Deaths Registered in England and Wales (Series DR), 2012

Coverage: **England and Wales**
Date: **22 October 2013**
Geographical Area: **Region**
Theme: **Population**
Theme: **Health and Social Care**

Key findings

- There were 499,331 deaths registered in England and Wales in 2012, a rise of 3.1% compared with 2011.
- Age-standardised mortality rates (ASMRs) continue to fall. The male rate (6,191 deaths per million population) is the lowest on record. The female rate was 4,510 deaths per million population, slightly higher than in 2011 which was the lowest rate on record.
- Cancers were the broad disease group which had the largest percentage of deaths registered in 2012, accounting for 29% of all deaths.
- The highest ASMR by broad disease group was for cancer with 2,004 deaths per million population for males and 1,471 deaths per million population for females.

Summary

This bulletin presents the number of deaths registered in England and Wales in 2012 by age, sex and selected underlying causes of death. In addition, the 10 leading causes of death have been ranked to provide a summary for both males and females. This bulletin provides more detailed statistics than the death registration summary tables for England and Wales which were released in July 2013.

Figures reported here are based on deaths registered in 2012. For more information on the differences between death registrations and death occurrences, please see Background note 2.

Mortality rates for 2011 and 2012 have been calculated using mid-year population estimates based on the 2011 Census. Mortality rates for 2002-2010 have been calculated using the revised

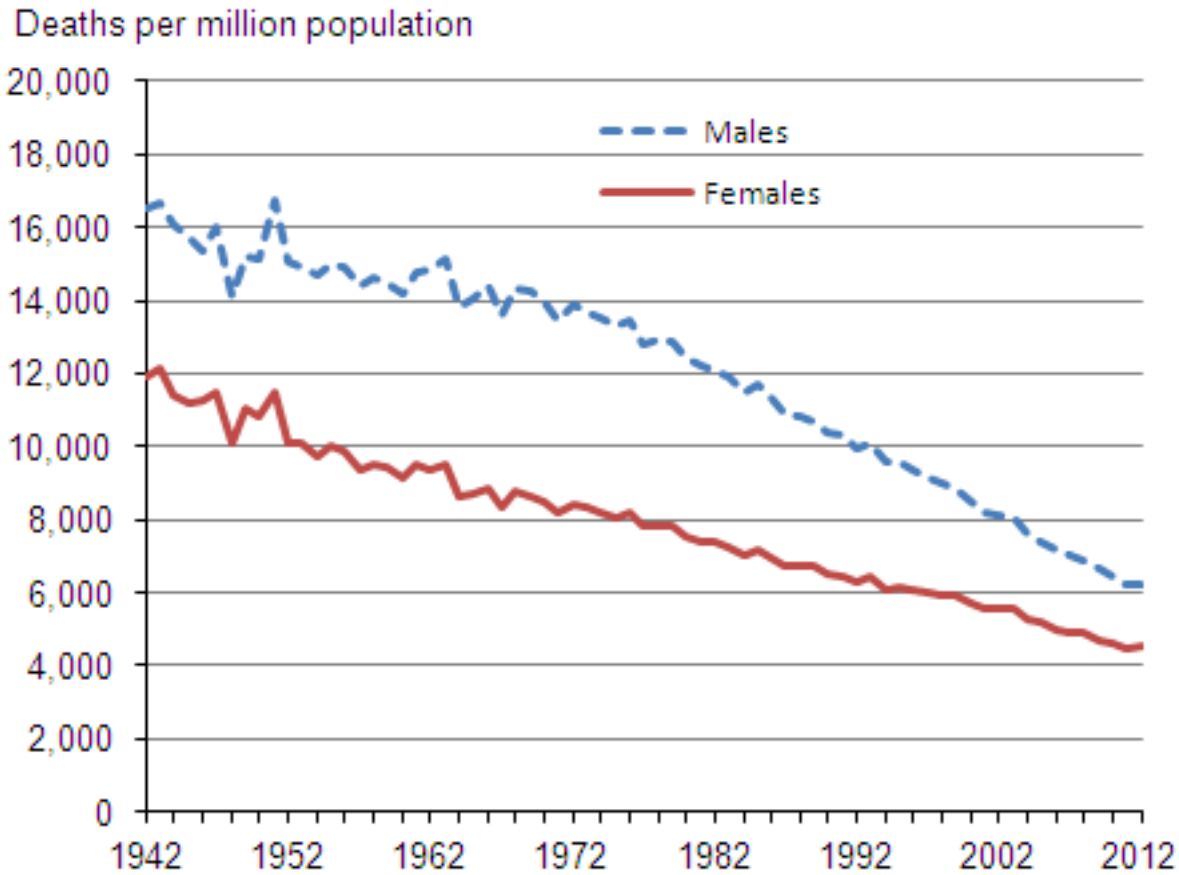
population estimates which take account of the 2011 Census, so rates may differ from those previously published.

