



Developing the Public Health Observatory for Wales

Datblygu Arsyllfa Iechyd y Cyhoedd i Gymru

Measuring childhood heights and weights in Wales

**Report to the Welsh Assembly
Government to inform the Minister
for Health and Social Services on
the findings from a study to explore
the feasibility of a national
measurement programme and
recommendations for future rollout
across Wales**

APPENDICES

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Appendix 1. Steering Group Membership – Feasibility Study Monitoring Childhood Heights and Weights in Wales

Objectives:

1. To agree the protocol for the feasibility study of childhood height and weight monitoring in Wales
2. To advise on the implementation of that protocol
3. To provide expert input into final recommendations

Membership:

Association of Head Teachers, Susan O'Halloran (initially), later Cheryl Weldon

Child Health System Mgr, NHS Trust, Chris Moulds

Community Dietetic Manager, Sian Beddoe, later Andrea Basu

Health Information Analysis Team, NPHS, Nathan Lester

Health Intelligence (Director), NPHS, Dr Judith Greenacre

Health Intelligence, NPHS, Dr Ciarán Humphreys

Health Promotion Specialist, NPHS, Christian Heathcote-Elliot

Healthy Schools, Lynne Perry

National Community Child Health Database, Louise James

North East Wales NHS Trust School Nursing Services, Lesley Taylor

North Glamorgan NHS Trust School Nursing Services, Susan Jones

Pembrokeshire & Derwen NHS Trust School Nursing Services, Anne Farr

Powys Teaching LHB School Nursing Services, Sandra Jones

Paediatrician, Gwent Healthcare NHS Trust, Dr John Barton

Study Researcher, NPHS, Thriveni Beerenahally

Swansea NHS Trust Health Visiting Service, Helen Jones

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Swansea NHS Trust Health Visiting Service, Paula Davies

Swansea University, Prof Rhys Williams

Wales Centre for Health, Susan Mably (Until January 2009)

Welsh Assembly Government, Chris Roberts

Welsh Assembly Government, Chris Tudor Smith

Welsh Assembly Government, Sue Bowker

Chair:

Dr Judith Greenacre, National Public Health Service for Wales

Deputy Chair: Prof Rhys Williams, Swansea University

Frequency of meetings

To meet approximately two monthly

15 January 2008; membership updated May 2009

Appendix 2. Letters to parents: 'A: Opt-out', 'B: Opt-in', Results of feedback

Below are examples of the standard letters used in the case where parents were being offered the opportunity of receiving the results of measurements by letter. These were accompanied by an information sheet about the study.

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**Standard 'opt out' letter with option to receive results of measurement
(North Wales)****Wales Childhood Heights and Weights Measurement and European Childhood
Growth Surveillance Initiative**

Please complete form 1 if you *do not* wish your child's height and weight to be measured.

Form 1. I do not wish my child to be measured

I, (insert name) _____ having read and understood the objective of the height and weight measurement initiative, do not wish my child to participate in this project and the data collected (not including any personal details) to be used for further analysis by the National Public Health Service for Wales and the World Health Organization, because (please insert reason)

.....

.....

Signature:

Child's name:

Child's date of birth:

Child's class:

Child's school:

Form 2. I wish to receive my child's results

I, (please print name) _____ do wish to receive the measurement results taken for my child as part of the Wales Childhood Heights and Weights Measurement and European Childhood Growth Surveillance Initiative.

Child's name:
.....

Child's school:.....

Child's date of birth:

Parent/guardian signature:
.....

I want my child's measurement results sent to me at this address (please print):

Address:

.....

.....

Postcode:

A

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**Standard 'opt in' letter with option to receive results of measurement
(North Wales)**

Date:

Dear parent/guardian,

The North Wales (east) School Nursing Service will be visiting your child's school to measure the heights and weights of children in Year 4. This is part of a pilot project taking place in your area coordinated by the National Public Health Service for Wales, working with the Welsh Assembly Government and the World Health Organization. The information will be used to understand growth patterns of children in Wales. Results will help the Welsh Assembly Government to decide on the best way to monitor the growth of the children of Wales for the future, to promote child health and wellbeing across Wales.

All measurements will be taken sensitively by appropriately trained staff. Where possible children will not be weighed and measured in front of their classmates and boys and girls will be measured separately. It will not be necessary for your child to undress. However, they will be asked to wear normal light clothing and take off their shoes.

The data will be held confidentially by North Wales NHS trust. Information will be transferred to the World Health Organization; however, it will not be possible to identify your child personally in any information transferred by the Trust.

If you **wish** your child to participate in this project, please complete the attached form. Your child can then return this to his/her teacher.

If we have not received a signed form back from you bywe will assume you **do not** wish your child to participate in this project.

We will **not** send the results of the measures back to you as a matter of course. If you **do wish** to receive these results please indicate this on the form.

If you have any concerns about the project or would like further information please do not hesitate to contact: Lesley Taylor School Nurse Clinical Lead on [REDACTED]

Yours Sincerely

Lesley Taylor
School Nurse Clinical Lead
North Wales NHS Trust

Dr Ciaran Humphreys
Consultant in Public Health &
Health Intelligence
National Public Health Service for Wales

Form: Consent for measurement

I, (please print name) _____ having read and understood the objective of the height and weight measurement initiative, want my child to participate in this project and I am happy for the data collected (not including any personal details) to be used for further analysis by the National Public Health Service for Wales and the World Health Organization.

Signature:

Child's name:

Child's date of birth:

Child's class:

Child's school:

The results of the measurement will not routinely be sent out to parents. However, **if you wish to receive the results** of the measurements please indicate this by marking the relevant box & completing the details below:

I **do wish** to receive the results of the measurement (please tick if relevant): ☐

I want my child's measurement results sent to me at this address (please print):

Address:

.....

.....

Postcode:

B

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Standard letter for supplying results to parents (Hywel Dda)

Date:

Results of your child's measurements

Dear Parent / Guardian:

Thank you for letting your childtake part in the childhood height and weight measurement feasibility study coordinated by the National Public Health Service for Wales. You have asked for your child's results.

This letter gives your child's height and weight measures and also a measure called the BMI (body mass index) percentile. The BMI percentile is calculated using height, weight, age and gender. This can be used to tell whether a child is underweight, of normal weight or overweight.

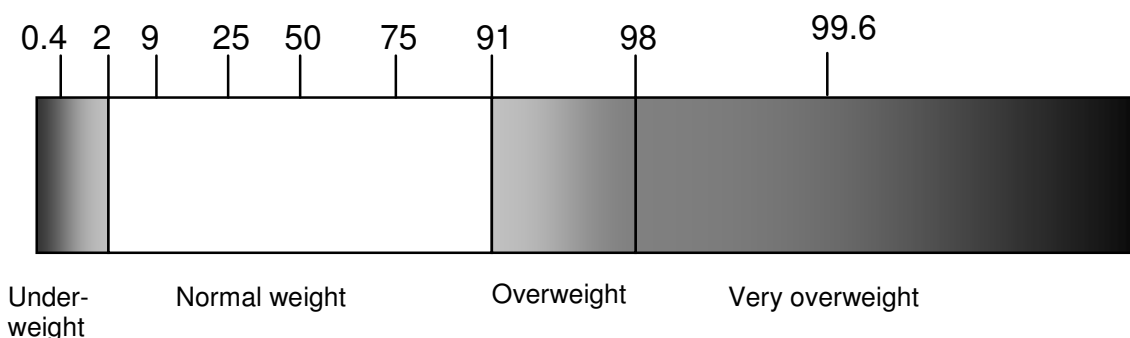
Overweight children are more likely to become overweight or obese adults. Obesity may lead to health problems such as type 2 diabetes, high blood pressure and heart disease. Sometimes a BMI percentile may be high because a child is particularly muscular, rather than due to too much body fat.

Some children are underweight and perfectly healthy. But, for some children, being underweight can be a sign of health problems.

Your child's result:

Your child wascentimetres tall and weighedkilograms, which gives a BMI of this corresponds to a BMI percentile as shown below.

Your child's BMI percentile (arrow)



Although these measures may be used, with others, as part of an assessment of the health of your child, their main purpose is to increase our understanding of the growth patterns of children in Wales.

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What should you do?

If you would like more information about these results or managing your child's weight please ring the NHS Direct dedicated support line on 0300 1000 00 09 (cost of a local call) Monday to Friday, 8am - 6pm or go to www.nhsdirect.wales.nhs.uk/BMI.

As always, if you have further concerns about your child's health, contact a health professional such as your school nursing service, health visitor, GP, or other service such as the general NHS Direct Wales line (0845 46 47).

Thank you

Anne Farr

School Nursing Service
Hywel Dda NHS Trust

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Appendix 3: Cost assessment

Cost analysis of the Feasibility Study Measuring Childhood Heights and Weights.

Authors: Sharon Hillier Specialty, Registrar in Public Health and Ciarán Humphreys, Consultant in Public Health/Health Intelligence, NPHS

June 2009

1.1 Introduction

1.1.1 The task

To estimate the financial cost of implementing the feasibility study measuring childhood heights and weights in the pilot areas in Wales.

To estimate the costs of implementing a quality assured All-Wales programme of measuring childhood heights and weights.

1.1.2 Background

A pilot study was set up in five geographical defined areas in Wales to investigate if it was feasible to undertake a childhood heights and weights study that would provide data suitable for surveillance. The five areas were representative in terms of type of setting in Wales, as they ranged from rural to urban settings. All state schools located within the five areas were included, except Swansea, where 60 of the 86 schools were included. The pilot areas are detailed below:

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Pilot Area	Type of Area	Description
Pembrokeshire	Rural	formerly covered by Pembrokeshire & Derwen NHS Trust, now a part of Hywel Dda NHS Trust
Flintshire and Wrexham	Urban Towns	formerly covered by North East Wales NHS Trust now a part of North Wales NHS Trust
Powys	Rural	covered by Powys Teaching LHB
Merthyr Tydfil and the Cynon Valley	Post industrial Valleys	formerly covered by North Glamorgan NHS Trust, now a part of Cwm Taf NHS Trust)
Swansea	Urban	formerly covered by Swansea NHS Trust, now a part of Abertawe Bro Morgannwg University NHS Trust

All pupils identified by the schools in reception year (age 4-5) and year 4 (age 8-9) were included in the study. For the reception year the current method of consent was used and letters were sent to parents by the school/community nursing service. However in year 4 there was a random allocation of schools into Group A (these were sent a standard opt-out letter) and Group B (these were sent a standard opt-in letter). The measurement assessment took place in the school by the trained assessors and was carried out in a private room or a private screened area.

1.2 Method

1.2.1 Costing of visits to undertake measures

For each school a school return form was completed usually by school staff in advance of the visit by the assessor and returned to the research officer. After each visit to a school a workload form was completed by the staff undertaking the visit and returned to the research officer. The workload form was entered onto an access database by staff at Swansea University and the data was analysed.

1.2.2 Other staff work load

Information on workload for the regional co-ordinators and time spent by staff managing the school visits and data entry was obtained by the co-ordinators completing a questionnaire at the end of the study and this was collated by a member of the team.

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1.2.3 Numbers of children registered and measured

Numbers of children were based on the numbers of children taken from the National Community Child Health Database and presented elsewhere in this report.

1.2.4 Data validation

Once most of the data from the individual pilot areas had been collated the preliminary costs were presented to the members of the steering group to ensure that the estimates were reasonable. Where concerns were raised these estimates were reviewed by those supplying the estimate.

1.3 Results

1.3.1 Local (Health Board/Trust) costs

Staff time organising measurements, entering data, providing results to parents and other related activities

Table 1 Time spent organising the activity for example collating and distributing letters, organising school visits, responding to concerns, producing list, updating information.

	Measuring		Providing results		Children health system entry		Other		Total cost (cost of staff * time)
	Staff Grade	Number of days (WTE)	Staff Grade	Number of days (WTE)	Staff Grade	Number of days (WTE)	Staff Grade	Number of days (WTE)	
Pembrokeshire	3	14	7	4	2	20.0	7	4	£4,799
	2	3	2	3					
Flintshire and Wrexham	3	64	Not provided		Estimated as 50p per entered record (n=4806) = £2,403		7	11	£10,225
Powys	3	52			4	3.5	8b	3	£6,708
					3	8.0			
					2	1.6			
Merthyr Tydfil and the Cynon valley			8a	4	4	9			£2,895
			6	1.5	3	9			
Swansea	5	2			6	5.0	7	1	£8,020
	3	21.2			3	2.1	5	13	
					2	38.9			

Note: WTE = whole time equivalent. Hours in a working day = 7.5. Cost taken as proportion of salary where number of annual leave days: 27 + 8 bank holidays.

When more than one member of staff at same grade total number of days is for all staff at that grade.

Costs is Agenda for Change pay band (as of April 2009) midpoint of scale used and has on-cost (22%) included.

This does not include time on 'research' activities, such as contributing to protocol development.

Table 2 Costs of stationary and postage.

Pilot Area	Cost
Pembrokeshire	
Flintshire and Wrexham	
Powys	£50
Merthyr Tydfil and the Cynon Valley	£400
Swansea	£41

1.1.1 Cost analysis of school visits to take measurements.

Table 3 Travelling Costs

Pilot Area	Number of Schools	Number of visits to schools	Total Mileage	Cost of travel (total miles * cost per mile)
Pembrokeshire	62	125	1327	£663.5
Flintshire and Wrexham	154	117	922	£461
	#Adjusted by 31.62% as database not complete	154	1,214	£607
Powys	107	112	2020	£1010
Merthyr Tydfil and the Cynon Valley	54	131	1063	£531.5
Swansea	63	118	610	£305

Mileage costs per mile= 50 pence

Table 4 Time associated costs (travel and measuring time)

Pilot Area	Grade of staff undertaking most of measurements	Total time spent travelling (hours)	Total time spent at the schools (hours)	Cost of time (total hours x cost per hour)
Pembrokeshire	3	80.36	159.25	£2,883.4
Flintshire and Wrexham	3	27.55	61.92	£1,076.7
	*Adjusted by 31.62% as database not complete	36.26	81.50	£1,417.1
Powys	3	88.13	85.63	£2,091.0
Merthyr Tydfil and the Cynon Valley	3	20.77	59.90	£970.8
Swansea	3	22.12	216.80	£2,875.1

*Interrogating the workload database revealed that there were less workload forms than schools for Flintshire and Wrexham. To take this into account the time and travel costs were adjusted to one visit per school (increased by 31/62%)

Costs is Agenda for Change pay band (as of April 2009) midpoint of scale used and has on-cost (22%) included

Staff time giving results to parents

Two of the three areas that provided results to children gave an estimate of the staff time involved in providing these results. The costs of this staff time were:

- £980 in Pembrokeshire where results were supplied to 421 families, or £2.33 per letter (95p per child measured in this instance) to
- £1,134 in Cwm Taf where results were supplied to 601 families, or approximately £1.89 per letter (105p per child measured in this instance).

Costs in relation to activity

Table 7. Estimated cost of school visits per 1,000 children measured by area

	Area type	Staff time at school*	Staff time travelling*	Travel expense *	Total	Number of children measured	Cost per 1,000 children measured
Pembrokeshire	Rural	£1,916	£967	£664	£3,547	2077	£1,708
Flintshire & Wrexham unadjusted		£745	£332	£461	£1,538	4806	£320
Flintshire & Wrexham adjusted#	<u>Urban/mixed</u>	£981	£436	£607	£2,024	4806	£421
Powys	Rural	£1,030	£1,061	£1,010	£3,101	2051	£1,512
Merthyr and Cynon valley	Post industrial valleys	£721	£250	£532	£1,502	2331	£644
Swansea	Urban	£2,609	£266	£305	£3,180	2867	£1,109

* Estimated from visit workload form; †From Table 1.

Increased by 31.62% as database not complete. Interrogating the workload database revealed that there were less workload forms than schools for Flintshire and Wrexham. To take this into account the time and travel costs were adjusted to one visit per school.

Table 8. Estimated cost of height and weight data entry per child registered*/measured

	Staff time, data entry	Number registered	Cost per 1000 children registered	Number measured	Cost per 1000 children measured
Pembrokeshire	£1,575	£2,452	£642	2077	£758
Flintshire & Wrexham	£2,403	£0		4806	£500
Powys	£1,217	£2,619	£465	2051	£593
Merthyr and Cynon valley	£1,761	£2,552	£690	2331	£755
Swansea	£4,028	£3,725	£1,081	2867	£1,405

*Data entry may include updating information on children not measured.

Table 9. Other costs per child measured

	Other staff costs associated with organising measurements *	Other staff costs*	Additional stationary/postage costs	Total other costs	Children measured	Other costs per 1000 children measured
Pembrokeshire	£1,500	£744	£0	£2,244	2077	£1,080
Flintshire & Wrexham	£5,776	£2,046	£0	£7,822	4806	£1,628
Powys	£4,693	£798	£50	£5,542	2051	£2,702
Merthyr and Cynon valley	£0	£0	£400	£400	2331	£172
Swansea	£2,166	£1,826	£41	£4,033	2867	£1,407

*From Table 1

Summary of local costs and adjustments for a future programme

Costs by area, excluding costs of feedback of results to families

	School visits	Data entry	other	Total	Total per 1,000 children measured
Pembrokeshire	£3,547	£1,575	£2,244	£7,365	£3,546
<i>Flintshire & Wrexham Unadjusted</i>	<i>£1,538</i>	<i>£2,403</i>	<i>£7,822</i>	<i>£11,763</i>	<i>£2,448</i>
Flintshire & Wrexham Adjusted	£2,024	£2,403	£7,822	£12,249	£2,549
Powys	£3,101	£1,217	£5,542	£9,859	£4,807
Merthyr and Cynon valley	£1,502	£1,761	£400	£3,663	£1,571
Swansea	£3,180	£4,028	£4,033	£11,241	£3,921

Note: This does not include time on 'research' activities, such as contributing to protocol development.

Table 10. Costs per 1,000 children for school visit by urban/mixed or rural

	School visit costs	Adjusted to account for additional return visits*	Further adjusted estimate for year 4 as an 'additional measurement' [†]	Estimate of costs for reception, as a 'baseline measurement' [‡]
Median of 5 pilot sites	£1,109	£1,775	£1,127	£2,423
Urban/mixed (Flintshire and Wrexham, Merthyr and Cynon Valley, Swansea) average	£725	£1,160	£828	£1,491
Rural (Pembroke, Powys) average	£1,610	£2,576	£1,429	£3,723

Based on Table 7.

* Return visits were not undertaken by most Trusts to measure children missed on the first visit due to time limits. An increase of 60% on cost of visits has been applied to account for these extra visits that would be anticipated in a future programme.

† Whole population measurements for year four would usually take place on the same day as reception year measurements. Cost of travelling for year four has been reduced to 20% to account for this. Cost of time spent at the school is unchanged (different factors might increase or decrease this time).

‡ This is intended to estimate the cost of undertaking reception year measures without undertaking year four measures. It has been assumed an equal number of years four and reception year pupils are measured; in this study 45% of those measured were year 4; 55% were in reception year.

Table 11. Cost per 1,000 children for other activities (excluding giving results to parents)

	Data entry	Other	Total	Data entry including additional data entry for European study (year 4)	Total year 4
Median	£755	£1,407	£2,162	£906	£2,313
Minimum	£500	£172	£672	£600	£772
Maximum	£1,405	£2,702	£4,170	£1,686	£4,338

Based on Table 8 and Table 9. Additional data entry items for participation in European Childhood Obesity Initiative, year 4, accounted for by a 20% increase in cost of data entry.

Table 12. Estimated cost per 1,000 children measured

	Reception alone	Year 4 additional	Average cost for a combined reception/year 4 programme
Rural minimum	£4,395	£2,200	£3,297
Rural maximum	£7,830	£5,816	£6,823
Urban/mixed minimum	£2,163	£1,600	£1,882
Urban/mixed maximum	£5,598	£5,216	£5,407

Based on Table 10 and Table 11.

Additional administrative costs may be incurred on Trusts in checking the school register for year 4 pupils. This may not be currently undertaken by Trusts.

1.3.2 Additional costs to consider to support a national programme in Wales.

Equipment costs and training costs based on this study

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Per set of equipment: weighing scales, height measure and carry bag = £264 + VAT. Based on equipment utilisation in this study, approximately one set per 800 children measured or 1.25 per 1,000 children would be required.

Annual calibration per set of equipment = £60

Training session on taking measurements for approximately 20 individuals (accommodation, trainer, room booking) = £1,771.97

Cost of creation of new screen with data entry items on the Child Health System 2000 by Health Solutions Wales; approximate estimate: £2,500-£3,000¹.

Costs of letters and support information

The above figures do not include costs of production and translation of letters or information sheets for parents or children, or any material for providing results of measurements to parents.

1.3.3 Proposed costs for implementing the programme across Wales

Below are proposed costs of implementing key central aspects of a national programme. This is based on a programme including year four. These would be lower if year four was not included.

