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Child Measurement Programme Health Intelligence Division

Report of Year 4 Child Measurement Programme Pilot 2012/13

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This is a report commissioned by Welsh Government on the outcomes of a pilot surveillance project examining heights and weights of children attending year 4 (children aged 8 to 9) in schools in Merthyr Tydfil and Rhondda Cynon Taff Local Authorities within Cwm Taf University Health Board.

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Abbreviations

BME	Black or Minority Ethnic
BMI	Body Mass Index
CCH2000	Community Child Health Database
CI	Confidence interval
CMP	Child Measurement Programme for Wales
COSI	Childhood Obesity Surveillance Initiative
CTUHB	Cwm Taf University Health Board
IOTF	International Obesity Task Force
LEA	Local Education Authority
L (M) (U) SOA	Lower (middle / upper) 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 Information Service
ONS	Office for National Statistics
SAIL	Secure Anonymised Information Linkage Databank
UK90	A growth reference system used in the Child Measurement Programme
WHO	World Health Organisation
WIMD	Welsh Index of Multiple Deprivation

Summary

Welsh Government Child Measurement Programme Regulations (2011) are in place that would allow for the existing Child Measurement Programme for Wales (CMP) to be extended beyond reception year to include children in year 4. However there is currently no additional funding identified for this implementation to occur.

Year 4 has been selected rather than any older year groups as children above this year group can enter early puberty and this may make results less reliable. In England all children are currently measured in reception year and year 6.

A pilot study measuring children in year 4 in schools in Merthyr Tydfil and Rhondda Cynon Taff Local Authorities in Cwm Taf University Health Board (CTUHB) was carried out in the 2012/13 school year. This report summarises the findings of that study and recommends that the Child Measurement Programme is extended to include child growth surveillance in year 4.

The pilot study found that 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. 954 of the children in the pilot study had also been measured in the feasibility study carried out in 2009, and 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.

There are two options for extension, full roll out to mirror the existing reception year programme, or a rolling programme of measurements, with frequency and extent to be determined. The advantages and disadvantages of each approach are discussed in the report.

Implementation of the CMP in year 4 in Wales would have three main advantages :

- Allow for an understanding of child growth changes over time.
- Evaluation of the impact of any activity or interventions aimed at combating obesity in children between reception class and year 4.
- Provide information to support the planning of services in the NHS and Local Authorities.

Implementation would have ongoing associated cost implications, mainly for the school health teams in health boards.

The pilot of the programme in year 4 in Cwm Taf also looked at the possibility of the Welsh measurements being included in the World Health Organisation (WHO) Childhood Obesity Surveillance Initiative (COSI) study. This would enable European comparisons between child growth and patterns of childhood obesity.

However the pilot study found that the additional information necessary for participation in the European study was not collected in a robust way, and unless this can be addressed, then any measurements gathered in Wales will not be eligible to be included in the COSI study. Further, there is a requirement¹ from COSI that measurements are all taken within a 4 to 10 week time frame, and currently in Wales these are taken at any time during the school year in the programme in reception year.

Introduction

This is a report on the outcomes of a pilot surveillance project examining heights and weights of children attending year 4 (children aged 8 to 9) in schools in Merthyr Tydfil and Rhondda Cynon Taff Local Authorities within Cwm Taf University Health Board. The children were weighed and measured in a systematic way which adhered to the standards and guidance for the Child Measurement Programme in Wales. The aim of the pilot project was to assess the feasibility, usefulness and acceptability of extending the scope of the existing Child Measurement Programme in Wales beyond reception year, building on the findings of the feasibility study² carried out in 2009.

The current Child Measurement Programme for Wales which is carried out with children in reception class was implemented in 2011/12 with the first report published in July 2013, and the second in July 2014. Prior to that an extensive feasibility study had been carried out by the National Public Health Service for Wales in primary schools in 2008/9 with a report going to Welsh Government in 2009. This feasibility study included information about children who were in year 4 as well as of those in reception year. That study found³ that 22% of children in reception year were overweight or obese, while in year 4, 26.4% of children in the opt-in group and 28.5% in the opt-out group were overweight or obese. This report should be read alongside the findings of the earlier feasibility study.

Children in the year 4 age group were selected for two reasons:

- firstly to provide information about child growth in a second cohort of children in Wales, following implementation of the Child Measurement Programme in reception year. The programme in England carries out surveillance in reception class and year 6, however because some children enter puberty quite early this can affect measurements taken in children in the Year 6 age group.
- secondly, measurements taken in this age group would be eligible for inclusion in the European Childhood Obesity Surveillance Initiative study (COSI) which examines child growth in children across Europe between the ages of 6 and 9.9. This would allow for international comparisons to be made between child growth in Wales and elsewhere in Europe. This pilot assessed whether information needed for participation in the COSI study could be collected by the relevant staff groups.

Coincidentally 954 of the children measured in the 2008/9 feasibility study formed part of the cohort of 2,687 children measured in the year 4 pilot in 2012/13. This report also examines the changes in that specific cohort across the four year period.

Background

The prevalence of childhood obesity increases with age. Experience from the National Child Measurement Programme in England (NCMP) has demonstrated that the prevalence of obesity and overweight in school age children increases between reception year and year 6. In the English NCMP in 2012/13 in reception class, 22.2% of the children measured were either overweight or obese. By year 6, this proportion was 33.3%. Meanwhile the percentage of obese children in year 6 (18.9%) was more than double that of the reception year children (9.3%).

Year 4 pilot study protocol

More information about the year 4 pilot study is contained in the protocol for the study written in May 2013⁴. The year 4 pilot study was designed to allow exploration of:

- The feasibility of obtaining reliable population level height and weight measurements for year 4.
- Comparison of weight categories between reception year and year 4 for all children in Cwm Taf who were measured in 2012/13.
- Comparison between the year 4 measurements and those obtained for the same cohort of children during the pilot for reception year. This was also carried out in Cwm Taf University Health Board.
- The acceptability to children and parents of undertaking measurements.
- The use of the Community Child Health Records (CCH2000) database and associated forms for year 4 measurements, including the specific set of mandatory fields required by COSI.
- Feedback from school staff, nurses/ health services, parents, health board/ implementation group about the year 4 implementation process.
- Further refining of costs for year 4 measures and consideration of any service implications from identifying new health issues as part of the programme.
- Whether the information requirements of the COSI study can be met.
- Identifying any other unexpected issues in advance of the year 4 proposal.

Childhood Obesity Surveillance Initiative (COSI)

Extension of the CMP to year 4 could allow for participation in the European Childhood Obesity Surveillance Initiative (COSI). This is the European arm of a World Health Organisation (WHO) study. Measurements from children aged between 6 – 9 from sixteen European countries are included in the study, although the COSI website suggests that twenty five countries are engaged with the initiative. The age group was selected as it precedes the onset of puberty. To date they have published data from 2007/8 and 2009/10. A third round is currently in preparation. Malta is the only country participating in COSI where all children in that age group are measured, but their population is relatively small, as about 2,300 children were measured. All other participating countries use a sample of measurements.

