GIG CYMRU NHS WALES

Arsyllfa Iechyd Cyhoeddus Cymru
Public Health Wales Observatory

Our Healthy Future Indicators, 2015

Technical Guide

Hip fracture admissions ***Alcohol-specific admissions*** ***Physical activity*** ***Overweight/obese***
SII in life expectancy ***Teenage conceptions*** ***SII in healthy life expectancy*** ***Adults smoking***
Fruit & vegetables ***Mental health inventory 5*** ***Childhood vaccinations*** ***Employment gap***

This technical guide describes the indicators for *Our Healthy Future*. It gives details of the indicators, data sources and definitions used as well as notes on interpretation. This guide accompanies the release of an interactive data file with tables and charts and PowerPoint slides with a summary of charts, which are available from the Public Health Wales Observatory website: http://www.wales.nhs.uk/sitesplus/922/page/83567

The indicators in the interactive data file and PowerPoint slides update the original set of indicators published in 2013. The baseline figures in this publication have been amended to account for changes in population estimates and the European standard population since the original publication and will therefore differ from those published previously.

Acknowledgements

Contributors: Andrew Dring, Arthur Duncan-Jones, Hugo Cosh, Tracy Price

Thanks to the following for their help and support:
Andrea Gartner, Anna Childs, Bethan Patterson, Daniel Owens, Leon May, Nathan Lester (Public Health Wales) and Cath Roberts, Geraint Turner (Welsh Government)

We welcome feedback via email: publichealthwalesobservatory@wales.nhs.uk

Contents

1. Introduction

This technical guide describes the twelve indicators for *Our Healthy Future*, the Welsh Government's strategic framework for Public Health. The strategy identifies ten priority outcomes. An indicator was proposed and agreed by Directors of Public Health, Welsh Government and Public Health Wales Observatory for each of the priority outcomes, with the exception of:

- reducing inequities in health which has two indicators
- one additional indicator (percentage obese or overweight) covering both physical activity and unhealthy eating.

The ten priority outcomes and their associated indicator(s) are:

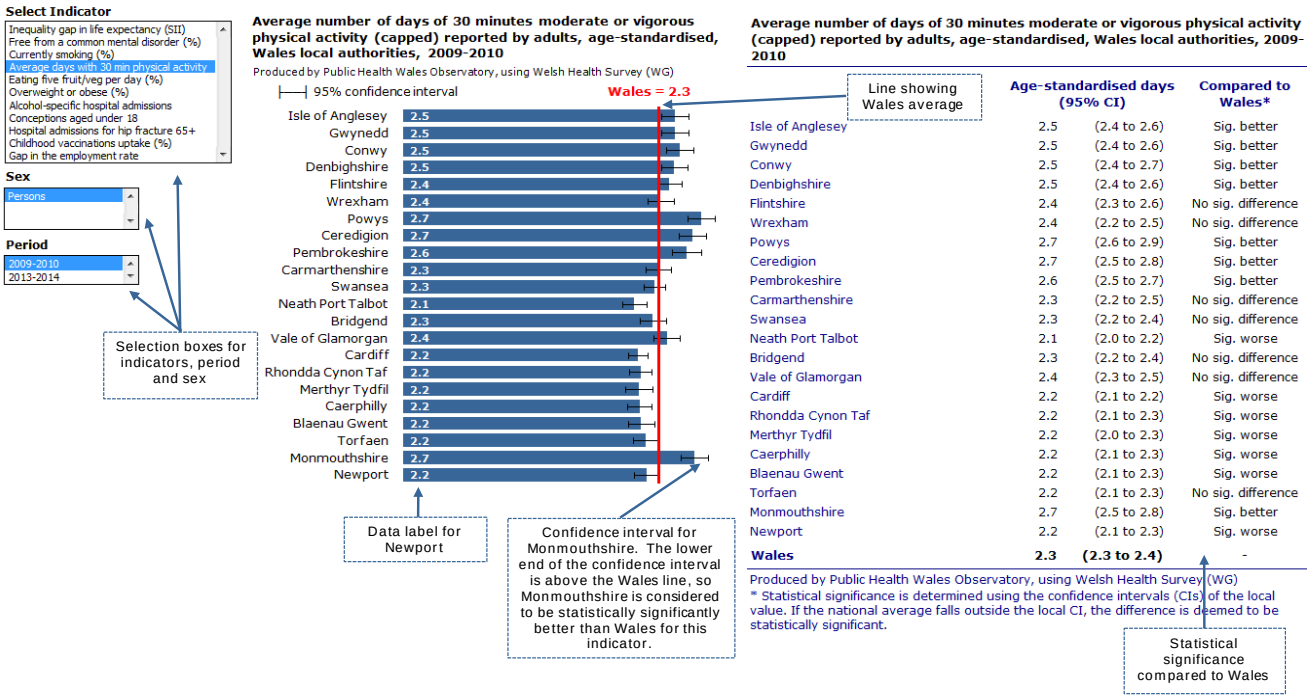
Priority outcome	Indicator(s)
Reducing inequities in health	• Slope index of inequality (SII) for healthy life expectancy at birth (national) • SII for life expectancy at birth (local)
Improving people's mental well-being	• Proportion of population free from a common mental disorder (as measured by a Mental Health Inventory 5 (MHI-5) score of > 60)
Improving health in the workplace	• Gap between the employment rate for those with a long-term health condition and the overall employment rate (age 16-64)
Reducing the level of smoking	• Proportion of adults who smoke age 16+ (age-standardised)
Increasing physical activity	• Average number of days with 30 minutes moderate or vigorous physical activity, age 16+ (age-standardised, up to maximum of five days) • Proportion of adults overweight or obese (body mass index ≥ 25)
Reducing unhealthy eating	• Proportion of adults eating five portions of fruit and vegetables per day (age-standardised) • Proportion of adults overweight or obese - body mass index ≥ 25 (age-standardised)
Stopping the growing harm from alcohol and drugs	• Rate of alcohol-specific admissions to hospital per 100,000 population (age-standardised)
Reducing the number of teenage pregnancies	• Rate of conceptions among females aged under 18
Reducing the number of accidents and injuries	• Rate of hip fracture admissions to hospital per 100,000 population, age 65 and above (age-standardised rate)
Increasing immunisation rates	• Uptake of scheduled childhood vaccinations at age 4

2. Using the interactive data file

The 'interactive' tab of the interactive data file allows the user to choose the sex and year (where appropriate) for each indicator by selecting the desired criteria from the selection boxes. This automatically updates the table and chart.