All-Wales level staff costs To maintain a quality assured national measurement programme with maintenance of surveillance database and production of annual report.	
Steering Group ; membership taken to be part of existing role so no additional staff costs included.	
Programme Lead - Consultant in Public Health Role: Responsibility for programme, Quality assurance, Reviewer of annual report Time: 1 session per week	Grade 8d/Consultant salary scale £8,550
Programme Manager- Role – operational manager for programme, quality assurance processes, writing annual report, training	Grade 7 £41,980

¹ Verbal estimate

Full time	
Database managers/ Data analysts Role – managing database for surveillance, quality assurance, assistance with data collection queries, analysis of data for annual report Full time	Grade 6/7 £38,568
Administrative support Role – coordinating meetings, supporting business activities, data entry of European school return forms and other administrative support for programme 0.4 Whole time equivalent.	Grade 4 £23,784
Regional Level, likely employer: Health Board (NHS Trust); most of costs have been accounted for within Trust level estimates	
Regional Co-ordinator (nurse manager) Role – co-ordination of programme in region, liaising with schools, operational issues, reporting to programme level 0.4 WTE per area	Grade 7
Assessors Role – liaising with school, obtaining consent, undertake measurements of children Full time/part time	Grade 3

Salary based on midpoint of salary scale and 22% on costs.
Other non-staff resources would depend on the hosting organisations involved.

1.4 Discussion

1.4.1 Costs analysis for the feasibility study

The results show that the estimated costs of measurement at a Trust level per 1,000 children measured ranged substantially from approximately £2,500 to £4,807 across the pilot areas (excluding cost of feedback). The costs of school visits per child measured were over double that in rural areas than urban/mixed areas. This is likely to be primarily related to the greater distances involved, but may also be related to high proportions of small schools. The estimation of other costs varied substantially. Depending on the

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estimate of other costs rurality is likely to increase costs for local aspects of a measurement programme by between 26 and 75%.

There was also variation in the grade of staff undertaking some of the roles and this affected the cost calculated.

Costs are mostly presented per 1000 children measured; these will be higher than the cost per 1000 children registered; both costs would be affected by the uptake rate.

It is impossible to accurately separate out the costs of measurement in reception year and year four. Whereas measurement of children in reception year is likely to take longer than those in year four, participation in European Surveillance involves collection of additional data items including a 'school return form'. An estimate of the cost of school visits if measurements were undertaken in reception year alone, and the additional cost of measurement when year four is also included are provided.

1.4.2 Cost implications of introducing a national programme

1.1.2 Reception year

Currently the heights and weights of reception or year one children are measured across Wales by NHS Trusts and therefore implementation of this feasibility study would not have a significant additional cost for this reception year age group (as a 'once-off' Trusts currently measuring in year one may have to do an additional measure in this age group to avoid a year missing the local height and weight measurement programme).

The main additional costs for this age group would include purchasing equipment, training and ongoing equipment calibration costs.

1.1.3 Year 4

A population approach to measuring year 4 by NHS Trusts/Health Boards would incur additional costs.

The analyses suggests that the cost of school visits for a joint reception year/year 4 measurement programme might be only about a third higher than a reception year programme alone (due to a reduced average cost per child measured); however, data entry costs per child measured would be expected to increase. Combining these effects the average cost per child measured appears lower when year four is added onto a programme measuring reception year; however, the effect is greater in more rural areas and areas with lower estimated data entry costs.

Substantial staff time is spent in organising the measurements, as well as undertaking measurements and entering data. This needs to be reflected in the cost if the programme is implemented across Wales.

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As costs of data entry on the child health system substantially impact the overall cost, ensuring that data processing was as efficient as possible would reduce overall cost. Entering all of the data on one screen which also had instructions would reduce the time taken and this would need input from Health Solutions Wales.

Costs were estimated for providing results to parents by two areas; the costs were estimated at around £2 in staff time per letter produced. It is anticipated that in a future programme any decision to routinely offer results would be accompanied by the development of a system to produce automated letters for families which would be expected to substantially reduce these costs. However, the initial outlay required to produce such a system would require further exploration.

Costs estimated here are on the basis of a population approach to year 4 measurement. If a sampled approach were taken the costs would be substantially reduced as the number measured would be 2,800 every two years rather than an estimated 34,800 children annually in year 4 across Wales. However, this sampled approach would require a separate organisation process outside of the remit of the Trusts/Health Boards, and would therefore need separate funding.

1.4.3 Limitations of the data

The data estimates for time spent on managing the study were estimated retrospectively and more accurate estimates might have been made if this had been collected prospectively.

The time taken for measurements at the school also included other tasks at some of the schools such as year one screening and vision screening. There were also several occasions that the children were in assembly or break-time and the staff had to wait; however, such delays are to be expected within any national programme that is rolled out.

There is considerable variation across the pilot areas for time spent on some of the tasks and this may relate to differences in approaches to estimation as well as true differences.

It was not possible to empirically assess the impact of year 4 as an additional measure above and beyond reception year measurements. The factors used to adjust the measures are subjective.

1.4.4 Strengths of the data

The time taken for travel and undertaking the measurements were recorded concurrent to these activities and therefore should be an accurate account. The co-ordinators of the different pilot areas organised the data return and ensured that it was realistic as they understood how the project had worked in their area. The data was entered into a database and this enabled prompt analysis.

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Once the data had been collected across the different pilot areas the findings were presented to the co-ordinators, as a group, and feedback was sought to ensure that the overall results were reasonable and consistent.

The pilot areas were diverse in their populations, geography and staffing structures and undertaking the study in these different areas added to the knowledge of issues that would enable good practice and highlighted any potential problems.

1.5 Recommendations

The cost analysis identified that staff needed to be adequately resourced in terms of time spent organising the study. Some of these costs will be for central coordination and running of the programme some will be local in particular for organising and taking measures, and for data entry. There was a variation in time spent entering the data on the child health system across the pilot areas and the data entry needed to be improved by developing one screen in which to enter the data. If feedback is to be offered to the parents then an automatic generation of the feedback is essential to reduce staff time.

If an All-Wales programme is implemented it is important that a quality assured national measurement programme is resourced with maintenance of surveillance database and production of annual report.

Appendix 4: Qualitative Study

Feasibility study measuring childhood heights and weights in Wales

Qualitative interviews – methods, results and recommendations

Summary – context and methods

- 1 Semi-structured interviews were conducted with parents, staff and children as part of the feasibility study measuring childhood heights and weights in Wales.
- 2 These interviews were carried out by researchers based at Swansea University and were scheduled over two weeks in May, 2009, at varying times after the measurement of children had taken place. All parents interviewed were parents of children who had been measured, the staff were of varying grades and had a variety of roles within the measuring programme and all children had participated in the programme.
- 3 There were 10 interviews of parents (8 mothers interviewed alone, one father interviewed alone and one couple interviewed together). There were 12 interviews of staff and 10 with children (1 in the Reception year and 9 in year 4).
- 4 All interviews were recorded, transcribed and analysed according to standard qualitative research methods.

Summary – main results – parents and staff

- 1 There was ambiguity in parents' comments about their understanding of the purpose of the measurements in that, although most were clear that the purpose was population monitoring or surveillance, these same people also regarded the results as of at least potential value with regard to the health of the individual child.
- 2 This ambiguity was also present amongst staff - an awareness that you can't separate out the identification of problems in individual children (which they are used to doing and which have implications for follow-up) from a population study.

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- 3 All the parents who took part in the interviews had consented to their children being measured, though when asked they were not always entirely clear that this had happened. However, in general parents did not seem to consider the issue of consent as problematical. There was a sense from many that measuring a child was a routine part of what happened at school, and one which they were quite familiar with already. Many gave considered responses to this question, discussing issues such as differences in response rates according to opt-in and opt-out models.
- 4 Staff, on the other hand, were more concerned with issues related to consent. There were mixed view points including anxieties about the risks associated with opt-out; concerns that the opt-in approach might generate bad feeling in parents – because, for example, follow up letters were sent if people didn't respond within a certain time.
- 5 In terms of suggestions for future programmes: some parents were interested in what use the Assembly was intending to make of the results and feedback would have been appreciated to see where their children kind of fitted into “the national average.”
- 6 Staff had enjoyed being involved though many reported that the programme was more work than anticipated. Providing feedback was particularly time-consuming and the process was too rushed. Senior staff had less time to spend on their core duties.
- 7 Children rarely told their parents that the measuring sessions had taken place. Parents regarded this as a good sign – that their children had not been troubled by the experience. However, staff commented that children had often been engaged and interested in the measuring (and had sometimes, on their own accord, declined to be measured) and emphasised the role of the child in the process.
- 8 A number of suggestions for modification of the programme were made by staff. A request made by some parents was for knowledge of what use was being made of the population level results.

Summary – main results – children

- 1 All of the children remembered being weighed and measured and most (though not all) knew that this was going to happen. None of the children knew why they were being measured although they did offer suggestions.

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- 2 There appeared potential for children to worry about that might happen to them as a result of their measurements.
- 3 The way in which the children had received information about their participation was inconsistent. It seems that even if the children were given information about the initiative they had not understood it fully or been given the opportunity to provide informed consent. The children knew very little about the staff who were taking the measurements.
- 4 The children were unclear about the information provided for parents, with one child commenting that their parents consented to them taking part in the weighing and measuring “because she thinks I am over weight”. Another parent had suggested to the class teacher that perhaps their child had been chosen because they were Polish.
- 5 Many children were comfortable with their experience in general, although a similar proportion of children were not. Even the children who had said they were happy or comfortable with the process were able to suggest ways that it might be improved. These suggestions related to privacy, being taken to a ‘holding area’ and being accompanied by a familiar adult.
- 6 A number of the children made reference to being ‘the wrong size’ or wanting feedback on whether they were the ‘right’ size. Although for the majority of the children in this sample, the parents had received the results it would appear that these were not communicated to the children. It would seem reasonable that children who had consented to having their measurements taken be given this opportunity.

Recommendations – arising from the interviews with parents and staff

- 1 The manner in which the purpose of the measurements was explained to parents and to staff should be re-examined. Their purpose as population monitoring measures should be clarified as necessary but there need to be a realistic expectation that ambiguity in relation to this may still persist.
- 2 The workload implications of any future programme must be carefully thought through and resourced. Particular attention needs to be paid to the workload implications of providing feedback to parents.
- 3 The design of a national programme for measuring children’s heights and weights needs to take full account of the suggestions of staff and parents made in relation to this feasibility study.

Recommendations – arising from the interviews with children

- 1 Ensure children and parents are properly informed about the process, ask parents and teachers to inform children about what will happen and crucially, why.
- 2 Ensure that the staff conducting the weighing and measuring tell the children who they are, what their role is and remind the children what is happening.
- 3 Take children individually to the weighing and measuring room rather than in a group and take them directly from the classroom rather than from a 'holding area'
- 4 Allow children to be accompanied by someone who is familiar to them if they wish
- 5 Give children the right to know their height and weight at the time of measuring if they wish

1 Protocol

The protocol for this feasibility study contains the following statements relating to the qualitative part of the study:

[sub-section 7.4] A sub-sample of these children and their parents are to be included for qualitative assessment of the process. The parents/guardians of five children from each Trust will be identified by the pilot area coordinator and should represent a purposive sample of parents in different arms of the study.

[Section 21] After the measuring process is complete each participating Trusts [sic] shall identify families to invite for interview from the measurement initiative. This shall be a purposive sample including at least two families who requested results of the measurement process and at least two families who did not request results of measurement processes and include representation from both reception year and year 4.

21.1 Interviews with parents will cover:

- their understanding of the purpose of a national programme of measurement
- how acceptable they found the pilot programme (purpose and implementation)
- their reasons for requesting/not requesting results
- If they requested results:
 - their satisfaction with the format of the results

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- what, if any, action they took following receiving the results
- any other support they would like to receive on getting results
- any suggestions they may have for a future programme

21.2 The research officer will work with Children in Wales to develop suitable formats to gather views from children in selected families including:

- what they understand about the programme
- how they found the taking of the measurements
- if their parents got results: do they know did their parents get results what happened and what did the children think of this?
- any suggestions they have for a future programme

21.3 The researcher will also undertake interviews with staff from the Trust sites, to include fifteen interviews of at least two staff members from each Trust covering both school/community nursing staff and staff working with the Child Health System to cover a range of grades involved in the programme.

- Their understanding of the purpose of a national programme
- How acceptable they find this purpose
- Their opinion on the running of the pilot including different aspects of implementation
- Their opinion on how results are supplied to parents
- Any suggestions for a future national programme

2 Researchers involved in the qualitative part of the feasibility study

The following individuals have contributed to the study design, interview scheduling, data collection, interview transcription, data analysis and report writing: [additional names will be required]

Parent and staff interviews – study design: Frances Rapport, Angela Evans, Alison Porter and Rhys Williams (CHIRAL Research Group), Thriveni Beeranahally, Ciaran Humphreys, Angela Jones and members of the Feasibility Study Advisory Group.

Parent and staff interviews – interview scheduling: Ruth Gould

Parent and staff interviews – data collection: Jenny Blackmore, Angela Evans, Garry Rutter, John Thomas and Trish Thomas.

Parent and staff interviews – interview transcription: Gaynor Demery, Christine Foley, Adele Herson (of 'Adele's typing works').

* CHIRAL = Centre for Health Information, Research and Evaluation, Swansea School of Medicine

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Parent and staff interviews – data analysis: Alison Porter and Rhys Williams

Children's interviews ("Consulting Children") – study design: Rhys Williams Thriveni Beerenahally, Ciaran Humphreys, Angela Jones, Justine Howard, Helen Elton, Dawn Alderson and Pete King

Children's interviews – interview scheduling, data collection, interview transcription, data analysis and report writing: Justine Howard, Helen Elton, Dawn Alderson and Pete King

3 Selection of subjects for interview

3.1 Parents

The goal was to engage two families in each of the five pilot areas, one family being from a school in a deprived area and one from a school not in a deprived area. Half of the families contacted had children attending small schools and half had children attending large schools. Within Powys, the aim was to include one family with a child attending a Welsh-medium school. The assumption was made that only 25% of the families contacted would agree to take part so that four times the required number of families were contacted.

Staff in each pilot area were asked to identify 16 families from year 4 for the parent interviews, using the following criteria:

Table 1: Summary of parent breakdown invited for interview.

	Deprived Area	Not Deprived Area
Sent 'Opt-in' letters	<ul style="list-style-type: none"> - 4 parents that did not request results. - 4 parents that did request results. 	<ul style="list-style-type: none"> - 4 parents that did not request results. - 4 parents that did request results.
Sent 'Opt-out' letters	<ul style="list-style-type: none"> - 4 parents that did not request results. - 4 parents that 	<ul style="list-style-type: none"> - 4 parents that did not request results. - 4 parents that

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	did request results.	did request results.
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Within this selection they were asked to include:

- 8 families from large schools
- 8 families from small schools
- 1 Family from a welsh school that had received results.

3.2 Children

For the Consulting Children element, the NPHS project team used a purposive sample. This was selected to be representative of area, whether or not parental feedback had been requested and age (both reception and year 4). Using this approach it was anticipated that 16 children would be interviewed for the evaluation, but some parents did not return consent letters and others returned them too late for their child to be included. This resulted in a sample of 10 children. 9 children were from year 4 (aged 8 years) and 1 child was in reception (aged 4 years), 8 of the participants were boys and 2 were girls. The table below summarises the sample. As can be noted from the table, Powys was not represented.

Table 2 Summary of the sample – Consulting Children

Area	No. children	Age
Pembrokeshire	2	1 x 4 years 1 x 8 years
Cwm Taf	2	8 years
North Wales	5	8 years
Swansea	1	8 years

3.3 Staff

The following staff members were contacted with invitations to be involved in the interviews:

Table 3 – staff members invited for interview

Pilot area	Staff members invited
Pembrokeshire	Pilot Area Coordinator Data Input Clerk
Cwm Taf	NNEB staff member Senior Nurse (not employed specifically for the project) Admin support worker
North Wales	Head of Nursing (overseeing the project) School Nurse Clinical Lead Data Input Clerk
Powys	Head of Health Visiting / School Health Nursing & Community Paediatrics Senior Child Health Administrator Health Care Support Worker
Swansea	School /Clinical Nurse Health Care Support Worker Manager of the Child Health data input staff

This report summarises the findings from twelve staff interviews. The staff concerned are summarised in table 4.

Table 4 – staff members interviewed

Pilot area	Staff members interviewed
Pembrokeshire	
Cwm Taf	
North Wales	

Powys	
Swansea	

Child Health or Child and Adolescent Mental Health Administrator (2); Senior Administrator (1); health visitor team support (1); School Nurse (4); Clinic Support Worker (1); Senior Nurse for Flying Start (1); Nursery Nurse (1)

4 The interview process

4.1 Parents and staff

Parent and staff interviews were carried out according to agreed schedules, reproduced in full as Appendices 1 (parents) and 2 (staff). Interviews were carried out in the parents' homes. There were 10 interviews - 8 mothers interviewed alone, one father interviewed alone and one couple interviewed together. All interviews were recorded and transcribed verbatim.

4.2 Children

Since the interviews with children formed a particularly important and sensitive element of the study, the methods employed for this are included in some detail. The methods were formulated by the research team led by Justine Howard of Swansea University's Centre for Child Research. The following is the relevant extract from their report.

4.2.1 Engaging children with developmentally appropriate methodologies

Play is children's natural mode of action. During play, children feel happy, in control and free from any fear of failure (Howard, 2002). Research also demonstrates that children show more active and prolonged engagement in playful rather than formal activities (McInnes, Howard, Miles and Crowley, 2009). For these reasons we felt that a playful methodology would be the most appropriate participatory technique to engage children in the research process. We were mindful of the ages of the children in the development of our methods and the need to ensure that authentic responses were documented. We used series of methods that ensured the children felt at ease with the research process. This allowed us to address the aims of the project reliably in a playful context, fully engaging children as participants in the research process. We met the project aims by framing our discussions within structured play activities and the

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use of appropriate and accessible language. Specifically these play activities included the use of a weighing and measuring activity, a hideaway puppet and a feelings storybook. A brief rationale and description of each is provided below. Figure 1 shows the complete set of materials used in the procedure.

4.2.1.1 Weighing and measuring

As an introductory activity we decided to use a task that would be familiar to the children but also likely to facilitate development of a discussion that focused on being weighed and measured. We chose to offer children the opportunity to weigh and measure different small items from a 'treasure bag' using a balance scale. We chose a balance scale rather than any other scale, as children would be used to this through their classroom experience. We deliberately avoided using the same equipment as was used in the Growth Surveillance Project. Whilst it could be argued that use of the same equipment would be a concrete prompt for the event, counter to this is the possibility that any negative emotion associated with the weighing and measuring experience might be unnecessarily evoked.

4.2.1.2 The hideaway puppet

The hideaway range is produced by The Puppet Company. They are high quality, plush characters that are frequently used in therapeutic work with children as they lend themselves well to conversations about feelings. They are simple to operate and attractive to children.

4.2.1.3 The 'All Kinds of Feelings Book' by Emma Brownjohn

This book is one of a series published by Tango. The series titles are all designed to support children's personal and social development and this one in particular facilitates discussion with children about their own and other people's feelings. It is highly interactive with flaps to lift, attractive illustrations, games and activities.

Figure 1. Materials used when talking with the children



4.2.2 Ensuring an accurate representation of children's thoughts and feelings

Children are capable of sharing their life experiences; however, as is proposed by Einarsdottir (2007), it is the responsibility of the researcher to ensure that the procedures that are adopted to facilitate their active participation in the research lead to the collection of data that accurately represents their views. We can be guided in the selection of methods and procedures by our knowledge and theoretical understanding of children's development. The issues that were relevant to this research were firstly, to ensure that the children were talking to us about this particular weighing and measuring experience and secondly, to ensure that the children were able to comprehend and explain emotional states.

Considering these issues maximised the potential to achieve an authentic response and subsequent validity of findings. Research demonstrates that children in playful situations demonstrate higher levels of meta-cognition than children operating in a formal setting (Whitebread et al., 2005). In play, it appears that children are better able to articulate their thought processes. Therefore, to achieve authentic response, we built simple verification techniques into the project design, again utilising play activities to guide discussion. The weighing and measuring game (see Figure 2a), led to the researcher asking about when the children were weighed and measured in school. To ensure children were talking about the NPHS weighing and measuring activity, photographs of the equipment used by the NPHS team were used (see Figure 2b).

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Figures 2a & 2b. The weighing and measuring game and the photographic prompt of the NPHS scale



To ensure children could recognise and explain emotional state, the researchers asked “what and why” questions whilst the child was playing with the hideaway puppet (see Figure 3). If the researcher felt that a child's understanding of emotional state remained ambiguous after the puppet activity, the feelings storybook was introduced. The child and the researcher read the book and played a 'draw a face' game. This involved the child spinning a dial and then drawing the face they felt depicted the emotion they had landed on (see Figure 4).

Figure 3. Playing with the hideaway rabbit puppet



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Figure 4. The book was used to clarify the child's understanding of feelings



4.2.3 Ensuring ethical conduct

The research was conducted by experienced research staff from the Centre for Child Research (CCR), Swansea University. All of the team had full police clearance for working with children and vulnerable groups. Three researchers were involved in the collection of the interview data. Details of participants were not shared outside of this group. For data protection purposes, the CCR team received photocopies of the consent letters that had been received from parents and, separately, details of the schools' and the children's names. In addition to the consent from parents obtained via the NPHS, the research team also ensured each child's verbal consent to participate in the interview by means of a standardised statement at the start of the process. Researchers also asked the children's permission to record the interview using the dictaphone. The introductory statement was as follows:

*"Hello, my name is **** and I'm a researcher from Swansea University. I'd like to talk to you about being weighed and measured. Is that OK? I've got some games and things for us to play. It's really important that I remember the things we say and I'd rather talk and play with you than have to write everything down. Is it OK if I record what we say using this special machine?"*

All children were interviewed on a one-to-one basis in a quiet area in their school and for child protection reasons the teacher was either present or proximal. The use of two researchers per interview was rejected as it was felt that this might cause increased anxiety. Confidentiality and anonymity have been

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preserved and throughout this report children are referred to with letters (i.e. Child A – Child J), these letters appearing in brackets after they are quoted. Photographs appearing in this report are solely demonstrative of the methods and materials adopted. The child in the photographs did not take part in the study but gave consent to be pictured playing with the materials and for these photographs to be used in this report.

