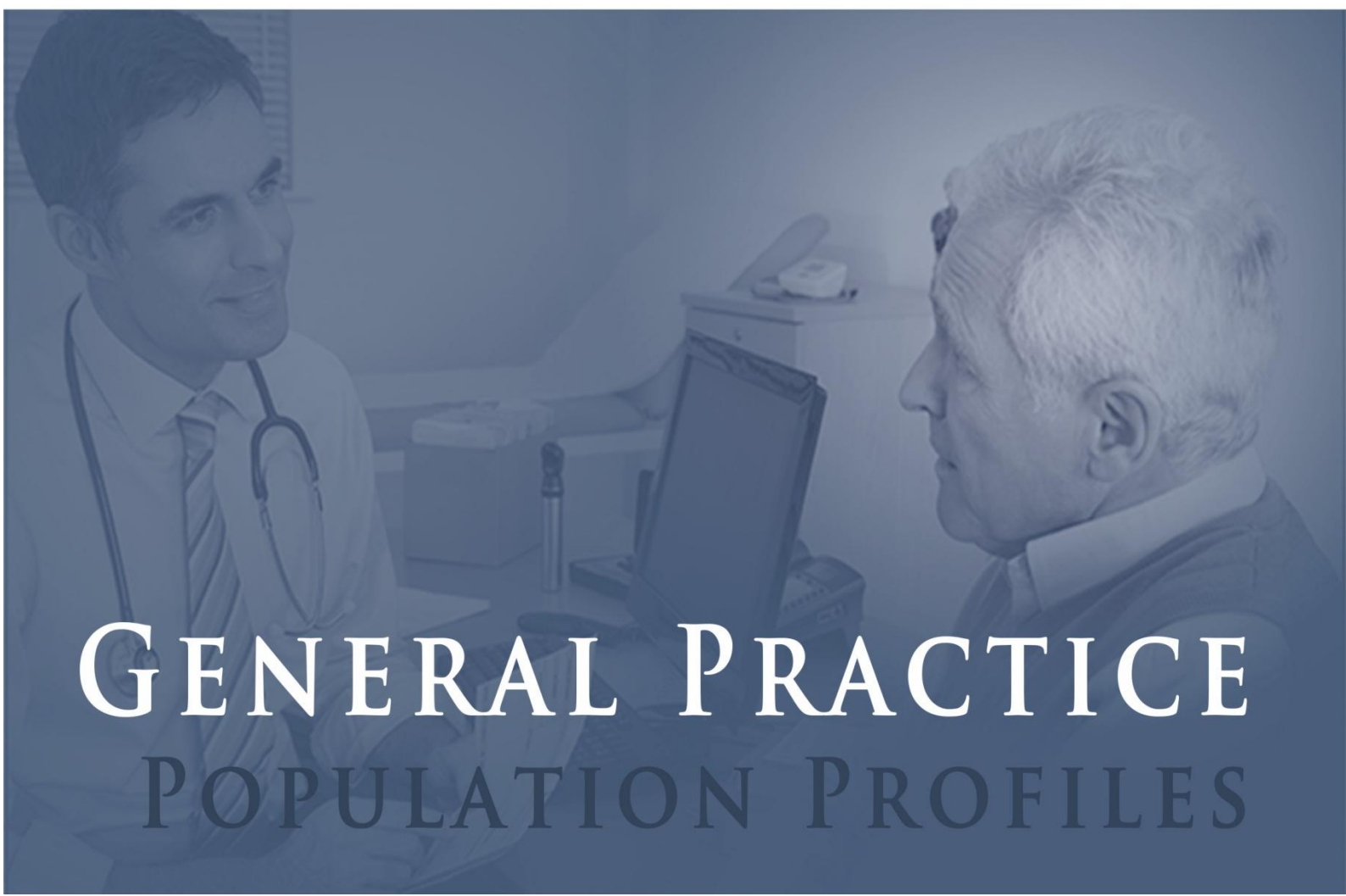




GIG
CYMRU
NHS
WALES

Arsyllfa Iechyd
Cyhoeddus Cymru
Public Health
Wales Observatory



GENERAL PRACTICE POPULATION PROFILES



TECHNICAL GUIDE

© 2015 Public Health Wales NHS Trust

Material contained in this profile may be reproduced without prior permission provided it is done so accurately and is not used in a misleading context.

Acknowledgment to Public Health Wales NHS Trust to be stated.

Typographical copyright lies with Public Health Wales NHS Trust.

Contents

1 Introduction	4
2 Interpreting the charts and tables	5
2.1 Population pyramids	5
2.2 Lifestyle and social factors	6
2.3 Chronic condition registers	7
3 Peer grouping (statistical cluster analysis)	8
3.1 Aim	8
3.2 Methods	8
3.3 Results	9
3.4 Similarity of practices to peer groups	11
4 Summary Indicators	12
4.1 Demographic characteristics	12
4.1.1 Total list size	12
4.1.2 Population pyramids	13
4.1.3 Population trends	14
4.1.4 Care home residents	15
4.1.5 Older people living alone	16
4.1.6 Rural/urban classification	17
4.1.7 Welsh Language speakers	18
4.1.8 Deprivation	19
4.1.9 Unemployment	20
4.1.11 Smoking	22
4.1.12 Alcohol consumption	23
4.1.13 Overweight and obese	25
4.1.14 Fruit and vegetable consumption	27
4.1.15 Physical activity	29
4.1.16 Mental health: Schizophrenia, bipolar affective disorders and other psychoses	31
4.2 Chronic condition registers	32
5 Data sources	34
5.1 Population data	34
5.2 Welsh Index of Multiple Deprivation	35
5.3 Rural/urban definition	37
5.4 Audit+	38
5.5 Welsh Health Survey	41
5.6 Census 2011	43
5.7 Quality and Outcomes Framework	44
6 Glossary	46
7 Appendix A	48

1 Introduction

This guide describes the methods, indicators, data sources and terms used in the Public Health Wales Observatory products that form the *General Practice Population Profiles*. It also provides definitions, notes for interpretation, and details of where to find further information. It is intended that this guide is used in conjunction with the online interactive spreadsheets.

How to use this Technical Guide:

- Section 2 contains guidance on how to interpret the charts included in the General Practice Population Profile interactive spreadsheets;
- Section 3 describes the peer grouping exercise (statistical cluster analysis) that enables comparisons with practices that are “most alike”;
- Section 4 describes the indicators used in the interactive spreadsheets, for example their definitions and the caveats to be considered when interpreting the data;
- Section 5 describes the main sources of data used in the interactive spreadsheets, to give more detail regarding their method of collection and associated caveats;
- Section 6 provides a glossary of terms used within the interactive spreadsheets and this technical guide.

In the electronic version of this guide, you can navigate the document by holding the ‘Ctrl’ key and left-clicking on a section of interest from the contents page.

The General Practice Population Profile interactive spreadsheets and this technical guide are available from <http://howis.wales.nhs.uk/practiceprofiles>.

For further details, please contact us on
publichealthwalesobservatory@wales.nhs.uk

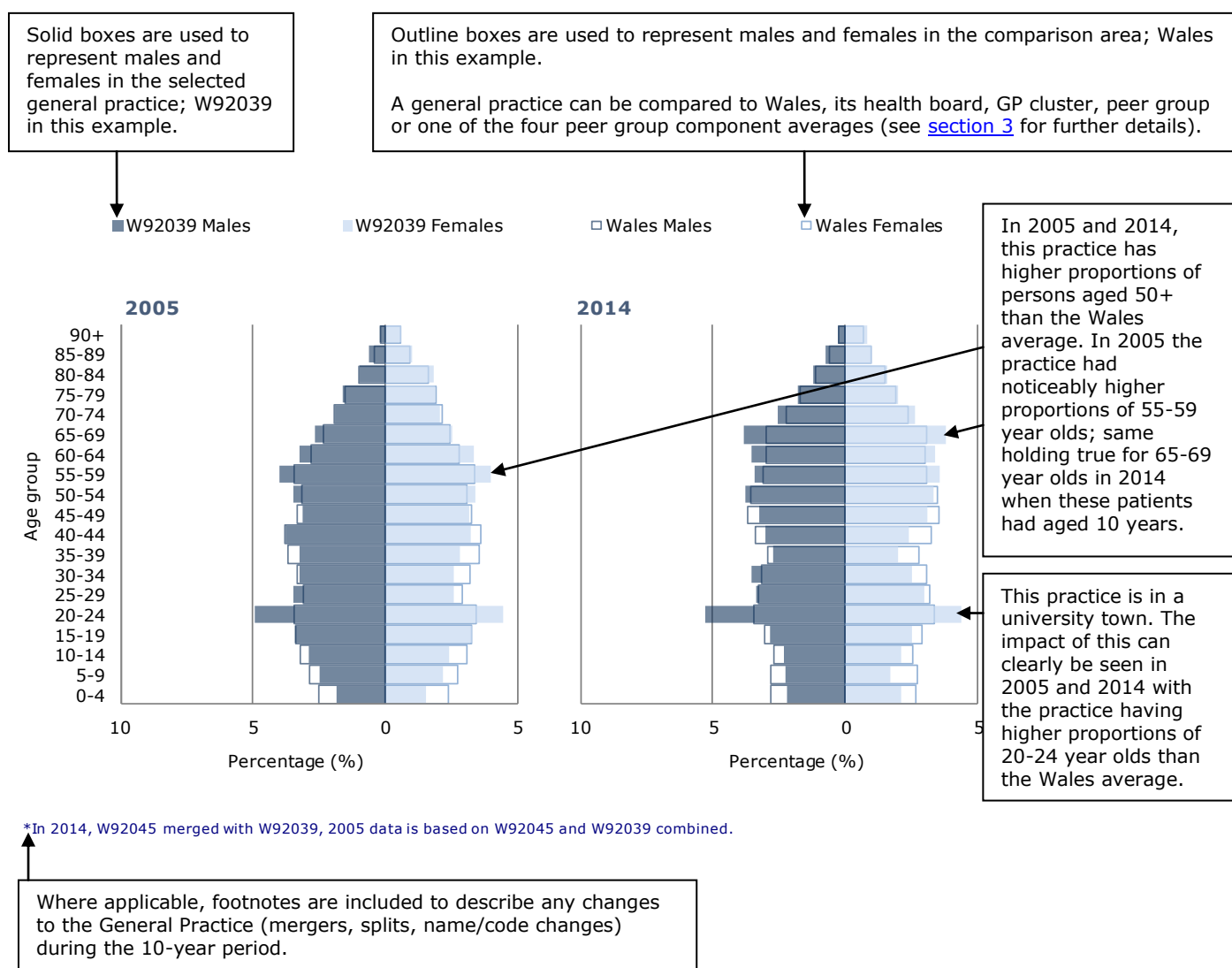
2 Interpreting the charts and tables

This section assists with the interpretation of some of the charts and tables contained in the interactive spreadsheets.