There are a number of requirements set by the World Health Organisation (WHO) regional office in Europe before measurements can be included within the study.

Because of the additional recording requirements for inclusion in the COSI study, the feasibility of gathering the additional information was included in the year 4 pilot study. For example the COSI study includes a mandatory school form which asks for the collection of information on school characteristics such as frequency of physical education lessons, availability of school playgrounds, the possibility to obtain food items and beverages (and types of food items / beverages) available on the school premises, and any school initiatives aimed at promoting a healthy lifestyle.

There is a mandatory requirement for all the measurements to be gathered within a time period of between four and ten weeks. Currently school health teams can measure children at any time during the school year.

There is also an option to collect data on waist and hip circumference measurements for a sample of the children. There is a further recommendation from the COSI office that information is gathered through the use of optional questionnaires with a sample of parents, looking at family socio-economic circumstances, any co-morbidities associated with obesity within the family, and information about the life of the child. This includes birth weight, gestation, sleep, transport to school and play.

More information about the COSI study and the requirements for inclusion are given in appendix 1 of this report.

Costs of introducing a Year 4 measurement programme

Prior to the introduction of the Child Measurement Programme in reception year, measurements had been undertaken with that age group as part of the routine school-entry health check. This is not the case for year 4 children, and there are no other age-groups other than reception year where the heights and weights of all the children have previously been routinely undertaken, which is why the significant additional costs would be incurred.

Table 1 – the cost of year 4 extension (2012)

	Number of Children	Total Wales Staff Cost*	Total Travel Cost	Total Sundries Cost
All Wales	36800	£ 307,206	£ 17,765	£ 9,639
	Number of Children	Staff Cost per child	Travel Cost per child	Sundries cost per child
All Wales	36800	£ 8.35	£ 0.48	£ 0.26
Cwm Taf Local Health Board	3806	£ 9.34	£ 0.03	£ 0.62
BCUHB	7970	£ 5.12	£ 0.17	£ -
Powys Teaching Health Board	1440	£ 5.27	£ 1.67	£ 0.50
Hywel Dda Health Board	4109	£ 8.06	£ 1.39	£ 0.06
Aneurin Bevan Health Board	7180	£ 5.01	£ 0.16	£ 0.15
Cardiff & Vale Health Board	6180	£ 11.80	£ -	£ 0.73
AMB ULHB	6115	£ 7.86	£ 0.21	£ 0.08

A comprehensive exercise estimating the costs of extending the programme into year 4 across all of Wales was undertaken in 2012⁵. As per table 1 the cost of undertaking year four measures across Wales were estimated as just under £335,000 (£9.10 per child) in 2012. This included all nursing and child health staff costs, including travel and other ancillary costs for the programme. The variation in estimated costs across health boards (£5.01 to £11.80 per child) arises as different grades of staff are deployed in different ways across the health boards, and travel costs vary across Wales. These are just the costs of the additional surveillance, and do not include any costs to address the issues that would be identified as a result of increased surveillance i.e. increased referral to obesity services.

Costings have not been updated in the two years since then, however it is suggested that the estimated costings from 2012 be increased in line with inflation as little new information came to light during the pilot in relation to costs of implementation apart from some confusion about numbers of children involved. One way of measuring inflation is the use of the Retail Price Index (RPI) which was 2.5% in December 2012, and 2% in December 2013. This would suggest a costing in 2014 of £350,243

(£9.50 per child), There would be an additional cost related to extra analysis and reporting for the Public Health Wales Observatory of £10,000 annually. Additionally there would be a need for one-off funding of £20,000 to purchase new measuring equipment needed for the programme and to fund additional training for NHS staff who would be involved in taking measurements.

It is clear from discussion with the school health teams and from the questionnaire responses that additional capacity within all the school health services and child health record services in the boards would be required in order for the Child Measurement Programme to be extended to year 4 across the whole country.

An alternative option could be to implement a partial programme, taking measurements from a sample of children each year. This could be done through employment of a small stand-alone team working across Wales, which could include school nurses, health care assistants or nursery nurses and an administrator able to input the data onto the community child health system. While this would be a more affordable option there are several challenges to implementation in this way :

- The picture of child growth between reception and year 4 would be incomplete.
- There is not one community child health database in use across Wales but several different systems. A pan-Wales team would need to be given access to and training in each of the systems.
- The geography and transport provision in Wales does not lend itself to this approach.
- Patterns of child growth differ across Wales.
- Universal roll-out would allow for a more comprehensive and swifter breakdown of information to smaller areas (middle / lower super output areas) than a rolling programme measuring samples of children. This would allow for faster and more robust evaluation of any interventions aimed at reducing childhood obesity.
- A stand-alone team would not have links with local schools in order to obtain the class lists, ensure that parent leaflets and opt-out letters were sent out in a timely way, or liaise effectively with local schools to identify a private space where measurements could be taken.

A benefit of the above approach is that it mirrors what is occurring in some other European countries who are involved in the Childhood Obesity Surveillance Initiative (COSI) where only a sample of children are measured and where COSI is regarded as research rather than universal surveillance. For each round of the COSI study a minimum sample of 2,800 children in the selected age-group are measured within the specified time frame and the COSI questionnaires are undertaken. In some countries the same schools are selected, in others a different sample of schools is selected. Malta is the one country within the survey where all children in the relevant age-group are measured, however they only have 95 primary schools.

Costings of the sample approach would depend upon decisions about the frequency of measurements and the size of the measurement cohort.

The study

Prior to the study being carried out there was an early estimate that there were 3,874 children in year 4 attending 135 primary schools across Cwm Taf. Funding (£25,827) was identified to enable staff in the Health Board to carry out the pilot programme.

The pilot study comprised:

- Letters to parents and school heads informing them of the pilot, and giving parents the opportunity of opting their children out of the programme.
- An initial visit to school to measure the children, followed by one second attempt to measure absentees.
- Weights and measurements being carried out in all year 4 classes in Primary Schools in Cwm Taf University Health Board.
- Weights and measurements being carried out in line with the existing CMP Standards and Guidelines.
- Use of the CMP form and screens for data collection and entry into the appropriate section of the Community Child Health 2000 System.
- Surveys of school staff, health staff including nurses and Child Health Records staff about their experience of carrying out the year 4 pilot.
- Letters being sent to any parents who requested feedback.
- Piloting of COSI questionnaires.

Survey questionnaires were carried out in all the schools where measurements were undertaken. Some of the children were the same cohort of children in year 4 that would have been in reception year when the Child Measurement Programme feasibility study was carried out four years previously. This allowed for some longitudinal analysis.

Study Results

Participation

There were discrepancies between both the number of children and the number of primary schools reported to be within the Cwm Taf University Health Board area. Initially school health staff reported that they carried out measurements in 134 schools. They reported they had missed one school due to oversight (Y.G.G. Tonyrefail). However during analysis of results it became apparent that while questionnaire responses were available from the majority of schools, they were not available from all 134 reported schools.

