Public Health England

Protecting and improving the nation's health

Cancer statistics
Availability and location

March 2020 update

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Public Health England exists to protect and improve the nation's health and wellbeing and reduce health inequalities. We do this through world-leading science, research, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. We are an executive agency of the Department of Health and Social Care, and a distinct delivery organisation with operational autonomy. We provide government, local government, the NHS, Parliament, industry and the public with evidence-based professional, scientific and delivery expertise and support.

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SUSTAINABLE DEVELOPMENT G⊙ALS

Contents

Executive summary

This document aims to provide an overview about cancer statistics, including information on the latest statistics publicly available and where to find them.

This is intended to be a useful reference guide for users of cancer statistics or audiences that may not be familiar with this information. This document is structured using key topics in the 'Achieving World Class Cancer Outcomes: Strategy for England 2015 - 2020' report (www.england.nhs.uk/wp-content/uploads/2017/10/national-cancer-transformation-programme-2016-17-progress.pdf), and with geographical breakdowns of data sources.

Geographies

NHS regions support local systems and are responsible for the quality, financial and operational performance of all NHS organisations in their region. They support the identity and development of Sustainability and Transformation Partnerships Sustainability and Transformation Partnerships (STPs - see below) and integrated care systems. There are 7 NHS regions in England.

Cancer Alliances bring together key organisations in an area to coordinate cancer care. There are 20 cancer alliances in England.

Sustainability and Transformation Partnerships (STPs) are partnerships between NHS organisations and local councils. Some have evolved to become Integrated Care Systems (ICSs). The Long Term Plan aims that every part of England will be covered by an ICS by 2021, replacing STPs. There are 42 STPs in England.

Clinical Commissioning Groups (CCGs) commission most of the hospital and community NHS services in the local areas for which they are responsible. There are 191 CCGs in England.

NHS trusts are organisations that provide goods and services for the purposes of the health service. There are approximately 200 trusts in England. Acute non-specialist trusts make up the majority, but there are also acute specialist trusts and mental health trusts.

Local authorities are responsible for a variety of local services, including social care. There are different types of local authority with different structures. There are 343 local authorities in England.

Middle Layer Super Output Areas (MSOAs) are geographic areas with a minimum population of 5,000 and a mean of 7,200. They are made up of contiguous Lower Layer Super Output Areas and are defined by ONS for the census. There are 6,791 MSOAs in England and 410 in Wales.

# Headline statistics: incidence, prevalence, survival and mortality

Incidence

Incidence is the number of new cases of cancer diagnosed for a given period, usually a year. The statistics are provided as the total number of cases or as rates (number of cases per 100,000 population).

Incidence rates can be 'crude' or age-standardised. The crude rate is calculated by dividing the number of patients who live in a given area by the population of that area. The age-standardised rate (ASR) accounts for the variations in age structures of populations. ASRs are most commonly standardised using the European standard population or world standard population statistics.

ASR is more commonly used because overall incidence of cancer increases with age. Therefore, age standardised rates allow for comparisons between areas/time periods with different age distributions.

Figure: Age Standardised Incidence for England (tumours per 100,000 person-years)
Source: www.cancerdata.nhs.uk/
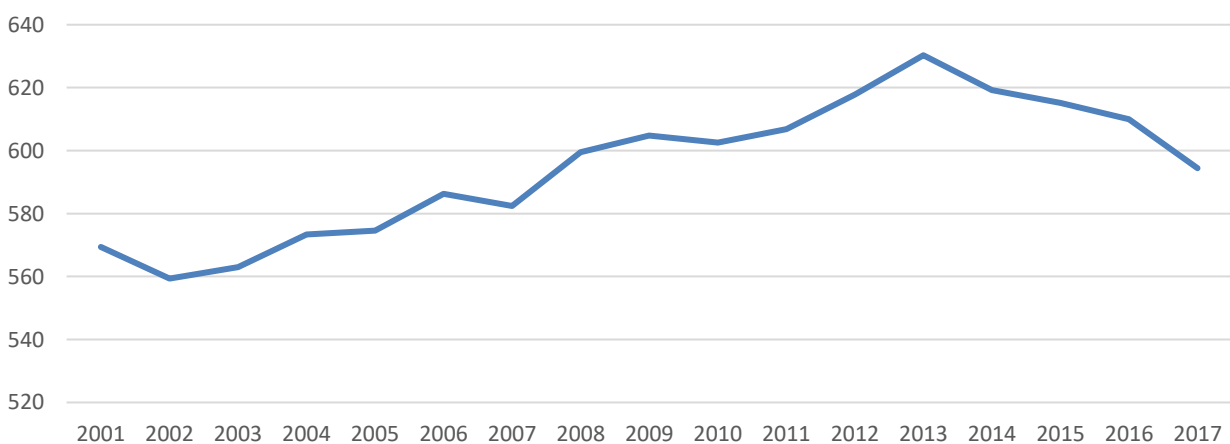
Key statistics