Figure 1 provides a guide to the interactive data file. The selection boxes for indicator, sex and period are on the left hand side.

Figure 1

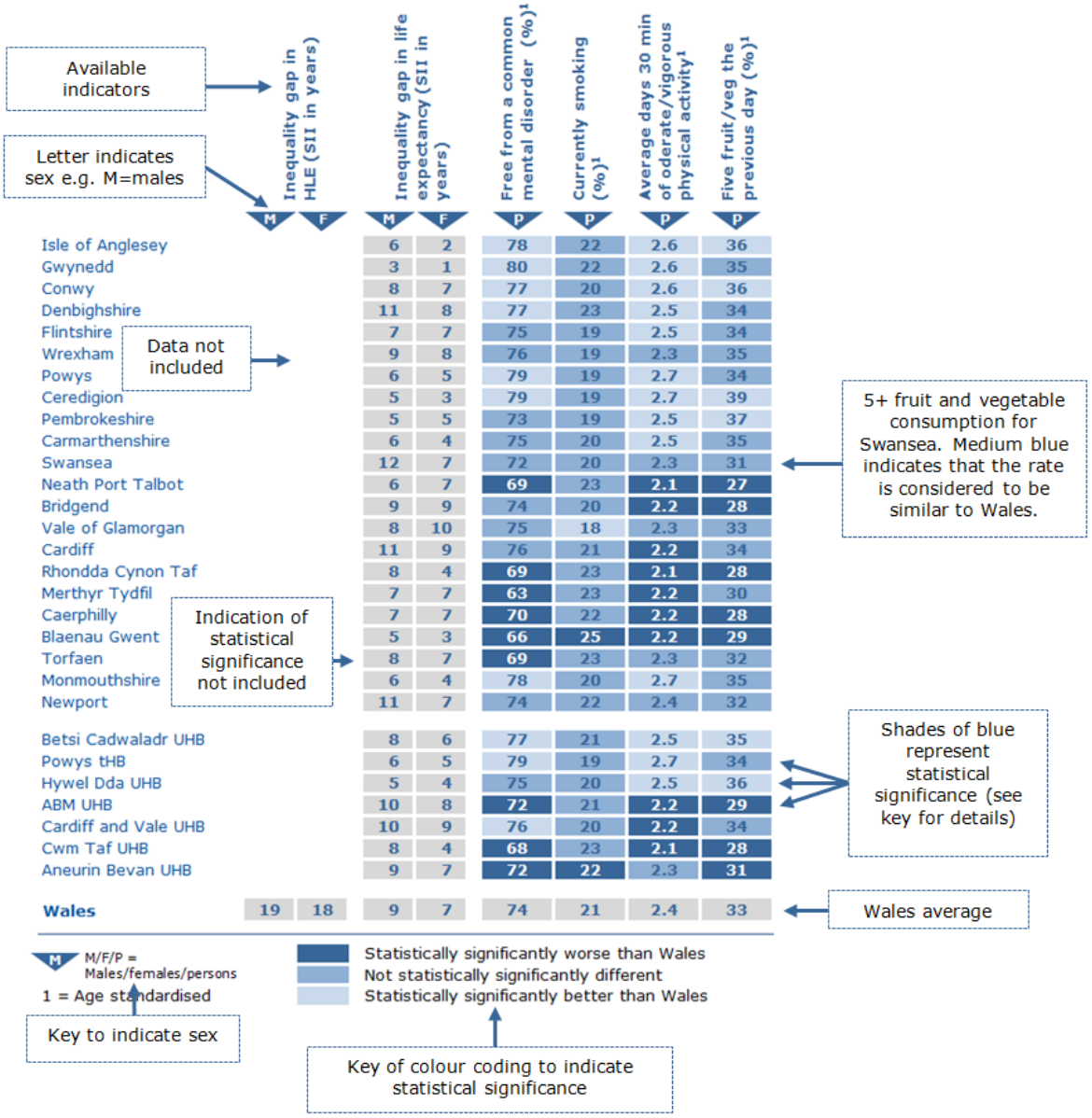


The interactive data file also contains information on how to copy and paste the tables and charts as pictures for use within other documents.

3. Understanding the overview table

The overview table is used to provide a snapshot of the indicators at local authority, health board and Wales level, and allows the user to make comparisons between the different geographical areas and the Wales rate. Figure 2 provides a guide to the overview table.

Figure 2



In the overview table, pale blue and dark blue values represent results that are statistically significantly better and worse respectively, compared to Wales. Medium blue represents results that are not statistically significantly different to Wales.

A statistically significant finding suggests that the difference between two values is likely not due to chance. In this publication, statistical significance is evaluated by the comparison of the 95% confidence intervals of the local values with the Wales rate. If the local confidence interval does not include the Wales rate, then the local value is considered to be statistically significantly different. Deeming a local value as

statistically significant suggests that there is only 5% chance of it being so different to the Wales rate due to natural variation alone.

It is important to note that whilst an indicator may show a light blue (statistically significantly lower) value, this only means that the result is significantly different to Wales, not that public health action is unnecessary. Statistical significance is not the same as public health importance.

It is possible for two areas to have the same rate for an indicator whilst displaying a different significance result. This is because the confidence interval ranges vary; they are narrower for some areas and wider for others. Therefore, for one population, the Wales rate may be within the local range, while falling outside the local range for another population with the same rate.

