Cancer Incidence and Prevalence in Scotland (to December 2019)
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0131 314 5300
phs.otherformats@phs.scot
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Introduction

This annual publication provides information on cancer incidence in Scotland, covering the years 1995-2019 for each main type of cancer; information on the relationship between cancer stage and socio-economic circumstances in Scotland, covering the years 2015-2019 for the sixteen most common types of cancer with the most complete information on stage; and information on prevalence and life time risk that is published every two years. The information presented here updates information previously available on the Public Health Scotland (PHS) website.

New cancer diagnoses (cancer incidence) reflect risk factors for developing cancer, an increase in efforts to detect cancer (such as public awareness and screening programmes) and an increase in the number of people at risk of developing cancer (with the ageing and expanding population). They inform our understanding of cancer prevention and the services needed to diagnose and treat cancer. We present information on cancer incidence to show changes over time, differences between groups of people (for example, by age, sex and socio-economic circumstances) and by geographic area. The rates, or risks, of developing cancer are given along with actual numbers.

Cancer registration in Scotland

The Scottish Cancer Registry has been collecting information on cancer since 1958. Data collected by the Registry are published by PHS. This information 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. New developments in the Scottish Cancer Registration and Intelligence Service will make cancer data more readily available and will make data on waiting times, screening, diagnosis and treatment more easily linked to the Registry.

Cautions on interpreting these data

It may be misleading to focus too much attention on any apparent changes in incidence between 2018 and 2019; it is more informative to examine trends in incidence observed over a number of years. Striking changes from one year to the next may occur in the case of rare cancers, but these are likely to reflect random fluctuation caused by the small numbers of cases. In these situations, it is more important to examine incidence rates for a number of years aggregated together, rather than focussing on a single year of incidence.

Cancer registrations are believed to be essentially complete for the year 2019, but it is important to note that the cancer registration database is dynamic. In common with cancer registries in other countries, cancer incidence rates in Scotland can take around five years after the end of a given calendar year to reach 100% completeness and stability, due to the continuing accrual of late registrations, coming to light through death certification, for example.
Data Visualisation

Data visualisation is included as part of this publication. This can be found on our website. If you have any comments or suggestions about this visualisation, please contact us by email.

Acknowledgement

This publication uses data shared by patients and collected by the NHS as part of their care and support. Data are processed in accordance with EU General Data Protection Regulation and Data Protection Act 2018 legislation.
Main points

• Over the last decade, the risk of developing cancer in Scotland fell by 5% in men but remained unchanged in women. The numbers of cancers increased in both sexes, from an overall total of over 30,600 in 2010 to more than 34,100 in 2019 – an increase of 11%. The increase in numbers reflects the increasing size of the older population.

• There were more cancers in females than males (around 17,300 and 16,800, respectively) in 2019 but the risk of cancer was higher in males than females. The higher number in females is because females live longer than males, and males and females get different types of cancer, in different proportions.

• Lung cancer is the most common cancer (more than 5,500 registrations overall), although breast (around 4,900) and prostate (around 4,100) cancers are the most common in females and males, respectively. Bowel (colorectal) cancer is the fourth most common cancer (around 4,200 in 2019).

• In the decade up to 2019:
  • in females, there were significant increases in rates of cancers of the liver (up 44%), thyroid (up 39%), and uterus (up 19%), while there were significant falls in the rates of cancers of the bowel (down 8%), stomach (down 26%), oesophagus (down 18%) and ovary (down 13%). Rates for carcinoma in situ of cervix uteri (abnormalities of the cervix that sometimes lead to cancer) also fell by 33%, leukaemia fell by 20% and non-Hodgkin lymphoma fell by 19%. There was very little change in lung or breast cancer rates.
  • in males, there were significant increases in rates of cancers of the prostate (up 11%), thyroid (up 42%), liver (up 24%), and kidney (up 21%) and malignant melanomas (up 21%). There were significant falls in the rates of cancers of the lung (down 19%), bowel (down 20%), bladder (down 10%) and oesophagus (down 10%).

• Lung cancer is three times more common in the most socio-economically deprived areas compared with the least deprived areas in Scotland. Cervical cancers are also more common in more deprived areas. In contrast, female breast and prostate cancers are more common in less deprived areas.

• The earlier a patient is diagnosed with cancer, the more likely they are to have a good outcome. Four out of five breast cancers (79%) were diagnosed at an early stage (I or II). In contrast, almost half of lung cancers (47%) and a fifth of colorectal cancers (20%) were diagnosed at a late stage (Stage IV). The quality of information on cancer stage in the Scottish Cancer Registry has improved over time with fewer records having missing data.

• There was convincing evidence that socio-economic deprivation increased the likelihood of being diagnosed with more advanced cancers of the bladder, bowel (colorectal), cervix, female breast, head and neck, melanoma and prostate. For these cancers, patients were more likely to have cancers that had spread to other parts of the body (metastatic disease - Stage IV) in the most deprived groups compared to the least deprived groups. Lower rates of participation in cancer screening (for breast, bowel and cervical cancers) are one potential explanation.
Results and commentary

These statistics can be found by cancer site on the Public Health Scotland website [cancer topic area](#). Other statistics available there include cancer mortality and survival.

Cancer incidence - numbers and risks over time

The overall numbers of cancers diagnosed annually increased from 30,618 in 2010 to 34,133 in 2019 – and overall increase in 11%. In contrast, the risk of developing cancer fell during the same period (by 3.1%; Figure 1 and [Cancer incidence: all cancers](#)).

The risk of all cancers (excluding non-melanoma skin cancers) has been higher in men than women, with a drop in age-adjusted incidence rates of 5.1% for males but no significant change in females over the last decade. The drop in cancer rates in males has reduced the gap between cancer risk in men and women. In contrast, there are more cancers diagnosed in women than men each year (nearly 17,300 females and over 16,800 males diagnosed in Scotland in 2019). The contrasting patterns between the numbers and rates, or risks, between the sexes is due to there being more women living to older ages than men, although the numbers of people in the older age groups of both sexes continue to increase over time.

To understand the implications of these trends over time, each cancer needs to be considered separately. Some have increased and others have decreased by similar or different degrees, while patterns in men and women may have gone in opposite directions. (See [Cancer Incidence by Site](#), below).

Note that all of the figures reported in this publication exclude diagnoses of non-melanoma skin cancers (almost 12,600 in 2019); an explanation for this can be found in [Appendix 1](#).
Figure 1. Cancer incidence in Scotland, 1995-2019. Number of cases and age-adjusted incidence rates by sex.

