

Centenarians in Scotland, 2006 to 2016

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

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A National Statistics publication for Scotland

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Main Points

The main points in this report are:

- In Scotland in 2016, there were an estimated 910 centenarians (people aged 100 and over). This is a 57% increase from 2006 when there were an estimated 580 centenarians.
- The majority of centenarians are women. In 2016, women accounted for 790 of Scotland's centenarians (87%) while around 120 men had reached the milestone.
- The number of male centenarians more than doubled between 2006 and 2016, increasing from 50 to 120, while the number of female centenarians increased from 530 to 790 during the same period.
- The ratio of male to female centenarians has increased to 15 men per 100 women in 2016 compared to 9 in 2006 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 2006 (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 28,430 in 2006 to 40,160 in 2016, an increase of 41%.
- The number of men aged 90 to 99 increased from 6,570 to 11,900 between 2006 and 2016, an increase of 81%. The number of females aged 90 to 99 increased from 21,860 to 28,260 during the same period, an increase of 29%.

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 2006 to 30 June 2016. 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 2016 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.

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 (9,430) 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 2014 to 2016 based on population estimates rolled forward from the 2011 Census) show a life expectancy at birth of 77.1 for males and 81.2 for females, which is an increase of 2.5 years for males and 1.7 years for females over the last 10 years (since the period 2004 to 2006). Life expectancy at age 65 has also increased over the last 10 years to 17.4 years for males and 19.7 years for females, an increase of 1.6 years for males and 1.2 years for females compared to 2004-2006.

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.

Footnote

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

Results

Population estimates by sex and age for the years 2006 to 2016 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 2016.

