

# Publication Report



## Cancer Mortality in Scotland (2013)

Publication date – 28 October 2014



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## Introduction

This publication provides information on deaths from cancer in Scotland, covering the years 1988-2013 for each main type of cancer. Information presented here replaces information previously available on the ISD website. The publication uses death registration data supplied by National Records of Scotland.

This publication also includes an update of cancer incidence and mortality rates by the 2012 Scottish Index of Multiple Deprivation (SIMD) quintiles for 28 major types of cancer. Detailed information on these types of cancer is provided on the [ISD Cancer Information website](#).

Throughout this publication, we refer to all malignant neoplasms (cancers) EXCLUDING non-melanoma skin cancers (NMSC). We use this classification to be consistent with our publication of [cancer incidence](#) information, which also excludes NMSC from the category 'all malignant neoplasms' because their recording is less likely to be complete than for other cancers. NMSC are very common, but do not usually result in death. More information can be found on our [FAQ](#) web page. Exclusion of NMSC from the mortality statistics for 'all malignant neoplasms' has very limited impact because case-fatality is so low. Statistics on deaths from 'all malignant neoplasms' INCLUDING NMSC can be found on [our website](#) or on the website of the [National Records of Scotland](#). From the National Records of Scotland website, it is evident that 'all malignant neoplasms' INCLUDING NMSC accounted for 29% of all deaths in Scotland in 2013.

It may be misleading to focus too much attention on any apparent changes in mortality between 2012 and 2013; it is more informative to examine trends in mortality 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 deaths. In such cases it is even more important to examine mortality rates for a number of years aggregated together, rather than focussing on a single year of mortality.

## Methods

The 2013 European Standard Population (ESP2013) has been used to calculate the European Age Standardised Rates (EASRs) within this publication. The European Standard Population (ESP), which was first used in 1976, was revised in 2013. Figures using ESP1976 and ESP2013 are not comparable. Therefore, [findings from this publication are not comparable with previous ISD reports](#). Further detail regarding this change and a worked example of EASRs using both ESP1976 and ESP2013 is included in [Appendix A1](#).

Please note that since the last publication of this report, the population estimates for 2002-2010 have been recalculated based on the 2011 census by National Records of Scotland. These updated population estimates have resulted in slightly different crude rates for 2002-2010 compared to the report that was published in November 2013.

## Key points

The 2013 European Standard Population (ESP2013) has been used to calculate the European Age Standardised Rates (EASRs) within this publication. The European Standard Population (ESP), which was first used in 1976, was revised in 2013. Figures using ESP1976 and ESP2013 are not comparable. See [Appendix A1](#) for further details.

- Over the last ten years, the overall age-standardised cancer (excluding non-melanoma skin cancers) mortality rate has fallen by 11.4%. Although the *rate* of death due to cancer has decreased over this period, the actual *number* of deaths due to cancer has not: this largely reflects an increase in older age groups within the population, and the fact that cancer is a relatively common disease among the elderly.
- The mortality rate has fallen by 15.0% for males and 5.8 for females over the last ten years. There is also considerable variation in trends for different types of cancer. For example, the rate of female deaths due to breast cancer has decreased by 19.2% over the last 10 years, while female mortality rates due to lung cancer have increased by 6.8% over the same time period. For males, the mortality rate due to lung cancer has decreased by 20.8% over the last ten years while the mortality rate for cancer of the liver has increased by 40.7%.
- Significant patterns exist when examining incidence and mortality rates by deprivation in Scotland. For all cancers combined, the most deprived areas have incidence rates that are 34% higher than the least deprived areas. Mortality rates are 71% higher in the most deprived areas compared with the least deprived.

## Results and Commentary

Please note that details of these statistics can be found by cancer site on the [Cancer website](#) and summarised in the [Cancer in Scotland summary report](#).

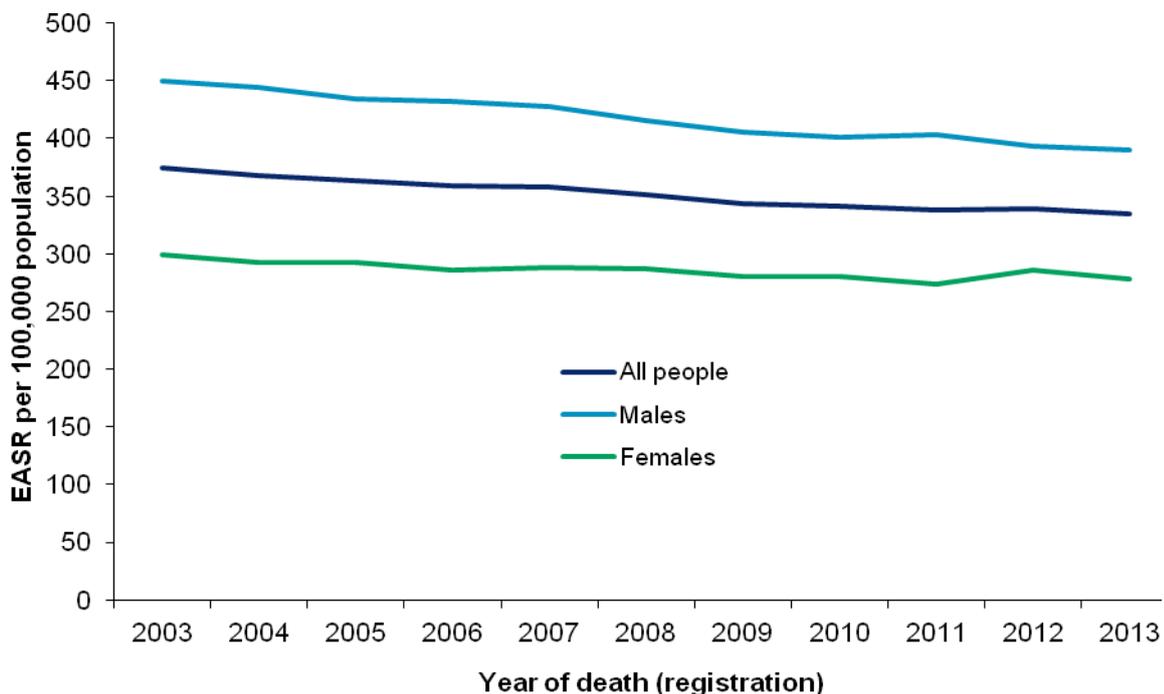
The cancer mortality statistics within this publication are based on the date of registration of the death rather than the date on which the death occurred. This is in order to be consistent with the information published by [National Records of Scotland](#). By law, a death should be registered within 8 days of the date of death.