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

1. All cancers excluding non-melanoma skin cancers (ICD-10 C00-C97 excl C44).
2. The estimated 10-year changes in age-adjusted (using the 2013 European Standard Population) incidence rates quoted in the text are calculated using Poisson regression analysis. The 10-year fall in rates to 2019 was 5.1% in males and 0.8% in females (which was not significant).
Cancer incidence by age

The rate, or risk, of cancer diagnosis increases with age in both sexes (Figure 2). Age-specific numbers of cancers reflect both the risk and the number of people at risk. The overall number of cancers increases with age to a peak at 70-74 years, and then declines thereafter as the size of the older population decreases. In 2019, three-quarters (76%) of cancer diagnoses were in people aged 60 and over. There are, however, very different age patterns observed for males and females, with risks being higher in females aged 20-59 years and higher in males aged 60 and over. This pattern reflects the different types of cancer with which males and females are diagnosed. Additionally, for some sites the pattern seen in Figure 2 is not followed and risk differs by age group; for example, cervical cancer where the highest risk is in the younger age groups (see Cancer Incidence by Site for more detail).

Figure 2. Number of cancer registrations and age-specific rates per 100,000 population for all malignant neoplasms\(^1\) diagnosed in 2019 by five-year age group and sex.

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

1. All cancers excluding non-melanoma skin cancers (ICD-10 C00-C97 excl C44).
Cancer incidence by socio-economic circumstances

Generally, people who live in more deprived areas of Scotland are more likely to be diagnosed with cancer, with the most deprived areas in Scotland having incidence rates that are 26% higher than the least deprived areas (Figure 3). This overall pattern is strongly influenced by higher rates of smoking-related cancers in more deprived areas although the opposite pattern – higher rates of cancer in less deprived areas – is seen for several common cancers.

Figure 3. Age-adjusted\(^1\) cancer incidence rates for all cancers combined (excluding non-melanoma skin cancer) by deprivation quintile\(^2\) in Scotland, 2015-2019. 95% confidence intervals shown.

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

2. Deprivation quintile based on SIMD2016.
Socio-economic deprivation may further increase the cancer risks of some behavioural factors. For example, smoking confers a relatively greater risk of cancer among people from more deprived areas.

For lung cancer, age-adjusted incidence rates were three times higher in the most deprived areas of Scotland compared with the least deprived (age-adjusted incidence rates of 178 and 61 per 100,000, respectively for 2015-2019) – Figure 4.

Figure 4. Age-adjusted\(^1\) cancer incidence rates for lung cancer by deprivation quintile\(^2\) in Scotland, 2015-2019. 95% confidence intervals shown.

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

2. Deprivation quintile based on SIMD2016.
For female breast cancer, incidence was 14% higher in the least deprived areas compared with the most deprived (age-adjusted incidence rates of 182 and 160 per 100,000, respectively, for 2015-2019) – Figure 5. This is likely to reflect differences in lifestyle, behavioural and reproductive factors, including higher rates of attendance at breast screening and having fewer children, in less deprived areas.

Figure 5. Age-adjusted\(^1\) cancer incidence rates for female breast cancer by deprivation quintile\(^2\) in Scotland, 2015-2019. 95% confidence intervals shown.

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

2. Deprivation quintile based on SIMD2016.
For prostate cancer, incidence was 33% higher in the least deprived areas compared with the most deprived (age-adjusted incidence rates of 183 and 138 per 100,000, respectively, for 2015-2019) – Figure 6. This may reflect higher rates of prostate specific antigen (PSA) testing in less deprived areas rather than a truly higher rate of prostate cancer (see Morgan et al)\(^*\).

**Figure 6. Age-adjusted\(^1\) cancer incidence rates for prostate cancer by deprivation quintile\(^2\) in Scotland, 2015-2019. 95% confidence intervals shown.**

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

2. Deprivation quintile based on SIMD2016.

There is almost no difference between the incidence of colorectal cancers in the most and least deprived groups (age-adjusted incidence rates of 80 and 77 per 100,000, respectively, for 2015-2019) – Figure 7.

**Figure 7. Age-adjusted¹ cancer incidence rates for colorectal cancer by deprivation quintile² in Scotland, 2015-2019. 95% confidence intervals shown.**

The incidence of cervical cancer is twice as high in women who live in the most deprived areas compared to the least deprived (age-adjusted incidence rates of 18 and 9 per 100,000 respectively for 2015-2019) reflecting socio-economic differences in exposure to risk factors, and lower attendance for cervical screening which aims to prevent cervical cancer by diagnosing and treating pre-cancerous changes. Head and neck cancers are two and a half times more common in the most deprived compared to the least deprived areas (153% higher, age-adjusted incidence rates of 41 and 16 per 100,000 respectively). This reflects higher exposures to cigarette smoke and alcohol among people in more deprived areas.

Other cancers where the incidence is higher in more deprived areas include bladder, kidney, liver, oesophagus, pancreas and stomach. These may reflect increases in exposure to risk factors such as smoking, alcohol consumption and obesity in more deprived areas.

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¹ Age-adjusted incidence rates using the 2013 European Standard Population.
² Deprivation quintile based on SIMD2016.

Source: Scottish Cancer Registry, Public Health Scotland (PHS)
In contrast, malignant melanomas are almost twice as common (91% higher) in people from the least deprived areas compared with the most deprived (age-adjusted incidence rates of 36 and 19 per 100,000 respectively for 2015-2019).

**Staging information in the Scottish Cancer Registry**

Cancer staging is the process of determining the extent to which a cancer has developed and spread at the time of diagnosis. For the majority of patients with cancer it is common practice to assign a number from I to IV to a cancer, with I indicating the cancer is confined to the original organ in which it occurred and IV being a cancer which has spread beyond the original organ and its local lymph glands (regional lymph nodes) to other parts of the body. Patients diagnosed with earlier stage cancers tend to have better outcomes and longer survival compared with patients diagnosed at later stages.

The completeness of recording of cancer staging information on the Scottish Cancer Registry has improved and been extended to include more cancer sites over time. Apparent changes in stage may be because of better recording of stage rather than true changes. Therefore, it is important to consider the proportion of cases with unknown stage, described below, when any inferences about comparisons of cancer registrations by stage are drawn over time.

**Trends in unknown cancer stage**

The completeness of recording of cancer staging information on the Scottish Cancer Registry has improved, with collection of staging data extended to additional cancer sites over time. Figures 8-10 show this for the 16 most common cancer sites.

The cancer sites are reported by the length of time they have been recorded in the Scottish Cancer Registry to make it clearer how completeness of staging information has changed over the time it has been recorded. It is generally the case that information on stage is most complete for the cancers that have been collecting staging information the longest.