It also became apparent that only 127 schools in Cwm Taf were recorded on the Community Child Health database where children eligible to be measured were attending, and this was reported to include one school in Cardiff Local Education Authority (LEA). The Cwm Taf Child Health records department supplied information that their school health teams provided services to 130 schools who had a year 4 class. This included 5 special schools where measurements for the year 4 pilot were not undertaken. It also emerged that there were actually three (not one) schools which came under Cardiff LEA and one which came under Bridgend LEA, which could explain the discrepancy between the figures of 127 and 130.

Of the 127 schools on the database valid measurements were actually received from 118 schools. Y.G.G. Tonyrefail (as already mentioned) was one of the schools where no valid measurements were returned and it appears that there were 38 children eligible for inclusion attending there. The other eight schools included at least three infants schools and the special schools. The three infants schools which appeared to have children of the year 4 age attending, reported between 1 and 4 children and their measurements were not taken. Children attending schools that had service provided by the CTUHB but were in other LEAs were included in the analysis if they

had a residential postcode within CTUHB area. All measurements and surveys were all carried out between January and July 2013.

As well as confusion about the number of schools, there were discrepancies in the number of children reported to be attending year 4. An initial estimate suggested there were 3,874 children eligible for measurement, broken down by local authority area as below:

- a. Merthyr (682)
- b. Rhondda Cynon Taff (3,192)

However it is possible that this estimate may have included all children and not just those resident in Cwm Taf. Measurements from the children were included if they met all the criteria for inclusion:

- Location of residence can be determined
- Residence in Cwm Taf University Health Board area
- School located in Wales
- Born in the period September 2003 to August 2004
- Sex is recorded

The national schools' census for 2012/13 reported that there were 642 children attending year 4 in schools in Merthyr Tydfil and 2,578 in Rhondda Cynon Taf, a total of 3,220 which would have included children resident in other local authorities but attending schools in Cwm Taf. According to the Community Child Health Database there were 2,993 children eligible to be measured. Of those, valid measurements on 2,687 children were received giving a participation rate of 89.8%. The breakdown of the 2,993 eligible children by local authority was 614 children in Merthyr Tydfil and 2,379 in Rhondda Cynon Taf.

The prevalence tables with the complete information is given in Appendix 2 of this report. Information where a number value is less than five is suppressed to avoid the potential that individual children could be identified. Suppression of related data has also happened where suppressed numbers could have been derived from totals.

Acceptability

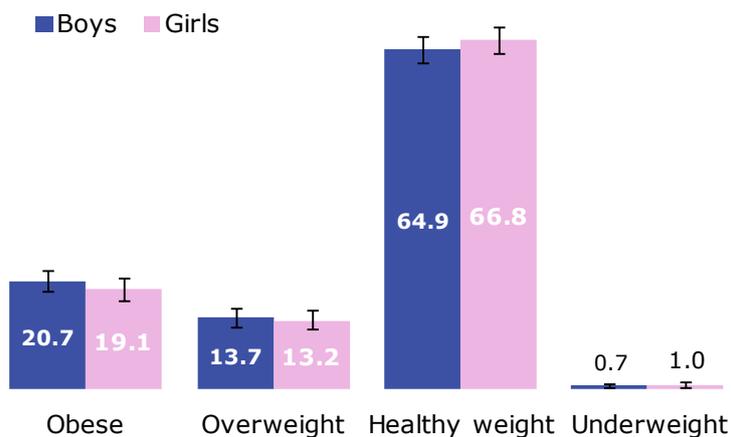
The Health Board staff involved in the exercise gave the information that during 2012/13 parents of eight of the children in reception year and 133 of the children in year 4 had withheld consent for their children to have their measurements included. This suggests that parents find it less acceptable as children get older. However no direct surveys of parental views were carried out to confirm this in 2013. Structured interviews with parents were part of the original 2009 feasibility study⁶. Qualitative responses given by staff to the questionnaires in 2013 indicate that some children in this age group are more self-conscious about the measuring process than those in reception year.

Data findings

As figure 1 shows, the majority of children were of a healthy weight. However about a third were either overweight or obese. There were slightly more boys in both the overweight and obese categories than girls but the difference does not appear to be significant.

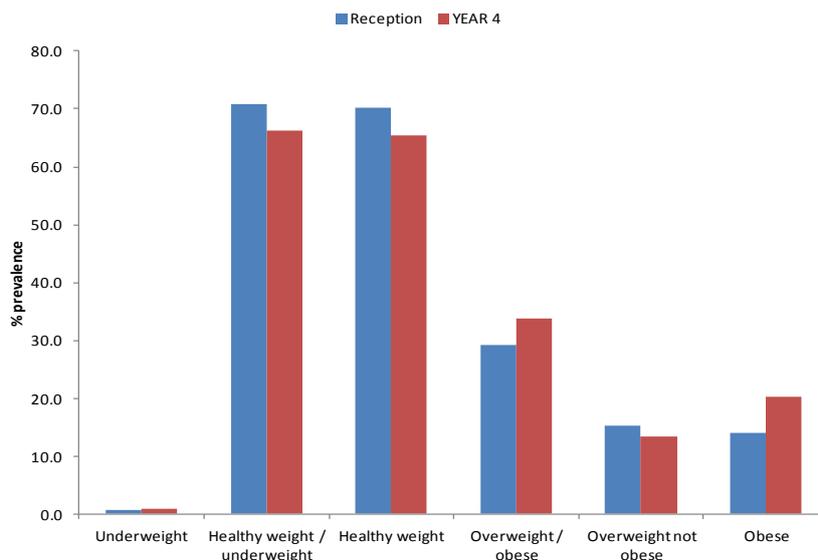
In Figure 2 information is given on all children resident within the Cwm Taf UHB area who were measured in the reception year and in year 4 during 2012/13.

Figure 1 – Percentage of children aged 8 to 9 by weight category, Cwm Taf pilot, 2012-13



Produced by Public Health Wales Observatory, using CMP data

Figure 2 – Weight categories for children in Reception and Year 4, Cwm Taf Health Board in 2012/13



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

As expected prevalence of overweight and obesity is greater in the year 4 children than in the reception year children. From the graph there does appear to be greater prevalence of overweight (and not obese) in the reception year children but this is not significant. However the higher obesity (but not overweight) prevalence in the year 4 children is significant. Figures 3 and 4 also show that BMI distribution is skewed to the right in both boys and girls.

