Projected Population of Scotland (2014-based)

National population projections by sex and age, with UK comparisons

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A National Statistics publication for Scotland

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Limitations of projections

When using a projection it is important to note some key limitations.

- A projection is a calculation showing what happens under certain assumptions about future fertility, mortality and migration.

- The assumptions are based on past trends and do not take account of any future changes that may occur as a result of policy initiatives but may reflect the past impact of policy and economic changes. These projections are not, therefore, forecasts of what the government expects to happen based on policy.

Main Points

The key points in this report are as follows:

Principal projection

- The population of Scotland is projected to rise from 5.35 million in 2014 to 5.51 million in 2024, and to continue to rise to 5.7 million in 2039 – an increase of seven per cent over the 25 year period.

- Over the next decade, ten per cent of the projected increase in Scotland's population can be attributed to natural increase (more births than deaths) while 90 per cent of the increase is due to assuming continuing inward net migration to Scotland (57 per cent from international migration and 32 per cent from cross-border migration with the rest of the UK).

- Between 2014 and 2024 the number of children aged under 16 is projected to increase by two per cent from 0.91 to 0.93 million. The number of children is then projected to decrease to 0.92 million by 2039, resulting in an overall increase of only one per cent over the 25 year period from 2014 to 2039.

- The population of working age[1] is projected to increase from 3.38 million in 2014 to 3.51 million in 2021 (an increase of four per cent). It is then projected to decrease to 3.49 million by 2025, before rising to peak at 3.54 million in 2028. After this the working population is projected to decline, to 3.42 million in 2039. Overall there is a one per cent projected increase over the 25 year period.

- The number of people of pensionable age and over[1] is projected to decrease slightly from 1.06 million in 2014 to 1.01 million in 2020 (a decrease of four per cent). It is then projected to increase, experiencing a small decrease around 2027,

Footnote
1) The figures for working age and pensionable age and over take into account the changes in the State Pension Age (SPA) as set out in the 2014 Pensions Act. Between 2014 and 2018, the state pension age will rise from 62 to 65 for women. Then between 2019 and 2020, it will rise from 65 years to 66 years for both men and women. A further rise in state pension age to 67 will take place between 2026 and 2028. Between 2044 and 2046, SPA will increase from 67 to 68. The UK Government plan to review state pension age every five years in line with life expectancy and other factors.

but reaching 1.36 million by 2039 (an increase of around 28 per cent compared with 2014).

- The number of people aged 75 and over is projected to increase by around 29 per cent in the first ten years of the projection period, from 0.43 million in 2014 to 0.56 million in 2024. It is then projected to continue rising, reaching 0.8 million in 2039 – an increase of 85 per cent over the 25 year period.

- The dependency ratio[2] – the ratio of people aged under 16 and of pensionable age and over to those of working age – is projected to rise from around 58 dependants per 100 working population in 2014 to 67 per 100 in 2039. This rise is mainly due to the increase in the population of state pension age and over.

- The populations of the other countries in the UK are also projected to increase with England's population projected to increase by 17 per cent, Northern Ireland's population by ten per cent and Wales's population by six per cent between 2014 and 2039.

Variant projections

- Under the majority of the alternative scenarios illustrated by the nine available variant projections Scotland's population is projected to increase between 2014 and 2039. Only the natural change only and low population variants project a decrease in Scotland's population, by two per cent from 2014 to 2039.

- All the variant projections show Scotland's population ageing over the next 25 years with the number of people aged 75+ projected to increase by between 72 per cent and 99 per cent under these variant assumptions.

Footnote

2) Dependency ratios can be defined in different ways, but here are defined as the number of children aged under 16 and the number of people of state pension age and over per 100 people of working age. These ratios should be interpreted with care. For example, a simple interpretation is the number of older people or children who are 'dependent' on the working age population, the assumption being that most older people and children are not economically active. The reality is of course much more complex, since – to give just a few reasons – many people of typically working age are unemployed or economically inactive (e.g. at school or university), the age at which people retire varies greatly and many retired people are financially independent. However, these 'dependency' ratios provide a useful way to examine the relative age structure of the population.

