

Centenarians in Scotland, 2005 to 2015

**Including mid-year population estimates for
those aged 90 and over**

Published on 29 September 2016

A National Statistics publication for Scotland

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Main Points

The main points in this report are:

- In Scotland in 2015, there were an estimated 900 centenarians (people aged 100 and over). This is a 67 per cent increase from 2005 when there were an estimated 540 centenarians.
- The majority of centenarians are women. In 2015, women accounted for 780 of Scotland's centenarians (87 per cent) while around 120 men had reached the milestone.
- The number of male centenarians more than doubled between 2005 and 2015, increasing from 50 to 120, while the number of female centenarians increased from 490 to 780 during the same period.
- The ratio of male to female centenarians has increased to 15 men per 100 women in 2015 compared to 10 in 2005 indicating that the gap between men and women's mortality in this age group has decreased over the period.
- The number of centenarians relative to the rest of the population has increased since 2005 (when there were 1.1 per 10,000 people). But there are still less than two centenarians for every 10,000 people (1.7 per 10,000).
- The number of people aged 90 to 99 increased from 27,990 in 2005 to 38,890 in 2015, an increase of 39 per cent.
- The number of men aged 90 to 99 increased from 6,360 to 11,300 between 2005 and 2015, an increase of 78 per cent. The number of females aged 90 to 99 increased from 21,630 to 27,590 during the same period, an increase of 28 per cent.

1. Background

This report details the estimated number of people by sex aged 90 to 104, by single year of age, and the number of people aged 105 and over in Scotland, for 30 June 2005 to 30 June 2015. All of the estimates presented here refer to the population at 30 June.

A time series of the number of people by sex aged 90 to 104, by single year of age, and the number of people aged 105 and over in Scotland for 30 June 1981 to 30 June 2015 is available on the [National Records of Scotland \(NRS\) website](#).

The data in this report use the revised mid-year population estimates for 2002 to 2010 published on 17 December 2013 which take into account the 2011 Census results. The estimates for 2012 to 2014 are based on corrected population estimates published on 28 April 2016. More details are available in the papers of the [Population and Migration Statistics Committee](#) (PAMS) available on the NRS website.

The number of centenarians (people aged 100 years and over) across the industrialised world has been growing at an increasing rate since the 1950s¹. At the start of the 20th Century, Scottish centenarians were extremely rare, but by the start of the 21st Century there were estimated to be around 500 people aged 100 or over in Scotland. Since the 1950s, centenarians have been growing at a faster rate than any other age group.

This increase in centenarians has been largely driven by increases in survival rates of older people, as the result of improvements in hygiene, sanitation, medical treatment, housing and living standards in general.

In recent years, there has been an increased interest in estimating the population of very elderly people in Scotland, as survival rates are expected to carry on increasing in the foreseeable future. These statistics give an important insight into the most rapidly growing age-group of Scotland's population and are used in the calculation of life expectancy statistics for Scotland.

Similar estimates for Northern Ireland and England & Wales are available on the [Northern Ireland Statistics & Research Agency](#) and the [Office for National Statistics](#) websites respectively. The Office for National Statistics also publish estimates for the UK as a whole.

The statistics in this report have been recently assessed by the UK Statistics Authority and have been designated as National Statistics. More information is available in the [letter of confirmation as National Statistics](#) and in the [assessment report](#) on the UK Statistics Authority website.

Footnote

1) Kannisto, V, 1997, *The Advancing frontier of survival*. Odense Monographs on Population Aging 3. Odense University Press.

2. Methodology

National Records of Scotland produce population estimates by single year of age from 0 to 89 using the 'cohort component' method. Starting with the census, each year the population of a given area is aged on by one year, births in the area are added to the population, deaths in the area are subtracted and estimates of migration are used to allow for people moving in and moving out. More information on the cohort component method can be found in the [Mid-Year Population Estimates methodology guide](#) on the National Records of Scotland website.

However this method is not currently reliable for single year of age populations for the very elderly because the census estimates are less reliable for populations aged 90 and over (as it becomes harder to firmly establish someone's age the older they get). In the National Records of Scotland mid-year estimate of the Scottish population, people aged 90 and over are aggregated together into one group.

To produce single year of age estimates of the population aged 90 and over, National Records of Scotland use the Kannisto-Thatcher² (KT) method. This method has also been adopted by the Office for National Statistics to produce population estimates of the very old (including centenarians) in England and Wales and for the UK as a whole. These estimates can be found in the [Ageing](#) section of the Office for National Statistics website.

The KT method uses 'age at death' data to build up distribution profiles of the numbers of elderly people in Scotland in previous years. For example, if someone dies in 2006 aged 105, then this means that they were alive and aged 104 in 2005, 103 in 2004, and so on. By collating 'age at death' data for a series of years, it becomes possible to make an estimate of the number of people of a given age alive in any particular year and so create age distribution profiles, assuming that migration at these oldest ages is minimal.

To make estimates for the latest year, it is not possible to use death data, as we are interested in the population who are currently or very recently alive. So the KT method uses an average of the last five years of age at death information to produce an estimate of the number of survivors for the most current year. Estimates are then made consistent with the mid-year estimate of people aged 90 and over.

One consequence of this method is that each year the estimates for earlier years become more accurate as more death records are available to inform the age profiles. For example, the current estimate of the number of people aged 90 in 2014 (9,330) is different from the estimate that was calculated in the 2014 publication (9,360).