Figure 3

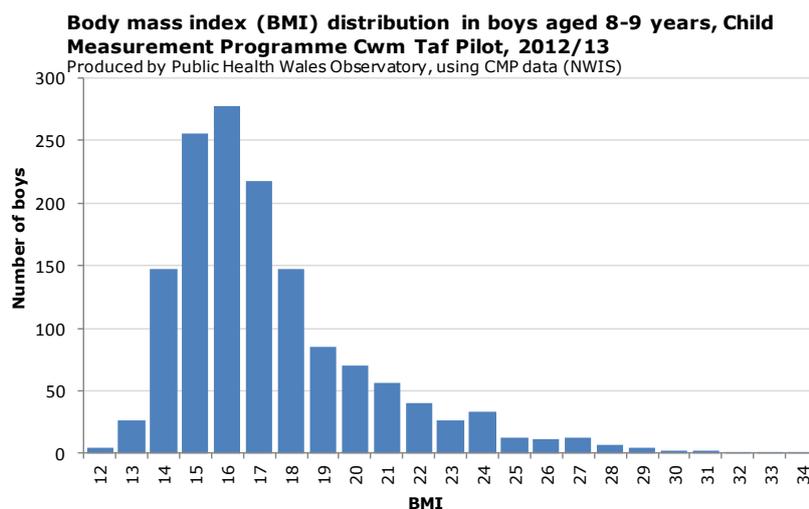
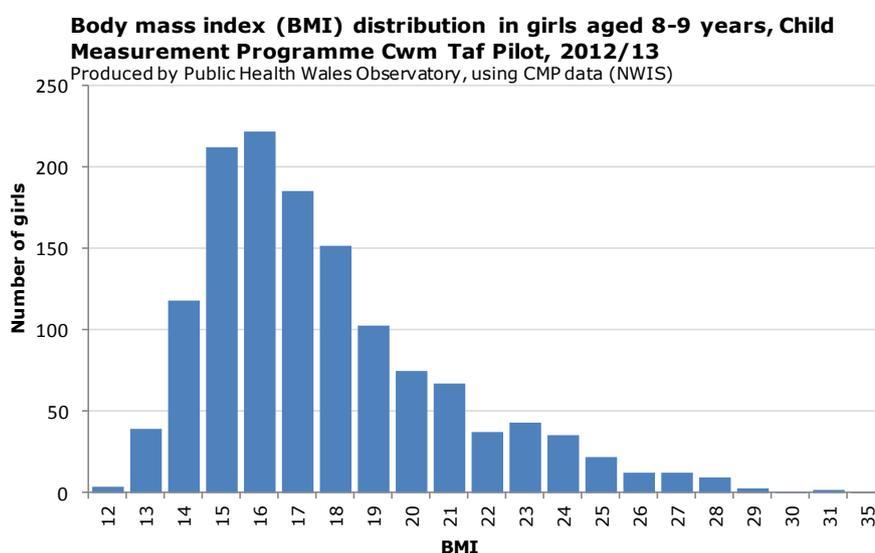


Figure 4

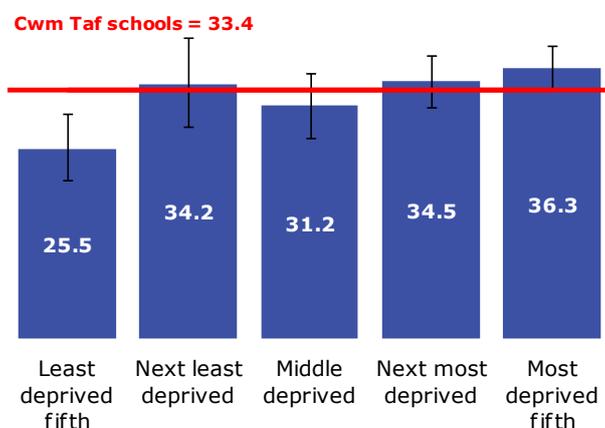


In Figure 5 prevalence of overweight and obesity is analysed by deprivation level. Geographical areas known as Lower Super Output Areas (LSOAs) are categorised using the Welsh Index of Multiple Deprivation (WIMD) 2011. Each LSOA consists of an area containing about 1500 households. The LSOAs are then assigned to deprivation fifths (quintiles), and information about each child is assigned to a deprivation category based on their LSOA of residence.

Children living in the least deprived areas of Cwm Taf were significantly less likely to be obese or overweight than those in the most and second most deprived areas (deprivation quintiles). However the difference across the other fifths is not significant and also presents quite a mixed picture. As the pilot programme was carried out in Cwm Taf where there are high levels of deprivation, only 22% of children measured

lived in either of the two least deprived quintiles, while 36% lived in the most deprived quintile¹.

Figure 5 – Percentage of children aged 8 to 9 who are overweight or obese, Cwm Taf pilot, WIMD quintiles, 2012-13



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

Movement between years – data linking

954 of the children measured in the year 4 Pilot study were the same children who were measured in reception year in Cwm Taf University Health Board as part of the feasibility study.

The Child Measurement Programme team only has access to information on children that has had all personal identifiers removed. However it was possible using the anonymised information to identify measurements of some children resident in Cwm Taf University Health Board who had also had their information recorded in the original feasibility study.

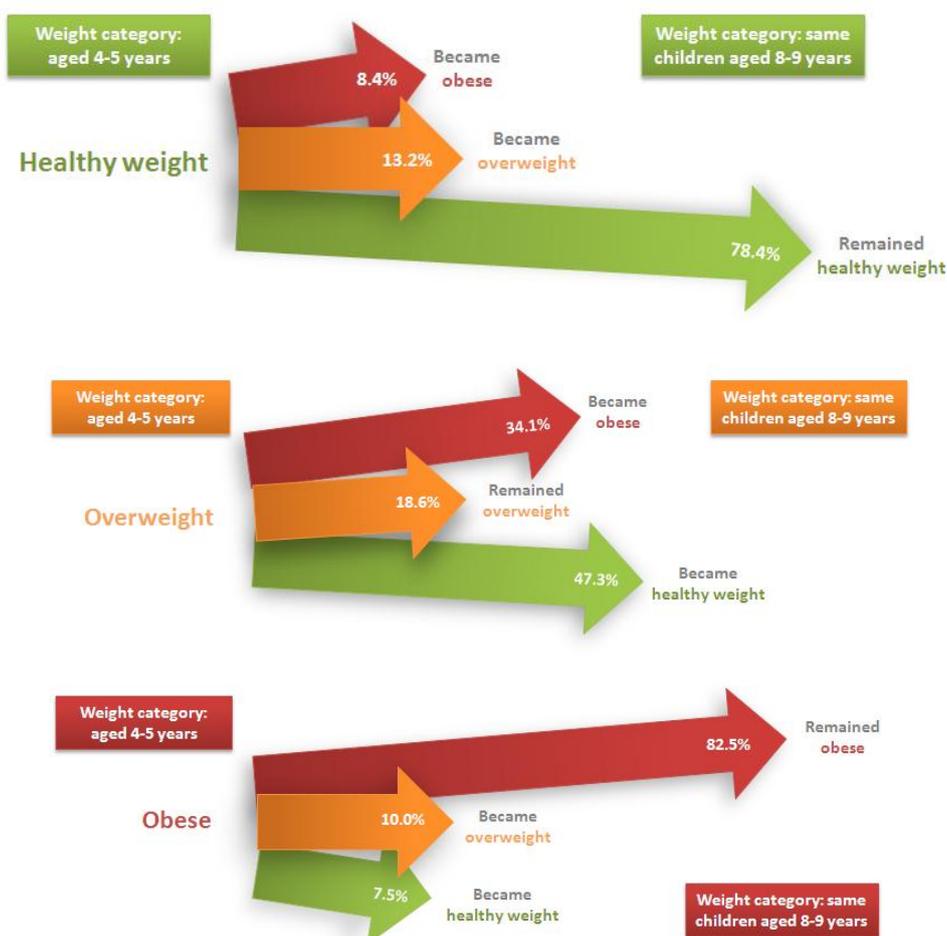
Table 2 – movement between weight categories, counts, children at ages 4-5 years and 8-9 years, Cwm Taf pilot, 2008-09 and 2012-13

		Weight category aged 8-9 years		
		Healthy weight (total 611)	Overweight (total 131)	Obese (total 212)
Weight category aged 4-5 years	Healthy weight (total 667)	523	88	56
	Overweight (total 167)	79	31	57
	Obese (total 120)	9	12	99

¹ See key data tables in appendix 2

Figure 6 shows the movement of those same children by weight categories between reception and year 4 by proportion. The actual number of children is reflected above in Table 2.