2.1 Population pyramids

The population pyramids have been produced to show the current age/sex structure of a general practice, how this has changed over the last 10 years and how it compares to Wales, its health board, GP cluster or peer group (see [section 3](#) for further details).

Note: The chart in this example is based on practice W92039 and Wales.



Further information on how the values were calculated for this chart is in section [4.1.2 Population pyramids](#) of this technical guide.

The following is intended to aid interpretation of the chart used for the lifestyle and social factor indicators. In the absence of any general mental health measure, the QOF mental health register has been included in this section as a proxy for general mental health.

Percentage of patients aged 15 and over who smoke, W95023, North Merthyr Tydfil cluster, Cwm Taf UHB & Wales, 2013/14

Percentages for the selected general practices peer group and components peer groups (see [section 3](#) for further details).

General Practice profiles: technical guide • Page 6

2.3 Chronic condition registers

This table and chart have been produced to show the burden of disease within general practices based on their chronic condition registers.

Further information on how the values were calculated for this table and chart is in [section 4.2](#) of this technical guide.

This shows the count, crude burden of disease and adjusted burden of disease percentages for the selected GP practice and chronic condition. The table provides further information on the burden of disease of the selected chronic condition for the comparator groups the selected practice lies in.

The chart shows the adjusted burden of disease percentage for the selected practice (the red diamond), along with the adjusted percentages of all practices in the same comparator group (the hollow diamonds). These are normalised age standardised rates which means the x axis is based on standard deviations, not absolute magnitude. As such comparisons can only be made within conditions and not between different conditions.

The between practice variation shown below has many potential causes and it is not possible to attribute any variation to performance.

Chronic condition:	GP Practice:	Count:	Crude burden of disease (%):	Adjusted burden of disease (%):
Asthma	W94612	231	7.2	7.3

			Adjusted recorded burden of disease							
Comparator	Comparator description	Comparator crude burden of disease %	Comparator adjusted burden of disease			Rank position of practice (1=lowest)	Number of comparator practices	Your Practice vs. Other Practices		
			%	Min %	Max %			◆ Your Practice	◆ Other Practices in the same comparator group	
All Wales	All GP Practices in Wales	6.7	6.8	3.3	11.3	283	404			
Health Board	Betsi Cadwaladr University Health Board	7.0	7.0	3.5	10.0	56	88			
GP Cluster	Dwyfor	6.5	6.5	3.5	7.3	5	5			
Peer group	1. Small/medium list, older, less deprived, rural villages	6.7	6.7	3.5	9.6	50	66			
Deprivation	Practices with lower than average % in most deprived two fifths	6.5	6.5	3.3	8.8	115	152			
Population	Practices with higher than average % aged 65+	6.5	6.4	3.3	9.1	34	40			
Urban/Rural	Practices with patients living in rural areas	6.7	6.6	3.5	9.6	35	45			
List Size	Practices with small list size	6.6	6.6	3.5	11.3	62	82			
Produced by Public Health Wales Observatory, using Audit+ (NWIS)								Lowest 25%	Middle 50%	Highest 25%

Produced by Public Health Wales Observatory, using Audit+ (NWIS)

Lowest 25% Middle 50% Highest 25%

This range includes the practices that fall within the expected middle 50% of disease burdens after adjusting for age. Practices falling to the left of the middle 50% are in the range that would be expected to contain the lowest 25% of disease burdens whilst those to the right are in the range that would be expected to contain the highest 25%.

3 Peer grouping (statistical cluster analysis)

3.1 Aim

The aim was to produce a general practice peer group classification which grouped together practices with similar demographic characteristics. By doing so, practices population characteristics, lifestyle and social factors can be viewed in the context of demographically similar practices, rather than just geographically similar practices.

3.2 Methods

A k-means cluster analysis was used to produce the classification. This analysis divided all 459 practices into a set number of groups based on the (dis-)similarities across a number of variables. The dissimilarity measure used was the squared Euclidian distance (SED), indicating how dissimilar (or similar) each practice was to the allocated peer group.

The following variables were included in the analysis to form the groups:

- 1) List size (Wales residents only)
- 2) % of practice population aged 65+
- 3) % population living in the most deprived two fifths of areas based on WIMD 2014
- 4) % population living in an area classed as "village, hamlet and dispersed area" as defined by ONS rural/urban definition

All four variables, the list size, the proportion of older people, deprivation and rural/urban class were considered to be important characteristics in indicating the challenges the practices are likely to face. For example, small practices with a single-handed GP in a rural, less deprived area are likely to experience different practice population needs and offer different services compared to a very large urban practice with a very deprived population.

All variables were range-standardised to ensure they have equal weight in the analysis. For each variable the value for each practice was divided by the range of values for all practices (i.e. the difference between the maximum and the minimum value). This method was chosen over z-scores as the data were not normally distributed.

The cluster analysis was run with group numbers of 5 – 10 groups, as well as 12, 15 and 20 groups and the dissimilarities as well as the groupings examined. The following criteria were used to decide on the most suitable classification:

- 1) All groups had a sufficient number of practices.
- 2) The groups were as distinctive as possible (ranges of values as tight as possible) with the fewest outliers possible.
- 3) There was at least one group with smaller list sizes.
- 4) The practices in each group were as similar as possible (distance of each practice to their allocated cluster centre was as small as possible)

To make the description of the groups as useful as possible other data was also considered, such as the proportion of people living in urban areas to specify the rural/urban category better and the percentage of people living in the least deprived two fifths. This also included inspection of the age distributions of the groups to give more detail than the percentage of people registered aged 65 and over.

3.3 Results

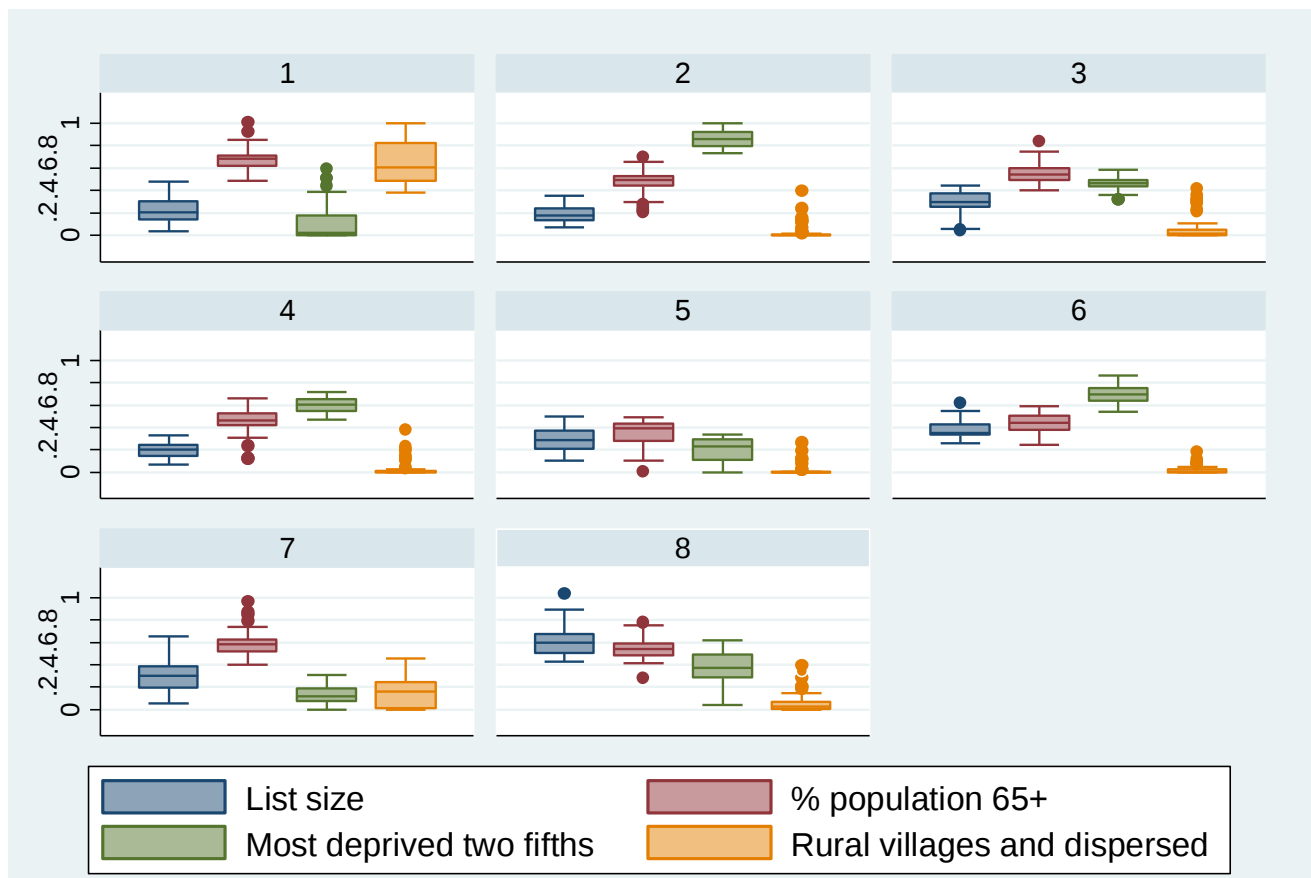
The table below shows the number of practices allocated to each of the 8 groups, and the description of the characteristics of each peer group. The short description is used in the interactive data files where space is limited whilst the main description gives more detail.

