Development of health and social care inequality indicators for Scotland

Indicator specifications

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Introduction

This project seeks to provide NHS Boards and Health and Social Care Partnerships with nationally comparable measures of inequalities relating to health and social care service provision. These measures will enable comparison within areas over time by estimating absolute and relative inequality gradients, alongside overall trends, for key system-wide indicators of access, quality and outcome.

Aim

The aim of this study was to develop public health intelligence systems for measuring inequalities relating to health and social care service access, quality and outcomes across Scotland.

Objectives

- Scope and develop systems for collation and analysis of relevant data.

- Measure inequalities in access to health and social care services, quality of care and treatment received, and health and social care service outcomes by area-based deprivation classification.

- Inform NHS Health Scotland's programmes of work regarding the contribution of NHSScotland and Health and Social Care Partnerships in reducing health inequalities and public service reform.

Report overview

This report provides technical specifications for the indicators in the current set.

Indicator specifications

Indicator 1 – Patients per general practitioner

Indicator name	Patients per general practitioner (GP)
Indicator definition	The number of patients per GP headcount, excluding registrars and retainers. It is adjusted for age, sex and deprivation quintile using the General Medical Services (GMS) workload adjustment model developed by Deloitte for the Scottish Government's Scottish Allocation Formula Review (see **Appendix 1**)
Domain	Access
Rationale for indicator	Increased primary care supply is a key measure of access to health and social care systems
Indicator type	Age, sex and neighbourhood ill health adjusted ratio
Measure	Number of patients per GP headcount, excluding registrars and retainers. It is adjusted for age, sex and deprivation quintile using the GMS workload adjustment model
Year type	Snapshot – 30 September
Geographies for presentation	Council area, NHS Board, Scotland – all by Scottish Index of Multiple Deprivation (SIMD) 2004 quintile (Scottish population weighted)
Aggregation of years	Three-year rolling average
Disclosure control	None applied to this indicator
Numerator definition	Practice population estimated on an annual basis, using 30 September as a reference point
Data source	Information Services Division (ISD) – GP Workforce and Practice Populations
Minimum geography	Practice-attributed deprivation quintile
Age bands	Five-year age bands from 0–4 to 90+ years
Gender	Male and female
Years	2002/03–2014/15

Indicator name	Patients per general practitioner (GP)
ICD-10 codes	n/a
Denominator definition	Number of GPs (headcount) excluding registrars and retainers at the mid-point of the current financial year attributed to each small area
Data source	ISD – GP Workforce and Practice Populations
Minimum geography	Practice-attributed deprivation quintile
Age bands	n/a
Gender	n/a
Years	2002/03–2014/15
ICD-10 codes	n/a

Indicator 2 – Primary care quality

Indicator name	Primary care quality
Indicator definition	Primary care quality is a score between 0 and 100. It is defined as a weighted average clinical process quality score in terms of population achievement for 16 indicators in the national Quality Outcomes Framework (QOF) (see **Appendix 2**)
Domain	Quality
Rationale for indicator	Primary care services are a key setting for treating and managing conditions for which hospitalisation and death are amenable to health and social care intervention. Increasing primary care quality is therefore central to health and social care systems adopting a more preventative and equitable approach
Reason for exclusion	Scottish QOF data (now discontinued) could not be stratified by SIMD deprivation category
Indicator type	Weighted average composite score
Measure	Composite score based on QOF population achievement on weighted clinical indicators
Year type	Financial
Geographies for presentation	Council area, NHS Board, Scotland – all by SIMD 2004 quintile (population weighted for each geography)
Aggregation of years	None applied to this indicator
Disclosure control	None applied to this indicator
Numerator definition	Number of patients for whom the indicator was met
Data source	ISD – QOF
Minimum geography	Practice-attributed deprivation quintile
Age bands	n/a
Gender	n/a

Indicator name	Primary care quality
Years	n/a
ICD-10 codes	n/a
Denominator definition	Number of patients diagnosed with the relevant condition
Data source	ISD – QOF
Minimum geography	Practice-attributed deprivation quintile
Age bands	n/a
Gender	n/a
Years	n/a
ICD-10 codes	n/a