Figure 6 – data linkage



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

As can be seen from figure 6 and table 2 the vast majority (78.4%) of children who were deemed to be of a healthy weight in the original study were still of a healthy weight in the year 4 pilot study. However of concern is the large number of children moving into the obesity category from either healthy or over weight categories. 82.5% (n=99) of children who were obese in reception year were still categorised as obese in year 4, and 34% of children deemed to be overweight in the feasibility study were categorised as obese by the time of the year 4 pilot. A small number (9) of the 120 children who were obese in reception year had achieved a healthy weight by the time they reached year 4, while 12 (10%) had moved from being categorised as obese to being categorised as overweight.

Questionnaire analysis

Five separate questionnaires were distributed in the spring of 2013. These were designed to elicit different information as below :

Questionnaire 1a – COSI form A. The aim of this questionnaire was to see if the information necessary for Welsh measurements to be included in the WHO COSI study could be gathered easily and correctly.

Questionnaire 1b – COSI form B. As well as having a form (1a) returned for each school, there is some class specific information needed in order for the measurements to be included in the COSI study, and form B was class specific.

Questionnaire 2a – this was to be returned by each of the nurses / health care assistants who were involved in taking measurements.

Questionnaire 2b – this was aimed at gathering views from school nurses who were employed by the health board but not directly involved in taking measurements.

Questionnaire 3 – school representative form, to be completed by someone on behalf of the teaching / schools staff to elicit views of the education staff about the process of implementing the programme.

A further questionnaire (4) was designed to be completed by the implementation group, therefore there was only one response to this questionnaire as it was completed in dialogue with the group.

Overall completion of the questionnaires was incomplete, with fields left empty and little qualitative information gathered.

Questionnaire 1 – COSI form

The questionnaire relating to the COSI study was in two separate parts and responses to the second part were particularly poor. Completed copies of both COSI form A and B were received from 92 schools. Only four of the 92 schools had completed the questionnaire in full, i.e. all fields had information in them.

The purpose of distributing the COSI questionnaires A and B was to assess how easy it was to gather the information needed for the Child Measurement Programme measurements from Wales to be included in the WHO COSI surveillance programme. Therefore the responses from the questionnaires, while of interest, do not form a substantive part of this report. However all the respondents to the Part A form reported that there were places for children to play actively, and all responded that some or all of the healthier options for food and drink could be obtained at the school by children.

Questionnaire 2 – health staff

This questionnaire was in two parts, part 2A for completion by health board staff involved in taking the measurements and part 2B for completion by school nurses who worked for the health board but were not involved in taking the measurements.

Questionnaire 2A

	TABLE 3 – QUESTIONNAIRE 2A	YES	NO	NOT ANSWERED
1	Had you any problems getting child registration / class list and related details?	2	6	0
2	The CMP requires measurement to be taken in a suitable private area. Had you any problem with this?	4	4	0
3	Did you find any specific issues with undertaking measures in this age group, as distinct from reception year	2	6	0
4	Had you any other problems making arrangements with schools for year four measures	2	6	0
5	What would you need to be able to measure reception and year 4 in the same school on the same day? <ul style="list-style-type: none"> • Additional space • Additional time • Additional staff 	4 7 0	1 1 2	0 0 0
6a	Do you think Wales should routinely measure hip and waist circumference as part of a year 4 programme?	1	5	2
6b	Do you think that it would be possible to measure routinely hip and waist circumference in a small group of children?	2	4	2
7	Letters to parents were planned to be handed back in a sealed envelope to children by teachers Was this method of sending letters to parents successful from your perspective?	4	0	4
8	Do you think parents should be provided with feedback (results) even when they do not request it?	5	2	1
9	Are you confident in knowing what to do with newly identified weight problems among children in year four?	7	1	0
10	Has any parent phoned or contacted you about consent, feedback, letters, advice or complaints?	4	4	0
11	Had you any feedback about the process from school staff?	2	6	0
12	Have you any suggestions on how to improve the process?	2	6	0
13	Were there any other unexpected issues, and if so what was the outcome of these?	1	7	0

Questionnaire 2 was aimed at eliciting views from school health staff about several areas including the acceptability and feasibility of taking waist and hip measurements in children; views on the capacity of health boards to undertake the additional measurements within existing resources; information giving to parents; and addressing additional health issues identified through undertaking additional measurements. Part A also asked for comments on accessing school registration lists, and specific issues with carrying out the actual measurements.

On examining the responses it was clear (from signatures) that the same two members of staff had returned a large number of forms, returning one per school,

rather than the one per member of staff requested, and that those two individuals had carried out measurements in a large number of schools. After duplicate responses were excluded it appeared that only eight separate members of staff had been involved in taking the measurements. Responses from the eight individuals are given in the table above.

Respondents were also given the opportunity to add text commentary to their responses. In response to question 1, four of the respondents highlighted a challenge with school secretaries being unaware of the programme or finding the time to supply school lists. Respondents reported some challenges in finding a private area to measure children in, with one person reporting that the measurements were carried out in the school dining hall. The responses to question 3 included some related to issues of privacy highlighted in question 2 in that the respondent suggested that more children in this age group actually requesting to be measured in private. They also stated that some children including children who were underweight were reluctant to participate and that the children were more self conscious than in reception year.

In response to question 6 most people felt that measuring hips and waists would be intrusive, would make the process more time consuming, and would not be welcomed by children or their parents. They also suggested it was something that parents would have to consent to (rather than 'opt out' consent). The majority of respondents also felt (question 8) that parents should be routinely supplied with results even if they did not request them. The rationale for this varied, with some respondents suggesting that parents did not recognise that their children were overweight or obese until they were supplied with actual measurements.

Respondents felt that schools should be supplied much earlier with information about the measurements programme and that this would increase cooperation from schools' staff. The 'unexpected' issue highlighted in the final question was that some of the parents could not converse in English, and the respondent requested information to be provided in other languages including Polish and Portuguese.

Questionnaire 2B

For part B thirteen individuals had responded but not every nurse answered every question.