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, 2006 to 2016

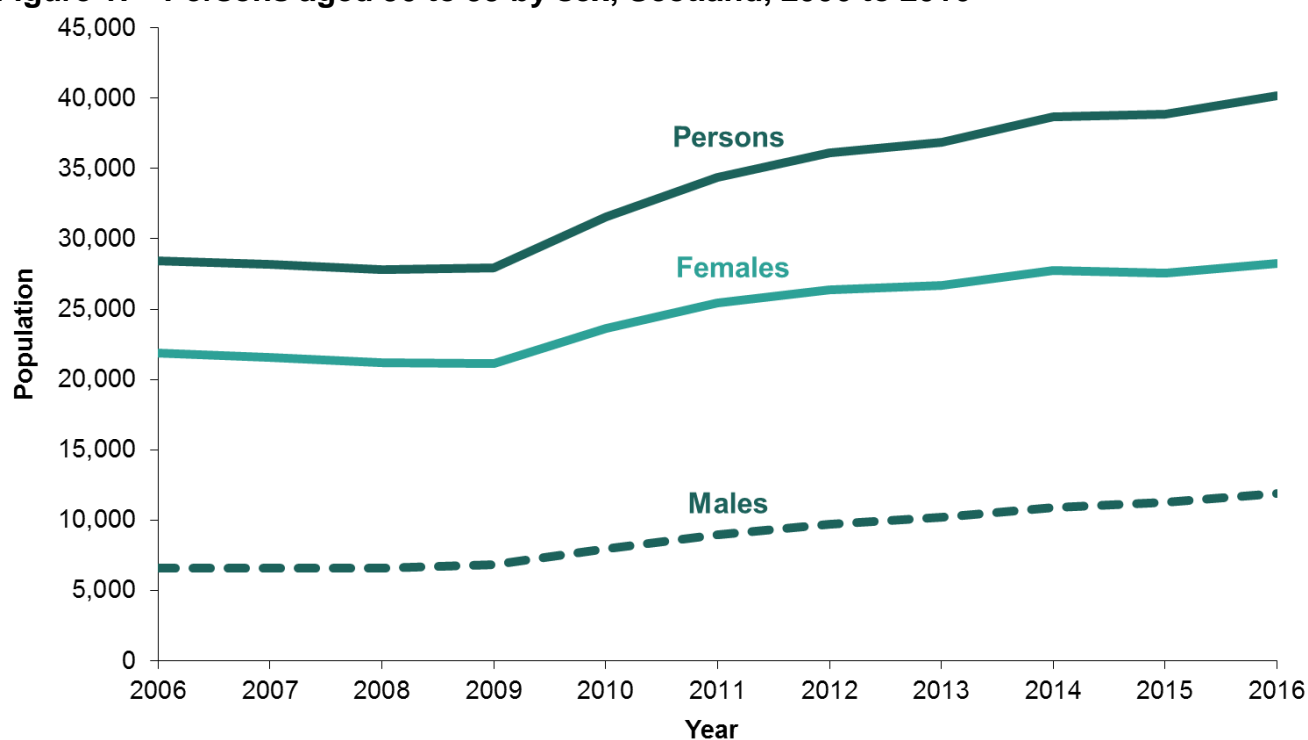
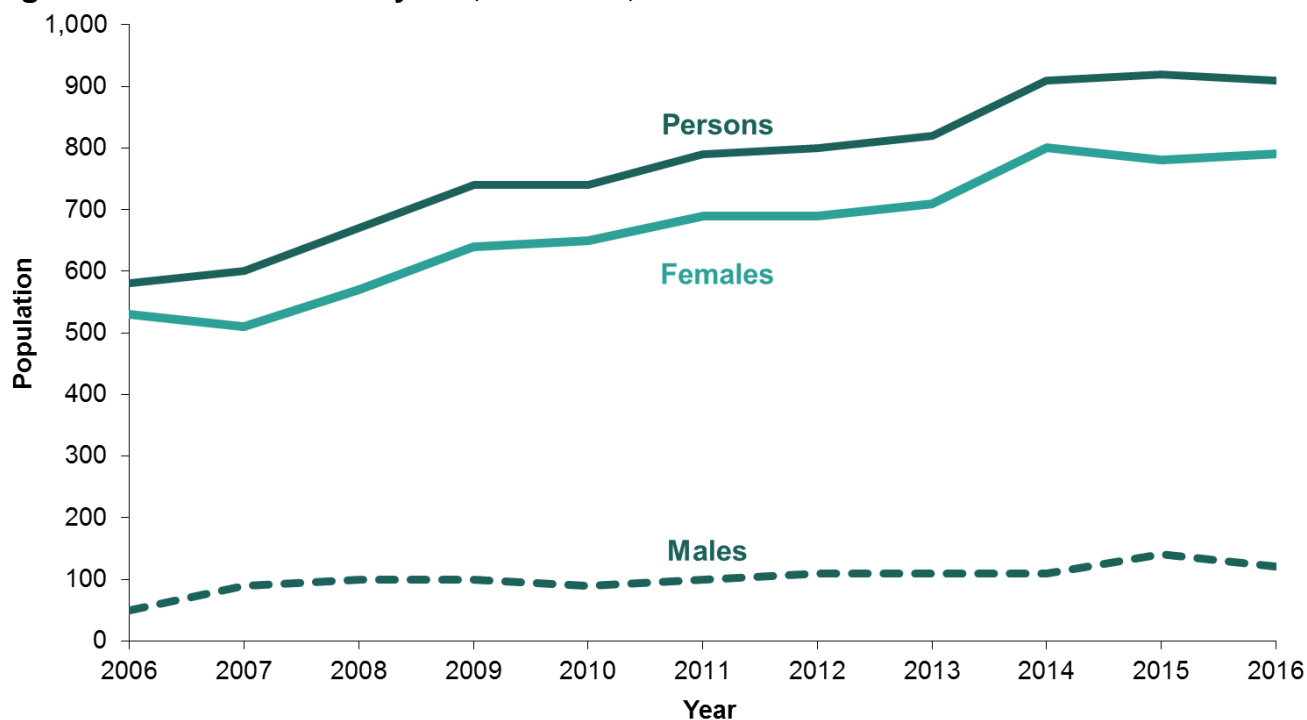


Figure 2: Centenarians by sex, Scotland, 2006 to 2016



In the period 2006 to 2016 the population aged 90 to 99 increased by 41% from 28,430 to 40,160: an 81% increase for males (from 6,570 to 11,900) and a more modest 29% increase for females (from 21,860 to 28,260).