- First release of Cancer registration statistics for England (2018) published by Public Health England (PHE)
- Cancer registration statistics for England (2017) published by Office for National Statistics (ONS)

- CancerStats is an online analytical tool for England, Cancer Alliances, STPs, CCGs and Local Authorities (2017). Published by National Cancer Registration and Analysis (NCRAS), login required
- CancerData is a tool for the public for the same geographies as CancerStats (2017). Published by NCRAS

Other sources of information

- UK and Ireland Association of cancer registries (UKIACR) contains links to a range of statistics for devolved administrations, and cancer related indicators. Statistics are provided by PHE, the Welsh Cancer Intelligence and Surveillance Unit and the Scottish and Northern Irish cancer registries
- Further links to incidence, mortality and survival data for Scotland, Wales, Northern Ireland and Ireland can be found on the NCRAS website
- The NCRAS website also has publications on incidence

International data

- The Global Cancer Observatory (GLOBOCAN) website provides access to various databases, factsheets, tabulations, charts and predictions containing information including information on the incidence of cancer worldwide (2018). It is held and managed by the Section of Cancer Information (CIN) of the International Agency for Research on Cancer (IARC)
- The European Cancer Observatory (ECO) site has a range of tools, including the GLOBOCAN one above
- The German centre for cancer registration data – Zentrum für Krebsregisterdaten, ZfKD – provides topical cancer mortality statistics for Germany from 1999 - 2015. In an interactive database query, information on incidence, mortality rates, prevalence and survival rates for different types of cancer can be obtained
- The USA National Cancer Institute (NCI) provides access to reports and interactive tools containing cancer incidence information (1999 – 2015) across the USA. This data can be segmented by state and a range of demographic factors

Predictions

- 'Cancer Incidence and Mortality Projections in the UK Until 2035'. CR Smittenaar, 2016, British Journal of Cancer 2016; 115(9), 1147-1155
- 'Cancer incidence in the UK: Projections to the year 2030'. M Mistry et al, 2011, British Journal of Cancer 105:1795 to 1803
- 'The future burden of cancer in England: incidence and numbers of new patients in 2020' H Møller et al, 2007, British Journal of Cancer 96:1484-8

- Based on the above data, 'Cancer mortality trends: 1992-2020' by Macmillan cancer support
- Cancer Research UK (CRUK) data visualisation displays projection for incidence of all cancers combined
- For Scotland, the cancer incidence projections report gives projections for the number of cancer cases up to 2027 with policy and methodology background.
- For Ireland, the National Cancer Registry Ireland published projections from 2015-2040
- GLOBOCAN provides UK and worldwide incidence (and mortality) predictions for up to 2040. Predictions can be generated on the future burden of a selected cancer or group of cancers, in a selected group of populations, in a selected year
- 'Global cancer transitions according to the Human Development Index (2008–2030): a population-based study' F Bray, The Lancet Oncology, 13(8), 790-80 highlights past and present cancer specific patterns to produce a future burden scenario for 2030

Prevalence

Cancer prevalence is the number of people, or the proportion of the population, who are alive on a specified date and have previously been diagnosed with cancer. As such it is an indicator of the burden of cancer and can help to inform health care service planning. The number of people alive with a diagnosis of cancer is increasing as incidence rises and survival improves.

