Publication date: 19 January 2021
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Introduction

Cancer is the leading cause of death in Scotland. The purpose of this report is to provide a description of one of the main cancer outcomes - survival - for all patients who were diagnosed with a cancer in Scotland between 2013 and 2017. Population-based cancer survival reflects the totality of efforts to improve cancer outcomes – from early detection through to prompt diagnosis and effective treatment.

An increasing proportion of the deaths among cancer patients are due to causes of death other than their cancer. This “background mortality” from other causes varies among cancer patients by age, sex, region, socio-economic status and over time, just as it does in the general population. Net survival is a measure that takes detailed account of background mortality among cancer patients, to reflect the survival from the cancer itself. This enables fair comparison of survival trends for different cancers, either over time, between the sexes, or between population groups.

Net survival from cancer is often lower in older than in younger patients, even after correction for background mortality. For this reason, changes over time in net survival for all cancer patients combined, or differences between groups of patients, may be due to changes over time, or differences between groups, in the age-profile of cancer patients. When we present net survival figures for all ages combined, they are age-standardised, to remove the impact of any such changes or differences in the age-profile of the cancer patients whose survival is being compared. Survival is also presented for specific age-groups.

This publication provides information on cancer survival in Scotland for people who were diagnosed between 2013 and 2017 and followed until the end of 2018, as well as long-term trends in survival for patients diagnosed since 1993. Cancer survival information is presented for 27 types of cancer for Scotland as a whole, and for the 4 most common types of cancer for subpopulation groups defined by socio-economic circumstances.

The information presented here updates information previously published in 2015 on the Public Health Scotland (PHS) website. Because this report includes a new methodology for estimating survival, direct comparisons cannot always be made with previously published cancer survival statistics. This report will now be published annually.
Cancer registration in Scotland

The Scottish Cancer Registry has been collecting data about all cancers diagnosed in residents of Scotland since 1958. Information derived from analysis of these data is used for a wide variety of purposes, including public health surveillance; health needs assessment, planning and commissioning of cancer services; evaluation of the impact of interventions on incidence and survival; clinical audit and health services research; epidemiological studies; and providing information to support genetic counselling and health promotion. This information is published by PHS.

New developments in the Scottish Cancer Registration and Intelligence Service will make the information derived from cancer registration more readily available and will facilitate linkage to the Registry of additional data on waiting times, screening, diagnosis and treatment, to improve understanding of their impact on cancer outcomes.

Acknowledgements

This publication uses data shared by patients and collected by the NHS as part of their care and support.

The data were processed during 2020 in accordance with the UK Data Protection Act 2018 and the EU General Data Protection Regulation (GDPR). The GDPR was in force in the UK until 31 December 2020, when the UK ceased to be an EU Member State. A modified version (the UK GDPR) will be in force from 1 January 2021, with very similar provisions.

We are grateful to Professor Michel Coleman, Dr Claudia Allemani, Dr Pamela Minicozzi and Ms Veronica Di Carlo, of the Cancer Survival Group at the London School of Hygiene and Tropical Medicine (LSHTM), for their generous assistance in preparing this work and assuring its quality.
Methods

Observed survival, net survival and age-standardisation

Observed survival is the probability that individuals diagnosed with a cancer will survive for a given time since diagnosis, such as 1, 5 or 10 years. Survival is usually expressed as a percentage, in the range 0 to 100%, for convenience. Observed survival is the simplest measure of survival, but it does not take account other causes of death, or changes in the age profile of cancer patients over time. Observed survival answers the question: what are the chances of surviving at least 1, 5 or 10 years after being diagnosed with cancer?

Net survival offers a more useful perspective on cancer outcomes. It provides an estimate of the probability that cancer patients will survive their cancer up to a given time since diagnosis after controlling for other causes of death. This is useful in understanding how early detection and the effectiveness of cancer treatment have changed over time, or how they differ between groups of patients in a given time period. Net survival is generally higher than observed survival because it controls for deaths due to other conditions. Net survival answers the question: what are the chances of surviving from the cancer itself?

Net survival is generally lower in older patients, even though it adjusts for other causes of death. Examination of trends in net survival for all adult patients requires an adjustment for any change in the age profiles of cancer patients over time. Age standardisation produces a one-number summary of survival for all ages combined as a weighted average of the survival estimates in each age group. For a given cancer, the same set of weights is used for each calendar period in the analysis. This means that the age-standardised survival figure will change only if survival in one or more of the age groups has changed. Age-standardised net survival answers the question: how does net survival from the specific cancer differ between groups of cancer patients, or change over time, when changes in the age profile of the cancer patients are controlled for?

Notable changes relative to previous publications

A number of changes have been implemented since the last publication in 2015:

1. Measures of survival reported:
The main aim of population-based cancer survival analysis is to partition the mortality experienced by cancer patients into two components: cancer-related mortality and general ‘background’ population mortality; or, in other words, to isolate the excess risk of death that is due to cancer – this allows us to estimate the ‘net survival’ from cancer. Estimates for net survival are obtained by estimating the probability that individual cancer patients will survive their cancer, after controlling for competing causes of death; and summing these up for all cancer patients. Survival probabilities are usually reported as the percentage of patients who have survived to a certain time point after diagnosis.

Numerous alternative methods have been developed to take account of the fact that the risks of death from causes other than the specific cancer under study (so-called ‘competing risks’) are higher in elderly patients than they are in younger patients. Previous reports by PHS on
cancer survival in Scotland have used a measure of survival called “relative survival” (i.e. the relative survival ratio). This method has been widely used in population-based studies of cancer survival for decades. However, in recent years, the Pohar-Perme estimator of net survival has been recognised as the only method that produces an unbiased estimate of net survival (see Cancer Survival Technical Report).

In this report, we have changed our estimator of the ‘net’ survival of cancer patients (compared to a matched demographic group in the general population) from “relative survival” to the new, unbiased Pohar-Perme estimator, called “net survival”.

2. Patient groups and cancers analysed:
This report provides estimates of cancer survival for 27 different cancer site groupings, as well as all cancers combined (excluding non-melanoma skin cancers).

For each of the 27 cancer sites, we report observed and net survival for patients diagnosed since 1993, analysed in five time periods, with the latest time period being 2013-2017. These calendar period cohorts are further broken down by sex and age-group (using five age-groups). The ‘observed’ survival estimates provide the percentage of patients who are still alive at a certain time point after diagnosis (calculated irrespective of whether the patients die of their cancer or some other cause), while the ‘net’ survival estimates provide the estimated percentage of patients who would be alive at a certain time point after diagnosis, if they could only die of their cancer (and it was not possible to die from some other cause).

For each cancer site, and for each of the five time periods, we also report the effect of age-standardisation on the estimates of observed and net survival for combined age-groups of 15-74 and 15-99 years.

We do not report net survival for all cancers combined because changes in the cancer case mix over time (i.e. the relative frequencies of different types of cancer) prevents meaningful interpretation of this measure. Moreover, as each type of cancer is a distinct disease, combining them into a single grouping is not always appropriate.

However, we do report overall ‘observed’ survival estimates for all cancers combined, with patient cohorts in each of the five time periods broken down by sex and age-group. We also provide observed survival and age-standardised survival for combined age-groups of 15-74 and 15-99 years. These estimates provide the percentage of patients alive at particular time point (1, 5 or 10 years after diagnosis) irrespective of whether they died of their cancer or from some other cause. These estimates have been provided solely to allow a general understanding around whether or not the outlook has improved for the 610,169 patients diagnosed with cancer in Scotland during the 25 years included in these analyses.

We do not report measures of survival for ‘all persons’, but focus on disaggregated statistics for separate sexes. This is because differing frequencies of incidence (or differential survival) between males and females, may yield ‘all persons’ estimates that mainly reflect the prognosis of only one sex or the other, thereby obscuring important differences (e.g. see sex differences in bladder, liver, lung and pancreatic cancers).
For the 4 most common cancers in Scotland (breast, colorectal, prostate and lung), we now provide estimates of survival for different socio-economic groups. Specifically, for these cancer sites, we report observed and net survival for patients diagnosed in four five-year time periods, with patient populations broken down by sex, age-group and deprivation quintile. For each sex and deprivation cohort, we also report age-standardised estimates of observed and net survival for combined age-groups of 15-74 and 15-99 years. For all cancers combined, we also report observed survival and age-standardised ‘observed’ survival, for different socio-economic groups.

3. Approach to small numbers: We have introduced more stringent minimum data requirements to ensure that estimates are more statistically robust (see Cancer Survival Technical Report).

Cancer survival analysis methods

The methods used to estimate cancer survival are described in a separate Technical Report available on the PHS website (Cancer Survival Technical Report). This publication provides estimates of observed survival from all cancers combined. Unless otherwise stated, estimates of survival for all cancers combined do not include non-melanoma skin cancers.