Key mortality trends

There were 499,331 deaths registered in England and Wales in 2012 compared with 484,367 in 2011, a rise of 3.1%. The total number of deaths in 2012 comprised 240,238 male and 259,093 female deaths representing a rise of 2.4% for males and 3.8% for females compared with 2011. This is the fourth consecutive year that annual death registrations have been below half a million.

Figure 1: Age-standardised mortality rates (ASMRs), 1942-2012

England and Wales



Source: Office for National Statistics

Notes:

1. Based on deaths registered in the calendar year.
2. ASMRs for 2011 and 2012 have been calculated using mid-year population estimates based on the 2011 Census. Rates for 2002-2010 have been recalculated using revised mid-year population estimates which take account of the 2011 Census and therefore may differ from previously published figures.
3. These rates are for all ages and are standardised to the 1976 European standard population, expressed per million population (see Background note 5).

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The age-standardised mortality rates (ASMRs) in 2012 were 6,191 deaths per million population for males and 4,510 deaths per million population for females. The male ASMR is the lowest ever recorded in England and Wales for males. For females, the ASMR increased slightly in 2012 from 4,458 deaths per million population in 2011. These age-standardised rates are for all causes and cover all ages (see Background note 5). Between 2002 and 2012, the age-standardised mortality rate for males fell by 24% (from 8,134 deaths per million), while for females it fell by 19% (from 5,542 deaths per million).

Over the course of the 20th century, ASMRs steadily decreased (Figure 1). Up until the early 1970s, year-on-year fluctuations were higher, a likely consequence of influenza epidemics and cold winters, although the relationship between temperature, influenza and winter mortality is complex (for further information see Excess winter mortality in England and Wales).

Mortality rates are generally falling; reasons for this include medical advances in the treatment of many illnesses and diseases. This is illustrated by the reduction in ASMRs for many causes of death (see Table 9 (1.05 Mb Excel sheet) of the DR tables).

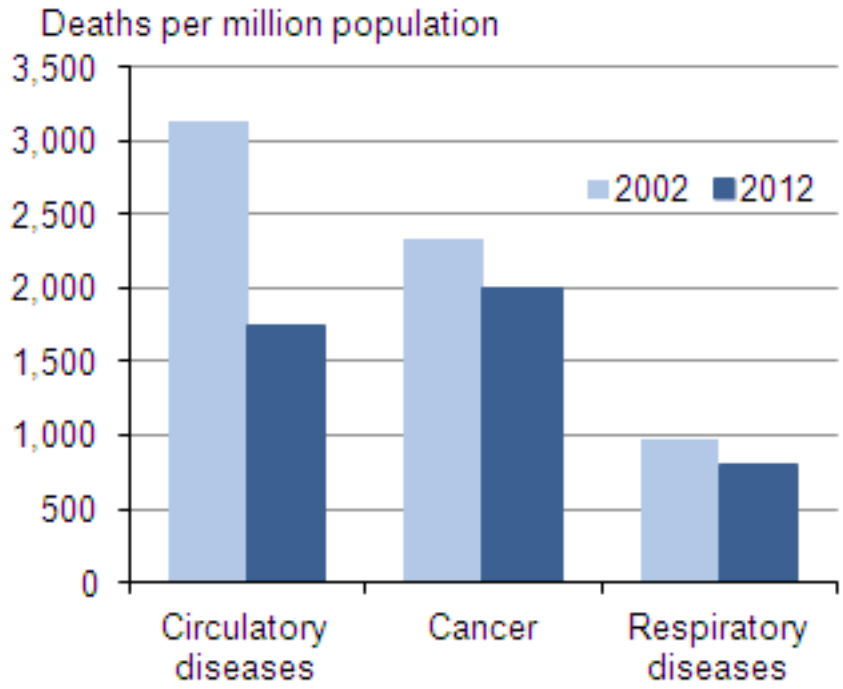
Deaths by underlying cause

Cancers (neoplasms), circulatory diseases, and respiratory diseases were the broad disease groups (chapters) of the International Classification of Diseases, 10th Revision (ICD-10) with the largest numbers of deaths registered in 2012. Cancers accounted for 29% of all deaths, while circulatory diseases (which includes deaths from ischaemic heart disease and strokes) and respiratory diseases (including deaths from pneumonia) accounted for 28% and 14% of all deaths respectively.