TABLE 4 – QUESTIONNAIRE 2B		YES	NO	NOT ANSWERED
1	Do you think Wales should routinely measure hip and waist circumference as part of a year 4 programme?	7	6	0
2	Do you think that it would be possible to measure routinely hip and waist circumference in a small group of children?	3	9	1
3	Do you think parents should be provided with feedback (results) even when they do not request it?	7	5	1
4	Do you think that following-up newly identified weight problems among children in year four would be possible for school nurses with the available resources	0	12	0
5	Do you have any other comments or feedback?	2 responses		

Comments included a call for clear plans to be in place for children who were over or underweight if parents were given results, the need for a multidisciplinary response to childhood obesity and the view that there was no capacity within the current service to carry out year 4 measurements.

Questionnaire 3

Responses from 108 schools to questionnaire three were received and these are displayed in table 5 below. This questionnaire was for completion by a representative of the school rather than the health board, and the people completing the report included head-teachers, class teachers, school secretaries and school clerks.

82 out of 108 responses suggested that their schools were following the “Appetite for Life” standards. These standards were still in place at the time the questionnaires were carried out, but were replaced later in 2013 by the new Welsh Government regulations “The Healthy Eating in Schools Regulations 2013”. 17 of the respondents either didn’t know or did not answer the question, while one said it was not applicable. Only one respondent said their school was not following the standards.

	TABLE 5 – QUESTIONNAIRE 3	Yes	No	Not applicable / don't know	No answer
1	Was any disruption of school activities kept to a reasonable level?	90	16	1	1
2	Has there been any problems sharing child registration (class list) and related details with school nurses?	4	104	0	0
3	The CMP require measurements to be taken in a suitable private area. Had this been difficult to achieve in your school?	13	91	0	4
4	Letters to parents were planned to be handed back in a sealed envelope to children by teachers Was this method of sending letters to parents successful from your perspective?	101	2	1	4
5	Has any parent phoned or contacted you about the CMP?	9	95	1	3
6	Have you had any feedback about the process from school staff?	3	102	0	3
7	Have you suggestions on how to improve the process?	2	99	0	7
8	Is your School following the Appetite for Life standards in relation to school meals and snack provision?	82	8	4	14
9	Is your school involved in the Welsh Network of Healthy Schools Scheme?	100	2	1	5
10	Were there any other unexpected issues, and if so what was the outcome of these?	2	103	1	2
11	Do you have any other comments or feedback?	10 responses			

Questionnaire 4

The final questionnaire was jointly completed by the implementation team in Cwm Taf Health Board. This comprised senior school nurse managers from the two teams in the health board, a representative from child health records and some of the school nurse training leads. The questionnaire was completed in writing and was also discussed at a meeting between the Child Measurement Programme staff and the local implementation team which meant that there was only one response.

The team agreed that there had been too many different questionnaires within the pilot study. In response to the questions about data sharing and timely access to class lists from the schools, the team reported that there had been some problems, with head teachers claiming that there was no data sharing agreement in place. They were working towards resolution of this issue as it cuts across the CMP in reception year too, and they had a new agreement with the education department that they would share the electronic class lists. These were needed for the immunisation programmes as well as the CMP.

Although some of the school health teams and school representatives had reported challenges with finding a suitable private space for measurements to be carried out the implementation team said there were no problems with this, but acknowledged that not all measurements could be carried out in private.

The team said that postage costs would be prohibitive and they sent the information (including the opt-out letter) out via the children's bags using sealed envelopes. This was usual with communication between schools and parents, however as only a few parents had requested results these were posted out using Royal Mail. The implementation team suggested that it would be desirable for all parents to be informed of their child's measurement results as a matter of course, and suggested that results letters were in a nationally agreed format that would mitigate against the school health teams coming into conflict with parents, recognising that sometimes the messages would not be welcomed by parents / carers.

There would be service and cost implications should the year 4 measurements be introduced as there were currently no other routine contacts required for children in this year group. Children in reception year were already weighed and measured prior to the introduction of the Child Measurement Programme, but the way in which measurements were taken and recorded is now standardised. While they acknowledged that the CMP is a surveillance programme they were concerned that existing pathways for referral for children who were overweight or obese were limited, and were concerned about the impact of identifying even more children who might need support from within the existing resources of the school health service.

Finally they identified that the study had revealed some issues with data and records, resulting in one school being missed. These issues had been rectified once identified. They had also used the same data entry screen for the year 4 pilot as was in use for the reception year programme, and this would need to be amended if a year 4 programme was introduced – there is a field for children in reception year whose parents have opted them out of the programme but not out of measuring for the school entry health check. As there is no routine health check required in year 4, this data field may be confusing.

The team identified no new issues with costings, although there was a suggestion that carrying out the measurements in this age group was easier and so took less time. In 2012/13 just two of the children in the year 4 pilot did not cooperate with the

measurement process, while in the reception year there were five children who were uncooperative. There were a similar number of absences in the two year groups (25 and 23). There was a suggestion that the discrepancy in figures could be caused by movements of children in and out of the area, as well as across schools, and that during the measurement period they identified 84 year 4 children who had moved on.

Discussion

The findings of the year 4 pilot have been assessed using a 'SWOT' analysis, looking at the strengths, weaknesses, opportunities and threats which would be associated with extending the existing CMP to year 4 children. Swot analysis is a commonly used tool when assessing potential projects or business ventures.

Strengths

There would be several advantages to extending the CMP to year 4 children. There is evidence that intervening early in childhood is more cost effective than waiting until adulthood. Failing to understand and address obesity in childhood could lead to an increase in obesity-related conditions in adults and older children, such as type 2 diabetes. There are no other routine measurements taken in all school children apart from those taken in reception class.

In 2003 a report prepared by Sir Derek Wanless⁷ looking at the cost of providing health and social care in Wales recommended that "*a much greater focus on children and young people's health and greater partnership with the education system in Wales to help improve it*". However it is also important to measure effectiveness of interventions.

The current programme measuring children in reception year shows what happens to child growth during the pre-school years, and also means that personnel have had the relevant training to carry out the measurements and to use the data entry systems. There would be no requirement for further development of software as the data module designed to capture the reception year results will also be able to capture the year 4 results with one small modification. Universal roll out of a year 4 programme would allow for information to be analysed at a smaller area (LSOA / MSOA) than local authority within three years of starting.

Both the 2009 feasibility study and this year 4 pilot demonstrate that prevalence of obesity in children increases as they get older. Linking the records of the same children showed that while many of the children who were identified as overweight (but not obese) in reception year, achieved healthy weight by year 4. However 82.5% of those children who were identified as obese during the feasibility study, were still obese in year 4 and others who had been of a healthy weight or overweight had become obese by year 4. Information on patterns and trends over time would identify where scarce resources need to be targeted.

Extending the existing Child Measurement Programme to include year 4 measurements would give reliable information about what happens to growth in children between reception class and year 4 and inform policy regarding school meals, physical activity programmes and other interventions taking place with primary school aged children in Wales. It would also provide evidence about whether any interventions aimed at tackling obesity between reception year and year 4 were having an impact over time.

Weaknesses

Extending the CMP to year 4 children will have significant costs, estimated at £360,00 annually, and there is no clear funding stream in place. This is at a time when many public bodies are trying to make savings. The Health Board staff involved clearly identified that they would need additional resources to implement an extension to the programme.