### Cancer Mortality

In 2013, 15,764 people died from cancer (excluding non-melanoma skin cancers) in Scotland.

Age-standardised cancer mortality rates for all cancers combined have decreased by 11.4% over the 10 year period of 2003-2013 (figure 1), with a greater decrease in males than in females (15.0% and 5.8% decrease, respectively). The percentage changes in the mortality rate over the ten year period are estimated using Poisson regression.

**Figure 1. Recent trends (2003-2013) in age-standardised mortality rates for cancer<sup>1</sup> in Scotland. (EASR: European Age Standardised Rate – using ESP2013<sup>2</sup>)**



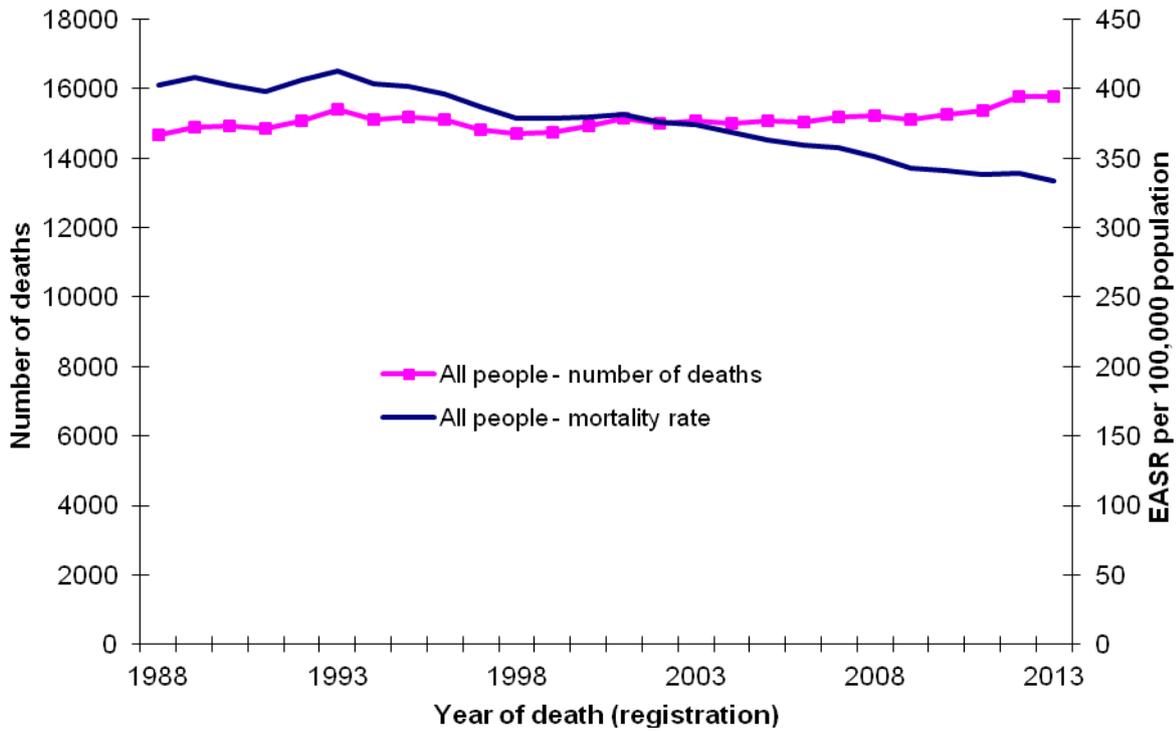
Source: National Records of Scotland.

1 All cancers excluding non-melanoma skin cancers (ICD-10 C00-C97 excl C44)

2 The European Standard Population (ESP), which was first used in 1976, was revised in 2013. Figures using ESP1976 and ESP2013 are not comparable. The European Age Standardised Rate (EASR) is calculated using ESP2013 and 5 year age groups 0-4, 5-9 up to an upper age group of 90+. See [Appendix A1](#) for further details.

The cancer mortality *rate* has decreased over the last decade but the actual *number* of deaths due to cancer has not (figure 2). This largely reflects an increase in older age groups within the population, and the fact that cancer is a relatively common disease among the elderly.

**Figure 2. Cancer<sup>1</sup> mortality in Scotland, 1988-2013. Number of deaths and age-standardised mortality rate. (EASR: European Age Standardised Rate – using ESP2013<sup>2</sup>)**