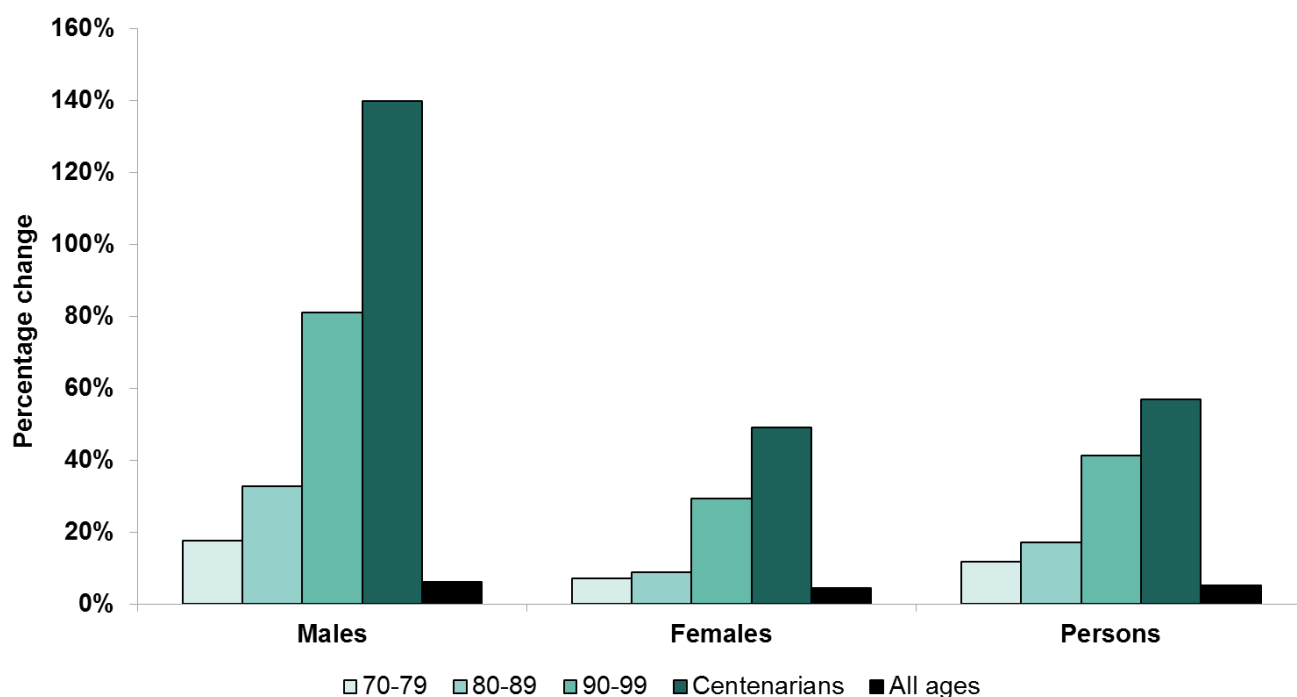
The population aged 100 and over (the centenarian population) increased by 57% (from 580 in 2006 to 910 in 2016). The male centenarian population more than doubled (from 50 in 2006 to 120 in 2016), while the female population increased by 49% (from 530 in 2006 to 790 in 2016).

However, in the most recent year between mid-2015 and mid-2016, there was a slight decline in the centenarian population from 920 in 2015 to 910 in 2016.

Figure 3 shows that between 2006 and 2016 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, 2006 to 2016



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 2016 and [Figure 4b](#) shows births from 1891 to 1926: 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 7,070 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 2016 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 2016, Scotland