Characteristics of the practice peer groups

Group	Number of practices	Short description	Main description
1	81	Small/medium list, older, less deprived, rural villages	Practices with small to medium list size, a higher proportion of older people and an older population structure, less deprived (a lower percentage of people in most deprived two fifths), people living mostly in rural villages but also in rural towns
2	57	Small/medium list, average age very deprived, mostly urban	Practices with small to medium list size, an average proportion of older people and an average population structure, very deprived (a very high percentage of people in most deprived two fifths), people living mostly in urban areas
3	68	Mostly medium list, average age, average/more deprived, urban	Practices with mostly medium list size, an average proportion of older people and an average population structure, average or more deprived (an average or higher percentage of people in most deprived two fifths), people living in urban areas
4	64	Small/medium list, average age, more deprived, urban	Practices with a small to medium list size, average proportion of older people and an average population structure, more deprived (a high percentage of people in most deprived two fifths), people living in urban areas
5	39	Younger, less deprived, urban	Practices with smaller than average proportions of older people and a younger population structure, less deprived (a lower percentage of people in most deprived two fifths), people living in urban areas
6	44	Medium/large list, younger/average age very deprived, urban	Practices with medium to large list size, lower or average proportions of older people and a younger or average population structure, very deprived (a very high percentage of people in most deprived two fifths), people living in urban areas
7	69	Slightly older, less deprived, rural/urban mix	Slightly higher proportion of older people and a slightly older population structure, less deprived (lower percentage of people in most deprived two fifths), people living mostly in urban areas, but also a sizeable rural population (villages and towns)
8	37	Very large list, average age, urban	Practices with a very large list, average proportion of older people and an average population structure, people living in urban areas.

The broad characteristics of each peer group are shown graphically in the box plots below. It shows the range of values for the four range-standardised variables on a scale of approximately 0 to 1. For example, group 4 had a relatively tight range of values for list size (shown in blue). Inspection of the data revealed that these ranged from around 1,600 to 8,000 and therefore this group was described as small to medium list size. It had a higher than average proportion of people in the most deprived two fifths (shown in green) and, apart from a couple of outliers, very few people living in areas classed as village and dispersed (shown in orange). Group 4 has a relatively wide range of values for the percentage of the population aged 65+ but generally around the Wales average.

Box plots showing range-standardised variables by peer group



3.4 Similarity of practices to peer groups

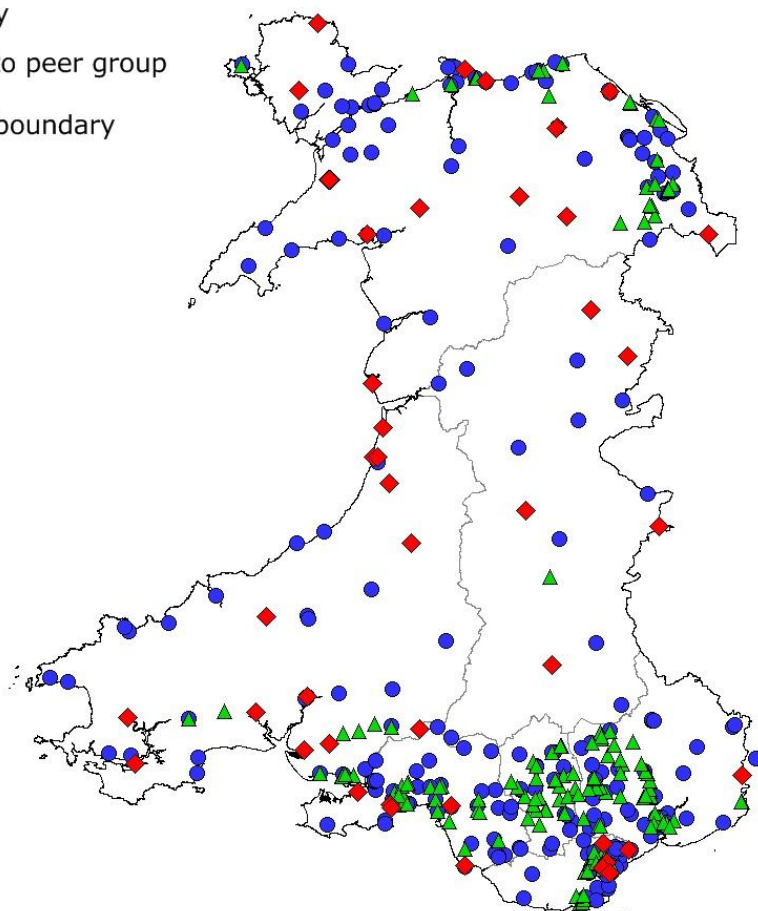
Practices were allocated to the peer group they were most similar to based on all four variables. Some practices, however, may be a closer match to their peer group than others. Practices may have a more unusual combination of values for all four variables compared to other practices in Wales. They may, for example, have similar deprivation, age structure and rural/urban classification but a very different list size.

The similarity measure, the Squared Euclidian Distance, and the data for each of the four variables for each practice are available in a separate [data file](#). The measure of similarity for each practice to their allocated peer group is shown on the map below. A large proportion of practices that were considered not to be very similar to their peer group are in group 1. Those practices tended to have very similar rural populations (villages and towns), but varied more so in one or more of list size, deprivation or age structure. This diversity of some of the characteristics is therefore reflected in the similarity measure (larger dissimilarity) and these practices are shown in red on the map. The practices shown in green are considered very similar (small dissimilarity).

Similarity of GP practices to their peer group

Similarity of GP practices to their peer group, Wales, 2014

- ▲ Very similar to peer group
- Average similarity
- ◆ Not very similar to peer group
- Health board boundary



Produced by Public Health Wales Observatory, using WDS, WIMD 2014 (NWIS) & rural-urban classification (ONS)
© Crown Copyright and database right 2015. Ordnance Survey 100044810

4 Summary Indicators

4.1 Demographic characteristics

4.1.1 Total list size

What is being measured?	The total list size of each GP practice.
How is this indicator defined?	The total list size of a GP practice is the sum of the patients registered to that practice.
Where does the data come from?	Welsh Demographic Service (WDS): NHS Wales Informatics Service (NWIS)
Who does it measure?	Welsh residents registered with GP practices in Wales.
When does it measure it?	Practice list size was extracted from WDS for registrations that were current in 2014. Please note rules have been applied to account for changes to practices in Wales – see Appendix A for more details.
What geographical areas does it cover?	Wales’ residents registered to practices in Wales.
How is it calculated?	The total list size of a GP practice is the sum of the patients registered to that practice.
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?	English residents that are registered with Wales’ practices are not included. There are also other known issues that affect the accuracy and completeness of WDS data. Further details are in section 5.1 of this technical guide. Total list sizes are rounded to the nearest 10 for ease of reading, therefore summing the total list size for each practice in the health board won’t always match the health board total list size.

4.1.2 Population pyramids

What is being measured?	Age and sex breakdown of patients and changes over time.
How is this indicator defined?	Percentage of patients by age group and sex by GP practices.
Where does the data come from?	Welsh Demographic Service (WDS), NHS Wales Informatics Service (NWIS)
Who does it measure?	Welsh residents registered with GP practices in Wales.
When does it measure it?	2005 and 2014. Please note rules have been applied to account for changes to practices in Wales – see Appendix A for more details.
What geographical areas does it cover?	Wales' residents registered to practices in Wales.
How is it calculated?	Percentages were calculated by dividing the patients in each age group (quinary age bands from 0 to 90+) and sex by the total patients (all ages and sexes) and then multiplying by 100. The count of patients, rounded to the nearest 10, and percentages by each age-group and sex are shown in the table below the chart.
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?	English residents that are registered with Wales' practices are not included. There are also other known issues that affect the accuracy and completeness of WDS data. Further details are in section 5.1 of this technical guide. The horizontal bars show the percentage of patients for each age-group and sex. The shaded area represents the GP cluster percentage whilst the outline represents the health board percentage that the cluster lies in. Therefore the percentage of patients in a particular age-group and sex in a practice is greater than the equivalent in the health board when the shaded area overlaps the black outline.

4.1.3 Population trends

What is being measured?	The total list size of each GP practice over time by age group.
How is this indicator defined?	The total list size of a GP practice is the sum of the patients registered to that practice broken down by age group (0-4, <18, 18-24, 65+, 75+, 85+ and all ages).
Where does the data come from?	Welsh Demographic Service (WDS): NHS Wales Informatics Service (NWIS)
Who does it measure?	Welsh residents registered with GP practices in Wales.
When does it measure it?	2005 to 2014. Please note rules have been applied to account for changes to practices in Wales – see Appendix A for more details.
What geographical areas does it cover?	Wales' residents registered to practices in Wales.
How is it calculated?	The total list size of a GP practice is the sum of the patients registered to that practice. This data has been split up into different age groups (0-4, <18, 18-24, 65+, 75+, 85+ and all ages).
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?	English residents that are registered with Wales' practices are not included. There are also other known issues that affect the accuracy and completeness of WDS data. Further details are in section 5.1 of this technical guide. In April 2013, W92030 split into W00133 and W00134. In the interactive spreadsheet, the W92030 list size has been allocated to W00133 and W00134 for 2005-12. To avoid the W92030 list size being double counted in the cluster, health board and Wales totals, the W00134 surgery has been subtracted. This means that the W92030 list size will be displayed against both surgeries in the interactive spreadsheet. Some adjustments have been made to account for other practice changes i.e. mergers, name/code changes over the 10 year period. Caveats for each affected practice are included alongside the relevant chart and/or table in the interactive data files.

4.1.4 Care home residents

What is being measured?	Estimated number and percentage of the registered practice population that live in a care home.
How is this indicator defined?	The number of people living in care homes in each practice is calculated by multiplying the practice list size by the proportion of people living in care homes within each Lower Super Output Area (LSOA) area as noted in the Census 2011.
Where does the data come from?	• Census 2011 (KS405EW and QS103EW), Office for National Statistics (ONS) • Welsh Demographic Service (WDS): NHS Wales Informatics Service (NWIS)
Who does it measure?	Numerator: Patients living in the following medical and care establishments: • Local authority – care home or other home • Other – care home with nursing • Other – care home without nursing Denominator: Total practice population
When does it measure it?	• The latest census for England and Wales took place on 27th March 2011. • Practice list size was extracted from WDS for registrations that were current in 2014. Please note rules have been applied to account for changes to practices in Wales – see Appendix A for more details.
What geographical areas does it cover?	Wales' residents registered to practices in Wales.
How is it calculated?	The proportion of people who indicated they were living in a care home in the Census 2011 was calculated for each Lower Super Output Area (LSOA). This proportion was then applied to the LSOA list size for each practice to calculate the number of patients living in care homes.
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?	English residents that are registered with Wales' practices are not included. There are also other known issues that affect the accuracy and completeness of WDS data. Further details are in section 5.1 of this technical guide. The proportion of people living in care homes in each area is taken from the 2011 Census and applied to the practice list size in 2014. There may have been changes in the proportion of people living in care homes in each LSOA between 2011 and 2014. The number of people living in care homes has been estimated from the proportion of people living in care homes in each small area, the true number of people living in care homes in each practice may differ from the reported number/percentage. Also, it may not be an accurate estimate for general practices with high student populations. Wales-resident patients with postcodes that could not be matched to a LSOA of residence in Wales are omitted. Approximately 2,700 Wales-resident registered patients were omitted in total.