Over the course of the 20th century, there have been steady decreases in mortality rates for the main three broad disease groups (cancer, circulatory and respiratory) in England and Wales. The reasons for this include improvements in the treatment of these diseases and the introduction of preventative programmes, such as NHS Breast screening which was introduced in 1988. There have also been initiatives to improve people's health through better diet and lifestyle, for example, the Department of Health's 'Change4life campaign' which began in 2009. More recently the Department of Health's 'Healthy Lives, Healthy People' strategy for England included a tobacco control plan and a call to take action to reduce obesity in England.

Figure 2: Male age-standardised mortality rates, for three categories of cause of death, 2002 and 2012

England and Wales



Source: Office for National Statistics

Notes:

1. The ASMRs for 2012 have been calculated using mid-2012 population estimates based on the 2011 Census. Rates for 2002 have been recalculated using revised mid-2002 population estimates which take account of the 2011 Census and therefore may differ from previously published figures.
2. These rates are for all ages and are standardised to the 1976 European standard population, expressed per million population.
3. These categories correspond to the three chapters of ICD-10 with the largest number of deaths in England and Wales.

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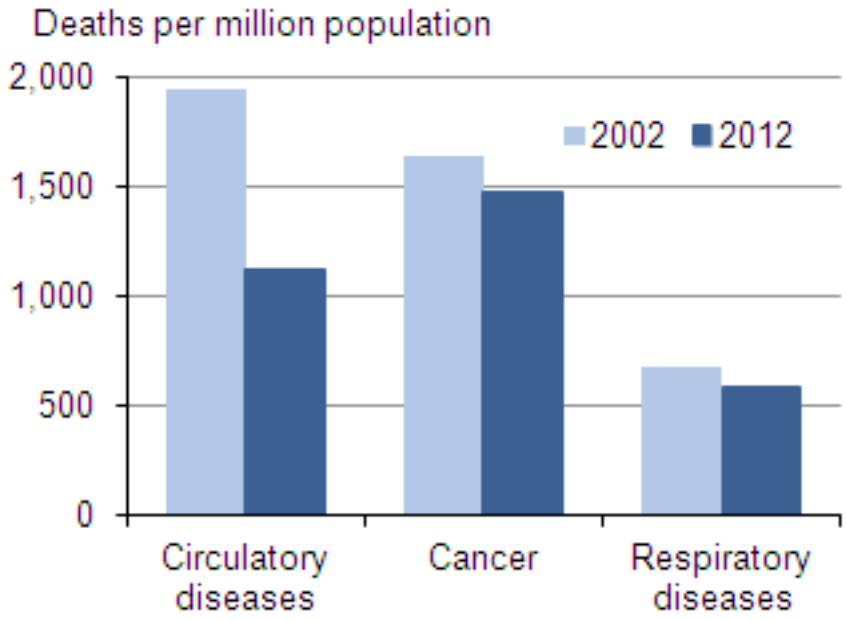
Figure 3: Female age-standardised mortality rates, for three categories of cause of death, 2002 and 2012

England and Wales



Source: Office for National Statistics

Notes:

1. The ASMRs for 2012 have been calculated using mid-2012 population estimates based on the 2011 Census. Rates for 2002 have been recalculated using revised mid-2002 population estimates which take account of the 2011 Census and therefore may differ from previously published figures.
2. These rates are for all ages and are standardised to the 1976 European standard population, expressed per million population.
3. These categories correspond to the three chapters of ICD-10 with the largest number of deaths in England and Wales.

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In 2012, deaths from cancer had the highest age-standardised mortality rates for both males and females whereas in 2002 the highest rates were for circulatory diseases. Throughout the period 2002 to 2012, circulatory diseases (which include heart disease and strokes) have seen the largest fall in age-standardised rates for males and females (44% and 43% respectively). The fall in age-standardised mortality rates for cancer has been more gradual, with death rates 14% lower for males and 10% lower for females in 2012 than in 2002 (Figures 2 and 3).

In ‘Improving Outcomes: A Strategy for Cancer’ the Department of Health states that although improvements have been made in the quality of cancer services in England, a significant gap remains in mortality rates compared with the European average.

The Outcomes Strategy sets out how the Department of Health aims to improve outcomes for all cancer patients and improve cancer survival rates, with the aim of saving an additional 5,000 lives every year by 2014/15. The Welsh Government’s Together for Health, Cancer Delivery Plan for the NHS up to 2016 sets out the vision for the population of Wales and what this means for NHS cancer services.

The male mortality rate for respiratory diseases decreased by 18% between 2002 and 2012, while the rate for females fell by 14%. Respiratory disease mortality rates in a given year are strongly influenced by influenza levels.

Leading causes of mortality in 2012

Tables 1 and 2 show the 10 leading underlying causes of death in 2012 for males and females. These are ranked according to a World Health Organisation (WHO) list which categorises causes using ICD-10 groups specifically designed for determining the leading causes of death. The list has been modified for use in England and Wales (Griffiths et al., 2005). The leading causes of mortality are ranked according to the number of deaths registered for each group in 2012.