There is currently no routine annual school health contact carried out with children in this year group, while reception year have had the “pre-school health check” in place for many years. So as there is no opportunistic contact, the programme would have to start from scratch.

Children may be less happy in this year group about participating, as they become more aware of their body image as they grow older - the All Party Parliamentary Group on Body Image published a report in 2012 which suggested that some girls as young as 7 had concerns about their weight⁸. The questionnaire responses for the pilot study indicated that a small number of children were self conscious and that this included children in all weight categories. This issue is exacerbated by the findings that some schools are not able to identify a private space where the measurements can be taken.

There was obvious difficulty in gathering the information required by the WHO COSI study in a robust way. Further it was found that there is a COSI requirement that measurements are gathered in a 4 to 10 week period, which is not currently the case in Wales and would be difficult to implement. However the COSI study is not integral to the year 4 extension, and the growth of children in Wales could still be looked at alongside the COSI findings from Europe.

Opportunities

The existing Welsh Government regulations already allow for an extension of the CMP without the need for further legislation. An extension of the programme will build on understanding of childhood growth patterns in Wales. The results of the CMP will be available to inform strategy and operational policy at national and more local level. It will be possible to measure the effect of any interventions aimed at tackling obesity between reception and year 4 once a baseline is established.

While the Child Measurement Programme is a surveillance programme, the health professionals who are taking the measurements are encouraged to follow up or refer children appropriately in line with good clinical practice. This means that more children with a height disorder or who are obese or underweight will be identified at an earlier age, when interventions may be more effective than if they were identified later in life.

There is criticism from the UK government that the NHS in Wales is not offering the same level of service to people living in Wales as the English NHS. The CMP in Wales is currently measuring children in one school year, while the NCMP in England is already measuring in two school years. Offering the CMP in both school years would mirror what the NHS in England currently funds.

There may be an opportunity to implement a partial programme, whereby a sample of children are measured. This is discussed earlier in this report (pages 8 and 9) in the cost-implications section. Further information on costings is not included as there

has been no discussion about the possible sample size were this approach to be adopted.

There is an opportunity for results of the Child Measurement Programme for both Reception Year and Year 4 to be anonymised and included in the Secure Anonymised Information Linkage Databank (SAIL databank) at Swansea University for linkage with other data. Currently SAIL can request the information stored on the Community Child Health Database by NWIS, so could already have access to the reception year measurements.

Threats

Funding and implementing an extension to the existing CMP in Wales could be unpopular with sections of the media who view this type of surveillance as intrusive, costly and unnecessary “nanny state-ism”.

It is also clear from some of the qualitative questionnaire responses, that while school health teams are given information that the CMP is a surveillance programme, staff also see it as an opportunity to identify and address individual health needs. Without robust referral pathways for children identified as needing support there may be a fall in staff engagement and delivery.

Conclusion

The prevalence of childhood obesity increases significantly between reception year and year 4. Therefore Public Health Wales recommend that the existing Child Measurement Programme is extended to include children in the year 4 age group, in order to monitor the outcome of any activity aimed at reducing obesity levels between reception year and year 4. However Public Health Wales recognise that this will have significant cost implications for all of the Health Boards in Wales.

While costings information varied across Wales, and this was attributed to different grades of staff being involved, it is suggested that any additional funding be allocated across the health boards on a “per capita” basis, using the schools census to allocate funding. Alternatively a decision could be made to implement a programme where only a sample of year 4 children are measured, decisions would be needed on sample size and frequency of measurements before funding requirements could be estimated.

Should the CMP be extended to include year 4, it would not be possible for the measurements to be included in the WHO COSI study, however it will be possible (because of the age of the children) to benchmark prevalence measurements from Wales with European measurements reported by COSI in their publications.

Appendix 1 – Childhood Obesity Surveillance Initiative (COSI)

There are additional recording requirements in order for childhood measurements from each country to be included in the COSI study, and the feasibility of gathering the additional information was included in the year 4 pilot study. This additional information includes measurements of waist and hip circumference as well as information about the school day, such as what food children are able to obtain on the school premises and the hours of physical activity they have each week. There is also a recommendation that some further information is gathered on a family's socio-economic circumstances but this is optional and not a requirement.

The COSI guidance states¹ that measurements should be :

- be carried out over as short a period as possible, preferably within four weeks and no longer than ten weeks;
- not take place during the first two weeks of a new school term or immediately after a major holiday; and
- be preferably done in the mornings before lunch time, although it may not always be feasible.

Children's characteristics to be gathered include: date of birth or age, sex, geography of residence, school grade, date and time of measurement, body weight, body height, body mass index, type of clothing. School characteristics to be gathered include: address, number and grade of classes sampled, number of registered / absent / measured children per class, and number of refusals. Information about the types of food and drink available in the school and the opportunity for physical activity is also required.

As this is seen as a study rather than routine surveillance in most of the other European countries involved, ethical approval for the measurements is sought. And COSI requires feedback about this. Ethical approval in Wales is not currently requested as this is seen as routine surveillance rather than a study.

The following additional information is condensed from information available on the COSI website at :

<http://www.euro.who.int/en/health-topics/disease-prevention/nutrition/activities/monitoring-and-surveillance/who-european-childhood-obesity-surveillance-initiative-cosi>

“Although each country is free to develop a system that fits its local circumstances, data must be collected according to a common agreed protocol containing core items. There is no intention to replace countries' existing or planned health, anthropometric and dietary surveillance systems. On the contrary, the system should if possible be integrated with them.

The Initiative targets primary school children aged 6.0–9.9 years. Once a nationally representative sample of primary schools is selected, the same schools remain the nationwide sentinel sites for the repeated measurements. A final effective sample size of 2800 children per age group (6.0–6.9; 7.0–7.9; 8.0–8.9; 9.0–9.9) is determined for each round. Core measurements are body weight and body height; waist and hip circumference are optional, along with information gathered about associated co-morbidities, dietary intake and physical activity/inactivity patterns.

Each country is responsible for its national data collection, funded by local resources, and identifies the institute to be responsible for overall national coordination. WHO develops the protocols and manages the international coordination of the surveillance initiative and facilitates investigators' meetings.

Each country is asked to sign an agreement with WHO in which it agrees to send a copy of the cleaned data file to WHO/Europe, as well as a detailed report of the data cleaning procedures. Data are analysed at both the country level by the national coordinating centre and at the European level by the surveillance initiative investigators team."