4. Indicators

4.1 *Inequality gap in healthy life expectancy (SII)*

What is being measured?	**The Slope Index of Inequality (SII) in healthy life expectancy at birth**
OHF priority area	Reducing health inequities
How is this indicator defined?	A measure of the absolute gap in years of healthy life expectancy between the least and most deprived, taking into account the distribution across all deprivation fifths within Wales. Results are reported as the slope of the regression line across all fifths within Wales.
How is it calculated?	**Calculating healthy life expectancy** Calculating the SII in healthy life expectancy requires the calculation of healthy life expectancy for each fifth of deprivation. For further details and guidance notes see section 4.2 in Measuring Inequalities: Technical Guide (2011)[1]. **Calculating the SII in healthy life expectancy** The SII was calculated following the method published by Low & Low[2]. This used ordinary least squares regression where the independent variable was healthy life expectancy, the dependent variable was the population mid-point of the deprivation fifth and the analytical weight was the square root of the fifth's population. A regression model was run to produce a line of best fit across all deprivation fifths, the gradient of which was the SII. A 95 per cent confidence interval for the slope was produced at the same time.
Where does the data actually come from?	• Annual District Deaths Extract (ADDE), Office for National Statistics (ONS) • Mid-year population estimates, Office for National Statistics (ONS) • Welsh Health Survey, Welsh Government (WG) • Welsh Index of Multiple Deprivation 2008 & 2011 (WIMD), Welsh Government (WG)
Who does it measure?	Males, females
What time period does it cover?	2005-09 – WIMD 2008 data 2008-12 – WIMD 2011 data
What geographical area does it cover?	Wales only
How accurate and complete will the data be for this indicator? Are there any problems, notes for interpretation or warnings with the data in relation to this indicator?	• The uncertainty of the SII estimate is reflected in the 95 per cent confidence intervals calculated which were influenced by the linearity of healthy life expectancy estimates across the fifths. The statistical method of calculating the SII assumes a linear relationship, i.e. where a diagonal straight line could roughly be drawn across the values by increasing deprivation fifth. • Prevalence data for children was only available from the Welsh Health Survey from 2007 onwards. Therefore, for 2005-09, children's survey data was only used for 2007-09. For 2008-12, survey data was available for all years. • For more information on the caveats associated with using WIMD 2008 and WIMD 2011 with Census 2011 geographies, see section

	5.6. • For further details on the definition and interpretation please see Measuring Inequalities: Technical Guide (2011)[1].
References	1. Public Health Wales Observatory. Measuring inequalities: Technical guide for trends in mortality and life expectancy. Available at: http://www.wales.nhs.uk/sitesplus/922/page/58379 [Accessed 7th May 2015] 2. Low A. & Low A. Measuring the gap: quantifying and comparing local health inequalities. *J Public Health*. 2004;26(4):388-395.

4.2 *Inequality gap in life expectancy (SII)*

What is being measured?	**The Slope Index of Inequality (SII) in life expectancy**
OHF priority area	Reducing health inequities
How is this indicator defined?	A measure of the absolute gap in years of life expectancy between the least and most deprived, taking into account the distribution across all deprivation fifths within the area. Results are reported as the slope of the regression line across all fifths within an area.
How is it calculated?	**Calculating life expectancy** SII in life expectancy requires the calculation of life expectancy for each fifth of deprivation. For further details and guidance notes, see section 4.1 in Measuring Inequalities: Technical Guide (2011) [1]. **Calculating the SII in life expectancy** The SII in life expectancy was calculated following the method published by Low & Low[2]. This used ordinary least squares regression, where the independent variable was life expectancy, the dependent variable was the population mid-point of the deprivation fifth and the analytical weight was the square root of the fifths population. For each area a regression model was run to produce a line of best fit across all deprivation fifths, the gradient of which was the SII. A 95 per cent confidence interval for the slope was produced at the same time.
Where does the data actually come from?	• Public Health Mortality (PHM), Office for National Statistics (ONS) • Mid-year population estimates, Office for National Statistics (ONS) • Welsh Index of Multiple Deprivation 2014 (WIMD), Welsh Government (WG)
Who does it measure?	Males, females
What time period does it cover?	2005-09 and 2009-13
What geographical area does it cover?	Wales, Welsh health boards, Welsh local authorities
How accurate and complete will the data be for this indicator? Are there any problems, notes for interpretation or warnings with the data in relation to this indicator?	• The uncertainty of the SII estimate is reflected in the 95 per cent confidence intervals calculated which were influenced by the linearity of life expectancy estimates across the fifths. The statistical method of calculating the SII assumes a linear relationship, i.e. where a diagonal straight line could roughly be drawn across the values by increasing deprivation fifth. • For further details on the definition and interpretation please see the publication Measuring Inequalities: Technical Guide (2011) [1]. • Both SII estimates have been calculated using WIMD 2014 data.
References	1. Public Health Wales Observatory. Measuring inequalities: Technical guide for trends in mortality and life expectancy. Available at: http://www.wales.nhs.uk/sitesplus/922/page/58379 [Accessed 7th May 2015] 2. Low A. & Low A. Measuring the gap: quantifying and comparing local health inequalities. *J Public Health.* 2004; 26(4):388-395.

4.3 *Population free from common mental disorder*

What is being measured?	**Age-standardised percentage of population free from a common mental disorder**
OHF priority area	Improving mental well-being
How is this indicator defined?	The Mental Health Inventory 5 (MHI-5) scale is derived from five questions in the SF-36 questionnaire in the Welsh Health Survey. Answers are combined and transformed to produce a score on a scale of 0-100, with higher scores indicating better mental health. A cut-point of 60 is discussed by Kelly *et al*.[1], and has been recommended by Fone[2] for this indicator with scores of over 60 indicating better mental health.
Where does the data actually come from?	Welsh Health Survey, Welsh Government
Who does it measure?	Persons aged 16 and over
What time period does it cover?	2009-10 and 2012-13
What geographical area does it cover?	Wales, Welsh health boards, Welsh local authorities
How accurate and complete will the data be for this indicator? Are there any problems, notes for interpretation or warnings with the data in relation to this indicator?	• The results reflect people's own understanding of their mental health, rather than a measured value. • It may be difficult to influence the MHI-5 score at population level; similarly, it may be difficult to define the causes behind a change in the population level score. • A study comparing the MHI-5 threshold against the general household questionnaire (GHQ-12) as the gold standard for classification of common mental disorders found that despite the differences in their design, the two scales perform similarly.[1] • A limitation of the use of the MHI-5 is that a valid cutpoint was not provided with its design to define a case of a common mental disorder. A cutpoint of 60 has since been suggested to identify cases within a given locality. [2] The questions included are: How much of the time in the past 4 weeks.... o Have you been very nervous? o Have you felt so down in the dumps that nothing could cheer you up? o Have you felt calm and peaceful? o Have you felt downhearted & low? o Have you been very happy? • For further details regarding the Welsh Health Survey, see section 5.1.
References	1. Kelly M.J., Dunstan F.D., Lloyd K., Fone D.L. Evaluating cutpoints for the MHI-5 and MCS using the GHQ-12: a comparison of five different methods. *BMC Psychiatry*. 2008, 8:10. 2. Fone D.L. (Professor, Institute of Primary Care and Public Health, Cardiff University), personal communication, March 2012.