Indicator 3 – Inpatient hospital waiting time

Indicator name	Inpatient hospital waiting time
Indicator definition	Inpatient hospital waiting time is defined as the mean number of days waited by the patient from agreeing treatment with the hospital to treatment for inpatient or day-case treatment, adjusted for specialty mix
Domain	Access
Rationale for indicator	Inpatient hospital waiting time is a key performance measure for most health and social care systems. Reducing inpatient hospital waiting time is an indicator of access to health and social care systems
Reason for exclusion	Inpatient hospital waiting time data collection is driven to a greater extent than other indicators by national target setting. As a result consistent data were only available from 2013/14, meaning that sufficient time trend data could not be produced for this indicator
Indicator type	Specialty-adjusted mean
Measure	Mean number of days waited by patient from agreeing treatment with the hospital to treatment for inpatient or day-case treatment
Year type	Financial
Geographies for presentation	Council area, NHS Board, Scotland – all by SIMD 2004 quintile (population weighted for each geography)
Aggregation of years	Not possible
Disclosure control	None applied to this indicator
Numerator definition	Summed number of days waited from outpatient referral to inpatient admission (< 12 months) per year
Data source	ISD – Waiting Times (Treatment Time Guarantee)
Minimum geography	2001 data zone
Age bands	n/a

Indicator name	Inpatient hospital waiting time
Gender	n/a
Years	2013/14–2016/17
ICD-10 codes	n/a
Denominator definition	Number of persons hospitalised per year
Data source	ISD – Waiting Times (Treatment Time Guarantee)
Minimum geography	2001 data zone
Age bands	n/a
Gender	n/a
Years	2013/14– 2016/17
ICD-10 codes	n/a

Indicator 4 – Preventable emergency hospitalisation for a chronic condition

Indicator name	**Preventable emergency hospitalisation for a chronic condition**
Indicator definition	The number of patients having one or more emergency hospitalisations for a chronic ambulatory care-sensitive condition, directly age–sex standardised rate per 100,000 population. All rates have been standardised against the European standard population (ESP2013)
Domain	Access and quality
Rationale for indicator	Chronic ambulatory care-sensitive conditions are chronic conditions for which emergency hospital admission could be prevented by timely and effective provision of other health and social care services. Reducing this type of hospital admission is an indicator of both access and quality for health and social care systems
Indicator type	Directly age- and sex-adjusted rate
Measure	European age–sex standardised rate (EASR) per 100,000
Year type	Financial
Trends from	2002/3–2014/15
Geographies for presentation	Council area, NHS Board, Scotland – all by SIMD 2004 quintile (population weighted for each geography)
Aggregation of years	Three-year rolling average
Disclosure control	For publication, affected geographies' individual entries < 5 are suppressed
Numerator definition	Number of people with emergency hospital admissions (both finished and unfinished admission episodes, excluding transfers) for specific long-term

Indicator name	**Preventable emergency hospitalisation for a chronic condition**
	conditions which should not normally require hospitalisation
Data source	ISD – Inpatient and Day Case Activity (SMR01)
Minimum geography	2001 data zone
Age bands	Five-year age bands from 0–4 to 90+ years
Gender	Male and female
ICD-10 codes	See **Appendix 3**
Denominator definition	Estimated number of people alive at mid-point in the current calendar year (30 June)
Data source	NRS mid-year population estimates
Minimum geography	2001 data zone
Age bands	Five-year age bands from 0–4 to 90+ years
Gender	Male and female
ICD-10 codes	n/a

Indicator 5 – Repeat emergency hospitalisation in the same year

Indicator name	**Repeat emergency hospitalisation in the same year**
Indicator definition	The number of patients having one or more acute inpatient hospital admission in a given year, who have one or more subsequent any-cause emergency readmission in the same year, directly age–sex standardised rate per 100,000 population. All rates have been standardised against the European standard population (ESP2013)
Domain	Quality
Rationale for indicator	Reducing repeat emergency hospitalisation of patients is an indicator of quality for health and social care systems
Indicator type	Directly age- and sex-adjusted rate
Measure	European age–sex standardised rate per 100,000 (EASR)
Year type	Financial
Trends from	2002/3–2014/15
Geographies for presentation	Council area, NHS Board, Scotland – all by SIMD 2004 quintile (population weighted for each geography)
Aggregation of years	Three-year rolling average
Disclosure control	For publication, affected geographies' individual entries < 5 are suppressed
Numerator definition	Number of people with one or more repeat emergency hospitalisations from any cause in the indicator year
Data source	ISD – Inpatient and Day Case Activity (SMR01)
Minimum geography	2001 data zone
Age bands	Five-year age bands from 0–4 to 90+ years
Gender	Male and female
ICD-10 codes	n/a