Population estimates calculated using the KT method for single year of age from 90 to 99 and for the 100 plus age group were found to be broadly similar to comparable data available from the Department for Work and Pensions (DWP) and broadly consistent with data published from the 2011 Census. More information about the

Footnote

2) Thatcher, R, 1999, The demography of centenarians in England and Wales. Population Trends 96.

quality of these estimates and the data they are derived from is available in the [Methodology Report](#) on the National Records of Scotland website.

The increase in the number of centenarians reflects an increase in life expectancy. The Office for National Statistics produce annual estimates of life expectancy for Scotland on behalf of National Records of Scotland³. The latest figures (for the period 2013 to 2015 based on population estimates rolled forward from the 2011 Census) show a life expectancy at birth of 77.1 for males and 81.1 for females, which is an increase of 2.9 years for males and 1.9 years for females over the last 10 years (since the period 2003 to 2005). Life expectancy at age 65 has also increased over the last 10 years to 17.3 years for males and 19.7 years for females, an increase of 1.9 years for males and 1.3 years for females compared to 2005.

With new data available from the 2011 Census, National Records of Scotland are working to improve the methodology for estimating the elderly population. We will also be working with the Office for National Statistics on a review of the method to produce the current estimates.

We have also published experimental statistics for mid-year population estimates for those aged 90 and over, by sex, age, and administrative area for the years 2005 to 2015 in the publication 'Sub-national Population Estimates for ages 90 and over, 2005 – 2015'. This is available in the [Centenarians](#) section of the NRS website.

Footnote

3) [Life expectancy at Scotland level](#) – available on the National Records of Scotland website.

3. Results

Population estimates by sex and age for the years 2005 to 2015 are shown in [Table 1](#). Scotland's population has continued to age and the number of people aged 90 to 99 was at the highest ever level in 2015. The number of people aged 100 and over was 10 fewer than the highest ever level estimated in 2014.

Between mid-2014 and mid-2015 there was an increase in the number of deaths compared to the previous year. This is likely to be the main reason for the slight decline in the number of centenarians in 2015. More information is available in the [Vital Events – Deaths](#) section of the National Records of Scotland website.

Figure 1 shows the increase in the number of 90 to 99 year olds over the past decade while the increase in the number of people reaching the age of 100 can be seen in [Figure 2](#).

The small dip seen in Figure 1 between 2006 and 2009 amongst the 90 to 99 year olds is a representation of the lower births during the First World War, while the increase from 2010 onwards is partly related to the large number of births that followed the end of the war. The overall increase in the number of people aged 90 and over can be attributed to a decrease in mortality amongst older ages.