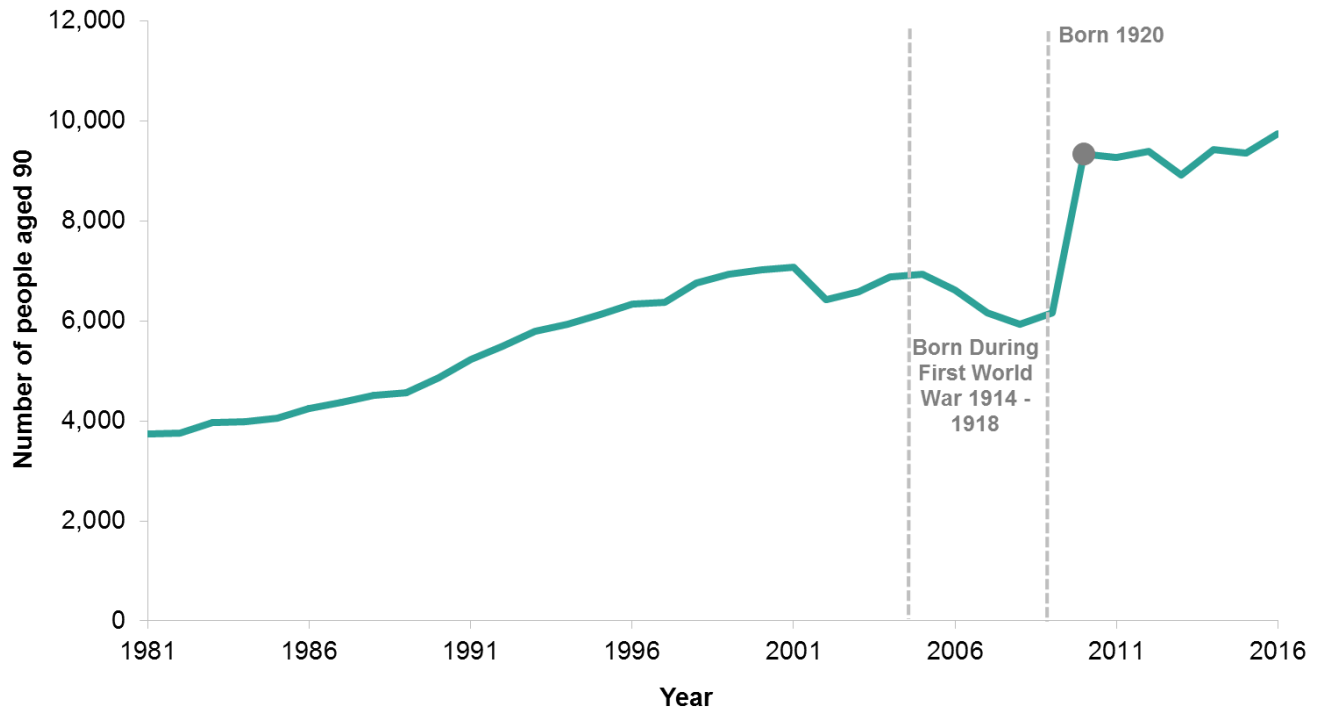


Figure 4b: Number of births from 1891 to 1926, Scotland

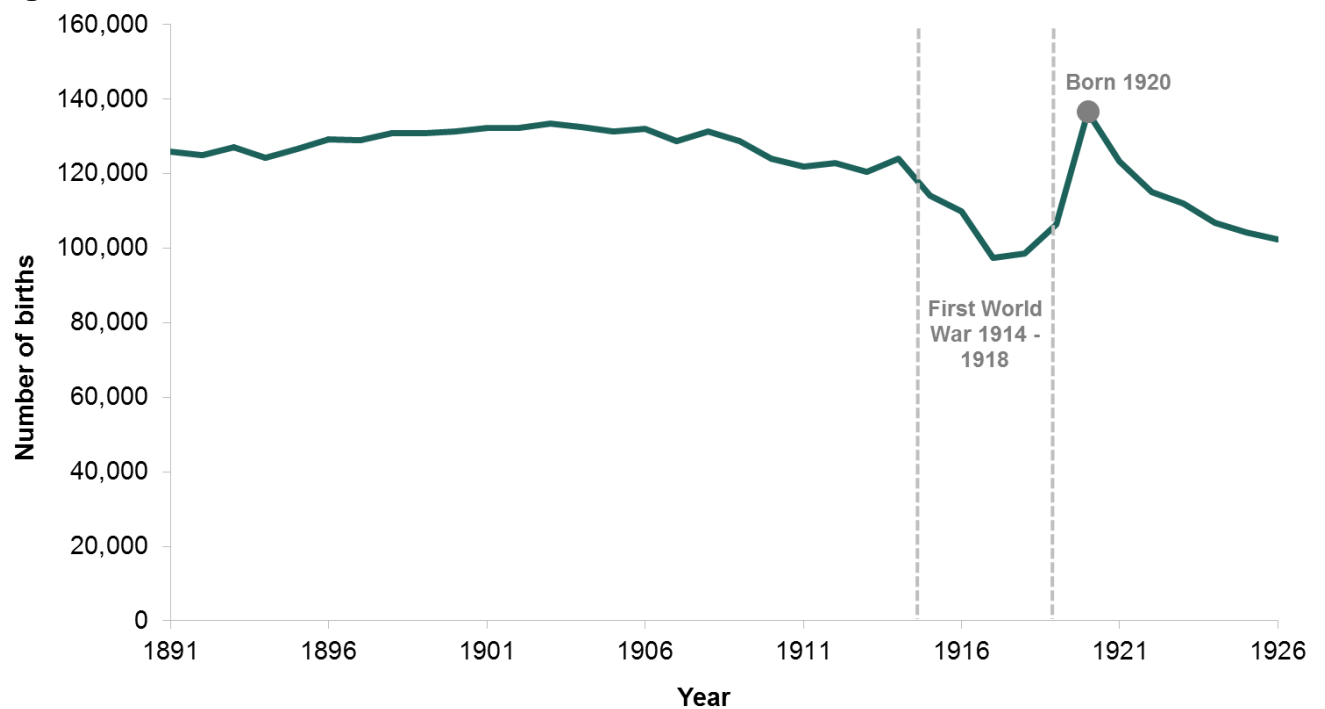


Figure 5 illustrates the age and sex structure of the population aged 90 and over. The majority of the population aged 90 and over are concentrated at the lower ages. Whilst there were over 9,500 people aged 90 in 2016, there were fewer than 1,000 people aged 98 and 99, and 910 people were aged 100 and 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 was 33% in 2016, but this declines to 13% for centenarians.

Figure 5: Number and percentages of males and females aged 90 to 99 and centenarians, Scotland, 2016