Figure: Prevalence for all cancers for England (1995-2015)
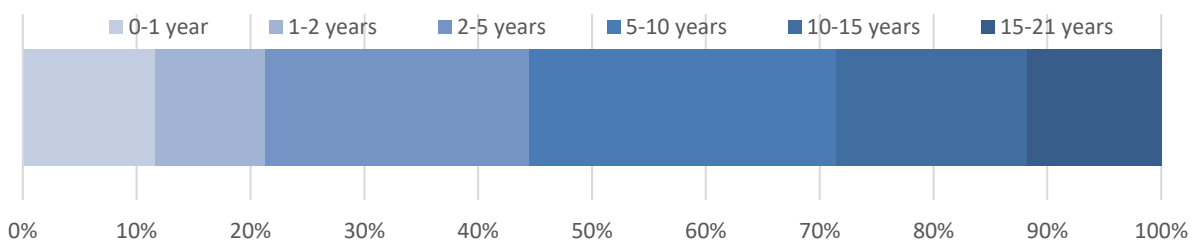
Source: www.ncin.org.uk/local_cancer_intelligence/tcst

Key statistics

NCRAS page on prevalence which includes:

- 22-year prevalence (1995-2016) in England of having more than one primary cancer at Region, Cancer Alliance, STP and CCG level - prevalence is further segmented by sex, age in 2016, ethnicity and deprivation quintile

- Comorbidity at diagnosis for those living with cancer in London (1995-2014) at STP and CCG

Macmillan-PHE Local Cancer Intelligence portal contains prevalence estimates and projections (1995-2015).

Other sources of information

- Macmillan produced an infographic detailing current and future cancer prevalence in the UK
- Age-standardised rate for all cancers ordered by the countries with the 50 highest rates in the world (2018). Published by World Cancer Research Fund
- GLOBOCAN estimated cancer prevalence worldwide for all cancers in 2018
- The USA National Cancer Institute cancer prevalence reports and interactive tools up to 2016
- The Australian Institute of Health and Welfare report and summary tables on cancer survival and prevalence statistics for the period from 1982-2010
- 'Projections of cancer prevalence in the United Kingdom, 2010–2040' J Maddams, 2012, British Journal of Cancer, 107:1195 to 1202
- Macmillan factsheet which includes prevalence projections

Mortality

Cancer mortality is the number of people who have died from cancer in a given period. Statistics are presented as the number and the rate of cancer deaths per year. Cancer mortality is commonly expressed as crude and age-standardised rates in the same way as cancer incidence.

Figure: Age Standardised Mortality for England (deaths per 100,000 person-years)
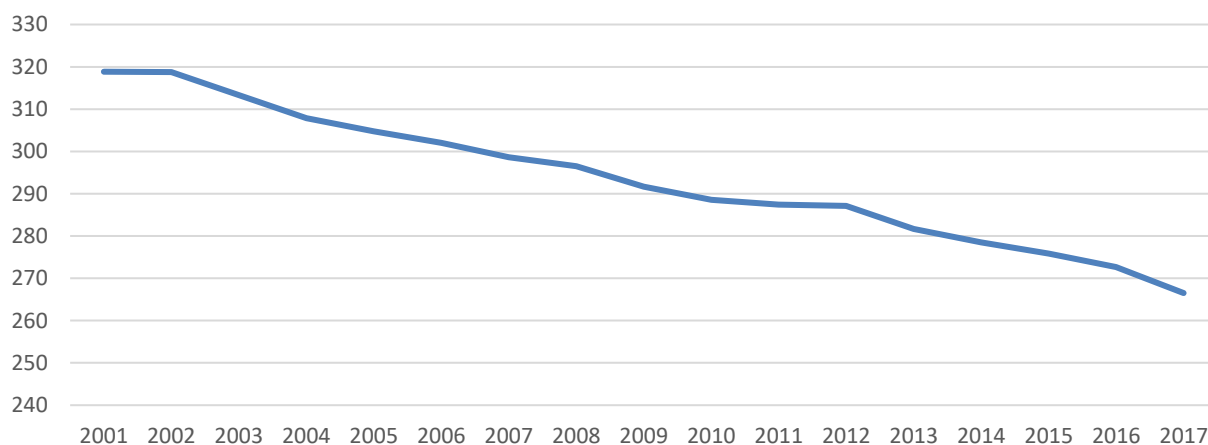
Source: www.cancerdata.nhs.uk/

Key statistics

- Deaths registered in England and Wales (2018) published by ONS
- CancerStats is an online analytical tool for England, Cancer Alliances, STPs, CCGs and Local Authorities (2017). Published by National Cancer Registration and Analysis (NCRAS), login required
- CancerData is a tool for the public for the same geographies as CancerStats (2017). Published by NCRAS
- PHE portal with statistics on all cancer mortality, including premature mortality by MSOA, Ward, LA, CCG and England (2011-2015)
- Macmillan-PHE Local Cancer Intelligence portal contains prevalence estimates and projections (1995-2015)
- CRUK mortality statistics for UK, and devolved administrations (2016)
- PHE Fingertips mortality tool for England, Districts and Counties (2015-17)
- Scotland mortality statistics (1994-2016)
- Welsh mortality statistics (2001-2017)
- Northern Ireland mortality statistics (1993-2017)

