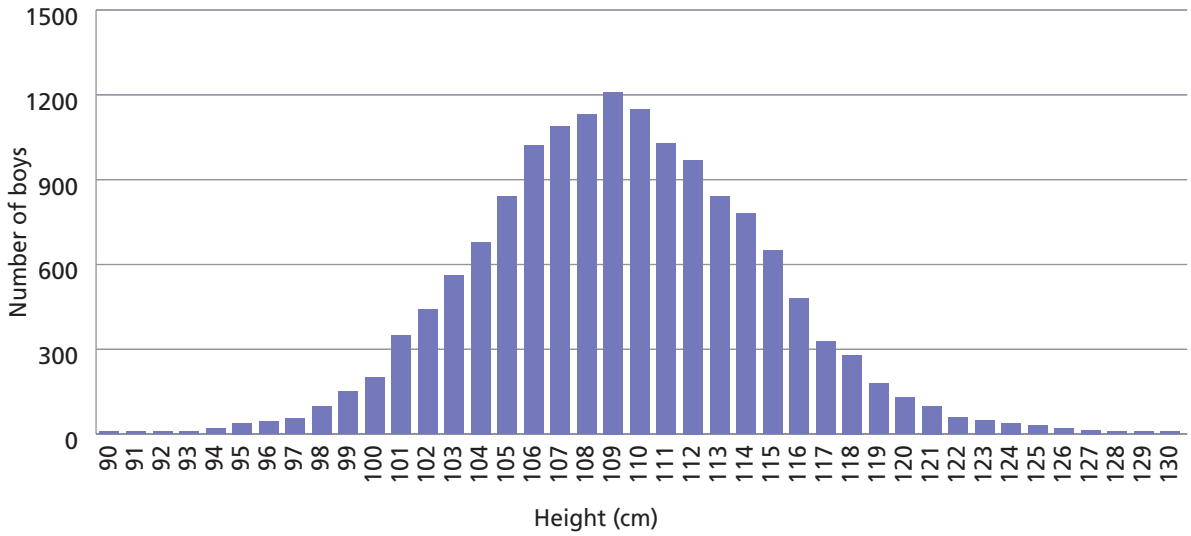
Produced by Public Health Wales Observatory, using CMP data (NWIS), WIMD (WG). x To avoid disclosure small numbers (0-4) and some larger complementary numbers have been suppressed.

Appendix C

Distribution of height, weight and body mass index

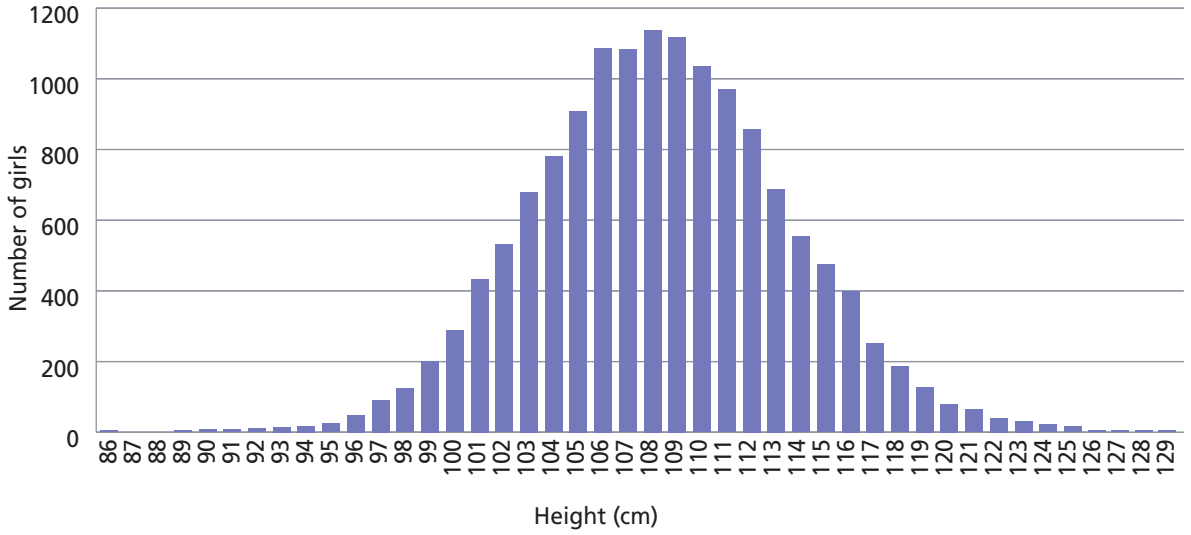
Distibution of height among both boys and girls show a symmetrical pattern.
The distribution of weight and BMI is skewed to the right.