4.1.5 Older people living alone

What is being measured?	Estimated number and percentage of the practice population who are aged 65 and over and living alone.
How is this indicator defined?	The number of people aged 65 and over and living alone in each practice is calculated by multiplying the practice list size by the proportion of people aged 65 and over and living alone within each Lower Super Output Area (LSOA) area as noted in the Census 2011.
Where does the data come from?	- Census 2011 (Key statistics QS110EW), Office for National Statistics (ONS) - Welsh Demographic Service (WDS): NHS Wales Informatics Service (NWIS)
Who does it measure?	Numerator: Patients aged 65 and over and living in a one person household Denominator: Total practice population
When does it measure it?	- The latest census for England and Wales took place on 27th March 2011. - Practice list size was extracted from WDS for registrations that were current in 2014. Please note rules have been applied to account for changes to practices in Wales – see Appendix A for more details.
What geographical areas does it cover?	Wales' residents registered to practices in Wales.
How is it calculated?	The proportion of people who indicated living in a one person household in the 2011 Census was calculated for each Lower Super Output Area (LSOA). This proportion was then applied to the LSOA list size for each practice to calculate the number of patients living alone.
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?	English residents that are registered with Wales' practices are not included. There are also other known issues that affect the accuracy and completeness of WDS data. Further details are in section 5.1 of this technical guide. The proportion of people living alone in each area is taken from the 2011 Census and applied to the practice list size in 2014. There may have been changes in the proportion of people living alone in each LSOA between 2011 and 2014. The number of people living alone has been estimated from the proportion of people living in care homes in each small area, the true number of people living alone in each practice may differ from the reported number/percentage. Wales-resident patients with postcodes that could not be matched to a LSOA of residence in Wales are omitted. Approximately 2,700 Wales-resident registered patients were omitted in total.

4.1.6 Rural/urban classification

What is being measured?	Estimated number and percentage of patients living in a rural area in Wales.
How is this indicator defined?	The percentage of patients in the GP practice that are resident in Wales and are living in a Lower Super Output Area (LSOA) area that is classified as rural. LSOAs are considered to be rural if it has one of the following ONS classifications: ○ Rural village and dispersed ○ Rural village and dispersed in a sparse setting
Where does the data come from?	• Welsh Demographic Service (WDS): NHS Wales Informatics Service (NWIS) • 2011 rural/urban definition: Office for National Statistics (ONS)
Who does it measure?	Wales' residents registered with GP practices in Wales.
When does it measure it?	• 2011 rural/urban classification. • Practice list size was extracted from WDS for registrations that were current in 2014. Please note rules have been applied to account for changes to practices in Wales – see Appendix A for more details.
What geographical areas does it cover?	Wales' residents registered to practices in Wales.
How is it calculated?	The number of Wales-resident patients in the practice living in a Lower Super Output Area (LSOA) area that is classified as rural divided by the total number of Wales-resident patients in the practice multiplied by 100. The count of the patients living in a rural area is also displayed.
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?	English residents that are registered with Wales' practices are not included. There are also other known issues that affect the accuracy and completeness of WDS data. Further details are in section 5.1 of this technical guide. Wales-resident patients with postcodes that could not be matched to a LSOA of residence in Wales are omitted. Approximately 2,700 Wales-resident registered patients were omitted in total. Further information on the rural/urban classification is in section 5.3 of this technical guide.

4.1.7 Welsh Language speakers

What is being measured?	Estimated number and percentage of the aged 3 and over registered practice population who can speak Welsh.
How is this indicator defined?	The number of Welsh speakers in each practice is calculated by multiplying the practice list size by the proportion of Welsh speakers within that Lower Super Output Area (LSOA) area as noted in the Census 2011.
Where does the data come from?	• Census 2011 (Key statistics QS207WA), Office for National Statistics (ONS) • Welsh Demographic Service (WDS): NHS Wales Informatics Service (NWIS)
Who does it measure?	Numerator: Welsh speakers include Wales' residents, aged 3 and over, that were registered with a practice in 2014. Denominator: Total practice population aged 3 and over
When does it measure it?	• The latest Census for England and Wales took place on 27th March 2011. • Practice list size was extracted from WDS for registrations that were current in 2014. Please note rules have been applied to account for changes to practices in Wales – see Appendix A for more details.
What geographical areas does it cover?	Wales' residents registered to practices in Wales.
How is it calculated?	The proportion of people that ticked the 'Can speak Welsh' option in the Census 2011 was calculated for each Lower Super Output Area (LSOA). This was applied to the LSOA list size for each practice to calculate the number of Welsh speakers in each practice.
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?	English residents that are registered with Wales' practices are not included. There are also other known issues that affect the accuracy and completeness of WDS data. Further details are in section 5.1 of this technical guide. Wales-resident patients with postcodes that could not be matched to a LSOA of residence in Wales are omitted. Approximately 2,700 Wales-resident registered patients were omitted in total. The proportion of Welsh speakers in each area is taken from the 2011 Census and applied to the practice list size in 2014. There may have been changes in the proportion of Welsh speakers in each LSOA between 2011 and 2014. The number of Welsh speakers has been estimated from the proportion of Welsh speakers in each small (LSOA) area, the true number of Welsh speakers in each practice may differ from the reported number/percentage. Census 2011 is self reported, the level of ability to speak Welsh may vary between respondents.

4.1.8 Deprivation

What is being measured?	Estimated percentage of patients living in the most deprived 40% of areas in Wales.
How is this indicator defined?	The percentage of patients of the GP practice, resident in Wales, who are living in a Lower Super Output Area (LSOA) in the two most deprived fifths of Wales.
Where does the data come from?	- Welsh Demographic Service (WDS): NHS Wales Informatics Service (NWIS) - Welsh Index of Multiple Deprivation 2014 (WIMD 2014): Welsh Government (WG)
Who does it measure?	Welsh residents registered with GP practices in Wales.
When does it measure it?	GP registrations as at December 2014 for Wales' residents. Please note rules have been applied to account for changes to practices in Wales – see Appendix A for more details.
What geographical areas does it cover?	Wales' residents registered to practices in Wales.
How is it calculated?	The number of Wales-resident patients in the practice that live in an LSOA in the two most deprived fifths divided by the total number of Wales-resident patients in the practice multiplied by 100. The count of the patients in the two most deprived fifths is also displayed.
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?	English residents that are registered with Wales' practices are not included. There are also other known issues that affect the accuracy and completeness of WDS data. Further details are in section 5.1 of this technical guide. Wales-resident patients with postcodes that could not be matched to a LSOA of residence in Wales are omitted. Approximately 2,700 Wales-resident registered patients were omitted in total. Further information on the Welsh Index of Multiple Deprivation is in section 5.2 of this technical guide.

4.1.9 Unemployment

What is being measured?	Estimated percentage of the registered practice population who are economically active and unemployed (excludes students).
How is this indicator defined?	The percentage of unemployed people in each practice is calculated by multiplying the economically active practice list size by the proportion of unemployed people who are economically active (aged 16-74) within that Lower Super Output Area (LSOA) as noted in the Census 2011.
Where does the data come from?	- Census 2011 (Key statistics QS601EW), Office for National Statistics (ONS) - Welsh Demographic Service (WDS): NHS Wales Informatics Service (NWIS)
Who does it measure?	Numerator: Number of people, aged 16-74, who were economically active and unemployed in each practice Denominator: Total economically active practice population aged 16-74
When does it measure it?	- The latest Census for England and Wales took place on 27th March 2011. - Practice list size was extracted from WDS for registrations that were current in 2014. Please note rules have been applied to account for changes to practices in Wales – see Appendix A for more details.
What geographical areas does it cover?	Wales' residents registered to practices in Wales.
How is it calculated?	The proportion of 'economically active' people that responded as 'unemployed' in the 2011 Census was calculated for each Lower Super Output Area (LSOA). This was applied to the 'economically active' LSOA list size for each practice to calculate the number of unemployed people in each practice.
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?	English residents that are registered with Wales' practices are not included. There are also other known issues that affect the accuracy and completeness of WDS data. Further details are in section 5.1 of this technical guide. Wales-resident patients with postcodes that could not be matched to a LSOA of residence in Wales are omitted. Approximately 2,700 Wales-resident registered patients were omitted in total. The 'Unemployed' definition does not include students or those that are employed part time. The number of unemployed people has been estimated from the proportion of unemployed people in each small (LSOA) area, the true number of unemployed people in each practice may differ from the reported number/percentage. Also, it may not be an accurate estimate for general practices with high student populations. Economic activity relates to whether or not a person was working or looking for work in the week before the Census date (27th March 2011). The proportion of unemployed people in each area is taken from the 2011 Census and applied to the practice list size in 2014. There may have been changes in the proportion unemployed people in each LSOA between 2011 and 2014.

4.1.10 Overcrowded housing

What is being measured?	Estimated number and percentage of the registered practice population who were living in overcrowded households.
How is this indicator defined?	A household's accommodation is considered overcrowded when it has an occupancy rating of -1 or less. Occupancy ratings are calculated by subtracting the number of required rooms/bedrooms from the number of available rooms/bedrooms.
Where does the data come from?	• Census 2011 (Key statistics QS412EW), Office for National Statistics (ONS) • Welsh Demographic Service (WDS): NHS Wales Informatics Service (NWIS)
Who does it measure?	Numerator: Number of Wales residents who were living in overcrowded households Denominator: Total practice population (all ages)
When does it measure it?	• The latest Census for England and Wales took place on 27th March 2011. • Practice list size was extracted from WDS for registrations that were current in 2014. Please note rules have been applied to account for changes to practices in Wales – see Appendix A for more details.
What geographical areas does it cover?	Wales' residents registered to practices in Wales.
How is it calculated?	The proportion of households that were overcrowded in the 2011 Census was calculated for each Lower Super Output Area (LSOA). This was applied to the LSOA list size for each practice as a proxy for the number of people in each practice that were living in overcrowded households.
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?	English residents that are registered with Wales' practices are not included. There are also other known issues that affect the accuracy and completeness of WDS data. Further details are in section 5.1 of this technical guide. Wales-resident patients with postcodes that could not be matched to a LSOA of residence in Wales are omitted. Approximately 2,700 Wales-resident registered patients were omitted in total. The proportion of overcrowded households in each area is taken from the 2011 Census and applied to the practice list size in 2014. There may have been changes in the proportion of people living in overcrowded households in each LSOA between 2011 and 2014. This indicator does not assess the extent of the overcrowding in each household.