Other sources of information

- The publications section of the NCRAS website, including a report on mortality in the first year after ovarian cancer diagnosis
- CRUK provides cancer mortality projections up to 2035 for all cancers combined.
- 'Cancer incidence and mortality projections in the UK until 2035' C R Smittenaar, 2016, British Journal of Cancer
- GLOBOCAN provides UK and worldwide mortality (and incidence) predictions to 2040 using data held in GLOBOCAN. Predictions can be generated on the future burden of a selected cancer or group of cancers, in a selected group of populations in a selected year
- Macmillan Cancer Support report in (2013), assimilating data focusing on the cancer burden by 2020 and associated mortality

International data

- The Global Cancer Observatory (GCO/GLOBOCAN) website provides access to various databases, factsheets, tabulations, charts and predictions containing information on the occurrence of cancer worldwide. It is held and managed by the CIN of IARC
- The German centre for cancer registration data – Zentrum für Krebsregisterdaten, ZfKD – provides topical cancer mortality statistics for Germany from 1999 - 2015. In an interactive database query, information on incidence, mortality rates, prevalence and survival rates for different types of cancer can be obtained

- The USA National Cancer Institute (NCI) provides access to reports and interactive tools containing cancer incidence information (1999 – 2015) by state and a range of demographic factors

Survival

Survival estimates are the percentage of patients who are still alive a specified time after their diagnosis of cancer. The most common estimates are one-year and 5-year survival. There are different methods used to calculate cancer survival. The most commonly used method is called net survival.

Net survival can be defined as the survival of cancer patients where competing causes of death, approximately equal to population mortality rates, are removed, leaving cancer as the only possible cause of death. Net survival is a more appropriate estimate for international comparisons because it is independent of general population mortality.

Figure: One-year age-standardised net survival for colorectal cancer
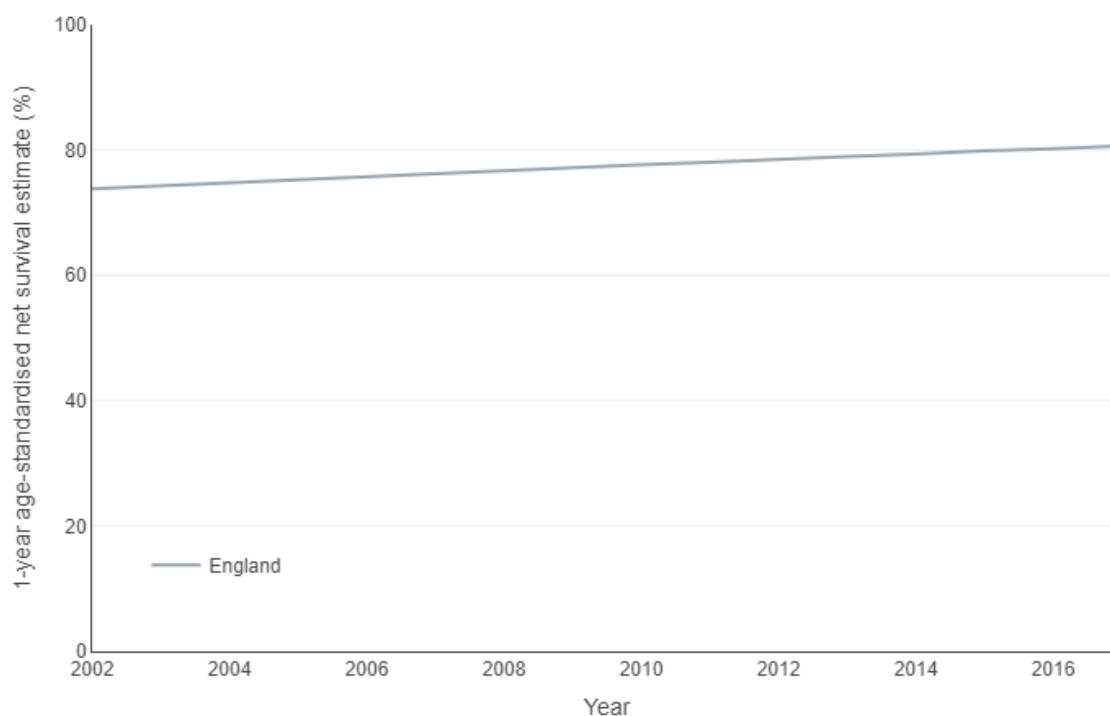
Source: www.cancerdata.nhs.uk/survival/indexofcancersurvival