Indicator name	Repeat emergency hospitalisation in the same year
Denominator definition	Number of people with an inpatient admission from any cause in the indicator year
Data source	ISD – Inpatient and Day Case Activity (Scottish Morbidity Record 01)
Minimum geography	2001 data zone
Age bands	Five-year age bands from 0–4 to 90+ years
Gender	Male and female
ICD-10 codes	n/a

Indicator 6 – Dying in hospital

Indicator name	Dying in hospital
Indicator definition	Dying in hospital is defined as the percentage of deaths from all causes that occurred in hospital in a given year
Domain	Quality
Rationale for indicator	Lower levels of patients dying in hospital is intended to act as a measure of end-of-life planning. A lower percentage of deaths occurring in hospital in a given year is an indicator of quality for health and social care systems
Indicator type	Percentage
Measure	Percentage of deaths from all causes that occurred in hospital in a given year
Year type	Financial
Geographies for presentation	Council area, NHS Board, Scotland – all by SIMD 2004 quintile (population weighted for each geography)
Aggregation of years	Three-year rolling average
Disclosure control	For publication, affected geographies' individual entries < 5 are suppressed
Numerator definition	Number of deaths from any cause that occurred in hospital in a given year
Data source	ISD/National Records of Scotland (NRS)
Minimum geography	2001 data zone
Age bands	n/a
Gender	n/a
Years	2002/3–2014/15
ICD-10 codes	n/a

Indicator name	Dying in hospital
Denominator definition	Number of deaths from any cause in a given year, irrespective of the place of death
Data source	ISD/NRS
Minimum geography	2001 data zone
Age bands	n/a
Gender	n/a
Years	2002/3–2014/15
ICD-10 codes	n/a

Indicator 7 – Mortality amenable to health care

Indicator name	Mortality amenable to health care
Indicator definition	The number of deaths (aged < 75 years) from causes considered amenable to health care, directly age–sex standardised rate per 100,000 population. All rates have been standardised against the European standard population (ESP2013)
Domain	Outcome
Rationale for indicator	Amenable deaths are part of a wider classification of 'avoidable deaths', which also include 'preventable deaths'. The Office for National Statistics (ONS) defines amenable mortality as 'all or most deaths from that cause (subject to age limits if appropriate) could be avoided through good quality healthcare'.[1] This classification therefore does not include 'preventable deaths', which are defined as those that could be avoided by non-health care public health interventions. Reduced health care amenable deaths are an indicator of improved outcomes for health and social care services
Indicator type	Directly age- and sex-adjusted rate
Measure	European age–sex standardised rate (EASR) per 100,000
Year type	Financial
Trends from	2002/3–2014/15
Geographies for presentation	Council area, NHS Board, Scotland – all by SIMD 2004 quintile (population weighted for each geography)
Aggregation of years	Three-year rolling average
Disclosure control	For publication, affected geographies' individual entries < 5 are suppressed

Indicator name	Mortality amenable to health care
Numerator definition	Number of people (aged < 75 years) who died as a result of a cause of death considered amenable to health care
Data source	NRS deaths register
Minimum geography	2001 data zone
Age bands	Five year age bands from 0–4 to 70–74 years
Gender	Male and female
ICD-10 codes	See Appendix 4
Denominator definition	Estimated number of people (aged < 75 years) alive at mid-point in the current calendar year (30 June)
Data source	NRS mid-year population estimates
Minimum geography	2001 data zone
Age bands	Five-year age bands from 0–4 to 70–74 years
Gender	Male and female
ICD-10 codes	n/a

Indicator 8 – All-cause premature mortality

Indicator name	All-cause premature mortality
Indicator definition	The number of deaths (all cause, aged < 75 years), directly age–sex standardised rate per 100,000 population. All rates have been standardised against the European standard population (ESP2013)
Domain	Outcome
Rationale for indicator	Reducing premature mortality is a national outcome for health and social care partnerships in Scotland. Change in this indicator over time may partly reflect change in health and social care delivery, but will also reflect change in the wider determinants of health. Reducing all-cause premature mortality is an indicator of improved outcomes for health and social care services
Indicator type	Directly age- and sex-adjusted rate
Measure	European age–sex standardised rate (EASR) per 100,000
Year type	Financial
Trends from	2002/3–2014/15
Geographies for presentation	Council area, NHS Board, Scotland – all by SIMD 2004 quintile (population weighted for each geography)
Aggregation of years	Three-year rolling average
Disclosure control	For publication, affected geographies' individual entries < 5 are suppressed
Numerator definition	Number of deaths from any cause that occurred in a given year
Data source	NRS deaths register
Minimum geography	2001 data zone
Age bands	Five-year age bands from 0–4 to 70–74 years