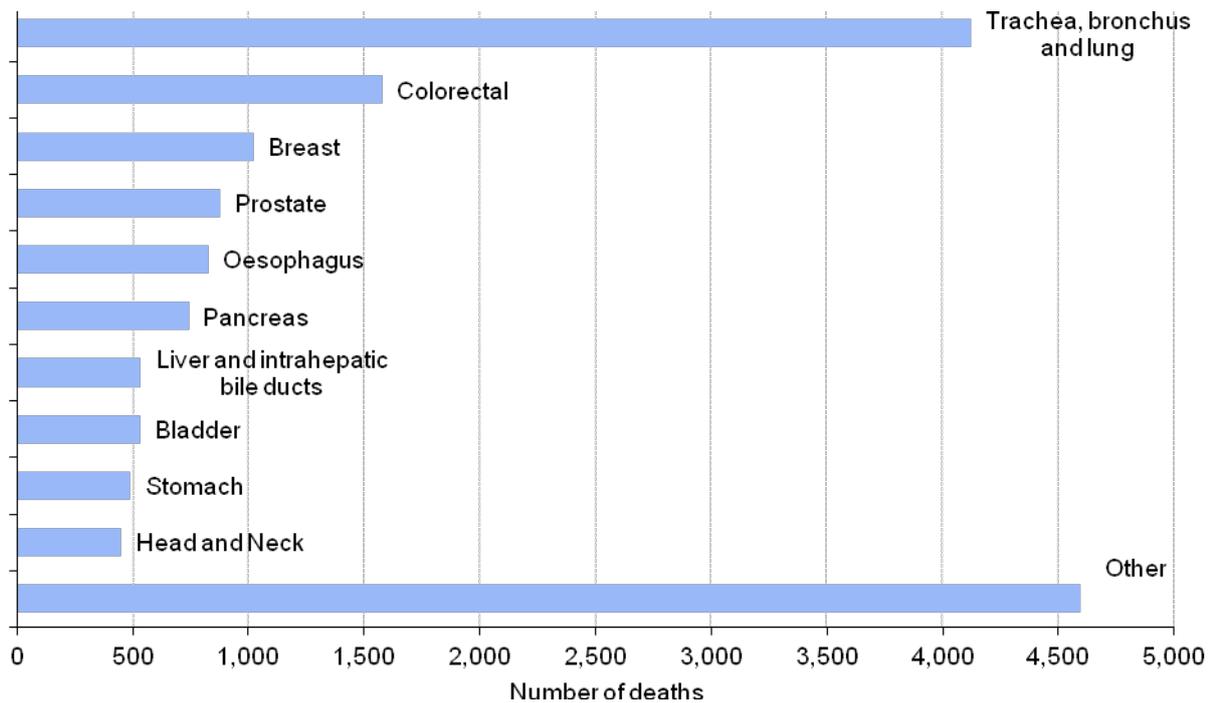
Source: National Records of Scotland.

1 All cancers excluding non-melanoma skin cancers (ICD-10 C00-C97 excl C44)

2 The European Standard Population (ESP), which was first used in 1976, was revised in 2013. Figures using ESP1976 and ESP2013 are not comparable. The European Age Standardised Rate (EASR) is calculated using ESP2013 and 5 year age groups 0-4, 5-9 up to an upper age group of 90+. See [Appendix A1](#) for further details.

Figure 3 shows the types of cancer that account for the greatest number of deaths in Scotland in 2013. Cancers of the lung (4,120), colorectum (1,578), breast (1,020), prostate (876) and oesophagus (828) are responsible for more than half of the deaths from cancer in Scotland.

Figure 3. Deaths from cancer<sup>1</sup> in Scotland, 2013<sup>2</sup>



Source: National Records of Scotland.

1 All cancers excluding non-melanoma skin cancers (ICD-10 C00-C97 excl C44)

2 Based on year of registration of death

Table 1 shows the ten most common causes of death from cancer for both sexes combined and for men and women separately. It also shows the percentage frequency and percentage change in mortality rate over ten years for those types of cancer. A p-value of less than 0.05 for the 10 year change indicates that this is statistically significant.

For men, the largest decreases in mortality rate in the ten most common causes of death from cancer have been in stomach, lung and colorectal cancer (37.6%, 20.8% and 19.8% respectively). Mortality rates from prostate cancer, the most frequently diagnosed cancer in males, have decreased by 11.9% over the 10 years to 2013. The mortality rate from cancer of the liver has increased by 40.7% in men over the last 10 years, a statistically significant trend.

For women, the largest decreases in mortality rates in the ten most common causes of death from cancer were observed in stomach, breast and ovarian cancer (24.9%, 19.2% and 15.9% respectively). Mortality rates from breast cancer, the most frequently diagnosed cancer in females, have decreased in spite of an increase in incidence of female breast cancer. The cervical cancer mortality rate has decreased by 18.2% over the same time period, in keeping with a longer term trend (data not shown in Table 1 as cervical cancer lies outside the ten most common causes of death from cancer).

**Table 1: Most common causes of death from cancer in Scotland in 2013: Rank, number, frequency and change in mortality rate since 2003**

Rank	ICD-10 site grouping	Number	Frequency	10 year % change <sup>1</sup>	p - value <sup>3</sup>
<b>All Persons</b>					
1	Trachea, bronchus and lung (C33-C34)	4,120	26.1%	-10.9	0.001
2	Colorectal (C18-C20)	1,578	10.0%	-15.9	<0.001
3	Breast (C50) <sup>2</sup>	1,020	6.5%	x	x
4	Prostate (C61) <sup>2</sup>	876	5.6%	x	x
5	Oesophagus (C15)	828	5.3%	-10.8	0.001
6	Pancreas (C25)	742	4.7%	+5.5	0.086
7	Liver and intrahepatic bile ducts (C22)	533	3.4%	+38.8	<0.001
8	Bladder (C67)	531	3.4%	-10.3	0.291
9	Stomach (C16)	491	3.1%	-33.8	<0.001
10	Head and Neck (C00-C14, C30-C32)	451	2.9%	+5.8	0.066
	Other malignant neoplasms	4,594	29.1%	x	x
	All malignant neoplasms excluding non-melanoma skin cancer	15,764	100.0%	-11.4	<0.001
Rank	ICD-10 site grouping	Number	Frequency	10 year % change <sup>1</sup>	p - value <sup>3</sup>
<b>Males</b>					
1	Trachea, bronchus and lung (C33-C34)	2,127	26.4%	-20.8	<0.001
2	Prostate (C61)	876	10.9%	-11.9	<0.001
3	Colorectal (C18-C20)	871	10.8%	-19.8	<0.001
4	Oesophagus (C15)	538	6.7%	-10.2	0.001
5	Pancreas (C25)	354	4.4%	+5.6	0.215
6	Liver and intrahepatic bile ducts (C22)	343	4.3%	+40.7	<0.001
7	Bladder (C67)	318	4.0%	-14.8	0.005
8	Head and Neck (C00-C14, C30-C32)	312	3.9%	+2.0	0.688
9	Stomach (C16)	265	3.3%	-37.6	<0.001
10	Brain and other CNS (C70-C72, C75.1-C75.3)	238	3.0%	-0.7	0.924
	Other malignant neoplasms	1,805	22.4%	x	x
	All malignant neoplasms excluding non-melanoma skin cancer	8,047	100.0%	-15.0	<0.001
Rank	ICD-10 site grouping	Number	Frequency	10 year % change <sup>1</sup>	p - value <sup>3</sup>
<b>Females</b>					
1	Trachea, bronchus and lung (C33-C34)	1,993	25.8%	+6.8	0.014
2	Breast (C50)	1,013	13.1%	-19.2	<0.001
3	Colorectal (C18-C20)	707	9.2%	-9.1	0.005
4	Ovary (C56)	396	5.1%	-15.9	<0.001
5	Pancreas (C25)	388	5.0%	+5.4	0.310
6	Oesophagus (C15)	290	3.8%	-12.2	0.016
7	Stomach (C16)	226	2.9%	-24.9	<0.001
8	Bladder (C67)	213	2.8%	+2.1	0.788
9	Non-Hodgkin's lymphoma (C82-C85)	191	2.5%	-12.3	0.067
10	Liver and intrahepatic bile ducts (C22)	190	2.5%	+34.8	<0.001
	Other malignant neoplasms	2,110	27.3%	x	x
	All malignant neoplasms excluding non-melanoma skin cancer	7,717	100.0%	-5.8	<0.001

