Office for National Statistics

Statistical bulletin

Geographic patterns of cancer survival in England: adults diagnosed 2012 to 2016 and followed up to 2017

Cancer survival estimates for England by NHS Region, Cancer Alliance, and Sustainability and Transformation Partnerships.

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1 . Main points

- 1-year survival estimates were above 75% and 5-year survival estimates were above 50% for the majority of the 14 cancer sites and 67 geographies examined.
- For most cancer sites and geographies, there were increasing trends in 1-year survival, between 2009 and 2016, and 5-year survival, between 2005 and 2012; although there were a few statistically significant decreases in 1-year survival for some geographies and cancer sites, most commonly for bladder cancer.
- For Cancer Alliances, the difference between the minimum and maximum 1-year survival estimates varies from 1.7 percentage points for prostate and breast cancers to 11.8 percentage points for stomach cancer.
- Comparing the Sustainability and Transformation Partnerships, the difference between the minimum and maximum 1-year survival estimates varies from 2.5 percentage points for breast and prostate cancers to 16.8 percentage points for cervical cancer.

2 . Collaboration

The cancer registration and net survival data in this bulletin have been collected and calculated by the National Cancer Registration and Analysis Service (NCRAS) within Public Health England (PHE). The Office for National Statistics (ONS) collects and provides the mortality data that PHE include in the survival analysis, as well as the life tables used to construct the survival outputs. The ONS works with PHE to quality assure the outputs. The ONS independently produces the bulletin based on the survival analysis produced by PHE, including determining the focus, content, commentary, illustration and interpretation of the survival analysis presented.

To ensure timely and accurate data delivery, the ONS and PHE have agreed on what data we expect and require from PHE, outlining quality, timing, definitions and format of data supply, and explaining how and why the data will be used.

3 . Things you need to know about this release

What’s included in this bulletin?

This bulletin provides age-standardised net 1-year and 5-year survival estimates, with 95% confidence intervals, for adults (aged 15 to 99 years) diagnosed with one of 14 common cancers in England between 2012 and 2016, followed up for their vital status for at least one whole calendar year to 31 December 2017. It also provides an unstandardised time series to support an eight-year trend analysis.

Survival estimates are presented for 14 cancer sites:

- bladder
- breast (in women)
- cervix
- colon
- colorectal
- kidney and urinary tract
- lung
- myeloma
- non-Hodgkin lymphoma
- oesophagus
- prostate
- rectal
- stomach
- uterus

These 14 cancer sites represent almost three-quarters of new cancers (excluding non-melanoma skin cancer) diagnosed in England in 2016. These cancers are included in the analysis as they have a wide range of pathways for diagnosis and treatment, and different levels of survival. Estimates of 1-year and 5-year net survival are presented for each sex, and for both sexes combined where appropriate.

Following advice from important stakeholders, subnational survival estimates are presented for the latest NHS geographical areas. Results are presented for England as a whole, and for three levels of organisation of the NHS in England:

- five NHS Regions
- 19 Cancer Alliances (CA) (average population about 2.9 million)
- 42 Sustainability and Transformation Partnerships (STP) areas (average population about 1.3 million)

This subnational analysis focuses on these areas, which are leading the local delivery of the improved cancer outcomes set out in Achieving world-class cancer outcomes: A Strategy for England 2015 to 2020. Further details of these health geographies can be found in the Quality and Methodology Information report.

The Office for National Statistics in partnership with Public Health England produce a number of official and National Statistics cancer survival publications. In Table 1 (Section 6) we have summarised the purpose of each publication and the similarities and differences between them.

What's changed in this release?

This bulletin includes the same methodology changes as the Cancer survival in England: national estimates for patients followed up to 2017 publication. Further details of the changes are provided in The impact of updating cancer survival methodologies for national estimates, 2019; the impact shown for England will be similar, with minor geographic variation, for NHS Regions, CAs and STPs. A back-series of the geographic variation survival estimates is provided with the accompanying datasets.

How to interpret these statistics

These subnational cancer survival estimates are based on net survival, which is calculated by comparing the survival of cancer patients with that of the general population. Estimates are age-standardised to adjust for changes in the age profile of cancer patients over time and differences between geographical areas.

Where it was not possible to age-standardise due to failing one or more robustness tests, the unstandardised estimate has been presented instead.

These cancer survival estimates are designated as National Statistics. National Statistics are a subset of official statistics, which have been certified by the UK Statistics Authority as compliant with its Code of Practice for Statistics.