Figure 8 includes information on the earliest cancer sites where staging information were collected. The proportions of cases where the stage is not recorded in the Scottish Cancer Registry has fallen over time. Unknown stage of lung cancer fell from 63% in 2005 to 6% in 2019; cervical cancer fell from a peak of 27% in 2007 to 4% in 2019; ovarian cancer fell from a peak of 42% in 2006 to 12% in 2019; and female breast cancer fell from a peak of 23% in 2004 to 4% in 2019. Thus staging information was available for the greater majority of these cancers by 2019. (Note that staging information has been collected for both cervical and breast cancers since 1997. In addition, both Breslow thickness and Clark’s level staging data for malignant melanoma have been collected by the Scottish Cancer Registry since 2005 but TNM staging data have been collected only since 2015.)
Figure 8. Trends in percentage of cancer patients (for lung, breast, cervical and ovarian cancer) with unknown stage in Scotland, 2000-2019.

Source: Scottish Cancer Registry, Public Health Scotland (PHS)
Figure 9 includes information on the cancer sites which begin collecting staging information between 2012 and 2014. There have generally been reductions in missing staging information over time but by 2019, the proportions were higher than for the cancers reported in Figure 8. By 2019, stage information was still missing for 24% of stomach cancers; 22% of pancreatic cancers; 18% of prostate cancers; 17% of colorectal cancers; and 12% of kidney cancers. This makes inferences about changes in stage somewhat unreliable because the actual stages of anywhere between 1 in 8 and 1 in 4 cancers are not recorded.

Figure 9. Trends in percentage of cancer patients (for colorectal, oesophageal, stomach, pancreatic, prostate and kidney cancer) with unknown stage in Scotland, 2012-2019.

Source: Scottish Cancer Registry, Public Health Scotland (PHS)
Figure 10 includes information on the cancer sites which began collecting staging information between 2015 and 2016. In general, the proportions of missing stage information were greatest in these cancers. By 2019, stage information was still missing from 51% of malignant melanomas of the skin; 35% of bladder cancers; 26% of testicular cancers; 23% of thyroid cancers; 18% of head and neck cancers; and 8% of uterine cancers. This makes inferences about any observed changes in stage at diagnosis unreliable. (Note: both Breslow thickness and Clark’s level staging data for malignant melanoma have been collected by the Scottish Cancer Registry since 2005 but TNM staging data have been collected only since 2015.)

Figure 10. Trends in percentage of cancer patients (for head and neck, melanoma, uterine, testicular, bladder and thyroid cancer) with unknown stage in Scotland, 2015-2019.

Cancer incidence by stage over time

The most common stages of breast cancer diagnoses in females were Stages I and II (together making up nearly 80% of all new diagnoses in 2019). However, the proportion of breast cancers diagnosed when the disease is already at a late stage has remained at around 5-6% since 2005. The proportion of patients with an unknown stage has fallen to a small percentage (4.2%; Figure 11). The generally early diagnosis of breast cancer is mainly due to the ability to feel breast lumps that may be cancer, greater awareness of breast cancer symptoms, the presence of a national screening programme and rapid referral of suspected breast cancers to diagnostic services.

Source: Scottish Cancer Registry, Public Health Scotland (PHS)
In contrast, for lung cancer (Figure 12), almost half are diagnosed when the cancer has spread elsewhere and the patient is unlikely to be cured (47% in 2019), with a further 6% with stage unknown. Symptoms of lung cancer are common but vague, and are not specific for lung cancer (for example, a persistent cough or unexplained weight loss) and often only appear later as the disease progresses. The proportions of both early (Stage I) and late (Stage IV) lung cancer have increased and it seems likely that this is largely due to the improvement in recording of stage at diagnosis, as there has been a large reduction in the proportion of lung cancers with no stage recorded.

Source: Scottish Cancer Registry, Public Health Scotland (PHS)
A fifth of colorectal cancers are diagnosed at a late stage (20\% in 2019). There has been little change between 2010 and 2019 in the proportion of colorectal cancers with early stage disease (15\% in 2019) (Figure 13). Bowel screening was introduced in Scotland for 50-74 year olds in 2007. Following this, early stage (Stage I) cancers increased but so, too, did late stage (Stage IV) diagnoses, so it is not clear if screening led to an increase in earlier diagnoses or better coding of stage (the proportion of unknown stage was generally lower after 2007). A new bowel screening test (Faecal Immunochemical Test (FIT)) was introduced in November 2017, and a change from Dukes’ to TNM staging in the Scottish Cancer Registry began in January 2019, so a simple comparison of stages before and after the FIT test is not valid using these data.

**Figure 13. Trends in stage 1 distribution of colorectal cancer in Scotland, 2000-2019.**

![Graph showing trends in stage distribution](image)

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

Cancer incidence by stage and socio-economic circumstances

Table 1 summarises whether or not there is any association between deprivation and cancer stage; and indeed, whether this relationship is linear (i.e. there is a progressive increase or decrease in stage with increasing deprivation). A non-linear association may be a genuine relationship between the known stages and deprivation, or could be a consequence of artefacts within the data. One explanation could be clinical awareness being more pronounced within certain groups (e.g. this could explain why there are more Stage I lung cancer patients in the most deprived group). Another reason could be in data collection (e.g. the association may be mainly caused by the distribution of those patients with unknown stage data). For example, for cancer of the stomach, there were more patients with unknown stage in the least deprived group, although there were also fewer Stage III cancers in the least deprived, and more Stage III cancers in the most deprived group than expected (Table 1).

There was a strong linear association between socio-economic circumstances and stage at diagnosis of female breast, colorectal, prostate, melanoma of the skin, head and neck, and cervical cancers. There was also a weak linear association with bladder cancer, and a non-linear association with lung and oesophageal cancers (Table 1).
Table 1: Relationship between cancer stage and deprivation quintile\(^1\): 2015-2019\(^2\).