Source: National Records of Scotland (NRS)

'x' = not applicable.

- 1 Estimated 10-year change in age-adjusted mortality rates, calculated using Poisson regression analyses.
- 2 Percentage change in mortality is not shown in the 'All Persons' table for cancers occurring mainly or only in one sex.
- 3 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.

Cancer mortality rates are influenced by both trends in the incidence of cancer and trends in survival from cancer. When attempting to interpret trends in cancer mortality, it is important to remember that recent patterns of cancer mortality are, for the most part, likely to reflect trends in the prevalence of risk (and protective) factors going back several decades, as well as changes in prognosis associated with advances in therapy and a range of other factors that can affect survival. The commentary below relates to changes in the mortality rates of selected types of cancer over the last ten years.

### Lung cancer

The change in mortality rates for lung cancer over the last ten years for males (a decrease of 20.8%) and females (an increase of 6.8%) reflects, in large part, historical trends in the prevalence of smoking, which has differed between men and women. A similar pattern is evident in incidence rates.

### Breast cancer

Breast cancer is the second most common cause of death from cancer in women. The incidence rates over the last ten years have increased, partly because of increased detection through screening but also because of an increase in the prevalence of known risk factors. The mortality rate has decreased by 19.2% over the last ten years, probably as a consequence of breast screening, but also due to advances in treatment.

### Prostate cancer

Prostate cancer is the second most common cause of death from cancer in men. The mortality rate has decreased by 11.9% over the last ten years. The reason for the decrease in the mortality rate is not clear but improvements in treatment may be one possible explanation.

### Liver cancer

The increase in the mortality rate of liver cancer over the last ten years by 38.8% reflects the increase in incidence of this type of cancer. Survival from liver cancer is poor in most cases. The main risk factors for liver cancer are alcohol and infection with hepatitis B and C.

### Stomach cancer

The reduction in the mortality rate for stomach cancer is thought to be caused mainly by a decrease in the prevalence of infection with the bacterium *Helicobacter pylori*, perhaps as a result of improvements in social conditions. People infected with *Helicobacter pylori* have an increased risk of developing stomach cancer.

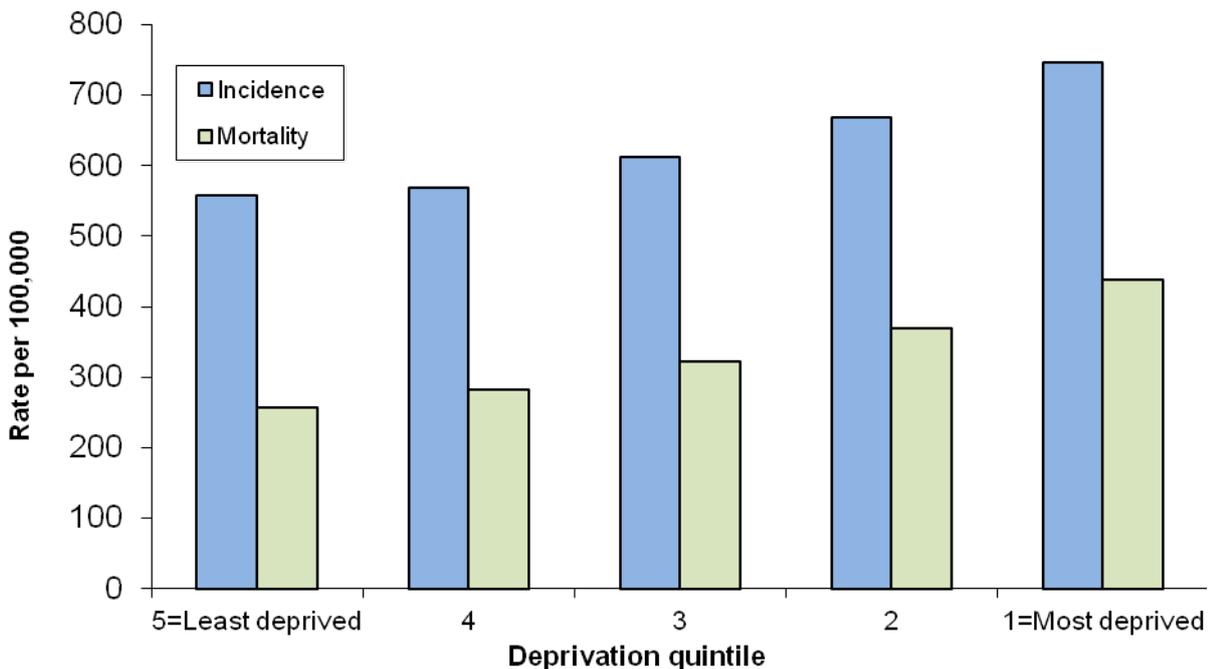
### Cervical cancer

The reduction in the mortality rate of cervical cancer over the last ten years by 18.2% is thought to be largely the result of improved detection and treatment of pre-malignant and early stage disease through the national cervical screening programme.

