

Arsyllfa lechyd Cyhoeddus Cymru Public Health Wales Observatory

GPCLUSTER Profiles:



Technical Guide

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1 Introduction

This guide describes the methods, indicators, data sources and terms used in the Public Health Wales Observatory publication, *GP Cluster 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 GP cluster profiles report;
- The online interactive spreadsheets.

How to use this Technical Guide:

- Section 2 contains guidance on how to interpret some of the charts and maps included in the *GP Cluster Profiles* report;
- Sections 3 and 4 describes the indicators used in the report, for example their definitions and the caveats to be considered when interpreting the data. The order of this section is in line with the order of the indicators in the report;
- Section 5 describes the main sources of data used in the report, to give more detail regarding their method of collection and associated caveats. The order of this section is in line with the order of the indicators in the report;
- Section 6 provides a glossary of terms used within the *GP Cluster Profiles* report 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 *GP Cluster Profiles*, plus the supporting interactive spreadsheets and this technical guide, are available from

http://www.publichealthwalesobservatory.wales.nhs.uk/gpclusters

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

2 Interpreting the charts, maps and tables

This section assists with the interpretation of some of the charts, maps and tables contained in the GP clusters profile.

2.1 Demographic Characteristics

2.1.1 Older people

The following can be used to aid interpretation of the percentage of patients aged 65+ (figure 1) and 85+ (figure 2) across GP clusters within the health board.

Note: The chart in this example is based on those aged 65+.

Further information on how the values were calculated for this chart is in $\frac{\text{section } 3.1.2}{\text{ of this technical guide.}}$



2.1.2 Deprivation/Rurality

The following can be used to aid interpretation of the percentage of patients living in deprived areas (figure 3) across GP clusters within the health board and with the percentage of patients living in rural areas (figure 4).

Note: The chart in this example is based on patients living in the most deprived fifth of all LSOAs in Wales.

Further information on how the values were calculated for the deprivation chart is in <u>section</u> 3.1.3 of this technical guide, whilst equivalent information for the rurality chart is in <u>section</u> 3.1.4.



2.1.3 LSOAs deprivation fifths

The following map shows the levels of deprivation of the resident population across the health board of interest. There are five deprivation categories (fifths) ranging from most deprived to least deprived, with the categories based on the ranking of LSOAs across the whole of Wales.

Further information on this map is in <u>section 3.1.5</u> of this technical guide.



2.2 Individual GP cluster indicators

The indicators in this section are provided individually for each of the GP clusters within the health board.

2.2.1 Geographical 'reach' maps

A 'reach map' has been produced for each cluster showing the percentage of the registered population in each LSOA registered with practices in the cluster.

The following maps are to aid with the interpretation of some of the more difficult maps i.e. when a proportion of a LSOAs population attend a branch practice in a different GP cluster; and LSOAs in rural areas with low population densities.

Further information on how the values were calculated for these maps is in <u>section 4.1</u> of this technical guide.



Effects of "branch surgeries"



Only 50-75% of the registered population of this LSOA are registered to practices in the GP cluster. This is because some of the patients in this LSOA are registered to a nearby branch practice belonging to a different GP cluster.

Produced by Public Health Wales Observatory, using WDS (NWIS), GP registrations from England (PCTs/CCGs) and MYE (ONS) © Crown Copyright and database right 2013. Ordnance Survey 100044810



This LSOA appears as an "island" with 5-50% of the registered population being registered to practices in the West & North Wrexham GP cluster. This is due to a nearby branch practice belonging to that cluster.

LSOAs with low population densities



Percentage of population registered to practices in the South Pembrokeshire GP cluster, 2012

Shading indicates that 5-50% of this LSOA's registered population are registered to practices in the South Pembrokeshire GP cluster.

The LSOA contains a number of settlements.

The majority of the registered population that are registered to practices in the South Pembrokeshire GP cluster are likely to come from the more southern and/or westerly settlements.

2.2.2 Age/sex breakdown of patients

Patients within each cluster are grouped by age and sex, with the health board total provided as a comparator.

The horizontal bars show the percentage of patients within each age/sex category, with the figures outside the bars showing the count of patients.

Further information on how the values were calculated for this chart is in $\frac{\text{section 4.2}}{\text{section 4.2}}$ of this technical guide.



Produced by Public Health Wales Observatory, using WDS (NWIS) and GP registrations from England (PCTs/CCGs)

Where some of the patients are resident in England the additional patient data has been obtained from PCTs/CCGs.

2.2.3 Deprivation/Rurality charts

The following can be used to aid the interpretation of the deprivation and rurality charts for each GP cluster within the health board.

Deprivation and rurality charts have been produced to show the proportion of clusters' Walesresident patients that reside within each deprivation fifth and within each rural/urban classification.