<table>
<thead>
<tr>
<th>Cancer site</th>
<th>% with unknown stage</th>
<th>Pearson chi-square (Cancer stage by deprivation quintile)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>p-value (incl unknown stage)(^3)</td>
</tr>
<tr>
<td>Bladder</td>
<td>39.4</td>
<td>0.156</td>
</tr>
<tr>
<td>Colorectal</td>
<td>16.4</td>
<td>&lt;0.0001</td>
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<tr>
<td>Cervix uteri</td>
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<td>0.003</td>
</tr>
<tr>
<td>Corpus uteri</td>
<td>7.9</td>
<td>0.198</td>
</tr>
<tr>
<td>Female Breast</td>
<td>4.9</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Head and neck(^2)</td>
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<td>0.045</td>
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<tr>
<td>Kidney</td>
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<td>0.595</td>
</tr>
<tr>
<td>Lung</td>
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<tr>
<td>Melanoma</td>
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<td>Ovary</td>
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<td>Pancreas</td>
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<tr>
<td>Prostate</td>
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</tr>
<tr>
<td>Stomach</td>
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<td>0.020</td>
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<tr>
<td>Testis</td>
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</tr>
<tr>
<td>Thyroid(^2)</td>
<td>24.7</td>
<td>0.228</td>
</tr>
</tbody>
</table>

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

1. Deprivation quintile based on SIMD2016.
2. Staging information for head and neck and thyroid is available only from 2016-2019.
3. Pearson chi-squared p-value based on cancer stage (including unknown stage) by deprivation quintile.
4. Pearson chi-squared p-value based on cancer stage (known stage only) by deprivation quintile.
5. Pearson chi-squared linear-by-linear association p-value based on cancer stage (known stage only) by deprivation quintile.
6. p-value is the probability that association between cancer stage and deprivation occurred by chance. A p-value of less than 0.05 indicates that the change is statistically significant.
Overall, the risk of colorectal (bowel) cancer is only slightly greater in more deprived areas of Scotland and the difference has reduced over time – Figure 14. Patients in the most deprived areas are less likely to be diagnosed with early stage (Stage 1) bowel cancer and more likely to be diagnosed with late stage (Stage IV) disease compared with patients in the least deprived areas. There were also more patients with stage not known in the more deprived areas, and correspondingly fewer missing stage cancers in the less deprived areas; it is not possible to say if the missing information would change the observed risks of some stages of bowel cancer more than others. There is a much greater uptake of bowel cancer screening among people from less deprived areas (around a 20% absolute gap) and screen-detected cancers tend to be at an earlier stage.

Figure 14. Stage\(^1\) distribution by deprivation quintile for colorectal cancer in Scotland, 2015-2019. 95% confidence intervals shown.

Source: Scottish Cancer Registry, Public Health Scotland (PHS)
1. Staging system - Dukes’ stages: A, B, C, D, or not known/not recorded (pre-2018); TNM* stages: I, II, III, IV, or not known/not recorded (2018 onwards).
2. EASR: age- and sex-standardised (using the 2013 European Standard Population) incidence rate per 100,000 person years at risk.
3. The European Standard Population (ESP), which was first used in 1976, was revised in 2013. Figures using ESP1976 and ESP2013 are not comparable.
4. European Age-Sex Standardised Rate (EASR), calculated using ESP2013 and using 5-year age groups 0-4, 5-9 up to an upper age group of 90+.
5. Confidence intervals for age-standardised rates (EASR) have been calculated using a formula which works only when numbers are sufficiently large. They are therefore set to 'not applicable' in the event of there being fewer than 20 cases.
The incidence of cervical cancer is twice as high in women from the most deprived areas of Scotland compared with the least deprived (age-adjusted incidence rates of 18 and 9 per 100,000, respectively for 2015-2019). The risk of being diagnosed with late stage cervical cancer is four times greater among women from the most deprived areas compared to the least deprived (2.9 and 0.8 per 100,000, respectively) - Figure 15. Early stage (Stage I) cervical cancer is one and a half times more common in women from the most compared to the least deprived areas of Scotland (7.6 and 5.0 per 100,000, respectively). There is no clear socio-economic pattern among missing data but the proportion is small (4.5%).

Uptake of cervical screening, which can both prevent cancer and also detect early cancer, is lower among women from more deprived areas and this may partly explain the difference in stage.

Figure 15. Stage distribution by deprivation quintile for cervical cancer in Scotland, 2015-2019. 95% confidence intervals shown.

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

Female breast cancer occurs more commonly in women from less deprived areas and they are more likely to be diagnosed at the earliest stage (age-adjusted incidence rates of Stage I cancer 79 and 59 per 100,000, in least and most deprived quintiles, respectively for 2015-2019). Women from the most deprived areas had higher risks of Stage IV disease (age-adjusted incidence rates 13 and 10 per 100,000 in most and least deprived quintiles, respectively). Rates of “not known” stage cancer were similar across socio-economic groups (Figure 16). Attendance at a breast screening appointment is much higher in women from less deprived areas (an absolute difference of about 20% between the least and most deprived in uptake) and screen-detected cancers tend to be smaller (i.e. generally lower stage).
Figure 16. Stage distribution by deprivation quintile for female breast cancer in Scotland, 2015-2019. 95% confidence intervals shown.

The incidence of head and neck cancers is higher among people from more deprived areas (37 and 16 per 100,000 in the most and least deprived quintiles, respectively). They are more likely to be diagnosed at any stage of the disease but their risk is highest for the most advanced stage, when the disease has spread to other parts of the body (Stage IV age-adjusted incidence rates of 15 and 6 per 100,000 in most and least deprived areas, respectively) (Figure 17).
Lung cancers occur much more commonly in people who live in more deprived areas compared with those in least deprived areas (age-adjusted incidence rates of 178 and 61 per 100,000, respectively for 2015-2019). Overall, nearly half of lung cancers (46%) are diagnosed when they have spread elsewhere in the body (Stage IV). There are some small differences in the stage of cancer between socio-economic groups, for example, people in the least deprived areas have more cancers diagnosed with the earliest stage than expected, and although there are more Stage IV cancers in all deprivation groups, there are fewer numbers diagnosed in the most deprived group than expected (Figure 18). This could arise because patients from the more deprived areas are more likely to smoke, leading to greater awareness of the potential of symptoms suggestive of lung cancer, leading to earlier referral. There is, however, no clear overall pattern to indicate that deprivation is associated with either earlier or later stage of diagnosis of lung cancer, and the significant association is more likely to be an explanation of the data as described above.

Source: Scottish Cancer Registry, Public Health Scotland (PHS)
1. Staging information for head and neck cancer is available only from 2016-2019.
Incidence of prostate cancer is higher in men from less deprived areas compared with those from more deprived areas (age-adjusted incidence rates of 183 and 138 per 100,000, respectively for 2015-2019). Overall, 13% of men had prostate cancer diagnosed at Stage I, while more than a quarter had their prostate cancer diagnosed once it had spread elsewhere in the body (Stage IV; 28%), and just under a fifth (18%) of cases had no information on stage. Although men of all deprivation quintiles were most likely to be diagnosed with Stage IV disease, in less deprived areas there were fewer men than expected diagnosed with metastatic disease. In contrast, despite the much lower risk of getting the prostate cancer in the most deprived group, there were more men than expected diagnosed with Stage IV disease in this group (Figure 19). The higher rates of early stage disease in the less deprived areas may be because men from these areas are more likely to request and to receive a Prostate-Specific Antigen (PSA) test by their GP.
Figure 19. Stage distribution by deprivation quintile for prostate cancer in Scotland, 2015-2019. 95% confidence intervals shown.