Figure 1: Persons aged 90 to 99 by sex, Scotland, 2005 to 2015

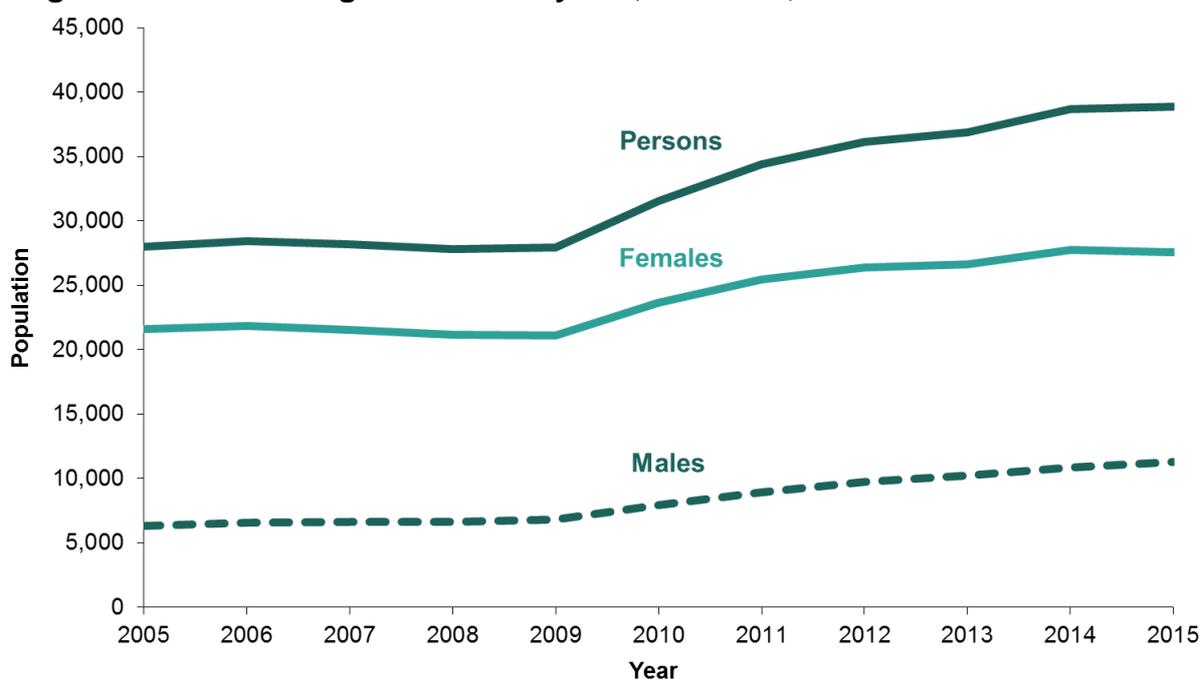
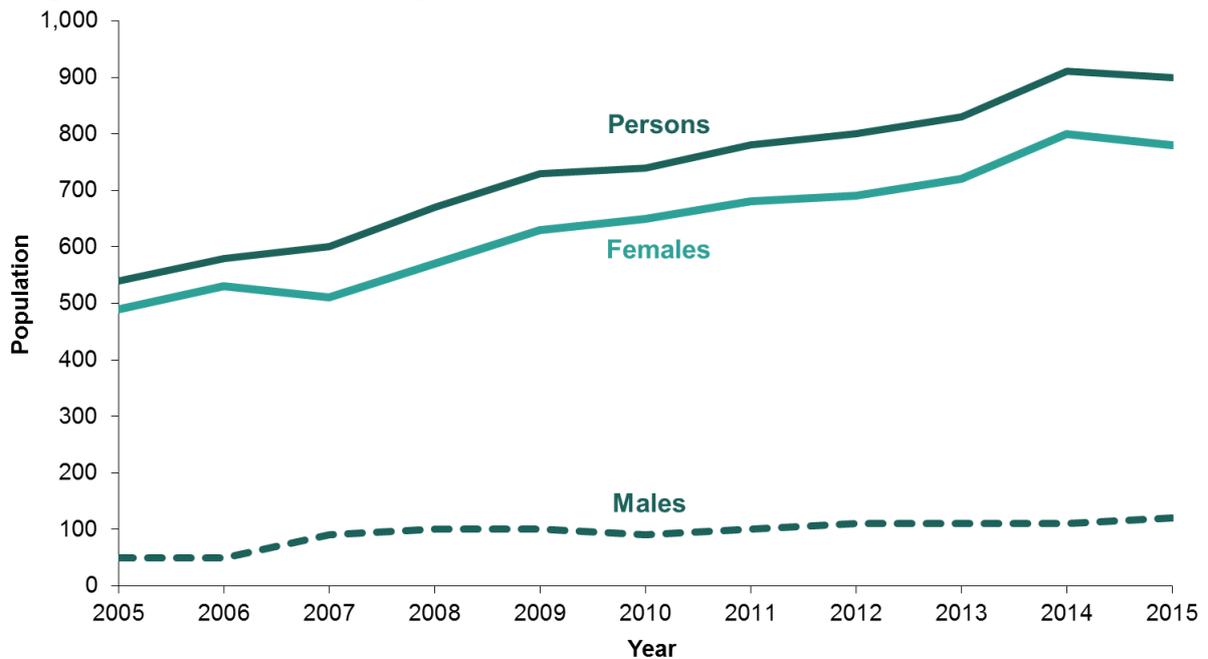


Figure 2: Centenarians by sex, Scotland, 2005 to 2015



In the period 2005 to 2015 the population aged 90 to 99 increased by 39 per cent from 27,990 to 38,890: a 78 per cent increase for males (from 6,360 to 11,300) and a more modest 28 per cent increase for females (from 21,630 to 27,590).

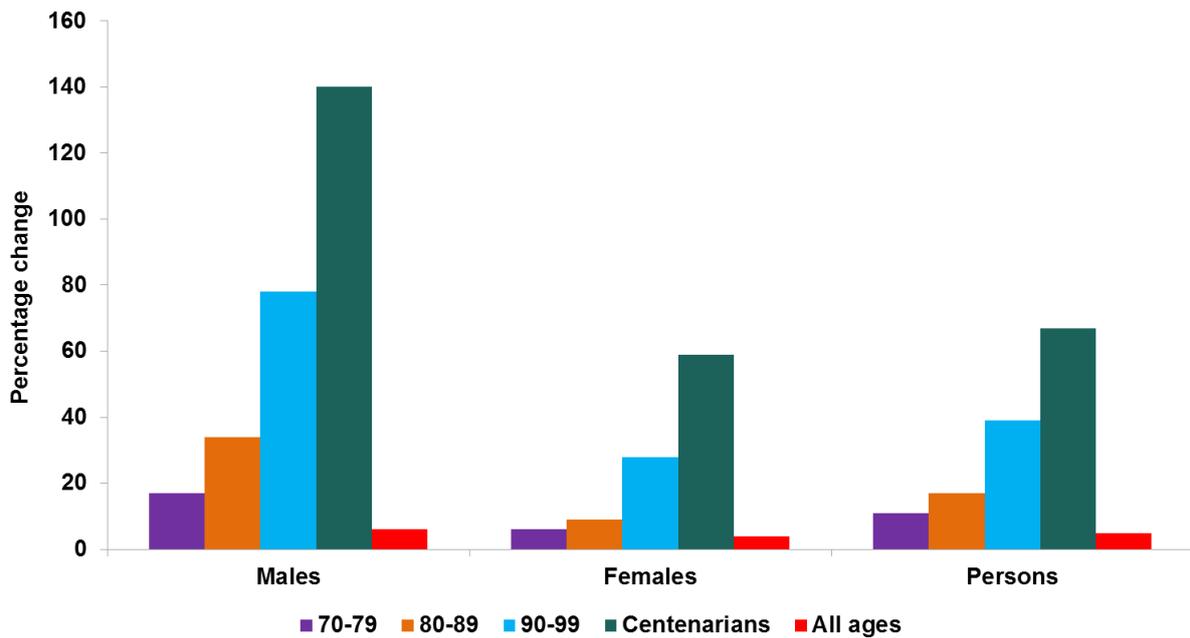
The population aged 100 + (the centenarian population) increased by 67 per cent (from 540 in 2005 to 900 in 2015). The male centenarian population more than doubled (from 50 in 2005 to 120 in 2015), while the female population increased by 59 per cent (from 490 in 2005 to 780 in 2015).