Key statistics

- Cancer survival in England: adult, stage at diagnosis and childhood (2013-2017, patients followed up to 2018) for 29 most common cancers, published by ONS
- Childhood cancer survival in England (2001-2017) published by ONS
- Geographic patterns of cancer survival in England: adults diagnosed 2012 to 2016 and followed up to 2017 by region, cancer alliance and STP, published by ONS

- Index of cancer survival for Clinical Commissioning Groups in England: adults diagnosed 2001 to 2016 and followed up to 2017 for CCG, STP and cancer alliance, published by ONS

Other sources of information

- Cancer survival statistical bulletin methodology by ONS
- Stage at diagnosis and early mortality from cancer in England, McPhail et al. 2015: British Journal of Cancer 2015; 112:S108S115
- NCRAS website survival by stage publications and general publications page
- ONS article, including visualisations, looking at survival trends over a 40-year period
- The UKIACR website points to statistics for devolved administrations
- 'On estimation in relative survival' examines net survival methodology, by M Perme et al, 2012. Biometrics 2012; 68(1): 113 to 120
- 'Global surveillance of cancer survival 1995–2009: analysis of individual data for 25 676 887 patients from 279 population-based registries in 67 countries (CONCORD-2)' Allemani et al, 2014, Lancet 2015;385(9972):977–1010
- A summary of the research above by Centre for Disease Control and Prevention.
- 'Cancer survival in Australia, Canada, Denmark, Norway, Sweden, and the UK, 1995-2007 (the International Cancer Benchmarking Project) an analysis of population-based cancer registry data' M Coleman et al, 2011, Lancet 2011; 377: 127-138

International data

- EUROCARE (EUROpean CAncer REgistry-based study on survival and care of cancer patients) is a cancer epidemiology research project on the survival of European cancer patients. A range of data and publications are available on the EUROCARE website
- The German centre for cancer registration data – Zentrum für Krebsregisterdaten, ZfKD – provides cancer survival rates for patients diagnosed between 2007-2014 in Germany. In an interactive database query, 1-10-year survival crude/age standardised survival rates can be obtained for different types of cancer
- The USA National Cancer Institute (NCI) Cancer Statistics Review (1975-2013, USA) for which data tables and reports can be accessed via interactive database query. It also includes relative survival rates by year of diagnosis (1975-2016) and 5-year survival (1975-2015) for all cancer sites
- 'Oncologic treatment strategies and relative survival of patients with stage I–III rectal cancer - A EURECCA international comparison between the Netherlands, Belgium, Denmark, Sweden, England, Ireland, Spain, and Lithuania' A.J. Breugom et al, 2018, European Journal of Surgical Oncology, Volume 44, Issue 9, September 2018, Pages 1338-1343

Prevention: reducing risk factors

Cancer prevention involves taking measures to reduce risk factors. Risk factors include increasing age, genetics, exposure to environmental factors, smoking, alcohol consumption, obesity and physical activity. Smoking remains the largest preventable cause of cancer in the UK, followed by obesity.

Nearly 4 in 10 cancer cases every year in the UK are known to have potentially preventable causes. Breast, lung, melanoma and bowel cancers account for nearly two-thirds of preventable cancers (source).