1. Background

1.1 The Office for National Statistics (ONS), on behalf of the National Records of Scotland (NRS), prepares population projections for the United Kingdom and its constituent countries. This publication presents the main results of the latest, 2014-based, projection for Scotland and outlines the fertility, mortality and migration assumptions used in its preparation. Some additional tables showing more detailed figures for Scotland can be found within the Projected Population for Scotland section of the NRS website whilst full results of the (2014-based) projections can be found in the Population Projections section of the ONS website.

1.2 The results in this paper concentrate on the period up to 2039, although they occasionally refer to up to 75 years ahead and ONS makes available projections up to 2114. However, the projection this far ahead becomes increasingly uncertain.

1.3 As well as producing the main principal projection, ONS also produces variant projections using alternative plausible assumptions. The nine variants discussed here include high fertility, low fertility, high life expectancy, low life expectancy, high migration, low migration, high population, low population and zero migration (natural change only). At the time of publication (29 October 2015) ONS had published these nine variant projections on the ONS website. Additional variants will follow on 26 November 2015. More information on the variant projections is given in Section 8.

1.4 The base population used in these projections is the 2014 mid-year estimate rolled forward from the 2011 Census. The assumptions used in these projections use the revised mid-year estimates series rolled-forward from the 2001 Census. While the level of the population changed the trends did not. More information on the differences between the 2011 Census and the mid-year estimates for 2001 are explained in the 2011 Census reconciliation report on the NRS website. More information on the assumptions used in the projections is available in the Annexes at the end of this publication (Annex A, Annex B and Annex C).

1.5 In October 2015, small errors in the mid-year population estimates for areas in Scotland were found. Whilst these errors do not affect the total population of Scotland, or other parts of the UK, they do have a small effect on the age and sex distribution of the population. The impact of these errors is much smaller than the uncertainty around the estimates due to sampling error from the 2011 Census. We will publish corrected mid-year population estimates for 2012, 2013 and 2014 in April 2016. The 2014-based National Population Projections are based on the original release of Scotland's mid-year population estimate in April 2015 and thus do not reflect the correction to the 2014 mid-year population estimate for Scotland used as the base population for the projection. The errors will also have a small effect on the projected age distribution of cross-border migration flows from Scotland to England and Wales. These effects are very small compared to other sources of uncertainty in the projections. More information on these errors can be found in the Population section of the NRS website.

1.6 Population projections were assessed by the UK Statistics Authority in May 2011, along with other population statistics for Scotland and again in July 2015. These statistics have been designated as National Statistics, provided they meet the requirements set out in the latest assessment report published in 2015[3].

Footnote

3) UK Statistics Authority (2011). Assessment Report 113: Statistics on Population and Demography in Scotland. PDF document which can be found on the UK Statistics Authority website.

UK Statistics Authority (2015). Assessment Report 311: Population estimates and projections for Scotland (National Records of Scotland). PDF document which can be found on the UK Statistics Authority website.

2. Uses and limitations of projections

2.1. It is increasingly important to have high quality population statistics and also projections of the population, for policy development and for planning and providing public services in different geographic areas.

2.2. The primary purpose of the national population projections is to provide an estimate of the future population of Scotland as a common framework for use in national planning in a number of different fields such as education and health. Projections are used for teacher workforce models, and looking at the implications of an ageing population. They are also used for making national and international comparisons, benchmarking other projections, and as a control for smaller area projections.

2.3. Population projections have limitations. A projection is a calculation showing what happens if particular assumptions are made. The population projections are trend-based. They are, therefore, not policy-based forecasts of what the government expects to happen. Many social and economic factors influence population change, including policies adopted by both central and local government. The relationships between the various factors are complex and largely unknown. While future policy changes are not taken into account projections will reflect the impact of past policy and economic changes

2.4. The effect of the assumptions about future migration, fertility and mortality is often limited by the inertia in population change; the future population of an area is strongly influenced by the initial base population. As the process of change is cumulative, the reliability of projections decreases over time. Change affects some populations more rapidly and more seriously than others. Projections of the number of adults are usually more reliable than those for children because of difficulties in projecting levels of fertility and parental migration. The size of the migration flows, and the uncertainty of future trends, mean that for many areas the migration assumptions are more critical than the fertility and mortality assumptions.