The following annotation is based on a deprivation chart which has five bars, one for each deprivation index, whereas the rurality chart has three bars, one for each rural/urban classification. However, the principles of interpretation for both charts are the same.

Further information on how the values were calculated for the deprivation chart is in <u>section</u> 4.3 of this technical guide, whilst further information on the rurality chart is in <u>section 4.4.1</u>.



2.2.4 Time taken to drive

This table has been produced to show the time taken by patients to travel to their main registered GP practice.

Further information on how the values were calculated for this table is in <u>section 4.4.2</u> of this technical guide.



2.2.5 Chronic condition registers

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

Further information on how the values were calculated for this table and chart is in <u>section</u> <u>4.5</u> of this technical guide.

These are the counts and crude percentages for each condition in the cluster along with comparison percentages.

By definition, the crude percentages have not been adjusted for any differences in the age structure between clusters. The chart shows the adjusted percentages for each condition in the cluster (the red diamond), the adjusted percentages of the other GP clusters in that health board (the small blue diamonds) and the adjusted percentages of all other GP clusters (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.

		Rec	orded burd	len of disea	ase		Adjusted recor	ded burg	len of disea	se
Indicator	Your Cluster:		Other Clusters in your Health Board:		Health Board	Wales	 Your Cluster Other Clusters: 			
	count	%	min %	max %	%	%	 in your Health E in other Health 	Board Boards		
Hypertension	7,330	12.9	12.9	19.1	16.7	15.3				
Asthma	3,550	6.3	5.8	6.5	6.2	6.7				
Diabetes	2,660	4.7	4.7	5.8	5.3	5.2	00000	C	> ♦380>	\diamond
СНД	1,970	3.5	3.5	4.9	4.2	4.0			1963 (* •¢	>
COPD	930	1.6	1.6	4.0	2.6	2.1			;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;;	٠
Epilepsy	390	0.7	0.7	1.1	0.8	0.7			***	٠
Heart Failure	350	0.6	0.6	1.5	0.9	0.9	◇ ∞ ◆		∞••∞∞	٠
Produced by Pul	blic Health	Wales O	bservatory,	using Audit-	+ (NWIS)		Lowest 25%	Middle 50%	Highes 25%	;t

This range includes the clusters that fall within the expected middle 50% of disease burdens after adjusting for age. Clusters 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 Summary Indicators

3.1 Demographic characteristics of clusters

3.1.1 Number of practices and total list size

What is being measured?	Number of GP practices in each GP cluster and the total list size of each GP cluster.
How is this indicator defined?	The number of practices relates to the number of GP practices which form the GP cluster, whilst the total list size of the GP cluster is the sum of the total number of patients that are registered to GP practices that form the GP clusters.
Where does the data come from?	 Welsh Demographic Service (WDS): NHS Wales Informatics Service (NWIS) GP registrations from England: Primary Care Trusts (PCTs) /Clinical Commissioning Groups (CCGs) – this is only relevant to GP clusters with registered patients that are normally resident in England.
Who does it measure?	Persons registered with GP practices which form the clusters in Wales.
When does it measure it?	 GP registrations as at September 2012 for Wales residents GP registrations between October 2012 and May 2013 for English residents (depending on extract date of the particular PCT/CCG)
What geographical areas does it cover?	GP clusters do not have a geographical definition. The indicator includes registrations to GP practices in the cluster from residents in Wales or England.
How is it calculated?	The number of practices relates to the number of GP practices which form the GP cluster. This count does not include branch surgeries as they are organisationally part of the main surgery. The total list size is the number of all patients registered with the GP practices within the GP cluster.
How accurate and complete will the data be for this	Total list sizes are rounded to the nearest 10 for ease of reading, therefore summing the total list size for each cluster in the health board won't always match the health board total list size.
indicator? Are there any problems, notes for interpretation or warnings with the data in relation to this indicator?	There are known issues that affect the accuracy and completeness of WDS data. Further details are in section 5.1 of this technical guide.