4.2.4 Procedure

Each interview lasted 20-30 minutes, and, following each child's consent, was recorded using a digital recorder. Each researcher followed a script to structure the interview process (see Appendices 3-5). The play activities within the interview script facilitated movement through a series of questions that related directly to the project aims.

Some items on the interview script were unstructured and the researcher was free to develop the activity in their own way and follow the natural flow of the conversation (e.g. the weighing and measuring activity). Other questions were designed to directly address the project aims. Each researcher ensured that these direct questions were covered, placing them where it was appropriate, according to the flow and progress of their session. All researchers were briefed about the aims of the project and the use of the play materials. The distinction between the unstructured and direct elements of the interview script was made clear.

In addition to the electronic recording of the interview session, the researchers also made field notes describing any issues that may be of relevance to the study (e.g. where a teacher described the procedure that was followed when the children were weighed and measured).

4.2.5 Materials

- Measuring tape and scales (of a type familiar to children)
- 'Treasure bag' with items for weighing and measuring
- Hideaway Feeling Puppet
- The 'All Kinds of Feelings' book
- Photographs of the weighing and measuring equipment used by NPHS
- A dictaphone

4.2.6 References

Einarsdottir, J. (2007) Research with Children. Methodological and Ethical Challenges. European Early Childhood Education Research Journal, 15 (2), 197-210

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McInnes, K., Howard, J., Miles, G., and Crowley, K. (2009) Behavioural differences exhibited by children when practising a task under formal and playful conditions. *Educational and Child Psychology*, 26 (2)

Whitebread, D., Anderson, H., Coltman, P., Page, C., Pino Pasternak, D. and Metha, S. (2005) Developing Independent Learning in the Early Years. *Education 3-13*, 33, 40-50

5 Analytical methods

5.1 – Interviews with parents and interviews with staff

The data were analysed thematically. A coding frame was devised based on the schedule for the interviews with parents, covering the following themes:

- understanding the purpose of the study;
- consent;
- motivation for agreeing to take part;
- results of measurement;
- suggestions for the future development of the programme.

The coding framework for staff covered the following themes:

- understanding the purpose of the study;
- consent;
- results of measurement;
- suggestions for the future development of the programme.

Two researchers analysed the transcripts, selecting instances of talk relating to each of the themes. An additional theme – obesity and the

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stigma associated with it – emerged during the analysis of the interviews with parents. The two researchers discussed, revised and agreed the findings.

5.2 – Interviews with children

The data were analysed thematically following the systematic guidelines of Braun and Clarke. The first level of analysis involved identifying instances of talk that referred to each project aim. These responses were then grouped thematically. Following this, the data were then revisited to identify instances of talk that were relevant, but not accounted for in stage one. For reliability, two researchers analysed the data following the same systematic procedure. On the single occasion where an instance of talk was coded differently by each researcher, a third researcher read through the transcription of this particular session to clarify the meaning of the statement. The findings below are presented according to the aims of the project and are organised thematically.

6 Results

6.1 - Interviews with parents

Aim 1 What did parents understand the purpose of the programme of measurement to be?

Theme (i) Ambiguous status – population survey or individual health check?

There was a certain amount of ambiguity in parents' comments about their understanding of the purpose of the study. Parents were, on the whole, clear that the purpose was to monitor children's heights and weights on a population or societal basis.

"They're probably getting a national average or statistic of what children are up to – where they are, but that's all I know." - P6

"Basically from the literature that you've given me it's to provide some sort of standardisation for height/weight ratios for male and female children at different levels of schooling." – P2

Similarly, other parents emphasised what she saw as the value of measurement at the level of the individual child, functioning as a health check in relation to norms of development:

"For their [individual child's] benefit I hope strongly." – P1

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“I think it’s great. The more you keep an eye on the children the better.” – P6

“It was interesting to see where you come out on the scale.” – P7

“Just to make sure that children are growing up healthy and that they’re reaching the goals that they’re – that they’re meant to be reaching.” – P9

In fact, P9 didn’t stop to wonder whether the measuring was part of a wider programme of measurement in other schools:

“I just thought, oh, it’s happening in - in L.’s school, so we’ll go ahead and she can have it done.” – P9

There was not a clear grouping of parents into those who talked about the individual benefits of measurements and those who talked about monitoring at a population level. Many of the parents reflected on both aspects, without necessarily making a clear distinction between them.

Although parents generally thought they had been given enough information about the purpose of the study, one expressed concerns:

“I think maybe there could have been additional information for parents that possibly don’t appreciate the relevance of it and for want of a better term are unfortunately ignorant of the purpose of it and the reason for it.” – P2

Theme (ii) Relating the study to routine measurements

Some of the parents made connections between the study and the familiar programme of routine measurements and checks which are carried out on all pre-school children to monitor their progress:

“My understanding [of the national programme] is that it’s up to age....well, from birth to one year of age. You’ve got the measurements with a health visitor in the red book that you get from the health visitor, it does go up higher but I’ve never...I think from maybe two years of age, I don’t think mine have been measured since.” – P3

Theme (iii) Placing the study in the context of wider concerns about obesity

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There was some spontaneous mention of the concept of obesity as being central to the purpose of the study.

“Well just from what I’ve gathered, it’s just measuring the heights and weights just to see if they can tackle the obese – the problem of obesity with children, generally, in the country.” - P5

“Well, I didn’t really know too much about it.....possibly to determine about obesity in schools.....which I think is a really good thing” – P7

“Keeping an eye on the weight and height of a few children and probably looking into childhood obesity” – P6

Theme (IV) – Questioning what impact the study would have

Some parents developed their consideration of the purpose of the study to talk about how it might actually make an impact, at either individual or population level. At population level, it did not necessarily seem clear about the process of how the study can make a difference. P5 was clear that the study was about monitoring population trends:

“but it doesn’t really tell me what it’s - what they’re gonna do with it afterwards.” – P5

Some parents also questioned the potential of the study to make a difference at the level of the individual child, because of what they saw as a lack of feedback and follow-up:

“No, no.....Because we didn’t get any feedback, if we knew the measurements and it was recorded in his book and we knew, I would have known then.” – P3

“If they felt that there was anything wrong with the height or weight of my child, then I think that we should know as parents because then there’s something we can do about it. [...] It would have been nice to have someone say there’s nothing wrong or you need to make sure he exercises a bit more or eats a bit less or whatever, it would have been nice.” – P3

Aim 2 – what did parents think about the way in which consent was obtained?

Theme (i) Lack of strong feelings

Parents were asked for their views on the way in which their consent for their child’s participation in the study was obtained, and, more generally, for their views of alternative models for consent. On the whole, parents did not have strong feelings on the issue of consent. All the parents who took part in

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the interviews had 'opted-in' to take part in the study, that is, they had completed and returned a form giving permission for their child to take part. However, when asked about it they were not always entirely clear that this had happened:

"I can't remember exactly what we had to do, it was a good few months ago, but I remember having a form saying that this was going to take place. And I can't remember whether it was – you signed if you didn't want your child to take place, or you signed if you did." - P5

"Um....I don't think we have [filled in a consent form], no." – P1

"I can't remember, it's a form that came.....I think it came from the Health Board rather than the school." – P2

Generally, parents did not seem to consider the issue of consent as a very problematical one. There was a sense from many that measuring a child was a routine part of what happened at school, and one which they were quite familiar with already, as described by P1:

"I would have thought it could be regarded as part of the education process to go ahead and measure weight and height. It wouldn't bother me." – P1

Theme (ii) Consideration of impact on response rates of different models of consent

Although parents on the whole didn't seem particularly bothered about consent, many gave quite considered responses to this question, discussing issues such as differences in response rates according to opt-in and opt-out models. Many parents spoke not from their own perspective, but tried to imagine the perspective of others. P2a, for example, suggested that the attitudes of other parents may vary according to the likely measurements of the child:

"Maybe if they felt, if they were aware that their children were obese or bordering on obese or whatever, then they might not consent to the study because of the implications of it and the ramifications in the sense that their child may be roped into this study which may basically tell them what they already know, but in a way that, I don't know, they would feel uncomfortable with." – P2a

There was some support for an opt-out system, on the pragmatic grounds that it would boost response rates,

"Would it be better to have an opt-out system, so in other words..." "I think possibly more people would do it then, as opposed to having to send a form back to school. They would maybe just think well it's easier really." *"and you wouldn't have a problem with that?"* "No, not at all." – P7

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“Yes, I would think that would probably be better. Um, yeah, you’d probably catch more children that way certainly, yes” – P6

However, there were also some anxieties expressed about the risks associated with the ‘opt-out’ consent model:

“I think in this age, I think when they draft things like this or when they devise things like this they’ve got to cover every aspect because of the political correct environment that we live in” – P2

“...yes, you’ve got to have parents’ consent, um, but you need a system in place to encourage parents to actually send the forms back.” – P6

Aim 3 What made parents decide that their child should be included in the measuring programme?

Theme (i) Getting accurate measurements for their child

Parents described a range of motivations for taking part. For some, the primary motivation was straightforward and practical, as a way of getting accurate measurements for their child:

“it was quite useful for us to know because the scales we have at home are not always accurate, and their height only tends go get done when you prop – done accurately, when you’ve got a proper measuring stick. I know you can do it against the way, but it’s not quite the same as having it done professionally, is it? [...] It sounds daft, but I was quite keen to know exactly how much she weighed and exactly how tall she is.” - P5

“I was just interested to see where he was. I mean, I’ve got no concerns at all, cause, you know, he’s not a big child but I was just wondering where he was and thought it would be a good thing.” - P7

Theme (ii) Confirmation that the child was healthy

A more subtle motivation was described by some parents, who suggested that the measuring process would give them confirmation that their child was healthy:

“well I just wanted to – to know, really – I wanted to know the results, obviously, to make sure that she was growing as she should be. Because it’s always a worry, isn’t it, to parents - oh, are they as tall as they should be, are they underweight, are they overweight or are they just right? [...] But you just like to know they they’re healthy and normal.” - P9

One parent took this further, suggesting that not only that the measurement would endorse his pride in his son as a healthy boy, but also provide reinforcement for his and his wife’s parenting skills:

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“Without sounding smug, but I They way I look at is your children basically are a , not a mirror image of yourself, but obviously sort of portray how you bring them up and to be honest I’m quite proud of the fact that my son is quite fit and healthy.” - P2a

Theme (iii) For the sake of contributing to research

Only one of the parents clearly described herself as being motivated to take part by a sense of contributing to the greater research agenda – a kind of civic duty, because she has an interest in research.

“I’m in to any research so anything that will help anybody in health....I have no problems. I assume it’s fairly anonymous.....and there’s no adverse effect on my son so go for it.” – P6

Aim 4 How acceptable did parents find the process by which the pilot measurement programme was carried out?

Theme (i) Acceptability of the overall purpose of the measuring programme

“I don’t know when it was done in school.....I didn’t know anything else about it.....until I got the letter asking me to participate in the research so the school didn’t tell me it had been done. It would be nice to, just out of interest, it would have been nice to know whether it was done....and maybe a feedback as to what happened.....what they found the national average or whatever they were doing with those statistics.” – P6

Theme (ii) Measuring process in school

“Yeah I mean my only concern again would be... obviously we weren’t there when the measurements were actually taken from my son but I’d like to assume that it was done in a way that it wouldn’t cause the child any concern” and “He didn’t say anything so it was obviously done in a way that didn’t really cause any concern.” – P2

“Yes, yes.....[but, later in the same interview].. I would have liked to have known the measurements, that would have been nice, but then we can do that at home anyway, isn’t it? But it would have been nice it was documented for us as well.” – P3

Theme (iii) Paperwork

P6 ‘ I think it’s great. The more you keep an eye on children the better.’

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P6 happy with the programme as long as the records are anonymous.

Some parents reported that it was hard for them to comment on the detail of the measuring process, as their children hadn't discussed with them what went on when the measuring team visited the school.

P4' Because she doesn't tell me anything that happens is school'

P6 'He tells me very little about what happens at school.'

But they were happy to assume that it had not been problematical.

P2a and P2b indicated that the system of communication by letter might work only if parents took an active role, like P2b who 'delves into school bags' in search of letters and forms.

P2a ' I think they need to possibly understand why it's being done so that they don't misconstrue that, you know maybe there's something wrong with them or you know it's just, you know it's done to everybody'

Aim (5) What did parents think about the process of getting the results of measurement?

Theme (i) Choosing whether or not to have the results

Four parents (P1, P5, P7 and P9) had requested and received their child's measurements, which were sent in the post some time after the measurement took place. P2a/b, P4, P6, P8 and P10 reported that they had not requested the results of the measurement.

"I didn't ask, no. Um, was there something on the form to tick...if there was something on the form I might have, probably would have done but no I didn't ask specifically." – P6

P3 said that she had been interested in getting the results and had tried to request them, but her phone calls had gone unanswered. She described why she was interested, referring to the 'red book' issued by health visitors to log the progress of pre-school children, and suggesting that the measurements could have a role in providing parents with reassurance as well as being a trigger for change in lifestyle where needed:

P3 'Like the percentiles you have in the red book, it would be nice to know if they could give you feedback as to where your child is on there [.....] It would have been nice to have someone say there's nothing wrong, or you

need to make sure he exercises a bit more or eats a bit less or whatever, it would have been nice.'

Even though P3 didn't have substantive concerns, she would still have liked advice and reassurance.

Those parents who had not requested results generally expressed an interest in their child's measurements felt that they had alternative ways to get them. P8, for example, was familiar with her child's measurements because he was recently measured at a hospital appointment, while others felt, one way or another, they could check their child for themselves:

"I didn't opt for that because I thought I can measure my own child if I want to, sort of thing. So I wasn't particularly interested in that." - P4

"The other side of it is that you know by looking at your child whether or not he's overweight or too tall or too small." - P1:

However, P1 did suggest that there was an issue of principle involved, and that individual feedback was an appropriate benefit for parents for taking part in the study:

"I'd have thought whether or not I asked they should be sent." - P1

Theme (ii) Following up the results

P3 'If they felt there was anything wrong with the height or weight of my child, then I think that we should know as parents because then there's something we can do about.'

Although P3 didn't get results, the process triggered her to do her own weighing and measuring, and looked up on the internet to find out how to calculate BMI – but aware that it is a complex process to calculate BMI for children.'

P1 'If your child had been measured, height and weight, then you need to know what the results are so you can decide if you need to do anything yourself.'

P5 'The day it happened we weren't given any feedback or anything, we just knew that someone was coming into school to weigh them, and measure them and R didn't really say anything about it when she came home, and I just forgot about it until the results came. And then you just think, okay, that's good, she's where she should be, and just carried on and I didn't think any more of it.'

P5 found it useful to get the results of measurement.

P5 'it was quite clear. You know, they'd fill in how high, how tall she was and how much she weighed and put it on a – on a graph, as to weigh, you know, where she is on the centile. And so I found that useful because I can refer back to her baby records and see whether she – how much she's changed. Because she was quite a big baby. [...] And it's just quite useful to – to think –

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yeah, to know how she's developed and you know that she's – where she should be really. '

P5 happy with results – which showed that her daughter was neither overweight nor underweight, but 'just right' - 'she's where she should be, so – and we're quite happy about that.'

If results had come back underweight, P5 would have consulted GP. If overweight, would consult GP but only after first having tried to change diet.

P5 expressed sense of moral responsibility re managing child's weight: If results came back that child was over weight, it would force you to think – look more carefully about how , how you're bringing your child up with regards to nutrition, really, whichever way – whether they're underweight or overweight and to see, is you or it something else.'

P7 found results useful and easy to understand: 'Yes, it showed you the scale and his BMI and whether he was more underweight, overweight on the scale, which I thought was really good, where they'd marked him, so you can see just how they're progressing. Yes.'

P7 didn't take any action after getting the results:' None, nothing at all. No I was just happy with reading them, and you know, I was happy with where he was and, yeah.'

P8 didn't ask for results, but if she had and they had come back concerning, would have gone to GP for advice.

P9 got results and pinned them up on the kitchen noticeboard – so she could use them for comparison with any future measurements.

P9 found it useful to get results 'Yeah, yeah, cause I mean, you know, they – do weigh and things at home, but then, you know, it shows you then, like where was on the scale of – you've got your underweight, normal, overweight and very overweight.[...] She's in the normal, so, I was happy with that.'

P9 was happy with the way the information was presented, but didn't seem confident that she understood how the BMI was calculated.

P9 'I don't know what I would have done if it would've come back and she was under or over. It would depend – I probably would have rung them [NHSD] up then [...] But no, because she was normal, I just thought well, she's in the normal weight band and that's fine by me.'

P9 felt that the charts in the results put a lot of emphasis on weight – would have liked to have seen another chart with the height.

Aim (6) What suggestions do parents have for a future programme measuring the height and weight of children?

Theme (i) Feedback on overall results of the study

“Maybe a feedback as to what happened to that information and [...] what they found the national average or whatever they were

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doing with those statistics – a little bit of feedback would have been nice to have.[...] as a mother, it would be nice to see where my children kind of fit into the national kind of average.” – P6

‘It would be nice to know what the plan is- after the study has been done, what use it’s going to serve for the Assembly then.’ - P5

Additional comments:

“My experience of when my eldest child was born as he was a very, very slow gainer of weight, he took three weeks to get back up to his birth weight. A lot of emphasis is put on how much your child is eating and how much they weigh and it was every time I saw a health visitor or midwife, it was how much he weighs and weight was very important. And being encouraged to feed him up, feed him up, feed him up so that he would get to a nice weight and thankfully he did get to a nice weight but there was a lot of pressure put onto us, I think, to make sure that he gained back up to his birth weight. And I something think that a lot of obesity in children can result from the mentality, when you have a baby, that you must feed this baby and the baby has to be a certain weight and it has to be a heavy baby. And lots of mums, when they meet with new babies, they ask how heavy the baby is and the weight of the baby when it’s celebrated really in our culture, a nice big fat baby (*laughs*). And then I think when they become toddlers and older children, then you can have obesity issues from having big babies but that’s my opinion.” – P3

“Not specifically.....I’ve got, you know, no problems with it being done in terms of [?public] health.....To me it [the purpose of the study] wasn’t ambiguous.....I want him [our son] to be fit and active and have a good physique and eat well.....” *So having him measured really was for the benefit of the child?* “Well yes..... I find it quite disconcerting really how conscious children are these days of their weight, you know, but they should... there should be other aspects of their life that they should be focusing on, you know whether their bum looks big in this I mean at my son’s sort of age shouldn’t really be an issue, you know.” – P2

6.2 Results – interviews with staff

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Aim 1 What did staff understand the purpose of the national programme of measurement to be?

Theme (i) Emphasis on the population-monitoring purpose of the study

“I think the main purpose is to monitor growth trends amongst children, and to inform strategies and interventions that could actually be put into place.” – S12

“Just information really, to have a baseline to work with.” – S7

“In its main part I thought it was just to see.... To get a baseline of the state of the nation, nice phrase.” – S10

“Yes, definitely..... It’s not an assessment of health, you know, on an individual basis, it’s basically a collection of data to monitor growth trends, so it’s not an actual assessment of health of individual children.” – S12

Theme (ii) Identification of individual children’s problems as a secondary aspect of the study

But there was awareness that you can’t separate out the identification of problems in individual children (which they are used to doing and which have implications for follow-up) from a population study.

“Obviously if there was something that arose from the measurements, then a nurse working in the trust would have looked at that and maybe put in some form of intervention if required, but that hasn’t actually occurred in [name of place].” – S12

“The difficulty we’ve got in relation that is that you can’t identify – we feel – we feel it’s difficult to identify without, you know, doing something about them.” – S6

“Right from the word go, the one thing I felt was wrong about the whole project was, ethically, why are we trying to identify overweight children if we’re not going to, at least, offer them something? [.....] You know, just to actually, to statistically say, “Well, we’ve got 50% that are very fat in Wales”, or whatever, “But we’re not going to do anything about them.” it just seemed – it seemed wrong, somehow.” – S4

“Yes, I think both really. I think across Wales this study will give us a lot of information. But individually, yes, there are certain children that I think particularly school nurses could target.” – S11

Theme (iii) Placing the study in the context of concern about obesity

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“Because there’s a lot of children overweight, with poor diets, and I just thought it was something along the lines to sort of help with the health and wellbeing of the future generation really.” – S7

“I think it’s an obesity study, looking at the children, children, because there is a growing worry about obesity in younger children and so – so a way of collating information and I suppose looking at the areas to see.” – S5

Aim 2 What did staff members think about the way in which consent was obtained?

Theme (i) Complexity of the processes for obtaining consent

There were many people involved in the process of getting consent.

“.....the letters of consent and information letters were delivered to the school and the health care support workers employed, and it was the school then, their responsibility to give the letters to the children to take home to the parents.” – S12

Theme (ii) Anxieties about risks associated with opt-out.

“I definitely think an opt-in is a safer way of ensuring actual consent has been obtained from the parent.” – S9

“I believe the opt-out letter, you could even say it was quite a dangerous way of weighing and measuring children, because we were relying on the school to give the letters to the children and then to give them on to the parents, but if the letter was misplaced in any way, we didn’t know for definite whether that parent had the letter or not.” – S2

There were concerns that the opt-in approach might actually generate bad feeling in parents – because follow up letters were sent if people didn’t respond within a certain time.