Indicator name	All-cause premature mortality
Gender	Male and female
ICD-10 codes	n/a
Denominator definition	Estimated number of people alive at mid-point in the current calendar year (30 June)
Data source	NRS mid-year population estimates
Minimum geography	2001 data zone
Age bands	Five-year age bands from 0–4 to 70–74
Gender	Male and female
ICD-10 codes	n/a

Appendix 1: Primary care weighting

Age group (years)	Females: % change in workload relative to 45–49 age group	Males: % change in workload relative to 45–49 age group
0–4	0.9946	0.9974
5–9	0.9921	0.9932
10–14	0.9928	0.9935
15–19	0.9968	0.9941
20–24	0.9988	0.9945
25–29	0.9986	0.9947
30–34	0.9988	0.9956
35–39	0.9989	0.9965
40–44	0.9993	0.9982
45–49	1	1
50–54	1.001	1.0028
55–59	1.0025	1.0065
60–64	1.0044	1.0113
65–69	1.0065	1.0162
70–74	1.0097	1.0201
75–79	1.0125	1.0246
80–84	1.0134	1.0260
85+	1.0134	1.0263

SIMD quintiles	% change in workload relative to the reference category
1 (Most deprived)	1.070
2	1.048
3	1.000
4	0.984
5 (Least deprived)	0.941

Source: adapted from Scottish Allocation Formula GMS workload model.[2]

Appendix 2: Quality Outcome Framework indicators

QOF indicator	Summary description of indicator
DM18	Diabetes: influenza vaccination
CHD12	CHD: influenza vaccination
BP5a	Hypertension: BP ≤ 150/90 mmHg
CHD10a	CHD: beta-blocker treatment
STROKE10	Stroke/TIA: influenza vaccination
DM23a	Diabetes: HbA1c ≤ 7.0%
COPD8	COPD: influenza vaccination
CHD9a	CHD: aspirin or other antithrombotic therapy
CHD8a	CHD: cholesterol ≤ 5.0 mmol/l
STROKE12a	Stroke (non-haemorrhagic): aspirin or other antithrombotic therapy
DM12	Diabetes: BP ≤ 145/85 mmHg
CHD6a	CHD: BP ≤ 150/90 mmHg
SMOKING4	CHD, stroke/TIA, hypertension, DM, CKD, COPD, asthma, psychosis: smoking cessation advice
DM25	Diabetes: HbA1c ≤ 9.0%
DM15a	Diabetes with proteinuria or microalbuminuria: ACEI or ARB therapy
CHD11a	CHD (myocardial infarction): ACEI or ARB therapy

ACEI, angiotensin-converting enzyme inhibitor; ARB, angiotensin receptor blocker; BP, blood pressure; CHD, chronic heart disease; CKD, chronic kidney disease; COPD, chronic obstructive pulmonary disease; DM, diabetes mellitus; SD, standard deviation; TIA, transient ischaemic attack.

Source: Ashworth, M et al (2013)[3]

Appendix 3: Primary ICD-10 codes for chronic ambulatory care-sensitive conditions

ICD code	Descriptor
Infections	
B18.1	Chronic viral hepatitis B, without delta-agent
B18.0	Chronic viral hepatitis B, with delta-agent
Nutritional, endocrine and metabolic	
E10	Insulin-dependent diabetes mellitus
E11	Non-insulin-dependent diabetes mellitus
E12	Malnutrition-related diabetes mellitus
E13	Other specified diabetes mellitus
E14	Unspecified diabetes mellitus
Diseases of the blood	
D50.1	Sideropenic dysphagia
D50.8	Other iron-deficiency anaemias
D50.9	Iron-deficiency anaemia, unspecified
D51	Vitamin B12-deficiency anaemia
D52	Folate-deficiency anaemia
Mental and behavioural disorders	
F00	Dementia in Alzheimer's disease
F01	Vascular dementia
F02	Dementia in other diseases classified elsewhere
F03	Unspecified dementia
Neurological disorders	
G40	Epilepsy
G41	Status epilepticus
Cardiovascular diseases	
I10X	Essential (primary) hypertension