Table 1: Leading causes of mortality for males, 2012

England and Wales

Rank	Underlying cause of death	Number of deaths registered	Percentage of all male deaths	Age-standardised mortality rate per million population
1	Ischaemic heart diseases (I20-I25)	37,423	15.6	954
2	Malignant neoplasm of trachea, bronchus and lung (C33, C34)	16,698	7.0	442
3	Chronic lower respiratory diseases (J40-J47)	14,378	6.0	351
4	Cerebrovascular diseases (I60-I69)	14,116	5.9	341
5	Dementia and Alzheimer's disease (F01, F03, G30)	13,984	5.8	313
6	Influenza and Pneumonia (J09-J18)	11,063	4.6	261
7	Malignant neoplasm of prostate (C61)	9,698	4.0	230
8	Malignant neoplasm of colon, sigmoid, rectum and anus (C18-C21)	7,841	3.3	205

9	Malignant neoplasms of lymphoid, haematopoietic and related tissue (C81-C96)	6,301	2.6	165
10	Malignant neoplasm of the oesophagus (C15)	4,603	1.9	125
	All male deaths	**240,238**		

Table source: Office for National Statistics

Table notes:

1. The cause of death groups used here are based on a list developed by the WHO, modified for use in England and Wales (Griffiths et al, 2005).
2. These rates are for all ages and are standardised to the 1976 European standard population, expressed per million population.

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The leading cause of death for males was ischaemic heart diseases, which accounted for 15.6% of male deaths. The leading cause of death for females was dementia and Alzheimer's disease, which accounted for 11.5% of female deaths during 2012. Ischaemic heart disease was the leading cause of death for females in 2011. The second leading cause of death in 2012 was malignant neoplasm of trachea, bronchus and lung (lung cancer) for males and ischaemic heart diseases for females.

Alzheimer's disease is the most common cause of dementia. Deaths from dementia and Alzheimer's disease are increasing as people live longer, with women living longer than men. Some of the rise over the last few decades may also be attributable to a better understanding of dementia meaning that doctors may be more likely to record dementia as the underlying cause of death. For more information on dementia see this infographic and trends in mortality from Alzheimer's disease, Parkinson's disease and dementia, England and Wales, 1979-2004.

If causes were ranked by their age-standardised mortality rates instead of number of deaths, the rankings for females would change. For example, influenza and pneumonia among females is ranked fourth on number of deaths but would be ranked seventh on mortality rates. This is because

the age standardisation process gives less weight to deaths at older ages (where most of the influenza and pneumonia deaths occur).

For both sexes, lung cancer (malignant neoplasm of trachea, bronchus and lung) was the most common cancer, appearing second in the leading cause of death list for males and sixth for females. The lists also contain four other cancers for males and two for females, including ones which are sex-specific (prostate cancer and female breast cancer).

Malignant neoplasm of the oesophagus replaced diseases of the liver as one of the 10 leading causes of death for males in 2012. Heart failure and complications and ill-defined heart disease replaced malignant neoplasms of lymphoid, haematopoietic and related tissue for females.

Table 2: Leading causes of death for females in England and Wales, 2012

England and Wales

Rank	Underlying cause of death	Number of deaths registered	Percentage of all female deaths	Age-standardised mortality rate per million population
1	Dementia and Alzheimer's disease (F01, F03, G30)	29,873	11.5	384
2	Ischaemic heart diseases (I20-I25)	26,741	10.3	426
3	Cerebrovascular diseases (I60-I69)	21,730	8.4	327
4	Influenza and Pneumonia (J09-J18)	15,075	5.8	208
5	Chronic lower respiratory diseases (J40-J47)	14,155	5.5	252
6	Malignant neoplasm of trachea, bronchus and lung (C33, C34)	13,575	5.2	298
7	Malignant neoplasms of female breast (C50)	10,311	4.0	239
8	Malignant neoplasm of colon, sigmoid, rectum and anus (C18-C21)	6,600	2.5	131

9	Diseases of the urinary system (N00-N39)	5,570	2.1	81
10	Heart failure and complications and ill-defined heart disease (I50-I51)	5,065	2.0	70
	All female deaths	**259,093**		

Table source: Office for National Statistics

Table notes:

1. The cause of death groups used here are based on a list developed by the WHO, modified for use in England and Wales (Griffiths et al, 2005).
2. These rates are for all ages and are standardised to the 1976 European standard population, expressed per million population.

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Comparing leading causes of death in 2002 and 2012

In 2002, deaths from ischaemic heart disease accounted for 22.4% of all male deaths, this fell by 6.8 percentage points by 2012 when it accounted for 15.6% of all male deaths. In contrast the percentage of deaths from dementia and Alzheimer's disease rose by 3.8 percentage points over the same period.