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

Cancer incidence by site

The most common cancers were breast, lung and colorectal cancers in females, accounting for 56% of all malignancies. Lung cancer remained the most common cancer overall in Scotland, with there now being more cases of lung cancer in females than males. This is due to the differing patterns of smoking between the sexes over the previous decades with an ongoing increase among women since the 1970s, while it started to decline in men. In total, there were 5,505 cases diagnosed in 2019, which accounted for 16% of all cancers in Scotland. There were a total of 4,895 cases of breast cancer (14%), with all but 38 cases diagnosed in females. There were 4,166 cases of colorectal cancer (12%), with 282 extra cases in males than in females (Figure 20) and 4,066 cases of prostate cancer (12%). In males, prostate, lung and colorectal cancers were the most common cancer (53% of cancers in men).
Figure 20. Most common 20 cancers in Scotland in 2019 for females and males (ordered by total for all persons).

Cancer incidence by site and over time

A publication in the British Journal of Cancer† estimated that nearly four in ten cancers can be attributed to – and therefore potentially prevented by - modifiable risk factors. Cigarette smoking, being overweight and some occupational risk factors are among the largest cancer risks to the Scottish population. The effects of sunburn, alcohol and a diet that is high in meat and low in fruit and vegetables are apparent in the Scottish cancer incidence data. The success of the national HPV vaccination programme to prevent cervical cancer is also apparent.

When attempting to interpret trends in cancer incidence, it is important to remember that recent patterns of cancer are, for the most part, likely to reflect trends in the prevalence of risk and protective factors going back several decades. They will also be affected by trends in the underlying age structure of the population. For example, fewer people now die of heart attacks and fewer men are now dying of smoking than they were; as such, the population is living longer and there are relatively more men in the older age groups in the population than in the last couple of decades. In some situations, they may also reflect the effects of screening or other awareness campaigns to diagnose cancers earlier. The commentary below relates to average changes in the incidence rates of different types of cancer over the last ten years.

The ten most common cancers in males and females in 2019 are different (Table 2). There are also different patterns observed for the changes over the decade to 2019 for the ten most common cancers in males and females, respectively. There appeared to be more stability in females than in males, with significant changes in the age-standardised incidence rates over the decade observed for only four of the cancers in females compared with seven in males. In addition, the age-standardised rates for all cancers significantly fell by 5% for males, but there was almost no change for females (slightly down by 0.8%) over the decade.

In females in the decade to 2019, there was a significant increase in rates of cancers of the uterus (up 19%), while there were significant falls in the rates of colorectal cancers (down 8%) and cancers of the ovary (down 13%), and also for non-Hodgkin lymphomas by 19%.

For males in the decade to 2019, there were significant increases in rates of cancers of kidney (up 21%) and prostate (up 11%). Malignant melanomas also increased by 21%. There were significant falls in the rates of colorectal cancers (down 20%), lung cancers (down 19%), oesophageal cancers (down 10%) and bladder cancers (down 10%).
Table 2: Most common cancers in Scotland in 2019: Rank, number, frequency and change in age-adjusted incidence rate since 2009.