“...and several of my staff felt, well, this is wrong, because you’ve asked parents to return the letter if they want their child to be done. You’re sending out another letter, when their way of saying “No I don’t want this” is to – to not return anything. And now you’re sending *another* letter which, you know, it might irate parents.” – S4

“I think it’s safer to have opt-in consent, yes, definitely, rather than opt-out, in this day and age. I mean, 10 years ago I don’t think it would have mattered.” – S11

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“If you’ve signed that document that says yes [laughter] it’s called covering your back!” – S10

Theme (iii) Awareness of the opt-out model will bring a bigger response rate

“The opt-in, we’ve had experience of other programmes moving to opt-in, and the uptake rate dropped dramatically.” – S1

“Most parents don’t mind [opt-out], it’s just getting the letters back in to us that takes – it’s very time consuming.” – S7

“I do believe from what experience I gathered while I was doing the survey that due to the large amount of children that very often mislay forms or parents don’t bring them back, it’s in the best interests of the child I believe the one form is better than the other, the form that actually says ‘if you don’t bring it back you’ll be measured, it’s taken as consent’ because then if the child forgets to bring it home or if the parent forgets the child is still done.” – S12

Aim 3 How acceptable did staff members find the programme and the way it was implemented?

Theme (i) A positive and interesting experience

“As far as we were concerned, the programme went really well.” – S8

“I’ve enjoyed doing it and I think it’s been fantastic to be part of the project. Burden, no. Challenging.” – S11

Theme (ii) The programme brought more work than anticipated

Lots of tasks, especially associated with providing feedback. More work for all involved – admin staff, nursing staff etc.

“.....it was intense; it was a lot more work than I thought it would be because of the consent issue.” – S3

“.....the girls at the end of it said they were fed up of, you know, all they did was just go into schools and measure, and because it was very – over a very intensive period [...] They found that – you know, they were all very glad to see the back of it, whereas they were all very keen to do it to start with.” – S4

“So, yes, it gave us a lot of work.” – S10

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Data bases of names and addresses needed updating.

“Our role was literally trying to give them the up to date list of children which was an almost impossible task and then afterwards obviously the inputting of data afterwards. [...] Horrendous.” – S10

S3: ‘it was intense, it was a lot more work than I thought it would be because of the consent issue.’

S4: ‘So that was the biggest problem, and the girls at the end of it said they were fed up of, you know, all they did was just go into schools and measure, and because it was very – over a very intensive period [...] They found that – you know, they were all very glad to see the back of it, whereas they were all very keen to do it to start with.’

“Every meeting I seem to go to the goalposts seem to change and it was more and more work.” – S11

“Huge, absolutely huge.” – S11

Especially lots of work associated with providing feedback:

“That’s been a huge piece of work.” – S6

“And that was quite a lot of work, because you had to – I was given their height and weight. I then had to work out their BMI, and then I had to work out where they were on the centile chart which all took time. And that was something I certainly had no idea I would have to do.” – S4

And daunting for admin staff. S10 reported being involved in only providing feedback for two, but it was an intimidating process for her and her colleague:

“So I must admit we both, J. and I, sort of shuddered a bit when we saw it and I know the one that J. did send out obviously she took it to a nurse and said ‘Can you now finish this for us?’ So it was actually a sort of, it involved two people one of whom has to be obviously qualified [...] to comment on where the BMI fell.” – S10

Theme (iii) Need for more time for the programme

“In [name of place] we did encounter a few problems initially relating to a hold on jobs going forward..... So we would have liked a little bit more time to actually complete the measurements and the paperwork that went with it.” – S12

“Timescales were a bit unrealistic” – S1

“We could have done with a bit more time, really” – S11

“It was way too rushed” – S10

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Theme (iv) Tension between core work and the measuring programme

“...it was very busy, extremely busy [.....] But yes, there were some health visitors who weren’t too happy because I was so busy doing other things.’ – S2

Hard to fit in with regular work

“Phone calls were coming into the office and I wasn’t here, because teachers and parents may have to wait a week for that, but that isn’t anybody’s fault, but it’s just something to think about, when parents ring they need somebody to speak to.” – S11

Theme (v) Aspects of working with schools

The work was felt not to be disruptive as far as the schools were concerned.

“We weren’t very disruptive to the [school] staff at all. They were quite happy for us to come in and I didn’t see any problem at all. I think they were quite – they’re quite used to people in and out with the school health team that work at schools anyway.” – S7

“It was horrendous, I started coming ... because of Easter, because of the deadline, I was coming in at half past 6 every morning to try and get on the computer. Because the computers are so slow once everybody gets on them I was coming in at half past 6 for four days and I did from half past 6 ‘til about lunchtime.” – S10

“Every room is taken up with one-to-one in that room, or guitar lessons – it’s very very difficult. I mean, we used to screen in corridors, but it has got a bit better now. But the privacy I knew was going to be an issue, to do a child individually, plus the fact it might be a long way away, you know. So I think the girls were bringing three or four children out of classes at a time and putting them round the corner if they could, so we tried our best.” – S11

“Another school seemed to lose all the consent forms, so none of those children were screened.” – S11

“Some of the barriers the girls have faced maybe is because they think it’s extra, because it is an extra. You know, you are pulling these children out of class, aren’t you, it is disruptive to the school day.” – S11

Aim 4 What did staff think about the process of providing results to parents??

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Theme (i) Concerns that not all parents would find the results easy to understand

“I think with hindsight, the feedback to the parents, in relation to the BMI – I think we felt even though they [the letters] had already been commented on and tweaked a bit, I think they were still quite complicated for a lot of parents. I think there was almost too much information on it. – S6

Because the BMI is displayed on a chart, that makes much more impact than the actual measurements.

BMI may be hard to understand

“I do wonder, I think the graph is easy for the parents to see underweight, overweight or whatever, that’s probably useful, but I don’t think they need to know [BMI].” – S11

“I think for a lot of parents they would have been quite confusing.[...] I could picture some parents wanting feedback and taking one look at that and thinking, well, yeah, OK, it doesn’t mean anything to me. I think it needed to be simplified.” – S10

metric measures are not always understood.

“And I know that we are in kilos and centimetres, but parents are still in feet and inches and stones and pounds.” – S7

Feedback letter can be seen as critical or upsetting

S4: ‘I mean I had one parent contact me who *immediately* started saying “I don’t feed my child McDonald’s and they say she’s very overweight, and blah blah blah.”

Theme (ii) Concerns that the BMI calculations would be misleading or inaccurate

“I’m not saying not to put them [the BMIs] in, but I think it would have been more helpful, as well, to have the growth centiles put in, because I think that’s what people can read or understand. And – because some children came out on the BMIs as being very overweight, and when we put them on the centile chart sometimes they’d be within normal limits.” - S7

“Some of them [children] are quite in proportion actually. They’re quite tall and solid, one would say, right? And when you put that into a BMI calculation and then put it onto a percentile, it came out as *very* overweight. And actually, to some of the members of our team, that is a bit of a surprise.” – S6

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“I wonder whether it needed to be as complicated, and it took an awful lot of working out for the people that were doing it.”- S11

“We would automatically get somebody to double check for us that we have got 100% the right child because we’ve got an awful lot of David Joneses, for example and you can have several with the same name in the same school.” – S10

Theme (iii) Perspectives on the value of providing feedback

“It was nice for me to finish, to finish it off, to see where they were. Because you remembered a lot of children, especially the heavy ones. It was interesting to see where they came on the chart.” – S7

Parents were entitled to feedback of the results.

“I would have liked to have said to the children, oh, we will be sending out letters to the parents with your measurements, but obviously I think they were entitled, the parents were entitled to know their child’s measurements.” – S2

“There’s one particular school that is in a very, very deprived area of [town], they didn’t have to sign the form to opt-in, so every child was measured, but nobody asked for feedback.” – S11

Aim 5 Suggestions for improvement

Theme (i) Better ways of offering follow-up support

Offer more follow up support to individual children identified through programme as being overweight

S4: ‘Right from the word go, the one thing I felt was wrong about the whole project was, ethically, why are we trying to identify overweight children if we’re not going to, at least, offer them something? [.....] You know, just to actually, to statistically say, “Well, we’ve got 50% that are very fat in Wales”, or whatever, “But we’re not going to do anything about them.” it just seemed – it seemed wrong, somehow.’

Have project director’s name on feedback letter, rather than school nursing service.

Theme (ii) Simplification of the process of providing feedback letters

S6 ‘I think it would be a lot easier if there was a computerised system to be able to print [the feedback letter] off.’

Theme (iii) A less rushed timetable for the work

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More time, better planning

“It probably would have been better if there had been a bit more research on a wider scale before they set a date to start and I don’t mean in terms of height and weight across Europe, I mean, in terms of how we would deal with it on our computer systems, the background stuff that gives you the results at the end and so I ... yes, the information needed to have been clearer and I think there were problems that could have been ironed should have been ironed out before we ever got to the point of saying ‘this is when we’re going to start it.’” – S10

S4: ‘It should be a programme that’s done throughout the year, or certainly on a much wider timescale.’

S1: ‘Anything is possible as long as programmes are funded properly.’

Other themes emerging

Theme (i) Role of child in the process

Some children declined to take part even though their parent had consented:

S3: ‘Every child was asked if they wanted to, you know, to partake, participate, because we checked if whoever was looking after them had said yes, are they happy, and I did have people, children, decline.’

S3: ‘the children were very keen, they were very keen what their height and weight were and that was an issue that we had to address then, we had to sort of say “well look, we’re all different shapes and sizes and not to compare.’

S2: ‘and for the children to be happy and to know what’s going on, because they were all asking, well, why are we being weighed and measured? And I did say that it was a study, but they didn’t really understand why there was a study, about health development and growth.’

“even if the parent actually consents to the child being measured.....On the day of measurement the children were all asked whether they were happy to have their height and weight measured. There were a few occasions that children did actually decline and didn’t want to have the measurements taken. My colleague, one of my helpers, did tell me one boy actually

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questioned her, he didn't know anything about the programme or the study, and so he wasn't happy to actually participate, and that was absolutely fine." – S12

Some scepticism about children's autonomy in the process, even in year 4:

"I mean, yes, I think a few did refuse, and ridiculous things, saying that their child didn't want to take part. Well I struggle with that when they're young, it's the parents who say no, but there you are, and that was mostly the reason that the children didn't want to do it." – S11

Theme (ii) Anxieties about obesity

S3: 'One of the children declined, he was, just by looking at him, overweight, and [...] he didn't want his height and his weight done in the school, and he went back to the class and told the teacher that he hadn't had it done. Teacher then obviously sort of told him that he has to have it done and he came back crying, and said "I have to have it done even though I don't want to have it done."'

S2: 'There was one child who was uncomfortable taking his jacket off because of his size, and then did refuse to go on the scale. And obviously for the privacy side, they have to take their jumpers off and shoes, it would perhaps be best if they were done individually.'

6.3 Interviews with children

Aim (1)

What did children understand about being weighed and measured as part of the Growth Surveillance Initiative (GSI)?

Remembering the procedure

Shoes

Staff

3 children said they did not know who had weighed and measured them. 1 child thought it was "someone from

How it happened

Some children described where the weighing and measuring took place for example the hall, library or school

All of the children remembered the event of being weighed and measured although the amount of detail offered varied amongst the group. Of note was that there were variations in where the activity took place and that the children did not really

Knowing about the procedure beforehand

Teacher

Teacher and Letter

Parents

7 of the 10 children had been told in some way that they would be weighed and measured but the way they received this information

Knowing why the procedure was taking place

Ideas offered

Children ventured guesses as to why they might have been weighed and measured such as "to see how heavy kids can be", "to see how healthy I am"

All of the 9 children asked said they did not know why they were weighed and measured, some offered ideas

Theme (i) Remembering the procedure

All of the children remembered some aspect of the procedure and were able to give an account of what had happened. Two of the children were able to express bits of information about the process but showed no real synthesis or understanding of the process.

Removing their shoes was something that six children remembered and for one child who had been “nervous” about the weighing, this was a positive part “I like taking my shoes off” (Child D)

Three children said they did not know who the people were who had conducted the weighing and measuring but one child suggested, “I think it was someone from casualty ...adult ... that’s all I think I know” (Child G). Another said, “well she had a clipboard that was blue colour” (Child A). Another child said that there were 2 people who came but didn’t know who they were. Some children described going in a large group, others a small group. One child (Child J) explained how “first it was the girls and then it was the boys”.

Theme (ii) Having prior knowledge about the procedure

Of the ten children, two said that they were informed by their teacher that they would be weighed and measured, two more said they had been told by their teachers and also received a letter to take home, three more children made reference to letters their parents had received and/or showed them about the project.

“I took a letter home I think ... I took a letter home and I let my mother read it, I don’t bother reading letters ...” (Child A)

Two children had not known that they would be weighed and measured. A further child seemed very confused about whether they had been told, answering with both nods and shakes of the head.

It would seem that the information about being weighed and measured was not passed on to the children very clearly and no child really understood why they were being weighed or measured. This raises issues in relation to informed consent. The children also had limited memory for who had taken the measurements and it may be that the staff conducting the weighing and measuring did not introduce themselves or their role.

Theme (iii) Understanding why the weighing and measuring process had taken place

One child was not asked this question. Of the remaining nine all said they did not know why they had been weighed and measured, though some ventured guesses, “to see how healthy I am”(Child C), or “they wanted to know how heavy kids can be” (Child G) and “it’s like a certain age when a group are getting really tall” (Child F). It seems that even if the children were given information about the growth surveillance initiative, they had not understood it fully.

Aim (2)

How did children feel about the taking of their measurements?

Feelings about the process

Going in a group

Some children described being in a holding area such as the library or hall. Some children felt uncomfortable, "embarrassed 'cos everyone heard"

Going on your own

One child was taken to be weighed and measured individually by a nursery nurse and was comfortable about the process. A further child stated that going on your own was important for "privacy"

Children's responses suggest that the process was run in different ways by different schools. Whether children went in groups or individually appears to have been an important factor as to whether they were comfortable or uncomfortable with the process

Feelings about being weighed and measured

Comfortable

6 of the 10 children were comfortable overall with the

Uncomfortable

4 children expressed being uncomfortable with the overall process ("I was nervous...I thought I wasn't going to be like the others", "that amount of people watching...makes me feel a bit crummy").

Being weighed

Half of the children appeared comfortable with being weighed but others were worried, "I didn't want to be overweight or underweight", "they could go around and tell people", "I am light"

Being measured

7 children were comfortable with being measured, "I like being measured, I like to see how tall I am". The remaining 3 children however were worried about being too small, "I thought I was going to be the small one, the teeny one and I wondered am I going to go out of the school".

Feelings of comfort or discomfort appear related to whether the children were seen as a group or individually. Some children were comfortable and others not. Children's responses suggested they were concerned about not being normal in terms of height (too small) and weight (too heavy or too light). Lack of clarity as to why the weighing and measuring was occurring also led one child to wonder if they would be leaving the school if they were too small.

Theme (i) Feelings about the process

Children's responses seem to suggest that schools organised the weighing and measuring sessions in different ways. This seems to have been an important factor in determining whether the children were comfortable with the process.

The difference in being weighed and measured in a group or individually is particularly notable where two children from one school had different experiences of being weighed and measured despite it happening in the same location. In this school, the weighing and measuring was done in the main hall. One child was taken to be weighed and measured by a familiar nursery nurse. That child seemed at ease with procedure. A second child in the same school was taken with a group of 4 or 5 who all waited together until all had completed the process. That child was "embarrassed 'cos everyone heard" (Child G).

In other schools children were taken in groups to a 'holding area' and then taken individually to be weighed and measured. "We were all in the library ... and we went up differently we were the only ones who could see our height and weight." (Child B). The child said that it was important that "people could have their privacy".

At another school "we were all just sitting by here [in the library] and they were calling us up and well, you don't want anyone to find out your weight or your measure, so ...[it should be] one by one from the classroom"(Child C)

Theme (ii) The weighing and measuring event

Four children expressed clearly that they were comfortable with being weighed and measured, using words such as "normal", "happy" and "positive" to describe how they had felt. For this group the experience ranged from their seeming very comfortable, with one child appearing to feel special, "I got picked and not other people" (Child F), to the more mundane, "when I'm being weighed and measured I just do what I have to do really" (Child A).

One child couldn't remember how they had felt.

One child made comments that were difficult to categorise. When asked a direct question about being measured Child E said that they felt "crazy" "because it was silly", but later commented that it was "good" to be weighed and measured "because like I feel this big to me, like this big". We have interpreted this as their being comfortable with the process.

Therefore, six of the ten children were comfortable with the overall experience of being weighed and measured.

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Four children were definitely uncomfortable with the experience, using words such as “nervous” and “embarrassed” to describe their feelings. Some were specific about what caused them to feel uncomfortable. One child who had felt nervous explained “I thought I wasn’t going to be like all the others” (Child C). Of this group of four, two children had been uncomfortable with both weighing and measuring, “there was at least four or five people watching ... and obviously I would get a bit embarrassed with that amount of people watching ...makes me feel a bit crummy”(Child G).

For another two of the four who were uncomfortable with the procedure, the experience appeared linked to personal sensitivities or lack of knowledge about the process. Child J, who described their self as “nearly the smallest in my class” said “it was a bit strange...coz I didn't know what was going on...I was like, oh why are they measuring me, what was going to happen with me, am I going to go out of the school, am I too small”. The other child said “I don’t mind being measured, because I like to see how tall I am, but when I’m being weighed...I’m quite nervous as I don’t want to be overweight or underweight” (Child D)

Sub theme (i) Feeling about being weighed

Five of the children appeared comfortable with being weighed and used positive descriptors such as “happy”, “OK”, and “not worried” when speaking about their feelings with regards the process. One child had no memory of how they felt at the time. A further child thought the experience was silly which is difficult to categorise as demonstrating their being comfortable or uncomfortable.

The remaining three children were “embarrassed”, “nervous” and “a bit nervous”. “I was nervous ‘coz I am light” (Child C), “I didn’t want to be overweight or underweight” (Child D). Other children overhearing the weight reading was particularly relevant for Child G, “they could remember it and go around and tell people”.

Sub theme (ii) Feelings about being measured

Seven of the children appeared completely comfortable with being measured. “I felt happy because um then I would know how tall I was” (Child B), “Look how tall I am, I’m five ... and when it’s my birthday I’m five” (Child E), “I like being measured, I like to see how tall I am” (Child D)

However, three of the children all worried that they were too small. “I thought I was going to be the small one, the teeny small one instead of one of the big ones” (Child C). This child seemed to think that her place in the school was dependant upon her height and had wondered “am I going to go out of the school”. For these children being measured made them feel “nervous”, “embarrassed”, and “strange”.

Aim (3)

How did children feel about parents receiving their results; what happened when / if parents received their results and what did children think about their parents obtaining results?

Knowing that parents had received results

Not knowing

All but one of the children claimed parents had not received their measurements

In the sample, we were aware that all of the parents had requested their child's results. Despite this, only one child knew of this suggesting that the other parents did not discuss the measurements with their child.

Feelings about parents getting results

Inform parents

Those who expressed a preference, thought it would be alright for parents to receive results, "I wouldn't mind really...she might be wrong about me being overweight, send it so she knows"

Not all children had a preference as to whether their parent was told the result. No child said it would be a bad thing and some offered reasons why it might be beneficial.

Theme (i) whether the parents had received the results

This was only relevant to Yr 4 children (nine of the sample). Only one child described how their parents received the result, "it was a letter and my Mum read it to me" (Child J). All other children either claimed their parents had not received information about their measurements or they didn't know whether they had, in either case it seems the children had not received feedback about their heights or weights from their parents.

Theme (ii) comfortable with parents receiving results

Those who expressed a preference about parents receiving their results said that they would be happy for their parents to get the information, "I wouldn't really mind ... she might have been wrong about me being overweight ... send it so that she knows" (Child G).

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Aim (4)

What suggestions do children have for any future programme?

Suggestions

Do it in the same way

6 children thought the process could be done in the same way. One liked that it was “quick” and another thought it was important to use the same equipment as “other things could measure differently”.

The ideas for change suggested by some of the children are of interest. These suggestions include: i). being weighed and measured in private, something that might influence whether or not children feel comfortable with the process, and

Do it in a different way

4 children thought that the process should be changed. Three responses related to being weighed and measured in private, “instead of sitting us all here just go one by one from the classroom”. A further child suggested that children might like to know what they weigh and measure at the time “it would be good to know if you are the right weight and height”.

ii.). being told the results of the measurements, especially as it is questionable whether this information can or should be withheld.

Theme (i) Do it in the same way

Six children thought that if the weighing and measuring were done again it could be conducted in the same way, “It can be the same because it was really quick” (Child D). One child appeared to offer a very sophisticated reason for it being done in the same way and with the same equipment, “because other things could measure differently” (Child F)

Theme (ii) Do it in a different way

Four of the children thought that if the weighing and measuring were done again it could be done differently. Three thought it was important that children were taken individually from class to be weighed and measured in private, “if they want to tell someone they can and if they don’t they don’t have to” (Child B), “instead of just sitting us all here, just go from the classroom” (Child G).

A further child thought that next time they would like to be told their weight and height, “It would be good to know if you are the right weight and height” (Child J).

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Appendix to qualitative study 1 – interview schedule – parents

Feasibility study measuring childhood heights and weights in Wales

NPHS/Swansea University April 2009

Qualitative interviews with parents

Introducing the interview:

‘Thank you very much for agreeing to take part in this interview. We are going to talk about the recent check of your child’s height and weight which took place at school. This was part of a feasibility study which is looking at introducing a national programme to measure the height and weight of all children in Wales. We want to know more about what parents think about getting their child measured in school.