## Cancer Incidence and Mortality by Deprivation Quintile

Significant patterns exist when examining incidence and mortality rates by deprivation in Scotland. Considering all cancers combined, the most deprived areas have incidence rates that are 34% higher than the least deprived areas; mortality rates for all cancers combined are 71% higher in the most deprived areas compared with the least deprived (figure 4).

**Figure 4. Cancer<sup>1</sup> Incidence (2008-2012) and Mortality (2009-2013) by deprivation quintile<sup>2</sup> in Scotland. Age-standardised rates. (EASR: European Age Standardised Rate – using ESP2013<sup>3</sup>)**



Source: Scottish Cancer Registry, ISD (registrations); National Records of Scotland (deaths)

1 All cancers excluding non-melanoma skin cancers (ICD-10 C00-C97 excl C44)

2 Deprivation quintile based on SIMD2012,

3 The European Standard Population (ESP), which was first used in 1976, was revised in 2013. Figures using ESP1976 and ESP2013 are not comparable. The European Age Standardised Rate (EASR) is calculated using ESP2013 and 5 year age groups 0-4, 5-9 up to an upper age group of 90+. See [Appendix A1](#) for further details.

There are variations in this pattern when looking at specific types of cancer. For example, while [lung cancer](#) incidence and mortality rates are higher in the most deprived areas of Scotland, incidence and mortality rates of [malignant melanoma of the skin](#) (melanoma skin cancer) are higher in the least deprived areas of Scotland.

Cancers associated with smoking tend to be strongly correlated with deprivation by having the highest incidence and mortality rates in the most deprived areas; these include cancers of the [trachea, bronchus and lung](#), [oral cavity](#) and [larynx](#). For cancer of the trachea, bronchus and lung, incidence and mortality rates are over three times higher in the most deprived areas compared to the least deprived areas.

The incidence of (and mortality from) [cervical cancer](#) tends to be higher in more deprived women, 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.

In contrast, the incidence of [breast cancer](#) tends to be higher in less deprived areas. Again, this is likely to reflect differences in exposure to risk factors, and higher rates of attendance at breast screening in less deprived areas, since breast screening is not designed to prevent breast cancer, but rather to diagnose the disease as early as possible, when treatment is more likely to be effective. Despite a lower incidence of breast cancer in more deprived areas, the mortality rate in these areas is not correspondingly lower – this is consistent with the observation that survival from breast cancer tends to be lower in patients from deprived areas.

For [prostate cancer](#), incidence is higher in the less deprived areas but mortality has no correlation with deprivation quintile. The higher incidence of prostate cancer in less deprived areas may reflect higher rates of prostate specific antigen (PSA) testing of the populations in these areas<sup>1</sup>.

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<sup>1</sup> Morgan RM, Steele RJ, Nabi G, McCowan C. Socioeconomic variation and prostate specific antigen testing in the community: a United Kingdom based population study. *J Urol.* 2013;190:1207-12.

## Glossary

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 ISD website <a href="#">here</a> .
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.
EASR	European Age Standardised Rate; 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. The European Standard Population (ESP), which was first used in 1976, was revised in 2013. Previous reports used ESP1976 to calculate EASRs. Figures using ESP1976 and ESP2013 are not comparable. Therefore, <u>findings from this publication are not comparable with previous ISD reports</u> . See <a href="#">Appendix A1</a> for further details.
ICD-10	The 10 <sup>th</sup> 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
NMSC	Non-melanoma skin cancer. A type of cancer that develops slowly in the upper layers of the skin.
Percentage	A rate, number or amount in each hundred.
PSA	Prostate specific antigen – a protein made in the prostate gland.

## List of Tables

Table No.	Cancer Mortality by year	Time period	File & size
0	<a href="#">Cancer in Scotland Summary</a>	2003-2013	PDF [264 kb]
1	<a href="#">All Cancers</a>	1988-2013	Excel [1023 kb]
2	<a href="#">Bladder</a>	1988-2013	Excel [981 kb]
3	<a href="#">Bone and Connective Tissues</a>	1988-2013	Excel [2047 kb]
4	<a href="#">Brain and CNS</a>	1988-2013	Excel [1581 kb]
5	<a href="#">Breast</a>	1988-2013	Excel [969 kb]
6	<a href="#">Colorectal</a>	1988-2013	Excel [2155 kb]
7	<a href="#">Female Genital Organs</a>	1988-2013	Excel [1519 kb]
8	<a href="#">Head and Neck</a>	1988-2013	Excel [4730 kb]
9	<a href="#">Hodgkins Disease</a>	1988-2013	Excel [945 kb]
10	<a href="#">Kidney</a>	1988-2013	Excel [985 kb]
11	<a href="#">Leukaemias</a>	1988-2013	Excel [3216 kb]
12	<a href="#">Liver</a>	1988-2013	Excel [979 kb]
13	<a href="#">Lung and Mesothelioma</a>	1988-2013	Excel [1455 kb]
14	<a href="#">Male Genital Organs</a>	1988-2013	Excel [946 kb]
15	<a href="#">Multiple Myeloma</a>	1988-2013	Excel [973 kb]
16	<a href="#">Non-Hodgkins Lymphoma</a>	1988-2013	Excel [992 kb]
17	<a href="#">Oesophagus</a>	1988-2013	Excel [990 kb]
18	<a href="#">Pancreas</a>	1988-2013	Excel [990 kb]
19	<a href="#">Skin</a>	1988-2013	Excel [1509 kb]
20	<a href="#">Stomach</a>	1988-2013	Excel [990 kb]