<table>
<thead>
<tr>
<th>Rank</th>
<th>Type of cancer</th>
<th>Number</th>
<th>Frequency</th>
<th>EASR&lt;sup&gt;1,2,3&lt;/sup&gt;</th>
<th>10 year % change&lt;sup&gt;4&lt;/sup&gt;</th>
<th>p-value&lt;sup&gt;4&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Males</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Prostate (C61)</td>
<td>4,066</td>
<td>24.1%</td>
<td>162.7</td>
<td>+11.5</td>
<td>0.0003</td>
</tr>
<tr>
<td>2</td>
<td>Trachea, bronchus and lung (C33-C34)</td>
<td>2,660</td>
<td>15.8%</td>
<td>109.7</td>
<td>-19.4</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>3</td>
<td>Colorectal (C18-C20)</td>
<td>2,224</td>
<td>13.2%</td>
<td>90.6</td>
<td>-19.5</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>4</td>
<td>Head and Neck (C00-C14, C30-C32)</td>
<td>894</td>
<td>5.3%</td>
<td>34.7</td>
<td>-2.6</td>
<td>0.3719</td>
</tr>
<tr>
<td>5</td>
<td>Malignant melanoma of skin (C43)</td>
<td>779</td>
<td>4.6%</td>
<td>31.2</td>
<td>+20.7</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>6</td>
<td>Kidney (C64-C65)</td>
<td>677</td>
<td>4.0%</td>
<td>26.9</td>
<td>+20.9</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>7</td>
<td>Non-Hodgkin lymphoma (C82-C86)</td>
<td>586</td>
<td>3.5%</td>
<td>23.4</td>
<td>-3.5</td>
<td>0.3523</td>
</tr>
<tr>
<td>8</td>
<td>Bladder (C67)</td>
<td>577</td>
<td>3.4%</td>
<td>24.4</td>
<td>-9.7</td>
<td>0.0055</td>
</tr>
<tr>
<td>9</td>
<td>Oesophagus (C15)</td>
<td>560</td>
<td>3.3%</td>
<td>22.7</td>
<td>-10.1</td>
<td>0.0052</td>
</tr>
<tr>
<td>10</td>
<td>Pancreas (C25)</td>
<td>483</td>
<td>2.9%</td>
<td>19.7</td>
<td>+2.4</td>
<td>0.5744</td>
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<tr>
<td></td>
<td>Other malignant neoplasms</td>
<td>3,350</td>
<td>19.9%</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>All malignant neoplasms excluding non-melanoma skin cancer</td>
<td>16,846</td>
<td>100.0%</td>
<td>681.7</td>
<td>-5.1</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td><strong>Females</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Breast (C50)</td>
<td>4,857</td>
<td>28.1%</td>
<td>167.1</td>
<td>+0.2</td>
<td>0.8798</td>
</tr>
<tr>
<td>2</td>
<td>Trachea, bronchus and lung (C33-C34)</td>
<td>2,845</td>
<td>16.5%</td>
<td>96.2</td>
<td>+2.4</td>
<td>0.1979</td>
</tr>
<tr>
<td>3</td>
<td>Colorectal (C18-C20)</td>
<td>1,942</td>
<td>11.2%</td>
<td>65.5</td>
<td>-7.7</td>
<td>0.0022</td>
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<tr>
<td>4</td>
<td>Corpus uteri (C54)</td>
<td>843</td>
<td>4.9%</td>
<td>28.8</td>
<td>+18.8</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>5</td>
<td>Malignant melanoma of skin (C43)</td>
<td>761</td>
<td>4.4%</td>
<td>26.4</td>
<td>+7.8</td>
<td>0.0661</td>
</tr>
<tr>
<td>6</td>
<td>Ovary (C56)</td>
<td>593</td>
<td>3.4%</td>
<td>20.4</td>
<td>-12.9</td>
<td>0.0001</td>
</tr>
<tr>
<td>7</td>
<td>Pancreas (C25)</td>
<td>460</td>
<td>2.7%</td>
<td>15.5</td>
<td>+1.1</td>
<td>0.8281</td>
</tr>
<tr>
<td>8</td>
<td>Non-Hodgkin lymphoma (C82-C86)</td>
<td>458</td>
<td>2.6%</td>
<td>15.5</td>
<td>-19.2</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>9</td>
<td>Kidney (C64-C65)</td>
<td>405</td>
<td>2.3%</td>
<td>13.7</td>
<td>+1.3</td>
<td>0.7709</td>
</tr>
<tr>
<td>10</td>
<td>Head and Neck (C00-C14, C30-C32)</td>
<td>400</td>
<td>2.3%</td>
<td>13.6</td>
<td>-5.9</td>
<td>0.1759</td>
</tr>
<tr>
<td></td>
<td>Other malignant neoplasms</td>
<td>3,723</td>
<td>21.5%</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>All malignant neoplasms excluding non-melanoma skin cancer</td>
<td>17,287</td>
<td>100.0%</td>
<td>589.3</td>
<td>-0.8</td>
<td>0.3667</td>
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<tr>
<td><strong>All persons</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Trachea, bronchus and lung (C33-C34)</td>
<td>5,505</td>
<td>16.1%</td>
<td>103.0</td>
<td>-10.4</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>2</td>
<td>Breast (C50)</td>
<td>4,895</td>
<td>14.3%</td>
<td>84.3</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>3</td>
<td>Colorectal (C18-C20)</td>
<td>4,166</td>
<td>12.2%</td>
<td>78.0</td>
<td>-15.0</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>4</td>
<td>Prostate (C61)</td>
<td>4,066</td>
<td>11.9%</td>
<td>162.7</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>5</td>
<td>Malignant melanoma of skin (C43)</td>
<td>1,530</td>
<td>4.5%</td>
<td>28.8</td>
<td>+14.5</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>6</td>
<td>Head and Neck (C00-C14, C30-C32)</td>
<td>1,294</td>
<td>3.8%</td>
<td>24.2</td>
<td>-3.6</td>
<td>0.1993</td>
</tr>
<tr>
<td>7</td>
<td>Kidney (C64-C65)</td>
<td>1,082</td>
<td>3.2%</td>
<td>20.3</td>
<td>+13.8</td>
<td>0.0001</td>
</tr>
<tr>
<td>8</td>
<td>Non-Hodgkin lymphoma (C82-C86)</td>
<td>1,044</td>
<td>3.1%</td>
<td>19.5</td>
<td>-10.6</td>
<td>0.0003</td>
</tr>
<tr>
<td>9</td>
<td>Pancreas (C25)</td>
<td>943</td>
<td>2.8%</td>
<td>17.6</td>
<td>+1.8</td>
<td>0.4814</td>
</tr>
<tr>
<td>10</td>
<td>Corpus uteri (C54)</td>
<td>843</td>
<td>2.5%</td>
<td>28.8</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>Other malignant neoplasms</td>
<td>8,765</td>
<td>25.7%</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>All malignant neoplasms excluding non-melanoma skin cancer</td>
<td>34,133</td>
<td>100.0%</td>
<td>635.5</td>
<td>-3.1</td>
<td>0.0041</td>
</tr>
</tbody>
</table>

Source: Scottish Cancer Registry, Public Health Scotland (PHS)  
1. EASR: age- and sex-standardised (using the 2013 European Standard Population) incidence rate per 100,000 person-years at risk.  
2. The European Standard Population (ESP), which was first used in 1976, was revised in 2013. Figures using ESP1976 and ESP2013 are not comparable.  
3. European Age-Sex Standardised Rate (EASR), calculated using ESP2013 and using 5-year age groups 0-4, 5-9 up to an upper age group of 90+.  
4. Estimated 10-year change in age-adjusted incidence rates, calculated using Poisson regression analyses.

*x* = not applicable.
5. p-value is the probability that the 10-year percentage change occurred by chance. A p-value of less than 0.05 indicates that the change is statistically significant.

6. Percentage change in incidence is not shown here for cancers occurring mainly or only in one sex.

Figure 21 shows the changes in the age-adjusted incidence rates for the 20 most common cancers in Scotland across both sexes. In addition to the changes mentioned above, there were also significant changes for some of the less common cancers. For example, in females, there had been significant increases in rates of cancers of the liver (up 44%) and thyroid (up 39%), while there had also been significant falls in the rates of cancers of the stomach (down 26%) and oesophagus (down 18%), and also leukaemias fell by 20%. Rates for carcinoma in situ of cervix uteri (abnormalities of the cervix that sometimes lead to cancer) fell by 33% (data not shown).

Similarly, for males in the decade to 2019, there were significant increases in rates of cancers of the thyroid (up 42%) and liver (up 24%), and there were significant falls in the rates of stomach cancer (down 33%) and of leukaemias (down 26%).

**Figure 21. 10-year percentage change in age-adjusted incidence rates for 20 most common cancers in Scotland.**

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

**Colorectal cancer**

Over half of bowel cancers are likely to be preventable in the UK, with eating processed meat, being overweight or obese, alcohol consumption and smoking being among the most common risk factors. Recent decreases in incidence might reflect the removal of pre-malignant polyps at colonoscopies resulting from the Scottish Bowel Screening Programme, but the larger decrease in
men compared with women is not consistent with men’s lower uptake of screening. Overweight and obesity prevalence has not fallen while smoking rates have decreased.

**Non-Hodgkin lymphoma**

Non-Hodgkin lymphoma (NHL) decreased in females by 19% but did not change significantly in males. Although immunosuppression has been associated with the development of NHL, much has still to be understood about the causes of NHL.

**Cancer of the body of the uterus (corpus uteri)**

The majority of these cancers affect the endometrium or lining of the womb. The increase in incidence (19%) may be due, at least in part, to longstanding changes in fertility (since childbearing appears to protect against endometrial cancer) and increases in levels of obesity (which increase risk). A further contributing factor may be a decrease in rates of hysterectomy, which leaves a larger population at risk of developing uterine cancer.