I am planning to record this interview. We will make a full transcription of the recording to help us with analysis, but no-one outside the research team will hear the recording. We will analyse what parents tell us and write this up for the study report which will go to the Welsh Assembly Government. In due course, we may also write research papers which will be published more widely. We may include direct quotations from parents in the report and papers, but we will not use your name or any information which could let people work out who you are.

The interview should take no more than forty minutes. If you want to stop at any time, you are free to do so.’

Before starting interview:

- Ask them to sign consent form
- Check that they are happy for you to record

Prompts are shown in italics after each question. Use these as necessary to draw more out of the respondent.

1. I mentioned that this study is looking into introducing a national programme of measurement of children. Can you tell me, please, what you understand the purpose of the national programme of measurement to be?
 - *Did you view it as health check for their individual child?*
 - *Was it clear that it was a means to monitor population trends in childhood growth (including obesity) in order to inform strategies and service development? Do you have any comments about this role?*

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- *Do you feel that the purpose was made clear when you first heard about the programme?*

2. Can you tell me, please, whether you were asked to fill in a form consenting to your child being measured at school?

[Make sure there is no confusion with the process of giving consent for this interview. Some parents would have been asked to positively give consent to the measurement. Others would only have been offered the chance to opt out. We do not know in advance which group your respondent was randomised to].

3a *[If they completed the opt-in consent form]* Do you think that this is the best way for parents to have a say in whether their child takes part in the study?

- *Would it be better to have an 'opt-out' system – all children included in the study, unless parents specifically say no*

3b *[If they weren't offered an opt-in consent form]* Do you think that this was the best approach – including all children unless their parents opted out?

- *Would it be better to have an 'opt-in' system – children only included in the study if their parents filled in the opt-in consent form*

4. What made you decide that your child should be included in the measuring programme?

- *For example, might say thought they ought to/For the benefit of their child /For the greater good /Didn't really think about it/ Don't remember seeing the paperwork about opting out*

5. We are interested in knowing how acceptable parents found the pilot measurement programme. Were you happy with the way it was carried out?

- *Were you given sufficient information about the programme? If not, what other information would you have liked?*
- *Were you happy with the way the measuring was done? Time, place, privacy, professional involved*
- *What did your child tell you about the measuring process?*

6. Did you ask to be sent results, telling you your child's measurements?

7a. *[If they didn't request results]* Why did you choose not to be sent the results?

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7b. *[If they requested results]* Did you find it useful to get the results?

- *Were you happy with the way they were presented? Were they easy to understand? If not, what didn't you understand about it? In what way, if any, would you like it to be changed?*
- *What, if any, action did you take following receiving the results? Did you consult a health care professional? If so, whom did you consult? What was the result of this consultation?*
- *If they did not contact a health professional was it because the BMI was marked as 'healthy weight'? If the weight had been outside the 'healthy weight' range would you have gone to a health professional for advice? If yes, what sort of health professional would you go to (GP/School nurse/health visitor/NHS Direct Wales/other). If would not contact a health professional for BMI outside 'healthy weight range' why not?*
- *Is there any other support you would like to receive on getting results?*

7. Do you have any suggestions for a future programme measuring the height and weight of children?

Appendix to qualitative study 2– interview schedule – staff

Feasibility study measuring childhood heights and weights in Wales

NPHS/Swansea University April 2009

Qualitative interviews with staff

Interviewees should be aware that Child Health Administrative staff (responsible for height and weight data entry) will have very different experiences from staff belonging to the nursing service. Some of the staff working for the nursing service are support workers employed by Trusts specifically for the project.

Introducing the interview:

‘Thank you very much for agreeing to take part in this interview. We are going to talk about the feasibility study which is looking at introducing a national programme to measure the height and weight of all children in Wales. We want to know more about what staff involved in implementing the feasibility study think about the programme.

I am planning to record this interview. We will make a full transcription of the recording to help us with analysis, but no-one outside the research team will hear the recording. We will analyse what staff members tell us and write this up for the study report which will go to the Welsh Assembly Government. In due course, we may also write research papers which will be published more widely. We may include direct quotations from parents in the report and papers, but we will not use your name or any information which could let people work out who you are.

The interview should take no more than forty minutes. If you want to stop at any time, you are free to do so.’

Before starting interview:

- Ask them to sign consent form
- Check that they are happy for you to record

Prompts are shown in italics after each question. Use these as necessary to draw more out of the respondent.

3. What is your job title?

[This will tell us if they are nursing staff or child health administration staff, and also their level of seniority.]

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4. I mentioned that this study is looking into introducing a national programme of measurement of children. Can you tell me, please, what you understand the purpose of the national programme of measurement to be?
 - *Did you view it as health check for individual children? How do you think it fits in with your role working directly with children?*
 - *Was it clear that it was a means to monitor population trends in childhood growth (including obesity) in order to inform strategies and service development? Do you have any comments about this role?*
 - *Do you feel that the purpose was made clear when you first heard about the programme?*

5. Did you have any involvement in gaining consent from parents or children as part of the programme?
[Make sure there is no confusion with the process of giving consent for this interview. Some parents would have been asked to positively give consent to the measurement. Others would only have been offered the chance to opt out. Staff involved in the consent process will have experience with both. Children did not provide written consent, but could 'refuse' to be measured].

6. Can you tell me, please, what you think about the process of gaining consent from parents to their child being measured?
 - *Would it be better to have an 'opt-out' system – all children included in the study, unless parents specifically say no; if so why?*
 - *Would it be better to have an 'opt-in' system – children only included in the study if their parents filled in the opt-in consent form; if so why?*

7. We are interested in knowing how acceptable staff members found the pilot measurement programme. Were you happy with the way it was carried out?
 - *Were you given sufficient information about the programme? If not, what other information would you have liked?*
 - *What did you think about the process of communicating with schools/school staff, if aware?*
 - *What did you think about the process of communicating with parents, if aware?*
 - *Were you happy with the way the measuring was done? Time, place, privacy, professional involved [traditionally often school nurses take measure; for this study in some areas more junior support staff took the measures – is this acceptable to professionals?]*

- *Were you happy with the way height and weight data was stored? [note: much data was collected for the study – this needs to be distinguished from height & weight data].*
 - *What impact did the programme have on your day to day job?*
8. Parents were offered the chance to received results showing their child's measurements. Were you involved in this feedback and what do you think about the way this was carried out?
- *Were you happy with the process for completing the feedback letters; if not why not? If it was technically possible would you be happy for Child Health administrative data to be directly used to produce the feedback letters? [letters were filled in manually by nursing staff due to objections to database being used as source of results letters]*
 - *Were you happy with the way they were presented? Do think they were they easy to understand? Did you have to explain them to parents? In what way, if any, would you like it to be changed?*
 - *Is there any other support you think parents should get on getting results?*
 - *Does the feedback to parents confuse parents as to the purpose of the process?*
9. Do you have any suggestions for a future programme measuring the height and weight of children?

Appendix to qualitative study 3 – children's interviews - issues arising

1 Time

The team were brought in late in the process, and the report was required very quickly. The time constraints dictated that interviews had to take place during one specific week. Schools were closed for the two weeks immediately prior to the data collection week, with some schools closed for an additional Inset training day on the first day of the allocated data collection week. This meant that a team of 3 researchers had to be used for data collection. Ideally, in order to ensure consistency of questioning, one researcher should have been used.

2 Organisation

Because of data protection information relating to a child had to be segmented and the details had to be passed separately e.g. the name of the child and the school they attended was not included on the consent form signed by parents. Consent to be contacted by a researcher (for the evaluation) was obtained separately from verbal and written consent for the child to participate in the interview. Selection of children for the evaluation was not part of this team's remit neither was the sending of letters to parents. Information was passed along a chain with too many opportunities for confusion and misinformation. This meant that researchers were given the wrong names of children and wrong details about schools. Had this team been involved in the set up of the project the systems could have been streamlined and such confusion avoided.

3 The data set is small.

It had been anticipated that 16 children would be interviewed but some parents did not return consent letters and others returned them too late for their child to be included. Had there been more time and opportunity for the project to be organised differently the data set could have been larger.

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Appendix to qualitative study 4 – children’s interviews - issues beyond our remit

Some additional issues have emerged which are beyond the remit of our section of the evaluation but that we feel professionally bound to convey to the NPHS. These comments come as a result of conversations with teachers and head teachers with whom researchers came into contact during the course of the evaluation.

1. Parental information:

a) The growth surveillance project

During conversation the teacher at the speech and language unit gave information about procedure that had been followed. All parents had been sent letters inviting them to allow their child to take part in the surveillance project. One child’s parents had refused. The teacher spoke with the parents about why. The parent broke down in tears, concerned about the repercussions and who else might become involved as child was overweight. Although the letter to parents states, “The information will be used to understand growth patterns of children in Wales”, the teacher felt that the project was being interpreted as a programme about being overweight not about national growth surveillance.

b) The evaluation project

It has not been made clear to some parents why their child has been chosen to be involved in the project evaluation. At Acton School the head teacher had spoken with the parents of the child involved in the evaluation. They were not aware of reasons for their children being chosen and were concerned that it was an issue with their particular child’s weight or height. At St Mary’s Catholic School a parent had asked the teacher why their child was selected for the evaluation part of the study. Was it because they are Polish? This may require some form of debriefing.

2. Procedural issues

Is it standard procedure for two people to conduct the weighing and measuring? As none of the children were clear about why they were weighed and measured we wonder whether it adds anxiety for children to have two strangers doing something they don’t understand. One child had seen what he weighed – was it procedure that children didn’t see or was this up to the person doing weighing?

3. A ‘competition’

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There seemed to be some confusion about being 'chosen' and being in a 'project' – this has been interpreted by one child as being in a competition. Child J said that her mother had received a letter about the height and weight programme and that the child was in a competition. "because...my mum had a letter that it's going to be...a competition somewhere...I am going to go somewhere and not a big amount of children are gonna be there...that's what I got read...to...so I don't know really". The child thinks they will have to go somewhere and wants to know what they will have to do in the competition. It seems possible that this was the letter asking for consent for the child to be part of the evaluation but it would appear debriefing may be required.

Appendix to qualitative study 5 – children’s interviews - the Interview Script

Items that directly relate to the collection of data to fulfil the project aims are in bold. These issues must be covered.

There is flexibility however in the natural conversation that emerges during the play activities. You are also able to take your own approach to the activities as long as they lead in appropriately to the aim related questions. All researchers must start with the introduction.

Introduction

Hello, my name is ** and I’m a researcher from Swansea University. I’d like to talk to you about being weighed and measured. Is that OK?**

I’ve got some games and things for us to play.

It’s really important that I remember the things we say and I’d rather talk and play with you than have to write everything down. Is it OK if I record what we say using this special machine?

WEIGHING AND MEASURING ACTIVITY

Aim: to develop rapport, put child at ease about the process and address aim 1

Materials: balance scales, tape, mixed ‘treasure bag’ for weighing, photo prompts

Do you ever do weighing and measuring in school? I've got lots of things here that we can weigh and measure. Would you like to have a go?

Weighing and measuring of different toys in the ‘treasure bag’. Interactive game, each player takes an item. Whose is heavier? Whose is lighter? Whose is tallest? Whose is shortest?

You’ve been weighed and measured in school. Do you remember when someone came in to weigh and measure you?

YES – proceed to Q

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NO – prompt with photographs of weighing and measuring equipment used**What happened when you were weighed and measured?****Do you know why you were weighed and measured?****Did anyone tell you, you were going to be weighed and measured?****THE HIDEAWAY PUPPET***Aim: to introduce concept of feelings and ensure child understands and is able to articulate feeling, to address aims 2 & 3**Materials: Hideaway Puppet /Feelings story book*

I've got another really special thing in my bag. I've only just got them and I haven't had time to give them a name. What do you think we could call them?

Development of a game with the puppet ensuring that you use the name assigned by the child, e.g. a story about it being the puppets birthday, how might they feel today? A game where you give an emotion and the child tries to show this is in the puppet

Establish if child is recognising and articulating feeling.**If YES proceed to Q****If NO introduce the feelings storybook****When you were being weighed, how did you feel?****Why did you feel ********What do you think made you feel like that?****When you were being measured, how did you feel?****Why did you feel ******

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What made you feel like that?

Did your parents get to know how much you weighed and how tall you were?

If NO

How do you think you would have felt if they were told?

If YES

What happened when they got the measurements?

How did you feel about that? Why?

THE CLOSING STATEMENT

Aim: to address aim 4, allow child to offer any further information and to close the interview

We need to tell other children about what it's like to be weighed and measured. What do you think we should tell them?

If we weighed and measured children again, should we do it the same or do it differently? (if differently – what kinds of things?)

Is there anything else you'd like to tell me about being weighed and measured?

Thank you for talking with me and playing my games.

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Appendix 5. Literature review report

Dr Thriveni Beerenahally

Methods

Searches were performed on the Ovid databases Medline, Embase, PsycInfo, HMIC, CINAHL, British Nursing Index and Social care online, using explode and focus options where appropriate. The Cochrane Library and Campbell Collaboration databases were checked for reviews and trials. All the U.K. health department sites, including National Institute for Clinical Excellence, were searched for policy and procedure reports.

Other web sites including Bandolier; Health Technology Assessment; National Library for Health; EPPI-Centre; Association of Public Health Observatories; American Public Health Association; Health Evidence Canada; Royal College of Paediatrics and Child Health; Association for the study of obesity; university research departments including Warwick and Birmingham; and some searching of specialist journals including Obesity Research and International Journal of Obesity.

Thesaurus and keyword terms varied slightly across different databases and web sites. Terms searched included:

(Weight AND Height) OR Obesity OR Obes* OR Overweight OR BMI OR BMI OR Body mass OR Waist circumference) AND (Child* OR Young OR Adolescent OR Teen) AND (Monitor* OR Measure* OR Screen* OR Surveillance OR Indicators)

Further terms were used to address specific questions: Feedback; Attitude*; Stigma*; Accept*; Feasibility; Callibrati*; Puberty.

All searches were limited to previous ten years (1999-2009) and to English language.

The studies related on children and teen measurements were considered. Studies from countries other than the UK were also considered. Adult studies were excluded from the search results.

Results

Is BMI a reliable measure of obesity in children?

Body Mass Index (BMI) as a measure of obesity is generally considered to be a reasonable measure with which to assess body fat levels in children and adolescents (Dietz, W. H and Bellizzi, M. C. 1999). It is also noted that BMI provides a general description of the adiposity characteristics of a healthy paediatric population (Ellis, K. J., Abrams, S. A., and Wong, W. W. 1999);

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however it needs to be interpreted with caution in children and young people (National Institute for Health and Clinical Excellence National Collaborating Centre for Primary Care 2006)

BMI as a measure of population prevalence of overweight and obesity has certain limitations. Research has shown that BMI correlates with the amount of body fat; it does not directly measure body fat (Centers for Disease Control and Prevention 2009). BMI can only give an indirect estimate of total body fat and cannot provide a reliable prediction of health outcomes (Speiser, P. W., Rudolf, M. C., Anhalt, H., Camacho-Hubner, C., Chiarelli, F., and Ells, Louisa J. 2005). BMI is not a diagnostic tool for screening overweight, normal weight or under weight children. BMI does not take into account skeletal size, amount of body water or muscle mass and it is not gender specific (van der Wilk 2007), nor does it reflect the distribution of fat in the body (Swedish Council on Technology Assessment in Health 2002).

BMI may be unsuitable for assessing children who are particularly short or tall for their age, or are of a particularly muscular or lean build (National Institute for Health and Clinical Excellence National Collaborating Centre for Primary Care 2006). BMI underestimates the degree of overweight in short children and overestimates overweight in tall children (Swedish Council on Technology Assessment in Health 2002). A study by Freedman et al found that BMI level increased with height among children and BMI was not associated with height after 15 year of age (Freedman, D. S., Kahn, L. K., Serdula, M. K., Dietz, W. H, Srinivasan, S. R., and Berenson, G. S. 2004).

Percentage of body fat and fat distribution vary between different ethnic groups.

A study by Deurenberg showed all Asian populations in the study had a higher body fat percentage at a lower BMI compared to Caucasians (Deurenberg, P., Deurenberg-Yap, M., and Guricci, S. 2002). For comparisons of obesity prevalence between ethnic groups, universal BMI cut-off points may not be appropriate. Apart from age and sex, ethnicity and physical activity level affect the percentage of body fat. For example, endurance runners have less body fat than swimmers (van der Wilk 2007).

A child may have a high BMI for age, sex and ethnicity, but to determine if excess fat is a problem, further assessments is needed. These assessments might include skin fold thickness measurements, evaluations of diet, physical activity, family history, and other appropriate health screenings (Centers for Disease Control and Prevention 2009).

Another measure of obesity and overweight in the population is an individual's waist circumference as abdominal fat is a predictor of risk for obesity-related diseases (Centers for Disease Control and Prevention 2009). However there is no current evidence on its diagnostic values in children (Scottish Intercollegiate Guidelines Network 2004) and there is no evidence-based

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threshold for waist circumference measurements in children (Department of Health 2009)

Different other techniques are available to determine the amount of body fat present in an individual, and there is variation in their accuracy and costs for use in routine practice. Body composition techniques such as dual-energy X-ray absorptiometry (DEXA) imaging, hydrodensitometry, Air-displacement Plethysmography (BodPod) and bioelectrical impedance analysis (BIA) tend to be used only in research settings or for the validation of other measurement methods (Fayter, D., Nixon, J., Hartley, S., Rithalia, A., Butler, G., Rudolf, M. C., Glasziou, P., Bland, M, Stirk, L., and Westwood, M. 2007).

For the purposes of routine clinical practice, the method to assess overweight and obesity in children needs to be simple. The most widely used and recommended measurement on a population level is the BMI, which describes a relative weight for height (Fayter, D., Nixon, J., Hartley, S., Rithalia, A., Butler, G., Rudolf, M. C., Glasziou, P., Bland, M, Stirk, L., and Westwood, M. 2007; Freedman, D. S., Kahn, L. K., Serdula, M. K., Dietz, W. H, Srinivasan, S. R., and Berenson, G. S. 2004; National Institute for Health and Clinical Excellence National Collaborating Centre for Primary Care 2006; van der Wilk 2007).

With exception of measuring very tall or short children and considering the ethnic differences, BMI is a reliable measure of child obesity in the population

What is the effect of puberty on BMI?

This search specifically looked at the evidence to support the particular age group for monitoring of childhood obesity. This replaced the original question 'what is the best age for weighing and measuring children for population monitoring purposes' due to a lack of literature identified. A number of studies examined the effect of BMI on the onset of puberty, there are not included.

Onset of puberty is typically between the age of 10 and 14 years in girls and between 12 and 16 years in boys (Stoppler, M. C. 2009). A study examining at BMI and age at Menarche concludes that age at menarche for the whole population was 12.16 ± 1.2 years (Lin-Su, K., Vogiatzi, M. G., and New, M. I. 2002).

Selected articles show growth spurts occurring during around the age of puberty. Chang et al described growth before and after menarche and conclude height velocity reached a peak 1 year before menarche (Chang, S. H., Tzeng, S. J., Cheng, J. Y., and Chie, W. C. 2000). O'Dea and Abraham reported significant differences when comparing BMI of age matched pre-menarche vs post-menarche girls (O'Dea, J. and Abraham, S. 1995). A cross sectional study by Bini et al demonstrated that the degree of pubertal maturation has a great influence on BMI than age in both genders and this is even more evident in girls. (Bini, V., CeliF., Berioli, M. L., Stella, P., Giglio, P., Tosti, L., and Falomi, A. 2000).

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A cross sectional study by Taylor et al demonstrated that pubertal stage was a more important co factor than age in the relationship between BMI and percentage body fat in boys. On the contrary, for the girls, age was a more important factor than pubertal status (Taylor, R. W., Falorni, A., Jones, I. E., and Goulding, A. 2003).

There is evidence that onset of puberty will affect measured BMI.

What are parents and children's attitudes to childhood height and weight measuring programmes?

Three studies identified examined the attitudes of parents and children to a population measurement programme and receiving the results of measurement. Another study examined attitudes of parents and further one more study looked at the attitudes of children to measurement programme.

A systematic review was undertaken by Westwood et al to look at the evidence for the effectiveness of monitoring children and screening for overweight and obesity in primary school children. (Westwood, M., Fayter, D., Hartley, S., Rithalia, A., Butler, G., Glasziou, P., Bland, M, Nixon, J., Stirk, L., and Rudolf, M. C. 2007). The authors in this review concluded that there were no trials assessing the effectiveness of monitoring or screening for overweight and obesity. The review also concluded that information on the attitudes of children, parents and health professionals to monitoring was extremely sparse.

Children view

Some research has been conducted around children's views of measuring programme and feedback. In the study conducted with 4 and 11 year olds by the National Children's Bureau (NCB) (National Children's Bureau Mutton, S. 2005), the 4 year olds had a limited understanding about the study, while the 11 year olds generally understood what it meant to be weighed and measured. Children in NCB study were concerned about the location of weighing and privacy was an important issue for the children in order to reduce any embarrassment and to prevent teasing or bullying. In the NCB study report that children were happy for a health or medical practitioner e.g. doctor, school nurse or a teacher weighing and measuring them as long as they were kept informed of what was happening, about the results and who would see the results.