3.1.2 Older people

What is being measured?	Percentage of patients aged 65+ and 85+ by GP cluster.
How is this indicator defined?	The percentage of patients aged 65+ and 85+ in each GP cluster in a health board.
Where does the data come from?	 Welsh Demographic Service (WDS): NHS Wales Informatics Service (NWIS) GP registrations from England: Primary Care Trusts (PCTs) /Clinical Commissioning Groups (CCGs) - this is only relevant to GP clusters with registered patients that are normally resident in England.
Who does it measure?	Persons registered with GP practices which form the clusters in Wales.
When does it measure it?	 GP registrations as at September 2012 for Wales residents GP registrations between October 2012 and May 2013 for English residents (depending on extract date of the particular PCT/CCG)
What geographical areas does it cover?	GP clusters do not have a geographical definition. The indicator includes registrations to GP practices in the cluster from residents in Wales or England.
How is it calculated?	The total number of patients aged 65 and over divided by the total number of patients of all ages multiplied by 100. The count of patients aged 65+ is also displayed. The total number of patients aged 85 and over divided by the total number of patients of all ages multiplied by 100. The count of patients aged 85+ is also displayed.
How accurate and complete will the data be for this indicator? Are there any problems, notes	The percentage labels have been rounded to 1 decimal place whilst the chart bars are plotted using the unrounded numbers. This means that whilst two clusters may have equal percentages to 1 decimal place, the bars of these two clusters may not necessarily be of equal length.
data in relation to this indicator?	There are known issues that affect the accuracy and completeness of WDS data. Further details are in section 5.1 of this technical guide.

3.1.3 Deprivation

What is being measured?	Percentage of patients living in the most deprived fifth of areas in Wales.
How is this indicator defined?	The percentage of patients of the GP cluster, resident in Wales, who are living in a Lower Super Output Area (LSOA) in the most deprived fifth in Wales.
Where does the data come from?	 Welsh Demographic Service (WDS): NHS Wales Informatics Service (NWIS) Welsh Index of Multiple Deprivation 2011 (WIMD 2011): Welsh Government (WG)
Who does it measure?	Persons registered with GP practices which form the clusters in Wales.
When does it measure it?	GP registrations as at September 2012 for Wales residents
What geographical areas does it cover?	GP clusters do not have a geographical definition. The indicator includes registrations to GP practices in the cluster from residents of Wales only.
How is it calculated?	The number of Wales-resident patients in the cluster living in an LSOA in the most deprived fifth divided by the total number of Wales-resident patients in the cluster multiplied by 100.
	displayed.
How accurate and complete will the data be for this indicator? Are there any problems, notes	Patients who are resident in England were excluded from the analyses from the outset since they could not be assigned to a deprivation index directly comparable to the Welsh Index of Multiple Deprivation. Approximately 20,000 patients were excluded.
for interpretation or warnings with the data in relation to this indicator?	Wales-resident patients with postcodes that could not be matched to an area of residence in Wales could not be assigned to a deprivation fifth. Approximately 2,700 Wales-resident registered patients were omitted in total.
	The percentage labels have been rounded to 1 decimal place whilst the chart bars are plotted using the unrounded numbers. This means that whilst two clusters may have equal percentages to 1 decimal place the bars of these two clusters may not necessarily be of equal length.
	There are known issues that affect the accuracy and completeness of WDS data. Further details are in section 5.1 of this technical guide.
	Further information on the Welsh Index of Multiple Deprivation is in <u>section 5.2</u> of this technical guide.

What is being measured?	Percentage of patients living in a rural area in Wales.
How is this indicator defined?	The percentage of patients in the GP cluster resident in Wales that are living in an area classified as rural.
	Rural area for this analysis is defined as those living in either a small town/fringe area or in a village, hamlet or isolated dwellings.
Where does the data come from?	 Welsh Demographic Service (WDS): NHS Wales Informatics Service (NWIS)
	 2004 rural/urban definition: Office for National Statistics (ONS)
Who does it measure?	Persons registered with GP practices which form the clusters in Wales.
When does it measure it?	GP registrations as at September 2012 for Wales residents
What geographical areas does it cover?	GP clusters do not have a geographical definition. The indicator includes registrations to GP practices in the cluster from residents in Wales only.
How is it calculated?	The number of Wales-resident patients in the cluster living in a rural area by classification divided by the total number of Wales-resident patients in the cluster 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?	Registered patients who are resident in England were excluded from the analyses from the outset in order to maintain consistency with the deprivation analysis. Approximately 20,000 patients were excluded.
	Wales-resident patients with postcodes that could not be matched to an area of residence in Wales are omitted. Approximately 2,700 Wales-resident registered patients were omitted in total.
	This chart defines rural area as those living in either a small town/fringe area or in a village, hamlet or isolated dwellings whilst the rural/urban chart in the individual GP clusters chapter differentiates those living in a small town/fringe area from those living in a village, hamlet or isolated dwelling.
	The percentage labels have been rounded to 1 decimal place whilst the chart bars are plotted using the unrounded numbers. This means that whilst two clusters may have equal percentages to 1 decimal place the bars of these two clusters may not necessarily be of equal length.
	There are known issues that affect the accuracy and completeness of WDS data. Further details are in section 5.1 of this technical guide.
	Further information on the rural/urban classification is in section 5.3 of this technical guide.