**Liver cancer**

About half of liver cancers are preventable in the UK, with overweight and obesity, smoking, infections and alcohol being among the common causes. The long-term and persistent increase in overweightness and obesity may explain substantial increases in risks of liver cancer (44% increase for females and 24% for males).

**Cervical cancer (cervix uteri)**

The incidence of cervical cancer has not changed significantly over the last ten years for all ages combined. It was the eleventh most common cancer in females in Scotland in 2019 but it is the most common cancer in women under the age of 35 (as it is in the rest of the UK). The main risk factor for cervical cancer is infection with the human papilloma virus (HPV). Rates of cervical cancer were much lower in 2019 in 20-29 year-old women compared to previous years while rates of histologically-verified CIN3 (the most serious pre-cancerous form of cervical intraepithelial neoplasia) have been falling for several years and is significantly different over the last ten years. Together, these suggest that the HPV vaccination programme introduced in Scotland in 2008 has been effective in reducing cervical cancer.

**Breast cancer**

Known risk factors for breast cancer include older mother’s age at the birth of her first child, having a smaller number of, or no children, post-menopausal obesity and alcohol consumption. The introduction or extension of existing screening programmes may also lead to increases in diagnoses of breast cancer.

**Prostate cancer**

There are few modifiable risk factors for prostate cancer. The rate of prostate-specific antigen testing has a significant effect on rates of diagnosis, and is likely to have been driven by greater awareness of the disease.
Lung cancer
The single largest risk factor for lung cancer is cigarette smoking and the large decrease in lung cancer in men reflects decreases in smoking prevalence over several decades. Occupational exposures and low fruit and vegetable consumption may also be risk factors.

Malignant melanoma of the skin
Malignant melanoma of the skin is the fifth most common cancer in women and also in men. Incidence rates increased over the last decade by 21% in males and while they did not change significantly in females over the past decade, substantial increases have occurred previously. The primary recognised risk factor for melanoma of the skin is exposure to ultraviolet radiation – natural sunlight and tanning lights - especially but not exclusively at a young age.

Ovarian cancer
The 13% decrease observed in ovarian cancer incidence may be partly due to increased use of the oral contraceptive pill from the 1960s onwards, since this appears to protect against the development of ovarian cancer.

Kidney cancer
Cancers of the kidney continue to show increases in incidence rates over the last ten years in men (by 21%) but no significant change in women. The increase has occurred primarily in cancers of the renal parenchyma rather than of the renal pelvis. The reason for this increase is not clear. Established risk factors include obesity and smoking, but advances in medical imaging may also have led to an increase in incidental diagnosis of some tumours.

Thyroid cancer
Thyroid cancer rates increased 42% in men and 39% in women in the decade to 2019. Similar increases have been observed in other countries but it is not clear to what extent it represents a true increase in the occurrence of thyroid cancer or improved detection of previously undiagnosed disease. A number of known risk factors for thyroid cancer exist, including exposure to radiation, family history and obesity.
Screen detected cancers

There are three national screening programmes for cancer in Scotland – for bowel (colorectal), breast and cervical cancers. These aim to detect asymptomatic cancers at an earlier stage than if they had become symptomatic and also to detect pre-cancerous conditions that can be treated to prevent cancer occurring. This section describes the role of cancer screening on overall cancer diagnoses for the eligible populations.

In 2019, a third (34%) of colorectal cancers in 50-74 year olds were detected by screening and two thirds (66%) by other routes (Figure 22). There has been an increase over time in the proportion of bowel cancers detected by screening, from 26% in 2015 to 34% in 2019.

Figure 22. Trends in screen detection of colorectal cancer in Scotland, ages 50-74, 2012-2019.

In 2019, just over half (53%) of breast cancers in 50-69 year old women were detected by screening and just under half (47%) by other routes (Figure 23). There has been no clear change in these proportions over time.
In 2019, just over half (51%) of cervical cancers in 25-64 year old women were detected by screening and just under half (49%) by other routes (Figure 24). While the proportion of screen-detected cervical cancers was lower in 2015 compared with 2019 (43% and 51%, respectively), there has been no clear trend between 2016 and 2019.

Source: Scottish Cancer Registry, Public Health Scotland (PHS)
**Lifetime risk of developing cancer**

Currently, it is estimated that two in five (41%) people in Scotland will be diagnosed with some form of cancer, including some cancers that may have no detrimental impact on life expectancy, such as slow-growing prostate tumours. Risk estimates are based on existing trends and are group statistics, meaning that individual variation in lifestyle, environmental influences and genetics will have an impact on an individual’s likelihood of developing cancer.

Details on the risk estimates for individual types of cancer, broken down by sex and by age bands are available on Cancer Statistics webpages.

Information on how lifetime risk is calculated can be found on our FAQs webpage.

**Prevalence of cancer**

The number of people in Scotland diagnosed with some form of cancer in the last 20 years who are still alive is estimated to be approximately 200,000 individuals (202,906), or approximately 3.7% of the population. This number is broken down by sex within each of the cancer types on the Cancer Statistics webpages.

Information on how prevalence is calculated can be found on our FAQs webpage.
Glossary

Age-adjusted rate
See European Age Standardised Rate (EASR) below.

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

Cancer registry
The Scottish Cancer Registry is responsible for the collection of information on all new cases of cancer arising in residents of Scotland. More detailed information is available on the PHS website here.

Carcinoma
A cancer of the epithelial tissue that covers all the body’s organs. Most cancers are carcinomas.

Confidence interval
The interval or range of values that is likely to contain the true value of a parameter.

Crude rate
The number of cases divided by the population. The crude rate does not attempt to adjust for differences in age and sex structures between different populations (see European age-standardised rate below). Typically expressed as the number of cases per 100,000 population.

Epithelial tissue
Tissue that covers the body’s organs and other internal surfaces.

European Age Standardised Rate (EASR)
The rate that would have been found if the population in Scotland had the same age-composition as the hypothetical standard European population. The 2013 European Standard Population (ESP2013) has been used to calculate EASRs within this publication.

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

Incidence
Incidence refers to the number of new cases of a condition in a defined population during a defined period and is typically expressed as the number of new cases per 100,000 population per year (or other suitable units).

Malignant tumour
Cancerous growth.

Mortality rate
The number of deaths as a rate per 100,000 population.
Neoplasm
Abnormal growth.

Non-melanoma skin cancer (NMSC)
A type of cancer that usually develops slowly in the upper layers of the skin.

