Indicator Notes: *Interactive atlas of variation in unscheduled care*

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Purpose and summary of document: To provide definitions and caveats for all indicators included in the *Interactive atlas of variation in unscheduled care.*	

Contents

1 Introduction

This guide describes the indicators, methods and data sources used in the Public Health Wales Observatory publication *Interactive atlas of variation in unscheduled care.* It provides definitions and notes for interpretation for each indicator. In addition, the metadata shown on the atlas itself is also provided for each indicator, along with references.

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2 General notes on methods

2.1 Rate calculation

Simple "crude" rates have been calculated, without making any adjustment for differing age structures of local authorities. This reflects the aim of the product, which is to stimulate discussion surrounding local factors and their influence on the unscheduled care system. Crude rates reflect the actual burden of disease or service utilisation, unlike age-standardised rates which are a relative figure to enable comparison between areas. However, the use of crude rates means that it is not possible to compare rates between areas X and Y if these areas have differing age structures, for example due to a large student population or a high proportion of older people.

2.2 Geography

Most indicators are based on the resident population of local authority areas. However, the indicators showing prevalence of obstructive pulmonary disease and uptake of 'flu vaccination are based on the location of GP practices, regardless of where their patients live. This means that a (relatively small) percentage of patients will be counted in the local authority where their GP is sited, rather than in the local authority where they live.

2.3 Confidence intervals

For some indicators, 95% confidence intervals have been calculated. Confidence intervals are indications of the natural variation that would be expected around a rate and they should be considered when assessing or interpreting a rate. The interval represents a range of values that we can be 95% confident contains the 'true' underlying rate. The method used for each indicator can be found in the notes.

2.4 Emergency departments

Only major emergency departments (EDs) have been included in the interactive map and the analysis of ED attendances. Major EDs are defined as a consultant-led service with appropriate resuscitation facilities and designated accommodation for the reception of accident and emergency patients. These departments must provide the resuscitation, assessment and treatment of acute illness and injury in patients of all ages, and services must be available continuously 24 hours a day.

Current major EDs are as follows:

Betsi Cadwaladr UHB
Wrexham Maelor Hospital, Ysbyty Glan Clwyd, Ysbyty Gwynedd

Hywel Dda UHB
Bronglais General Hospital, Glangwili General Hospital, Withybush General Hospital

Abertawe Bro Morgannwg UHB
Morriston Hospital, Princess of Wales Hospital

Cwm Taf UHB
Prince Charles Hospital, The Royal Glamorgan Hospital

Aneurin Bevan UHB
Royal Gwent Hospital, Nevill Hall Hospital

Cardiff and Vale UHB
University Hospital of Wales

3 Indicators

3.1 Percentage of population aged 85+, 2013

Source	Mid-year population estimates, Office for National Statistics (ONS)
Demography	All persons aged 85 and over
Geography	Wales local authorities
Numerator	Estimated population aged 85 and over
Denominator	Total estimated population
Period	2013
Notes from "About this indicator" box on interactive tool	Studies suggest that around 1 in 4 people in this age group are likely to be frail (Collard et al 2012). When an individual becomes ill, frailty increases the chances of an unscheduled inpatient care admission. As the population of Wales becomes older, frailty presents considerable challenges to the health and social care system. The age of the population can have a substantial effect on rates of service utilisation, for example. This should be considered when interpreting the other indicators within this atlas, none of which have been adjusted for age (see section 2.1).
Further notes	The estimated resident population of an area includes all people who usually live there, whatever their nationality. Members of the UK and non-UK armed forces stationed in the UK are included. UK forces stationed outside the UK are excluded. Students are taken to be resident at their term time address. 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). The estimates do not include short term migrants (people who come to or leave the UK for less than a year). The census, and therefore mid-year population estimates, may underestimate the population in some areas e.g. areas of multi-occupancy housing. Further information about population estimates is available from ONS (2014).
References	Collard RM et al (2012) Prevalence of Frailty in Community-Dwelling Older Persons: A Systematic Review. *Journal of the American Geriatrics Society*. 60(8):1487-1492. ONS (2014) *Methods guide for the national and local authority population estimate*s. Available at: http://www.ons.gov.uk/ons/guide-method/method-

	quality/specific/population-and-migration/pop-ests/population-estimates-for-las/index.html (Accessed 03/11/14)