4.1.11 Smoking

What is being measured?	Estimated percentage of the registered practice population (aged 15+) who smoke, using a method proposed by Honeyford <i>et al</i> ¹
How is this indicator defined?	By combining the denominators of two QOF indicators: • SMOK001W: The percentage of patients aged 15 or over whose notes record smoking status in the preceding 27 months. • SMOK004W: The percentage of patients aged 15 or over who are recorded as current smokers who have a record of an offer of support and treatment within the preceding 27 months.
Where does the data come from?	Quality and Outcomes Framework Data 2013/14 (QOF), Welsh Government (WG)
Who does it measure?	Numerator: Denominator of SMOK004W (the number of patients who were eligible to have a recorded offer of smoking cessation services). Denominator: Denominator of SMOK001W (the number of patients who were eligible to have a recorded smoking status).
When does it measure it?	Data were extracted for financial year 2013/14. Please note rules have been applied to account for changes to practices in Wales – see Appendix A for more details.
What geographical areas does it cover?	All patients registered to practices in Wales
How is it calculated?	Smoking prevalence was estimated by dividing the denominator of QOF indicator SMOK004W by the denominator of QOF indicator SMOK001W
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 analysis includes English residents that are registered with a practice in Wales (unlike indicators which use data from the WDS). Smoking status is usually self reported, patients may be reluctant to indicate that they are smokers when asked by their GP. The indicator does not include patients aged 14 and under that are smokers. Variation in Read code recording between practices may influence the reported number of smokers. Comparison with unitary authority level Welsh Health Survey smoking prevalence estimates suggests good agreement between the Honeyford method and the self reported survey results.
Reference	1. Honeyford K <i>et al</i> (2014) <i>Estimating smoking prevalence in general practice using data from the Quality and Outcomes Framework (QOF)</i> . BMJ Open 2014, volume 4, issue 7. Available: http://bmjopen.bmj.com/content/4/7/e005217.full

4.1.12 Alcohol consumption

What is being measured?	Estimated percentage of adults who reported heavy (binge) drinking on the heaviest day in the past week.
How is this indicator defined?	Welsh Health Survey respondents are asked to indicate how many measures of each type of alcohol they had consumed on their heaviest drinking day the previous week. This is then used to calculate the number of units drunk on that day. Heavy (binge) drinking is defined as men drinking more than 8 units, women drinking more than 6 units.
Where does the data come from?	• Welsh Demographic Service (WDS): NHS Wales Informatics Service (NWIS) • Welsh Health Survey (WHS): Welsh Government (WG) • Welsh Index of Multiple Deprivation (WIMD) 2014: Welsh Government (WG)
Who does it measure?	Wales' residents aged 16+ registered with GP practices in Wales.
When does it measure it?	• GP registrations as at September 2013 for Wales' residents. Adjustments have been made to align the practices with those open in December 2014 – see Appendix A for more details. • WHS: 2011-2013 • WIMD: 2014
What geographical areas does it cover?	Wales' residents registered to practices in Wales.
How is it calculated?	The percentage of adults who reported heavy (binge) drinking is calculated by applying national percentages broken down by 10 year age groups, sex and deprivation fifth, to the equivalent registered general practice populations.
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 figures presented are estimates for heavy (binge) drinking in the <u>registered</u> practice population. For all other purposes the figures published by the Welsh Government should be used (see http://gov.wales/statistics-and-research/welsh-health-survey/?lang=en). English residents that are registered with Wales' practices are not included. There are also other known issues that affect the accuracy and completeness of WDS data. Further details are in section 5.1 of this technical guide. Wales-resident patients with postcodes that could not be matched to a LSOA of residence in Wales are omitted. Approximately 2,700 Wales-resident registered patients were omitted in total. Applying estimated national percentages to individual practices does not account for the variation in drinking habits of small areas. Survey data on alcohol consumption are known to be underestimated and likely to only capture 60% of consumption. Data from the Welsh Health Survey only reflects the week before the survey, whereas binge drinking may depend on events that do not occur weekly e.g. birthday celebrations. It may also be difficult to estimate the amount of alcohol poured without a measure.

	The Welsh Health Survey excludes people living in institutions (e.g. care homes, student halls). Therefore, this indicator may not be an accurate estimate for general practices with a high proportion of such patients. Further information on the Welsh Index of Multiple Deprivation is in section 5.2 of this technical guide. Further information on the Welsh Health Survey is in section 5.5 of this technical guide.
--	--

4.1.13 Overweight and obese

What is being measured?	Estimated percentage of adults who reported to be overweight or obese.
How is this indicator defined?	The annual Welsh Health Survey asks adults to report their height and weight. From this the BMI of respondents can be calculated. Persons with a BMI of 25+ and 30+ are defined to be overweight and obese respectively.
Where does the data come from?	- Welsh Demographic Service (WDS): NHS Wales Informatics Service (NWIS) - Welsh Health Survey (WHS): Welsh Government (WG) - Welsh Index of Multiple Deprivation (WIMD) 2014: Welsh Government (WG)
Who does it measure?	Wales' residents aged 16+ registered with GP practices in Wales.
When does it measure it?	- GP registrations as at September 2013 for Wales' residents. Adjustments have been made to align the practices with those open in December 2014 – see Appendix A for more details. - WHS: 2011-2013 - WIMD: 2014
What geographical areas does it cover?	Wales' residents registered to practices in Wales.
How is it calculated?	The percentage of adults who reported to be overweight or obese is calculated by applying national percentages broken down by 10 year age groups, sex and deprivation fifth, to the equivalent registered GP practice populations.
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 figures presented are estimates for the percentage of adults in the <u>registered</u> practice population that are overweight / obese. For all other purposes the figures published by the Welsh Government should be used (see http://gov.wales/statistics-and-research/welsh-health-survey/?lang=en). English residents that are registered with Wales' practices are not included. There are also other known issues that affect the accuracy and completeness of WDS data. Further details are in section 5.1 of this technical guide. Wales-resident patients with postcodes that could not be matched to a LSOA of residence in Wales are omitted. Approximately 2,700 Wales-resident registered patients were omitted in total. Applying estimated national percentages to individual practices does not account for the variation in eating habits of small areas. 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 persons who are overweight or obese. 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. The Welsh Health Survey excludes people living in institutions (e.g. care homes, student halls). Therefore, this indicator may not be an accurate estimate for general practices with a high proportion of such patients.

	Further information on the Welsh Index of Multiple Deprivation is in section 5.2 of this technical guide. Further information on the Welsh Health Survey is in section 5.5 of this technical guide.
--	---

4.1.14 Fruit and vegetable consumption

What is being measured?	Estimated percentage of adults who reported consuming five or more portions of fruit or vegetables on the previous day.
How is this indicator defined?	The annual Welsh Health Survey asks adults about their fruit and vegetable consumption. Respondents are defined as achieving the recommended fruit and vegetable consumption if they consumed five or more portions on the previous day.
Where does the data come from?	- Welsh Demographic Service (WDS): NHS Wales Informatics Service (NWIS) - Welsh Health Survey (WHS): Welsh Government (WG) - Welsh Index of Multiple Deprivation (WIMD) 2014: Welsh Government (WG)
Who does it measure?	Wales' residents aged 16+ registered with GP practices in Wales.
When does it measure it?	- GP registrations as at September 2013 for Wales' residents. Adjustments have been made to align the practices with those open in December 2014 – see Appendix A for more details. - Welsh Health Survey data: 2011-2013
What geographical areas does it cover?	Wales' residents registered to practices in Wales.
How is it calculated?	The percentage of adults who reported consuming five or more portions of fruit or vegetables the previous day is calculated by applying national percentages broken down by 10 year age groups, sex and deprivation fifth, to the equivalent registered GP practice populations.
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 figures presented are estimates for the percentage of adults in the <u>registered</u> practice population that eat 5 or more portions of fruit and vegetables on a daily basis. For all other purposes the figures published by the Welsh Government should be used (see http://gov.wales/statistics-and-research/welsh-health-survey/?lang=en). English residents that are registered with Wales' practices are not included. There are also other known issues that affect the accuracy and completeness of WDS data. Further details are in section 5.1 of this technical guide. Wales-resident patients with postcodes that could not be matched to a LSOA of residence in Wales are omitted. Approximately 2,700 Wales-resident registered patients were omitted in total. Applying estimated national percentages to individual practices does not account for the variation in eating habits of small areas. Self-reported data of fruit and vegetable consumption may be prone to respondent bias i.e. overestimating their behaviour to give a more favourable response. Although portion size guidance was provided, interpretation may have been difficult for respondents. Also, the respondents were asked about the previous day's behaviour and so this might not reflect overall eating patterns. The Welsh Health Survey excludes people living in institutions (e.g. care homes, student halls). Therefore, this indicator may not be an accurate estimate for general practices with a high proportion of such patients.