What is being measured?	Deprivation status of Lower Super Output Areas (LSOA).
How is this indicator defined?	The deprivation index of each LSOA in the health board is shown on the map. Each LSOA in Wales is assigned to a deprivation fifth, from least
	deprived (1) to most deprived (5).
Where does the data come from?	2011 Welsh Index of Multiple Deprivation 2011 (WIMD 2011): Welsh Government (WG)
Who does it measure?	Lower Super Output Areas (LSOAs)
When does it measure it?	2011 deprivation index status of LSOAs
What geographical areas does it cover?	All LSOAs in Wales
How is it calculated?	The Welsh Index of Multiple Deprivation has calculated a deprivation rank for each LSOA in Wales between 1 and 1896, with 1 being most deprived and 1896 being least deprived. The LSOAs are then ordered from highest to lowest rank and split into five equal bands, ranging from the least deprived to most deprived fifth. The LSOAs have been shaded on the map according to which
	deprivation fifth they fall in.
How accurate and complete will the data be for this indicator? Are there	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 rank.
any problems, notes for interpretation or warnings with the data in relation to	The WIMD cannot tell you how much more deprived one LSOA is than another. Therefore you cannot say that those LSOAs in the most deprived fifth are 5 times more deprived than those LSOAs in the least deprived fifth.
	Further information on the Welsh Index of Multiple Deprivation is in <u>section 5.2</u> of this technical guide.

3.2 Chronic condition registers

What is being measured?	Chronic condition registers
How is this indicator defined?	Table 2 shows the actual number of patients on selected chronic condition registers.
	Table 3 shows the percentage of patients on selected chronic condition registers.
	Table 4 shows the age-standardised percentage of patients on selected chronic condition registers.
Where does the data come from?	Audit+: NHS Wales Informatics Service (NWIS)
Who does it measure?	Persons registered with GP practices which form the clusters in Wales.
When does it measure it?	Data extracted March 2012
What geographical areas does it cover?	GP clusters do not have a geographical definition. The indicator includes registrations to GP practices in the cluster from residents in Wales or England.
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 cluster from Audit+ (NWIS).
	Percentages were calculated for each of the chronic conditions by measuring the total cases as a proportion of the total list size multiplied by 100.
	Age-standardised percentages were calculated by applying the age-specific percentages for each condition to the standard population used, in this instance the standard European population.
How accurate and complete will the data be for this indicator? Are there any problems, notes	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 prevalences are more likely to be underestimates of the "true" prevalence of conditions.
for interpretation or warnings with the data in relation to this indicator?	Numbers on disease registers will vary depending on the demographic structure of the registered population, skills and priorities of the practice, coding habits of the practice and organisational constraints such as communications from partners who have input into the care of the practices patients.
	Table 3 (percentages) show the actual burden of disease within each cluster while table 4 (age-standardised percentages) takes into account the differing age profiles of clusters and provides the age-standardised percentages which allow comparison of the recorded burden of disease across clusters.
	The data on the chronic conditions were collected in line with 2009/10 guidance:
	http://www.nhsemployers.org/aboutus/publications/documents/q of guidance 2009 final.pdf
	Further information on definitions and any caveats for chronic conditions are found within the document:

 Diabetes - starting on page 49 COPD - starting on page 63 Epilepsy - starting on page 68 Asthma - starting on page 85.
of Audit+ data. One issue is the fact that not all practices submit data to Audit+. Further details are in <u>section 5.4</u> of this technical guide.

4 Individual cluster indicators

4.1 Geographical 'reach' maps

What is being measured?	Percentage of the registered population in each Lower Super Output Area (LSOA) that are registered with practices in a specific cluster.
How is this indicator defined?	 Percentage of the registered population in an LSOA that are registered with practices in a specific cluster. The LSOAs are shaded on the map according to which percentage interval the registered population falls into. The intervals are as follows: Less than 5% (labelled as 0 to 5%) At least 5% but less than 50% (labelled as 5 to 50%) At least 50% but less than 75% (labelled as 50 to 75%) 75% or more (labelled as 75 to 100%)
Where does the data come from?	 Welsh Demographic Service (WDS): NHS Wales Informatics Service (NWIS) GP registrations from England: Primary Care Trusts (PCTs) /Clinical Commissioning Groups (CCGs) - this is only relevant to GP clusters with registered patients that are normally resident in England Mid-Year population estimates (MYE): Office for National Statistics (ONS).
Who does it measure?	Persons registered with GP practices which form the GP clusters in Wales.
When does it measure it?	 GP registrations as at September 2012 for Wales residents GP registrations between October 2012 and May 2013 for English residents (depending on extract date of the particular PCT/CCG) MYEs for 2010 (based on Census 2001)
What geographical areas does it cover?	GP clusters do not have a geographical definition. The indicator includes registrations to GP practices in the cluster from residents in Wales or England.
How is it calculated?	LSOAs in Wales:
	specific GP cluster is calculated by dividing the registered population for the specific GP cluster by the total registered population for that LSOA multiplied by 100.
	The percentage of each LSOAs population that are registered to a specific GP cluster is calculated by dividing the registered population for the specific GP cluster by the mid-year population estimate (2010) for the LSOA multiplied by 100.
How accurate and complete will the data be for this indicator? Are there	There are known issues that affect the accuracy and completeness of WDS data. Further details are in <u>section 5.1</u> of this technical guide.
any problems, notes for interpretation or warnings with the data in relation to this indicator?	for English and Welsh LSOAs – LSOAs in England are calculated using MYEs as the denominator rather than the registered population. This is due to difficulties in getting the total registered population for LSOAs in England.