Table No.	Summarised Cancer Mortality	Time period	File & size
21	<a href="#">All Cancers</a>	2009-2013	Excel [203 kb]
22	<a href="#">Bladder</a>	2009-2013	Excel [198 kb]
23	<a href="#">Bone and Connective Tissues</a>	2009-2013	Excel [303 kb]
24	<a href="#">Brain and CNS</a>	2009-2013	Excel [256 kb]
25	<a href="#">Breast</a>	2009-2013	Excel [198 kb]
26	<a href="#">Colorectal</a>	2009-2013	Excel [305 kb]
27	<a href="#">Female Genital Organs</a>	2009-2013	Excel [249 kb]
28	<a href="#">Head and Neck</a>	2009-2013	Excel [547 kb]
29	<a href="#">Hodgkins Disease</a>	2009-2013	Excel [196 kb]
30	<a href="#">Kidney</a>	2009-2013	Excel [199 kb]

31	<a href="#">Leukaemias</a>	2009-2013	Excel [400 kb]
32	<a href="#">Liver</a>	2009-2013	Excel [199 kb]
33	<a href="#">Lung and Mesothelioma</a>	2009-2013	Excel [249 kb]
34	<a href="#">Male Genital Organs</a>	2009-2013	Excel [196 kb]
35	<a href="#">Multiple Myeloma</a>	2009-2013	Excel [198 kb]
36	<a href="#">Non-Hodgkins Lymphoma</a>	2009-2013	Excel [200 kb]
37	<a href="#">Oesophagus</a>	2009-2013	Excel [199 kb]
38	<a href="#">Pancreas</a>	2009-2013	Excel [199 kb]
39	<a href="#">Skin</a>	2009-2013	Excel [248 kb]
40	<a href="#">Stomach</a>	2009-2013	Excel [199 kb]

Table No.	Cancer Incidence and Mortality by deprivation quintile	Time period	File & size
41	<a href="#">All Cancers</a>	2008-2013	Excel [35 kb]
42	<a href="#">Bladder</a>	2008-2013	Excel [35 kb]
43	<a href="#">Bone and Connective Tissues</a>	2008-2013	Excel [35 kb]
44	<a href="#">Brain and CNS</a>	2008-2013	Excel [35 kb]
45	<a href="#">Breast</a>	2008-2013	Excel [34 kb]
46	<a href="#">Cervix</a>	2008-2013	Excel [34 kb]
47	<a href="#">Colon</a>	2008-2013	Excel [35 kb]
48	<a href="#">Colorectal</a>	2008-2013	Excel [35 kb]
49	<a href="#">Corpus Uteri</a>	2008-2013	Excel [34 kb]
50	<a href="#">Head and Neck</a>	2008-2013	Excel [35 kb]
51	<a href="#">Hodgkins Disease</a>	2008-2013	Excel [35 kb]
52	<a href="#">Kidney</a>	2008-2013	Excel [35 kb]
53	<a href="#">Larynx</a>	2008-2013	Excel [35 kb]
54	<a href="#">Leukaemias</a>	2008-2013	Excel [35 kb]
55	<a href="#">Liver</a>	2008-2013	Excel [35 kb]
56	<a href="#">Lung and Mesothelioma</a>	2008-2013	Excel [35 kb]
57	<a href="#">Multiple Myeloma</a>	2008-2013	Excel [35 kb]
58	<a href="#">Non-Hodgkins Lymphoma</a>	2008-2013	Excel [35 kb]
59	<a href="#">Oesophagus</a>	2008-2013	Excel [35 kb]
60	<a href="#">Oral</a>	2008-2013	Excel [35 kb]
61	<a href="#">Ovary</a>	2008-2013	Excel [34 kb]
62	<a href="#">Pancreas</a>	2008-2013	Excel [35 kb]

63	<a href="#">Prostate</a>	2008-2013	Excel [34 kb]
64	<a href="#">Rectum &amp; Rectosigmoid junction</a>	2008-2013	Excel [35 kb]
65	<a href="#">Skin</a>	2008-2013	Excel [35 kb]
66	<a href="#">Stomach</a>	2008-2013	Excel [35 kb]
67	<a href="#">Testis</a>	2008-2013	Excel [34 kb]
68	<a href="#">Thyroid</a>	2008-2013	Excel [35 kb]

Table No.	Other updated files	Time period	File & size
69	<a href="#">All Cancers in under 75s</a>	1995-2013	Excel [273 kb]
70	<a href="#">Breast cancer screening</a>	1979-2013	Excel [59 kb]

## Contact

**Andrew Deas**

Principal Information Analyst

[andrew.deas@nhs.net](mailto:andrew.deas@nhs.net)

0131 275 7030

## Further Information

Further information on cancer statistics can be found on the [ISD Cancer Information website](#).

Further information can be found on the [ISD website](#)

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## Appendix

### A1 – Changes to the European Standard Population

The 2013 European Standard Population (ESP2013) has been used to calculate the European Age Standardised Rates (EASRs) within this publication. The European Standard Population (ESP), which was first used in 1976, was revised in 2013. Previous reports used ESP1976 to calculate EASRs. EASRs calculated using ESP1976 cannot be compared with EASRs calculated using ESP2013. This section contains a worked example of EASRs using both ESP1976 and ESP2013 to show how the rates differ and why they cannot be compared.

#### Example: Trend in age-standardised mortality rates for all cancers (excluding non-melanoma skin cancer) 2003-2013)

Based on the number of death registrations in each of the calendar years, the following rates were calculated:

##### 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 death as areas with larger percentages of older people – and therefore if we don't 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. 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 ESP1976

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 1976 European Standard Population, to give the overall EASR.