It is important to note that the proportions of different cancers that make up ‘all cancer combined’ varies and changes over time and that the proportion of older cancer patients has increased for some cancers over time (data not shown). This means that the most recent cohort of patients (2013-17) may be older than in previous years for some cancers, and their older age may in itself be associated with shorter survival.

Age-standardised survival estimates are the estimates that would occur if the population of cancer patients had the same age structure (as a standard population) over time (see Cancer Survival Technical Report). They essentially allow fairer comparisons to be made, either over time or with survival estimates produced by other countries. Age-standardised ‘observed’ survival is often greater than observed survival because this adjustment often increases the improvement in survival over time because it removes the effects of cancer patients becoming on average older over time. However, these impacts vary by cancer. Note that age-standardisation of observed survival does not strictly speaking yield an ‘observed’ survival (that applies to actual patients), but rather an adjusted estimate better suited for examining trends over time. However, we will sometime use the term age-standardised ‘observed’ survival for clarity and convenience, especially when making comparisons with age-standardised net survival.

For the purpose of this report, we consider there to be clear evidence for a change in survival between calendar periods (or a difference between demographic groups within a calendar period), if there is no overlap in the 95% confidence intervals estimated for the two patient cohorts being compared.
Main Points

During the five-year period 2013-17, 138,150 adults were diagnosed with cancer (excluding non-melanoma skin cancers) in Scotland. For these patients:

- Overall, two thirds of men (67%) and women (71%) survived for at least one year, while 2 in 5 men (43%) and 1 in 2 women (51%) survived for at least five years.

- However, an individual’s chance of survival depends largely on which cancer they have, with 1-year survival ranging from around 20% to almost 100%, for different types of cancer.

After taking account of changes in the population age structure over time:

- Survival from all cancers (excluding non-melanoma skin cancers) improved, at both one and five years, by around 2% between 2008-12 and 2013-17, for both men and women.

After using methods to take account of background mortality rates as well as changes in population age structure, survival appears to be improving for many cancers, but there was clear evidence for improvement in the following cases:

- For lung cancer, the most recent estimates of 1-year age-standardised net survival were: 36.7% in men and 44.9% in women, with corresponding 5-year estimates of 12.5% in men and 18.6% in women. This represents an absolute increase of 2.3 and 5.1 percentage points among men and women respectively since 2008-12.

- Similarly, 1-year survival clearly improved for cancers of the kidney, pancreas (in women), liver (in men), ovary, and multiple myeloma (in men). Five-year survival also clearly improved for cancers of the kidney (in men) and ovary.

Reasons for improved cancer survival may include diagnosis at an earlier stage and use of more effective treatments. Further analysis of additional data may help to show what has led to improvements in outcomes.

- Anyone offered screening for cancer should be encouraged to take it up and anyone who is worried about symptoms should be encouraged to seek medical advice: the chances of surviving cancer in Scotland have never been better.

Increasing socio-economic deprivation is associated with poorer survival from cancer. For example, the difference in 1-year age-standardised net survival between the most and least deprived 20% of the population were: for lung cancer, 7.8% in men and 5.8% in women; for breast cancer in women, 2.5%; for colorectal cancer, 8.1% in men and 8.3% in women; and for prostate cancer, 2.5%. Further analyses of additional data may help to understand why these differences occur.

This publication uses a new method of estimating cancer-specific survival – age-standardised net survival – which is considered to be the best way of understanding outcomes due to cancer itself rather than other factors (such as age and underlying background mortality).
Results and Commentary

The statistics discussed below can be found for each cancer on the Public Health Scotland website cancer topic area. Other statistics available there include cancer incidence, mortality, lifetime risk and prevalence.

Survival from all cancers combined (patients aged 15-99 years)

**Observed survival** (Figures 1a-b)

In 2013-17, of the 68,360 men diagnosed with a cancer (all cancers combined), 67.2% were alive one year, and 43.2% were alive five years after diagnosis. Over the same period, of the 69,790 women diagnosed with a cancer (all cancers combined), 71.1% and 50.5% were alive at one and five years after diagnosis. For both men and women, cancer survival has increased in every five-year period since 1993-97 (See the following Excel on our publication webpage: ‘Estimates of survival from all cancers’). Between 2008-12 and 2013-17, 1-year survival increased by 1.9 percentage points in men (from 65.3% to 67.2%) and 1.8 percentage points in women (69.3% to 71.1%).

**Age-standardised (observed) survival** (see Excel file: ‘Estimates of survival from all cancers’)

In 2013-17, age-standardised 1-year and 5-year survival in men were 68.9% and 45.7%, respectively, while in women, they were 71.9% and 51.6%, respectively. Between 2008-12 and 2013-17, age-standardised 1-year survival increased by 2.1 percentage points in both men and women, while age-standardised 5-year survival increased by 2.2 percentage points in men and by 1.6 percentage points in women.
Figure 1a: Observed survival for males aged 15-99 years, diagnosed during 2013-17 in Scotland, at 1 and 5 years since diagnosis.

Source: Scottish Cancer Registry, Public Health Scotland (PHS)

1. Observed survival for each cancer site grouping with sufficient data available for estimation.
2. Patients have been followed up until 31 December 2018. Estimates of observed survival for patients diagnosed during 2013-17 are therefore 'complete' estimates (see Technical Report).
3. Cancer registration is a dynamic process: the data presented here may differ from other published data relating to the same time period.
Figure 1b: Observed survival for females aged 15-99, diagnosed during 2013-17 in Scotland, at 1 and 5 years since diagnosis.

Source: Scottish Cancer Registry, Public Health Scotland (PHS)

1. Observed survival for each cancer site grouping with sufficient data available for estimation.
2. Patients have been followed up until 31 December 2018. Estimates of observed survival for patients diagnosed in 2013-17 are therefore ‘complete’ estimates.
3. Cancer registration is a dynamic process: the data presented here may differ from other published data relating to the same time period.
Survival from specific cancers (patients aged 15-99 years)

**Observed survival** (Figures 1a-b), **age-standardised (observed) survival, and age-standardised net survival** (Figures 2a-b, 3a-b, 4a-b and 5a-b)

Survival appears to be improving for many cancers, but there was clear evidence for improvement between 2008-12 and 2013-17 in the following cases: 1-year net survival clearly improved for cancers of the lung, kidney, pancreas (in women), liver (in men), ovary, and multiple myeloma (in men). Similarly, 5-year survival clearly improved for cancers of the kidney (in men) and ovary. It is important to note that, especially for less common cancers, changes in survival between periods can be difficult to distinguish from fluctuations due to chance and the relatively small numbers involved in the analyses.

**Trachea, bronchus and lung**

Lung cancers are the most common malignancy (excluding non-melanoma skin cancers) in Scotland. In 2013-17, 33.8% of men diagnosed with lung cancer survived at least 1 year and 9.1% survived at least 5 years (Figure 1a; Table 1a). For women, survival was better, with 40.4% surviving at least 1 year and 14.0% surviving at least 5 years (Figure 1b; Table 1b). Between 2008-12 and 2013-17, 1-year age-standardised (observed) survival increased by 3.3 percentage points in men (from 32.3% to 35.6%), and although there also appeared to be a smaller increase in 5-year survival between the two cohorts, this was not significant (see Excel file: ‘Estimates of survival from lung cancer’). For women with lung cancer, age-standardised survival improved between 2008-12 and 2013-17 more than it had in any previous successive 5-year period since the early 1990s. In 2013-17, 1-year survival was up by 7.5 percentage points in women with lung cancer (from 36.5% to 44.0%), while 5-year survival increased by 4.6 percentage points from 12.2% in 2008-12 to 16.8%.

For men, age-standardised net survival from lung cancer was 36.7% at 1 year after diagnosis and 12.5% at 5 years (Figure 2a). For women, net survival from lung cancer was better at 44.9% at 1 year after diagnosis and 18.6% at 5 years (Figure 2b). Improvements in age-standardised net survival over time (Figures 4a-b and 5a-b) were greater than for observed or age-standardised observed survival, suggesting that improvements in cancer outcomes had occurred. For example, between 2008-12 and 2013-17, age-standardised 5-year net survival from lung cancer increased by 2.3 percentage points in men and 5.1 percentage points in women.

**Breast**

Breast cancer is the most common malignancy in women in Scotland. It also occurs in men, though this is relatively rare. Therefore, we present results for women only. For the 21,449 women diagnosed with breast cancer in 2013-17, 94.1% were alive one year after diagnosis and 77.4% were alive at 5 years (Figure 1b; Table 1b). Observed survival of women with breast cancer increased in every five-year calendar period from 1993-97 to 2013-17, although not all the differences were significant (see Excel file: ‘Estimates of survival from breast cancer’).
Due to the hormonal nature of breast cancer, there are relatively more women in the younger age groups than seen in many other cancers, and therefore adjusting for age means that the age-standardised survival (see Excel tables) of women with breast cancer was lower than observed survival (Figure 2b). This is because the standardisation gives much more weighting to the survival of the two older age groups (i.e. women aged 65-74 and 75-99), among whom survival is much poorer.