In 2012, for females the percentage of deaths from ischaemic heart disease fell by 6.2 percentage points compared with 2002. In contrast the percentage of deaths from dementia and Alzheimer's disease rose by 7.1 percentage points in the same period for females.

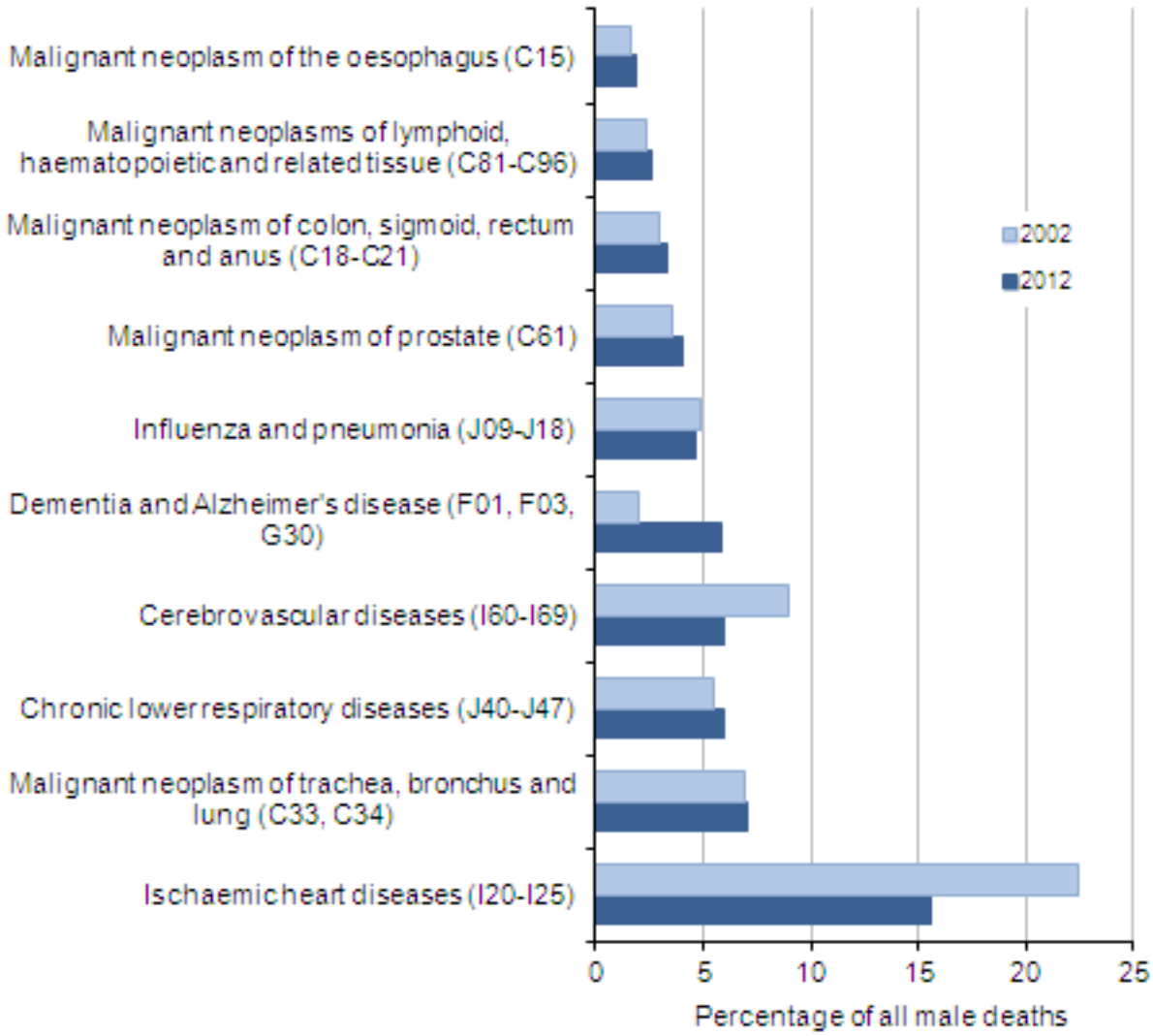
This change may partially be explained by the update from ICD-10 version 2001.2 to ICD-10 version 2010. The results of the bridge coding study showed that within the dementia cause group there is a large change for vascular dementia (F01), which is a result of a correction implemented in ICD-10 v2010. In ICD-10 v2001.2, vascular dementia deaths were coded as cerebrovascular disease (I60–I69), in particular I67.9 (cerebrovascular disease, unspecified).

Also, in ICD-10 v2001.2 a number of dementia deaths were coded as N39.0 (urinary tract infection, site not specified). This change is due to an addition to the modification tables of valid causal

sequences. See Background note 7 for more information on the implementation of ICD-10 v2010 in January 2011.