4 . Geographic patterns of cancer survival

England

In England as a whole, 1-year survival estimates were above 75% and 5-year survival estimates were above 50% for the majority of cancer sites analysed for this bulletin, except for lung, oesophagus, stomach and bladder (in women and persons for 1-year and women for 5-year). These estimates are the same as the equivalent estimates in the national cancer survival bulletin, which focuses on 1-year and 5-year survival for adults diagnosed with one of 29 common cancers in England.

This subnational survival bulletin includes trend analysis to assess geographical improvements over time. Trends in cancer survival are shown in the datasets as the annual change in net survival over the eight-year periods 2005 to 2012 (for 5-year survival), and 2009 to 2016 (for 1-year survival).

In England as a whole and for both sexes, 1-year survival improved between 2009 and 2016 for all but two of the 14 cancers examined in this report, with the largest improvement of 1.3% on average per year for lung cancer in women. There was a small reduction in 1-year bladder cancer survival in both men (0.2%) and women (0.3%); although a decreasing trend was seen previously, this is the first time it has been statistically significant for persons.

A possible reason for this decrease is that during the period under observation, there have been periods of a worldwide shortage of the therapeutic treatment Bacille Calmette-Guérin (BCG) used to treat higher risk bladder cancer patients diagnosed at an early stage of disease progression (about one in five of all bladder cancer patients). This may explain the contrast between the decreasing trend for 1-year bladder cancer survival and improvements in cancer sites other than bladder. There was also a small, but not statistically significant, decrease of 0.1% in 1-year survival for colon cancer in women.

For 5-year survival estimates, there was an average annual increase in net survival over the eight-year period from 2005 to 2012 for all of the 14 cancer sites reported in this bulletin, except bladder cancer in women.

Cancer Alliances

1-year and 5-year survival estimates have been calculated across all 19 Cancer Alliances (CAs). Figure 1 shows the minimum and maximum CA 1-year net survival estimate for each cancer site, including the national estimate for England.

Figure 1: Across Cancer Alliances, the range of 1-year survival estimates varies from 1.7 percentage points for prostate cancer to 11.8 percentage points for stomach cancer

Age-standardised 1-year net cancer survival (%) for adults diagnosed in the period 2012 to 2016 and followed up to 2017, and the range of survival estimates for Cancer Alliances: England, by cancer site

Notes:

1. Survival estimates were age-standardised using a standard set of age-specific weights.
2. Adults aged 15 to 99 years for all persons except for sex-specific cancers (breast, cervix and uterus for women and prostate for men).
3. The International Classification of Diseases 10th Revision (ICD-10) was used to classify cancer sites.

Across CAs, the range in 1-year survival estimates is narrowest for prostate [1] cancer in men and breast cancer in women, with the difference between the minimum and maximum being 1.7 percentage points for both.

The largest range in 1-year survival estimates is for stomach cancer, with a range of 11.8 percentage points between the lowest (42.7% for Kent and Medway) and highest (54.5% for South East London) CAs.

Figure 2: Explore Cancer Alliance 1-year survival estimates by cancer site

Age-standardised 1-year net survival (%) for adults diagnosed in the period 2012 to 2016 and followed up to 2017: 14 common cancers, by sex for selected Cancer Alliances

Notes:

1. Only standardised survival estimates are included here; estimates were suppressed if no robust age-standardised estimate was available.
2. Survival estimates were age-standardised using a standard set of age-specific weights.
3. Adults aged 15 to 99 years.
4. The International Classification of Diseases 10th Revision (ICD-10) was used to classify cancer sites.

As shown in Figure 2, for the majority of CAs prostate cancer had the highest 1-year survival of all sites included in the analysis, with the exception of two CAs where breast cancer had the highest survival (South Yorkshire, Bassetlaw, North Derbyshire and Hardwick Cancer Alliance; and Surrey and Sussex Cancer Alliance). Lung cancer had the lowest 1-year survival across all CAs.

Across the 14 cancer sites, the CA with the largest difference in 1-year survival estimates was Lancashire and South Cumbria Cancer Alliance, a difference of 60.2 percentage points from 35.9% for lung cancer to 96.1% for prostate cancer. The smallest difference, where 1-year survival estimates were closer together across cancer sites, was in the North West and South West London Cancer Alliance, with a difference of 52.3 percentage points from 43.8% for lung cancer to 96.1% for prostate cancer. These differences are driven by variation in lung cancer survival estimates, as these two CAs had the lowest and highest, respectively, lung cancer survival estimates across all CAs.