	Further information on the Welsh Index of Multiple Deprivation is in section 5.2 of this technical guide. Further information on the Welsh Health Survey is in section 5.5 of this technical guide.
--	---

4.1.15 Physical activity

What is being measured?	Estimated percentage of adults who reported exercising on five or more days in the previous week.
How is this indicator defined?	The annual Welsh Health Survey asks adults about their weekly physical activity. Respondents are defined as achieving the recommended amount of physical activity if they undertook at least 30 minutes of moderate physical exercise on five or more days in the previous week.
Where does the data come from?	- Welsh Demographic Service (WDS): NHS Wales Informatics Service (NWIS) - Welsh Health Survey (WHS): Welsh Government (WG) - Welsh Index of Multiple Deprivation (WIMD) 2014: Welsh Government (WG)
Who does it measure?	Wales' residents aged 16+ registered with GP practices in Wales.
When does it measure it?	- GP registrations as at September 2013 for Wales' residents. Adjustments have been made to align the practices with those open in December 2014 – see Appendix A for more details. - Welsh Health Survey data: 2011-2013
What geographical areas does it cover?	Wales' residents registered to practices in Wales.
How is it calculated?	The percentage of adults who reported undertaking five or more 30 minute periods of exercise in the previous week is calculated by applying national percentages broken down by 10 year age groups, sex and deprivation fifth, to the equivalent registered GP practice populations.
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 figures presented are estimates for the percentage of adults in the <u>registered</u> practice population that meet the physical activity guidelines. For all other purposes the figures published by the Welsh Government should be used (see http://gov.wales/statistics-and-research/welsh-health-survey/?lang=en). English residents that are registered with Wales' practices are not included. There are also other known issues that affect the accuracy and completeness of WDS data. Further details are in section 5.1 of this technical guide. Wales-resident patients with postcodes that could not be matched to a LSOA of residence in Wales are omitted. Approximately 2,700 Wales-resident registered patients were omitted in total. Applying estimated national percentages to individual practices does not account for the variation in exercise habits of small areas. Self-reported physical activity may be prone to respondent bias i.e. overestimating their behaviour to give a more favourable response. There may be misclassification of the types of exercise e.g. some housework may be 'moderate' rather than 'light'. The Welsh Health Survey excludes people living in institutions (e.g. care homes, student halls). Therefore, this indicator may not be an accurate estimate for general practices with a high proportion of such patients.

	Further information on the Welsh Index of Multiple Deprivation is in section 5.2 of this technical guide. Further information on the Welsh Health Survey is in section 5.5 of this technical guide.
--	---

4.1.16 Mental health: Schizophrenia, bipolar affective disorders and other psychoses

What is being measured?	Percentage of patients with Schizophrenia, bipolar affective disorders and other psychoses.
How is this indicator defined?	Patients with Schizophrenia, bipolar affective disorders and other psychoses are recorded on the general practice mental health register.
Where does the data come from?	Quality and Outcomes Framework Data 2013/14 (QOF), Welsh Government (WG)
Who does it measure?	Numerator: Wales residents registered with a GP practice in Wales and who appear on the practice mental health register. Denominator: Total practice population
When does it measure it?	Data were extracted for financial year 2013/14, the data provide a snapshot of the mental health register on the date of extraction. Adjustments have been made to align the practices with those open in December 2014 – see Appendix A for more details.
What geographical areas does it cover?	Wales' residents registered to practices in Wales
How is it calculated?	The numbers of patients appearing on the QOF mental health register were divided by the total practice population (and multiplied by 100) at the time of the QOF data extract.
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 analysis includes English residents that are registered with a practice in Wales (unlike indicators which use data from the WDS). Further details on QOF are in section 5.7 of this technical guide.

4.2 Chronic condition registers

What is being measured?	Recorded burden of disease and adjusted recorded burden of disease.
How is this indicator defined?	The total number, crude percentage and adjusted percentage of patients with selected chronic conditions. The seven chronic conditions are: Hypertension, Asthma, Diabetes, CHD, COPD, Epilepsy and Heart Failure.
Where does the data come from?	Audit+: NHS Wales Informatics Service (NWIS)
Who does it measure?	Persons registered with GP practices in Wales.
When does it measure it?	Data extracted 31st March 2014.
What geographical areas does it cover?	GP practices do not have a geographical definition. The indicator includes registrations to GP practices in Wales from residents of England and Wales.
How is it calculated?	For each chronic condition, the count of patients with the condition was extracted by 10-year age bands along with the total list size by GP practice from Audit+ (NWIS). Burden of disease percentages were calculated by dividing the number of patients on the respective chronic condition register by the list size and multiplying by 100, other than for diabetes and epilepsy where the list size aged 15+ were used to more closely match the age restrictions of the registers for the two conditions (diabetes 17+ and epilepsy 18+). Adjusted burden of disease percentages were calculated by applying the age-specific percentages for each condition to the standard population used, in this instance the standard 2013 European population. The resultant rates were transformed to achieve a normal distribution and then converted to Z-scores. The rationale for this method was to enable a harmonised x axis for all conditions to allow them to be plotted to the same scale, which here is that of normalised standard deviations.
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?	A GP practice with the highest percentage of patients with a chronic condition doesn't necessarily mean that it will have the highest adjusted burden of disease in the chart. This is due to differential age structures in the GP practices, with practices with higher proportions of older people expected to have higher percentages of people with conditions associated with old age. The adjusted burdens of disease are based on the age-adjusted percentages meaning the differing age structures of practices have been accounted for. Comparisons of the adjusted burden of disease can only be made between practices within each condition and not between conditions. The figures only report on diagnosed cases of the conditions. There will be a certain number of undiagnosed cases within all practice populations which therefore means the burden of disease are more likely to be underestimates of the "true" prevalence of conditions. A higher number of patients on the disease register may reflect greater efforts on the behalf of GPs to identify patients with the

	condition. The data on the chronic conditions were collected in line with 2013/14 guidance: http://www.wales.nhs.uk/sites3/documents/480/Quality%20and%20Outcomes%20Framework%20Guidance%20for%20GMS%20Contract%20Wales%202013-14%20Final2.pdf Further information on definitions and any caveats for chronic conditions are found within the document: • CHD – starting on page 43 • Heart Failure – starting on page 49 • Hypertension – starting on page 54 • Diabetes – starting on page 70 • COPD – starting on page 98 • Epilepsy – starting on page 137 • Asthma – starting on page 91 There are known issues that affect the accuracy and completeness of Audit+ data. One such issue is that not all practices submit data to Audit+. Further details are in <u>section 5.4</u> of this technical guide.
--	---

5 Data sources

5.1 Population data

What the data tells you?	Provides the demographic characteristics of people registered with GP practices in Wales.
How are the data collected?	Data on Welsh residents were collected from the Welsh Demographic Service (WDS). The WDS, which is managed by the NHS Wales Informatics Service (NWIS), maintains a register of demographic details (including name, address, date of birth, general practice and NHS number) for Wales' residents. It is a database of patients resident in Wales and registered with a GP practice in Wales or England. Data on English residents registered with practices in Wales has not been collected for this project.
How accurate and complete will the data be? Are there any problems, notes for interpretation or warnings with the data?	The following issues are known to affect the accuracy and completeness of the WDS: • Receipt of information about new births. • De-registration of patients from general practice lists – this only happens when a patient registers with a new practice. This can be problematic if the patient has moved to England or elsewhere. • Full-time students are known to be less likely to notify GPs of changes of address. They are also more likely to not be de-registered when moving back 'home', particularly when this is overseas. The analysis is concentrated on GP practices in Wales, therefore information on Welsh residents that are registered with a GP practice in England are excluded. Approximately 20,000 English residents are registered to practices in Wales, this is most likely to affect practices near the border between Wales and England.
Who manages the data?	Welsh Demographic Service is managed by NHS Wales Informatics Services.
Where can you get hold of the data?	Contact details for the NHS Wales Informatics Service can be found on their website: http://www.NWIS.wales.nhs.uk/

5.2 Welsh Index of Multiple Deprivation

What the data tells you?	The Welsh Index of Multiple Deprivation (WIMD) is the official measure of relative deprivation at small area level in Wales¹. WIMD is made up of eight separate domains of deprivation: income; employment; health; education; housing; access to services; environment; and community safety. WIMD is used to give an overall deprivation rank for each of the 1,909 lower super output areas (LSOA) in Wales and to give ranks for the separate deprivation domains for each of the LSOAs.
How are the data collected?	Deprivation ranks are calculated for each LSOA in Wales. One area has a higher deprivation rank than another if the proportion of people living there that are classed as deprived is higher. The most deprived area is ranked as one and the least deprived area is ranked as 1,909. Each of the eight domains are based on a range of different indicators. The domain indices are weighted and combined into an overall index of multiple deprivation. The weightings determine the contribution of each domain to the overall index. 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 bands, 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 is an ecological measure whereas individuals within an area (LSOA in this instance) may vary. 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. 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 and the Local Government Data Unit (Wales)

Where can you get hold of the data?	WIMD can be downloaded from the following Welsh Government web pages: http://wales.gov.uk/statistics-and-research/welsh-index-multiple-deprivation/?lang=en
References	1. Welsh Government. <i>Welsh Index of Multiple Deprivation 2014: Technical Report</i>. Cardiff: WG; 2014. Available at: http://wales.gov.uk/statistics-and-research/welsh-index-multiple-deprivation/?lang=en#/statistics-and-research/welsh-index-multiple-deprivation/technical-information/?lang=en

5.3 Rural/urban definition

What the data tells you?	The rural/urban classification describes the rurality of small geographical areas in England and Wales. This information was used to show the number and percentage of GP cluster patients living in the following three types of area: • Urban • Rural: small town / fringe • Rural: village / hamlet / isolated dwellings
How are the data collected?	The Rural Evidence Research Centre at Birkbeck College was responsible for the technical development of the classification, as part of a multi-agency project. Hectare grid squares were used as the basis for the project, using postcode information for each square and settlement definitions from the Office of the Deputy Prime Minister. The following measurement criteria were used¹: • Settlement form: each hectare grid square was assigned as either dispersed dwellings, hamlet, village, small town, urban fringe or urban (>10K population) • Sparsity: each hectare grid square was given a score based on the number of households in surrounding squares
How accurate and complete will the data be? Are there any problems, notes for interpretation or warnings with the data?	The following caveats are taken directly from an online guide to the classification¹: • "The classification is set up to be a measure of settlement pattern and context. It does not consider the issues of land use beyond land used for residential purposes. • The great strength of the classification is in providing a framework to be used in broad statistical analyses. Conversely, it is less robust when we wish to consider the characteristics of individual local areas. There are two main problems with considering specific localities. – Firstly the classification is derived from a set of decision rules. At an aggregate level the exact specification of these rules is not critical. A small change in the criteria will lead to a small change in the classification. However, locally such small changes can be significant. A particular Output Area may for example change from being a village to a small town because of a very small change in the criteria. – Secondly the classification does not consider the "look" or "feel" of a locality. It is simply an objective measure of the settlement pattern and context. This can lead to local anomalies where the classification does not agree with what local residents think about their area."
Who manages the data?	The classification was introduced in 2004 following a multi-agency project, with partners including the Office for National Statistics, DEFRA and the Welsh Assembly.
Where can you get hold of the data?	Office for National Statistics website available at: http://www.ons.gov.uk/ons/guide-method/geography/products/area-classifications/rural-urban-definition-and-la/index.html
References	1. The Countryside Agency / DEFRA / Office of the Deputy Prime Minister / Office for National Statistics / Welsh Assembly Government. <i>Rural and urban area classification 2004: an introductory guide</i> [Online]. 2004. Available: http://archive.defra.gov.uk/evidence/statistics/rural/documents/rural-defn/Rural_Urban_Introductory_Guide.pdf