However, in the most recent year between mid-2014 and mid-2015, there was a slight decline in the centenarian population from 910 in 2014 to 900 in 2015.

Figure 3 shows that between 2005 and 2015 the percentage increase for males was consistently higher than for females at older ages. However, as seen in [Figure 1](#) for people aged 90 to 99 and [Figure 2](#) for people aged 100 and over, the number of females at the highest ages remains much larger than the number of males.

It is also clear that, over the past 10 years, the number of people in the older age groups has increased at a higher rate than the population of Scotland as a whole, an indication of the ageing population.

Figure 3: Percentage population change by age group, Scotland, 2005 to 2015



The size of cohorts can have an effect on the sizes of age groups in the population over time. [Figure 4a](#) shows the population aged 90 from 1981 to 2015 and [Figure 4b](#) shows births from 1891 to 1925: the years when those aged 90 in [Figure 4a](#) were born.

Between 2006 and 2008 there was a drop in the estimated number of 90 to 99 year olds (from 28,430 to 27,810). The decline in the population aged 90 during this period is shown in [Figure 4a](#). The small size of this cohort relative to previous years can be traced back to a lower number of births in the years 1915 to 1919, coinciding with the First World War, as shown in [Figure 4b](#). After the war there was a baby boom, with the number of births recorded in 1920 the highest since the introduction of civil registration in 1855. After 1920, the number of births declined to a level generally lower than seen in the pre-war years.

The effect that the number of births in each year has on the population surviving to age 90 can be seen in [Figure 4a](#). Fewer births during the First World War resulted in fewer people aged 90 during the years 2006 to 2008 than previously. The large peak of those aged 90 in 2010 also corresponds to the post-war baby boom cohort born in 1920.

However, other trends are also visible. From 1981 to 2001 there was an increase in the number of people aged 90 each year, increasing from 3,740 to 7,060 over this period. [Figure 4b](#) shows that the number of births 90 years earlier (1891 to 1911) than each of these years, however, was fairly stable at around 130,000 per year. Migration will also affect the number of people reaching age 90 each year. However, the long term increase in the population aged 90 mostly reflects mortality improvements experienced by each cohort.

These effects can also be seen in the years from 2011 to 2015 in [Figure 4a](#). Despite a decrease in the number of births in the years after 1920, the number of people reaching age 90 in these cohorts remains fairly stable.

It should be noted that the scale on the Y-axis in [Figure 4a](#) is much smaller than that in [Figure 4b](#).