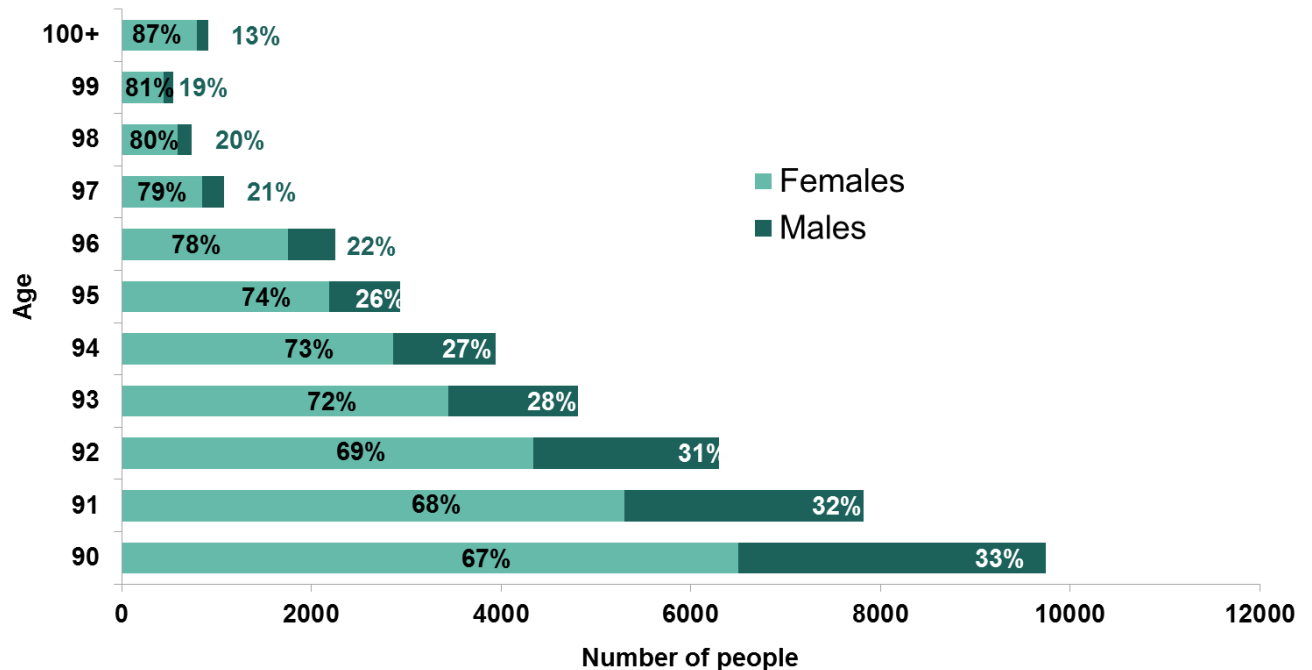
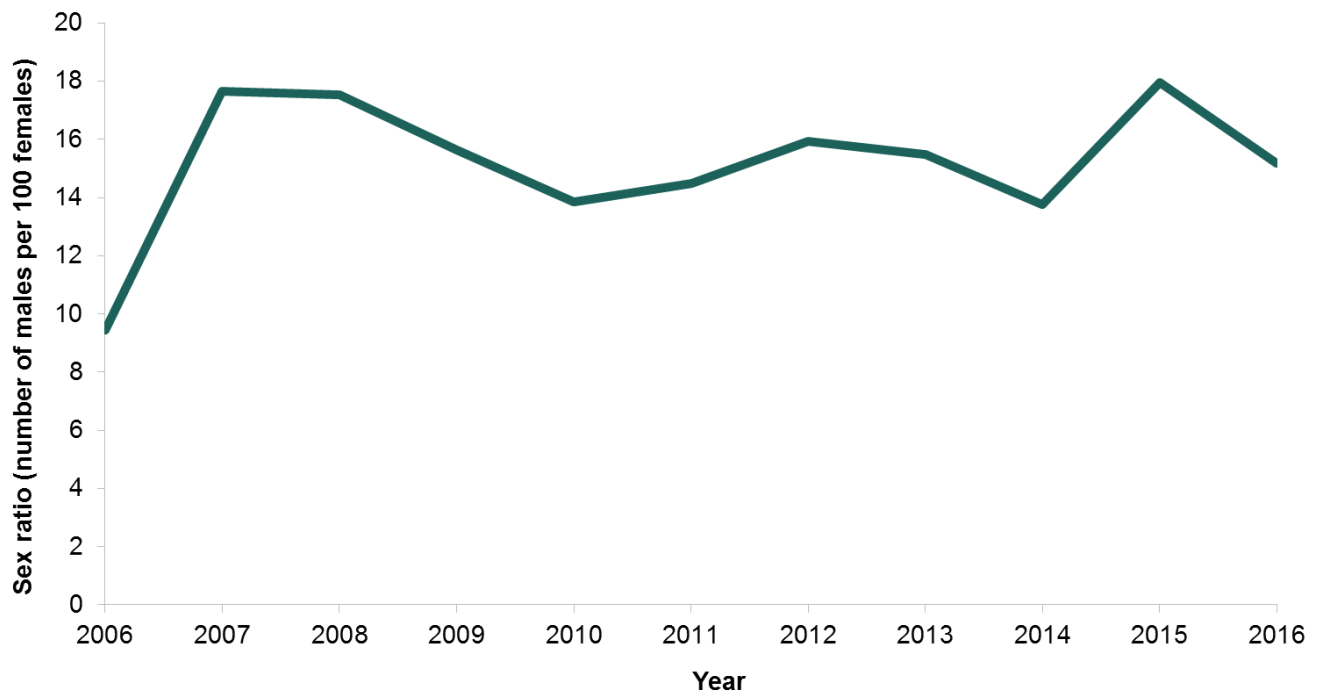


Figure 6 shows that between 2006 and 2016, the number of male centenarians per 100 female centenarians increased from 9 to 15. However, following a large increase between 2006 and 2007, the ratio of male to female centenarians has remained broadly stable over the last eight years.