In 2013-17, after adjusting for underlying background mortality and for age for breast cancer patients, age-standardised net survival from breast cancer was 95.5% at 1 year and 84.5% at 5 years (Figure 2b; Table 1b). Although there appeared to be small increases in survival since 2008-12, there was no clear evidence for that these were not just due to chance (Figures 4b and 5b).

**Figure 2a: Age-standardised net survival for males aged 15-99, diagnosed during 2013-17 in Scotland, at 1 and 5 years since diagnosis.**

Source: Scottish Cancer Registry, Public Health Scotland (PHS)

1. Net survival for each cancer site grouping with sufficient data available for estimation.
2. These net survival probabilities are age-standardised using the International Cancer Survival Standards (ICSS).
3. Patients have been followed up until 31 December 2018. Estimates of net survival for patients diagnosed during 2013-17 are therefore ‘complete’ estimates.

4. Cancer registration is a dynamic process: the data presented here may differ from other published data relating to the same time period.

Table 1a: Estimates of observed and age-standardised net survival at 1 and 5 years since diagnosis, for males aged 15-99, diagnosed during 2013-17 in Scotland.

<table>
<thead>
<tr>
<th>Cancer site grouping</th>
<th>Cases analysed</th>
<th>Observed survival (%) at 1 year</th>
<th>AS Net survival (%) at 1 year</th>
<th>5 years</th>
<th>5 years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cases analysed</td>
<td>% 95 % CI</td>
<td>% 95 % CI</td>
<td>% 95 % CI</td>
<td>% 95 % CI</td>
</tr>
<tr>
<td>All cancers</td>
<td>68,360</td>
<td>67.2 66.8 67.5</td>
<td>43.2 42.7 43.6</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Bladder</td>
<td>2,845</td>
<td>67.3 65.6 69.0</td>
<td>35.9 33.6 38.2</td>
<td>75.0 73.0 77.0</td>
<td>51.6 48.8 54.7</td>
</tr>
<tr>
<td>Brain and other CNS</td>
<td>1,204</td>
<td>42.4 39.6 45.2</td>
<td>13.3 11.0 16.0</td>
<td>35.6 33.2 38.1</td>
<td>-</td>
</tr>
<tr>
<td>Colon</td>
<td>6,502</td>
<td>71.4 70.3 72.5</td>
<td>45.9 44.4 47.4</td>
<td>77.0 75.9 78.1</td>
<td>59.4 57.5 61.3</td>
</tr>
<tr>
<td>Colorectal</td>
<td>9,883</td>
<td>74.1 73.3 75.0</td>
<td>47.0 45.8 48.2</td>
<td>79.1 78.2 79.9</td>
<td>59.4 57.9 61.0</td>
</tr>
<tr>
<td>Head and Neck</td>
<td>4,122</td>
<td>75.1 73.7 76.3</td>
<td>49.7 47.7 51.6</td>
<td>75.1 73.6 76.5</td>
<td>56.2 53.7 58.7</td>
</tr>
<tr>
<td>Hodgkin Lymphoma</td>
<td>442</td>
<td>88.9 85.6 91.5</td>
<td>76.7 71.3 81.3</td>
<td>92.0 89.9 94.1</td>
<td>-</td>
</tr>
<tr>
<td>Kidney</td>
<td>3,217</td>
<td>76.3 74.7 77.7</td>
<td>52.0 49.8 54.2</td>
<td>79.1 77.7 80.6</td>
<td>61.3 58.6 64.2</td>
</tr>
<tr>
<td>Larynx</td>
<td>1,129</td>
<td>77.2 74.7 79.6</td>
<td>51.2 47.5 54.9</td>
<td>79.0 76.6 81.5</td>
<td>59.8 55.6 64.3</td>
</tr>
<tr>
<td>Leukaemias</td>
<td>2,088</td>
<td>72.4 70.4 74.3</td>
<td>47.9 45.2 50.5</td>
<td>76.9 75.1 78.8</td>
<td>60.9 57.7 64.3</td>
</tr>
<tr>
<td>Liver</td>
<td>2,119</td>
<td>42.3 40.2 44.4</td>
<td>12.9 11.0 14.9</td>
<td>46.3 44.0 48.7</td>
<td>-</td>
</tr>
<tr>
<td>Malignant Melanoma of the Skin</td>
<td>3,009</td>
<td>94.1 93.2 94.9</td>
<td>74.6 72.4 76.7</td>
<td>98.1 97.5 98.8</td>
<td>91.8 89.9 93.8</td>
</tr>
<tr>
<td>Mesothelioma</td>
<td>904</td>
<td>34.1 31.0 37.2</td>
<td>-    :    :</td>
<td>:        :    :</td>
<td></td>
</tr>
<tr>
<td>Multiple Myeloma</td>
<td>1,312</td>
<td>75.3 72.9 77.5</td>
<td>41.9 38.0 45.8</td>
<td>81.6 79.5 83.7</td>
<td>-</td>
</tr>
<tr>
<td>Non-Hodgkin Lymphoma</td>
<td>2,482</td>
<td>77.2 75.5 78.8</td>
<td>58.6 56.2 61.0</td>
<td>80.3 78.7 81.9</td>
<td>69.5 66.5 72.6</td>
</tr>
<tr>
<td>Oesophagus</td>
<td>3,014</td>
<td>41.0 39.2 42.7</td>
<td>11.8 10.3 13.4</td>
<td>43.9 41.9 46.0</td>
<td>-</td>
</tr>
<tr>
<td>Oral Cavity</td>
<td>1,447</td>
<td>75.2 72.9 77.3</td>
<td>48.4 45.0 51.7</td>
<td>74.0 71.4 76.6</td>
<td>55.7 51.6 60.2</td>
</tr>
<tr>
<td>Pancreas</td>
<td>1,998</td>
<td>21.2 19.4 23.0</td>
<td>:    :    :</td>
<td>24.5 22.4 26.8</td>
<td>-</td>
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<tr>
<td>Prostate</td>
<td>17,363</td>
<td>92.0 91.6 92.4</td>
<td>68.4 67.5 69.3</td>
<td>96.1 95.7 96.6</td>
<td>84.3 83.1 85.6</td>
</tr>
<tr>
<td>Rectosigmoid Junction and Rectum</td>
<td>3,534</td>
<td>79.4 78.1 80.7</td>
<td>49.0 46.9 51.2</td>
<td>83.4 82.1 84.7</td>
<td>59.4 56.7 62.2</td>
</tr>
<tr>
<td>Stomach</td>
<td>2,005</td>
<td>41.0 38.8 43.1</td>
<td>14.5 12.7 16.5</td>
<td>45.2 42.8 47.7</td>
<td>-</td>
</tr>
<tr>
<td>Testis</td>
<td>994</td>
<td>97.5 96.3 98.3</td>
<td>93.2 90.7 95.0</td>
<td>95.4 93.4 97.4</td>
<td>-</td>
</tr>
<tr>
<td>Thyroid</td>
<td>409</td>
<td>90.5 87.2 92.9</td>
<td>77.6 72.1 82.0</td>
<td>-        :    :</td>
<td>-</td>
</tr>
<tr>
<td>Trachea, Bronchus and Lung</td>
<td>12,902</td>
<td>33.8 32.9 34.6</td>
<td>9.1  8.4  9.8</td>
<td>36.7 35.7 37.7</td>
<td>12.5 11.6 13.6</td>
</tr>
</tbody>
</table>

Source: Scottish Cancer Registry, Public Health Scotland (PHS)

1. Net survival for each cancer site grouping with sufficient data available for estimation. The colon symbol ‘:’ denotes 'not available', indicating time-points at which survival could not be estimated robustly, because patient cohort sizes were too small and/or because too few deaths were observed.

2. These net survival probabilities are age-standardised using the International Cancer Survival Standards (ICSS).

3. Patients have been followed up until 31 December 2018. Estimates of net survival for patients diagnosed in 2013-17 are therefore ‘complete’ estimates.

4. Cancer registration is a dynamic process: the data presented here may differ from other published data relating to the same time period.
Figure 2b: Age-standardised net survival for females, diagnosed during 2013-17 in Scotland, at 1 and 5 years after diagnosis.

Source: Scottish Cancer Registry, Public Health Scotland (PHS)

1. Net survival for each cancer site grouping with sufficient data available for estimation.
2. These net survival probabilities are age-standardised using the International Cancer Survival Standards (ICSS).
3. Patients have been followed up until 31 December 2018. Estimates of net survival for patients diagnosed in 2013-17 are therefore 'complete' estimates.
4. Cancer registration is a dynamic process: the data presented here may differ from other published data relating to the same time period.
### Table 1b: Estimates of observed and age-standardised net survival at 1 and 5 years since diagnosis, for females aged 15-99, diagnosed during 2013-17 in Scotland.

