

Cancer Survival by Cancer Network in England - Patients diagnosed 1996-2009 and followed up to 2010



Coverage: **England**

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Theme: **Health and Social Care**

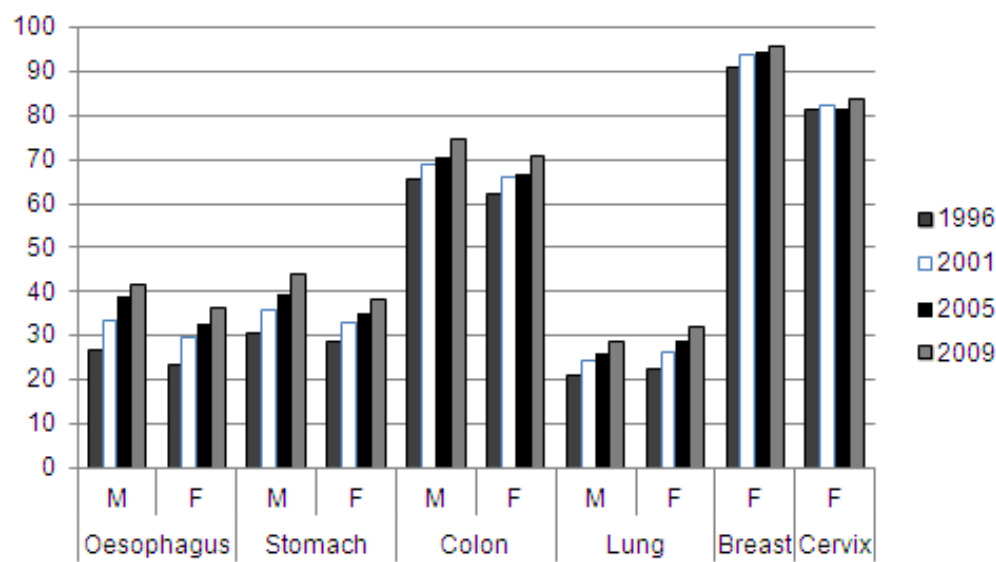
Headline Figures

- One-year and five-year net survival from cancers of the oesophagus, stomach, colon, lung and breast (women) improved by 3 to 15 per cent for adults in England diagnosed in 2009 compared to those diagnosed in 1996.
- There were disparities in net survival between the 28 Cancer Networks of England, with a difference of over 10 per cent between the networks with the highest and lowest one-year net survival for cancers of the oesophagus, stomach, colon (women), lung (women) and cervix in 2009.
- Regional disparities were relatively stable over the period 1996–2009, despite the large overall improvements in survival.

Summary

This report presents one-year and five-year age-standardised net survival estimates (see background note 3) for the 28 Cancer Networks of England, for patients who were diagnosed with a cancer of the oesophagus, stomach, colon, lung, breast (women) or cervix during 1996–2009 and followed up to 31 December 2010. One-year survival estimates are reported for patients diagnosed in 1996, 2001, 2005 and 2009, and five-year survival for those diagnosed in 1996, 2001 and 2005.

Figure 1: One-year age-adjusted net survival (per cent) for adults diagnosed with one of six cancers, England, 1996-2009: by year of diagnosis and sex



Source: ONS and London School of Hygiene and Tropical Medicine

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Table 1: Range in one and five-year age-standardised net survival between Cancer Networks in England, 1996-2009

		One-year				Five-year		
		1996	2001	2005	2009	1996	2001	2005
Oesophagus	Men	18.6	19.3	15.7	16.9	6.2	7.8	7.4
	Women	14.7	14.1	14.2	13.8	4.3	8.5	7.7
Stomach	Men	17.2	14.4	10.9	14.8	10.6	9.7	11.9
	Women	20.9	14.2	13.5	18.0	8.4	7.7	13.9
Colon	Men	10.3	11.9	8.5	9.1	11.0	14.2	11.0
	Women	15.4	12.1	12.0	11.3	17.4	14.5	13.4
Lung	Men	9.7	6.8	8.1	9.1	4.0	3.3	5.2
	Women	12.0	9.8	11.1	11.0	7.4	4.8	7.5
Breast	Women	4.5	4.1	3.2	3.0	9.1	6.6	8.0
Cervix	Women	11.3	8.0	8.0	10.4	12.0	8.3	9.4