Appendix 2 – key data tables

Key data from the Child Measurement Programme for Wales, Cwm Taf pilot, children aged 8-9 years,

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
Cwm Taf schools	1,863	66.6	(64.8, 68.3)	934	33.4	(31.7, 35.2)	23	0.8	(0.5, 1.2)	1,840	65.8	(64.0, 67.5)	377	13.5	(12.3, 14.8)	557	19.9	(18.5, 21.4)
Least deprived fifth	283	74.5	(69.9, 78.6)	97	25.5	(21.4, 30.1)	5	1.3	(0.6, 3.0)	278	73.2	(68.5, 77.4)	53	13.9	(10.8, 17.8)	44	11.6	(8.7, 15.2)
Next least deprived	154	65.8	(59.5, 71.6)	80	34.2	(28.4, 40.5)	-	-	-	-	-	-	31	13.2	(9.5, 18.2)	49	20.9	(16.2, 26.6)
Middle deprived	302	68.8	(64.3, 72.9)	137	31.2	(27.1, 35.7)	5	1.1	(0.5, 2.6)	297	67.7	(63.1, 71.9)	56	12.8	(10.0, 16.2)	81	18.5	(15.1, 22.3)
Next most deprived	478	65.5	(62.0, 68.8)	252	34.5	(31.2, 38.0)	8	1.1	(0.6, 2.1)	470	64.4	(60.8, 67.8)	100	13.7	(11.4, 16.4)	152	20.8	(18.0, 23.9)
Most deprived fifth	646	63.7	(60.7, 66.6)	368	36.3	(33.4, 39.3)	-	-	-	-	-	-	137	13.5	(11.5, 15.8)	231	22.8	(20.3, 25.5)
Cwm Taf HB	1,779	66.2	(64.4, 68.0)	908	33.8	(32.0, 35.6)	23	0.9	(0.6, 1.3)	1,756	65.4	(63.5, 67.1)	361	13.4	(12.2, 14.8)	547	20.4	(18.9, 21.9)
Rhondda Cynon Taf	1,431	66.7	(64.6, 68.6)	716	33.3	(31.4, 35.4)	18	0.8	(0.5, 1.3)	1,413	65.8	(63.8, 67.8)	287	13.4	(12.0, 14.9)	429	20.0	(18.3, 21.7)
Merthyr Tydfil	348	64.4	(60.3, 68.4)	192	35.6	(31.6, 39.7)	5	0.9	(0.4, 2.1)	343	63.5	(59.4, 67.5)	74	13.7	(11.1, 16.9)	118	21.9	(18.6, 25.5)
Other	84	76.4	(67.6, 83.3)	26	23.6	(16.7, 32.4)	-	-	-	-	-	-	16	14.5	(9.2, 22.3)	10	9.1	(5.0, 15.9)

Produced by Public Health Wales Observatory, using CMP data (NWIS), WIMD 2011 (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, Cwm Taf pilot, boys aged 8-9 years, 2012/13

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
Cwm Taf schools	946	65.6	(63.1, 68.0)	497	34.4	(32.0, 36.9)	10	0.7	(0.4, 1.3)	936	64.9	(62.4, 67.3)	198	13.7	(12.0, 15.6)	299	20.7	(18.7, 22.9)
Least deprived fifth	143	74.5	(67.9, 80.1)	49	25.5	(19.9, 32.1)	-	-	-	-	-	-	25	13.0	(9.0, 18.5)	24	12.5	(8.5, 17.9)
Next least deprived	66	57.9	(48.7, 66.6)	48	42.1	(33.4, 51.3)	-	-	-	-	-	-	19	16.7	(10.9, 24.6)	29	25.4	(18.3, 34.1)
Middle deprived	147	67.1	(60.7, 73.0)	72	32.9	(27.0, 39.3)	-	-	-	-	-	-	32	14.6	(10.5, 19.9)	40	18.3	(13.7, 23.9)
Next most deprived	252	62.8	(58.0, 67.4)	149	37.2	(32.6, 42.0)	-	-	-	-	-	-	63	15.7	(12.5, 19.6)	86	21.4	(17.7, 25.7)
Most deprived fifth	338	65.4	(61.2, 69.4)	179	34.6	(30.6, 38.8)	-	-	-	-	-	-	59	11.4	(9.0, 14.4)	120	23.2	(19.8, 27.0)
Cwm Taf HB	908	65.0	(62.5, 67.5)	488	35.0	(32.5, 37.5)	-	-	-	-	-	-	-	-	-	-	-	-
Rhondda Cynon Taf	720	65.5	(62.7, 68.3)	379	34.5	(31.7, 37.3)	-	-	-	-	-	-	-	-	-	-	-	-
Merthyr Tydfil	188	63.3	(57.7, 68.6)	109	36.7	(31.4, 42.3)	-	-	-	-	-	-	-	-	-	-	-	-
Other	38	80.9	(67.5, 89.6)	9	19.1	(10.4, 32.5)	-	-	-	-	-	-	-	-	-	-	-	-

Produced by Public Health Wales Observatory, using CMP data (NWIS), WIMD 2011 (WG)

¹ 95% confidence interval

x To avoid disclosure small numbers (0-4) and some larger complementary numbers have been suppressed.

Report of Year 4 Child Measurement Programme Pilot 2012/13

Key data from the Child Measurement Programme for Wales, Cwm Taf pilot, girls aged 8-9 years, 2012/13

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
Cwm Taf schools	917	67.7	(65.2, 70.2)	437	32.3	(29.8, 34.8)	13	1.0	(0.6, 1.6)	904	66.8	(64.2, 69.2)	179	13.2	(11.5, 15.1)	258	19.1	(17.1, 21.2)
Least deprived fifth	140	74.5	(67.8, 80.2)	48	25.5	(19.8, 32.2)	-	-	-	-	-	-	28	14.9	(10.5, 20.7)	20	10.6	(7.0, 15.9)
Next least deprived	88	73.3	(64.8, 80.4)	32	26.7	(19.6, 35.2)	-	-	-	-	-	-	12	10.0	(5.8, 16.7)	20	16.7	(11.1, 24.3)
Middle deprived	155	70.5	(64.1, 76.1)	65	29.5	(23.9, 35.9)	-	-	-	-	-	-	24	10.9	(7.4, 15.7)	41	18.6	(14.0, 24.3)
Next most deprived	226	68.7	(63.5, 73.5)	103	31.3	(26.5, 36.5)	-	-	-	-	-	-	37	11.2	(8.3, 15.1)	66	20.1	(16.1, 24.7)
Most deprived fifth	308	62.0	(57.6, 66.1)	189	38.0	(33.9, 42.4)	-	-	-	-	-	-	78	15.7	(12.8, 19.2)	111	22.3	(18.9, 26.2)
Cwm Taf HB	871	67.5	(64.9, 70.0)	420	32.5	(30.0, 35.1)	-	-	-	-	-	-	-	-	-	-	-	-
Rhondda Cynon Taf	711	67.8	(65.0, 70.6)	337	32.2	(29.4, 35.0)	-	-	-	-	-	-	-	-	-	-	-	-
Merthyr Tydfil	160	65.8	(59.7, 71.5)	83	34.2	(28.5, 40.3)	-	-	-	-	-	-	-	-	-	-	-	-
Other	46	73.0	(61.0, 82.4)	17	27.0	(17.6, 39.0)	-	-	-	-	-	-	-	-	-	-	-	-

Produced by Public Health Wales Observatory, using CMP data (NWIS), WIMD 2011 (WG)

¹ 95% confidence interval

x To avoid disclosure small numbers (0-4) and some larger complementary numbers have been suppressed.

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