Populations derived from GP registrations are typically larger than the mid-year estimate of the population. This has implications when comparing England and Wales LSOAs due to differences in denominator data.
MYEs from 2010 are likely to be an underestimate of the population in 2012. Therefore LSOA proportions in England could be overestimated due to the differences in the period being considered for numerator and denominator data.
The normal LSOA of residence has been derived using the patient postcode. Where the postcode cannot be geo-coded the data are excluded (around 2,300 patients $<0.1\%$).
In some cases GP registrations identified as normal residents in one country have a postcode that geo-codes to an LSOA in a different country. This is the result of postcode areas that span across a border. As the true LSOA of residence cannot be derived these occurrences are treated as geo-coding errors and are excluded from the analysis.
Registration data
In some cases patients will attend a branch practice rather than the main GP surgery. Branch practices are not shown on reach maps which has implications when interpreting patient distribution. For example, in some maps "holes" and "islands" can be seen. "Holes" occur when a proportion of the LSOAs population attend a nearby branch practice associated with a different GP cluster. "Islands" occur when a proportion of distant LSOA are registered to a branch practice within the GP cluster (annotated examples in section 2.2.1 here). The location of the main GP practice has been taken from national reference data hosted by NWIS.
LSOAs are statistical geographies with a similar population size. In rural areas with a low population density LSOAs are likely to be larger than those in urban areas. LSOAs have been shaded according the proportion of the entire LSOA that is registered to practices in a specific cluster. This can be misleading for larger LSOAs with a settlement on or near the boundary as the majority of patients will be coming from the smaller settlement area but this will not be clear from LSOA shading (annotated examples in section 2.2.1 <u>here</u>).

4.2 Age/sex breakdown of patients

What is being measured?	Age and sex breakdown of patients.
How is this indicator defined?	Percentage of patients by age group and sex by GP clusters.
Where does the data come from?	 Welsh Demographic Service (WDS): NHS Wales Informatics Service (NWIS) GP registrations from England: Primary Care Trusts (PCTs) /Clinical Commissioning Groups (CCGs) – this is only relevant to GP clusters with registered patients that are normally resident in England
Who does it measure?	Persons registered with GP practices which form the clusters in Wales.
When does it measure it?	 GP registrations as at September 2012 for Wales residents GP registrations between October 2012 and May 2013 for English residents (depending on extract date of the particular PCT/CCG)
What geographical areas does it cover?	GP clusters do not have a geographical definition. The indicator includes registrations to GP practices in the cluster from residents in Wales or England.
How is it calculated?	Percentages were calculated by dividing the patients in each age group (00-02, 03-04, 05-14, 15-24, 25-44, 45-64, 65-74, 75-84, 85+) and sex by the total patients (all ages and all sexes) and then multiplying by 100. The actual count of patients, rounded to the nearest 10, within each age-group and sex are shown next to the bars.
	The percentage by age-group and sex for the health board that the cluster lies within is also shown on 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	The horizontal bars show the percentage of patients within each age-group and sex. The shaded area represents the GP cluster percentage while 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 cluster is greater than the equivalent in the health board when the shaded area overlaps the black outline.
this indicator?	There are known issues that affect the accuracy and completeness of WDS data. Further details are in <u>section 5.1</u> of this technical guide.