Figure: Preventable cases by risk factor
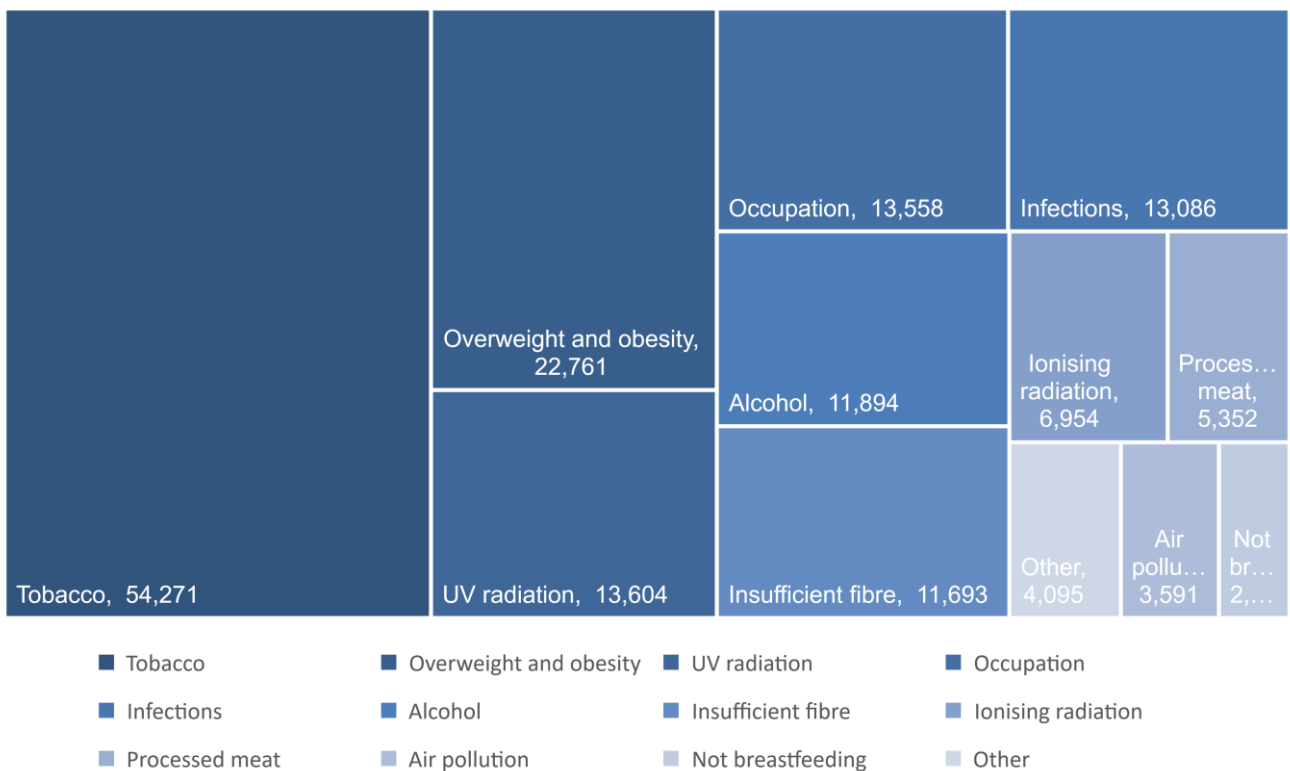
Smoking

In 2018 14.4% of people in the UK aged 18 years and above smoked cigarettes (source below).

PHE smoking prevalence tool contains data on various metrics for England, by Region, STP, CCG, County and District. Latest data 2018/19.

Obesity

Being overweight or obese is related to more than one in 20 cancers cases in the UK (source), and more than 6 in 10 adults in the UK are overweight (source).
NHSD Statistics on Obesity, Physical Activity and Diet contains data for England, by LA, Region, CCG, STP for 01/04/17 to 31/12/18.

Alcohol

PHE alcohol consumption tool contains data for England, by Region for 2017/18.
An investigation of public knowledge of the link between alcohol and cancer (2016) by CRUK.

General risk factor

Estimate of preventable cancers in the UK by World Cancer Research Fund.
'The fraction of cancer attributable to modifiable risk factors in England, Wales, Scotland, Northern Ireland, and the United Kingdom in 2015' Brown KF, 2018, British Journal of Cancer.

Diagnosing earlier and faster

Awareness

Public awareness of the potential signs and symptoms of cancer, as well as an understanding of when and how to seek help, can play an important part in ensuring that cancer is diagnosed at an early stage.

Cancer Research UK (CRUK), University College London, King's College London and the University of Oxford, as part of the National Awareness and Early Diagnosis Initiative (NAEDI), developed a cancer awareness measure (CAM). The CAM is a validated set of questions designed to reliably assess and track public awareness of: cancer warning signs, anticipated delay and perceived barriers to seeking medical advice.

CAM data comes from 2 surveys which were:

- an ONS opinions survey that is sampled to be representative of the UK population
- an Ethnibus survey of the main ethnic minority groups in England - surveys were carried out in 2008, 2010, 2012 and 2014

Site specific CAMs have also been completed for breast, colorectal/bowel, cervical, lung and ovarian cancer. These measures were developed with the support of Breakthrough Breast Cancer, Breast Cancer Care, Cancer Research UK, Ovarian Cancer Action, The Eve Appeal, Ovacome, Target Ovarian Cancer and the Department of Health.