3.2 Percentage of population aged 65+ and living alone, 2011

Source	Census 2011, Office for National Statistics (ONS)
Demography	All persons
Geography	Wales local authorities
Numerator	Population aged 65 and over living in a single person household
Denominator	Total population
Period	2011 (Census day 27th March)
Notes from "About this indicator" box on interactive tool	Older people who live alone may place a greater demand on health and social care services compared to older people with other living arrangements. Living with others can help older people to manage chronic conditions and to avoid the kinds of crisis that can lead to unscheduled care being required. Societal trends are towards higher proportions of older people living alone (Blood 2010), due to factors such as greater financial independence and higher rates of divorce or relationship breakdown.
Further notes	This indicator shows the percentage of the total population aged 65 and over and living alone in a household. People aged 65 and over who live in a communal establishment (e.g. residential home) are not included in the numerator. Numerator data taken from Census 2011 table DC1109; denominator data taken from table KS102. 95% confidence intervals derived using the method proposed by Wilson (1927).
References	Blood I (2010) *Older people with high support needs: how we can empower them to enjoy a better life.* York: Joseph Rowntree Foundation. Available at: http://www.jrf.org.uk/sites/files/jrf/supporting-older-people-summary.pdf (Accessed 22/10/14) Wilson EB (1927) *Probable inference, the law of succession, and statistical inference.* J Am Stat Assoc, 22:209-212. Cited in Altman DG et al (2000) *Statistics with confidence*. BMJ books: UK.

3.3 Percentage of working-age population receiving employment-related benefits, 2011-12

Source	Welsh Index of Multiple Deprivation (WIMD) indicator data, Welsh Government
Demography	All persons of working age
Geography	Wales local authorities
Numerator	Working age population receiving employment-related benefits
Denominator	Working age population from 2013 mid-year estimates, Office for National Statistics (ONS)
Period	2011-12 (see notes)
Notes from "About this indicator" box on interactive tool	This indicator uses the receipt of key employment-related benefits as a proxy measurement of socio-economic deprivation. It should be noted that some individuals may receive such benefits for a limited time, without generally living in deprived circumstances. In general, there is a clear association between socio-economic deprivation and the prevalence of chronic conditions. For example, the 2013 Welsh Health Survey reports 18% of adults in the most deprived fifth areas in Wales currently being treated for a respiratory illness, compared to 12% in the least deprived fifth. This pattern can lead to increased need for unscheduled care services in more deprived areas. Research also suggests that emergency care is more commonly used in areas of greater deprivation, with a tendency to attend A&E with symptoms more appropriate for a GP consultation (CHSEO 2012).
Further notes	The numerator is defined as the de-duplicated total number of working age people: • in receipt of one or more of the following employment related benefits: Incapacity Benefit, Severe Disablement Allowance, Jobseeker's Allowance, Employment and Support Allowance. • participating in one of the following programmes: New Deal for Young People, New Deal for 25+, New Deal for Lone Parents This indicator is calculated by combining the counts (combined count of yearly average: Nov 11, Feb 12, May 12, and Aug 12) of claimants of the benefits and allowances listed above, and the counts of participants in the New Deal programmes listed above. Working age population is defined as 16-64 for males and 16-60 for females. By combining the data for the various benefits the number of people could be identified, rather than the number of claimants of each benefit, which would inevitably lead to duplication. Therefore this is a more comprehensive and accurate measure of the number of people claiming an employment-related benefit than

	any of the benefits alone. For more information, see WIMD 2011 technical guide (Welsh Government 2011).
References	Centre for Health Service Economics & Organisation (2012) *Are hospital services used differently in deprived areas? Evidence to identify commissioning challenges*. London: CHSEO. Available at: http://www.chseo.org.uk/downloads/wp2-hospitalservices-deprivedareas.pdf (Accessed 22/10/14) Welsh Government (2011) *Welsh Index of Multiple Deprivation 2011: Technical Report*. Available at: http://wales.gov.uk/statistics-and-research/welsh-index-multiple-deprivation/contents/technical-documents/?lang=en (Accessed 22/10/14)

3.4 Percentage of GP-registered population on chronic obstructive pulmonary disease register (COPD), 2013/14

Source	Quality Outcomes Framework data 2013/14, Welsh Government
Demography	All persons, all ages
Geography	Wales local authorities (see notes below)
Numerator	Patients on COPD GP register
Denominator	All patients registered with a GP
Period	2013/14 financial year
Notes from "About this indicator" box on interactive tool	COPD is a key cause of emergency hospital admission in older people; effective management in primary care, including flu vaccination and regular lung function testing, may decrease the risk of emergency admission for the condition (NWPHO 2010). This indicator is based on the location of the GP practice, which may be different from the residence of the patient (see section 2.2). The figures only report on diagnosed cases of COPD. The true prevalence within GP practice populations may be higher. No adjustment has been made for age, so variation in COPD prevalence across local authority areas may be due to their populations having different age structures (see section 2.1).
Further notes	The QOF register for COPD captures patients who have been diagnosed with the condition at any point. 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.