For 5-year survival, robust age-standardised estimates could not be obtained for some cancer sites and some CAs. Of the cancer sites where robust age-standardised estimates were available for at least half of CAs, the largest range of CA estimates was for kidney and urinary tract cancers, ranging from 55.5% (East Midlands Cancer Alliance) to 70.5% (North West and South West London Cancer Alliance). Similarly, the smallest range of CA estimates was for prostate cancer, ranging from 84.1% (South Yorkshire, Bassetlaw, North Derbyshire and Hardwick Cancer Alliance) to 89.2% (East of England Cancer Alliance).

Across all CAs, prostate or breast cancer had the highest 5-year survival estimates and lung, colon or oesophageal cancer had the lowest 5-year survival estimates.

Sustainability and Transformation Partnerships

Sustainability and Transformation Partnerships (STPs) are partnerships between NHS and local councils to improve health and care in practical ways. They are smaller areas than Cancer Alliances, and more variation can be expected due to smaller populations (average population of approximately 1.3 million compared with 2.9 million in Cancer Alliances).

The range of estimates was larger than 10 percentage points for six cancer sites: cervical, stomach, kidney and urinary tract, oesophageal, myeloma and bladder cancers. Breast and prostate cancers had the smallest ranges in estimates.

Figure 3: Across Sustainability and Transformation Partnerships, the range of 1-year survival estimates varies from 2.5 percentage points for breast cancer to 16.8 percentage points for cervical cancer

Age-standardised 1-year net cancer survival (%) for adults diagnosed in the period 2012 to 2016 and followed up to 2017, and the range of survival estimates for Sustainability and Transformation Partnerships: England, by cancer site

Notes:

1. Only standardised survival estimates are included here; STPs were excluded from this comparison if no robust standardised estimate was available. The number in brackets shows the number of STPs included in the comparison, with a robust age-standardised estimate.

2. Survival estimates were age-standardised using a standard set of age-specific weights.

3. Adults aged 15 to 99 years for all persons except for sex-specific cancers (breast, cervix and uterus for women and prostate for men).

4. The International Classification of Diseases 10th Revision (ICD-10) was used to classify cancer sites.

Figure 4 can be used to explore the variation by STP in age-standardised 1-year net cancer survival estimates for adults diagnosed between 2012 and 2016.

Figure 4: Explore Sustainability and Transformation Partnership 1-year survival estimates by cancer site

Age-standardised 1-year net cancer survival estimates for adults in England diagnosed between 2012 and 2016 and followed up to 2017, by STP

Notes:

1. Only standardised survival estimates are included here; STPs estimates were suppressed on the map (shown in grey) if no robust age-standardised estimate was available.
2. Survival estimates were age-standardised using a standard set of age-specific weights.
3. Adults aged 15 to 99 years for all persons except for sex-specific cancers (breast, cervix and uterus for women and prostate for men).
4. The International Classification of Diseases 10th Revision (ICD-10) was used to classify cancer sites.

Estimates of 5-year net survival for STPs are provided in the datasets where they are deemed to be robust. However, a full comparison of these estimates is not reported due to the suppression of many estimates.

NHS Regions

England is split into five NHS regions:

- North of England
- Midlands and East of England
- London
- South East
- South West

As these regions contain larger populations than Cancer Alliances and Sustainability and Transformation Partnerships, variation in survival estimates is smaller. For both 1-year and 5-year survival, the North of England, and the Midlands and East of England tend to have lower estimates; conversely, the South West and the South East tend to have higher estimates. Varying by cancer site, London sometimes has lower and sometimes higher estimates.

Data for these regions are available in the accompanying datasets.

Notes for: Geographic patterns of cancer survival

1. The introduction of the Prostate-Specific Antigen (PSA) test during the 1990s increased the diagnosis of asymptomatic prostate cancers. Men with these tumours have higher survival. There is continuing geographic variation in the usage of these tests, which will contribute to the geographical variation of survival estimated in prostate cancer.

5 . Who uses these statistics and for what purpose?

Subnational survival estimates are presented here for the latest geographies: Cancer Alliances (CAs) and Sustainability and Transformation Partnerships (STPs). CAs were established in late 2016 (September to December) to lead local implementation of the 2015 cancer strategy. STPs were established in December 2016 as local partnerships between NHS organisations and councils in 42 areas, which aim to improve health and care by setting out practical ways to improve NHS services and health outcomes.

Previous editions of this bulletin have presented cancer survival estimates for Clinical Senates, Area Teams, Government Office Regions, Strategic Health Authorities (SHA) and Cancer Networks, which are no longer applicable.