Number of preventable cases and *percentage of all cases*

	England	Scotland	Wales	N. Ireland	UK
Males	58,141	6,567	3,838	1,856	70,425
	38%	*43%*	*39%*	*40%*	*39%*
Females	53,480	6,455	3,373	1,663	65,130
	36%	*40%*	*37%*	*36%*	*37%*
Persons	111,722	13,038	7,207	3,519	135,507
	37%	*42%*	*38%*	*38%*	*38%*

Source: CRUK (excludes non-melanoma skin cancer)

Key statistics

- Be clear on cancer campaign reports for England, published by NCRAS
- Statistics on preventable cancers (2015) for UK, England, Scotland, Wales and Northern Ireland by CRUK
- Cancer Awareness Measures (CAM) report (2017) for UK, England, Scotland, Wales

Other sources of information

- Improving cancer symptom awareness among deprived communities in the UK Moriarty Y, 2019, BioMed Central (BMC) Public Health
- 'Impact of national cancer awareness campaigns for bowel and lung cancer symptoms and inequalities' Moffat J, 2015, PubMed
- Cervical cancer risk factor knowledge among screening non-participants by socio-demographic group, 'Socio-demographic correlates of cervical cancer risk factor knowledge among screening non-participants in Great Britain' Ryan M, 2011, PubMed
- Be Clear on Cancer Programme Evaluation Summaries (2013 and 2014) published by CRUK

Site specific CAMs

- 'Validation of a measurement tool to assess awareness of breast cancer' Linsell L, 2010, European Journal of Cancer; 46(8):1374-81
- 'The impact of national cancer awareness campaigns for bowel and lung cancer symptoms on sociodemographic inequalities in immediate key symptom awareness and GP attendances' Moffat J, 2015, British Journal of Cancer
- 'Ovarian and cervical cancer awareness: development of two validated measurement tools' Simon A, 2012, Journal of Family Planning and Reproductive Health Care; 38(3):167-74
- 'What do British women know about cervical cancer symptoms and risk factors?' Low EL, 2012, European Journal of Cancer; 48(16):3001-8
- 'Assessing awareness of colorectal cancer symptoms: measure development and results from a population survey in the UK' Power E, 2011, BMC Cancer
- 'Knowledge of lung cancer symptoms and risk factors in the UK: development of a measure and results from a population-based survey' Simon A et al, 2012, Thorax; 67(5):426-32

General CAM

- CAM National Baseline Report, 'Public awareness of cancer in Britain', published in 2009
- 'Public awareness of cancer in Britain: a population-based survey of adults' Robb K et al, 2009, British Journal of Cancer; 101:S18–S23 - covers the process of data collection and analysis
- 'Development of a measurement tool to assess public awareness of cancer' Stubbings S, 2009, British Journal of Cancer 2009; 101:S13–S17
- 'Delay Kills' (2012) published by CRUK and Tesco. It details key results from the CAM 2010 survey, the problems of diagnosing cancer early and why we need to solve them
- 'Differences in cancer awareness and beliefs between Australia, Canada, Denmark, Norway, Sweden and the UK (the International Cancer Benchmarking Partnership): do they contribute to differences in survival?' Forbes L J L, 2013, British Journal of Cancer

Screening

The UK National Screening Committee makes UK-wide policies. It recommends systematic population screening programmes for breast cancer, cervical cancer and bowel cancer. It is up to each part of the UK to determine when, and how, to put those policies into practice. This means that there will be some differences in the screening services available in England, Northern Ireland, Scotland or Wales.

Key screening measures are 'coverage' and 'uptake'. These definitions vary by tumour group and are detailed below.

Breast screening

Purpose

Breast screening is intended to detect breast cancer at an early stage, enabling more effective treatment.

Invited population

In the UK, women aged 50 to 70 are routinely invited for breast screening every 3 years under a national programme. Women over the age of 70 can request screening every 3 years by making an appointment at their local screening unit, but they do not receive invitations. Since 2010 some parts of England have extended screening to those aged 47 to 73 as part of a trial. In Wales, younger women at increased risk of breast cancer can be referred by the All Wales Cancer Genetics service for screening.

Coverage

For a given time point, the percentage of women resident and eligible for screening who had a test with a recorded result within the last 3 years.

Uptake

The percentage of women who, having been sent an invitation for screening, attend a screening unit and undergo mammography in response to that invitation.