Percentage
A number or amount in each hundred.
Contact

Lesley Bhatti, Senior Information Analyst
Email: lesley.bhatti@phs.scot

Douglas Clark, Information Analyst
Phone: 0131 275 7182
Email: douglas.clark@phs.scot

Amy McKeon, Principal Information Analyst
Phone: 0131 275 6559
Email: amy.mckeon@phs.scot

David Morrison, Director of the Scottish Cancer Registry
Phone: 0131 275 6087
Email: david.morrison4@phs.scot

For all media enquiries please email phs.comms@phs.scot or call 07500 854 574.

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 May 2022.

Open data

Data from this publication is available to download from the Scottish Health and Social Care Open Data Portal.

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 – Background information

Source of data
The Scottish Cancer Registry is the source of the cancer incidence data provided in this publication. More information on the registry can be found on the Public Health Scotland website.

Note that cancer registrations differ from recorded hospital admissions for cancer, the statistics for which can be found on the Hospital Care pages on the PHS Website. An individual diagnosed with a new primary cancer would have a single registration for that cancer, whereas he/she might have multiple admissions to hospital for the cancer. Moreover, the diagnosis and treatment of cancer does not inevitably lead to hospital admission in every case.

Non-melanoma skin cancer
As noted within the main body of the publication, non-melanoma skin cancer is excluded from analyses of all cancers combined for the following reasons:

- In the interests of comparison with other countries, because not all cancer registries collect data on non-melanoma skin cancers.
- Only the first occurrence of a basal cell carcinoma (the most common type of non-melanoma skin cancer) is collected in Scotland because they are so common.

The PHS data on non-melanoma skin cancer is available here Cancer Incidence: skin.

Data completeness
Cancer registrations are believed to be essentially complete for the year 2019, but it is important to note that the cancer registration database is dynamic. In common with other cancer registries, cancer incidence rates in Scotland can take up to five years after the end of a given calendar year to stabilise due to the continuing accrual of late registrations coming to light, for example through death certification.

This seems to be a particular issue for chronic lymphocytic leukaemia (CLL) – if the disease is progressing slowly and diagnosed incidentally on the basis of a blood test, hospital contact (and therefore opportunities for ascertainment) may be limited for some months or even years after diagnosis.

Note on trends
It may be misleading to focus too much attention on any apparent changes in incidence between 2018 and 2019; it is more informative to examine trends in incidence observed over a number of years. Striking changes from one year to the next may occur in the case of rare cancers, but these are likely to reflect random fluctuation caused by small numbers of cases - in such cases, it is even more important to examine incidence rates for a number of years aggregated together, rather than focusing on a single year of incidence.
Comparisons – UK and international

Cancer incidence publications for the rest of the UK can be found at the links below:

England
Wales
Northern Ireland

Comparisons are also produced by Cancer Research UK, and the most recent incidence data can be found on their CancerStats page.

Comparison of Scottish and UK cancer data to that of other countries is a complex process because of the wide variation amongst data collection and coding practices, as well as variation in the quality and completeness of data. The International Agency for Research on Cancer maintain an online database, Global Cancer Observatory, that is searchable for comparative data.

Age-adjusted incidence rates

Based on the number of cancer registrations in each of the calendar years, the following rates were calculated for this publication:

Crude Rate

The crude rate is the total number of people with an illness (or who die) in a country or region, divided by the total population of that country or region, and is normally expressed ‘per 1,000’, ‘per 10,000’ or ‘per 100,000’.

Making comparisons on the crude rate can be misleading if the age structures of the populations of the countries or regions are quite different. Areas with larger percentages of younger people are unlikely to have as high levels of incidence as areas with larger percentages of older people – and therefore if we do not adjust for these differences we may draw the wrong conclusion about the health of an area simply because of the age-structure of the population. European Age-Sex Standardised Rates (EASRs) allow us to make comparisons between different geographical areas as they allow the effects of having different age structures in either the same population over time or different geographies to be removed.

European Age-Sex Standardised Rate (EASR) using ESP2013

For each 5 year age group, the crude rate is calculated and then the weighted average of all age groups is taken based on the weightings of the 2013 European Standard Population, to give the overall EASR.
Appendix 2 – Publication metadata

Publication title
Cancer Incidence and Prevalence in Scotland (to December 2019)

Description
Annual and 5 year summaries of new incidence cases of cancer in Scotland, by Cancer Network Region and Health Board. Within Scotland and Network levels of reporting, the incidence figures are broken down by age group and sex.

Theme
Health and Social Care

Topic
Conditions and Diseases

Format
Excel workbooks

Data source(s)
Scottish Cancer Registry (SMR06)

Date that data are acquired
22 February 2021

Release date
11 May 2021

Frequency
Annual

Timeframe of data and timeliness
Data up to 31 December 2019. No delays between data availability and processing of data for publication.

Continuity of data
Reports include data from 1995 to 2019. Coding of cancer registrations moved from ICD-9 to ICD-10 and from ICD-O to ICD-O2 in incidence year 1997, then to ICD-O3 in incidence year 2006. ICD codes have been back-mapped to 1989 for continuity of reporting. The range of statistics provided does mean that the continuity will vary, and while considered to be very high, any notable discontinuities (e.g. for specific conditions) will be highlighted within the published data.

Revisions statement
Not Applicable

Revisions relevant to this publication
Not Applicable
Concepts and definitions

See the Cancer Information FAQs

Relevance and key uses of the statistics

The number and type of cancer registrations, by sex and geography, allow planning for provision of cancer treatment services and palliative care planning. Permits indirect measure of success of public health measures and interventions over the longer term. Key uses include: 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.

Accuracy

Registry data are subject to validation at data entry and quality assurance procedures. See the Cancer Information FAQs. Reported data are compared to previous years' figures and to expected trends.

Completeness

At time of extraction, data for the most recent year are estimated to be at least 98% complete. See above note on Revisions. 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

Cancer incidence data are regularly compared with the UK and other countries, for example in the publication Cancer Incidence in Five Continents. Cancer incidence data is also published separately for England, Wales and Northern Ireland.

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 Cancer tables are accessible via the Cancer pages on the PHS website. Cancer sites are presented within Excel spreadsheets of cancer 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. Geographical hierarchies are also presented using drop down menus. Spreadsheets may require the user to manipulate drop-down menus, to avoid a frequent problem of confounding data on males and females, and geographical designations.

Value type and unit of measurement

Number of new cases of cancer as count; rates of cancer as crude, European age standardised, World Age standardised, and as Standardised incidence ratios. Number, e.g. 1.1

Disclosure

The PHS protocol on Statistical Disclosure Protocol is followed.
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National statistics

UK Statistics Authority Assessment
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Help email
phs.cancerstats@phs.scot

Date form completed
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Appendix 3 – 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
Appendix 4 – 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’.