4.4 *Gap in employment rate for those with a long-term health condition*

What is being measured?	Gap between the employment rate for those with a long-term health condition and the overall employment rate
OHF priority area	Improving health at the workplace
How is this indicator defined?	The percentage point gap between the percentage of respondents in the Labour Force Survey (LFS) who have a long-term condition who are classified as employed (aged 16-64) and the percentage of all respondents in the LFS classed as employed (aged 16-64).
Where does the data actually come from?	Annual Population Survey (APS), Office for National Statistics (ONS)
Who does it measure?	Persons aged 16-64
What time period does it cover?	2010/11 & 2013/14 (Financial years)
What geographical area does it cover?	Wales, Welsh health boards, Welsh local authorities
How accurate and complete will the data be for this indicator? Are there any problems, notes for interpretation or warnings with the data in relation to this indicator?	• This indicator uses data from a survey sample. As a result of this, employment rates are only estimates of the true employment rate rounded to the nearest 100. • 95 per cent confidence intervals have been calculated for the percentage gap in employment using the Wilson score method described by Newcombe[1]. • The definition used matches that for England. For further details see: http://fingertips.phe.org.uk/search/employment%20gap#page/6/gid/1/pat/6/par/E12000004/ati/102/are/E06000015/iid/90282/age/204/sex/4
References	1. Newcombe R.G. Interval estimation for the difference between independent proportions: comparison of eleven methods. *Statistics in Medicine.* 1998; 17:873-890.

4.5 *Adults who smoke*

What is being measured?	**Age-standardised percentage of adults who reported being a current smoker (smoking daily or occasionally)**
OHF priority area	Reducing smoking prevalence
How is this indicator defined?	This indicator shows the percentage of people who reported smoking daily or occasionally (current smokers). The results have been age-standardised. • The survey asked adults whether they smoked (daily or occasionally), used to smoke (daily or occasionally) or had never smoked.
Where does the data actually come from?	Welsh Health Survey, Welsh Government
Who does it measure?	Persons aged 16 and over
What time period does it cover?	2009-10 and 2012-13
What geographical area does it cover?	Wales, Welsh health boards, Welsh local authorities
How accurate and complete will the data be for this indicator? Are there any problems, notes for interpretation or warnings with the data in relation to this indicator?	• Self-reported prevalence of smoking may be more prone to respondent bias[1] i.e. smokers may be less likely to answer questions about smoking. The smoking prevalence is more likely to be an underestimate than an overestimate of the true percentage of people who smoke. • For further details see the Welsh Health Survey data source section.
References	1. Wilson A, Manku-Scott T, Shepherd D and Jones B. A comparison of individual and population smoking data from a postal survey and general practice records. *Br J Gen Pract.* 2000; 50(455):465-468. Available at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1313724/ [Accessed 7th May 2015]

4.6 *Average days with 30 minutes physical activity*

What is being measured?	**Average number of days that adults achieved 30 minutes of moderate or vigorous physical activity**
OHF priority area	Increasing participation rates in physical activity
How is this indicator defined?	Results are reported as the average number of days in the past week where adults undertook at least 30 minutes of moderate or vigorous exercise. The results have been age-standardised.
Where does the data actually come from?	Welsh Health Survey, Welsh Government (WG)
Who does it measure?	Persons aged 16 and over
What time period does it cover?	2009-10 and 2012-13
What geographical area does it cover?	Wales, Welsh health boards, Welsh local authorities
How accurate and complete will the data be for this indicator? Are there any problems, notes for interpretation or warnings with the data in relation to this indicator?	• Self-reported physical activity may be prone to respondent bias[1] i.e. overestimating or underestimating their behaviour to give a more favourable response. • There may be misclassification e.g. some housework may be 'moderate' rather than 'light'. • The number of days is capped at five (combining five days or more). This affects the average and helps to measure the progress of the less physically active. • For further details regarding the Welsh Health Survey, see section 5.1.
References	1. Adams SA, Matthews CE, Ebbeling CB, Moore CG, Cunningham JE, Fulton J, and Herbert JR. The Effect of Social Desirability and Social Approval on Self-Reports of Physical Activity. *American Journal of Epidemiology* 2005; 161 (4):389-398. Available at: http://aje.oxfordjournals.org/cgi/content/full/161/4/389 [Accessed 7th May 2015]

4.7 *Adults who eat fruit & vegetables (5-a-day)*

What is being measured?	**Age-standardised percentage of adults who reported consuming five or more portions of fruit and vegetables the previous day**
OHF priority area	Reducing unhealthy eating
How is this indicator defined?	Results are reported as a percentage of adults reporting to eat five or more portions of fruit and vegetables the previous day. The results have been age-standardised.
Where does the data actually come from?	Welsh Health Survey, Welsh Government (WG)
Who does it measure?	Persons aged 16 and over
What time period does it cover?	2009-10 and 2012-13
What geographical area does it cover?	Wales, Welsh health boards, Welsh local authorities
How accurate and complete will the data be for this indicator? Are there any problems, notes for interpretation or warnings with the data in relation to this indicator?	• Self-reported prevalence of healthy eating may be prone to respondent bias[1] i.e. overestimating or underestimating behaviour to give a more favourable response. • Although portion size guidance was provided, interpretation may have been difficult for respondents, especially for composite foods e.g. apple pie, stew etc[2]. • The respondents were asked about the previous day's behaviour and so this might not reflect overall eating patterns. • This indicator is a measure of healthy eating, not unhealthy eating. • For further details regarding the Welsh Health Survey, see section 5.1.
References	1. Miller TM, Abdel-Maksoud MF, Crane LA, Marcus AC, and Byers TE. Effect of social approval bias on self-reported fruit and vegetable consumption: a randomized controlled trial. *Nutrition Journal* 2008; 7:18. Available at: http://www.nutritionj.com/content/7/1/18 [Accessed 7th May 2015] 2. Association of Public Health Observatories. *The Indicator Guide: Health Profiles 2009*. York: APHO; 2009. Available at: http://www.apho.org.uk/resource/item.aspx?RID=50198 [Accessed 28th May 2015]