4.3 Deprivation

What is being measured?	Percentage of patients by deprivation fifth.
How is this indicator defined?	The proportion of Wales-resident patients in each deprivation fifth by cluster.
Where does the data come from?	 Welsh Demographic Service (WDS): NHS Wales Informatics Service (NWIS) Welsh Index of Multiple Deprivation 2011 (WIMD 2011): Welch Covernment (WC)
Who does it measure?	Persons registered with GP practices which form the clusters in Wales.
When does it measure it?	GP registrations as at September 2012 for Wales residents
What geographical areas does it cover?	GP clusters do not have a geographical definition. The indicator includes registrations to GP practices in the cluster from residents in Wales only.
How is it calculated?	Percentages were calculated for each GP cluster by dividing the Wales-resident patients within each deprivation fifth in the cluster by the total Wales-resident patients in the cluster then multiplying by 100.
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?	Patients who are resident in England were excluded from the analyses from the outset since they could not be assigned to a deprivation index directly comparable to the Welsh Index of Multiple Deprivation. Approximately 20,000 patients were excluded. The chart omits any Wales-resident patients with postcodes that could not be matched to an area of residence in Wales and therefore could not be assigned to a deprivation fifth. The sum of percentages of each deprivation fifth won't equal 100 where there are unmatched Welsh postcodes. The number of omitted Wales-resident patients in the cluster is given below the chart. Approximately 2,700 Wales-resident patients were omitted in total. There are known issues that affect the accuracy and completeness of WDS data. Further details are in section 5.1 of this technical quide
	Further information on the Welsh Index of Multiple Deprivation is in <u>section 5.2</u> of this technical guide.

4.4 Rurality

4.4.1 Rural/urban classification

What is being measured?	Percentage of patients by rural/urban classification.
How is this indicator defined?	The proportion of Wales-resident patients in each rural/urban classification by cluster.
	The three classifications are:
	• urban area
	 rural area (small town/fringe) rural area (village/hamlet/isolated dwellings)
Where does the data come from?	 Welsh Demographic Service (WDS): NHS Wales Informatics Service (NWIS)
	 2004 rural/urban definition: Office for National Statistics (ONS)
Who does it measure?	Persons registered with GP practices which form the GP clusters in Wales.
When does it measure it?	GP registrations as at September 2012 for Wales residents
What geographical areas does it cover?	GP clusters do not have a geographical definition. The indicator includes registrations to GP practices in the cluster from residents in Wales only.
How is it calculated?	Percentages were calculated for each cluster by dividing the Wales-resident patients in each rural/urban classification by the total Wales-resident patients then multiplying by 100.
	The count of the total patients in each classification 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?	Patients who are resident in England were excluded from the analyses from the outset in order to keep the analyses consistent with the deprivation analysis. Approximately 20,000 patients were excluded.
	The chart omits any Wales-resident patients with postcodes that could not be matched to an area of residence in Wales and therefore could not be classified. The sums of percentages for the GP clusters won't equal 100 where there are unmatched postcodes.
	The number of omitted Wales-resident patients in the cluster is given below the chart. Approximately 2,700 Wales-resident registered patients were omitted in total.
	There are known issues that affect the accuracy and completeness of WDS data. Further details are in section 5.1 of this technical guide.
	Further information on the rural/urban classification is in section $\frac{5.3}{5.3}$ of this technical guide.

4.4.2 Time taken to drive to registered practice

What is being measured?	Number and percentage of patients by the length of time it takes to drive to the patients main registered GP practice.
How is this indicator defined?	 Each clusters patients has been grouped by the length of drive to the patients registered GP practice. Drive times have been grouped into the following time bands: Less than 5 minutes 5 minutes or more, less than 10 minutes 10 minutes or more, less than 15 minutes 15 minutes and over
Where does the data come from?	 Welsh Demographic Service (WDS): NHS Wales Informatics Service (NWIS) GP registrations from England: Primary Care Trusts (PCTs) /Clinical Commissioning Groups (CCGs) - this is only relevant to GP clusters with registered patients that are normally resident in England. Length of drive (minutes) were generated using Mapinfo Drivetime
Who does it measure?	Persons registered with GP practices which form the GP clusters in Wales.
When does it measure it?	 GP registrations as at September 2012 for Wales residents GP registrations between October 2012 and May 2013 for English residents (depending on extract date of the particular PCT/CCG)
What geographical areas does it cover?	GP clusters do not have a geographical definition. The indicator includes registrations to GP practices in the cluster from residents in Wales or England.
How is it calculated?	The analyses use the default road speeds within MapInfo. These are average road speeds and not the maximum speed. The default speeds are based on the Department for Transport surveys of off-peak speeds and may vary on any single road as it passes through different environments. For example, the A55 has 41 miles with a default speed of less than 30 mph and 48 miles with a default speed of 50 mph. Single carriageway B roads have the following speeds: • Rural 34 mph • Small urban 19 mph • Large urban 16 mph • Inner urban 12 mph MapInfo Drivetime was used to find the amount of time taken to drive from each patient's postcode to their registered GP practice. The drivetime is the time taken when travelling by car and not public transport. Drivetimes were then grouped into four time bands. The number of people in each time band was calculated for each GP cluster's total patients. The percentage of the GP clusters patients in each time band is found by dividing the number of patients in each time band by the