	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. 95% confidence intervals derived using the method proposed by Wilson (1927).
References	NorthWest Public Health Observatory (2010) *The winter forecast for NHS emergency care.* Liverpool: NWPHO. Available at: http://www.nwph.net/nwpho/Publications/winter2010_synthesis.pdf (Accessed 22/10/14) Wilson EB (1927) *Probable inference, the law of succession, and statistical inference.* J Am Stat Assoc, 22:209-212. Cited in Altman DG et al (2000) *Statistics with confidence*. BMJ books: UK.

3.5 Percentage of adults reporting to be current smokers, 2012-13

Source	Welsh Health Survey (WHS), Welsh Government
Demography	All persons age 16+
Geography	Wales local authorities
Numerator	Survey respondents reporting to be smoking daily or occasionally
Denominator	All survey respondents
Period	2012-13 (survey data from 2012 and 2013 aggregated)
Notes from "About this indicator" box on interactive tool	Despite prevalence slowly falling over time, tobacco use continues to be a major cause of morbidity and mortality in Wales. A considerable number of emergency hospital admissions in older people are caused by respiratory and circulatory diseases, and many forms of these diseases are related to smoking. This indicator is based on people's own reporting of smoking status. The resulting estimates may therefore underestimate the true prevalence of smoking. No adjustment has been made for age, so variation in smoking prevalence across local authority areas may be due to their populations having different age structures (see section 2.1).
Further notes	Rates and confidence intervals were downloaded from the Welsh Government website.

	WHS data are weighted to adjust for non-response to the survey. Further information is available in the technical report (NatCen 2014).
References:	NatCen (2014) *Welsh Health Survey 2013 Technical Report.* Available at: http://wales.gov.uk/docs/statistics/2014/140930-welsh-health-survey-2013-technical-report-en.pdf (Accessed 20/10/14)

3.6 Percentage of population aged 65+ not vaccinated against 'flu, 2013/14

Source	Public Health Wales Immunisation and Vaccine Preventable Disease Programme
Demography	All persons aged 65 and over
Geography	Wales local authorities (see notes below)
Numerator	Population aged 65 and over who had not received an influenza vaccination
Denominator	Population aged 65 and over registered with a GP in Wales
Period	2013/14 financial year
Notes from "About this indicator" box on interactive tool	The aim of seasonal flu vaccination is to minimise the impact of flu on both the health of the population of Wales and also its health services. When combined with other winter pressures, unscheduled care arising from flu has the potential to place considerable strain on the NHS (Welsh Government 2014). This indicator is based on the location of the GP practice, which may be different from the residence of the patient (see section 2.2).
Further notes	The rate shown is for the percentage of the 65+ population that had not had a 'flu vaccination. The numerator was calculated by subtracting the number of patients receiving the flu vaccination from the total population figure provided in the uptake report (Cottrell et al 2014). The uptake report states that data was submitted by 447 of the 470 (95.1%) General Practices in Wales. This is a decrease of 4.7% compared to the 2012/13 season, believed to be largely due to technical issues. General Practice data submission rates varied by Health Board from 91.0% (Aneurin Bevan University Health Board) to 100% (Cwm Taf University Health Board).

References	Cottrell et al (2014) *Seasonal Influenza vaccine uptake in Wales – 2013/14.* Available at: http://nww2.nphs.wales.nhs.uk:8080/CommunitySurveillanceDocs.nsf/3dc04669c9e1eaa880257062003b246b/0357576424e6504980257d190055f394/$FILE/Seasonal%20influenza%20vaccine%20uptake%20in%20Wales%20201314_v1a.docx.pdf (Accessed 20/10/14) Welsh Government (2014) *Seasonal flu plan*. Available at: http://wales.gov.uk/docs/phhs/publications/140812fluplanen.pdf (Accessed 22/10/14)