<table>
<thead>
<tr>
<th>Cancer site grouping</th>
<th>Cases analysed</th>
<th>Observed survival (%) at 1 year</th>
<th>AS Net survival (%) at 1 year</th>
<th>5 years</th>
<th>Observed survival (%) at 5 years</th>
<th>AS Net survival (%) at 5 years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>95 % CI</td>
<td>95 % CI</td>
<td>95 % CI</td>
<td>95 % CI</td>
<td>95 % CI</td>
</tr>
<tr>
<td>All cancers</td>
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<td>70.7</td>
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<td>50.1</td>
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<td>Bladder</td>
<td>1,389</td>
<td>53.1</td>
<td>50.5</td>
<td>55.7</td>
<td>27.9</td>
<td>25.1</td>
</tr>
<tr>
<td>Brain and other CNS</td>
<td>921</td>
<td>38.1</td>
<td>34.9</td>
<td>41.2</td>
<td>14.6</td>
<td>11.8</td>
</tr>
<tr>
<td>Breast (Female)</td>
<td>21,449</td>
<td>94.1</td>
<td>93.8</td>
<td>94.4</td>
<td>77.4</td>
<td>76.7</td>
</tr>
<tr>
<td>Cervix Uteri</td>
<td>1,690</td>
<td>87.7</td>
<td>86.1</td>
<td>89.2</td>
<td>70.3</td>
<td>67.5</td>
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<td>Colon</td>
<td>6,137</td>
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<td>68.5</td>
<td>70.8</td>
<td>45.9</td>
<td>44.4</td>
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<td>Colorectal</td>
<td>8,200</td>
<td>71.5</td>
<td>70.5</td>
<td>72.5</td>
<td>46.7</td>
<td>45.3</td>
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<td>Corpus Uteri</td>
<td>3,885</td>
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<td>87.2</td>
<td>89.3</td>
<td>66.8</td>
<td>66.7</td>
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<tr>
<td>Head and Neck</td>
<td>1,791</td>
<td>74.3</td>
<td>72.2</td>
<td>76.3</td>
<td>50.8</td>
<td>47.9</td>
</tr>
<tr>
<td>Hodgkin Lymphoma</td>
<td>354</td>
<td>88.4</td>
<td>84.6</td>
<td>91.3</td>
<td>75.7</td>
<td>69.4</td>
</tr>
<tr>
<td>Kidney</td>
<td>2,014</td>
<td>74.6</td>
<td>72.7</td>
<td>76.5</td>
<td>52.2</td>
<td>49.4</td>
</tr>
<tr>
<td>Larynx</td>
<td>293</td>
<td>73.7</td>
<td>68.3</td>
<td>78.4</td>
<td>41.4</td>
<td>34.1</td>
</tr>
<tr>
<td>Leukaemias</td>
<td>1,410</td>
<td>69.3</td>
<td>66.8</td>
<td>71.6</td>
<td>46.0</td>
<td>42.7</td>
</tr>
<tr>
<td>Liver</td>
<td>967</td>
<td>32.1</td>
<td>29.1</td>
<td>35.0</td>
<td>9.2</td>
<td>6.9</td>
</tr>
<tr>
<td>Malignant Melanoma of the Skin</td>
<td>3,041</td>
<td>96.3</td>
<td>95.6</td>
<td>97.0</td>
<td>83.7</td>
<td>81.8</td>
</tr>
<tr>
<td>Mesothelioma</td>
<td>157</td>
<td>41.4</td>
<td>33.7</td>
<td>49.0</td>
<td>:</td>
<td>:</td>
</tr>
<tr>
<td>Multiple Myeloma</td>
<td>991</td>
<td>73.9</td>
<td>71.0</td>
<td>76.5</td>
<td>42.5</td>
<td>38.2</td>
</tr>
<tr>
<td>Non-Hodgkin Lymphoma</td>
<td>2,187</td>
<td>77.4</td>
<td>75.6</td>
<td>79.1</td>
<td>59.5</td>
<td>56.9</td>
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<tr>
<td>Oesophagus</td>
<td>1,581</td>
<td>38.7</td>
<td>36.3</td>
<td>41.1</td>
<td>12.2</td>
<td>10.2</td>
</tr>
<tr>
<td>Oral Cavity</td>
<td>862</td>
<td>73.7</td>
<td>70.6</td>
<td>76.5</td>
<td>51.8</td>
<td>47.7</td>
</tr>
<tr>
<td>Ovary</td>
<td>2,566</td>
<td>66.7</td>
<td>64.8</td>
<td>68.5</td>
<td>33.9</td>
<td>31.5</td>
</tr>
<tr>
<td>Pancreas</td>
<td>2,064</td>
<td>22.5</td>
<td>20.8</td>
<td>24.4</td>
<td>5.4</td>
<td>4.3</td>
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<tr>
<td>Rectosigmoid Junction and Rectum</td>
<td>2,163</td>
<td>76.9</td>
<td>75.1</td>
<td>78.6</td>
<td>48.7</td>
<td>46.0</td>
</tr>
<tr>
<td>Stomach</td>
<td>1,242</td>
<td>37.3</td>
<td>34.6</td>
<td>40.0</td>
<td>14.0</td>
<td>11.8</td>
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<tr>
<td>Thyroid</td>
<td>968</td>
<td>93.1</td>
<td>91.3</td>
<td>94.5</td>
<td>85.9</td>
<td>82.7</td>
</tr>
<tr>
<td>Trachea, Bronchus and Lung</td>
<td>12,957</td>
<td>40.4</td>
<td>39.5</td>
<td>41.2</td>
<td>14.0</td>
<td>13.2</td>
</tr>
</tbody>
</table>

Source: Scottish Cancer Registry, Public Health Scotland (PHS)

1. Net survival for each cancer site grouping with sufficient data available for estimation. The colon symbol ‘:’ denotes 'not available', indicating time-points at which survival could not be estimated robustly, because patient cohort sizes were too small and/or because too few deaths were observed.

2. These net survival probabilities are age-standardised using the International Cancer Survival Standards (ICSS).

3. Patients have been followed up until 31 December 2018. Estimates of net survival for patients diagnosed in 2013-17 are therefore ‘complete’ estimates.

4. Cancer registration is a dynamic process: the data presented here may differ from other published data relating to the same time period.
**Prostate**

Prostate cancer is the most common malignancy in men in Scotland. For the 17,363 men diagnosed with prostate cancer in 2013-17, 92.0% were alive at 1 year after diagnosis and 68.4% were alive at 5 years (Figure 1a; Table 1a). Although observed survival of men with prostate cancer increased over time in each successive 5-year period from 1993-97 to 2013-17 (see Excel file: ‘Estimates of survival from prostate cancer’), there was no clear evidence for an improvement in age-standardised survival between 2008-12 and 2013-17 (see Excel table), suggesting the improvements were simply due to the relative mix of younger and older age groups in the cohorts.

In 2013-17, age-standardised net survival from prostate cancer at 1 and 5 years was 96.1% and 84.3%, respectively (Figure 2a; Table 1a). Again, there was no clear evidence for an improvement in net survival between 2008-12 and 2013-17.

**Colorectal**

Colorectal cancer is the third most common cancer in Scotland and is more common in men than women. Survival is generally poorer in older patients. For the 9,883 men diagnosed with colorectal cancer in 2013-17, 74.1% survived at least 1 year and 47.0% survived at least 5 years (Figure 1a; Table 1a). Over the same period, 8,200 women were diagnosed with colorectal cancer, with 71.5% of women were alive at 1 year after diagnosis and 46.7% were alive 5 years (Figure 1b; Table 1b). There was no improvement in observed or age-standardised survival over the most recent two calendar periods (2008-12 and 2013-17; see Excel file: ‘Estimates of survival from colorectal cancer’).

Net survival from colorectal cancer is better now for both men and women than it was in 1993-97, although it has not always improved in each successive five-year period since that time (see Excel table). For example, in 2013-17, age-standardised net survival from colorectal cancer at 1 and 5 years since diagnosis was not significantly different from 2008-12, for both men and women (Figures 4a-b and 5a-b).

In 2013-17, 1-year age-standardised net survival from colorectal cancer was higher in men than women (79.1% and 77.8%, respectively), but there was no difference between men and women in 5-year net survival (59.4% and 59.4%, respectively; Figures 3a-b).

**Malignant melanoma of the skin**

In 2013-17, the observed survival of men with skin cancer at 1 and 5 years after diagnosis was 94.1% and 74.6%, respectively (Figure 1a; Table 1a), while over the same period, survival was higher for women at 96.3% and 83.7%, respectively (Figure 1b; Table 1b). There was no evidence for improvement in age-standardised survival between 2008-12 and 2013-17, for either men or women (see Excel file: ‘Estimates of survival from skin cancer’).