Figure 4: Percentage of deaths for the 10 leading causes of death for males, 2002 and 2012

England and Wales



Source: Office for National Statistics

Notes:

1. The cause of death groups used here are based on a list developed by the WHO, modified for use in England and Wales (Griffiths et al, 2005).
2. Figures for 2002 are given for the top 10 causes of death in 2012 as a comparison.

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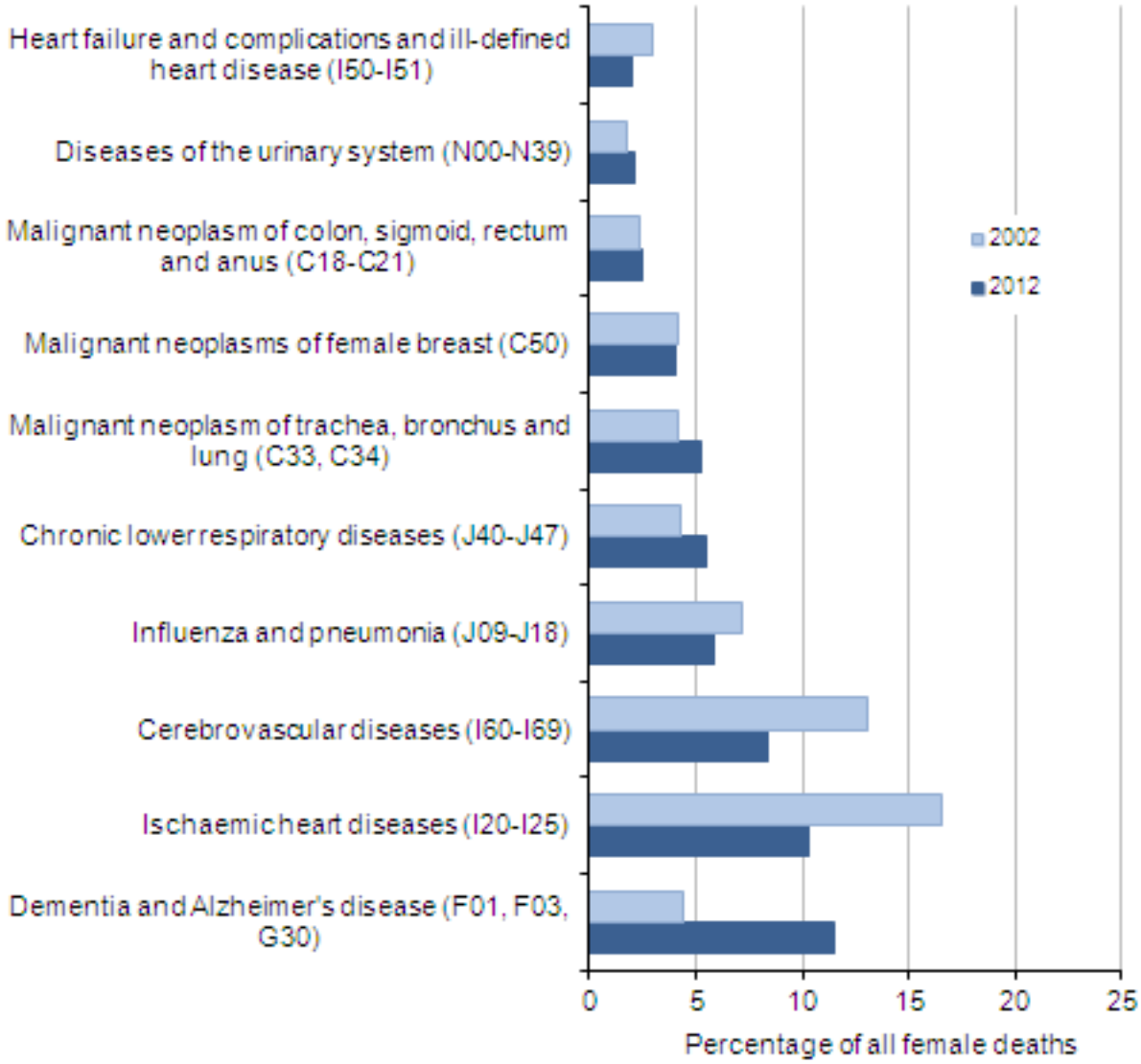
Figure 5: Percentage of deaths for the 10 leading causes of death for females, 2002 and 2012

England and Wales



Source: Office for National Statistics

Notes:

1. The cause of death groups used here are based on a list developed by the WHO, modified for use in England and Wales (Griffiths et al, 2005).
2. Figures for 2002 are given for the top 10 causes of death in 2012 as a comparison.