The national child measurement programme (NCMP) routine feedback research by Shucksmith et al., (Shucksmith, J., Carlebacl, S., Summerbell, C., Smith, S. 2008) report that young people liked to receive their own results back. Some children were concerned whether their parents would tell them their results if the letter was sent to their parents. Children in this study preferred imperial measurements to metric measurements. Not all the children in the focus group understood what the word 'obese' or 'BMI' meant. Shucksmith et al., report young people (yr 6-15) did not like the overweight

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children to be called as 'obese'. They wanted to make overweight children feel confident. This finding is supported by research by Routh et al, where children have expressed that the measurement to be conducted sensitively without causing stigmatisation to overweight children. (Routh, K., Denley, J., and Rao, J. N. 2006)

Children body esteem was found lower in overweight children than healthy weight children in Grimmett et al study. (Grimmett, C., Croker, H., Carnell, S., and Wardle, J. 2008) In the same study overweight children reported significantly more to be teased by other children than healthy children. But the study did not find any evidence for increase in teasing after weight feedback in any children. The majority of children have said that they enjoyed the measurement process.

Parents view

Few selected studies are specifically related to parent's views about height and weight measurement programme and feedback.

Shucksmith et al., (2008) report that parents were generally welcoming of the NCMP and the extension of the programme to provide them with their child's results. However parents had raised few objections to the use of an opt-out rather than opt-in system. In this study most parents had no real understanding of BMI; however, many felt they could understand a visual interpretation. Parents believed that measurement process would automatically be followed if any problem identified, like child screening programmes. Sensitive and non-stigmatising feedback would generally be welcomed by parents as an aid to caring for their child's health whereas confrontational material which labels the child is likely to be seen as doing the reverse. Parents have raised concerns about underweight children which they see as being overlooked in this programme.

A British Market Research Bureau (BMRB) (British Market Research Bureau Department of Health 2007) study to understand parental attitudes towards the routine measurement of children's height and weight, reported limited awareness and knowledge of the 2005-06 weighing and measuring exercise to the parents. In this study parents had limited knowledge about BMI. Parent's considered prior information about the programme; choice to opt out and provision of feedback were important elements of this programme. Regarding feedback with BMI, parents view was that height and weight graph with a visible display of sections to show the result would be a clear and easy way to interpret the BMI result. Clarity of language and a positive tone was considered important for a feedback letter by parents in BMRB 2007 study. Parents suggested that sending information leaflet with feedback letter would be helpful and could be put into practice by parents. One particular issue that concerned respondents more than any was the protection of privacy of the child's data and sensitivity in the weighing and measuring process.

Kubik et al found that nearly half of the parents were unaware that annual health screening was conducted at their child's school, in spite of parents being informed of the weighing and measuring through letters. (Kubik, M. Y., Story, M., and Rieland, G. 2007) As in other studies, Kubik et al., also found that parents were concerned about privacy of the child during screening, teasing from other children, accuracy of the results, and out of classroom time required for screening to occur. Parents have suggested using the data to present the case for healthier school meals and increased gym time and recess for children. Parents have felt that BMI is well understood and that it is important to include a simple, easy-to-understand explanation of BMI and how to interpret results. All parents wanted the results to be notified to them. Parents questioned the purpose of the programme if information was not routinely fed back to them.

A study by Grimmer et al was conducted to understand the reaction of parents and children to a weight and measurement programme and feedback to parents (Grimmett, C., Croker, H., Carnell, S., and Wardle, J. 2008). In this study very few parents of overweight children in a sample of 3 to 6 years old viewed their overweight children as overweight after feedback. Crawford et al report that parents were unaware that their child was overweight (Crawford, P. B., Woodward-Lopez, G., Ikede, J. P. 2006) and Jain et al., report that low income mothers were reluctant to accept their children described as overweight (Jain, A., Sherman, S. N., Chamberlain, D. L., Carter, Y., Powers, S. W., and Whitaker, R. C. 2001). Conflicting evidence was found in a study by Boutelle et al where the majority of adolescent children's parents did not need to be told that their children were overweight and parents were more accepting of overweight among their sons than their daughters. (Boutelle, K., Fulkerson, J. A., Neumark-Sztainer, D., and Story, M. 2004) Similar findings were described in a study of the parents of younger children (2-11 years) by Maynard et al., (Maynard, L. M., Galuska, D. A., Blanck, H. M., and Serdula, M. K. 2003)

The Grimmer study reported that parental dietary restriction was higher in families with overweight children than healthy-weight children at baseline and more so for overweight girls. Most of the parents wanted weight feedback on a regular basis, with no difference according to child weight group. Grimmer et al provide evidence regarding feedback indicating mixed reactions, with some parents finding the feedback helpful and informative and others identifying upset to themselves or their child.

Summary

All identified studies showed that, on the whole, attitudes of parents and children were largely positive and supportive of the height and weight measurement programme and obtaining feedback, where applicable. Children and parents have expressed some concerns but no strong opposition towards the programme or the proposed routine feedback in Shucksmith et al., study. (Shucksmith, J., Carlebacl, S., Summerbell, C., Smith, S. 2008)

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Children were generally happy about weighing and measuring undertaken by a doctor, school nurse or a teacher in the study conducted in the UK. However both parents and children had concerns about the privacy of measuring in school. There was no evidence that giving written results of BMI measures to parents gives rise to weight related teasing or bullying.

One particular issue that concerned parents in all the identified research was the protection of privacy of the child's data and sensitivity in the weighing and measuring process. Shucksmith et al., (2008) and BMRB (2007) reported lack of understanding about BMI among the parents. On the contrary Kubik et al report that parents well understood BMI. Parents suggested using simple language and a positive tone explaining BMI in a feedback letter.

Grimmett et al study report that not all of the parents were convinced of their child's overweight status after feedback. However parents who refused to accept the overweight status of their child reported making healthy lifestyle changes after feedback, which could indicate a positive reaction to the feedback despite rejection of the weight status label.

No evidence could be found examining the effect of weighing and measuring on children's body image or in relation to an impact on eating disorders.

Table of Results:

Effect of Puberty on growth

Author, date and title of the study	Aim of study	Study design and sample size	Key Findings	Summary	Comments
Bini, V. et al (2000). Body mass index in children and adolescents according to age and pubertal stage.	To evaluate the dependence of body mass index (BMI) values on pubertal stage in subjects similar in age	<p>Cross sectional study- Height and weight were recorded in school subjects</p> <p>from three provinces in central Italy.</p> <p>The subjects were subdivided into three groups:</p> <p>(1) 4271 8.5 ± 15.5 yr old school subjects (2125 males and 2146 females) from</p> <p>schools where the pubertal development</p>	<p>Analysis of variance did not show any significant difference among the mean ages of subjects of the same age-group subdivision at different pubertal stages.</p> <p>The Kruskal - Wallis test demonstrated that significant differences existed among the BMI values in 12, 13 and 14 y old males and in 11, 12 and 13 y old females subdivided in relation to pubertal stage.</p> <p>A significant positive trend was observed in both genders according to pubertal stage for BMI values of subjects similar in age (z-test for trend, P<0.01).</p> <p>BMI values were significantly higher in post-</p>	BMI values depend on pubertal degree of maturation, especially in girls. This influence should be taken into account when BMI is evaluated in adolescents.	<p>Study conducted in Italy, therefore generisability subject to cultural differences.</p> <p>Study helps to decide with identifying the age for monitoring child measurement.</p>

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		<p>was recorded</p> <p>were selected to compile BMI subdivided according to their pubertal stage;</p> <p>(2) the 10.5 ± 14.5 yr old females from</p> <p>the entire survey (6345 subjects) were selected to compile</p> <p>BMI subdivided according to age in pre-menarche and</p> <p>post-menarche girls, separately</p> <p>(3) the 10.5 ± 14.5 yr</p> <p>old females of the entire survey who had presented their</p> <p>menarche within the</p>	menarche girls as compared to pre-menarche girls similar in age (P<0.001).		

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		<p>previous 6 months (1919 subjects) were selected to compile short-term post-menarche BMI</p> <p>subdivided according to age</p>			
<p>He, Q., Karlberg, J., (2001). BMI in Childhood and Its Association with Height Gain, Timing of Puberty, and Final Height.</p> <p>Abbreviations: PHV-Peak Height Velocity</p> <p>$\Delta B8-2$-BMI change</p>	<p>To investigate the association between BMI change in childhood, <i>i.e.</i> from 2 to 8 year of age, and gain in height during childhood, the timing of the puberty growth spurt and final height.</p>	<p>Quantitative design- Data represented 3650 healthy Swedish children with growth information from birth to 18 years of age.</p> <p>Study subjects selected from 5111 final grade school children born full term between 1773 & 1975 in Goteborg, Sweden.</p> <p>Health records for each child from birth to the last grade at school were retrieved and parents of</p>	<p>1. BMI change between 2 and 8 yr of age ($\Delta B8-2$) was defined as the childhood obesity pattern or adiposity rebound pattern.</p> <p>2. Height gain between 2 and 8 yr of age ($\Delta HCM8-2$) was regarded as the short-term outcome measure.</p> <p>3. Height gain between 8 and 18 yr of age ($\Delta HCM18-8$) and the age of reaching the PHV were taken as the interim outcome measure and</p> <p>4. Final height was defined as the long-term outcome measure of the childhood obesity pattern.</p>	<p>An increase of 1 BMI unit between 2 and 8 yr of age was associated with a gain in height of 0.23 cm in boys and 0.29 cm in girls during the same period.</p> <p>The result supports the hypothesis that over nutrition accelerates linear growth in childhood.</p> <p>A significant negative association</p>	<p>Question about accuracy of data and data collection method needs to be addressed.</p> <p>Reliability of parents reporting their children's current height and weight is not answered.</p> <p>Generalisability is subject to cultural differences as the study conducted in Sweden.</p>

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<p>between 2 and 8 yr of age</p> <p>ΔHCM8-2- height gain between 2 and 8 yrs of age</p> <p>Δ HCM18-8- height gain between 8 and 18 yr of age</p>		<p>each child asked to report their current height and weight.</p> <p>The information of each child at birth and throughout the prenatal period (size at birth, length of gestation, and any health problems) was obtained from the Swedish Birth Register.</p>	<p>The 8–2, ΔHCM8–2 and ΔHCM18–8, were significantly different ($p < 0.05$) between the two sexes.</p> <p>A multiple linear regression analysis was used to test the relationship between BMI change and its short-term, interim, and long-term effects.</p> <p>No significant difference ($p > 0.05$) was found for the mean height at birth nor at 18 yr of age, among the three different childhood BMI change groups, for either of the two sexes.</p> <p>A significant positive association was found between the ΔB8–2 and the ΔHCM8–2, after adjusting for both the observed BMI value and measured height at 2 yr of age.</p> <p>A significant difference was noted in the mean height at both 2 and 8 yr of age ($p < 0.05$) among the three childhood BMI change</p>	<p>between the ΔB8–2 and the age of PHV after adjustment for both the observed BMI at 2 or 8 yr and measured height at 2 yr of age.</p> <p>An increase of 1 BMI unit between 2 and 8 yr of age was associated on average with a 0.11 yr earlier timing of puberty.</p> <p>Regression analysis revealed that the ΔHCM18–8 was reduced by 1.25 cm in boys and 1.45 cm in girls for each year</p>	

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			<p>groups.</p> <p>BMI at 2 y of age and the $\Delta B8-2$ were positively ($p < 0.05$) associated with the $\Delta HCM8-2$.</p> <p>The $\Delta HCM8-2$ and the $\Delta B8-2$ were both negatively associated ($p < 0.05$) with the age at reaching PHV for the two Sexes.</p> <p>With $\Delta HCM18-8$ as the dependent variable for</p> <p>liner regression models showed both BMI at 2 yr and BMI at 8 yr were negatively ($p < 0.05$) associated with the</p> <p>$\Delta HCM18-8$.</p>	<p>of earlier pubertal maturity.</p> <p>Study clearly shows an association between the magnitude of childhood adiposity rebound in terms of an earlier timing of puberty, potentially reflecting both the increased pre-pubertal height and metabolic changes or influence on the trigger mechanism of pubertal onset.</p>	
Lin-Su et al., (2002). Body Mass Index and Age at Menarche in an Adolescent	Not clearly mentioned	108 female patients between the age of 10 and 18yrs were selected from adolescent clinic at New York Presbyterian Hospital. Measurements	<p>1. Average BMI SDS for this population was +1.13 and did not differ significantly with race.</p> <p>2. The mean age at menarche also did not</p>	The study indicates a relation between body fatness and age at menarche.	The age at menarche was based on recall; this raises the question of accuracy of data.

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Clinical Population.		<p>were taken at the time of recall of the month and year of menarche or at the closest time to onset of menarche.</p> <p>1. BMI calculated.</p> <p>2. Standard deviation score (SDS) calculated based for each on reference curves for age and sex.</p> <p>3. Correlation between BMI, SDS and age at menarche was calculated using Pearson co-efficient.</p> <p>Analysis-age at menarche was compared among the different races and among the different weight groups using one way analysis of variance.</p>	<p>differ significantly with race (12.11 ± 1.2 vs 12.24 ± 1.3 vs 12.29 ± 1.8 in Hispanics, African Americans and White respectively)</p> <p>3. Age at menarche for the whole population was 12.16 ± 1.2 years.</p> <p>4. Negative correlation between BMI SDS and age at menarche, signifying that the heavier girls reached menarche at a younger age ($r = -1.24$. $p < 0.01$).</p>	The obese girls reached menarche at an average of 0.4 years earlier than normal weight girls.	Study population from one clinic population in America. So the results can not be generalised.

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Mandel, D. et al. (2004). Age at menarche and body mass index: a population study.	To test the hypothesis that age at menarche is inversely related to body mass index	<p>Randomly selected 11,293 young women (mostly Caucasian and Jewish origin) completed the questionnaire at the time of discharge from compulsory Israeli military service, to determine the self-reported age at onset of menarche.</p> <p>Participants were weighed and measured at 20 years of age. BMI calculated.</p> <p>Analysis conducted using Statistical Analysis System (SAS). ANOVA was used to compare the age at menarche between obese and non-obese participants.</p>	<p>1. The age at menarche was significantly and inversely correlated with BMI ($R = -0.11$, $p < 0.001$).</p> <p>2. Obesity was defined as BMI > 30 and leanness as BMI < 20, there were significant differences in age at menarche between obese women, non obese, non lean women and lean women by ANOVA.</p>	<p>It appears from this study that the difference in age at menarche between obese and lean females was relatively small.</p> <p>Study shows inverse correlation between BMI in 20-21 year old women and their age at menarche.</p>	<p>Not well designed study.</p> <p>High chances of recollection bias in the data collection method.</p> <p>The relation of BMI to menarche is not clear as the measurement were taken at the age of 20 years.</p> <p>Study conducted in Israeli, generalisability is subject to cultural differences.</p>

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		Regression analysis was used to study the correlation between BMI and age at menarche.			
Okada. T. et al., (2005). Assessment of individual changes in body fatness in boys during early pubertal period.	To know whether the changes in indexes of overweight, body mass index (BMI; kg/m ²) and percentage of overweight (POW) (%), really represent the tendency toward obesity	<p>Study population was 50 boys who lived in Shizuoka in Japan.</p> <p>Height and weight were measured, and BMI and POW were obtained.</p> <p>Body fat percentage (BF%), fat mass (FM) and lean body mass (LBM) were estimated by bioelectrical impedance method.</p> <p>The 3-year changes in BMI, POW and predictive variables in each individual, from 9 to 12</p>	<p>1. The mean change of BMI was 1.7 ± 0.3 (mean \pm SEM) kg/m² and that of POW was $2.2 \pm 1.9\%$.</p> <p>2. A strong linear correlation was found between them ($r_2 = 0.823$, $P < 0.0001$).</p> <p>3. The change in BMI was influenced by both LBM and FM ($r_2 = 0.891$, $P < 0.0001$).</p>	<p>This study shows the change in POW indicated the change of fat accumulation, rather than a change in LBM, while the change in BMI was influenced by both body compartments, FM and LBM.</p> <p>POW is the better index of body fatness to assess its individual change for boys during early pubertal period, because the index independent from</p>	<p>Well conducted study.</p> <p>Using POW as index of obesity needs to be further explained.</p> <p>Study conducted in Japan, so generalisability is subject to cultural differences.</p>

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		<p>years of age were collected.</p> <p>Simple regression analysis was used to assess correlation between BMI and POW.</p> <p>The multiple regression analysis was used to analyse the influence of predictive variables (LBM, FM) on the changes in BMI and POW.</p>		<p>the change in</p> <p>LBM is supposed to be the appropriate index for obesity in practical use.</p>	
Chang. S. (2000). Height and Weight Change Across Menarche of Schoolgirls	To describe height and weight change before and after menarche.	<p>Quantitative study.</p> <p>900 fourth grade school girls were selected from 8 elementary schools in Taiwan as a closed cohort. All subjects were</p>			

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With Early Menarche.		<p>followed up from fourth grade in September 1993 to the end of sixth grade in June 1997.</p> <p>Data collected from once a year from self – administered questionnaires and height and weight data were collected from school health records.</p> <p>Height and weight measured either twice or four times each year.</p> <p>S-plus software (MathSoft Inc, Seattle, Wash) was used to conduct empirical smoothing growth curves for heights,</p>			

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		weights, and BMIs against the chronological age and the time from menarche			

What are parents and children's attitudes to measuring programmes?

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Shucksmith, J.et al (2008). <i>The National Child Measurement Programme: routine feedback</i>	To identify a method to deliver NCMP results to parents in a manner which the parents and their children would find most useful	PCT audit- 152 questionnaires sent to parents; 54 responded. Qualitative study-on the	From the audit, PCTs are at very variable stages of readiness in terms of their ability to implement a full-scale routine feedback. Parents and children view:	The parents and children have some concerns but no strong opposition towards the programme or the proposal for routine feedback.	Well conducted research. Gives insight whether to consider routine feedback or

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<i>research: A final report for the Department of Health.</i>	and beneficial.	<p>basis of audit information; 3 PCT area selected.</p> <p>Focus group interview-(maximum 5), of reception year children parents in each primary school 2 focus group (maximum 10) with year 6 children parents in each school and 1 focus group of year 6 children in each primary school.</p> <p>Questionnaire-to parents in one PCT area.</p> <p>Interviews-with PCT staff with responsibility for management of NCMP programme and with Staff nurses and health care assistants involved in the measurement programme.</p>	<p>1. Parents were generally welcoming of the NCMP and the extension of the programme to provide them with their child's results.</p> <p>2. Parents had raised few objections to the use of an opt-out rather than opt-in system.</p> <p>3. Sensitive and non-stigmatising feedback would generally be welcomed by parents as an aid to caring for their child's health whereas confrontational material which labels the child is likely to be seen as doing the reverse.</p> <p>4. Most parents had no real understanding of BMI but it worked for many when shown as a visual interpretation.</p> <p>5. Parents raised concerns about underweight which they see as being overlooked in this programme</p>	Consequently it may need to be made clearer to parents that the responsibility lies with them to seek help or take action.	not. Conducted in Leeds, Solihull and Walsall PCT area could be generalised for UK population.

