

Guidance on producing UK Level Child Obesity Statistics

This paper is to signpost users to data collected from England, Northern Ireland, Scotland and Wales to enable the production of aggregated UK level child obesity statistics, or to make valid comparisons between countries. This paper deals with child obesity statistics that use BMI – it does not cover production of figures using waist circumference or other measures

There are differences in methods of collection and analysis which make harmonisation and consistency across the UK difficult; different BMI reference curves and thresholds, different modes and time periods of collection need to be taken in to consideration by the user. The information below details some of this.

Data Sources

Data is available from national level surveys, or from direct data sources:

Health Survey for England

The Health Survey for England is a series of annual surveys designed to measure health and health related behaviours in adults and children, in England.

- [Overview](#)
- [2011 Report](#)
- [Archive](#)

Health Survey Northern Ireland

The Health Survey Northern Ireland (HSNI) replaced the Northern Ireland Health and Wellbeing Survey. The HSNI is an annual continuous survey that ran for the first time in 010/11 with first results due to be published in October 2011. The content and methodology of the survey is broadly similar to Health and Social Wellbeing Survey and focuses on a range of issues including cardiovascular disease, mental health and ill-health, physical activity, smoking and drinking.

- [Overview - The Health and Wellbeing Survey](#)
- [The Health Survey for Northern Ireland Report](#)
- [Archive – The Northern Ireland Health Survey](#)

Scottish Health Survey

The Scottish Health Survey is an annual survey and provides a detailed picture of the health of the Scottish population in private households and is designed to make a major contribution to the monitoring of health in Scotland.

- [Overview](#)
- [2012 Report](#)
- [Archive](#)

Welsh Health Survey

The Survey provides unique information about the health and health-related lifestyle of people living in Wales. The survey meets a range of needs that includes providing national estimates of health and health-related lifestyle.

- [Overview](#)
- [2012 Report](#)
- [Archive](#)

Northern Ireland – Health board extract

Childhood obesity is measured during the first school year (P1) and recorded in the Child Health System. The Child Health System is operational in all Community Trusts in Northern Ireland. BMI measurements are recorded at all schools but specialist schools are not included in the analysis. Extracts are not available online and if required the data would need to be requested from the health Trusts via the Directors of Public Health Agency.

The latest published childhood obesity data in the:

[Northern Ireland Health and Social Care Inequalities Monitoring System – third update bulletin](#)

Scotland – Health board extract

Height and weight measurements are recorded at the routine Primary 1 school review which is part of the Universal Core Programme for Child Health Screening and Surveillance. There is variation in the timing of the Primary 1 measurement, with some schools recording measurements early in the academic year and others towards the end of the academic year.

- [Child Health Data Tables](#)
- [Primary 1 BMI Statistics](#)

National Child Measurement Programme: England

The NCMP is an NHS IC collection that takes actual measurements of Height & Weight of school children (excluding private schools).

- [2010 / 2011 school year Report](#)
- [Archive \(2010 / 2011\)](#)

Child Measurement Programme for Wales

A child measurement programme has been piloted in Wales and there are now plans to implement the programme for specific age groups. See reports at:

- <http://www.wales.nhs.uk/sitesplus/888/page/46589>
- <http://www.wales.nhs.uk/sitesplus/888/page/56237>

Health Behaviour in School-aged Children (HBSC)

Information on height and weight for adolescents is collected every 4 years through the international HBSC study, in which UK countries take part. However this is based on self-reported information rather than physical measurements of height and weight.

<http://www.hbsc.org/>

Description of the methodological differences between the sources:

National data on child height and weight is collected via surveys and direct data sources using different methodologies in each country. The differences are summarised in the table below

Detailed information on the differences in published health surveys conducted in the four countries in the UK can be found in the introduction of the “[Scottish Health Survey: Topic Report UK Comparisons](#)”, published on 31 Aug 2010.