Net survival from skin cancer at 1 and 5 years since diagnosis was 98.1% and 91.8%, respectively, in men, and 98.8% and 95.5% in women. Although there appeared to be small increases in net survival for men, these were not significant. For women there was no evidence that the chances of survival from skin cancer had increased since the previous calendar period (Figures 4a-b and 5a-b).
Figure 3a: Age-standardised net survival for males and females aged 15-99, diagnosed during 2013-17 in Scotland, at 1 year since diagnosis.

Source: Scottish Cancer Registry, Public Health Scotland (PHS)

1. Net survival for each cancer site grouping applicable to both sexes and with sufficient data available for estimation.
2. Cancer sites are sorted by the difference in survival between males and females.
3. These net survival probabilities are age-standardised using the International Cancer Survival Standards (ICSS).
4. Patients have been followed up until 31 December 2018. Estimates of net survival for patients diagnosed in 2013-17 are therefore ‘complete’ estimates.
5. Cancer registration is a dynamic process: the data presented here may differ from other published data relating to the same time period.
Figure 3b: Age-standardised net survival for males and females aged 15-99, diagnosed during 2013-17 in Scotland, at 5 years since diagnosis.

Source: Scottish Cancer Registry, Public Health Scotland (PHS)

1. Net survival for each cancer site grouping applicable to both sexes and with sufficient data available for estimation.
2. Cancer sites are sorted by the difference in survival between males and females.
3. These net survival probabilities are age-standardised using the International Cancer Survival Standards (ICSS).
4. Patients have been followed up until 31 December 2018. Estimates of net survival for patients diagnosed in 2013-17 are therefore ‘complete’ estimates.
5. Cancer registration is a dynamic process: the data presented here may differ from other published data relating to the same time period.

**Head and neck**

The observed survival of patients diagnosed with head and neck cancers to 1 year after their diagnosis has changed little since 1993-97, but there appeared to be greater improvements in 5-year survival, for both men and women (see Excel file: ‘Estimates of survival from head and neck cancers’). In 2013-17, around 3 in 4 patients diagnosed with head and neck cancer survived to at least 1 year after diagnosis (75.1% and 74.3% for men and women, respectively), while 1 in 2 patients survived to 5 years after diagnosis (49.7% and 50.8% in men and women, respectively; Figures 1a-b; Tables 1a-b).

In 2013-17, net survival from head and neck cancer at 1 and 5 years since diagnosis was 75.1% and 56.2%, respectively, in men, and 75.4% and 56.5% in women. Again, while there had been no improvements in 1-year age-standardised net survival between 2008-12 and 2013-17, for men or women (Figures 4a-b and 5a-b), there was an apparent improvement in 5-year survival, although this was not significant.
**Kidney**

Observed survival for men with a cancer of the kidney was 76.3% and 52.0% at 1 and 5 years, respectively (Figure 1a; Table 1a). Similarly, 74.6% of women diagnosed with a cancer of the kidney were alive after one year and 52.2% alive after five years, respectively (Figure 1b; Table 1b). Survival improved generally over time since 1993-97 (see Excel file: ‘Estimates of survival from kidney cancers’). For example, between 2008-12 and 2013-17, 1-year age-standardised survival improved in men by 5.1 percentage points (from 71.6% to 76.7%) and in women by 4.5 percentage points (from 72.2% to 76.7%). Increases of a similar magnitude were seen for 5-year age-standardised survival.

Age-standardised net survival at 1 year increased between 2008-12 and 2013-17 by 5.2 percentage points to 79.1% in men and by 4.7 percentage points to 78.5% in women (Figures 4a-b). Net survival at 5 years increased between 2008-12 and 2013-17 by 6.2 percentage points to 61.3% in men, and 5.3 percentage points in women, although this increase was not statistically significant (Figures 5a-b). These trends suggest continuing improvements in cancer-specific outcomes over the past 25 years.

**Ovary**

In 2013-17, observed survival for women with ovarian cancer was 66.7% at 1 year after diagnosis and 33.9% at 5 years (Figure 1b; Table 1b). Survival has improved over time since at least 1993-97. Between 2008-12 and 2013-17, 1-year age-standardised survival increased by 4.6 percentage points to 68.3%, while 5-year survival increased by 4.7 percentage points to 34.9% (see Excel file: ‘Estimates of survival from ovarian cancers’). There were similar improvements in age-standardised net survival between 2008-12 and 2013-17, with 1-year survival increasing by 4.7 percentage points to 69.6%, and 5-year survival increasing by 5.2 percentage points to 37.7%. This suggests that improvements in cancer-specific outcomes have occurred.

**Pancreas**

Among people diagnosed with pancreatic cancer in 2013-17, 21.2% of men and 22.5% of women were alive one year after diagnosis (Figures 1a-b). Survival has improved progressively since 1993-97 (see Excel file: ‘Estimates of survival from pancreatic cancers’). Over the most recent two periods (2008-12 and 2013-17), 1-year age-standardised survival in women increased by 7.5% points to 29.1%, but there was no evidence for a similar increase in men (see Excel file).

Age-standardised net survival at 1 year increased between 2008-12 and 2013-17 by 7.6 percentage points to 29.6% in women, but there was no clear evidence for an increase in men (Figures 4a-b). Age-standardised net survival could not be reliably estimated for longer term follow-up time-points, though substantial increases in observed survival at 5-years after diagnosis over the last 25 years suggests there have been improvements in cancer-specific survival over time.
Brain and other CNS

Among people diagnosed with brain and other CNS tumours in 2013-17, 1-year observed survival was 42.4% and 38.1% in men and women, respectively, while 5-year observed survival was 13.3% and 14.6% in men and women, respectively (Figures 1a-b; Tables 1a-b). Between 2008-12 and 2013-17, age-standardised 1-year (observed) survival increased by 4.5 percentage points to 35.1% in men, but there was no evidence for an increase in survival in women (see Excel file: ‘Estimates of survival from brain and other CNS’). Five-year age-standardised survival could not be estimated reliably.

Age-standardised net survival at 1 year was 35.6% in men and 32.1% in women (Figures 2a-b; Tables 1a-b), but there was no evidence for an improvement on the estimates obtained for the previous calendar period (Figures 4a-b).
Figure 4a: Trends in age-standardised net survival at 1 year since diagnosis, for males diagnosed in Scotland, during 2008-2012 or 2013-2017.

Source: Scottish Cancer Registry, Public Health Scotland (PHS)

1. Net survival is shown for each cancer site grouping with sufficient data available for estimation.
2. These net survival probabilities are age-standardised using the International Cancer Survival Standards (ICSS).
3. Patients have been followed up until 31 December 2018. Estimates of net survival for patients diagnosed in 2013-17 are therefore ‘complete’ estimates.
4. Cancer registration is a dynamic process: the data presented here may differ from other published data relating to the same time period.
Figure 4b: Trends in age-standardised net survival at 1 year since diagnosis, for females diagnosed in Scotland, during 2008-2012 or 2013-2017.

- Bladder
- Brain and other CNS
- Breast (Female)
- Cervix Uteri
- Colon
- Colorectal
- Corpus Uteri
- Head and Neck
- Hodgkin Lymphoma
- Kidney
- Larynx
- Leukaemias
- Liver
- Malignant Melanoma of the Skin
- Multiple Myeloma
- Non-Hodgkin Lymphoma
- Oesophagus
- Oral Cavity
- Ovary
- Pancreas
- Rectosigmoid Junction and Rectum
- Stomach
- Thyroid
- Trachea, Bronchus and Lung

Source: Scottish Cancer Registry, Public Health Scotland (PHS)

1. Net survival is shown for each cancer site grouping with sufficient data available for estimation.
2. These net survival probabilities are age-standardised using the International Cancer Survival Standards (ICSS).
3. Patients have been followed up until 31st December 2018. Estimates of net survival for patients diagnosed in 2013-17 are therefore ‘complete’ estimates.
4. Cancer registration is a dynamic process: the data presented here may differ from other published data relating to the same time period.
Figure 5a: Trends in age-standardised net survival at 5 years since diagnosis, for males diagnosed in Scotland, during 2008-2012 or 2013-2017.

Source: Scottish Cancer Registry, Public Health Scotland (PHS)

1. Net survival is shown for each cancer site grouping with sufficient data available for estimation.
2. These net survival probabilities are age-standardised using the International Cancer Survival Standards (ICSS).
3. Patients have been followed up until 31st December 2018. Five-year net survival estimates for patients diagnosed during 2013-17 are therefore 'complete' estimates (see background notes).
4. Cancer registration is a dynamic process: the data presented here may differ from other published data relating to the same time period.
Figure 5b: Trends in age-standardised net survival at 5 years since diagnosis, for females diagnosed in Scotland, during 2008-2012 or 2013-2017.