Height distribution (cm) in boys aged 4-5 years, Child Measurement Programme for Wales, 2011/12



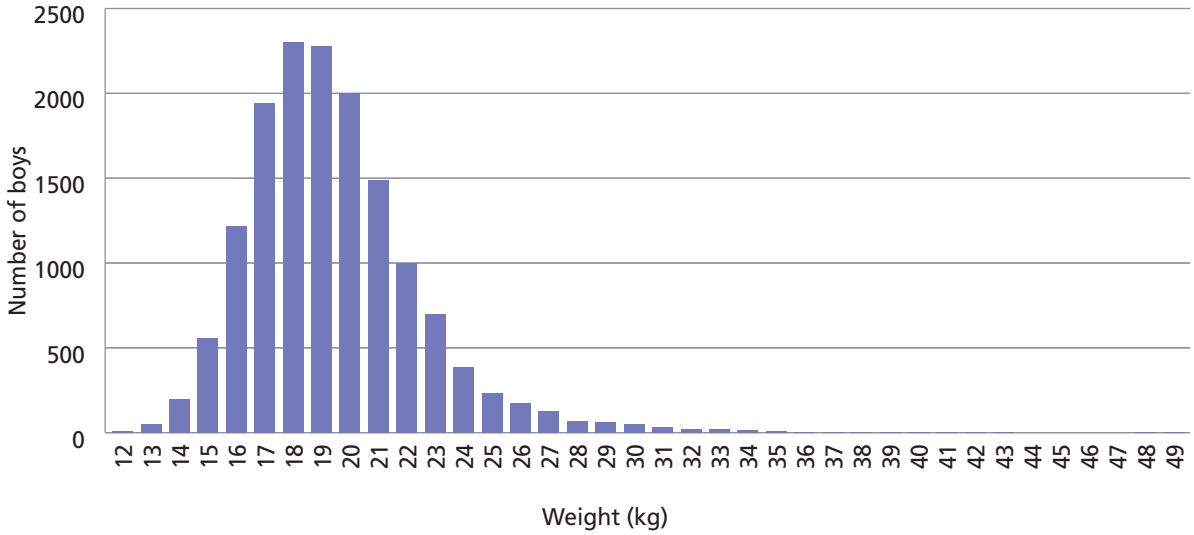
Produced by Public Health Wales Observatory, using CMP data (NWIS)

Height distribution (cm) in girls aged 4-5 years, Child Measurement Programme for Wales, 2011/12



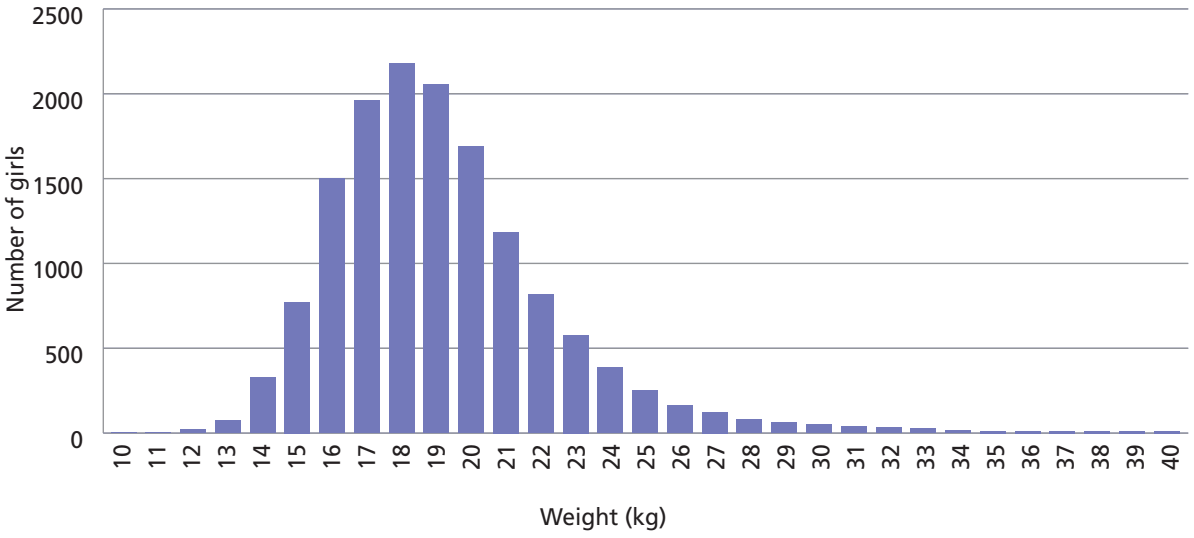
Produced by Public Health Wales Observatory, using CMP data (NWIS)