4.8 *Adults who are overweight or obese*

What is being measured?	**Age-standardised percentage of adults who are overweight or obese based on self-reported height and weight measurements**
OHF priority area	Reducing unhealthy eating / increasing physical activity: obese or overweight
How is this indicator defined?	This indicator reports the percentage of the resident adult population who are overweight or obese. The results have been age-standardised. • The survey asked adults to report their height and their weight in order for Body Mass Index (BMI) to be calculated. Overweight and obese are defined as BMI 25+ and 30+ respectively. • Body Mass Index (BMI) is calculated as weight in kilograms (kg) divided by the height squared (m^2). Pregnant women and respondents providing invalid measurement were excluded.
Where does the data actually come from?	Welsh Health Survey, Welsh Government (WG)
Who does it measure?	Persons aged 16 and over
What time period does it cover?	2009-10 and 2012-13
What geographical area does it cover?	Wales, Welsh health boards, Welsh local authorities
How accurate and complete will the data be for this indicator? Are there any problems, notes for interpretation or warnings with the data in relation to this indicator?	• Height and weight of respondents are self-reported, and there is evidence to show that some people tend to under report weight and/or over report height resulting in an under-estimation of the prevalence of overweight and obesity[1]. • BMI does not distinguish between mass due to body fat and mass due to muscular physique, nor does it take account of the distribution of fat. • Ethnicity may affect BMI. • For further details regarding the Welsh Health Survey, see section 5.1.
References	1. Gorber S.C. et al. A comparison of direct vs. self-report measures for assessing height, weight and body mass index: a systematic review. *Obesity reviews* 2007; 8:307-326. Available at: http://www3.interscience.wiley.com/journal/117981349/abstract?CRETRY=1&SRETRY=0 [Accessed 7th May 2015]

4.9 *Alcohol-specific hospital admissions*

What is being measured?	**The rate of alcohol-specific hospital admissions (person-based)**
OHF priority area	Stop the growth in harm from alcohol and drugs
How is this indicator defined?	The European age-standardised rate of persons with an alcohol-specific hospital admission per 100,000 population with 95% confidence intervals calculated using the method proposed by Dobson et al[1]. Individuals were included in the analyses where there was any mention of one or more of the following diagnosis codes[2]: ***ICD-10*** ***Diagnosis*** E24.4 Alcohol-induced pseudo Cushings syndrome F10* Mental and behavioural disorders due to use of alcohol G31.2 Degeneration of nervous system due to alcohol G62.1 Alcoholic polyneuropathy G72.1 Alcoholic myopathy I42.6 Alcoholic cardiomyopathy K29.2 Alcoholic gastritis K70* Alcoholic liver disease K85.2 Alcohol induced acute pancreatitis K86.0 Alcohol induced chronic pancreatitis Q86.0 Fetal alcohol syndrome (dysmorphic) R78.0 Excessive alcohol blood levels T51.0 Ethanol poisoning T51.1 Methanol poisoning T51.9 Toxic effect of alcohol, unspecified X45* Accidental poisoning by and exposure to alcohol X65* Intentional poisoning by and exposure to alcohol Y15* Poisoning by and exposure to alcohol, undetermined intent Y90* Evidence of alcohol involvement determined by blood alcohol levels Y91* Evidence of alcohol involvement determined by level of intoxication * *indicates any fourth-character classification can be added to the first three characters*
Where does the data actually come from?	• Numerator: Patient Episode Database for Wales (PEDW), NHS Wales Informatics Service (NWIS) • Denominator: Mid-year population estimates, Office for National Statistics (ONS)
Who does it measure?	Males, females & persons all ages
What time period does it cover?	2010 and 2013 (financial years)
What geographical area does it cover?	Wales, Welsh health boards, Welsh local authorities
How accurate and complete will the data be for this indicator? Are there any problems, notes for interpretation or	• This indicator is person-based rather than episode-based; individuals could only be counted once per calendar year[1]. It measures the burden of alcohol misuse in the population. • Hospital admissions for alcohol-specific conditions only include those wholly attributable to alcohol (not those partially attributable). It may therefore underestimate the overall

warnings with the data in relation to this indicator?	burden of alcohol use due to the limited number of conditions. • Due to anomalies within PEDW data and potential methodological differences, the information published may differ from other sources. Such differences are, however, likely to be very small and will not therefore affect interpretation of the patterns shown. • Further information on alcohol-specific admissions and their comparability to England can be found in section 6.7 of the Alcohol and health in Wales technical guide.
References	1. Dobson A.J. et al. Confidence intervals for weighted sums of Poisson parameters. *Stat Med* 1991; 10(3):457-462. 2. North West Public Health Observatory. *Local Alcohol Profiles England 2014, User Guide*. Available at: http://www.lape.org.uk/downloads/LAPE%20User%20Guide_Final.pdf [Accessed 7th May 2015]

4.10 *Teenage conceptions*

What is being measured?	**Conceptions in females aged under 18 years**
OHF priority area	Reducing teenage pregnancy rates
How is this indicator defined?	The rate of conceptions among females aged under 18 years per 1,000 females in Wales aged 15-17, including 95% confidence intervals[1]. • Conception statistics include pregnancies that result in one or more live or still births (maternities) and legal abortions. They do not include miscarriages or illegal abortions. • Maternities resulting in multiple births are only counted once.
Where does the data actually come from?	• Numerator: Conception Statistics, Office for National Statistics (ONS) • Denominator: Mid-year population estimate, Office for National Statistics (ONS)
Who does it measure?	Females under 18 years
What time period does it cover?	2010 and 2013
What geographical area does it cover?	Wales, Welsh health boards, Welsh local authorities
How accurate and complete will the data be for this indicator? Are there any problems, notes for interpretation or warnings with the data in relation to this indicator?	• Recording data relating to births and legal abortions is mandatory; therefore, the data is expected to be of a high level of quality and completeness. • Miscarriages are not included; therefore the actual number of teenage conceptions may be underestimated. • Local authorities with a small number of events are prone to random variation, meaning that rates could substantially change from one period to another by chance alone.
References	1. Altman D.G. et al *Statistics with confidence.* 2nd ed. UK: BMJ books; 2000