##### 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.

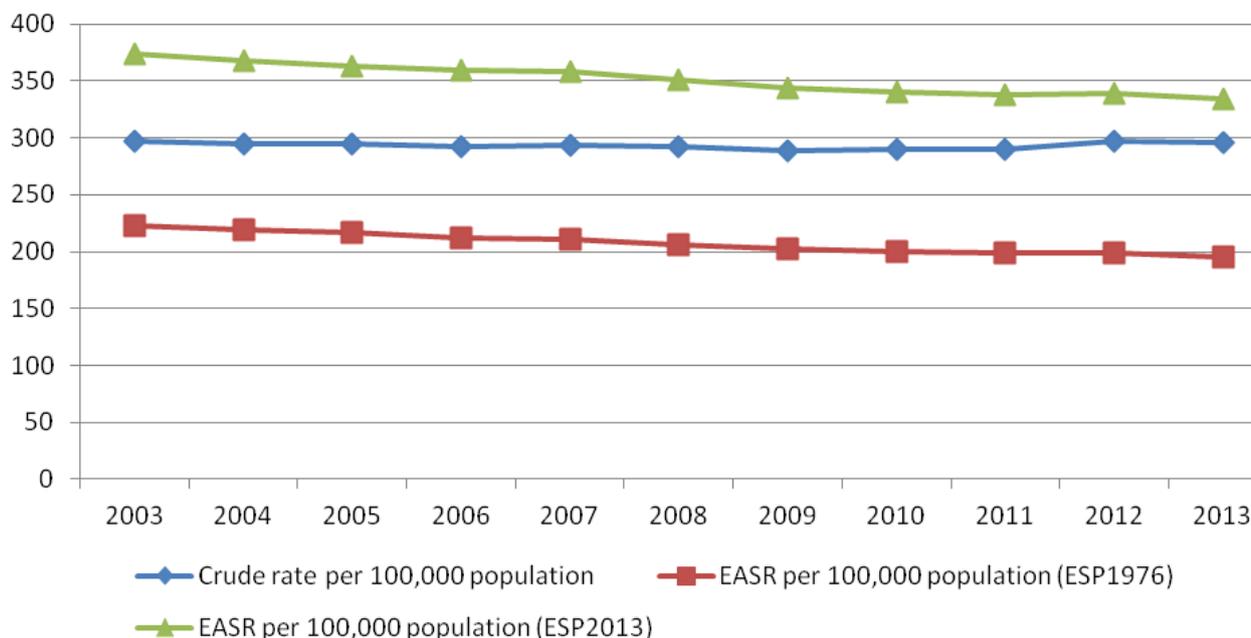
The table and chart below are for illustrative purposes to show how the rates differ.

**Table A1.1: Comparison of European Age-Sex Standardised Rates (EASRs)<sup>1,2</sup> of mortality for all cancer types (excluding non-melanoma skin cancer) using both 1976<sup>3</sup> and 2013<sup>4,5</sup> European Standard Populations, and crude rates, by calendar year (2003-2013)**

	Calendar Year										
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Number of deaths	15,063	14,997	15,087	15,025	15,202	15,211	15,119	15,270	15,375	15,787	15,764
Crude rate per 100,000 population	297.2	295.0	295.2	292.7	294.0	292.4	289.0	290.2	290.1	297.1	295.9
EASR per 100,000 population (ESP1976)	222.5	219.0	216.7	212.5	210.7	206.3	202.1	199.8	198.5	198.6	195.5
EASR per 100,000 population (ESP2013)	374.2	368.3	363.6	359.0	357.9	351.5	343.2	340.8	338.4	339.5	334.1

Source: National Records of Scotland

**Figure A1.1: Comparison of European Age-Sex Standardised Rates (EASRs)<sup>1,2</sup> of mortality for all cancer types (excluding non-melanoma skin cancer) using both 1976<sup>3</sup> and 2013<sup>4,5</sup> European Standard Populations, and crude rates, by calendar year (2003-2013)**



Source: National Records of Scotland

Notes:

1. The population estimates used in the calculation of rates above are based on the 2011 Census results.
2. The European Standard Population (ESP), which was first used in 1976, was revised in 2013. European Age-Sex Standardised Rates (EASRs) using ESP1976 and ESP2013 are not comparable.
3. European Age-Sex Standardised Rate (EASR), calculated using ESP1976 and using 5 year age groups 0-4, 5-9 up to an upper age group of 85+.
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. The upper age group for the 2013 European Standard Population structure is 95+. However, due to Scotland population estimates data being unavailable for the 95+ age group for all required geographies and for all required years, the upper age group used is 90+. This is an amalgamated age group containing both the 90-94 and 95+ age groups.

From this example (see Table A1.1 and Figure A1.1 above), it can be seen that the EASR (using ESP2013) is the highest of the three rates. The Crude Rate is in the middle and the EASR (using ESP1976) is the lowest. The mortality of cancer is higher in older age groups. ESP2013 differs from ESP1976 by its inclusion of fewer young people and more people from older age groups. Therefore, in this example, the EASRs calculated using ESP2013

are higher than those calculated using ESP1976. The trends shown for each method of calculating rates are similar, giving confidence to trend analysis. EASRs (using ESP1976) are not comparable with EASRs (using ESP2013). For example, comparing the EASR (using ESP1976) for calendar year 2012 in a report issued in 2013, to an EASR (using ESP2013) relating to the same year 2012, in a report issued in 2014, is meaningless. On this basis, findings from this publication are not comparable with previous ISD reports.

Further information can be obtained from:

ISD website: <http://www.isdscotland.org/Products-and-Services/GPD-Support/>

ONS website: <http://www.ons.gov.uk/ons/about-ons/get-involved/consultations/consultations/implementation-of-the-2013-european-standard-population/index.html>

## A2 – Background Information

### **Source of data**

Cancer mortality data are provided by the National Records of Scotland, as released on [their website](#) in August 2014.

The cancer mortality statistics within this publication are based on the date of registration of the death rather than the date on which the death occurred. This is in order to be consistent with the information published by [National Records of Scotland](#). By law, a death should be registered within 8 days of the date of death.

Please note that since the last publication of this report, the population estimates for 2002-2010 were recalculated based on the 2011 census by National Records of Scotland. These updated population estimates have resulted in slightly different crude rates for 2002-2010 compared to the report that was published in November 2013.

### **Note on trends**

The cancer mortality rates for the less common cancers may be highly variable from year to year; this is due in part to random fluctuation due to small numbers. As such, cancer mortality trends are more stable when assessed over longer time periods, such as decades.

All time trends were estimated using Poisson regression in SPSS (IBM®, Inc)

### **Comparisons**

Comparisons of cancer statistics across the UK are regularly produced by the Office for National Statistics (ONS). The most recent [comparison of incidence and mortality statistics](#) can be found on their website. Please note that ONS have no plans to update the comparison in future.

