Indicator Specification:

CCG OIS 2.13
PHOF 4.16
CCG IAF 126a
EAS 1

Dementia: 65+ Estimated Diagnosis Rate

Version: 1.0
Date: May 2017
Author: Primary Care Domain

Document Management

Revision history

Version	Date	Summary of Changes
0.1	March 2017	Draft for internal review
0.2	May 2017	Confidence interval methodology and appendix added
1.0	May 2017	First publication

Indicator assurance

	Status	Date
Methodology Review Group	Recommended	26.01.2017
Indicator Governance Board	Assured	16.03.2017

Contents

Overview

Indicator title

Dementia: 65+ Estimated Diagnosis Rate

Changes from previous versions

From 2017/18 this indicator methodology replaces those used previously by the below domains and will not produce comparable results when applied to the same source data. Where the new indicator time series overlaps with previously published periods, values will differ. To understand why, please refer to the comparison of methodologies for previous versions of the indicator contained in the appendix.

Indicator family name

CCG Outcomes Indicator Set (OIS) Domain 2 – Enhancing the quality of life of people with long term conditions

Public Health Outcomes Framework - Healthcare and Premature mortality domain; Mental Health, Dementia and Neurology: Dementia Profile

CCG Improvement and Assessment Framework – Better Care

NHS England Operational Information for Commissioning - Delivering the Forward View

Condition / Topic area

Long term conditions

Detailed Descriptor

Plain English description

Not everyone with dementia has a formal diagnosis. The indicator compares the number of people thought to have dementia with the number of people diagnosed with dementia, aged 65 and over. The target is for at least two thirds of people with dementia to be diagnosed.

Technical description

The rate of persons aged 65 and over with a recorded diagnosis of dementia per person estimated to have dementia given the characteristics of the population and the age and sex specific prevalence rates of the Cognitive Function and Ageing Study II, expressed as a percentage with 95% confidence intervals. Significance is determined by the non-overlapping of confidence intervals with the 66.7% benchmark.

Data Sources

Denominator: registered patients

Patients aged 65+ registered for General Medical Services, counts by 5-year age and sex band from the National Health Application and Infrastructure Services (NHAIS / Exeter) system; extracted on the first day of each month following the reporting period end date of the numerator. Source: NHS Digital.

Numerator: recorded dementia prevalence

Patients aged 65+ registered for General Medical Services with an unresolved diagnosis of dementia, counts by 5-year age and sex band from GP Clinical Systems via the General Practice Extraction Service (GPES); extracted on the reporting period end date (the last day of the month). Source: NHS Digital.

Reference rates: sampled dementia prevalence

Age 65+ age and sex-specific dementia prevalence rates, binomial proportions with 95% confidence limits by 5-year age and sex band from the Medical Research Council Cognitive Function and Ageing Study II (CFAS II). Reference rates remain static. Source: MRC CFAS II.

Organisational data

GP practices open and active on the reporting period end date from the NHS Business Services Authority Prescriptions Services (NHS BSA), with postcodes and Clinical Commissioning Group (CCG). Source: NHS Digital Organisational Data Service.

Office for National Statistics (ONS) mappings from CCG to Sustainability and Transformation Plan Footprint (STP); NHS England Local Office (DCO); and NHS England Region. Source: ONS Open Geography.

ONS mappings from postcode to Local Authority (LA). Source: ONS Open Geography.

Public Health England (PHE) mappings from LA to PHE Centre; County Council, PHE Region; ONS Group and Sub-Group; Average LA Deprivation Decile; Devolved Area. Source: Public Health England.

Construction

Calculation Methodology

Introduction

This indicator reports the rate of persons aged 65 and over with a recorded diagnosis of dementia per person estimated to have dementia given the characteristics of the population and the age and sex-specific prevalence rates of the CFAS II study, expressed as a percentage with 95% confidence intervals.

Applying the age and sex-specific 65+ prevalence rates of the CFAS II population (the reference rates) to the age and sex structure of the registered patients in the subject population (the denominator), yields the number of people aged 65+ one would expect to have dementia within the subject population. Dividing the actual number of cases recorded in the subject population (the numerator) by the estimated number yields the estimated diagnosis rate.

95% confidence intervals are derived from the 12 individual measures of uncertainty given with the CFAS II reference rates and the uncertainty around the numerator. The indicator is calculated 100,000 times, resampling randomly each time from the distributions of the 13 variables, to produce an overall distribution of indicator values closely approximating the true distribution. The 2,500th smallest and the 2,500th largest values in the distribution give robust estimates of the 95% lower and upper confidence limits respectively to one decimal place.

This indicator is expressed as a percentage.