Weight distribution (kg) in boys aged 4-5 years, Child Measurement Programme for Wales, 2011/12



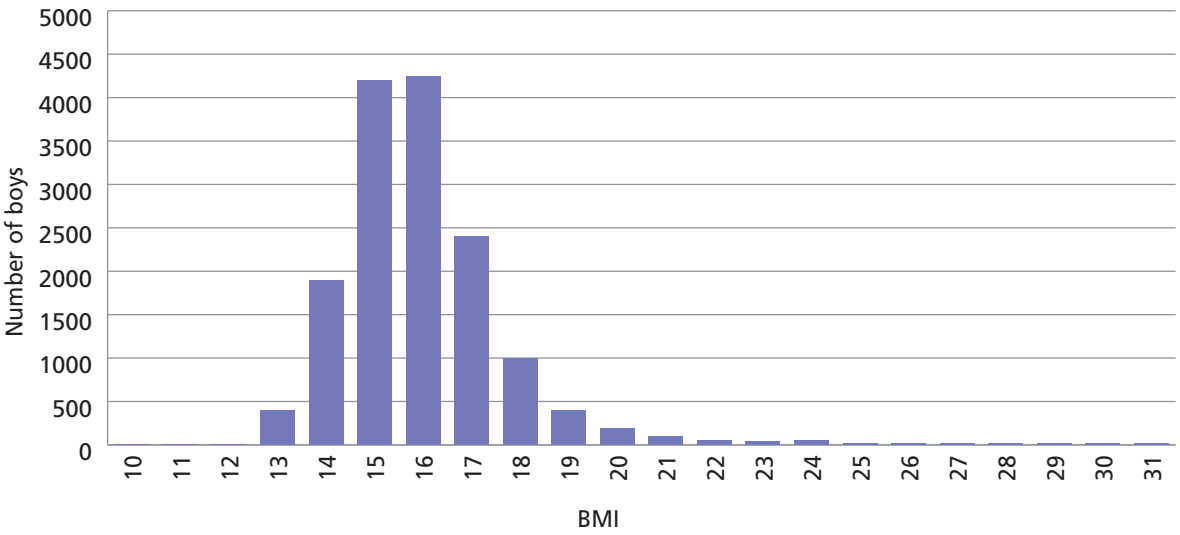
Produced by Public Health Wales Observatory, using CMP data (NWIS)

Weight distribution (kg) in girls aged 4-5 years, Child Measurement Programme for Wales, 2011/12



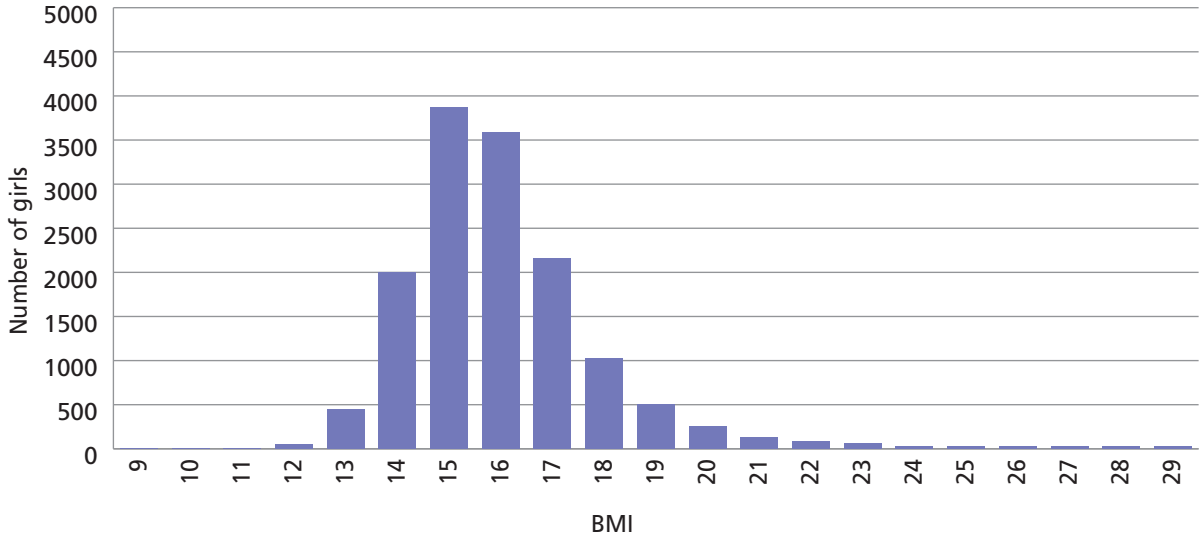
Produced by Public Health Wales Observatory, using CMP data (NWIS)