Figure 4a: Population aged 90 from 1981 to 2015, Scotland

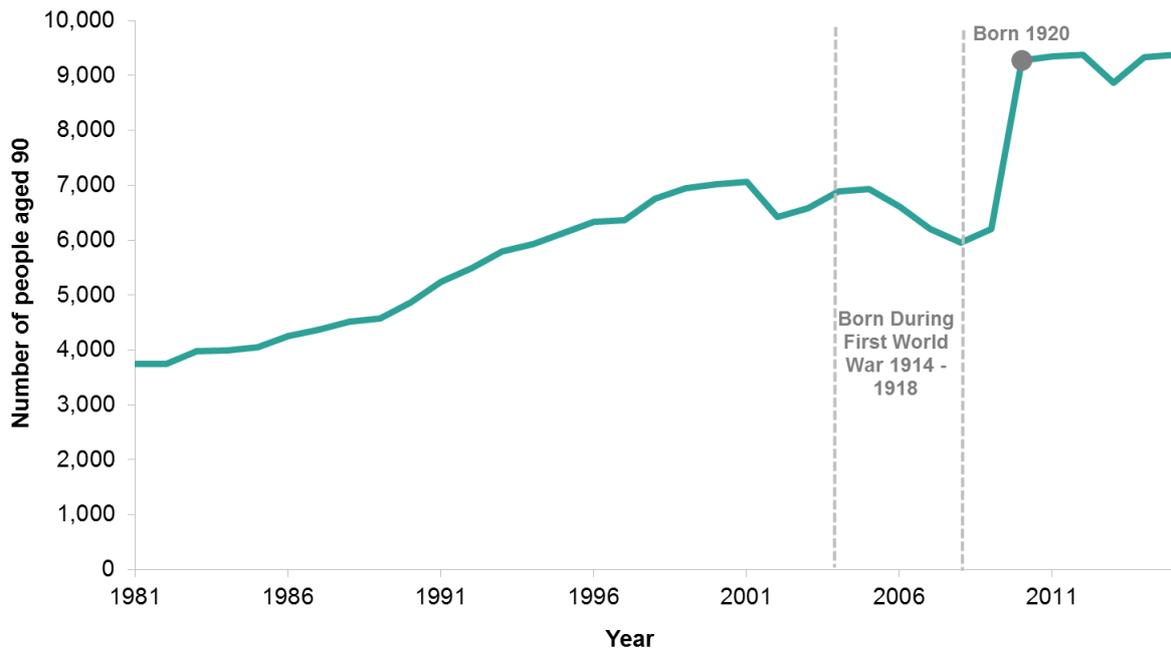


Figure 4b: Number of births from 1891 to 1925, Scotland

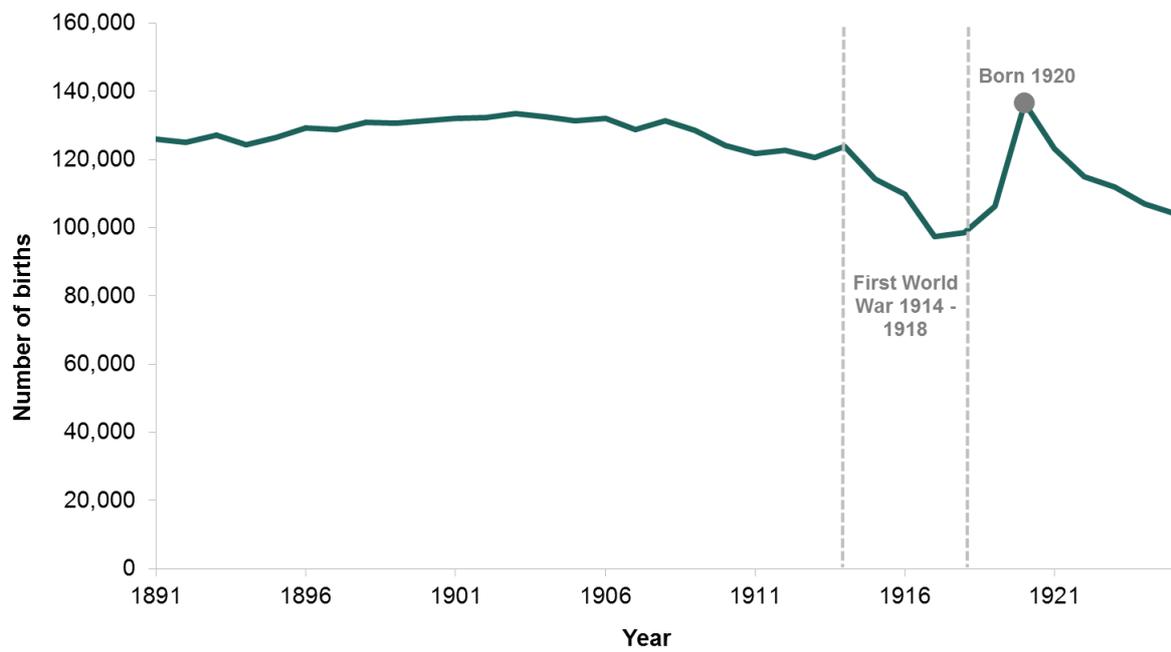


Figure 5 illustrates the age and sex structure of the population aged 90 and over. The majority of the population aged 90 and over are concentrated at the lower ages. Whilst there were over 9,000 people aged 90 in 2015, there were fewer than 1,000 people aged 98 and 99, and 900 people were aged 100 and over.

The proportion of males relative to females also declines at higher ages as a result of higher male mortality amongst the very old. The percentage of males amongst those aged 90 and 91 was 33 per cent in 2015, but this declines to 13 per cent for centenarians.

Figure 5: Number and percentages of males and females aged 90 to 99 and centenarians, Scotland, 2015