4.11 *Admissions for hip fractures (aged 65 and over)*

What is being measured?	**The rate of emergency admissions for hip fractures in the over 65s**
OHF priority area	Reducing accident and injury rates
How is this indicator defined?	The European age-standardised rate per 100,000 of emergency hospital admissions in the over 65s where the admitting episode has a primary diagnosis of hip fracture (ICD-10 codes: S720, S721, S722). 95% confidence intervals are included and were calculated using the method proposed by Dobson et al[1]. • This data does not include emergency transfers. • The analysis was admissions-based i.e. the total number of hip fracture admissions in each local authority and health board and not the number of patients.
Where does the data actually come from?	• Numerator: Patient Episode Database for Wales (PEDW), NHS Wales Informatics Service (NWIS) • Denominator: Mid-year population estimates, Office for National Statistics (ONS)
Who does it measure?	Males, females and persons aged 65 and over
What time period does it cover?	2010/11 and 2013/14 (financial years)
What geographical area does it cover?	Wales, Welsh health boards, Welsh local authorities
How accurate and complete will the data be for this indicator? Are there any problems, notes for interpretation or warnings with the data in relation to this indicator?	• The data reflects a subset of the population and one aspect of accident and injury. It is expected that hip fractures will be admitted to hospital, but some fractures may be unrelated to falls (e.g. road traffic accidents). • This indicator definition is similar to that published in the Public Health England *Health Profiles* for all persons. Available at: http://fingertips.phe.org.uk/profile/health-profiles
References	1. Dobson A.J. et al. Confidence intervals for weighted sums of Poisson parameters. *Stat Med* 1991; 10(3):457-462.

4.12 *Uptake of scheduled childhood vaccinations at age 4*

What is being measured?	**The uptake of scheduled vaccinations at age 4**
OHF priority area	Increasing vaccination and immunisation rates to target levels
How is this indicator defined?	Percentage of children who received the following scheduled vaccinations at age 4: • 4 in 1 pre-school booster (against diphtheria, tetanus, pertussis and polio) • Pneumococcal conjugate booster (2011/12 data only) • HibMenC booster (against *Haemophilus influenzae* type B disease and Meningococcal type C disease) • Two doses of MMR (against measles, mumps and rubella)
Where does the data actually come from?	• The ultimate sources of childhood immunisation uptake data in Wales are scheduled and unscheduled immunisation forms, which are completed when healthcare workers vaccinate children and then returned to Health Board Child Health Administration Offices. • Data for monitoring immunisation uptake in children is provided to The Public Health Wales Communicable Disease Surveillance Centre (CDSC) by Health Board Child Health Administration Offices, via the National Community Child Health Database (NCCHD). • Public Health Wales CDSC analyse and report on immunisation uptake in children, on a quarterly and annual basis through the Wales COVER report[1].
Who does it measure?	Males and females aged 4
What time period does it cover?	2011/12 and 2013/14 (financial years)
What geographical area does it cover?	Wales, Welsh health boards, Welsh local authorities
How accurate and complete will the data be for this indicator? Are there any problems, notes for interpretation or warnings with the data in relation to this indicator?	• Public Health Wales Annual COVER report contains information for children living and resident in Wales, registered for NHS care, who reach appropriate birthdays during the 12 month period April – March. • NCCHD immunisation uptake data is reliant on timely return of scheduled and unscheduled immunisation forms and accurate data entry in Health Board Child Health Administration Offices (guidance for immunisers and Child Health Offices on ensuring timeliness and accuracy of Child Health immunisation data is available from Public Health Wales Vaccine Preventable Disease Programme[2]). • Immunisations given by private healthcare providers would not be recorded in the NCCHD, unless the provider had returned a completed unscheduled immunisation form to the Health Board Child Health Administration Office. • Health Board and Local Authority level COVER figures are calculated on the basis of Health Board of residence, not Health Board of treatment. • The calculation for percentage of children up to date by four years was revised in 2013/14 after the pneumococcal conjugate booster was removed from the required immunisations. • Immunisation data where the area was unknown have only been

	included at the Wales level. The total of local authority or health board values will not match Wales for this reason.
References	1. Public Health Wales Communicable Disease Surveillance Centre, *COVER, Annual Report, 2012.* Cardiff, CDSC, 2012. Available at: http://www.wales.nhs.uk/sites3/page.cfm?orgid=457&pid=54144 [Accessed 7th May 2015]. 2. Public Health Wales Vaccine Preventable Disease Programme, *CHIPS – Child Health Immunisation Process Standards*, 2014. Available at:http://www2.nphs.wales.nhs.uk:8080/VaccinationsImmunisationProgsDocs.nsf/($All)/AECCB7E88F70BB8680257863002F377E/$File/CHIPS%20v2%20-%205th%20March%202014%20final.pdf?OpenElement [Accessed: 7th May 2015]

5. Data sources

5.1 *Welsh Health Survey*

How is the data collected?	• The Welsh Health Survey provides information about the health of the population of Wales, their use of health services and health-related lifestyle. • The survey collects information at the household-level through a short interview, and on individuals through a self-completion questionnaire. • It is based on a representative sample of people living in private households in Wales, selected using a random sample from the Post Office's Postcode Address File (with appropriate stratification at unitary authority level)[1] which covers more than 99% of private households in Wales.
How accurate or complete will the data be?	• The Welsh Health Survey was designed to be representative of the general adult population and is the most regular comprehensive survey of lifestyle data at the local authority level across Wales. • In 2013, self-completion questionnaires were obtained for 79% of adults in participating households and interviews were obtained with 79% of eligible households in the sample[2]. • A small proportion of the population are not covered by survey, for example those living in institutions such as nursing homes.
Are there any notes for interpretation /warnings /problems associated with the data?	• The results in this report are based on individual self-completed questionnaires which reflect people's own understanding of their health and health-related behaviours. • The results are weighted to ensure that the age and sex distribution of respondents matches Wales. • The results are age-standardised to adjust for the differences in age structure between populations and to allow comparisons to be made between local authorities and health boards.
Potential for errors due to type of measurement, or bias and confounding	• Results are prone to respondent bias i.e. people may adjust their answers to give a more favourable response. • As the survey is based on a sample of households rather than the entire population of Wales, there will be a sampling error. For this reason, confidence intervals are added to give an indication of the extent of this error.
Who manages the data?	The survey is carried out by the National Centre for Social Research (NatCen) on behalf of the Welsh Government.
Where can you get hold of the data?	Welsh Health Survey results are available at: http://gov.wales/statistics-and-research/welsh-health-survey/?lang=en [Accessed 7th May 2015]
References	1. Welsh Government. *Welsh Health Survey 2013 Technical Report.* Cardiff: WG; 2014. Available at: http://gov.wales/docs/statistics/2014/140930-welsh-health-survey-2013-technical-report-en.pdf [Accessed 5th June 2015] 2. Welsh Government. *Welsh Health Survey 2013.* Cardiff: WG; 2014. Available at: http://gov.wales/docs/statistics/2014/140930-welsh-health-survey-2013-en.pdf [Accessed 7th May 2015]