3.7 Rate of attendances at major emergency departments per 1,000, 2013/14

Source	Emergency Department Data Set, NHS Wales Informatics Service (NWIS); Mid-year population estimates, Office for National Statistics (ONS)
Demography	All persons, all ages
Geography	Wales local authorities
Numerator	Emergency department attendances, NWIS
Denominator	2013 mid-year population estimates, ONS
Period	2013/14 financial year
Notes from "About this indicator" box on interactive tool	Variation in rates of emergency department (ED) attendance across areas is caused by a complex interplay of factors, including disease prevalence, incidence of injuries, frailty, deprivation, social circumstances, healthcare-seeking behaviour and the availability of health services (including the ED itself). This indicator only includes data from major EDs in Wales (see section 2.4). Therefore, in areas of Wales where residents commonly use EDs in England, the attendance rates shown in this tool are likely to underestimate true levels of utilisation. No adjustment has been made for age, so variation in rates across local authority areas may be due to their populations having different age structures (see section 2.1).
Further notes	Planned follow-up attendances (attendance category 2) were excluded. Patients who were dead on arrival (outcome of attendance = 11 or attendance group = 30) were excluded. The emergency department data set is refreshed monthly; this may result in small differences when updating any analysis (data extracted 22/10/2014).

	Emergency department attendances are based on financial years; mid-year population estimates are based on calendar years. 95% confidence intervals derived using the method proposed by Altman et al (2000).
References	Altman DG et al (2000) *Statistics with confidence*. BMJ books: UK.

3.8 Average length of time (median, in hours) spent in major emergency departments, 2013/14

Source	Emergency Department Data Set, NHS Wales Informatics Service (NWIS)
Demography	All persons, all ages
Geography	Wales local authorities
Numerator	Duration of stay (in hours): Length of time between the administrative arrival time and treatment end time. For records with an invalid treatment end time the administrative end time is used.
Denominator	N/A; median is the middle value in the distribution of waiting times within each local authority
Period	2013/14 financial year
Notes from "About this indicator" box on interactive tool	The target for NHS Wales is that 95% of patients should spend less than four hours in the emergency department (ED) from arrival until admission, transfer or discharge. Longer waiting times in the ED can indicate pressure on the unscheduled care system, where for example the ED is struggling to cope with demand, or there is a lack of beds available in local hospitals to receive patients who require admission. This indicator shows the average waiting time for attendances at major EDs over financial year 2013/14, for people living in each area. The median has been used, because mean averages can be skewed by very high values; however, this does not therefore reflect the more extreme times in EDs that can add to pressures on the unscheduled care system. This indicator only includes data from major EDs in Wales (see section 2.4). Therefore, in areas of Wales where residents commonly use EDs in England, the average waiting times shown will not be fully representative of their experience. No adjustment has been made for age or case-mix of patients, so variation across local authority areas may be due to their

	populations having different age structures (see section 2.1) and/or severity of condition.
Further notes	Planned follow up attendances (attendance category 2) were excluded. Patients who were dead on arrival (outcome of attendance = 11 or attendance group = 30) were excluded. The emergency department data set is refreshed monthly; this may result in small differences when updating any analysis (data extracted 22/10/2014).

3.9 Rate of emergency hospital admissions per 1,000, 2013/14

Source	Patient Episode Database for Wales, NHS Wales Informatics Service (NWIS); Mid-year population estimates, Office for National Statistics (ONS)
Demography	All persons, all ages
Geography	Wales local authorities
Numerator	Emergency admissions
Denominator	2013 mid-year population estimates
Period	2013/14 financial year
Notes from "About this indicator" box on interactive tool	The vast majority of emergency admissions are taken from emergency units and via GP referrals. Variation in the rate of emergency admission across areas is caused by a complex interplay of factors, including disease prevalence, frailty, deprivation, social circumstances, healthcare-seeking behaviour and the availability of health services. There are inconsistencies in the recording of emergency assessment unit activity across Wales, which may affect the patterns shown. Emergency transfers between hospitals have been excluded, aiming to count each patient's entry into the secondary care system only once. No adjustment has been made for age, so variations in rates across local authority areas may be due to their populations having different age structures (see section 2.1).

Further notes	This indicator includes inpatient admissions only (patient_class=1). Wales residents were counted whether treated in Wales or elsewhere (e.g. in England). 95% confidence intervals derived using the method proposed by Altman et al (2000).
References	Altman DG et al (2000) *Statistics with confidence*. BMJ books: UK.