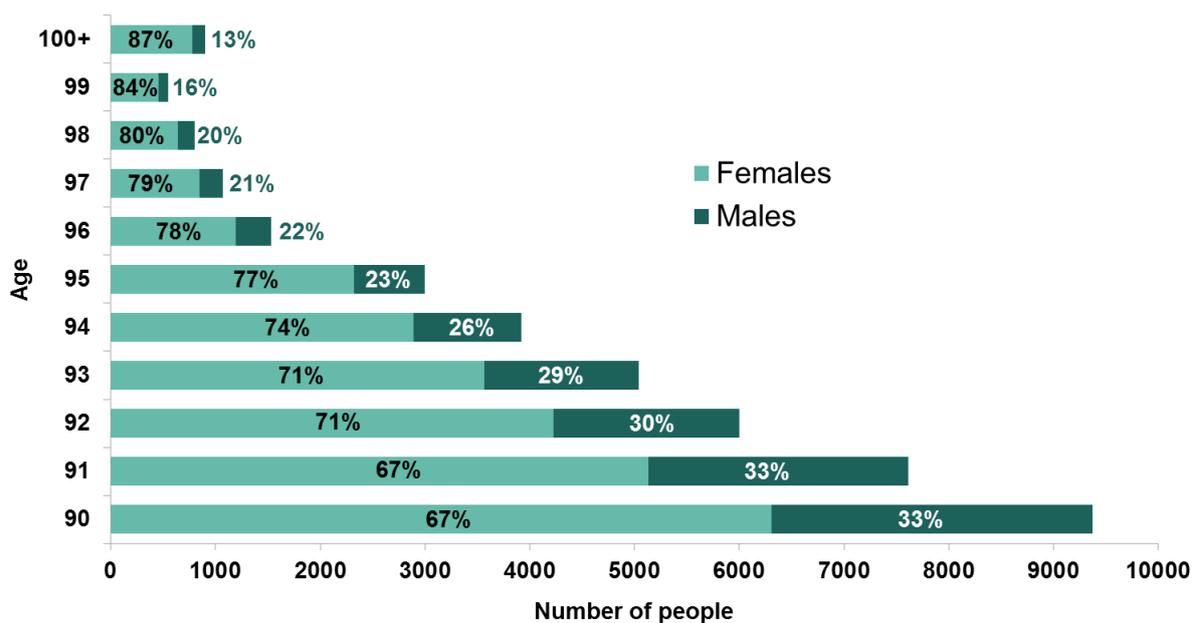
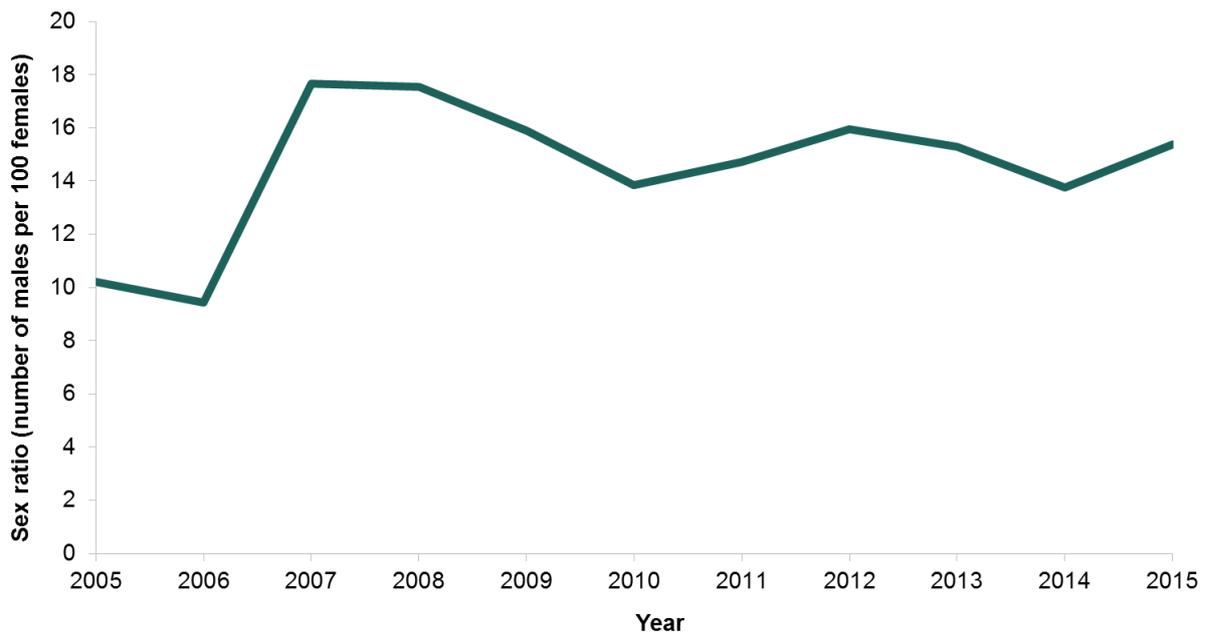


Figure 6 shows that between 2005 and 2015, the number of male centenarians per 100 female centenarians increased from 10 to 15. However, following a large increase between 2006 and 2007, the ratio of male to female centenarians has remained broadly stable over the last 8 years.

The number of male centenarians is very small, numbering around 120 in 2015, while there were 780 females aged 100 and over. The small numbers involved mean that relatively small changes in the population can have a large effect on the percentage of centenarians that are male.

Figure 6: Number of male centenarians per 100 female centenarians, Scotland, 2005 to 2015



Centenarians make up a slightly larger proportion of the population at UK level (2.2 per 10,000 population) than in Scotland (1.7 per 10,000 population). However between 2005 and 2015 the percentage increase in the number of centenarians in Scotland (67 per cent) was slightly greater than in the UK as a whole (65 per cent).

Although centenarians are still rare, the number of centenarians in Scotland's total population has increased from 1.1 per 10,000 in 2005 to 1.7 per 10,000 in 2015, as shown in Figure 7. The number of male centenarians per 10,000 males in the total population increased from 0.2 to 0.5 per 10,000 in this period. For females, there was an increase from 1.9 per 10,000 to 2.8 per 10,000 between 2005 and 2015.