Source: ONS and London School of Hygiene and Tropical Medicine

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Results

The range in one-year survival between the Cancer Networks with the highest and lowest survival in 2009 was widest for women diagnosed with stomach cancer, at 18.0 per cent, and the narrowest was for women diagnosed with breast cancer, at 3.0 percent. For five-year survival the range between the Cancer Networks in 2005 was widest for women diagnosed with stomach cancer at 13.9 per cent and narrowest for men diagnosed with lung cancer at 5.2 per cent.

These estimates should not be used to rank Cancer Networks by their survival, because a change of just one or two per cent may radically alter the ranking of a given network.

One-year and five-year age-standardised net survival estimates for each of the six cancers are presented in [tables and charts \(715.5 Kb Excel sheet\)](#) by Cancer Network, sex and calendar period. [Maps \(0.98 Mb Pdf\)](#) show the most recent survival estimates by Cancer Network and sex for patients diagnosed in 2009 (one-year survival) and 2005 (five-year survival). A [summary map \(82.9 Kb Pdf\)](#) shows the location of the Cancer Networks in England.

Additional Information

Further information about the cancer survival estimates published by the Office for National Statistics (ONS) can be found in the [Summary Quality Report](#) for cancer survival.

Summary quality reports are overview notes which pull together key qualitative information on the various dimensions of the quality of statistics as well as providing a summary of the methods used to compile the output. Information about key users of these statistics are also provided.

Policy Context

In [Improving Outcomes: A Strategy for Cancer](#) (January 2011), the Department of Health states that although improvements have been made in the quality of cancer services in England, a significant gap remains in survival compared with the European average. Survival rates for cervical, colorectal and breast cancer are some of the lowest among member states of the Organisation for Economic Co-operation and Development (OECD). The Outcomes Strategy sets out how the Department of Health aims to improve outcomes for all cancer patients and improve cancer survival rates, with the aim of saving an additional 5,000 lives every year by 2014/15.

Outcomes strategies set out how the NHS, public health and social care services will contribute to the ambitions for progress agreed with the Secretary of State in each of the high-level outcomes frameworks. The indicator set for the National Health Service (NHS) [Outcomes Framework](#) includes one- and five-year relative survival from colorectal, breast and lung cancers.

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Authors

Ula Nur,^a Michel P Coleman,^a Emma Gordon,^b Natalie Jakomis,^b Chris Carrigan^c and Bernard Rachet^a

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Background notes

1. National cancer registration data for England were received from the National Cancer Registry at the Office for National Statistics (ONS), which collates cancer registrations submitted

by regional cancer registries in England. The National Health Service Information Centre (NHS IC) updates these records with the registration of death or emigration. The data used in these analyses were extracted from the live database at ONS on 11 July 2011 and provided to the Cancer Research UK Cancer Survival Group at the London School of Hygiene and Tropical Medicine on 22 July 2011.

2. All adults (15–99 years) who were diagnosed with a first, invasive, primary, malignancy during the period 1996–2009 were eligible for inclusion in the analyses. We excluded patients who were diagnosed with a tumour that was benign (behaviour code 0), in situ (2) or of uncertain behaviour (1). Patients were excluded if their cancer was only registered from a death certificate. Patients with zero recorded survival time were included in the analyses with one day added to their survival. [Table 2 \(29 Kb Excel sheet\)](#) shows the number of patients excluded and [Table 3 \(25.5 Kb Excel sheet\)](#) shows the final number of patients in each Cancer Network who were included in the analyses.