2.5. Population projections, like some other types of projections, may indicate that existing trends and policies are likely to lead to outcomes which are judged undesirable. If new policies are then introduced, they may result in the original projections not being realised. However, this means the projections will have fulfilled one of their prime functions, to show the consequences of present demographic trends with sufficient notice for any necessary action to be taken.

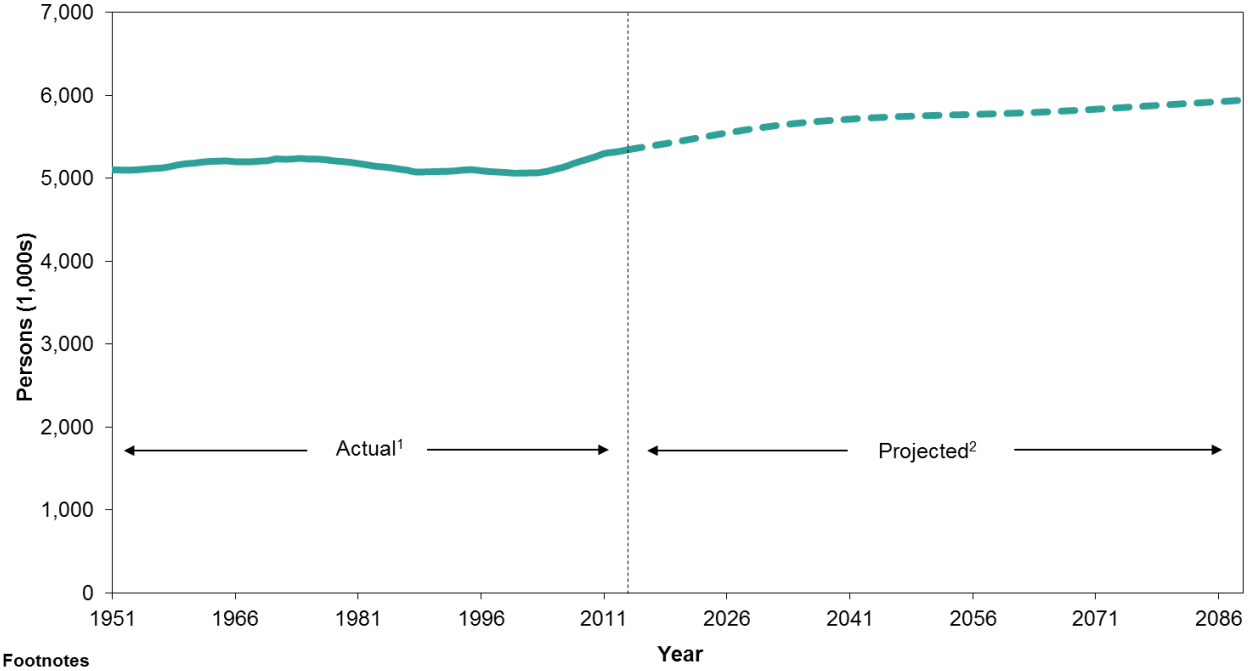
2.6. It should be noted that as these population projections are trend based, they are less reliable in periods of rapid change. For example, the change in volume of migrants from the EU A8 accession countries to Scotland was not picked up by earlier projections.

2.7. The Scottish Government has set a target to match average European (EU15) population growth over the period from 2007 to 2017. More details can be found within the Scotland Performs section of their website.

3. Summary of results

3.1. The results of this new set of projections, summarised in Table 1 and illustrated in Figure 1, show the total population of Scotland increasing from 5.35 million in 2014. After this, the population is projected to reach 5.51 million in 2024 (an increase of about 167,000 or three per cent compared with 2014) and then 5.7 million by 2039 (a seven per cent increase on the 2014 level). Looking further ahead, the population is projected to continue to rise, reaching around 5.9 million by 2089.