Figure 7: Centenarians per 10,000 population by sex, Scotland 2005 to 2015

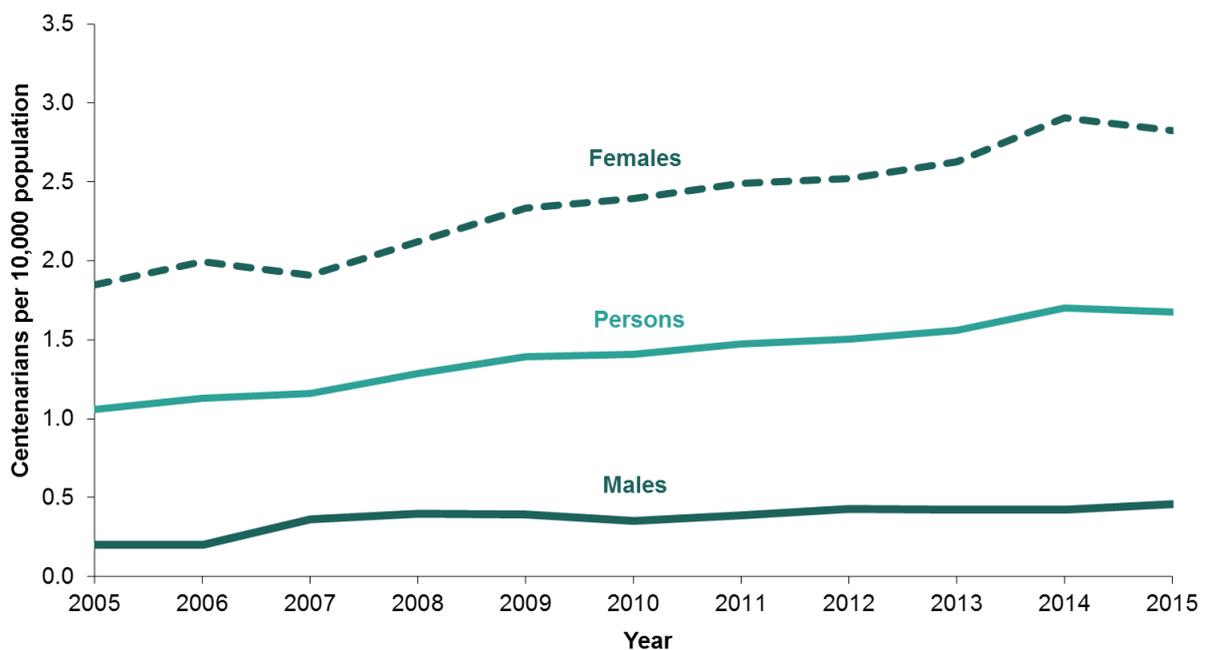


Table 1: Population estimates of centenarians (and people aged 90 and over), by sex and single year of age, Scotland mid-2005 to mid-2015

Mid-year population	Persons 90-99	Persons 100+	Persons 90	Persons 91	Persons 92	Persons 93	Persons 94	Persons 95	Persons 96	Persons 97	Persons 98	Persons 99	Persons 100	Persons 101	Persons 102	Persons 103	Persons 104	Persons 105+
2005	27,990	540	6,930	5,730	4,300	3,290	2,460	1,870	1,390	1,020	590	410	230	120	90	50	20	30
2006	28,430	580	6,610	5,810	4,690	3,430	2,550	1,860	1,380	1,020	680	400	270	140	80	40	30	20
2007	28,170	600	6,210	5,500	4,700	3,760	2,640	1,900	1,350	950	700	460	250	180	80	40	20	30
2008	27,810	670	5,960	5,210	4,480	3,710	2,910	2,030	1,410	980	650	470	300	160	110	50	20	30
2009	27,940	730	6,200	4,980	4,370	3,580	2,910	2,210	1,530	1,010	700	450	310	200	100	70	20	30
2010	31,560	740	9,270	5,330	4,210	3,610	2,860	2,290	1,640	1,150	720	480	290	200	130	60	40	20
2011	34,390	780	9,350	7,890	4,430	3,420	2,810	2,230	1,740	1,190	830	500	330	170	120	70	50	40
2012	36,100	800	9,370	7,750	6,400	3,500	2,660	2,130	1,670	1,250	830	540	330	220	110	60	40	40
2013	36,860	830	8,870	7,790	6,290	5,060	2,690	1,980	1,560	1,210	850	560	360	210	120	60	40	40
2014	38,650	910	9,330	7,480	6,460	5,090	4,060	2,070	1,520	1,160	870	610	390	240	140	70	30	40
2015	38,890	900	9,370	7,610	6,000	5,040	3,920	3,000	1,530	1,070	800	550	380	230	140	70	40	40

	Males 90-99	Males 100+	Males 90	Males 91	Males 92	Males 93	Males 94	Males 95	Males 96	Males 97	Males 98	Males 99	Males 100	Males 101	Males 102	Males 103	Males 104	Males 105+
2005	6,360	50	1,830	1,390	1,020	710	490	340	240	200	90	50	20	10	10	10	<5	<5
2006	6,570	50	1,700	1,480	1,120	800	520	350	250	170	120	60	30	10	10	<5	<5	<5
2007	6,610	90	1,690	1,380	1,140	850	600	370	250	150	110	70	40	30	10	10	<5	<5
2008	6,620	100	1,620	1,370	1,070	860	650	440	270	170	100	70	40	30	20	10	<5	<5
2009	6,820	100	1,770	1,350	1,140	790	640	450	310	180	120	70	40	30	20	10	<5	<5
2010	7,940	90	2,600	1,490	1,100	920	620	470	330	210	120	80	40	20	20	10	<5	<5
2011	8,950	100	2,830	2,160	1,180	870	660	470	350	210	140	80	50	20	10	10	10	<5
2012	9,730	110	2,940	2,290	1,700	910	650	470	320	230	140	80	60	30	20	<5	<5	<5
2013	10,210	110	2,790	2,400	1,810	1,300	680	440	330	230	140	90	50	30	20	10	<5	<5
2014	10,880	110	3,080	2,250	1,890	1,390	980	480	320	230	160	100	50	30	20	10	<5	<5
2015	11,300	120	3,060	2,480	1,770	1,470	1,030	680	340	220	160	90	60	30	20	10	<5	<5