Subnational survival estimates are also published for Clinical Commissioning Groups (CCG), using a different methodology and reported as an index of cancer survival.

The official statistics are commissioned by the Department of Health and Social Care and are used to:

- help inform government policy on cancer
- help inform programmes aimed at improving cancer outcomes
- provide non-government bodies with accurate and timely data on the disease
- provide citizens with accessible data on the disease to help inform debate

Health policymakers use population-based cancer survival statistics to plan services aimed at cancer prevention and treatment. Cancer survival estimates feed in to national cancer plans, such as Achieving world-class cancer outcomes: A Strategy for England 2015 to 2020. The report recommends six strategic priorities to help improve cancer survival in England by 2020.

Cancer survival estimates also feed into outcomes strategies that set out how the NHS, public health and social care services will contribute to the progress agreed with the Secretary of State, in each of the high-level outcomes frameworks. The indicators set for the Compendium of Population Health Indicators include 1-year and 5-year survival from bladder, breast, cervical, colorectal, lung, oesophagus, prostate and stomach cancers.

6 . Links to other related statistics

In common with all the other cancer survival bulletins, this publication is based on the data summarised in the Cancer registration statistics, England statistical bulletin.

Estimates for England are the same as those presented in Cancer survival in England: national estimates for patients followed up to 2017; combining diagnoses from across England allows for survival estimates to be presented for a further 15 cancer sites.

Estimates for Cancer Alliances (CAs) and Sustainability and Transformation Partnerships (STPs) are also presented in the Index of cancer survival for Clinical Commissioning Groups in England: adults diagnosed 2001 to 2016 and followed up to 2017 for breast, colorectal and lung cancers and an index of all cancers combined for single diagnosis years using a different methodology. The results presented here are not directly comparable because of this methodological difference. The main use for the index of cancer survival in other geographies is the calculation of an all-cancer estimate of survival.

Users interested in survival estimates by cancer site and local geographies should use this geographic patterns publication.

More information on the contents and uses of these publications can be found in the article Cancer statistics explained: different data sources and when they should be used. Table 1 also provides a brief outline of the similarities and differences between our cancer survival outputs.

Table 1: Similarities and differences between the latest cancer survival publications

	Cancer survival in England	Index of survival for Clinical Commissioning Groups in England	Geographic patterns of cancer survival
Purpose	Provides 1-year and 5-year net cancer survival for adults in England, for all cases and by stage at diagnoses. Provides 1-year, 5-year and 10-year predictions of net cancer survival for adults diagnosed in 2016 in England.	Provides 1-year net survival for all-cancers combined; for breast, colorectal and lung cancer separately; and for these three cancers combined.	Provides 1-year and 5-year cancer survival estimates for England by Sustainability Transformation Partnership (STP), Cancer Alliance (CA) and NHS Region.
Age	All these publications relate to cancer survival for adults aged 15 to 99 years.		
Data source	All publications use data from the National Cancer Registration and Analysis Service, within Public Health England.		
Sites	Provides estimates for 29 cancer sites.	Provides an all-cancer survival estimate (excluding prostate cancer). Provides estimates for breast, colorectal and lung cancer separately.	Provides estimates for 14 cancer sites.
Timeframe	Cohorts, diagnosed between 2012 and 2016 followed up to 2017.	Trend (2001 to 2016) of adults followed up to 2017.	Cohorts, diagnosed between 2012 and 2016 followed up to 2017. Trends; 1-year (2009 to 2016) and 5-year (2005 to 2012) followed up to 2017.
Geographies	England cancer survival estimate.	England cancer survival estimate. Provides lower-level geographies; CCG, STP and CA.	England cancer survival estimate. Provides lower-level geographies; STP, CA and NHS region.

Source: Public Health England – National Cancer Registration and Analysis Service, Office for National Statistics

The Office for National Statistics also publishes statistics on Childhood Cancer Survival for children aged (0 to 14 years) diagnosed with cancer in England. This release provides an all cancer survival estimate trend for the years 2001 to 2016 followed up to 2017 using data from the National Cancer Registration and Analysis Service, Public Health England.

Statistics on cancer around the UK are produced in:

- Scotland by the Scottish Cancer Registry
- Wales by the Welsh Cancer Intelligence and Surveillance Unit
- Northern Ireland by the Northern Ireland Cancer Registry

7 . Quality and methodology

The Cancer Survival Quality and Methodology Information report contains important information on:

- the strengths and limitations of the data and how it compares with related data
- uses and users of the data
- how the output was created
- the quality of the output including the accuracy of the data

8 . Authors

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