5.4 Audit+

What the data tells you?	Provides a count of patients with the identified chronic conditions by 10 year age-groups and sex. The chronic conditions are defined in the same way as the General Medical Service Quality & Outcomes Framework (QOF).
How are the data collected?	Audit+ is a centrally funded analysis tool which is available to GP practices in Wales. More can be found in the GP Clinical System strategy for Wales (Section 7 Data quality): http://www.wales.nhs.uk/sitesplus/documents/956/GP%20Clinical%20Systems%20Strategy.pdf Audit+ provides practices with a number of tools that allow them to manage their patient registers as defined in an audit specification. These tools allow the practices to browse patients and easily identify those that require attention, to graphically view any patient treatment and outcome targets that may have been set for a specified audit, along with other internal uses. The extracted data is locally analysed at each practice and then the aggregated results of those analyses are sent to a central NHS Wales repository and presented in the web based system AuditWeb¹.
How accurate and complete will the data be? Are there any problems, notes for interpretation or warnings with the data?	Audit+ is non-mandatory which enables a GP practice to choose whether or not to use this analysis tool. Audit+ is installed in excess of 95% of GP practices on a voluntary basis. Data is extracted weekly, however the general return rate is around 90%, therefore data completeness may vary depending on which practices have submitted at the time of extraction. Following quality control of the Audit+ extract by monitoring data completeness and comparison of counts to the QOF counts, the extraction used for the GP Practice profile excludes 53 GP practices from across Wales for all chronic conditions: Abertawe Bro Morgannwg UHB: • Bay Health cluster: Uplands Surgery • Bridgend East Network cluster: Newcastle Surgery, Oak Tree Surgery • Bridgend North Network cluster: Nantylffyllon Surgery, The Surgery (Nantymoel) • City Health cluster: Greenhill Medical Centre, High Street Surgery • Neath cluster: Britton Ferry Health Centre • Upper Valleys cluster: Amman Tawe Partnership (Neath Port Talbot) Aneurin Bevan UHB: • Caerphilly East cluster: Avicenna Medical Centre, North Celynen Practice, Risca Surgery • Monmouthshire North cluster: Chippenham Surgery • Monmouthshire South cluster: Mount Pleasant Practice, Town Gate Practice • Newport Central cluster: Malpas Brook Health Centre • Torfaen North cluster: The Mount Surgery

Betsi Cadwaladr UHB:

- Anglesey cluster: The Surgery (Gwalchmai)
- Arfon cluster: Bron Seiont, Corwen House, Dolwenith, Llys Meddyg (Penygroes), Market Street Surgery
- Central & South Denbighshire cluster: Beech House Surgery
- Conwy East cluster: Cadwgan Surgery
- Conwy West cluster: The Medical Centre (Penrhyn Bay), West Shore Surgery
- Deeside, Hawarden & Saltney cluster: Marches Medical Practice, Queensferry Medical Practice
- Dwyfor cluster: Treflan
- Holywell & Flint cluster: Allt Goch Medical Centre, Eyton Place Surgery, Panton Surgery, The Laurels Surgery
- Meirionnydd cluster: Bron Meirion
- Mold, Buckley & Caergwle cluster: Caergwle Medical Practice
- North Denbighshire cluster: Seabank Surgery, The Health Centre (Rhuddlan)
- South Wrexham cluster: Ruabon Medical Centre, The Surgery (Hanmer), The Surgery (Overton On Dee), Wrexham Town cluster: Hillcrest Medical Practice (Wrexham), The Health Centre (Prince Charles Road)

Cardiff & Vale UHB:

- Cardiff North cluster: Whitchurch Road Surgery
- Eastern Vale cluster: Albert Road Surgery

Cwm Taf UHB:

- North Merthyr Tydfil cluster: Morlais Medical Practice

Hywel Dda UHB:

- South Ceredigion cluster: Ashleigh Surgery
- South Pembrokeshire cluster: Meddygfa Rhiannon, Narberth & Clarbeston Road Practice, The Surgery (Tenby)
- Taf/Teifi/Tywi cluster: Furnace House Surgery

Powys tHB:

- Mid Powys cluster: Presteigne Medical Practice
- South Powys cluster: Ystradgynlais Group Practice

In addition, further GP practices were excluded for some chronic conditions:

Cardiff & Vale UHB

- Western Vale cluster: Cowbridge & Vale Medical Practice (Asthma & epilepsy)

Powys tHB:

- North Powys cluster: Montgomery Medical Practice (Asthma, COPD & epilepsy)

The data is provided at aggregated level rather than patient level which means it is not possible to identify those who appear on more than one register.

	QOF data is primarily used to monitor GP practice performance against their contract; secondary use of data should be interpreted with caution. QOF prevalence represents prevalence of the diagnosed condition as captured by GP information systems and the QOF algorithms. Guidance on this can be found at: http://www.wales.nhs.uk/sites3/page.cfm?orgid=480&pid=6063 The data was captured in line with 2013/14 guidance: http://www.wales.nhs.uk/sites3/documents/480/Quality%20and%20Outcomes%20Framework%20Guidance%20for%20GMS%20Contract%20Wales%202013-14%20Final2.pdf Some conditions are not overtly apparent to the patient or clinician and there may be some clinical uncertainties in specifically diagnosing these types of condition e.g. Hypertension or Diabetes. In addition it is important to understand the environment and constraints under which the data was captured. The QOF data recording specifications are consistent and practices must comply in order to receive remuneration under the GMS contract requirements. Practices do vary to some extent in their coding and recording, and their data reflects the priorities, needs, specialisms, capacity, skills of the whole practice, the nature of the balance of services between primary and secondary care and the communication of information relating to the care of patients. The comparative analysis of practice or health board level QOF achievement may also be inappropriate without taking account of the underlying social and demographic characteristics of the populations concerned. The delivery of services will be related, for example, to population age/sex, ethnicity or deprivation characteristics that are not included in the QOF data collection processes. Due to these issues there may well be some significant variation in the percentage of patients on register with a selected chronic condition between individual practices within a cluster. The data were extracted on the 31st March 2014.
Who manages the data?	The data is managed by the Primary Care Informatics program within NHS Wales Informatics Service (NWIS).
Where can you get hold of the data?	Audit+ data can only be obtained by request to NWIS: http://www.wales.nhs.uk/sitesplus/956/home The number of patients on QOF registers is available by GP practice on the Welsh Government web pages: Welsh Government General Medical Services Contract: Quality and Outcomes Framework Statistics, 2013-14
References	1. Welsh Government. General Medical Services Contract: Quality and Outcomes Framework Statistics for Wales, 2013-14. Cardiff: WG; 2014. Available at: http://gov.wales/docs/statistics/2014/141029-general-medical-services-contract-quality-outcomes-framework-2013-14-en.pdf [Accessed 24th February 2015]

5.5 Welsh Health Survey

What does the data tell you?	The Welsh Health Survey (WHS) provides information about the health of people living in Wales, the way they use health services and their health related lifestyle.
How are the data collected?	The adult survey was established in 2003 and runs all year round. The information relating to children has been collected since 2007. The WHS 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 File¹. Families with children aged under 16 are eligible for the child elements of the survey. In households with three or more children, two children are selected at random to avoid respondent burden. Information is collected on households through a short interview and on individuals through a self-completion questionnaire. One of three age-specific questionnaires is used for children. Two are designed for parents to complete on behalf of children aged 0-3 and 4-12. A third questionnaire is given to children aged 13-15 to complete on their own behalf. Adults (aged 16+) complete their own questionnaire. At each household, all adults and a maximum of two children are eligible for inclusion in the survey. A sample of around 15,000 adults and 3,000 children is aimed for per year, to include a minimum of 600 adults from each local authority area.
How accurate and complete will the data be? Are there any problems, notes for interpretation or warnings with the data?	The Welsh Health Survey is the most comprehensive survey into the health of the population across Wales. However, as with all surveys of a sample of the population it is subject to sampling error i.e. the difference between the estimates derived from the sample and the true population values. The Welsh Health Survey achieves high response rates e.g. in 2011 78% of eligible households took part and self-completion questionnaires were obtained for 83% of adults and 79% of children in participating households. Survey data is usually presented at a Wales level. Combining data from more than one year can allow results to be presented at a lower level (e.g. age group, geography) by improving the precision of the estimates due to the larger sample size used. As the survey is based on self-reported data, the results are prone to respondent bias i.e. people may under or over estimate their behaviour to give a more favourable response. The survey results are weighted to ensure that the age and sex distribution of the responding sample matches that of the population of Wales.