Author, date and title of the study	Aim of study	Study design and sample size	Key Findings	Summary	Comments
		Semi-structured interviews with 11 Stake holders.	<p>6. Parents believed that measurement process would automatically be followed if any problem identified, like any other child screening programme.</p> <p>7. Many parents have concerns that a focus on weight <i>per se</i> will be unhealthy for their children.</p> <p>Stakeholders from professional groups raised some concerns about the process of feeding back height/weight results. They questioned about Staff nurse involvement in NCMP programme due to heavy work loads and changed way of work load.</p> <p>Staff nurse from Leeds found organising measurement and feedback was hard work and they rather not take part in the NCMP at all.</p>		

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Author, date and title of the study	Aim of study	Study design and sample size	Key Findings	Summary	Comments
British Market Research Bureau. Social Research. (2007). <i>Research into parental attitudes towards the routine measurement of childrens height and weight</i> [Online]	<p>1. To explore the perspective of parents and children towards weighing and measuring in relation to the 2005-06 exercise</p> <p>2. To consider the impact of providing feedback to parents on height and weight data regarding their children, as well as considering Body Mass Index (BMI)</p>	<p>Qualitative Method-</p> <p>1. In depth interviews with the family involving at least one parent and the child measured.</p> <p>Key variables-</p> <p>I. age of the child when weighed and measured</p> <p>II. parental weight</p> <p>III. socio-economic group</p> <p>IV. parental ethnicity</p> <p>Research took place in six geographical areas across England which involved urban, suburban or rural neighbourhoods.</p> <p>2. In-depth interview with family who opted out of</p>	<p>1. Limited awareness & knowledge of the 2005-06 weighing and measuring exercise</p> <p>2. Prior information, choice to opt out and provision of feedback were considered important elements of this programme.</p> <p>3. Parents valued feedback of the height and weight data as well as information on whether the child is a healthy weight or not. Feedback of the height and weight data alone was not viewed as sufficient detail</p> <p>4. Little evidence of understanding of BMI.</p> <p>5. Height and weight graph with coloured sections to show whether the result meant overweight, healthy weight or underweight would be more useful as a clear and easy way to interpret the BMI result.</p>	<p>On the whole attitudes were largely positive and if the exercise were to be implemented on a more permanent basis, the research findings suggest that people would have few worries with the weighing and measuring procedure itself.</p> <p>Giving information in advance and the choice to opt out and the provision of feedback were considered important elements of a NCMP exercise.</p> <p>Particular issues</p>	<p>This study identified important issue that the parents knew very little about the programme prior to measurement.</p> <p>Family interview is a positive approach in terms of comforting the child to talk however this approach have caused bias to the child view.</p> <p>Feedback was viewed as very important by the parents which supports DOH, NCMP guidance which recommends giving feedback to all the parents, unless requested by parent not to do so.</p>

Author, date and title of the study	Aim of study	Study design and sample size	Key Findings	Summary	Comments
		<p>the exercise. 40 family interviews were conducted.</p> <p>3. Focus group discussions with parents of children in year 1, year 6 or year 7. Parents whose children had measured and those who had not were included in the discussion.</p> <p>6 group discussions conducted with 3-7 respondents in each group.</p>	<p>6. Clarity of language and a positive tone was considered important for a feedback leaflet.</p> <p>7. Parents generally suggested that receipt of height and weight data and the information in the feedback leaflet would be informative and helpful and</p> <p>could be put into practice by parents</p>	<p>that concerned respondents were the protection of privacy of the</p> <p>child's data and sensitivity in the weighing and measuring process.</p>	<p>This study also highlighted the need to define BMI with feedback, as the study identified very little understanding of BMI.</p>
Kubik et al., (2006). Developing School-Based BMI Screening and Parent Notification Programs: Findings from Focus Groups	1. To gather information with regard to parents' opinions and beliefs about height, weight and BMI screening at school.	<p>Qualitative study-focus group discussion with parents of students attending two elementary schools in Minnesota.</p> <p>Total of 71 parents participated in 10 focus group discussion. Average group size was</p>	<p>1. Half of the parents were unaware of the screening programme. This was despite parents being informed of the weighing and measuring through letters and on the school website.</p> <p>2. Parents were generally supportive of the programme, but felt that the information</p>	<p>Parents were generally supportive of the programme but questioned the purpose of the programme if information was not routinely fed back to parents or used</p>	<p>Only parents from two elementary schools in one suburban metropolitan school in Midwest America were selected for this study therefore generisability</p>

Author, date and title of the study	Aim of study	Study design and sample size	Key Findings	Summary	Comments
With Parents of Elementary School students.	2. to understand how to develop notification programs in a sensitive manner and convey supportive messages to parents and children about weight and healthy weight control	7.	<p>should be reported back to them to help with the detection of important health conditions</p> <p>3. Parents suggested using the data to present the case for healthier school meals and increased gym time and recess for children.</p> <p>4. Parents raised concern about privacy of the child during screening, teasing from other children, accuracy of the results, and out of classroom time required for screening to occur.</p> <p>5. Most parents felt that school-based height and weight screening was more important for children and families who were without health insurance or had limited access to health care.</p> <p>6. Parents felt that BMI is well understood by everyone and felt that it is important to include a simple, easy-to-understand explanation of</p>	<p>for a purpose (e.g. surveillance).</p> <p>Parents needed assurance that the measurement process would be private and respectful and that deliberate steps would be taken by school staff to minimize any weight-related teasing among children.</p>	<p>subject to cultural differences.</p> <p>This study has raised concern over method of informing parents about the screening programme.</p>

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Author, date and title of the study	Aim of study	Study design and sample size	Key Findings	Summary	Comments
			<p>BMI and how to interpret results.</p> <p>7. Parents felt that all parents should be notified about the results from the height and weight screening and provide BMI information.</p> <p>8. Mailed information directly to parents was perceived as more confidential; because it would allow parents the flexibility to decide whether and how to share the information with the child and family. However only a very few were happy with receiving an e-mail or including the information on a child's report card.</p>		
Grimmett et al., (2008). Telling Parents Their Child's Weight Status: Psychological Impact of a weight-Screening program.	To compare parents' and children's reactions to a weighing and measurement program that included weight feedback	<p>1. Children-</p> <p>Base line questionnaire - completed by year 6 and Year 3 children.</p> <p>Within 6 weeks of collecting base line data, children's weight and height were measured.</p>	<p><u>Anthropometrics-</u></p> <p>1 defined as underweight (< 0.5 percentile)</p> <p>297 (83%) healthy weight</p>	<p>This study identified that even with feedback,</p> <p>not all of the parents were convinced of their child's overweight status. However 30% of parents who continued to</p>	Well conducted study and the author claims that this is the first study to use validated measures of parents and child outcomes to assess the impact of weight feedback.

Author, date and title of the study	Aim of study	Study design and sample size	Key Findings	Summary	Comments
	<p>given to the parents in families with overweight or healthy weight children.</p>	<p>2. Parents- Parents from 6 schools in the London area were selected for the study.</p> <p>Out of 786 parents, 375 parents of children in year 3 and year 6 consented to participate. 26 actively declined participation. Those who declined were invited to give their reasons. Parental questionnaire sent to the homes by the school.</p> <p>3. Feedback Letters with qualitative and quantitative information along with simple healthy diet and physical activity advice were sent to the parents.</p> <p>4. Follow up</p>	<p>45 (13%) overweight</p> <p>16 (4% very overweight)</p> <p><u>Parental Weight Perceptions</u></p> <p>Few parents said their child as “very underweight” or “very overweight”.</p> <p>After feedback there was little change in perceived weight status among parents of healthy-weight children.</p> <p>Slightly more parents of overweight children identified their child as overweight (from 40% to 49%).</p> <p><u>Parental Feeding Style</u></p> <p>Monitoring of children’s eating declined overall</p>	<p>describe their child as at a healthy weight reported making healthy lifestyle changes after feedback, which could indicate a positive reaction to the feedback despite rejection of the weight status label.</p> <p>There was no evidence of any increase in weight-related teasing, which encourages measurement and feedback.</p> <p>Parents welcomed the approach of sending information about healthy eating and activity for families.</p>	<p>Although majority of parents and children were comfortable with the process, there were few who found it distressing.</p> <p>There is a need to identify the best format for providing feedback which is neutral.</p>

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Author, date and title of the study	Aim of study	Study design and sample size	Key Findings	Summary	Comments
		<p>questionnaire completed by Parents and children 4 weeks after the feedback was sent.</p> <p>5. Formative research method used. This included telephone interviews with parents, teachers and school nurses about presentation of feedback.</p>	<p>from before to after feedback.</p> <p>Parental restriction was higher in families with overweight than healthy-weight children at baseline.</p> <p>Posthoc tests – parental restriction increased significantly for overweight girls from baseline to follow-up ($P = .032$).</p> <p><u>Health Behaviours</u></p> <p>At follow-up, significantly more parents of overweight (49%) than healthy-weight children (12%) reported dietary changes ($P = .001$) and physical activity (48% vs 10%; $P = .001$).</p> <p><u>Child Body Esteem</u></p>		

Author, date and title of the study	Aim of study	Study design and sample size	Key Findings	Summary	Comments
			<p>Body esteem was lower in overweight than in healthy weight children at baseline.</p> <p>Posthoc tests showed that body esteem increased significantly in healthy-weight children in this year group ($P = .027$), whereas it was unchanged in overweight children.</p> <p><u>Child Dietary Restraint</u></p> <p>Dietary restraint was higher in overweight than in healthy-weight children at baseline.</p> <p>Posthoc tests on the year 6 sample showed a significant reduction in restrained eating among healthy-weight children ($P = .001$) but no change in restraint for overweight children</p> <p><u>Teasing</u></p> <p>At baseline, overweight children were significantly more likely than healthy-weight</p>		

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Author, date and title of the study	Aim of study	Study design and sample size	Key Findings	Summary	Comments
			<p>children to report teasing by other children (38% vs 17%; $P = .001$), parents (18% vs 8%; $P = .017$), and siblings (39% vs 22%; $P = .007$). There was no evidence for increases in teasing after weight feedback in any subgroup.</p> <p><u>Subjective Reactions to Weighing and Weight Feedback</u></p> <p>66% of parents wanted weight feedback on a regular basis, with no difference according to child weight group.</p> <p>The responses indicated mixed reactions, with some parents finding the feedback helpful and informative and others identifying upset to themselves or their child.</p> <p>The majority of children ($n = 351$ [96%]) either said they “enjoyed it” or found it “OK.” A small number of healthy-weight children (3%) and overweight children (7%) reported “not liking” or even “hating” the process.</p>		

Author, date and title of the study	Aim of study	Study design and sample size	Key Findings	Summary	Comments
National Children's Bureau (2005). <i>A Report for the Children's Commissioner's Office on NCB's consultations with primary school children on measuring children's height and weight in school.</i>	<p>The aim of this consultations was to gather children's views on what they think and how they feel about having their height and weight measured regularly at primary school with particular reference to:</p> <p>1. Where measuring should take place</p> <p>2. Who should do it</p>	<p>Three schools one rural, one suburban and one inner-city were selected from different areas of the country.</p> <p>219 children aged between 4-11 years were consulted across Reception (4-5 years), Year 1 (5-6 years), Year 3 (7-8 years) and Year 5 (9-10 years) classes in each of the three schools.</p> <p>Sample had a representation of children from a range of backgrounds including children from black and ethnic minority communities and low-income families.</p>	<p><u>1. Children's perceptions of health and being healthy</u></p> <p>Children's perceptions and thoughts about health were mainly related to diet and exercise.</p> <p>7 and 8 year old children expressed about the benefits of exercise and rest.</p> <p><u>2. Children's understanding of what it means to be weighed and measured</u></p> <p>The many children aged 4 years and below did not fully understand the concept of being weighed and measured in school.</p> <p>Children felt that it was important to</p>	This study gives a positive feedback from children about national programme for regular weighing and measuring as long as their concerns are addressed.	Well conducted consultation; however there is little information about how parents/carers and schools could be involved in the programme.

Author, date and title of the study	Aim of study	Study design and sample size	Key Findings	Summary	Comments
	<p>3. How the results might be used e.g. who would see them, where would they go?</p> <p>4. How parents/carers might be involved</p> <p>4. How the intervention provides opportunities for children to learn about health and healthy lifestyles</p>	<p>Individual interviews with a small sample of children in Year 5.</p> <p>Session with children followed following design:</p> <p>1. Individual exercise to find out children's personal feelings about being weighed and measured</p> <p>2. A group exercise to decide the best place in the school for weighing and measuring to take place and who they would like to measure and weigh them.</p>	<p>understand the relation between weight and health and how to eat and exercise properly.</p> <p>Privacy was an important issue for the children in order to reduce any embarrassment and prevent teasing or bullying.</p> <p>Children expressed that keeping them fully informed, before and during the measurement helps to reduce their anxiety.</p> <p><u>3. Who should measure</u></p> <p>Children said they would be happy with a health or medical practitioner e.g. Doctor, school nurse or a teacher weighing and measuring them as long as they were kept informed of what was happening, the results and who would see the results.</p>		

Author, date and title of the study	Aim of study	Study design and sample size	Key Findings	Summary	Comments
		<p>3. A whole class exercise to find out whether the children would like to be accompanied during the weighing and measuring process and if so, who by</p>	<p>Majority of children said they would like their parents and carers to go with them when being weighed and measured in order to reduce their anxiety</p> <p><u>4. Why is it important and how will results are used?</u></p> <p>Children felt the results would be used in a helpful way to improve their health and to give advice to children and their parents about diet and exercise.</p> <p>5. How could the intervention be a useful way to learn about health and healthy lifestyles?</p> <p>Children said that weighing and measuring them provides opportunities to reinforce</p>		

Author, date and title of the study	Aim of study	Study design and sample size	Key Findings	Summary	Comments
			<p>existing information and messages about health and healthy life style.</p> <p>Children expressed that during measurement they should have the opportunity to ask questions about their own and their family's health and changes to their body, for example in relation to puberty.</p>		

Abbreviations used in evidence tables:

BMI-Body Mass Index

CDC- Centres for Disease Control and Prevention

DOH-Department of Health

NCMP-National child measurement programme

PCT-Primary Care Trust

PHV-Peak Height Velocity

Δ B8-2, BMI change between 2 and 8 yr of age

Δ HCM8-2, height gain between 2 and 8 yrs of age

Δ HCM18-8, height gain between 8 and 18 yr of age

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Appendix 6. Additional quantitative analyses

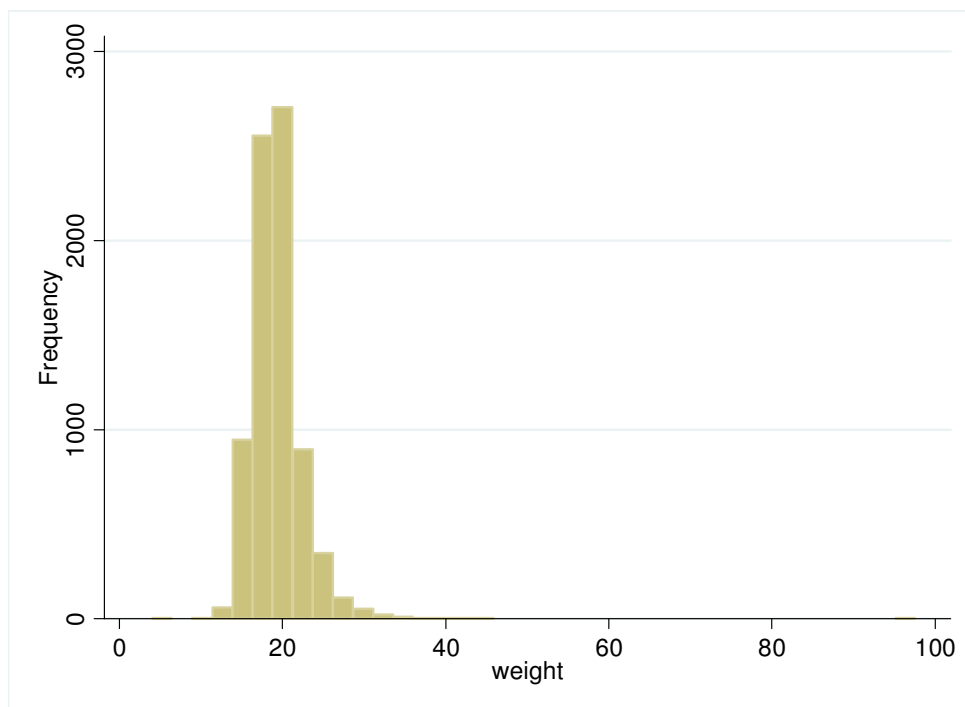


Figure 1. Distribution of weight results in kg (weight <100kg), reception year

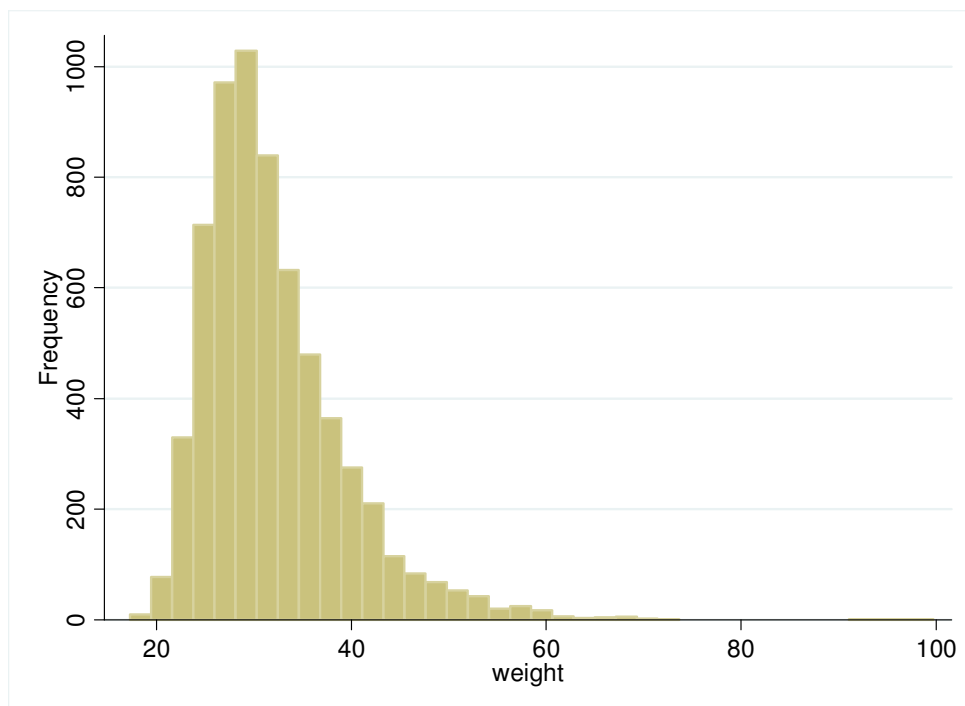


Figure 2 Distribution of weight results in kg (weight < 100kg), year 4

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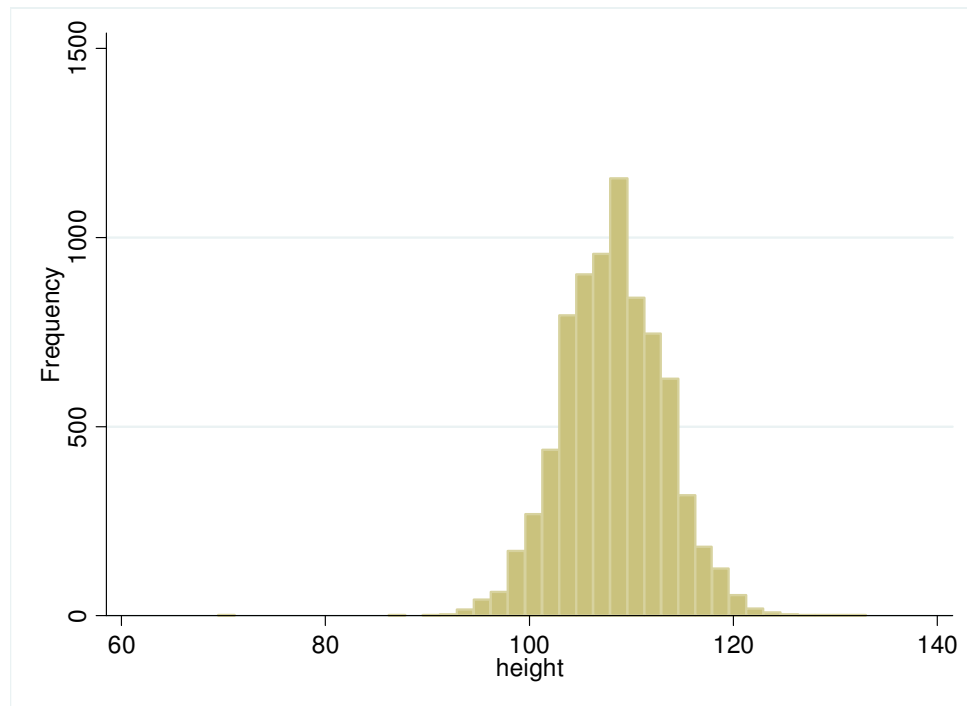


Figure 3 Distribution of height results in cm (height > 50cm), reception year

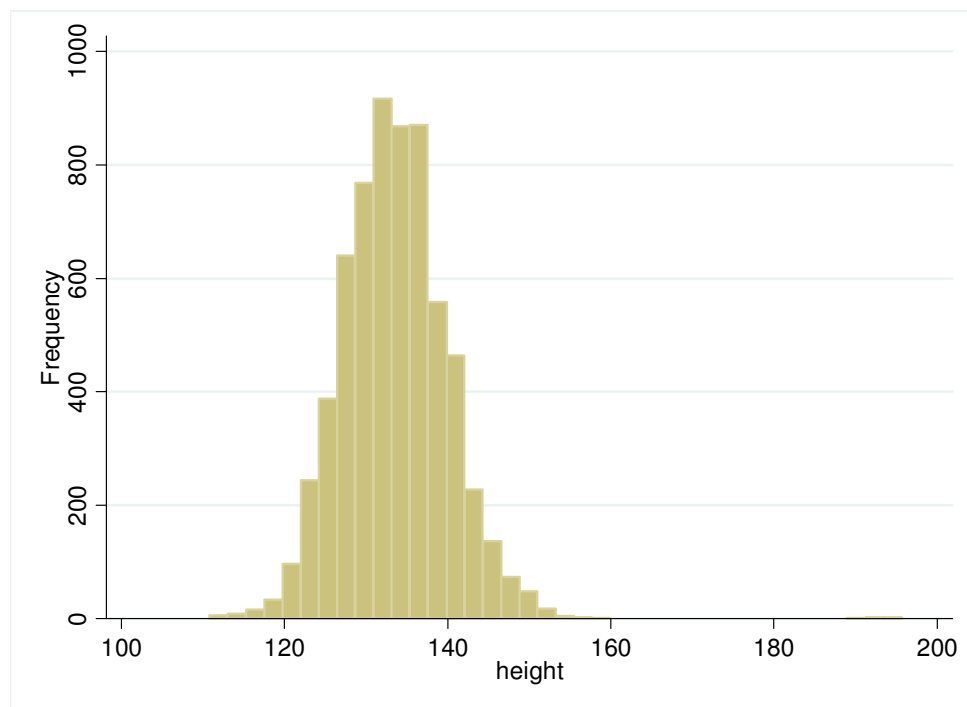


Figure 4 Distribution of height results in cm (height > 50cm), year 4

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Uptake

Please note that, for the reasons outlined in the main report, NCCHD data referring to Flintshire and Wrexham are excluded from the following analysis.

In addition to having data which are of a consistently high standard in terms of their quality, a worthwhile national measurement programme must ensure high levels of uptake. Low uptake rates would mean that data may not be representative and therefore the programme would be of little benefit in terms of the core aims of:

- monitoring trends;
- assessment of population based interventions;
- acting as a source for population based epidemiological research.

