CCG Outcome Indicator Set

Indicator 1.20
Mortality from breast cancer in females

Domain 1
Preventing people from dying prematurely

Indicator specification

Version: 1.5
Date: June 2018
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Document Management

Revision History

Version	Date	Summary of Changes
1.0	September 2014	Initial Release
1.1	February 2015	Clarification of confidence interval methodology
1.2	September 2015	Area Team archive
1.3	September 2016	Rebranding to NHS Digital and source links
1.4	December 2017	Update to Excel and CSV Outputs
1.5	June 2018	Disclosure control update

Indicator assurance

	Status	Date
Indicator Governance Board	Assured	22.07.2014

Contents

Overview

Indicator title

Mortality from breast cancer in females

Indicator family name

CCG Outcomes Indicator Set (OIS) Domain 1 - Preventing people from dying prematurely

Condition / Topic area

Breast Cancer

NHS Digital Indicator Portal code

P01819

Detailed Descriptor

Plain English description

CCG OIS 1.20 measures the number of female deaths from breast cancer.

Technical description

Directly age standardised mortality rate from breast cancer for females in the respective time period per 100,000 registered female patients, 95% confidence intervals.

Data Sources

Denominator

Unconstrained GP registered female patient counts by single year of age from the NHAIS (Exeter) Systems; extracted annually on 1 April for the forthcoming financial year.

https://digital.nhs.uk/services/systems-and-service-delivery

Numerator

Female death registrations, due to breast cancer, in the calendar year for all England deaths based on GP of registration from the Primary Care Mortality Database (PCMD).

https://digital.nhs.uk/data-and-information/data-tools-and-services/tools-for-accessing-data/primary-care-mortality-database

Standard population

Office for National Statistics (ONS) mid-year England population estimates for the respective calendar years. If estimates are not available for a specific calendar year, the most recent available estimates are used.

https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates

Data from 2012-14 onwards is released without the Area Team breakdown. Prior years Area Team breakdown has been archived, see indicator portal.

Construction

Calculation Methodology

Introduction

This indicator gives the number of deaths from breast cancer in females, registered in the calendar year; it is directly standardised by age group and given as a rate per 100,000 registered female patients.

Data Fields

For this indicator data are derived from PCMD and registered patient counts from NHAIS which are supplied annually on 1 April.

The data fields and filters used within PCMD (numerator) are as follows:

CALCULATED_AGE_UNIT

CALCULATED_AGE

SEX

DATE_OF_REGISTRATION

CCG_OF_REGISTRATION

UNDERLYING_CAUSE_OF_DEATH

Data Filter

1. Field Name: CALCULATED_AGE_UNIT
   - Conditions: When CALCULATED_AGE_UNIT equals 2, 3 or 4, then re-code age to zero years
   - Rationale: The calculated age unit is used to specify whether the CALCUALTED_AGE field refers to years (1), months (2), weeks (3) or days (4) of life.

     Those recoded to zero years are added back into the CALCULATED_AGE field.

2. Field Name: CALCULATED_AGE
   - Conditions: Is valid number
   - Rationale: Combined with the recoded zero ages from CALCULATED_AGE_UNIT selects only those with a valid age.

3. Field Name: DATE_OF_REGISTRATION
   - Conditions: Between 1 January and 31 December inclusive
   - Rationale: Selects only those deaths registered during the relevant calendar year.

4. Field Name: SEX
   - Conditions: Is equal to 2
   - Rationale: Selects females only.

5. Field Name CCG_OF_REGISTRATION

   Conditions Is valid English CCG

   Rationale Selects people registered with a CCG in England.

6. Field Name UNDERLYING_CAUSE_OF_DEATH

   Conditions Is equal to ICD-10 code ‘C50’

   Rationale Selects those whose underlying cause of death was coded on the death certificate as breast cancer.

Calculation

This indicator is calculated as a rate directly standardised by age and sex. Calculated per 100,000 registered female patients. A list of the age groups used in the standardisation can be seen in appendix 1.

Denominator

CCG level count of females registered with the constituent GP Practices, provided by NHAIS (Exeter) Systems.

Numerator

The number of female deaths from breast cancer (ICD-10: C50), classified by the underlying cause of death registered in the respective calendar years.