5.2 *Patient Episode Database for Wales (PEDW)*

How is the data collected?	• The Patient Episode Database for Wales (PEDW) is managed by the NHS Wales Informatics Service (NWIS) and comprises records of all episodes of inpatient and daycase activity in NHS Wales hospitals. Hospital activity for Welsh residents treated in other UK nations (primarily England) is also included. • The data is collected and coded at each hospital. The records are then electronically transferred to NWIS, where they are validated and merged into the main database.
How accurate or complete will the data be?	• Outpatient activity is not included in this dataset
Are there any notes for interpretation / warnings / problems associated with the data?	• PEDW was created primarily to track hospital activity from the point of view of payments for services, rather than for epidemiological analysis. • The use of PEDW in public health analysis can be complex. For example, there are a number of different 'currencies' that can be counted such as episodes, admissions, discharges and patients, and there are benefits and limitations associated with analysis based on each of these.
Potential for errors due to type of measurement, or bias and confounding	• Coding practices vary from hospital to hospital, particularly in recording secondary diagnoses.
Who manages the data?	NHS Wales Informatics Service (NWIS)
Where can you get hold of the data?	Contact details for the NHS Wales Informatics Service can be found on their website: http://www.wales.nhs.uk/sitesplus/956/home

5.3 *Office for National Statistics (ONS) Conceptions Data*

How are the data collected?	• Data are collected through the mandatory recording of births and legal abortions. • Maternities which result in one or more live births or stillbirths are only counted once. • The registration is carried out by the Local Registration Service in partnership with the General Register Office and information is passed on to the Office for National Statistics (ONS). Most information on live births and still births is supplied by one or both parents. • For stillbirths, details are supplied on a certificate or notification by a doctor or midwife[1]. • Information on abortions is derived from notifications supplied under the Abortion Act 1967. These are sent by registered practitioners to the Chief Medical Officer for Wales[1].
How accurate or complete will the data be?	• The recording of births and legal abortions is mandatory and so conceptions data is considered to be a complete data source. • Conception figures are included only for England and Wales to women usually resident in England and Wales. • The postcode of the mother's usual address was used to assign the area of residence at the time of the conception.
Are there any notes for interpretation / warnings / problems associated with the data?	• Miscarriages and illegal abortions are not included in ONS conceptions data. Data may therefore underestimate the actual number of teenage conceptions.
Potential for errors due to type of measurement, or bias and confounding	• Recording data relating to births and legal abortions is mandatory; therefore, the data is expected to be of a high level of quality and completeness.
Who manages the data?	Office for National Statistics (ONS)
Where can you get hold of the data?	Office for National Statistics. *Conception Statistics*. *Conceptions for women resident in England and Wales, 2013*. Newport: ONS; 2015. Available at: http://www.ons.gov.uk/ons/rel/vsob1/conception-statistics--england-and-wales/index.html
References	1. Office for National Statistics. *Conception Statistics*. *Conceptions for women resident in England and Wales, 2013*. Newport: ONS; 2015. Available at: http://www.ons.gov.uk/ons/rel/vsob1/conception-statistics--england-and-wales/2013/index.html [Accessed 7th May 2015]

5.4 *Office for National Statistics (ONS) Mid-year population estimates*

How are the data collected?	Mid-year population estimates (as at 30 June each year) provide an estimate of the resident population of an area based on births, deaths and an estimate of migration since the last census.
How accurate or complete will the data be?	• The estimated resident population of an area includes all usual residents, whatever their nationality[1]. • Members of the UK and non-UK armed forces stationed in the UK are included[1]. • UK forces stationed outside the UK are excluded[1]. • Students are taken to be residents of their term time address[1]. • The estimates include long term international migrants (defined as somebody who changes his or her country of usual residence for a period of at least one year)[1]. • The estimates do not include short-term migrants (people who come to or leave the UK for less than a year)[1].
Are there any notes for interpretation / warnings / problems associated with the data?	The census and mid-year population estimates may underestimate the population in some areas e.g. areas of multi-occupancy housing.
Potential for errors due to type of measurement, or bias and confounding	Full details of caveats can be found in the ONS methodology guide for population estimates[1].
Who manages the data?	Office for National Statistics
Where can you get hold of the data?	Office for National Statistics website available at: http://www.ons.gov.uk/ons/rel/pop-estimate/population-estimates-for-uk--england-and-wales--scotland-and-northern-ireland/2013/sty-population-estimates.html
References	1. Office for National Statistics. *Methodology Guide for Mid-2013 UK Population Estimates (England and Wales)* [Online]. 2014. Available at: http://www.ons.gov.uk/ons/guide-method/method-quality/specific/population-and-migration/pop-ests/population-estimates-for-las/methods-guide-for-mid-2013-population-estimates.pdf [Accessed 7th May 2015].

5.5 *Mortality – includes Annual District Death Extract (ADDE) and Public Health Mortality (PHM)*

What does the data tell you?	The Annual District Death Extract (ADDE) contains the details of all deaths registered for residents of Wales. The Public Health Mortality (PHM) dataset also includes details of all deaths occurring in Wales irrespective of residence.
How are the data collected?	Individual records for death registrations are sent on a weekly basis from the Registrars' offices across England and Wales to the Office for National Statistics (ONS). The ONS collates and validates the data. Data is based on the underlying cause of death e.g. if an individual dies from pneumonia but has been made vulnerable to that disease by end-stage cancer, then cancer (rather than pneumonia) is recorded as the underlying cause of death[1].
How accurate and complete will the data be? Are there any problems, notes for interpretation or warnings with the data?	• It is a legal requirement to register a death and so the mortality datasets provide a reliable and complete data source. • Cause of death is based on the medical certificate of cause of death. This is completed by the certifying doctor for about three quarters of deaths and by a coroner for the remainder. Most of the deaths certified by a coroner do not involve an inquest or any suspicion of violence, but are referred to the coroner because there was no doctor in attendance during the deceased's last illness. There will be a long delay in registering a small number of deaths for which a coroner's ruling is required e.g. suicide, homicide, undetermined intent. • It is important to note that with many thousands of doctors writing certificates, the differences in their training, habits and knowledge mean that there will inevitably be variations in the quality of medical certificates of cause of death. • The cause of death is easier to define in younger people. Older people are far more likely to have many underlying health conditions, making it more difficult to determine the underlying cause of death[1]. • ADDE data were used for the healthy life expectancy indicator and PHM data were used for SII gap in life expectancy indicator.
Who manages the data?	Office for National Statistics (ONS)
Where can you get hold of the data?	Summary data are available from: • The Office for National Statistics website: http://webarchive.nationalarchives.gov.uk/20140721132900/http://www.statistics.gov.uk/hub/health-social-care/health-of-the-population/causes-of-death/index.html [Accessed 8th May 2015] • The Welsh Assembly Government website: https://statswales.wales.gov.uk/Catalogue/ [Accessed 8th May 2015]
References	1. Rooney C, Smith S. Implementation of ICD-10 for mortality data in England and Wales from January 2001. *Health Statistics Quarterly* 2000; 8:41-69. Available at: http://www.ons.gov.uk/ons/rel/hsq/health-statistics-quarterly/no--8--winter-2000/implementation-of-icd-10-for-mortality-data-in-england-and-wales-from-january-2001.pdf [Accessed 8th May 2015]