Source	Sample	Sample Size	Measured
Health Survey for England	Households: <ul style="list-style-type: none"> • HSE 2001-2007: 0 -15 years olds • HSE 2008-2011: 2 -15 year olds (height & weight) • HSE 2008-2011: 0 -1 year olds (weight only) 	2008: <ul style="list-style-type: none"> • 3,473 – main sample • 4,048 – child boost 2009: <ul style="list-style-type: none"> • 1,147 – main sample • 2,801 – child boost 	Physical measurements: <ul style="list-style-type: none"> • Height (cm) 2001 – 2007: 0 -15 year olds and 2008 – 2011: 2 – 15 year olds) • Weight (kg) 2001 – 2011: 0 – 15 year olds
Health Survey Northern Ireland (previously - Northern Ireland Health and Wellbeing Survey)	Households: <ul style="list-style-type: none"> • 2 -15 year olds 	2011 / 2012: <ul style="list-style-type: none"> • 5,8500 addresses 	Physical measurements (2011/2012): <ul style="list-style-type: none"> • Height • Weight
Source	Sample	Sample Size	Measured
Scottish Health Survey	Households: <ul style="list-style-type: none"> • 1995, 1998, 2003: 2 – 15 year olds • 2008 – 2011: 0 - 1 years olds (weight only) • 2008 – 2012: 2 -15 year olds (height & weight) 	2010: <ul style="list-style-type: none"> • 1,422 – main sample • 371 – child boost 2012: <ul style="list-style-type: none"> • 9,555 addresses 	Physical measurements: <ul style="list-style-type: none"> • Height (cm) 1995, 1998, 2003, 2008 – 2012: 2 – 15 year olds • Weight (kg): 1995, 1998, 2003, 2008 – 2011: 0 – 15 year olds • Weight (kg): 2012; 2 - 15
Welsh Health Survey	Households: <ul style="list-style-type: none"> • 2 – 15 year olds Households:	2010: <ul style="list-style-type: none"> • Approx 2,700 children aged 2 - 15 2012: <ul style="list-style-type: none"> • 14,830 addresses 	Physical measurements (since 2007): <ul style="list-style-type: none"> • Height (cm) • Weight (kg)

Northern Ireland – Health board extract	Health & Social Services Boards' Health System: <ul style="list-style-type: none"> • Generally children aged 54 – 66 months 	2008 / 2009: 24,295 measured ; 65% used in obesity calculations	Physical measurements: <ul style="list-style-type: none"> • Height • Weight
Scotland – Health board extract	School children: <ul style="list-style-type: none"> • 4.55 – 6.25 years old 	The statistics include approximately 62% of children in Primary 1 across Scotland	Physical measurements: <ul style="list-style-type: none"> • Height • Weight
National Child Measurement Programme: England	School children (excluding private schools): <ul style="list-style-type: none"> • Aged 4 and 5 (reception class) • Aged 10 -11 (school year 6) 	2009 / 2010: <ul style="list-style-type: none"> • 1,026,366, approximately 91% of those eligible 	Physical measurements (since 2008/2009): <ul style="list-style-type: none"> • Height (cm) • Weight (kg)
Child Measurement Programme of Wales	School children in reception year (age 4/5)	Not yet know	Physical measurements (expected to commence from 2011/2012): <ul style="list-style-type: none"> • Height (cm) • Weight (kg)

Things to consider

When aggregating data from the surveys, or from the direct data sources, the user should consider the following:

Combining Data

Great care must be taken when combining the data across countries as not all dataset cover the same age ranges. For example, a dataset such as the NCMP provides very good data for England, but only for the 4-5 and 10-11 age group. It will therefore be difficult to combine or compare these data with that from other countries as these tend to collect data from a much broader age range.

Growth Curves and Thresholds

The concept of using growth curves to define obesity only makes sense for children, adult BMI measures tend to remain stable unless they gain or lose a lot of weight. It is more complicated for children because their BMI changes as they grow; there are also differences between boys and girls. Therefore children are classified into a BMI category using thresholds derived from a reference population. For more information please refer to the

‘National Obesity Observatory (NOO) - A simple guide to classifying body mass index in children’ paper.

Besides differences in data collection methods, there are also differences in the growth curves used to analyse different sources across the UK in published data.

There are 2 different categories of growth curves:

- A growth reference describes the growth of a sample of individuals without making any association with health,
- A growth standard describes the growth of a ‘healthy’ population and suggests an aspirational model or target.

More information can be found on the [Scientific Advisory Committee on Nutrition \(SACN\)](#) website.