Data Fields

NHAIS registered patients

PRACTICE_CODE

AGE

SEX

VALUE

EXTRACT_DATE

GPES recorded dementia prevalence

PRACTICE_CODE

AGE

SEX

VALUE

ACH_DATE

CFAS II reference rates

Sex	Age	Rate	Lower	Upper
M	65–69 years	0.012	0.006	0.023
M	70–74 years	0.030	0.020	0.044
M	75–79 years	0.052	0.038	0.070
M	80–84 years	0.106	0.082	0.137
M	85–89 years	0.128	0.090	0.180
M	≥90 years	0.171	0.106	0.264
F	65–69 years	0.018	0.009	0.036
F	70–74 years	0.025	0.016	0.039
F	75–79 years	0.062	0.045	0.084
F	80–84 years	0.095	0.073	0.123
F	85–89 years	0.181	0.145	0.222
F	≥90 years	0.350	0.284	0.423

NHS BSA organisational data

PRACTICE_CODE

STATUS

OPEN_DATE

CLOSED_DATE

PRESCRIBING_SETTING

POSTCODE

COMMISSIONING_ORGANISATION

Data Filter

NHAIS registered patients

1. Field Name EXTRACT_DATE

   Conditions = reporting period end date +1

Rationale: Returns data as close to the reporting period end date as possible

2. Field Name VALUE

   Conditions sum(VALUE) > 0

   Rationale Returns data for practices with at least one registered patient of any sex or age

3. Field Name AGE

   Conditions > 64

   Rationale Returns data for patients aged 65 and over

GPES recorded dementia prevalence

1. Field Name ACH_DATE, PRACTICE_CODE

   Conditions = max(ACH_DATE) per PRACTICE_CODE where ACH_DATE >= reporting period end date -182

   Rationale: Returns the most recent data available for each practice to a maximum of 6 months prior to the reporting period end date

2. Field Name AGE

   Conditions > 64

   Rationale Returns data for patients aged 65 and over

NHS BSA organisational data

1. Field Name STATUS

   Conditions = A

   Rationale: Returns data for active practices

2. Field Name OPEN_DATE

   Conditions <= reporting period end date

   Rationale Returns data for practices open as at the reporting period end date

3. Field Name CLOSED_DATE

   Conditions >= reporting period end date; or NULL

   Rationale: Returns data for practices not closed as at the reporting period end date

4. Field Name PRESCRIBING_SETTING

   Conditions = 4

   Rationale Returns data for practices with GP prescribing cost centres

NHAIS registered patients, GPES recorded dementia prevalence, NHS BSA organisational data

1. Field Name PRACTICE_CODE

   Conditions Inner join

   Rationale: Return data only for practices existing in all three sources as queried above, i.e. open practices, with one or more registered patient, with dementia data available within the last 6 months.

Calculation

1. Calculate the estimated number of cases of dementia for each organisation (denominator) by applying the age and sex-specific reference rates to the age and sex structure of its population:

$$E_k = \sum_{ij} N_{ijk} \times p_{ij}$$

Where:

E_k is the estimated value for the subject organisation *k*

N_{ijk} is the population (65+ patient list size) for each combination of age band *i* and sex *j* in subject organisation *k*

p_{ij} is the binomial proportion for each combination of age band *i* and sex *j* in the reference population (CFAS II)

2. Calculate the estimated diagnosis rate for each organisation (indicator value) by dividing its observed dementia diagnoses by its estimated value and express this as a percentage:

$$\lambda_k = \frac{O_k}{E_k} \times 100$$

Where:

λ_k is the estimated diagnosis rate for the subject organisation *k*

O_k is the recorded 65+ dementia diagnoses in the subject organisation *k*

E_k is the estimated value for the subject organisation *k*

3. Calculate the upper and lower 95% confidence limits for each organisation's indicator value by simulation. Repeat the indicator calculation 100,000 times, randomly resampling each time from the age and sex-specific expected distributions, and the recorded diagnoses count distribution, to create a distribution of 100,000 random samples from the overall indicator distribution. Take the 2500th smallest and the 2500th largest values from this distribution as estimates of the 95% lower and upper confidence limits respectively:

$$\lambda_k^{LL} = \lambda sim_{k(n)} = n\{\lambda sim_{k1},...,\lambda sim_{k100,000}\}$$
$$\lambda_k^{UL} = \lambda sim_{k(100,000-n)} = 100,000 - n\{\lambda sim_{k1},...,\lambda sim_{k100,000}\}$$

Where:

λ_k^{LL} is the lower 95% confidence interval for subject organisation *k*

λ_k^{UL} is the upper 95% confidence interval for subject organisation *k*

n defines the threshold of the indicator distribution based on the number of repetitions, 100,000, and level of confidence, 95%: 100,000 * (1-0.95) / 2

$\lambda sim_{k1,...,k100,000}$ is the order of randomly sampled indicator values for subject organisation *k* produced by repetition of the following:

$$\left(\lambda sim_k = \frac{Orand_k}{Erand_k} \times 100\right)_{1,...,100,000}$$

Where:

$Orand_k$ is the randomly sampled diagnoses count value for organisation *k* produced by the inverse cumulative probability function with:

probability: R ∈ {0,...,1}

mean: O_k

standard deviation: $\sqrt{O_k}$

$Erand_k$ is the randomly sampled expected value for organisation *k* produced as follows:

$$Erand_k = \sum_{ij} N_{ijk} \times prand_{ij}$$

Where:

N_{ijk} is the population (65+ patient list size) for each combination of age band *i* and sex *j* in subject organisation *k*

$prand_{ij}$ is the randomly sampled binomial proportion for each combination of age band *i* and sex *j* in the reference population (CFAS II) produced as follows:

$$prand_{ij} = \frac{\exp(p_{ij}^{icf})}{1 + \exp(p_{ij}^{icf})}$$

Where:

p_{ij}^{icf} is the inverse cumulative probability function for each for each combination of age band *i* and sex *j* in the reference population (CFAS II) with:

probability: R ∈ {0,...,1}

mean: $Log_e(\frac{p_{ij}}{100 - p_{ij}})$

standard deviation: $\frac{\left(Log_e(\frac{p_{ij}^{UL}}{100 - p_{ik}^{UL}})\right) - \left(Log_e(\frac{p_{ij}^{LL}}{100 - p_{ik}^{LL}})\right)}{2/1.96}$

Where:

p_{ij}^{UL} is the lower 95% confidence limit for each combination of age band *i* and sex *j* in the reference population (CFAS II)

p_{ij}^{LL} is the lower 95% confidence limit for each combination of age band *i* and sex *j* in the reference population (CFAS II)

Presentation

Breakdowns

Time periods

Month

Geographic

England (all patients under the responsibility of NHS England)

England (all patients registered to a practice geographically situated in England)

CCG

Sustainability and Transformation Plan Footprint

NHS England DCO

NHS England Region

Lower Tier Local Authority

Upper Tier Local Authority

PHE Centre

PHE Region

County Council

ONS Group

ONS Sub-group

Average Local Authority Deprivation Decile

Devolved Area

Disclosure control

All source data are publicly available unsuppressed.

Rates are rounded to one decimal place before publication.

CSV output

Column name	Output
ORG_TYPE	Organisational breakdown
ORG_CODE	Organisational Data Service organisation identifier
ONS_CODE	Office for National Statistics organisation identifier
NAME	Organisation name

ACH_DATE	Reporting period end date
MEASURE	Identifier for contents of VALUE column: DEMENTIA_REGISTER_65_PLUS – Recorded diagnoses of dementia ages 65+ DEMENTIA_ESTIMATE_65_PLUS – Expected diagnoses of dementia ages 65+ DIAG_RATE_65_PLUS – Diagnosis rate (recorded/expected) ages 65+ DIAG_RATE_65_PLUS_UL – Upper 95% confidence limit of diagnosis rate ages 65+ DIAG_RATE_65_PLUS_LL – Lower 95% confidence limit of diagnosis rate ages 65+
VALUE	Value of measure
DQ	Flags organisations with a smaller denominator population than the CFAS II reference population with a ‘1’. Values for these organisations should be interpreted with caution.

Appendix: Comparison of Indicator Methodologies

	Current	2015-16, 2016-17 NHS England EAS 1	2014-15 NHS Outcomes Framework	2014-15 Primary Care Web Tool	2014-15 CCG Assurance
Age group	65 and over	65 and over	40 and over	30 and over	30 and over
Study underlying prevalence estimate	CFAS II	CFAS II	Alzheimer's Society 2007	Alzheimer's Society 2007	Prevalence as estimated by CCG
Population in prevalence estimate	GP list size for submitting practices	ONS sub-national population projections	ONS mid-year population estimates	GP list size for submitting practices	
Dementia register source	Most recent monthly age 65+ data available within 6 months	Most recent monthly age 65+ data available since April 2015, or where unavailable annual QOF all ages data	Annual QOF all ages data	Annual QOF all ages data	Annual QOF all ages data
Other standardisation	-	-	-	Adjustment for care home residency, normalised to area team.	-
Presentation of uncertainty	95% confidence intervals	None	None	None	None