ICD code	Descriptor
I11.0	Hypertensive heart disease with (congestive) heart failure
I11.9	Hypertensive heart disease without (congestive) heart failure
I13.0	Hypertensive heart and renal disease with (congestive) heart failure
I20	Angina pectoris
I25	Chronic ischaemic heart disease
I50	Heart failure
I48X	Atrial fibrillation and flutter
J81X	Pulmonary oedema
Respiratory diseases	
J20	Acute bronchitis
J41	Simple and mucopurulent chronic bronchitis
J42X	Unspecified chronic bronchitis
J43	Emphysema
J44	Other chronic obstructive pulmonary disease
J45	Asthma
J46X	Status asthmaticus
J47X	Bronchiectasis

Source: reproduced from Cookson et al (2016)[4]

Appendix 4: ONS list of causes of death considered amenable to health care

Condition group and cause	ICD-10 codes	Age (years)
Infections		
Intestinal infectious diseases	A00–A09	0–14
Tuberculosis	A15–A19, B90	0–74
Selected invasive bacterial and protozoal infections	A38–A41, A46, A48.1, B50–B54, G00, G03, J02, L03	0–74
Hepatitis C	B17.1, B18.2	0–74
Pertussis (whooping cough)	A37	0–14
Measles	B05	1–14
Other infections (diphtheria, tetanus, poliomyelitis and varicella)	A35, A36, A80, B01	0–74
HIV/AIDS	B20–B24	All
Neoplasms		
Malignant neoplasm of colon and rectum	C18–C21	0–74
Malignant melanoma of skin	C43	0–74
Malignant neoplasm of breast	C50	0–74
Malignant neoplasm of cervix uteri	C53	0–74
Malignant neoplasm of bladder	C67	0–74
Malignant neoplasm of thyroid gland	C73	0–74
Hodgkin's disease	C81	0–74
Leukaemia	C91, C92.0	0–44
Malignant neoplasm of testis	C62	0–74
Malignant neoplasm of unspecified parts of uterus and body of uterus	C54–C55	0–44
Benign neoplasms	D10–D36	0–74
Nutritional, endocrine and metabolic		
Diseases of the thyroid	E00–E07	0–74
Diabetes mellitus	E10–E14	0–74
Addison's disease	E27.1	0–74

Condition group and cause	ICD-10 codes	Age (years)
Neurological disorders		
Epilepsy and status epilepticus	G40–G41	0–74
Cardiovascular diseases		
Rheumatic and other valvular heart disease	I01–I09	0–74
Hypertensive diseases	I10–I15	0–74
Ischaemic heart disease	I20–I25	0–74
Cerebrovascular diseases	I60–I69	0–74
Respiratory diseases0		
Influenza (including swine flu)	J09–J11	0–74
Pneumonia	J12–J18	0–74
Chronic obstructive pulmonary disorder	J40–J44	0–74
Asthma	J45–J46	0–74
Selected respiratory diseases	J00–J06, J20–J22, J30–J39	1–14
Digestive disorders		
Gastric and duodenal ulcer	K25–K28	0–74
Acute abdomen, appendicitis, intestinal obstruction, cholecystitis/lithiasis, pancreatitis, hernia	K35–K38, K40–K46, K80–K83, K85, K86.1–K86.9, K91.5	0–74
Genitourinary disorders		
Nephritis and nephrosis	N00–N07, N17–N19, N25–N27	0–74
Obstructive uropathy and prostatic hyperplasia	N13, N20–N21, N35, N40, N99.1	0–74
Maternal and infant		
Complications of perinatal period	P00–P96, A33	All
Congenital malformations of the circulatory system	Q20–Q28	0–74
Intentional injuries		
Misadventures to patients during surgical and medical care	Y60–Y69, Y83–Y84	All

Source: reproduced from Cookson et al (2016).[4]

References

[1] Office of National Statistics. Avoidable mortality in the UK: 2017. ONS: Newport; 2019.

[2] Deloitte. Scottish Allocation Formula GMS workload model. Deloitte: London; 2016.

[3] Ashworth M, et al. The public health impact score: a new measure of public health effectiveness for general practices in England. British Journal of General Practice 2013;**63**(609):e291–e299.

[4] Cookson R, et al. Health equity indicators for the English NHS: A longitudinal whole-population study at the small-area level. Health Services and Delivery Research 2016;**4**(26):1–224.

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