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Impact of registration delays on mortality statistics, 2012

The information used to produce mortality statistics is based on the details collected when deaths are certified and registered. In England and Wales, deaths should be registered within five days of the death taking place but there are some situations which result in the registration of the death being delayed. Deaths considered unexpected, accidental or suspicious will be referred to a coroner who may order a post mortem and/or carry out a full inquest to ascertain the reasons for the death. The death cannot be registered until the inquest is completed, which can take many months or even years, and ONS is not notified that a death has occurred until it is registered. If someone is to be charged in relation to the death, the coroner must adjourn the inquest, and they may carry out an accelerated registration. However, the full details are not recorded until the inquest is completed. These accelerated registrations are assigned a U50.9 code, and are included in the DR Series Table 5 (2.81 Mb Excel sheet).

Mortality statistics are presented based on the number of deaths registered in a particular period, rather than the number of deaths that actually occurred in that period. This approach is used as a trade off between timeliness and data quality to meet user needs.

In 2012 there were 499,331 deaths registered in England and Wales. Of these deaths, 478,733 occurred in 2012, representing 95.9% of the deaths registered. The proportion of deaths registered in 2012 that also occurred in 2012 varies depending upon the underlying cause of death classified using the ICD-10. More information on registration delays is available on the ONS website.

Users and uses of mortality statistics

The Office for National Statistics uses death data to:

- produce population estimates and population projections at both national and subnational level,
- quality assure census estimates,
- report on social and demographic trends,
- carry out further analysis, for example life expectancies and causes of death (including deaths from injury and poisoning, certain infections and drug related deaths), and
- further analyse infant mortality where infant deaths are linked to their corresponding birth record to enable more detailed analyses on characteristics such as age of parents, birthweight and whether the child was born as part of a multiple birth.

The Department of Health (DH) is a key user of mortality statistics. The Public Health Outcomes Framework sets out the desired outcomes for public health and how these will be measured. Data are used, for example, to inform policy decisions and to reduce premature mortality from the major causes of death under an NHS Outcomes Framework.

Infant mortality continues to take a central role in DH's work on health inequalities. Other key users of mortality data are local authorities and other government departments for planning and resource allocation. The Department for Work and Pensions uses detailed mortality statistics to feed into statistical models they use for pensions and benefits.

Users also include other public sector organisations such as the Police and the Home Office who are interested in data on external causes of death. Private sector organisations such as banks, insurance and investment companies are particularly interested in deaths by single year of age and region which feeds into risk estimation, while funeral directors are interested in the number of deaths occurring at the local area level.

Other users include academics, demographers and health researchers who conduct research into trends. Lobby groups and charities use death statistics to support their cause, for example, campaigns against alcohol and drug misuse or suicide. Organisations such as Eurostat and the UN use death statistics for making international comparisons. The media also report on key trends in mortality.

Further information

More data on deaths in England and Wales in 2012 are available on the ONS website.

Data on births in England and Wales in 2012 is also available on the ONS website.

A Quality and Methodology Information (222.3 Kb Pdf) document for mortality statistics is available on the ONS website. Further information on data quality, legislation and procedures relating to mortality is available in the mortality metadata (2.46 Mb Pdf).

Mortality statistics: Deaths registered in England and Wales by area of usual residence, 2012 will be published in December 2013/January 2014.

An interactive mapping tool enables trends in mortality to be analysed. Mortality rates for 2002-2010 in this tool need to be recalculated using revised population estimates which take account of the 2011 Census. The tool will be updated once decisions are made about implementing changes to the European Standard Population in the UK.

To meet user needs, very timely but provisional counts of death registrations are published as follows: Provisional counts of weekly death registrations by age-sex group and region and provisional counts of monthly death registrations by local authority. Users should note that figures for 2013 have not been subject to the full quality assurance process so figures are considered provisional.

Information illustrating the processes in certification and registration (1.05 Mb Excel sheet) for deaths registered in 2012 is published on the ONS website.

The 21st Century Mortality Files are a record of mortality in England and Wales from 2001 onwards. They are designed to complement the 20th Century Mortality Files. The files consist of an aggregated database of deaths by age-group, sex, year and underlying cause, and include populations for England and Wales.

Crude death rates for selected international countries are available in the Vital Statistics: Population and Health Reference Tables (see annual time series data reference table).

For mortality data for other UK countries please see statistics on deaths in Northern Ireland and statistics on deaths in Scotland.

Future changes to mortality outputs are outlined in the plan for mortality outputs (116 Kb Pdf) available on the ONS website.