3.10 Average length of stay (mean, in days) for emergency hospital admissions, 2013/14

Source	Patient Episode Database for Wales, NHS Wales Informatics Service (NWIS)
Demography	All persons, all ages
Geography	Wales local authorities
Numerator	Sum of durations of hospital stays (in days): Number of days between the episode start date of the admitting episode of care and the episode end date of the discharging episode of care.
Denominator	Number of hospital spells
Period	2013/14 financial year
Notes from "About this indicator" box on interactive tool	The length of time people stay in a hospital bed affects the ability to accommodate further patients coming in through the unscheduled care system. Length of stay can vary due to severity of condition, need for treatment, clinical judgement and delays in discharge. The mean length of stay has been calculated, which is common practice. However it should be noted that this statistic is likely to be affected by very long lengths of stay within the dataset, some of which may be a result of miscoded data. For all Wales residents, around 4% of lengths of stay are greater than 31 days. If these are excluded from the calculation, mean length of stay reduces from 6.8 to 4.1 days. There are inconsistencies in the recording of emergency assessment unit activity across Wales, which may affect the patterns shown. Emergency transfers between hospitals have been excluded, aiming to count each patient's entry into the secondary care system only once.

	No adjustment has been made for age, so variation across local authority areas may be due to their populations having different age structures.
Further notes	This indicator includes inpatient admissions only (patient_class=1). Records where the discharge date was not recorded have been excluded. Duration of stay does not account for time of admission, therefore someone admitted at 11pm and discharged at 9am the following morning would have a duration of stay of 1 day. Wales residents were counted whether treated in Wales or elsewhere (e.g. in England).

3.11 Rate of delayed transfer of care for social care reasons per 1,000, 2013/14

Source	StatsWales, Welsh Government
Demography	All persons
Geography	Wales local authorities
Numerator	All patients aged 18 and over experiencing a delayed transfer of care for social reasons
Denominator	Population aged 75 and over
Period	2013/14 financial year
Notes from "About this indicator" box on interactive tool	The timely transfer of patients can help to ensure that the NHS effectively manages emergency pressures. However, transferring patients to more appropriate settings in the community can be complex, leading to delays. This indicator captures delays for social reasons, e.g. where community care assessments or arrangements are awaiting completion. Data from the most recent 12 monthly censuses of delayed transfers of care for social reasons have been combined, in order to provide more robust figures. Delays occurring before or after each monthly census are not included. The indicator does not therefore capture all delayed transfers of care for social reasons.
Further notes	A delayed transfer of care is experienced by an inpatient in a hospital, who is ready to move on to the next stage of care but is prevented from doing so for one or more reasons. For more information on this indicator, see guidance on the National

	Strategic Indicators (Welsh Government 2014). The StatsWales table where this data is published gives the following caveat: "Figures from Local Health Boards were used in the calculation of this indicator for which the auditor was unable to obtain assurance of their accuracy". No adjustments have been made for different age structures in local authorities (see section 2.1) It should be noted that this indicator presents the rate per head of population, rather than the proportion of admissions that resulted in a delayed transfer of care. 95% confidence intervals derived using the method proposed by Altman et al (2000).
References	Altman DG et al (2000) *Statistics with confidence*. BMJ books: UK. Welsh Government (2014) *National Strategic Indicator guidance 2013-14*. Available at: http://wales.gov.uk/docs/statistics/2014/140331-national-strategic-indicators-2013-14-guidance-en.pdf. (Accessed 29/10/14)

3.12 Rate of older people supported in the community per 1,000, aged 65+, 2014

Source	StatsWales, Welsh Government
Demography	All persons aged 65+
Geography	Wales local authorities
Numerator	Number of people aged 65 and over supported in the community
Denominator	Total population aged 65 and over
Period	31st March 2014
Notes from "About this indicator" box on interactive tool	Effective support of older people in the community may prevent the kinds of crisis that can lead to unscheduled care being required. Variation in the rate of community-based services across areas is caused by a number of factors, for example people's living arrangements, rurality, and the availability of local services. Lower rates of support could be due to i) lower levels of need, which in turn could be due to greater support from family and the wider community, or ii) lower levels of supply, which may lead to unmet need in the community.

Further notes	This indicator covers all people who are living in their own home or supported living and receiving care that has been commissioned by social services following an assessment, regardless of how it is funded. A complete list of all care services covered by this indicator can be found in the guidance on the National Strategic Indicators (Welsh Government 2014). No adjustments have been made for different age structures in local authorities (see section 2.1) 95% confidence intervals derived using the method proposed by Altman et al (2000).
References	Altman DG et al (2000) *Statistics with confidence*. BMJ books: UK. Welsh Government (2014) *National Strategic Indicator guidance 2013-14*. Available at: http://wales.gov.uk/docs/statistics/2014/140331-national-strategic-indicators-2013-14-guidance-en.pdf. (Accessed 29/10/14)