The data used are based on the original cause of death recorded on the death certificate rather than any final amended causes. Data are aggregated by age group.

Direct Standardisation

The directly age and sex standardised rate (DSR) is the rate of events that would occur in a standard population if that population were to experience the age and sex specific rates of the subject population. The age and sex specific rates of the subject population are applied to the age and sex structure of the standard population.

$$DSR = \frac{1}{\sum_i w_i} \times \sum_i \frac{w_i O_i}{n_i}$$

where:

Oi is the observed number of events in the local or subject population in age and sex group *i*;

ni is the number of individuals in the local or subject denominator population in age and sex group *i*,

wi is the number of individuals in the standard population in age and sex group *i*.

The standard population used for the direct method is the England female population from ONS mid-year population estimates. The age groups used are: 0-4, 5-9,… 90+ (see appendix 1).

Confidence Intervals

95% confidence intervals are calculated using Dobson's[1] and Byar's[2] methods. Byar's method is recommended for larger counts whereas for smaller numerators (less than 389) a more exact method based on the Poisson distribution (Dobson's method) is used:

$$DSR_{lower} = DSR + \sqrt{\frac{Var(DSR)}{Var(O)}}(O_{lower} - O)$$

$$DSR_{upper} = DSR + \sqrt{\frac{Var(DSR)}{Var(O)}}(O_{upper} - O)$$

where:

O is the total number of observed deaths in the subject population

[1] Dobson A et al. Confidence intervals for weighted sums of Poisson parameters. Stat Med 1991;10:457-62
[2] Breslow NE, Day NE. Statistical methods in cancer research, volume II: The design and analysis of cohort studies. Lyon: International Agency for Research on Cancer, World Health Organization; 1987: 69.

$$Var(DSR) = \frac{\sum_i \frac{{w_i}^2 O_i}{{n_i}^2}}{(\sum_i w_i)^2}$$

$$Var(O) = \sum_i O_i$$

O_{lower} and O_{upper} are the lower and upper confidence limits for the observed number of events;

When $O < 389$ then,

$$O_{lower} = \frac{\chi^2_{lower}}{2}$$

$$O_{upper} = \frac{\chi^2_{upper}}{2}$$

Where:

χ^2_{lower} is the 97.5th percentile value from the χ^2 distribution with $2O$ degrees of freedom;

χ^2_{upper} is the 2.5th percentile value from the χ^2 distribution with $2O+2$ degrees of freedom.

When $O >= 389$ then,

$$O_{lower} = O\left(1 - \frac{1}{9O} - \frac{z}{3\sqrt{O}}\right)^3$$

$$O_{upper} = (O+1)\left(1 - \frac{1}{9(O+1)} + \frac{z}{3\sqrt{O+1}}\right)^3$$

Where:

z is the 97.5th percentile value from the Standard Normal distribution.

Presentation

Breakdowns

Time periods

3 year, rolling calendar year data from 2009-2011 onwards.

Demographic

None

Geographic

All registered patients in England

CCG

Disclosure control

Where the indicator is calculated from a numerator of 0, 1 or 2 the value is suppressed to ensure an individual's identity is not at risk of being disclosed. If there is only one value suppressed in this way, the rate based upon the next lowest numerator is also suppressed, reducing the risk of the first suppressed number being identifiable in isolation.

Indicator values calculated from numerators under 10 are also suppressed following the recommendations in the PHE Technical Guide Calculating Directly Standardised Rates.

https://fingertips.phe.org.uk/documents/PHDS%20Guidance%20-%20DSRs.pdf

Rates are rounded to one decimal place before publication.

Excel and CSV output

Column name	Output
Reporting period	Calendar years of death registration
Period of coverage	Start and end date of reporting period
Breakdown	Organisation type
ONS code	ONS organisation code
Level	Organisation code
Level description	Organisation name
Gender	Female
Indicator value	Directly standardised mortality rate per 100,000
CI lower	DSR lower 95% confidence interval
CI upper	DSR upper 95% confidence interval
Denominator	The count of registered patients (denominator)
Numerator	Number of deaths from breast cancer during the respective calendar years

Appendices

Appendix 1 - England standard population age groups

Age group
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75-79
80-84
85-89
90+