References

Department of Health (2013), Public Health Outcomes Framework

Department of Health (2012), NHS Outcomes Framework

Department of Health (2011), Improving Ooutcomes: A Strategy for Cancer

Department of Health (2010), Healthy Lives, Healthy People

Department of Health (2009), Change4life

Griffiths C and Rooney C (2006) 'Trends in mortality from Alzheimer's disease, Parkinson's disease and dementia, England and Wales, 1979-2004', Health Statistics Quarterly 30, 6–14.

Griffiths C, Rooney C and Brock A (2005) 'Leading causes of death in England and Wales – how should we group causes?', Health Statistics Quarterly 28, 6–17.

NHS (2013), NHS Breast Cancer Screening Programme

Welsh Government (2006), Together for Health, Cancer Delivery Plan for the NHS up to 2016

World Health Organisation (WHO) (1992–94) International Statistical Classification of Diseases and Related Health Problems, volumes 1, 2 and 3 (10th Revision). WHO: Geneva.

Background notes

1. The year in which a death is registered may not correspond to the year in which the death occurred. Up to 1992, Office for National Statistics (ONS) publications gave numbers of deaths registered in the data year. Between 1993 and 2005 the majority of ONS's published figures represented the number of deaths that occurred in the data year. For 2006 onwards, ONS changed the reporting of death figures back to deaths registered in a reference year. In most years (and for most causes of death), this change has little effect on annual totals but allows the output of more timely mortality data. For an annual extract of death occurrences to be acceptably complete, it must be taken some months after the end of the data year to allow for any late registrations.

2. Death figures reported here are based on deaths registered in the data year. For 2012 this includes some deaths that occurred in previous years (20,598 deaths). ONS also takes an annual extract of death occurrences in the autumn following the data year (to allow for late registrations). This is used for seasonal analysis of mortality data and several infant mortality

outputs. The difference between death registrations and death occurrences in a year is relatively small. For example, the number of death registrations in 2011 involving deaths occurring in 2011 was 463,450 while the number of 2011 death occurrences was 481,156 (a difference of 3.7%).

3. The cause of death data are based on the final underlying cause of death, which takes account of any additional information provided by medical practitioners or coroners after the death has been registered. The original underlying cause of death only changes in a very small number of deaths (around 0.2%) in a given year.

4. Following guidance from the World Health Organisation (WHO), the ICD-10 code J09 'Influenza due to identified avian influenza virus' has been used to record H1N1 swine influenza. For ease of use J09 has been renamed to 'Influenza due to identified avian or swine influenza virus' in the tables. The number of deaths shown under J09 differs from figures reported by the Health Protection Agency.

5. The age-standardised mortality rates in this release cover all ages. Age-specific rates for 2012 are calculated using the mid-2012 population estimates based on the 2011 Census, and are then directly age-standardised to the 1976 European Standard Population, which allows comparisons between populations with different age structures, including between males and females and over time. Eurostat, the statistical institute of the European Union, has decided to update the European Standard Population which is used in the calculation of age-standardised rates. ONS will publish details of the impact of this change on age-standardised rates, and, following user engagement in summer 2013, the timetable for implementation of the new standard population in relevant publications.

6. The population estimates used to calculate rates refer to the usually resident population of an area on 30 June of each year. The usually resident population is defined by the standard United Nations definition for population estimates, and includes people who reside in the area for a period of at least 12 months whatever their nationality. ONS mid-year population estimates are based on updates from the most recent census, allowing for births, deaths, net migration and ageing of the population. The population estimates used for the calculation of mortality rates are the latest consistent estimates available at the time of production. Further information on population estimates methodology (179.5 Kb Pdf) can be found on the ONS website.

7. In January 2011 the software used for cause of death coding was updated from the International Classification of Diseases, 10th Revision (ICD-10) version 2001.2 to version 2010. The main changes in ICD-10 v2010 are amendments to the modification tables and selection rules, which are used to ascertain a causal sequence and consistently assign underlying cause of death from the conditions recorded on the death certificate. Overall, the impact of these changes is small although some cause groups are affected more than others. For further information, see the results of the bridge coding study on the ONS website. There is also another study looking at the impact on stillbirths and neonatal deaths.

8. There is a large degree of comparability in mortality statistics between countries within the UK. However, there are some differences although these are believed to have a negligible impact on the comparability of the statistics. These differences are outlined in the Quality and Methodology Information (222.3 Kb Pdf) document for mortality statistics.

9. Special extracts and tabulations of mortality data for England and Wales are available to order (subject to legal frameworks, disclosure control, resources and agreement of costs, where appropriate). Such enquiries should be made to:

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   Titchfield

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   Email: vsob@ons.gsi.gov.uk

10. We would welcome feedback on the content, format and relevance of this release. Please send feedback to the postal or email address above.

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12. Details of the policy governing the release of new data are available by visiting www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html or from the Media Relations Office email: media.relations@ons.gsi.gov.uk

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