	Females 90-99	Females 100+	Females 90	Females 91	Females 92	Females 93	Females 94	Females 95	Females 96	Females 97	Females 98	Females 99	Females 100	Females 101	Females 102	Females 103	Females 104	Females 105+
2005	21,630	490	5,100	4,340	3,280	2,580	1,970	1,530	1,150	820	500	360	210	110	80	40	20	30
2006	21,860	530	4,910	4,330	3,570	2,630	2,030	1,510	1,130	850	560	340	240	130	70	40	30	20
2007	21,560	510	4,520	4,120	3,560	2,910	2,040	1,530	1,100	800	590	390	210	150	70	30	20	30
2008	21,190	570	4,340	3,840	3,410	2,850	2,260	1,590	1,140	810	550	400	260	130	90	40	20	30
2009	21,120	630	4,430	3,630	3,230	2,790	2,270	1,760	1,220	830	580	380	270	170	80	60	20	30
2010	23,620	650	6,670	3,840	3,110	2,690	2,240	1,820	1,310	940	600	400	250	180	110	50	40	20
2011	25,440	680	6,520	5,730	3,250	2,550	2,150	1,760	1,390	980	690	420	280	150	110	60	40	40
2012	26,370	690	6,430	5,460	4,700	2,590	2,010	1,660	1,350	1,020	690	460	270	190	90	60	40	40
2013	26,650	720	6,080	5,390	4,480	3,760	2,010	1,540	1,230	980	710	470	310	180	100	50	40	40
2014	27,770	800	6,250	5,230	4,570	3,700	3,080	1,590	1,200	930	710	510	340	210	120	60	30	40
2015	27,590	780	6,310	5,130	4,230	3,570	2,890	2,320	1,190	850	640	460	320	200	120	60	40	40

4. Notes on statistical publications

National Statistics

The United Kingdom Statistics Authority has designated these statistics as National Statistics, in line with the Statistics and Registration Service Act 2007 and signifying compliance with the Code of Practice for Official Statistics (available on the [UK Statistics Authority website](#)).

National Statistics status means that official statistics meet the highest standards of trustworthiness, quality and public value.

All official statistics should comply with all aspects of the Code of Practice for Official Statistics. They are awarded National Statistics status following an assessment by the Authority's regulatory arm. The Authority considers whether the statistics meet the highest standards of Code compliance, including the value they add to public decisions and debate.

It is National Records of Scotland's responsibility to maintain compliance with the standards expected of National Statistics. If we become concerned about whether these statistics are still meeting the appropriate standards, we will discuss any concerns with the Authority promptly. National Statistics status can be removed at any point when the highest standards are not maintained, and reinstated when standards are restored.

Information on background and source data

Further details on data source(s), timeframe of data and timeliness, continuity of data, accuracy, etc can be found in the [about this publication](#) document that is published alongside this publication on the NRS website.

National Records of Scotland

We, the National Records of Scotland, are a non-ministerial department of the devolved Scottish Administration. Our aim is to provide relevant and reliable information, analysis and advice that meets the needs of government, business and the people of Scotland. We do this as follows:

- Preserving the past – We look after Scotland's national archives so that they are available for current and future generations, and we make available important information for family history.
- Recording the present – At our network of local offices, we register births, marriages, civil partnerships, deaths, divorces and adoptions in Scotland.
- Informing the future – We are responsible for the Census of Population in Scotland which we use, with other sources of information, to produce statistics on the population and households.

You can get other detailed statistics that we have produced from the [Statistics](#) section of our website. Scottish Census statistics are available on the [Scotland's Census](#) website.

We also provide information about [future publications](#) on our website. If you would like us to tell you about future statistical publications, you can register your interest on the Scottish Government [ScotStat](#) website.

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Revisions and Corrections

We, the National Records of Scotland, also label any revisions and corrections that have applied to any of our statistics. These revisions or corrections are clearly marked on the webpage of the publication as well on our [revisions and corrections](#) page located on the NRS website.

Enquiries and suggestions

Please contact our Statistics Customer Services if you need any further information.
Email: statisticscustomerservices@nrscotland.gov.uk

If you have comments or suggestions that would help us improve our standards of service, please contact:

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5. Related organisations

Organisation	Contact
<p>The Scottish Government (SG) forms the bulk of the devolved Scottish Administration. The aim of the statistical service in the SG is to provide relevant and reliable statistical information, analysis and advice that meets the needs of government, business and the people of Scotland.</p>	<p>Office of the Chief Statistician Scottish Government 3WR, St Andrews House Edinburgh EH1 3DG</p> <p>Phone: 0131 244 0442</p> <p>Email: statistics.enquiries@scotland.gsi.gov.uk</p> <p>Website: www.scotland.gov.uk/Topics/Statistics</p>
<p>The Office for National Statistics (ONS) is responsible for producing a wide range of economic and social statistics. It also carries out the Census of Population for England and Wales</p>	<p>Customer Contact Centre Office for National Statistics Room 1.101 Government Buildings Cardiff Road Newport NP10 8XG</p> <p>Phone: 0845 601 3034 Minicom: 01633 815044</p> <p>Email: info@statistics.gsi.gov.uk</p> <p>Website: www.ons.gov.uk/</p>
<p>The Northern Ireland Statistics and Research Agency (NISRA) is Northern Ireland's official statistics organisation. The agency is also responsible for registering births, marriages, adoptions and deaths in Northern Ireland, and the Census of Population.</p>	<p>Northern Ireland Statistics and Research Agency McAuley House 2-14 Castle Street Belfast BT1 1SA</p> <p>Phone: 028 9034 8100</p> <p>Email: info.nisra@dfpni.gov.uk</p> <p>Website: www.nisra.gov.uk</p>

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