Cervical screening

Purpose

Cervical screening is intended to detect abnormalities within the cervix that could, if untreated, develop into cancer.

Invited population

Women aged 25 to 49 are invited for screening every 3 years. Women aged 50 to 64 are invited every 5 years.

Coverage

The percentage of women who were screened adequately within a specified period as a percentage of eligible women. The period for women aged 25 to 49 is 3.5 years, and for women aged 50 to 64 is 5.5 years.

Uptake

The percentage of people with a final screening test result, out of those eligible.

Bowel screening

Purpose

Bowel screening is intended to detect bowel cancer at an early stage, when treatment is more likely to be effective or to help prevent cancer from developing in the first place by allowing the treatment of pre-cancerous conditions.

Invited population

All UK programmes invite men and women for bowel screening every 2 years. Screening is offered to people aged 50 to 74 in Scotland, and to those aged 60 to 74 in Wales, England and Northern Ireland. A further one-off diagnostic test using flexible sigmoidoscopy is being piloted in England, aimed at men and women aged 55. In

August 2018 the UK National Screening Committee recommended the bowel cancer screening should be offered from age 50 to 74 using the new faecal immunochemical test (FIT) kit.

Coverage

The proportion of eligible men and women aged 60 to 74 years invited for screening who have had an adequate screening result in the previous 30 months.

Uptake

The proportion of eligible men and women aged 60 to 74 years invited to participate in bowel cancer screening who adequately participate.

Key statistics

- Screening coverage (2018) from Public Health Outcomes Framework, Health Improvement, metrics 2.20i-iii by region, county and district
- Coverage and uptake (2017/18) from Cancer Services profiles, by region, county and district
- Breast Screening Programme summaries (2017/18), including an interactive dashboard for England and regions
- Audit of screen detected breast cancer (2017/18) published by Association of Breast Surgery by devolved administrations, and English regions
- Cervical Screening Programme summaries (2017/18), by England, CCG and GP

Other sources of information

- UK screening portal contains information on the UK screening programmes
- NHS bowel cancer screening programme in England
- NCRAS data briefing 'Improved Survival for Screen-Detected Breast Cancer' based on data from the ABS Audit
- 'Outcomes from the first UK bowel cancer screening programme (BCSP) site: screening and surveillance experience since 2006', Padmanabhan H, 2015 BMJ Gut
- 'Reasons for non-uptake and subsequent participation in the NHS Bowel Cancer Screening Programme: a qualitative study', Palmer et al. 2014, British Journal of Cancer
- Flexible-sigmoidoscopy trial results
- 'Nationwide bowel cancer screening programme in England: cohort study of lifestyle factors affecting participation and outcomes in women' Blanks R G, 2015, British Journal of Cancer
- 'Outcomes of the Bowel Cancer Screening Programme (BCSP) in England after the first one million tests', Logan R, 2012, BMJ Gut

- Scotland breast screening statistics: Annual statistics (2018) published on the Information Services Division (ISD) Scotland website
- Wales breast screening statistics: Annual statistical report (2017-18)
- Northern Ireland breast screening statistics: Annual report and statistical bulletin (2012-13)
- Scotland cervical screening statistics: Scottish Cervical Screening Programme (2016-17)
- Wales cervical screening statistics: Cervical Screening Wales Programme (2018-19)
- Northern Ireland cervical screening statistics: Northern Ireland cancer screening programme
- Scotland bowel screening statistics: Scottish bowel screening programme key performance indicators (2018)
- Wales bowel screening statistics: annual report 2017-18
- Northern Ireland bowel screening statistics: Bowel screening programme reports up to 2013

Routes to diagnosis

Routes to Diagnosis defines a methodology by which the route the patient follows to the point of diagnosis can be categorised to examine demographic, organisational, service and personal reasons for delayed diagnosis. Administrative hospital episode statistics (HES) data is combined with cancer waiting times (CWT) data, data from the cancer screening programmes and cancer registration data. Using these datasets, every case of cancer registered is categorised into one of 8 routes to diagnosis.

Different cancers show substantial differences in the proportion of cases that present by each route, in reasonable agreement with previous clinical studies. Patients presenting via emergency routes have substantially lower one-year relative survival. This methodology can be used to explore possible reasons for delayed diagnosis, direct the focus of early diagnosis initiatives and identify areas for further research.

Graph from CRUK www.cancerresearchuk.org/health-professional/cancer-statistics/diagnosis-and-treatment#heading-Zero