Within these two categories there are **4** different growth curves that can be considered for use in the UK:

UK90

Methodology	Centile curves for BMI for British children which excluded children from ethnic minorities due to the small number of children sampled from these groups. The measurements are taken from 12 distinct surveys, although collected over a number of years, the data were rebased to 1990 levels				
Age Range (years)	0 - 23	Date range	1978-1994	Sample size	32,222
Further information can be found at:	http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1511150/ http://onlinelibrary.wiley.com/doi/10.1002/(SICI)1097-0258(19980228)17:4%3C407::AID-SIM742%3E3.0.CO;2-L/abstract				

WHO 0 – 5

Methodology	The Child Growth Standards 0-5 years (WHO 0-5) were developed in order to show 'how children should grow in all countries rather than merely describing how they grew at a particular time and place'. They are based on an international sample from Brazil, Ghana, India, Norway, Oman and the United States		
Age Range (years)	Consisted of a longitudinal follow-up from birth to 24 months and a cross-sectional survey of children aged 18 to 71 months		
Date range	Collected between 1997 & 2003 and published in 2006	Sample size	The total sample size for the longitudinal and cross-sectional components from all six sites was 8440 children. A total of 1737 children were enrolled in the longitudinal sample
Further information can be found at:	http://www.who.int/childgrowth/standards/technical_report/en/index.html		

WHO 5 - 19

Methodology	The WHO 2007 (WHO 5-19) growth reference provides BMI-for-age centiles from 5-19 years. It was developed using the same Box-Cox Power Exponential (BCPE) method as used for the WHO 0-5 , but merged data from the cross-sectional component of the MGRS (for children aged 18-71 months) with data used for the earlier National Center for Health Statistics (NCHS)/WHO growth reference (children aged 1-24 years).		
Age Range (years)	5 – 19	Date range	Published 2007
Further information can be found at:	http://www.who.int/growthref/en/		

UK WHO

Methodology	This was developed specifically for use in the UK for children aged 0-4 years. SACN (the Scientific Committee on Nutrition) considered the application of WHO growth standards in the UK in 2007 and decided to implement a variation on WHO 5-19; UK WHO, which was developed based on the WHO 5-19 and UK90. It is the UK WHO curves that are now used to monitor the growth of 0-4 year olds, and have replaced the UK 90 curves that had previously been used in the Red Books (which are used by parents and health visitors to monitor growth, development, immunisations etc).
Age Range (years)	0 – 4
Further information can be found at:	http://webarchive.nationalarchives.gov.uk/+www.dh.gov.uk/en/Healthcare/Children/Maternity/Maternalandinfantrnutrition/UK-WHOgrowthcharts/index.htm

Users may wish to consider the International Obesity Taskforce (IOTF) which provides international obesity / over weight thresholds.

IOTF

Methodology	Thresholds are derived from body mass index data from six large nationally representative cross sectional surveys from Brazil, Great Britain, Hong Kong, the Netherlands, Singapore, and the United States. Thresholds were chosen to align with the adult BMI thresholds at age 18 (25 and 30 kg/m ²)		
Age Range (years)	0-25 (each survey covers a minimum age range of 6–18).		
Date range	First published 2000	Sample size	192,727 (each dataset has over 10,000 subjects)
Further information can be found at:	http://www.ncbi.nlm.nih.gov/pubmed/10797032/ http://www.ncbi.nlm.nih.gov/pubmed/17591624		

Across the UK, national analyses of data sources use the following growth curves:

Source	Ages for which measures are collected	UK90	IOTF	UKWHO
England – HSE	2-15	X		
Scotland – SHS	2-15	X		
Northern Ireland - NI HWS 2005/6	2-15	X	X	
Northern Ireland - (NI HWS) 2010/11	-		X	
Wales – WHS	2-15	X	includes comparison with IOTF	
England - NCMP	4/5 and 10/11	X		
Scotland – Health board extract	4.5-6.25	X		
Northern Ireland – Health board extract	4.5-5.5		X	

Besides which growth curve to use, users will also need to consider which thresholds to apply. Most growth curves have 2 sets of thresholds applied to them. For example, when the UK90 is used in a clinical setting those that fall within the 91st-98th are classified overweight and above 98th are classified obese. However for population monitoring purposes in England, between the 85th and 95th are classified as overweight and above 95th classified as obese. The issue of population vs a clinical setting will therefore need to be considered when deciding which is the most suitable threshold to be used with survey data.

If any analysis is conducted which combines or compares data from different sources, it is essential to ensure that the same definition of childhood obesity (both in terms of growth curve and threshold) is used for all data.

Significance Testing

In the National Child Measurement Programme: England, 2009/10 school year report the NHS Information Centre discussed a methodology for significance testing that is in line with that used by the Association of Public Health Observatories (APHO) and the National Obesity Observatory (NOO). Details of significance testing can be found in annex 3 of the [National Child Measurement Programme: England, 2009/10 school year](#) report.

Weighting

Users may also wish to consider weighting the data so that country level bases are proportionate to the relative country population sizes and population demographic, such as age, sex or socio-demographic mix. Guidance on this can be found at:

<http://www.esds.ac.uk/government/docs/weighting.pdf>