Source: Scottish Cancer Registry, Public Health Scotland (PHS)

1. Net survival is shown for each cancer site grouping with sufficient data available for estimation.
2. These net survival probabilities are age-standardised using the International Cancer Survival Standards (ICSS).
3. Patients have been followed up until 31 December 2018. Estimates of net survival for patients diagnosed in 2013-17 are therefore 'complete' estimates.
4. Cancer registration is a dynamic process: the data presented here may differ from other published data relating to the same time period.
Differences in survival by socio-economic circumstances

Socio-economic deprivation influences cancer occurrence and survival in a variety of ways. For example, the single largest preventable risk factor for cancer – smoking – is much more common among people who live in more deprived areas, as defined by the Scottish Index of Multiple Deprivation (SIMD). Smoking is not only a risk factor for developing cancer but also affects survival because it causes other diseases (for example heart and lung diseases) that may shorten life expectancy and because it may limit the ability of patients to benefit from the most effective cancer treatments. There is evidence that access to health services may in other ways be more difficult for people from deprived backgrounds. There is also evidence that patients from more deprived areas are diagnosed with cancers at a later stage, when survival is poorer (see Cancer Incidence in Scotland publication).

Observed survival for all patients diagnosed with a cancer (all cancers combined) shows a gradient of decreasing 1-year and 5-year survival for patients who live in the least to the most deprived areas (Figure 6a-b; see Excel file: ‘Deprivation estimates of survival from all cancers’).

**Figure 6a: Observed survival at 1 and 5 years since diagnosis, by SIMD quintile, for males aged 15-99, diagnosed with a cancer (all cancers combined) during 2013-17.**

Source: Scottish Cancer Registry, Public Health Scotland (PHS)

1. Patients have been followed up until 31 December 2018. Estimates of net survival for patients diagnosed in 2013-17 are therefore ‘complete’ estimates.
2. Deprivation quintiles were defined according to the Scottish Index of Multiple Deprivation (SIMD). For diagnoses in 2013-17, deprivation quintiles are based on SIMD2012 (2013) and SIMD2016 (2014-17).
3. Cancer registration is a dynamic process: the data presented here may differ from other published data relating to the same time period.
Figure 6b: Observed survival at 1 and 5 years since diagnosis, by SIMD quintile, for females aged 15-99, diagnosed with a cancer (all cancers combined) during 2013-17.

Source: Scottish Cancer Registry, Public Health Scotland (PHS)

1. Patients have been followed up until 31 December 2018. Estimates of net survival for patients diagnosed in 2013-17 are therefore ‘complete’ estimates.
2. Deprivation quintiles were defined according to the Scottish Index of Multiple Deprivation (SIMD). For diagnoses in 2013-17, deprivation quintiles are based on SIMD2012 (2013) and SIMD2016 (2014-17).
3. Cancer registration is a dynamic process: the data presented here may differ from other published data relating to the same time period.

Survival for the four most common cancers in the least and most deprived areas.

This deprivation inequality in cancer survival was also observed for adults diagnosed with one of the four most common cancers; with adults living in the least deprived areas having better outcomes than adults diagnosed with cancer in the most deprived areas.

*Trachea, bronchus and lung*

Age-standardised net survival from lung cancer at 1 year after diagnosis was better for patients from the least deprived areas, compared to the most deprived areas, for both men and women (Figures 7a-b; Tables 2a-b). One-year age-standardised net survival for men in the most deprived areas was 7.8 percentage points lower at 34.7% than net survival in the least deprived areas at 42.4%. In women, net survival from lung cancer at 1 year after diagnosis was 43.3% and 49.1% in the most and least deprived areas, respectively, a difference of 5.8 percentage points. Age-standardised net survival at 5 years could not be reliably estimated for lung cancer for either men or women.
Figure 7a: Age-standardised net survival from lung cancer at 1 year since diagnosis, by SIMD quintile, for males aged 15-99, diagnosed during 2013-17.

Table 2a: Estimates of observed and age-standardised net survival from lung cancer by SIMD quintile, for males aged 15-99, diagnosed during 2013-17.

<table>
<thead>
<tr>
<th>SIMD quintile</th>
<th>Cases analysed</th>
<th>Observed survival (%) at</th>
<th>AS Net survival (%) at</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1 year</td>
<td>5 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>95 % CI</td>
</tr>
<tr>
<td>Least deprived (5)</td>
<td>1,499</td>
<td>37.2</td>
<td>34.8</td>
</tr>
<tr>
<td>4</td>
<td>1,923</td>
<td>35.8</td>
<td>33.7</td>
</tr>
<tr>
<td>3</td>
<td>2,573</td>
<td>33.2</td>
<td>31.3</td>
</tr>
<tr>
<td>2</td>
<td>3,182</td>
<td>32.3</td>
<td>30.6</td>
</tr>
<tr>
<td>Most deprived (1)</td>
<td>3,725</td>
<td>33.0</td>
<td>31.5</td>
</tr>
</tbody>
</table>

Source: Scottish Cancer Registry, Public Health Scotland (PHS)
1. Patients have been followed up until 31 December 2018. Estimates of net survival for patients diagnosed in 2013-17 are therefore ‘complete’ estimates.
2. Deprivation quintiles were defined according to the Scottish Index of Multiple Deprivation (SIMD). For diagnoses in 2013-17, deprivation quintiles are based on SIMD2012 (2013) and SIMD2016 (2014-17).
3. Cancer registration is a dynamic process: the data presented here may differ from other published data relating to the same time period.
Figure 7b: Age-standardised net survival from lung cancer at 1 year since diagnosis by deprivation, for females aged 15-99, diagnosed during 2013-17.

Table 2b: Estimates of observed and age-standardised net survival from lung cancer by SIMD quintile, for females aged 15-99, diagnosed during 2013-17.

<table>
<thead>
<tr>
<th>SIMD quintile</th>
<th>Cases analysed</th>
<th>Observed survival (%) at 1 year</th>
<th>AS Net survival (%) at 1 year</th>
<th>5 years %</th>
<th>5 years 95% CI</th>
<th>5 years %</th>
<th>5 years 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Least deprived (5)</td>
<td>1,413</td>
<td>42.8 40.2 45.4</td>
<td>17.6 15.0 20.3</td>
<td>49.1</td>
<td>46.4 52.0</td>
<td>43.3</td>
<td>41.5 45.2</td>
</tr>
<tr>
<td>4</td>
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<td>16.4 14.3 18.7</td>
<td>47.1</td>
<td>44.7 49.6</td>
<td>43.5</td>
<td>41.5 45.2</td>
</tr>
<tr>
<td>3</td>
<td>2,352</td>
<td>38.6 36.7 40.6</td>
<td>13.0 11.3 14.8</td>
<td>42.1</td>
<td>40.0 44.2</td>
<td>45.7</td>
<td>43.5 48.0</td>
</tr>
<tr>
<td>2</td>
<td>3,305</td>
<td>40.6 38.9 42.3</td>
<td>13.0 11.6 14.6</td>
<td>45.7</td>
<td>43.5 48.0</td>
<td>43.3</td>
<td>41.5 45.2</td>
</tr>
<tr>
<td>Most deprived (1)</td>
<td>4,016</td>
<td>39.6 38.0 41.1</td>
<td>13.1 11.7 14.6</td>
<td>43.3</td>
<td>41.5 45.2</td>
<td>17.5</td>
<td>15.8 19.4</td>
</tr>
</tbody>
</table>

Source: Scottish Cancer Registry, Public Health Scotland (PHS)

1. Patients have been followed up until 31 December 2018. Estimates of net survival for patients diagnosed in 2013-17 are therefore 'complete' estimates.
2. Deprivation quintiles were defined according to the Scottish Index of Multiple Deprivation (SIMD). For diagnoses in 2013-17, deprivation quintiles are based on SIMD2012 (2013) and SIMD2016 (2014-17).
3. Cancer registration is a dynamic process: the data presented here may differ from other published data relating to the same time period.
**Colorectal**

Age-standardised net survival from colorectal cancer was better in patients from the least deprived areas, compared to the most deprived areas, at both 1 and 5 years after diagnosis, for both men and women (Figures 8a-b; Tables 3a-b). One-year age-standardised net survival in men was 74.6% and 82.7% in the most and least deprived areas, respectively, a difference of 8.1 percentage points. Similarly, in women, survival was higher by 8.3 percentage points in women from the least deprived areas. Five-year age-standardised net survival showed a widening of this deprivation inequality, with gaps of 10.3 and 10.9 percentage points for men and women, respectively, between those from in the most and least deprived areas, respectively.