	total registered GP cluster population multiplied by 100.
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?	There are known issues that affect the accuracy and completeness of WDS data. Further details are in section 5.1 of this technical guide.
	Mapinfo drivetime will return the approximate time taken to drive between two points. These approximations do not account for factors such as heavy traffic and road works. It is important to note that these are modelled drivetimes and in some cases may differ from the real life scenario. In general the length of drive is an overestimate but becomes more accurate with increasing distance.
	Drivetime results will not be calculated if the patient's postcode is unknown or cannot be geocoded. Typically postcodes cannot be geocoded if the postcode has recently been introduced. Due to a technical fault with the software a small number of drivetime results were not generated. This issue has impacted a small number of postcodes with a population of around 900 patients.
	Practice/Patient locations are approximated using the centroid of the postcode.
	WDS contains registrations from Welsh residents only. Registrations from English residents were requested from PCTs/CCGs in England and were received between October 2012 and May 2013.
	In some cases patients will attend a branch practice rather than the main GP surgery. It is not possible from the available data to identify which patients normally attend a branch practice. As a result analyses only consider the main GP surgery location. For patients attending a branch practice the length of drive is likely to be overestimated.

4.5 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 cluster 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 which form the GP clusters in Wales.
When does it measure it?	Data extracted March 2012
What geographical areas does it cover?	GP clusters do not have a geographical definition. The indicator includes registrations to GP practices in the cluster from residents in Wales or England.
How is it calculated?	Crude percentages are calculated by dividing the number of patients on the respective chronic condition register by the GP cluster size and multiplying by 100.
	Adjusted burden of disease is calculated by age standardising to the European population, transforming the resultant rates to achieve a normal distribution and then converting 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 cluster with the highest percentage of patients with a chronic condition within the health board 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 clusters, with clusters 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 clusters have been accounted for.
	Comparisons of the adjusted burden of disease can only be made between clusters within each condition and not between conditions – age-adjusted percentages in table 4 should be used for comparisons 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 within the cluster to identify patients with the condition.
	The data on the chronic conditions were collected in line with 2009/10 guidance:
	http://www.nhsemployers.org/aboutus/publications/documents/q

of guidance 2009 final.pdf
Further information on definitions and any caveats for chronic conditions are found within the document:
 CHD – starting on page 26 Heart Failure – starting on page 38 Hypertension – starting on page 47 Diabetes – starting on page 49 COPD – starting on page 63 Epilepsy – starting on page 68 Asthma – starting on page 85.
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 which form the clusters.
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 Welsh residents' demographic details, including name, address, date of birth, general practice and NHS number. 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 were collected from Primary Care Trusts (PCTs)/Clinical Commissioning Groups (CCGs) covering the following Areas: • Cheshire • Shropshire • Herefordshire • Gloucestershire
	Population estimates are based on births, deaths and an estimate of migration since the last census. They are produced using a well established demographic approach called the cohort component method by the Office for National Statistics (ONS). In simple terms, population estimates are calculated by:
	 Taking the previous years' population estimate
	Taking out special population groups
	Ageing every person on one year
	Adding births and subtracting deaths
	 Allowing for inward and outward migration
	Adding back in the special population groups.
How accurate and complete will the data be? Are there any problems,	The analysis is concentrated on GP clusters in Wales, therefore information on Welsh residents that are registered with a GP practice in England are excluded. The following issues are known to affect the accuracy and
interpretation or	completeness of the WDS:
warnings with the data?	 De-registration of patients from GP 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.
	Missing or invalid postcodes in data received from WDS or GP registrations in England will impact the following indicators:
	 Patients cannot be assigned a deprivation index and are excluded from the deprivation analysis Patients cannot be assigned a rural/urban classification and are excluded from the rural/urban analysis Patients cannot be identified as resident of a particular LSOA and are excluded from the reach maps Patients cannot be geo-coded and are excluded from the

	drive-time analysis
	Approximately 20,000 English residents are registered to practices in Wales. GP clusters whose patients include some English residents are identified in the 'Produced by' statement in the footer of the table or chart, these are:
	Deeside, Hawarden & Saltney; Mold, Buckley & Caergwle; West & North Wrexham; South Wrexham; North Powys; Mid Powys; South Powys; Monmouthshire North; and Monmouthshire South.
	Population data have been received for differing periods. WDS data were extracted during September 2012 whilst English registrations were received between October 2012 and May 2013. Population estimates are for 2010 and are based on census 2001.
	Population estimates:
	• The estimated resident population of an area includes all people who usually live there, whatever their nationality ¹ .
	 Members of the UK and non-UK armed forces stationed in the UK are included¹.
	• UK forces stationed outside the UK are excluded ¹ .
	• Students are taken to be resident at 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 .
	• The census and therefore mid-year population estimates are thought to underestimate the population in some areas e.g. areas of multi-occupancy housing.
	 ONS have a long-term programme of work on improving migration and population statistics. In May 2010 ONS released revised sub-national mid-year estimates 2002-2008 to reflect improved methods for measuring migration ².
	Full guidance on the methodology used by ONS to calculate population estimates can be accessed at:
	www.ons.gov.uk/ons/guide-method/method-
	quality/specific/population-and-migration/pop-ests/index.html
Who manages the data?	Welsh Demographic Service is managed by NHS Wales Informatics Services.
	GP registrations from England are managed by PCTs/CCGs.
	Population estimates are managed by ONS.
Where can you	WDS data were provided by NWIS.
data?	Registrations from English residents were provided by PCTs/CCGs in England.
	Office for National Statistics website available at:
	www.statistics.gov.uk/hub/population/population- change/population-estimates
References	1 Office for National Statistics Topic quide to: Population Estimates
	- Technical Data [Online]. 2011. Available at:
	www.statistics.gov.uk/hub/population/population-
	<u>change/population-estimates</u> [Accessed 1 July 2013].