	The Postcode Address File covers more than 99% of private households in Wales; the small percentage of people not covered by the Postcode Address File, for example those living in institutions, were not covered by the Welsh Health Survey. The Welsh Health Survey therefore does not include adults living in institutional settings such as care homes or nursing homes etc. In general terms whereas non-responding adults were more likely than those who responded to be described as having good general health the converse is true for children i.e. children who responded to the survey were more likely to be described as having good general health than non-responding children². The indicators provided as part of the General Practice Population Profiles relate to the <u>registered</u> general practice population. For all other purposes the figures published by the Welsh Government should be used (see http://gov.wales/statistics-and-research/welsh-health-survey/?lang=en). The Welsh Health Survey excludes people living in institutions (e.g. care homes, student halls). Therefore, the registered population indicators provided may not be an accurate estimate for general practices with a high proportion of such patients.
Who manages the data?	The data is owned and managed by the Welsh Government. NatCen Social Research (www.natcen.ac.uk) conducts the survey on behalf of the Welsh Government.
Where can you get hold of the data?	Welsh Health Survey results are available at: http://wales.gov.uk/topics/statistics/theme/health/health-survey/results/?lang=en
References	1. Welsh Government. Welsh Health Survey Quality Report. Cardiff: WG; 2011. Available at: http://wales.gov.uk/docs/statistics/2012/120116healthqualityen.pdf 2. Sadler et al. Welsh Health Survey 2011 Technical Report. National Centre for Social Research; 2012. Available at: http://wales.gov.uk/topics/statistics/theme/health/health-survey/results/?lang=en

5.6 Census 2011

What does the data tell you?	The Census provides a comprehensive picture of the population of England and Wales. It provides key information on health, housing, employment, transport and ethnicity.
How are the data collected?	The latest census for England and Wales took place on 27th March 2011. The 2011 Census was distributed to every household in England and Wales in the form of a questionnaire and asked 56 questions in total. For Wales, there was a Welsh and English language version of the questionnaire which contained an additional question about the Welsh language.
How accurate and complete will the data be? Are there any problems, notes for interpretation or warnings with the data?	The 2011 Census is the most recent source of health status data with universal population coverage. The data are likely to be an accurate indicator of general health status at the time of collection. It is inevitable that some people will be missed in the Census however ONS have developed statistical techniques to measure the level of undercount, which also provides an assessment of the characteristics of individuals and households missed. The Census design includes methods to insert the best estimate of a missing response and management of data quality throughout. However, although everyone in the country is obliged to complete a Census form, because the Census is designed for self-completion, there may still be some scope for under or over reporting. The Office for National Statistics (ONS) has worked on this and is confident of a 94% enumeration for England & Wales and a minimum of 80% in all local authorities. As the Census is only performed every 10 years, it can become dated towards the latter part of the decade; the last one was held on Sunday 27 March 2011. The Census includes statistical adjustment to allow for any shortfall detected in a follow up survey of Census coverage.
Who manages the data?	Office for National Statistics (ONS)
Where can you get hold of the data?	ONS website as follows: http://www.ons.gov.uk/ons/guide-method/census/2011/census-data/index.html

5.7 Quality and Outcomes Framework

What does the data tell you?	The Quality and Outcomes Framework (QOF) is a voluntary system for annual rewards for general practice achievements¹. QOF awards general practice points for¹: • chronic disease management • implementing preventative measures (e.g. regular blood pressure checks) • additional services offered (e.g. child health care and maternity services) • quality and productivity of the service provided • compliance with the minimum time a GP should spend with each patient during an appointment
How are the data collected?	General practices submit data electronically on an annual basis. Guidance is provided to general practices of the indicators to be submitted and the criteria for each indicator². When data from all participating practices is submitted, QOF points and rewards for each practice for the previous financial year are calculated.
How accurate and complete will the data be? Are there any problems, notes for interpretation or warnings with the data?	QOF is voluntary which enables a general practice to decide whether or not to submit data. However, due to the financial awards available via QOF the large majority of practices submit data electronically each year. QOF data is primarily used to monitor GP practice performance against their contract; secondary use of data should be interpreted with caution. QOF prevalence represents prevalence of the diagnosed condition as captured by GP information systems and the QOF algorithms. Guidance on this can be found at: http://www.wales.nhs.uk/sites3/page.cfm?orgid=480&pid=6063 The data used for this project was captured in line with 2013/14 guidance: http://www.wales.nhs.uk/sites3/documents/480/Quality%20and%20Outcomes%20Framework%20Guidance%20for%20GMS%20Contract%20Wales%202013-14%20Final2.pdf In addition it is important to understand the environment and constraints under which the data was captured. The QOF data recording specifications are consistent and practices must comply in order to receive remuneration under the GMS contract requirements. Practices do vary to some extent in their coding and recording, and their data reflects the priorities, needs, specialisms, capacity, skills of the whole practice, the nature of the balance of services between primary and secondary care and the communication of information relating to the care of patients. The comparative analysis of practice or health board level QOF achievement may also be inappropriate without taking account of the underlying social and demographic characteristics of the populations concerned. The delivery of services will be related, for example, to population age/sex, ethnicity or deprivation characteristics that are not included in the QOF data collection processes.
Who manages the data?	NHS Wales Informatics Service (NWIS) manage the data on behalf of the Welsh Government (WG)

Where can you get hold of the data?	NHS Wales Informatics Service (NWIS): http://www.wales.nhs.uk/nwis/page/52504
References	1. Health and Social Care Information Centre. Quality and Outcomes Framework. Leeds: HSCIC; 2015. Available: http://www.hscic.gov.uk/qof 2. NHS Wales Informatics Service. Guidance Documents: NWIS; 2014. Available: http://www.wales.nhs.uk/sites3/page.cfm?orgid=480&pid=68247

6 Glossary

Age-standardised percentage

- Age standardisation allows comparison of percentages across different populations while taking account of the different age structures of those populations. Failure to take account of differing age structures can be very misleading when comparing percentages in different populations. For example, in an area with a high proportion of older people, one would expect more people to have certain chronic conditions than in an area with a low proportion of older people. Without age standardisation, it would be difficult to compare the percentage of disease burden in two such areas.

Chronic Condition

- Chronic conditions are diseases of long duration and generally slow progress. Here they are identified using the QOF definitions.

European age-standardised percentage

- The European age-standardised percentage represents the overall rate you would get if the population had the same age-structure as a theoretical standard European population (direct age-standardisation). In order to calculate this we apply the percentages which occur in each age band to the new (standard) population structure. The measure only allows for comparison between percentages which have been standardised; it is not a proportion or risk of an event occurring and does not, of itself, involve a comparison with percentages across Europe. See *age-standardised percentage* for further details.

Fifths of deprivation

- Geographical areas are ranked from highest to lowest by deprivation score, using the Welsh Index of Multiple Deprivation, and then split into five groups of similar size, ranging from most deprived to least deprived fifth.

GP cluster

- A small group of GP practices working collaboratively to develop services in the community. GP clusters typically each serve a population of between 30 and 50 thousand patients. The concept of 'GP clusters' was first set out in '[Setting the Direction](#)', the Welsh Government's primary & community services strategic delivery programme.

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 services and specialised services.

List size

- The number of registered patients at a GP practice.

Lower Super Output Area (LSOA)

- Defined geographical area based on Census 2011 output areas with an average of 1,500 persons per LSOA. There are 1,909 LSOAs in Wales, and the number of LSOAs varies widely between health boards.

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.

Quality and Outcomes Framework

- The Quality and Outcomes Framework (QOF) is a voluntary system of financial incentives. It is about rewarding contracts for good practice (and its associated workload) through participation in an annual quality improvement cycle.

Welsh Index of Multiple Deprivation (WIMD)

- WIMD is a measure of multiple deprivation at lower super output area level. A WIMD deprivation score is calculated using eight domains i.e. income, employment, health, education, access to services, housing, physical environment and community safety.

7 Appendix A

Adjustments have been made to take account of the changes to General Practices over the last 10 years. These changes include General Practice mergers, splits and practice code/name.

Current GP practice code(s)	Other code(s) to be used	Year(s) rule applicable for	Notes
W00133+W00134	W92030	2005-2012	In April 2013, W92030 split into W00133 and W00134
W00141	W98052	2005-2013	In 2014, W98052 changed practice name and code to W00141
W00142	W92610	2005-2014	After the latest WDS 2014 extract, W92610 changed practice name and code to W00142
W00143	W98058+W98786	2005-2014	After the latest WDS 2014 extract, W98058 changed practice name and code to W00143 and merged with W98786
W00144	W98038	2005-2014	After the latest WDS 2014 extract, W98038 changed its name and code to W00144
W93067	W93067+W93122	2005-2014	After the latest WDS 2014 extract, W93122 merged into W93067
W00067	W00067+W92049+W92012+W92010	2005-2012	Over the years, W92012, W92049 and W92010 have all merged into W00067
W95623	W95623+W95607	2005-2013	In May 2014, W95607 merged into W95623
W97055	W97055+W97066	2005-2013	In 2014, W97066 merged into W97055
W95645*	-	2005-2006	Only have data for 2007-2014. Response from practice manager "We have always had code W95645 but Dr. Pal used to have a branch with a w number which closed in 2004."
W95751	W98600	2005-2007	In 2007, W98600 changed practice name and code to W95751
W94609	W94609+W94042	2005-2012	In February 2013, W94042 became a branch surgery of W94609
W93075	W93075+W93638	2005-2012	W93638 merged with W93075
W91059	W91059+W91062	2005-2011	W91062 merged with W91059

Current GP practice code(s)	Other code(s) to be used	Year(s) rule applicable for	Notes
W95068	W95068+W95082	2005-2011	W95082 merged with W95068
W00007	W00007+W91041	2005-2010	W91041 merged with W00007
W97027	W97027+W97050	2005-2010	W97050 merged with W92027
W95001	W95001+W95022+W95618	2005-2010	In 2006, W95022 merged with W95001 as did W95618 in 2010
W95633	W95633+W95048+W95638	2005-2010	In 2008, W95048 merged with W95638. Practice code is now W95633
W95086	W95086+W95641	2005-2008	In 2009, W95641 merged with W95086
W95026	W95026+W95646	2005-2008	In 2009, W95646 merged with W95026
W95016	W95016+W95039	2005-2010	W95039 merged with W95016
W92039	W92039+W92045	2005-2013	In 2014, W92045 merged with W92039
W95634	W95634+W95635	2005-2013	In 2014, W95635 merged with W95634
W92003	W92003+W92434+W92029	2005-2008	W92003 took over the patients from W92434 and W92029 when the practices closed
W00005	W00005+W95002+W95629	2005-2011	W95002 and W95629 merged with W00005
W93051	W93051+W93066	2005-2010	W93066 merged with W93051
W92064	W92064+W92615	2005-2009	W92064 merged with W92615
W97619	W97619+W95626	2005-2011	W95626 merged with W97619
W97614	W97614+W97051	2005-2010	W97051 used to be a branch surgery for W97614
W91622	W91622+W00095	2009-2012	W00095 merged with W91622
W93623	W93623+W93633	2005-2006	W93633 merged with W93623
W93068	W93069+W93017+W93608	2005-2009	W93017 merged with W93068. Also, W93608 was a branch of this practice
W95295	W95295+W95053+W95292	2005-2011	W95053 used to be a branch surgery + in 2011, W95292 merged with W95295
W97064	W97064+W97624	2005-2010	W97624 merged with W97064
W95049	W95049+W95083	2005-2009	W95083 merged with W95049