3. Net survival in a population of cancer patients is their survival from the cancer of interest in the absence of other causes of death. It was estimated at one and five years after diagnosis for each cancer, sex and year of diagnosis. Net survival was estimated with an excess hazard model in which the all-cause mortality is modelled as the sum of the excess (cancer-related) mortality hazard and the expected (or background) mortality. The background mortality is defined by life tables from the general population. This approach enables population-level cancer survival to be estimated in the absence of detailed data on the cause of death. To obtain an unbiased estimation of net survival, age needs to be carefully modelled to account for the informative censoring associated with age (Danieli et al., 2011). We used flexible parametric models (Royston and Parmar, 2002) with age and year of diagnosis as main effects and an interaction between age and year of diagnosis. We also examined interactions between year and follow-up time and between age and follow-up time to deal with potential non-proportionality of the excess hazards over time since diagnosis. The Akaike Information Criterion (AIC) (Akaike, 1974) was used to select the best-fitting statistical model using the relative goodness of fit. The publicly available program, *stpm2*, was used to estimate net survival (Lambert and Royston, 2009). Analyses were performed in Stata 12 (Statacorp, 2011).

4. Life tables were constructed for the years 1996, 2001, and 2005 using the mid-year population estimates and the mean annual number of deaths in the three years centred on those index years (Cancer Research UK Cancer Survival Group 2004). Life tables for each year from 1996 to 2005 were created by linear interpolation. The life table for 2005 was used for 2006–09. Background mortality changes with time and varies by sex, age, socio-economic status and region, so life tables were created by single year of age, sex, Government Office Region (GOR) and deprivation quintile for each calendar year of death. National life tables were used for the very small number of patients with missing GOR, and regional life tables for those with missing deprivation category.

5. The age distribution of cancer patients at diagnosis changes with time and varies between Cancer Networks. Since survival also varies with age at diagnosis, robust summary comparisons of survival require control for these differences. The directly standardised overall survival figure for each cancer is a weighted average of the age-specific survival estimates, with standard weights taken from the proportionate distribution by age and sex of patients diagnosed in England and Wales during 1996–99. Age-standardisation requires a set of survival estimates for each age group. It is not always possible to obtain an estimate for each combination of cancer, age group, sex and calendar year of diagnosis in geographic units with small populations because of the limited number of cases. In this situation, the missing estimate was replaced by the equivalent age-specific estimate for England.

6. A 95 per cent confidence interval is a measure of the uncertainty around an estimate. It provides a range of values which contains the true population value with a 95 per cent level of confidence.

7. Cancer Networks were formed in 2001 following the recommendations of the Calman–Hine report (Expert Advisory Group on Cancer, 1995) and the NHS Cancer Plan (Department of Health, 2000). The most recent Cancer Network boundaries were applied to the whole period 1991–2006, enabling geographic trends to be charted over time (Figure 7). Cancer Network populations range from 0.6 to 3.0 million (2002 figures), making them more suitable for detailed statistical comparison of survival than smaller health geographies such as Primary Care Trusts. The role of Cancer Networks in the organisation of cancer services, and in improving regional equity in cancer management, makes them a meaningful unit with which to describe the geography of cancer survival in England (Ellis et al., 2007).

8. Cancers were defined by codes in the International Classification of Diseases, Tenth Revision (ICD-10) and International Classification of Diseases for Oncology, Second Edition (ICD-O-2). See [Table 2 \(29 Kb Excel sheet\)](#)

9. Details of the policy governing the release of new data are available from the Media Relations Office.

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Email: psi@nationalarchives.gsi.gov.uk

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Office for National Statistics, Government Buildings, Cardiff Road, Newport NP10 8XG

Media contact:

Tel: Media Relations Office + 44(0)845 6041858

Emergency on-call 07867 906553

Email: media.relations@ons.gsi.gov.uk

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This document is also available on our website at www.ons.gov.uk.

Statistical contacts

Name	Phone	Department	Email
Natalie Jakomis	+44 (0)1633 456801	Cancer Analysis Team	natalie.jakomis@ons.gsi.gov.uk

Issuing Body:

Office for National Statistics

Media Contact Details:

Telephone: 0845 604 1858
(8.30am-5.30pm Weekdays)

Emergency out of hours (limited service): 07867 906553

Email:

media.relations@ons.gsi.gov.uk