and Population Statistics [Online]. Available at:
www.ons.gov.uk/ons/guide-method/method-quality/imps/msi-
programme/communication/improvements-mid-2008/index.html
[Accessed 1 st July 2013].

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. The <i>GP Cluster profiles</i> uses WIMD 2011 ranks which update WIMD 2008. 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 1,896 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 1,896. 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?	 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. Patients resident in England were excluded from any deprivation analyses from the outset since WIMD can only assign a

	deprivation index to Welsh LSOAs.
Who manages the data?	Welsh Government's Statistical Directorate and the Local Government Data Unit (Wales)
Where can you get hold of the	WIMD can be downloaded from the following Welsh Government web pages:
data?	http://wales.gov.uk/topics/statistics/theme/wimd/wimd2011/;jsessi onid=vtp9PtQGt7KVnyjQBKmBbGF57R2yPK1f3FVCvyb6c5c9PdTdct2j !-587213559?lang=en
References	1. Welsh Government. <i>Welsh Index of Multiple Deprivation 2011:</i> <i>Technical Report</i> . Cardiff: WG; 2011. Available at:
	http://wales.gov.uk/docs/statistics/2011/111222wimd11techen.p df [Accessed 11 th May 2012]

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 were 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
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: <u>http://www.ons.gov.uk/ons/guide-</u> <u>method/geography/products/area-classifications/rural-urban-</u> <u>definition-and-la/index.html</u>
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 at:
http://archive.defra.gov.uk/evidence/statistics/rural/documents/r ural-defn/Rural Urban Introductory Guide.pdf [Accessed 11 th May 2012].

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): <u>http://www.wales.nhs.uk/sitesplus/documents/956/GP%20Clinical%</u> <u>20Systems%20Strategy.pdf</u> 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 AuditWeb ¹ .
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. The extraction used for the GP Clusters profile excludes 10 practices from across Wales, three of which have opted out from installing the Audit+ software. The impact of this on individual GP clusters depends on the total list sizes of the practices not submitting data, which are as follows: • ABM UHB: • CityHealth GP cluster: 3,020 (one practice) • Llwchwr: 8,730 (one practice) • Llwchwr: 8,730 (one practice) • Llwchwr: 8,730 (one practice) • Monmouthshire South: 6,350 (one practice) • Monmouthshire South: 6,350 (one practice) • North Denbighshire: 2,220 (one practice) • North Ceredigion: 8,830 (one practice) • North Ceredigion: 8,830 (one practice) • South Pembrokeshire: 14,070 (one practice) • South Pembrokeshire: 14,070 (one practice) • North Pembrokeshire: 8,840 (one practice) • North Powys: 6,870 (one practice) • North Powys: 6,870 (one practice) • North Powys: 6,870 (one practice) • Onorth Powys: 6,870 (one practice) • Onorth Powys: 6,870 (one practice) • Onorth a dat 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. QOE prevalence represents prevalence of the diagnosed condition as
	Audit+ software. The impact of this on individual GP clusters depends on the total list sizes of the practices not submitting data, which are as follows:

	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 2009/10 guidance: http://www.nhsemployers.org/aboutus/publications/documents/qof guidance_2009_final.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 in March 2012.
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: <u>http://www.wales.nhs.uk/sitesplus/956/home</u> The number of patients on QOF registers is available by GP practice on the Welsh Government web pages: <u>Welsh Government General Medical Services Contract: Quality and</u> <u>Outcomes Framework Statistics, 2011-12</u>
References	 Welsh Government. General Medical Services Contract: Quality and Outcomes Framework Statistics for Wales, 2011- 12. Cardiff: WG; 2012. Available at: <u>http://wales.gov.uk/docs/statistics/2012/120927sdr1642012en.pdf</u> [Accessed 20th June 2013]

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.

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 2001 output areas with an average of 1,500 persons per LSOA. There are 1,896 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.