**Breast**

Age-standardised net survival was better in female breast cancer patients from the least deprived areas, compared to the most deprived areas, at both 1 and 5 years after diagnosis (Figure 9; Table 4). The difference was larger at 5 years than at 1 year, with 1-year age-standardised net survival 94.1% and 96.6% in the most and least deprived areas, respectively, a difference of 2.5 percentage points (Table 4). Five-year age-standardised net survival was 81.4% and 87.1% in the most and least deprived areas, respectively, a difference of 5.7 percentage points.

**Prostate**

Age-standardised net survival at 1 year after diagnosis was better in prostate cancer patients from the least deprived, compared to the most deprived areas (Figure 10; Table 5). One-year age-standardised net survival was 94.5% and 97.0% in the most and least deprived areas, respectively, a difference of 2.5 percentage points. However, 5-year age-standardised net survival could not be estimated for men in the most deprived areas, due to small numbers of patients and deaths in the youngest and oldest age-groups. However, age-standardised net survival at 5-years for patients living in the second most deprived areas was 77.8% and in the least deprived areas was 87.4%, a difference of 9.6 percentage points.
Figure 8a: Age-standardised net survival from colorectal cancer at 1 and 5 years since diagnosis, by SIMD quintile, for males aged 15-99, diagnosed during 2013-17.

Table 3a: Estimates of observed and age-standardised net survival from colorectal cancer at 1 and 5 years since diagnosis, by SIMD quintile, for males aged 15-99, diagnosed during 2013-17.

<table>
<thead>
<tr>
<th>SIMD quintile</th>
<th>Cases analysed</th>
<th>Observed survival (%) at</th>
<th>AS Net survival (%) at</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1 year</td>
<td>5 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>95 % CI</td>
</tr>
<tr>
<td>Least deprived (5)</td>
<td>1,899</td>
<td>78.3</td>
<td>76.4</td>
</tr>
<tr>
<td>4</td>
<td>1,976</td>
<td>75.8</td>
<td>73.8</td>
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<tr>
<td>3</td>
<td>2,047</td>
<td>74.5</td>
<td>72.5</td>
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<tr>
<td>2</td>
<td>2,112</td>
<td>72.4</td>
<td>70.5</td>
</tr>
<tr>
<td>Most deprived (1)</td>
<td>1,849</td>
<td>69.7</td>
<td>67.5</td>
</tr>
</tbody>
</table>

Source: Scottish Cancer Registry, Public Health Scotland (PHS)

1. Patients have been followed up until 31 December 2018. Estimates of net survival for patients diagnosed in 2013-17 are therefore ‘complete’ estimates.
2. Deprivation quintiles were defined according to the Scottish Index of Multiple Deprivation (SIMD). For diagnoses in 2013-17, deprivation quintiles are based on SIMD2012 (2013) and SIMD2016 (2014-17).
3. Cancer registration is a dynamic process: the data presented here may differ from other published data relating to the same time period.
Figure 8b: Age-standardised net survival from colorectal cancer at 1 and 5 years since diagnosis, by SIMD quintile, for females aged 15-99, diagnosed during 2013-17.

Table 3b: Estimates of observed and age-standardised net survival from colorectal cancer at 1 and 5 years since diagnosis, by SIMD quintile, for females aged 15-99, diagnosed during 2013-17.

<table>
<thead>
<tr>
<th>SIMD quintile</th>
<th>Cases analysed</th>
<th>Observed survival (%) at</th>
<th>AS Net survival (%) at</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1 year</td>
<td>5 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>95 % CI</td>
</tr>
<tr>
<td>Least deprived (5)</td>
<td>1,659</td>
<td>74.9</td>
<td>72.7</td>
</tr>
<tr>
<td>4</td>
<td>1,605</td>
<td>73.1</td>
<td>70.8</td>
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<tr>
<td>3</td>
<td>1,755</td>
<td>72.8</td>
<td>70.7</td>
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<tr>
<td>2</td>
<td>1,698</td>
<td>70.2</td>
<td>68.0</td>
</tr>
<tr>
<td>Most deprived (1)</td>
<td>1,483</td>
<td>66.1</td>
<td>63.7</td>
</tr>
</tbody>
</table>

Source: Scottish Cancer Registry, Public Health Scotland (PHS)

1. Patients have been followed up until 31 December 2018. Estimates of net survival for patients diagnosed in 2013-17 are therefore ‘complete’ estimates.
2. Deprivation quintiles were defined according to the Scottish Index of Multiple Deprivation (SIMD). For diagnoses in 2013-17, deprivation quintiles are based on SIMD2012 (2013) and SIMD2016 (2014-17).
3. Cancer registration is a dynamic process: the data presented here may differ from other published data relating to the same time period.
Figure 9: Age-standardised net survival from breast cancer at 1 and 5 years since diagnosis, by SIMD quintile, for females aged 15-99, diagnosed during 2013-17.

Table 4: Estimates of observed and age-standardised net survival from breast cancer at 1 and 5 years since diagnosis, by SIMD quintile, for females aged 15-99, diagnosed during 2013-17.

<table>
<thead>
<tr>
<th>SIMD quintile</th>
<th>Cases analysed</th>
<th>Observed survival (%) at 1 year</th>
<th></th>
<th>AS Net survival (%) at 1 year</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>95 % CI</td>
<td>%</td>
<td>95 % CI</td>
</tr>
<tr>
<td>Least deprived (5)</td>
<td>4,626</td>
<td>95.7</td>
<td>95.0</td>
<td>96.2</td>
<td>81.9</td>
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<tr>
<td>4</td>
<td>4,453</td>
<td>95.0</td>
<td>94.3</td>
<td>95.6</td>
<td>80.0</td>
</tr>
<tr>
<td>3</td>
<td>4,401</td>
<td>93.8</td>
<td>93.1</td>
<td>94.5</td>
<td>77.9</td>
</tr>
<tr>
<td>2</td>
<td>4,238</td>
<td>93.3</td>
<td>92.5</td>
<td>94.0</td>
<td>73.9</td>
</tr>
<tr>
<td>Most deprived (1)</td>
<td>3,731</td>
<td>92.2</td>
<td>91.3</td>
<td>93.0</td>
<td>72.4</td>
</tr>
</tbody>
</table>

Source: Scottish Cancer Registry, Public Health Scotland (PHS)

1. Patients have been followed up until 31 December 2018. Estimates of net survival for patients diagnosed in 2013-17 are therefore ‘complete’ estimates.
2. Deprivation quintiles were defined according to the Scottish Index of Multiple Deprivation (SIMD). For diagnoses in 2013-17, deprivation quintiles are based on SIMD2012 (2013) and SIMD2016 (2014-17).
3. Cancer registration is a dynamic process: the data presented here may differ from other published data relating to the same time period.
Figure 10: Age-standardised net survival from prostate cancer at 1 and 5 years since diagnosis, by SIMD quintile, for males aged 15-99, diagnosed during 2013-17.

Table 5: Estimates of observed and age-standardised net survival from prostate cancer at 1 and 5 years since diagnosis, by SIMD quintile, for males aged 15-99, diagnosed during 2013-17.

<table>
<thead>
<tr>
<th>SIMD quintile</th>
<th>Cases analysed</th>
<th>Observed survival (%) at 1 year</th>
<th>5 years</th>
<th>AS Net survival (%) at 1 year</th>
<th>5 years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>95 % CI</td>
<td>%</td>
<td>95 % CI</td>
</tr>
<tr>
<td>Least deprived (5)</td>
<td>3,999</td>
<td>93.8</td>
<td>93.0</td>
<td>94.5</td>
<td>74.8</td>
</tr>
<tr>
<td>4</td>
<td>3,842</td>
<td>93.2</td>
<td>92.4</td>
<td>94.0</td>
<td>70.5</td>
</tr>
<tr>
<td>3</td>
<td>3,720</td>
<td>92.5</td>
<td>91.6</td>
<td>93.3</td>
<td>68.8</td>
</tr>
<tr>
<td>2</td>
<td>3,198</td>
<td>90.2</td>
<td>89.1</td>
<td>91.2</td>
<td>62.0</td>
</tr>
<tr>
<td>Most deprived (1)</td>
<td>2,603</td>
<td>89.0</td>
<td>87.7</td>
<td>90.1</td>
<td>62.8</td>
</tr>
</tbody>
</table>

Source: Scottish Cancer Registry, Public Health Scotland (PHS)

1. Patients have been followed up until 31 December 2018. Estimates of net survival for patients diagnosed in 2013-17 are therefore 'complete' estimates.
2. Deprivation quintiles were defined according to the Scottish Index of Multiple Deprivation (SIMD). For diagnoses in 2013-17, deprivation quintiles are based on SIMD2012 (2013) and SIMD2016 (2014-17).
3. Cancer registration is a dynamic process: the data presented here may differ from other published data relating to the same time period.
Glossary

Tumour/Neoplasm Abnormal growth

Benign tumour A tumour that does not invade and destroy local tissue or spread to other sites in the body

Malignant tumour Cancerous growth

ICD-10 The 10th revision of the International Classification of Diseases (ICD) produced by the World Health Organisation (WHO). It assigns codes to particular diseases and conditions

ICD-O The International Classification of Diseases for Oncology (ICD-O), currently in its 3rd revision. ICD-O is an oncology-specific extension of the International Classification of Diseases (ICD).