Comparisons are also produced by Cancer Research UK, and the most recent [mortality report](#) can be found on their [CancerStats page](#). The interactive, web-based [Cancer e-Atlas](#) produced by the National Cancer Intelligence Network is also a good source of information, however the website is currently being updated and is not available at present.

## A2 – Publication Metadata (including revisions details)

Metadata Indicator	Description
Publication title	Cancer Mortality in Scotland
Description	Annual and 5 year summaries of deaths from cancer in Scotland, by Cancer Network Region and Health Board. Within Scotland and Network levels of reporting, the mortality figures are broken down by age group and sex. Summary of incidence and mortality by deprivation quintile.
Theme	Health and Social Care
Topic	Conditions and Diseases
Format	Excel workbooks
Data source(s)	National Records of Scotland (NRS), Scottish Cancer Registry (SMR06)
Date that data are acquired	September 2014
Release date	28 October 2014
Frequency	Annual
Timeframe of data and timeliness	Data up to 31 December 2013 for mortality data. No delays between receipt and processing of data for publication. Data up to 31 December 2012 for incidence.
Continuity of data	Reports data since 1988. NRS moved from ICD-9 to ICD-10 in 2000. ICD codes have been back-mapped to 1988 as accurately as possible for continuity of reporting.
Revisions statement	No revisions have occurred and there are no revisions planned.
Revisions relevant to this publication	The 2013 European Standard Population (ESP2013) has been used to calculate the European Age Standardised Rates (EASRs) within this publication. The European Standard Population (ESP), which was first used in 1976, was revised in 2013. Previous reports used ESP1976 to calculate EASRs. EASRs calculated using ESP1976 cannot be compared with EASRs calculated using ESP2013. Therefore, <u>findings from this publication are not comparable with previous ISD reports</u> . Further detail regarding this change and a worked example of EASRs using both ESP1976 and ESP2013 is included in <a href="#">Appendix A1</a> .
Concepts and definitions	<a href="#">Cancer Information FAQs</a>
Relevance and key uses of the statistics	The number and type of cancer deaths, 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.

Accuracy	For coding of deaths see the website of the <a href="#">National Records of Scotland</a> . Reported data are compared to previous years' figures and to expected trends.
Completeness	At time of extraction, data for the most recent year are considered to be complete.
Comparability	Cancer mortality data are regularly compared with other UK countries and the UK as a whole (eg NCIS) and international reports (eg EUROCIM). In such comparisons, data are provided only at national (Scotland) level.
Accessibility	It is the policy of ISD Scotland to make its web sites and products accessible according to <a href="#">published guidelines</a> .
Coherence and clarity	All Cancer tables are accessible via the <a href="#">Cancer section of the ISD website</a> . 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.
Value type and unit of measurement	Number of deaths from cancer as count; rates of deaths from cancer as crude, European age standardised, World Age standardised, and as Standardised mortality ratios. Number, eg 1.1
Disclosure	The <a href="#">ISD protocol on Statistical Disclosure Protocol</a> is followed.
Official Statistics designation	National Statistics
UK Statistics Authority Assessment	May 2010
Last published	26 November 2013
Next published	27 October 2015
Date of first publication	2003
Help email	<a href="mailto:nss.isdcancerstats@nhs.net">nss.isdcancerstats@nhs.net</a>
Date form completed	13 October 2014

## **A3 – Early Access details (including Pre-Release Access)**

### **Pre-Release Access**

Under terms of the "Pre-Release Access to Official Statistics (Scotland) Order 2008", ISD are 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 and, separately, those receiving extended Pre-Release Access.

#### **Standard Pre-Release Access:**

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

#### **Extended Pre-Release Access**

Extended Pre-Release Access of 8 working days is given to a small number of named individuals in the Scottish Government Health Department (Analytical Services Division). This Pre-Release Access is for the sole purpose of enabling that department to gain an understanding of the statistics prior to briefing others in Scottish Government (during the period of standard Pre-Release Access).

- Scottish Government Health Department (Analytical Services Division)

## A4 – ISD and Official Statistics

### About ISD

Scotland has some of the best health service data in the world combining high quality, consistency, national coverage and the ability to link data to allow patient based analysis and follow up.

Information Services Division (ISD) is a business operating unit of NHS National Services Scotland and has been in existence for over 40 years. We are an essential support service to NHSScotland and the Scottish Government and others, responsive to the needs of NHSScotland as the delivery of health and social care evolves.

**Purpose:** To deliver effective national and specialist intelligence services to improve the health and wellbeing of people in Scotland.

**Mission:** Better Information, Better Decisions, Better Health

**Vision:** To be a valued partner in improving health and wellbeing in Scotland by providing a world class intelligence service.

### Official Statistics

Information Services Division (ISD) is the principal and authoritative source of statistics on health and care services in Scotland. ISD is designated by legislation as a producer of 'Official Statistics'. Our official statistics publications are produced to a high professional standard and comply with the Code of Practice for Official Statistics. The Code of Practice is produced and monitored by the UK Statistics Authority which is independent of Government. Under the Code of Practice, the format, content and timing of statistics publications are the responsibility of professional staff working within ISD.

ISD's statistical publications are currently classified as one of the following:

- National Statistics (ie assessed by the UK Statistics Authority as complying with the Code of Practice)
- National Statistics (ie legacy, still to be assessed by the UK Statistics Authority)
- Official Statistics (ie still to be assessed by the UK Statistics Authority)
- other (not Official Statistics)

Further information on ISD's statistics, including compliance with the Code of Practice for Official Statistics, and on the UK Statistics Authority, is available on the [ISD website](#).

The United Kingdom Statistics Authority has designated these statistics as National Statistics, in accordance with the Statistics and Registration Service Act 2007 and signifying compliance with the Code of Practice for Official Statistics. Designation can be broadly interpreted to mean that the statistics:

- meet identified user needs;
- are well explained and readily accessible;
- are produced according to sound methods, and
- are managed impartially and objectively in the public interest.

Once statistics have been designated as National Statistics it is a statutory requirement that the Code of Practice shall continue to be observed.