The number of male centenarians is very small, numbering around 120 in 2016, while there were 790 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, 2006 to 2016



Centenarians make up a larger proportion of the population at UK level (2.27 per 10,000 population) than in Scotland (1.7 per 10,000 population). Between 2006 and 2016 the percentage increase in the number of centenarians in Scotland (57%) was slightly lower than in the UK as a whole (60%).

Although centenarians are still rare, the number of centenarians in Scotland's total population has increased from 1.1 per 10,000 in 2006 to 1.7 per 10,000 in 2016, 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 2.0 per 10,000 to 2.8 per 10,000 between 2006 and 2016.

Figure 7: Centenarians per 10,000 population by sex, Scotland 2006 to 2016

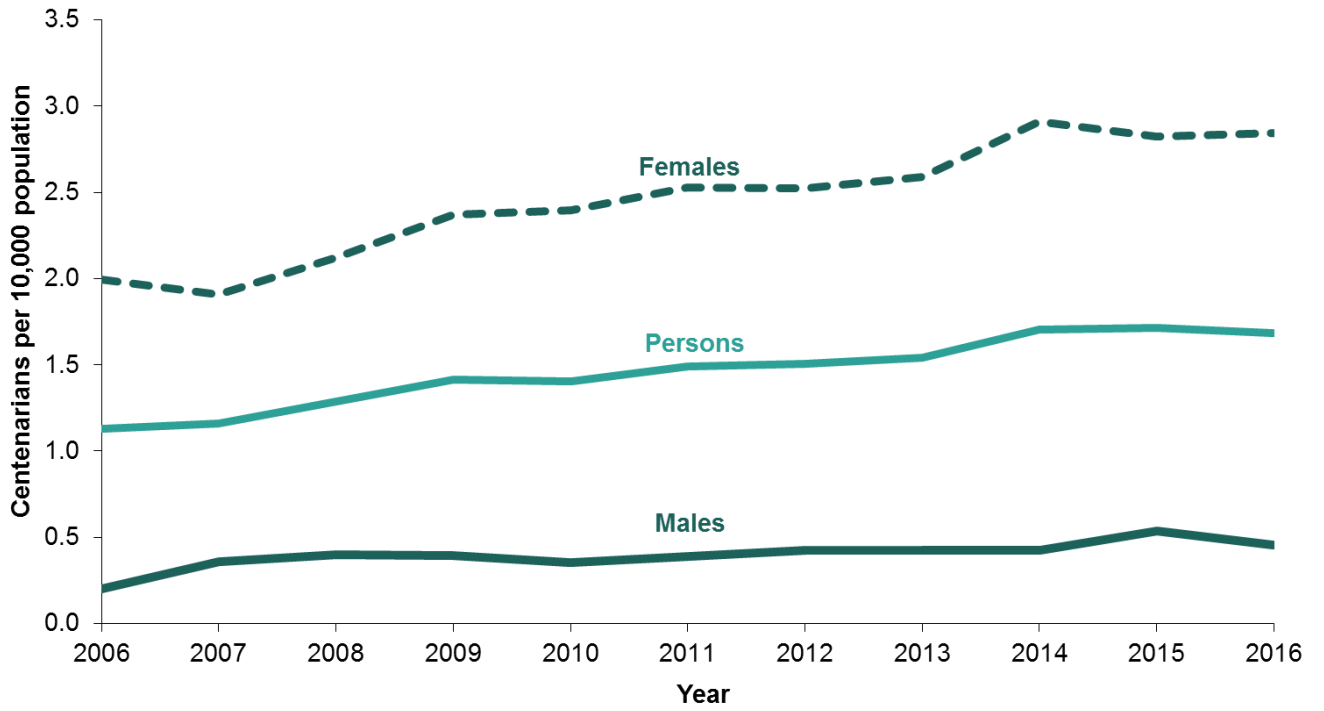


Table 1: Population estimates of centenarians (and people aged 90 and over), by sex and single year of age, Scotland mid-2006 to mid-2016