Observed survival For a defined group of cancer patients, observed survival is an estimate of the probability that the average or 'typical' patient will be alive at a given time-point after diagnosis. It does not take account of cause of death, so it provides for this typical patient a crude overall prognosis from all possible causes of death. Observed survival is typically expressed as a percentage in the range 0-100%.

Net survival For a defined group of cancer patients, net survival is an estimate of the probability that the average or 'typical' patient will be alive at a given time-point after diagnosis, after controlling for other causes of death (i.e. competing risks of death, which can be estimated from background population mortality rates). Net survival is also expressed as a percentage in the range 0-100%.

Life tables Life tables are tables of estimated annual mortality rates for the general population of an area or country. These mortality rates are calculated using estimates of population size and counts of the number of recorded deaths, within a given calendar year. They are typically calculated as an annual time series with data disaggregated by calendar year, sex and single year of age.
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Further Information

Further information and data for this publication are available from the publication page on our website.

The next release of this publication will be January 2022.

Rate this publication

Let us know what you think about this publication via the link at the bottom of this publication page on the PHS website.
Appendices

Appendix 1 – Publication Metadata

<table>
<thead>
<tr>
<th>Metadata Indicator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Publication title</td>
<td>Cancer Survival in Scotland 2013-2017</td>
</tr>
<tr>
<td>Description</td>
<td>Estimates of two measures of survival at 1, 5 and 10 years after diagnosis, for patients diagnosed with cancer in Scotland. Estimates are reported for 27 cancer site groupings ('types of cancer'), as well as all cancers combined (excluding non-melanoma skin cancer). Estimates are provided for patient cohorts defined by cancer site grouping, calendar period of diagnosis, sex, age group and (where applicable) SIMD deprivation quintile. Age-standardised estimates are provided where possible.</td>
</tr>
<tr>
<td>Theme</td>
<td>Health and Social Care</td>
</tr>
<tr>
<td>Topic</td>
<td>Conditions and Diseases</td>
</tr>
<tr>
<td>Format</td>
<td>Excel workbooks and PDF reports</td>
</tr>
<tr>
<td>Data source(s)</td>
<td>Patient data are from the Scottish Cancer Registry (SMR06), with deaths linked from National Records of Scotland (NRS). Life tables of mortality rates for the general population of Scotland use NRS Deaths Data and NRS Mid-year Population Estimates and Small Area Population Estimates.</td>
</tr>
<tr>
<td>Date that data are acquired</td>
<td>14 October 2020 (data extracted from SMR06)</td>
</tr>
<tr>
<td>Release date</td>
<td>19 January 2020</td>
</tr>
<tr>
<td>Frequency</td>
<td>Annual (going forward)</td>
</tr>
<tr>
<td>Timeframe of data and timeliness</td>
<td>Cancer registrations are up to 31 December 2017, with passive patient follow-up using deaths data to 31 December 2018.</td>
</tr>
<tr>
<td>Continuity of data</td>
<td>This report uses registration data from 1993 to 2017. Coding of cancer registrations changed from ICD-9 to ICD-10 for anatomic location and from ICD-O-1 to ICD-O-2 for morphology in incidence year 1997, and then to ICD-O-3 in incidence year 2006. ICD codes have been back-mapped for continuity of reporting. The range of statistics provided means continuity will vary, though it is considered to be very high: any notable discontinuities (e.g. for specific conditions) will be highlighted within the published data.</td>
</tr>
<tr>
<td>Revisions statement</td>
<td>As with other population-based cancer registries, the Scottish Cancer Registry is dynamic, with ongoing updating of records. Each release includes refreshed data from previous years, and so, as new registrations from previous years come to light, or as changes in the coding systems are taken into account, the numbers may change. The timing of the release is intended to balance the likelihood of significant revision with timeliness of the data.</td>
</tr>
<tr>
<td>Revisions relevant to this publication</td>
<td>The definition of Non-Hodgkin Lymphoma has changed to include ICD-10 code C86, which was introduced in 2014. Incidence figures for 2014 and 2015 have been recalculated. There is minimal impact on the overall incidence figures for Non-Hodgkin Lymphoma.</td>
</tr>
<tr>
<td>Concepts and definitions</td>
<td>See the Cancer Information FAQs</td>
</tr>
<tr>
<td>Relevance and key uses of the statistics</td>
<td>Population-based measures of cancer survival allow service providers to evaluate and monitor changes in cancer prognosis over time, and how this may be impacted by changes in cancer diagnosis, treatment and care. Measures of survival provide an indirect measure of the success of public health measures and interventions over the longer term. See Comparability.</td>
</tr>
</tbody>
</table>
| Accuracy | Registry data are subject to validation at data entry and quality assurance procedures. See the Cancer Information FAQs. Reported estimates are compared to previously published estimates for Scotland. Methods have been reviewed by researchers at the LSHTM. See Acknowledgements.
### Completeness

At time of extraction, data for the most recent year are estimated to be at least 98% complete. Routine indicators of data quality are compared to the rest of the UK and to other countries, and are available on the UKIACR website. There have been ad-hoc studies of data completeness in the past. See the Cancer Information FAQs.

### Comparability

**Observed survival** (produced using the Kaplan-Meier estimator) may be compared with equivalent statistics provided by other UK and international countries. However, since population age profiles and background mortality rates vary between countries, comparisons must be interpreted with understanding and caution.

**Age-standardised net survival** (produced using the Pohar-Perme estimator) takes account of both population age structure and background mortality rates, and is considered the most appropriate measure of survival for international comparisons. However, in practice, net survival is difficult to compare reasonably with equivalent statistics produced by other organisations due to the variety of ways that the underlying life tables can be produced and the various analytical choices and permutations possible in the survival analysis process. The best use of these estimates is therefore for comparison between cancer sites, time periods or demographic groups within this analysis.

International comparisons are best performed using estimates produced within an international study, using standard methods for each country. Cancer survival information suitable for international comparisons are presented by programmes such as **CONCORD**, **EUROCARE**, and **ICBP** (International Cancer Benchmarking Partnership).

### Accessibility

It is the policy of Public Health Scotland to make its web sites and products accessible according to published guidelines.

### Coherence and clarity

All tables of cancer survival statistics are available via the Cancer topic webpages on the PHS website. Tables for each cancer are presented within Excel spreadsheets of cancer site groupings, where appropriate. This should minimise the number of spreadsheets a user has to go through to find data, as well as ensure that they are selecting the correct data.

### Value type and unit of measurement

- **Number of cases included in the analysis for each cohort analysed (an integer count)**
- **Number of deaths, patients censored, or patients still alive, at or within specified time points/periods (all integer counts)**
- **Estimates of observed and net survival probabilities, which are expressed as percentages for convenience and are often interpreted as proportions (probabilities).**

### Disclosure

The PHS protocol on Statistical Disclosure Protocol is followed.

### Official Statistics designation

National Statistics

### UK Statistics Authority Assessment

May 2010

### Last published

03 March 2015

### Next published

January 2022

### Date of first publication

31 August 2010 (in current format, but using a different measure of survival)

### Help email

phs.cancerstats@phs.scot

### Date form completed

08 January 2021
Appendix 2 – Early access details

Pre-Release Access

Under terms of the "Pre-Release Access to Official Statistics (Scotland) Order 2008", PHS is obliged to publish information on those receiving Pre-Release Access ("Pre-Release Access" refers to statistics in their final form prior to publication). The standard maximum Pre-Release Access is five working days. Shown below are details of those receiving standard Pre-Release Access.

Standard Pre-Release Access:

Scottish Government Health Department
NHS Board Chief Executives
NHS Board Communication leads

Early Access for Quality Assurance:

These statistics have also been made available to those who needed access to help quality assure the publication:

Cancer Survival Group at the London School of Hygiene & Tropical Medicine (LSHTM); namely: Professor Michel Coleman, Dr Claudia Allemani, Dr Pamela Minicozzi and Ms Veronica Di Carlo.
Appendix 3 – PHS and Official Statistics

About Public Health Scotland (PHS)

PHS is a knowledge-based and intelligence-driven organisation with a critical reliance on data and information to enable it to be an independent voice for the public’s health, leading collaboratively and effectively across the Scottish public health system, accountable at local and national levels, and providing leadership and focus for achieving better health and wellbeing outcomes for the population. Our statistics comply with the Code of Practice for Statistics in terms of trustworthiness, high quality and public value. This also means that we keep data secure at all stages, through collection, processing, analysis and output production, and adhere to the ‘Five Safes’.