Evidence shows that consent method can have a significant bearing on uptake. Studies where consent is assumed unless a participant (or their parent/guardian) actively signals an unwillingness to participate (opt-out) tend demonstrate higher rates of participation than those where positive consent is required to allow participation (opt-in). This study wished to explore how much of an effect, if any, consent method would have on uptake of height and weight measurements in primary school pupils. As outlined in section in the main document, for children in reception year, the consent method was in accordance with existing procedures. This meant that, in Merthyr Tydfil & Cynon Valley, Pembrokeshire and Swansea an opt-out method was used whereas in Powys and Wrexham & Flintshire (not shown) opt-in was used. In the case of year 4 children, existing procedures regarding consent were not followed. Instead, schools were randomly allocated to parental opt-out or parental opt-in groups with the aim of testing the effect on uptake of measurement.

It had been planned to analyse uptake primarily by looking at the consent fields. However, since consent has not been recorded accurately on the CCH2000 systems and, hence, the NCCHD extract, uptake will be measured by looking at the number and proportion of children with a height or weight measure recorded. This is, in a sense, the ultimate measure of consent. Having discussed with trust colleagues we are assured that no measurement was undertaken on children whose parents did not consent for them to participate.

As discussed in the main report it was decided that results for year 4 pupils would be included in a WHO European childhood obesity surveillance programme. In order to participate, data needed to be recorded on a WHO pro forma at the individual school level. Some of these data were not recordable on the CCH2000 but others, including number of children registered, examined and consenting/not consenting duplicated information gathered on the child measurement forms. Since it was decided to use these forms for reception year children as well, this represents an alternative source

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of uptake data. However, the collection of data via this source has also proved problematic with no forms having been received for 67 (15%) schools. In addition, information on catch-up visits does not appear to have been captured in most instances. However, the key advantage of this source of uptake information is that analysis can be included for the Flintshire and Wrexham area. So, whilst this section presents this alternative source of uptake data for schools where forms were received, this does not represent a gold standard. Due to the fact that for most schools, catch-up visit information was not captured, analysis of the forms is restricted to information gathered on the first visit to the school.

Table .1 shows the number of children included in the feasibility study in each year group broken down by trust area as recorded on the NCCHD. The table shows that there were a small number of records which could not be assigned to a year group or the opt-out / opt-in group within year 4.

Table 1 Number of pupils included in the study for measurement, NCCHD

	Yr R	Yr 4 opt-out	Yr 4 opt-in	Yr 4 no group	Total
Merthyr Tydfil & Cynon Valley	1289	647	616	5	2557
Pembrokeshire	1105	689	658	3	2455
Powys	1264	678	677	2	2621
Swansea (part)	1816	954	955	3	3728
All [†]	5474	2968	2906	13	11361

Source: NCCHD

[†] Excluding Flintshire & Wrexham

Table 1 shows the equivalent data sourced from the European forms.

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Table 2 Number of pupils included in the study for measurement, European forms

	Yr R	Yr 4 opt-out	Yr 4 opt-in	Total
Flintshire & Wrexham	2195	1634	1422	5251
Merthyr Tydfil & Cynon Valley	1165	629	623	2417
Pembrokeshire	926	625	614	2165
Powys	966	548	539	2053
Swansea (part)	1914	1232	1196	4342
All	7166	4668	4394	16228

Source: European forms

Comparing the areas shows that the total numbers captured are slightly lower in European forms than the NCCHD. This is as expected because not all schools returned a form. The total figure for the European forms is, of course, higher than in the NCCHD table since data for Flintshire and Wrexham are included.

Tables 3 and 4 show number and percentage of children for whom a height or a weight measurement was recorded on the NCCHD. In the absence of accurate recording of consent this indicator is being taken as a measure of willingness to participate in the feasibility study.

Focusing firstly on the reception year, NCCHD data indicate that participation rates are very high in all areas. Only in Powys was the proportion less than 90%. This may be explained by the use of an opt-in method of consent in that area whereas in all other areas shown an opt-out method of consent was used.

Turning to the year 4 children, participation rates are slightly lower in the year 4 opt-out children than their reception year counterparts. Year 4 opt-in children were much less likely to participate than year 4 opt-out children and this is in line with expectations. The p value of <0.001 shows that the difference in uptake between the opt-out and opt-in groups is highly statistically significant. Although uptake is lower in the opt-in group in all areas, the variation between trust areas is nevertheless interesting to note and warrants further investigation.

Table 3 Number of children* where a height or weight measurement was recorded by school year and trust, NCCHD

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Number

	Reception		Year 4 opt-out		Year 4 opt-in		Total
	ht/wt	no ht/wt	ht/wt	no ht/wt	ht/wt	no ht/wt	
Merthyr Tydfil & Cynon Valley	1243	46	606	41	482	134	2552
Pembrokeshire	1044	61	624	65	409	249	2452
Powys	1090	174	568	110	393	284	2619
Swansea (part)	1645	171	780	174	442	513	3725
All	5022	452	2578	390	1726	1180	11348

Source: NCCHD

* excludes 13 children where the year or opt-in/opt-out group could not be established

Table 4 Percentage of children* where a height or weight measurement was recorded by school year and trust, NCCHD

Per cent

	Reception		Year 4 opt-out	Year 4 opt-in	P value
Merthyr Tydfil & Cynon Valley	96.4		93.7	78.2	<0.001
Pembrokeshire	94.5		90.6	62.2	<0.001
Powys	86.2		83.8	58.1	<0.001
Swansea (part)	90.6		81.8	46.3	<0.001
All	91.7		86.9	59.4	<0.001

Source: NCCHD

* excludes 13 children where the year or opt-in/opt-out group could not be established

Tables 5 to 6 show the number of children for whom a height or a weight measurement was recorded on the European forms for reception and year 4 children. The European forms allowed the collection of information on absenteeism and a breakdown of non-consent by child and parent. It is clear that there are some data quality concerns borne of the fact that the number of children registered (2nd column) does not equal the sum of those examined, absent, declined and parental non-consent (columns 3 to 6). This difference

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varies across trusts by up to 5% but the overall difference is around 1%. Uptake percentages use the number of children registered as the denominator.

Comparing the two sources of data the overall uptake figures are similar. The NCCHD tends to report higher uptake in the reception year and the year 4 opt-in group compared with the European forms. Significantly, both sources show that uptake is much lower in the opt-in group compared with the opt-out group.

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Table 5 **Number of children where a height or weight measurement was recorded by trust, reception year children, European forms**

	Registered	Examined	Absent	Child declined	Parents did not consent
Flintshire & Wrexham	2195	1892	223	1	7
Merthyr Tydfil & Cynon Valley	1165	1023	130	1	16
Pembrokeshire	926	833	117	5	7
Powys	966	852	121	1	21
Swansea (part)	1914	1620	189	2	7
All	7166	6220	780	10	58

Source: European forms

Table 6 **Number of children where a height or weight measurement was recorded by trust, year 4 children, European forms**

	Opt-out schools						Opt-in schools				
	Registered	Examined	Absent	Child declined	Parents did not consent		Registered	Examined	Absent	Child declined	Parents did not consent
Flintshire & Wrexham	804	680	71	2	42		713	365	72	3	258
Merthyr Tydfil & Cynon Valley	300	255	31	5	8		290	205	36	0	62
Pembrokeshire	328	297	28	1	10		292	150	29	0	110
Powys	264	236	38	0	11		248	137	42	0	98
Swansea (part)	607	570	65	3	37		615	315	66	0	309
All	2303	2038	233	11	108		2158	1172	245	3	837

Source: European forms

Table 7 Percentage of records where a height or weight measurement was recorded by trust, reception year children, European forms

	Reception	Year 4 opt-out	Per cent
			Year 4 opt-in
Flintshire & Wrexham	86.2	85.1	52.2
Merthyr Tydfil & Cynon Valley	87.8	87.6	69.8
Pembrokeshire	90.0	89.1	50.7
Powys	88.2	89.6	55.8
Swansea (part)	84.6	89.0	48.5
All	86.8	87.5	53.9

The lower super output area of residence of children was recorded (using the postcode) enabling the data to be linked to the Welsh Index of Multiple Deprivation (2008). The data were then analysed to ascertain whether the deprivation status of the area of residence had any effect on participation rates. The data were grouped according to fifths of deprivation whereby LSOAs were ranked by WIMD score and placed into five equally sized groups. It is not possible to analyse European form data in this way.

Table 9 shows that in all year groups area deprivation status appears not to have any effect on willingness to participate. In year 4 opt-in children, participation rates are slightly lower in both the least deprived and most deprived areas, but this is unlikely to be statistically significant.

Table 9 Uptake rates* (% ht or wt measurement recorded) by school year and WIMD

%	Reception	Year 4 opt-out	Year 4 opt-in
1 - least deprived	91.0	85.6	56.9
2	90.6	85.9	60.5
3	92.0	87.8	61.8

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4	92.6	88.7	58.4
5 - most deprived	92.5	87.0	57.6
All*	91.7	86.9	59.4

* excludes all children in Flintshire & Wrexham plus 133 children where LSOA was not recorded, LSOA not in Wales or year or group could not be established

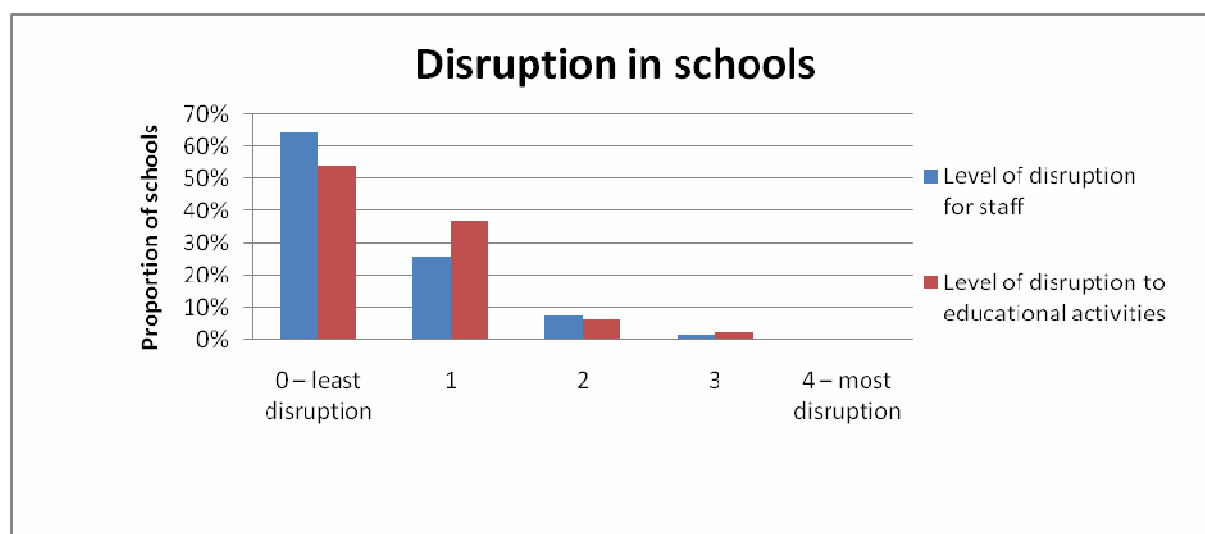
Appendix 7. Additional feedback from various sources on implementation of heights and weights study

Feedback from parents and staff were captured in a number of ways. These include prospective capture of any contacts families made with nursing staff about the programme. These were usually either (1) general contact made with staff following a parent's receipt of the consent or results letter or (2) queries or complaints (minimal) made about the process, table 1.

When parents opted-out of measurement they were invited to give a reason for not participating. These are captured in table 2.

Feedback from staff during the study from various sources including during steering group meetings and by email or other sources are recorded in table 3.

During the measurement visits schools were asked to describe the level of disruption for staff and educational activities. These are summarised in the figure below:



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Table 1. Table showing details of contacts made with nurses

Trust	Year (if known)	Person making contact	Nature	Regarding	Detail
North.Wales		Parent	Complaint	Child Health DB	Old surname called out for child causing embarrassment. Wrong name given to nurse from NCCHD.
Swansea	Year 4	Parent	Complaint	Consent	Parent complained that she hadn't received letter & consent information. Measurements taken as worker informed by school that letters had been given to each pupil.
Powys	Year 4	Parent teacher	Concern	Results	Concerns on child's weight - passed on to school nurse
Swansea	Year 4	Health visitor to parent	Concern	Consent	Pupil stated that she hadn't had consent form before children were due to have measurements (opt out school). Health Visitor contacted parent before measuring and consent was given.
Powys		Parent	Request for Information	General	
Powys		Parent	Request for Information	General	
Powys		Parent	Request for Information	General	
Powys		Parent	Request for Information	General	
Powys	Year 4	Parent	Request for Information	General	Query on where the measurement will take place. CM took information on who child was ensuring they would be measured on their own.
Pembrokeshire	Reception	Parent	Request for Information	Data	Query on whether information would be kept and for how long.

Table 2. Table to show reasons given on returned consent forms for opting out of child measurement process

Trust	Year (if given)	Comment Type	Comment Given
Swansea		Child refusal	"My daughter is uncomfortable about it and does not wish to participate"
Swansea		Child refusal	"My daughter is not happy to take part. She does not want to do it"
Pembrokeshire	Year 4	Child refusal	"My son having understood the reason behind the data made a choice that he did not want t participate. I respect his wishes"
Pembrokeshire	Year 4	Child refusal	"We did not fill in the first copy of the form as our daughter expressed violent distaste for the research involved." (This was following sending out the 2nd letter.)
Powys		Child refusal	I asked ____ if he wanted to be measured and weighed and he said no'
Powys		Child refusal	- 'daughter unwilling'
Cwm Taf		Child refusal	"I asked my son if he wishes to take part in this study and he declined "
Powys		Disability	- 'In wheelchair & can't stand'
Cwm Taf		Disability	"I do not think the effects of having a disability that affects mobility has been taken into consideration with an 8 year olds weight and height."
Pembrokeshire	Reception	Medical reasons	" ____ has already being monitored as born at 3 lbs and still small for age and hated it so no more if we can help it"
Powys		Medical reasons	- 'I know my child is below certain percentiles & I do not wish her to take part. She is seen by her health visitor & I feel that is appropriate enough'
Pembrokeshire	Reception	Medical reasons	"She is going through enough at moment with Drs etc doing it"
Pembrokeshire	Year 4	Medical reasons	"[child] visits numerous specialists and is measured often. I don't want her messed around with more than needed"
Powys		Medical reasons	- 'We are dealing with circumstances'
Swansea		Parent objection to measurements	"I do not believe in measuring children"
Cwm Taf		Parent objection to measurements	I do not see any need for this study . I do not want any unnecessary comments made unintentionally to my daughter.
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Trust	Year (if given)	Comment Type	Comment Given
Powys		Parent objection to measurements	Ability to look after their own child
Powys		Parent objection to measurements	Ability to look after their own child
Powys		Parent objection to measurements	Child eats healthy balanced diet & does not need measuring
Powys		Parent objection to measurements	Child eats healthy balanced diet & does not need measuring
Swansea		Parent objection to reason behind study	"There is no direct benefit for her involvement therefore I do not give my permission"
Pembrokeshire	Reception	Parent objection to reason behind study	"This nanny state has enough information without resorting to this. Use resources better! "
Pembrokeshire	Reception	Parent objection to reason behind study	"It suggests I am not trusted to monitor the growth of my child and is therefore another form of patronising government interference."
Powys		Parent objection to reason behind study	'Not necessary'
Powys		Parent objection to reason behind study	- 'My child is happy and healthy and I have no worries about her. Children come in all shapes and sizes and should not be compared. My daughter is of a larger build and if I thought she was dangerously overweight I would visit my GP'
Powys		Parent objection to reason behind study	- ' 1. I think it is a total waste of money. 2. My child thought I was saying she was fat which she is not. 3. Too much information is collected'
Powys		Parent objection to reason behind study	- 'I feel it is my job as a mother to monitor my child's growth'
Pembrokeshire	Year 4	Parent objection to reason behind study, Weight/Being weighed conscious	"It is not relevant to my child's education and is currently being bullied about her weight and I feel this may exacerbate the situation"
Swansea		Parent personal opinion	"I feel it is unhealthy to subject children of this age to negative comments"
Pembrokeshire	Year 4	Parent personal opinion	"I don't feel comfortable about it"
Pembrokeshire	Year 4	Parent personal opinion	"Personal choice"

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Trust	Year (if given)	Comment Type	Comment Given
Pembrokeshire	Year 4	Parent personal opinion	"I do not wish him to participate and I do not need to justify my reasons"
Powys		Parent personal opinion	- 'I do not want to'
Powys		Parent personal opinion	Parents felt it was their right to not have their child measured.
Powys		Preference to contact GP for measurements	- 'Any information with regard to my sons weight & height can be obtained through his medical records'
Powys		Preference to contact GP for measurements	-'If I have any concerns over my child's health I speak to my GP'
Powys		Preference to contact GP for measurements	- ' Happy with the doctors to keep records of my child'
Pembrokeshire	Reception	Weight/Being weighed conscious	" _____ has never liked being weighed so I'd rather not let him get upset about it"
Pembrokeshire	Year 4	Weight/Being weighed conscious	"I do not wish for my child to have a complex about her weight at this young age"
Powys		Weight/Being weighed conscious	- ' _____ would be self conscious about being measured'
Powys		Weight/Being weighed conscious	Child sensitive about their weight

Further feedback from staff was collected in addition to the interviews. This information is varied shown in the following table.

Table 3. Table capturing feedback from staff throughout the duration of the programme

Trust	Subject	Comment
North Wales	Child Health database	Very time consuming i.e. any queries on links with child health records which need to be corrected at the time.
North Wales	Child Health database	With having 'B' consents the child health records were not being audited, as they would have been with the 'A' consents.
North Wales	Equipment	Could have done with trolleys, weight of scales became very heavy.
North Wales	Equipment	Lack of plugs available. It was necessary to have batteries available to use in the scales at times.
North Wales	Process - consent	Would be a good idea to put children's names on envelopes. In some schools forms were given out ad hoc i.e two forms being given out to one child with separated parents.
North Wales	Process - consent	Only two people replied in welsh – is the extra 'welsh' translated paperwork worthwhile?
North Wales	Process - consent	We felt the letter should have had the date of the measurement on.
Powys	Process - Consent	Looks OK. I just wonder if there ought to be an invitation to get in touch if the parent has further questions?
North Wales Wrexham area	Process - consent	Very few forms were replied in welsh – is the extra 'welsh' translated paperwork worthwhile?
North Wales Wrexham area	process - consent	We also feel that all relevant paperwork that the schools need to fill in are left at the same as the consent forms, as the information was not readily available to us when leaving the schools.
North Wales	Process - measurements	Mixed years caused disturbance in the class and confusion when class lists were asked for.
North Wales	Process - measurements	· Some schools insisted that the children were chaperoned i.e. possible lack of trust or 'nosiness'.

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Trust	Subject	Comment
North Wales	Process - measurements	· The number of 'disturbance forms' underestimated, as tendencies were more than one class per year and also not in welsh.
North Wales	Process - measurements	Some parents wanted their children to be weighed on their own in 'private'.
North Wales	Process - measurements	Head lice!
North Wales Wrexham area	Process - measurements	We feel that the job should be done as a whole. I.e the inputting of all data to be done by screeners, and the results would be sent out in a timelier manner.
Cwm Taf	Process - measurements	During one measurement session, one boy decided not to be measured and 9 of his peers then joined in.
North Wales	Results	So many of the consent forms had a different address (to send the results to), to the school lists and child health system. Sticky labels c/o school may be a better idea.
North Wales	Results	Exact centile not shown on Child health system, we had to rework each one which was very time consuming.
Pembrokeshire	Results	Regarding the feedback forms: - More space needed to write Height and weight - We need an indication of sex of child on form parent fills out as have all sorts of names I'm having to guess the sex of the child - I would suggest that the arrow is filled in in red or other colour as otherwise difficult to see"
North Wales Wrexham area	School communication	Found that schools were not informed enough of the outcome of the study i.e MEND
North Wales Wrexham area	School communication	One school never gave consents out. Booked into school another and when we arrived no consent forms to be found.
North Wales Wrexham area	School communication	Schools booking us in between 9.15 and 9.30 and then when we arrived the children were in assembly, and having to wait for it to finish.
North Wales Wrexham area	School communication	A lot of the schools were very positive about the study, and themselves joined in with the children to be measured.

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Trust	Subject	Comment
North Wales	Schools communication	Some schools/teachers unhelpful e.g. failure to help on the day and consents given out to wrong classes.
North Wales	Schools communication	Schools saying ' haven't booked in', when had previously confirmed.
North Wales	Schools communication	Teachers wanting to know results.
North Wales	Schools communication	Some school staff did not know their own codes.
North Wales	Time	Short amount of time for completion overall. If not have been so much of a rush we would have been able to have completed the job properly i.e being able to have completed a second visit to each school ' B', as second consent forms had been given out (also such a waste of paper).
Powys	Time	We however have failed to conduct second visits in all the schools due to the time constraints and the geography of Powys. I did highlight previously that it would be difficult to conduct these because of the number of schools involved. No second visits have been performed in the North of the county, however some have been performed in the Breconshire area.
North Wales Wrexham area	Time	Not enough time to do re-visits to schools, also felt that with 'A' consents there was a greater catchment of children to measure
North Wales Wrexham area	Time, equipment	No time to go back to base to do paperwork or to ring schools to book appointments. Everything had to be done in the car on the move. We also had to use personal mobiles to do the ringing.