5.6 *Welsh Index of Multiple Deprivation (WIMD)*

What does the data tell you?	• The Welsh Index of Multiple Deprivation (WIMD) is the official measure of relative deprivation at small area level in Wales[1]. • WIMD is used to give an overall deprivation rank for each LSOA in Wales and to give ranks for the separate deprivation domains for each of the LSOAs.
How are the data collected?	• WIMD is made up of eight separate domains of deprivation: income; employment; health; education; housing; access to services; environment; and community safety. • Deprivation ranks are calculated for each LSOA in Wales. One area has a higher deprivation rank than another if a larger percentage of its population is classed as deprived. The most deprived area is ranked as one and the least deprived area is given the highest rank. • Each of the eight domains is based on a range of different indicators. The domain indices are weighted and combined into an overall index of multiple deprivation. Income and employment are classed as the most important indicators and are given the biggest weighting in the overall index. • To obtain deprivation fifths, geographical areas are ranked from highest to lowest by the deprivation rank and then split into five equal groups, ranging from least deprived to most deprived fifth.
How accurate and complete will the data be? Are there any problems, notes for interpretation or warnings with the data?	• WIMD 2008 and 2011 data were used for the healthy life expectancy indicator and WIMD 2014 data were used for SII gap in life expectancy indicator. • The 2008 and 2011 WIMD includes 1,896 lower super output areas (LSOA) while the 2014 WIMD has 1,909. This is due to boundaries that have split or merged where there have been significant population changes between the 2001 and 2011 Censuses. • Current ONS population estimates are only available for the 1,909 LSOAs created for Census 2011. Therefore, a patching exercise was undertaken to apply the 2008 and 2011 WIMD indices to the 2011 geographies. From a national point of view, the majority of LSOAs did not change their boundaries in Census 2011, so this patching exercise should not have a large impact on the healthy life expectancy indicator. • Not everyone living in a deprived area is deprived and not all deprived people live in deprived areas. An area itself is not deprived, it is the circumstances and lifestyle of people who are living there that affects its deprivation ranks. • The WIMD cannot tell you how much more deprived one LSOA is than another. If one area is ranked as the 100th most deprived and another area as the 300th most deprived, you cannot say that one area is three times more deprived than the other. • Deprivation ranks cannot be compared with scores from a previous index. • The WIMD ranks cannot be compared with those from deprivation indices of other UK countries. • There are no official Local Authority scores. • WIMD is an ecological measure whereas individuals within an area (LSOA in this instance) may vary. • The overall WIMD index includes a health measure and so it can

	be argued that assessing health experiences against WIMD can have a circular effect. • Unlike measures of material deprivation some of the factors do not relate directly to material deprivation e.g. access to services. • It is important to note that low deprivation does not equate to affluence.
Who manages the data?	Welsh Government's Statistical Directorate
Where can you get hold of the data?	The Welsh Government website is available at: http://gov.wales/statistics-and-research/welsh-index-multiple-deprivation/?lang=en [Accessed 8th May 2015]
References	1. Welsh Government. *Welsh Index of Multiple Deprivation 2014: Technical Report*. Cardiff: WG; 2014. Available at: http://gov.wales/docs/statistics/2014/141126-wimd-2014-en.pdf [Accessed 8th May 2015]

6. Definitions

Age-standardised rate

- Age-standardisation allows for the comparison of rates between populations while taking account of the different age structures of those populations. In order to calculate this we apply the rates which occur in each age band to the standard population structure. Calculating age-standardised rates is particularly useful for health-related behavioural indicators where age has an important influence, and where it may be misleading to compare crude rates. For example, the average number of days with at least 30 minutes physical activity per week may become less common with age and so populations with older age profiles may be observed to perform worse than populations with younger age profiles - age-standardisation adjusts for these differences.

Body Mass Index (BMI)

- BMI is a measurement of a person's weight, compared to their height. BMI is calculated as weight (in kilograms) divided by the height squared (in metres). Adults with a BMI of 25 or more are categorised as overweight and adults with a BMI of 30 or more are categorised as obese.

Conception statistics

- Conception figures include live births, stillbirths and legal abortions that occurred in England and Wales for women usually resident in England and Wales. The figures exclude miscarriages and illegal abortions.

European age-standardised rate

- The European age-standardised rate represents the overall rate you would expect if the population had the same age-structure as a theoretical standard European population. See age-standardised rate for further details.

Health board

- Health boards are the NHS bodies in Wales responsible for the health of the population within their geographical area. This includes planning, designing, developing and securing the delivery of primary, community, in-hospital care and specialised services.

Mid-year estimates

- Annual estimates of the resident population as at 30 June each year, provided by ONS. The figures are based on the census and take into account population change due to births, deaths and migration.

Our Healthy Future

Our Healthy Future is the Welsh Government's strategic framework for Public Health.

Public Health Wales NHS Trust

- Public Health Wales was established as an NHS Trust on 1 October 2009. The Trust incorporates the functions and services previously provided by the National Public Health Service for Wales, the Wales Centre for Health, the Welsh Cancer Intelligence and Surveillance Unit and Screening Services Wales.

Statistical significance

- A difference is called statistically significant if it is unlikely to have occurred by chance. In this publication, Statistical significance is determined using the confidence intervals (CIs) of the local value. The Wales rate is treated as an exact reference value and if it falls outside the local confidence interval range, the difference is considered to be statistically significant.