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+
2006	28,430	580	6,620	5,800	4,700	3,430	2,560	1,860	1,370	1,010	680	400	270	140	80	40	30	20
2007	28,170	600	6,170	5,520	4,700	3,770	2,640	1,910	1,360	950	700	450	250	180	80	40	20	30
2008	27,810	670	5,940	5,180	4,510	3,700	2,920	2,040	1,410	990	650	470	300	160	110	50	20	30
2009	27,930	740	6,160	4,970	4,340	3,610	2,920	2,230	1,530	1,020	700	450	310	200	110	70	20	30
2010	31,560	740	9,350	5,280	4,190	3,560	2,880	2,290	1,640	1,150	730	490	290	200	130	60	40	20
2011	34,380	790	9,280	7,990	4,380	3,410	2,770	2,260	1,740	1,210	830	510	340	170	120	70	50	40
2012	36,100	800	9,400	7,690	6,500	3,460	2,650	2,080	1,710	1,230	840	540	340	220	100	60	40	40
2013	36,870	820	8,920	7,800	6,210	5,150	2,650	1,980	1,520	1,230	840	570	350	220	120	60	40	30
2014	38,650	910	9,430	7,500	6,450	4,990	4,130	2,020	1,510	1,110	900	610	400	230	140	70	30	40
2015	38,870	920	9,360	7,720	6,030	5,030	3,830	3,070	1,470	1,040	750	570	380	240	130	80	50	40
2016	40,160	910	9,740	7,820	6,300	4,810	3,940	2,940	2,250	1,080	740	540	370	240	140	80	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+
2006	6,570	50	1,710	1,480	1,130	800	520	350	240	160	120	60	30	10	<5	<5	<5	
2007	6,610	90	1,670	1,390	1,140	850	600	370	260	150	110	70	40	30	10	<5	<5	
2008	6,620	100	1,630	1,350	1,080	850	660	440	260	180	100	70	40	30	20	10	<5	<5
2009	6,820	100	1,760	1,360	1,120	800	640	460	310	180	120	70	40	30	20	10	<5	<5
2010	7,940	90	2,620	1,470	1,110	890	630	470	330	210	120	90	40	20	20	10	<5	<5
2011	8,950	100	2,790	2,190	1,170	890	640	480	350	220	140	80	50	20	10	10	10	<5
2012	9,730	110	2,890	2,270	1,750	910	670	450	340	220	150	80	60	30	20	<5	<5	<5
2013	10,210	110	2,790	2,340	1,790	1,350	680	470	310	240	140	100	50	30	20	10	<5	<5
2014	10,880	110	3,080	2,250	1,840	1,370	1,020	480	350	210	180	100	60	30	10	10	<5	<5
2015	11,280	140	3,130	2,470	1,760	1,400	1,000	720	330	230	140	100	60	40	20	10	10	<5
2016	11,900	120	3,240	2,520	1,960	1,370	1,080	750	500	230	150	100	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+
2006	21,860	530	4,910	4,320	3,570	2,630	2,040	1,510	1,130	850	560	340	240	130	70	40	30	20
2007	21,560	510	4,500	4,130	3,560	2,920	2,040	1,540	1,100	800	590	380	210	150	70	30	20	30
2008	21,190	570	4,310	3,830	3,430	2,850	2,260	1,600	1,150	810	550	400	260	130	90	40	20	30
2009	21,110	640	4,400	3,610	3,220	2,810	2,280	1,770	1,220	840	580	380	270	170	90	60	20	30
2010	23,620	650	6,730	3,810	3,080	2,670	2,250	1,820	1,310	940	610	400	250	180	110	50	40	20
2011	25,430	690	6,490	5,800	3,210	2,520	2,130	1,780	1,390	990	690	430	290	150	110	60	40	40
2012	26,370	690	6,510	5,420	4,750	2,550	1,980	1,630	1,370	1,010	690	460	280	190	80	60	40	40
2013	26,660	710	6,130	5,460	4,420	3,800	1,970	1,510	1,210	990	700	470	300	190	100	50	40	30
2014	27,770	800	6,350	5,250	4,610	3,620	3,110	1,540	1,160	900	720	510	340	200	130	60	30	40
2015	27,590	780	6,230	5,250	4,270	3,630	2,830	2,350	1,140	810	610	470	320	200	110	70	40	40
2016	28,260	790	6,500	5,300	4,340	3,440	2,860	2,190	1,750	850	590	440	310	210	120	70	40	40

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

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- 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.

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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

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