Body mass index (BMI) distribution in boys aged 4-5 years, Child Measurement Programme for Wales, 2011/12



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

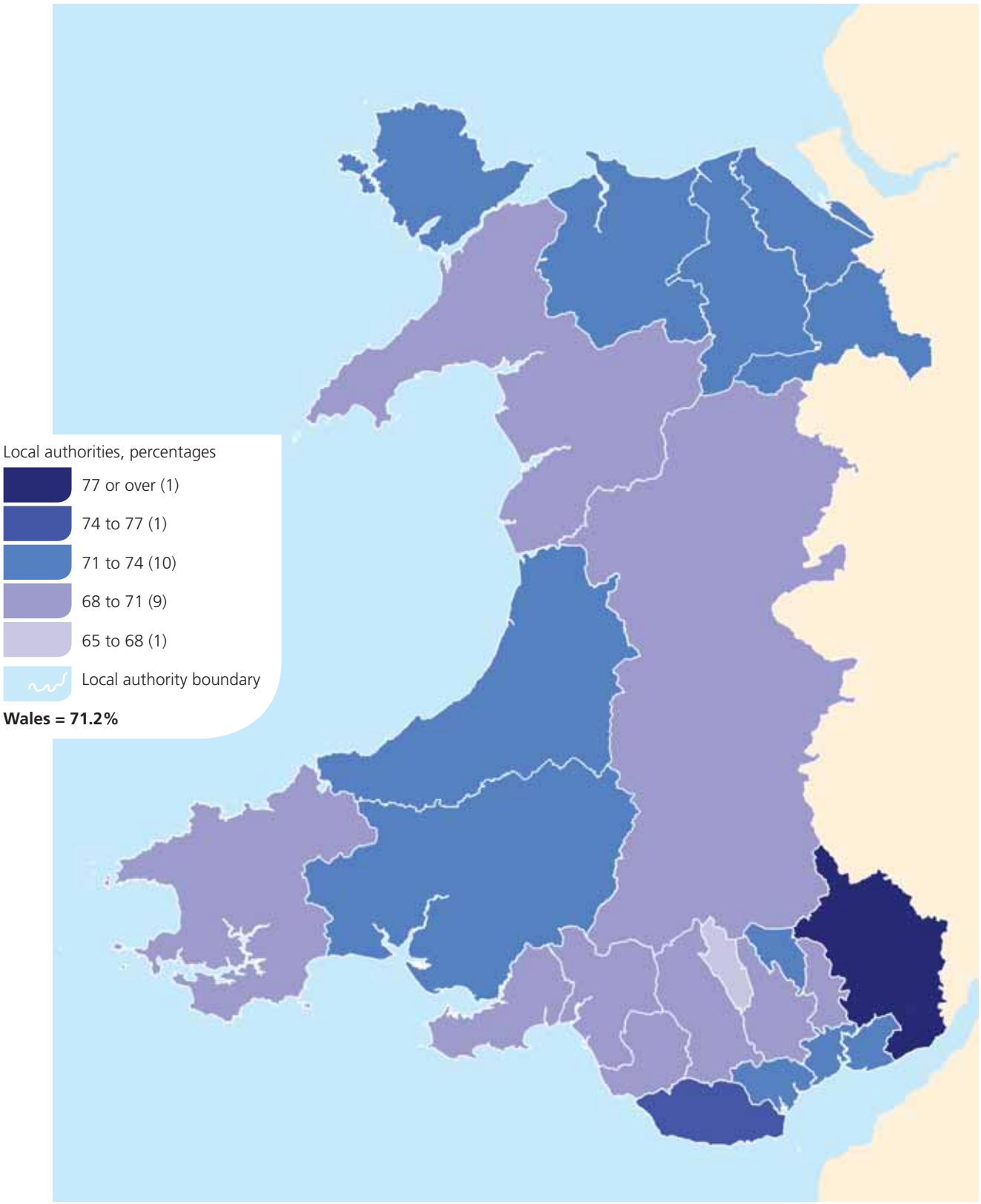
Body mass index (BMI) distribution in girls aged 4-5 years, Child Measurement Programme for Wales, 2011/12



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

Appendix D

Prevalence of healthy weight, children aged 4-5 years, local authority map, 2011/12



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

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