Figure 1: Estimated population of Scotland, actual[1] and projected[2], 1951-2089



Footnotes
1) Mid-year population estimates
2) 2014 based projection

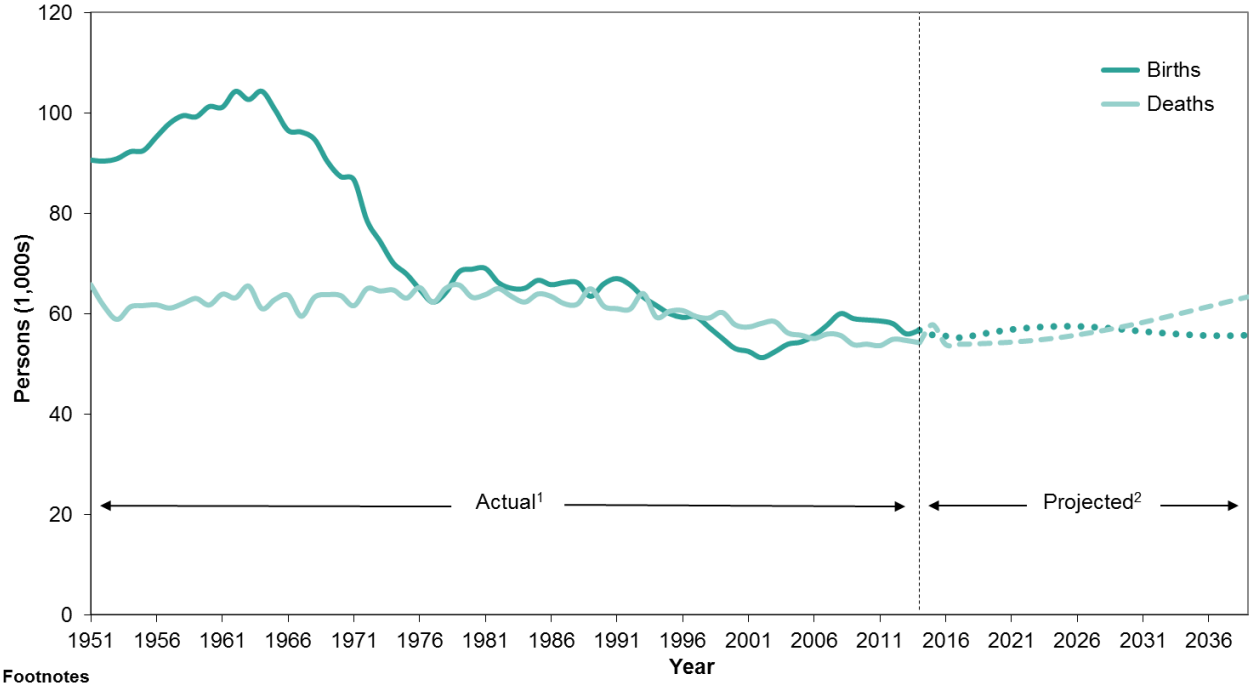
3.2. Table 2 provides information on the projected components of change between 2014 and 2039. The table shows that from 2015 to 2028 natural change and migration both act to increase the size of the population as the number of births exceeds the number of deaths and there are more people coming to Scotland than leaving. After that point, the number of deaths exceeds the number of births whilst net in-migration continues.

3.3. Over the next decade, ten per cent of the projected increase in Scotland's population can be attributed to natural increase (more births than deaths) while 90 per cent of the increase is due to assuming continuing inward net migration to Scotland (57 per cent from international migration and 32 per cent from cross-border migration with the rest of the UK).

3.4. As Figure 2 shows, the number of births in Scotland fell significantly between the early 1960s and 2002. Between 2002 and 2008, the number of births increased steadily but then decreased (by around 4,000 births) to 56,000 in 2013. Since 2011 the general trend has been a decrease in natural change (births minus deaths), as the numbers of births has decreased and the number of deaths has increased. The projections suggest a slight increase in the number of births until a peak in 2025 of around 57,500. Thereafter births generally decline but only to about 55,700, remaining above the historically low number of births observed in

2002 (51,300). Meanwhile, the number of deaths is projected to initially increase but then fall to around 53,900 per year until 2017, before increasing back to the levels experienced in the 1990s by 2035 and to continue to increase to 2039. The result is a change from natural increase (more births than deaths) to natural decrease (more deaths than births) from 2029 onwards.

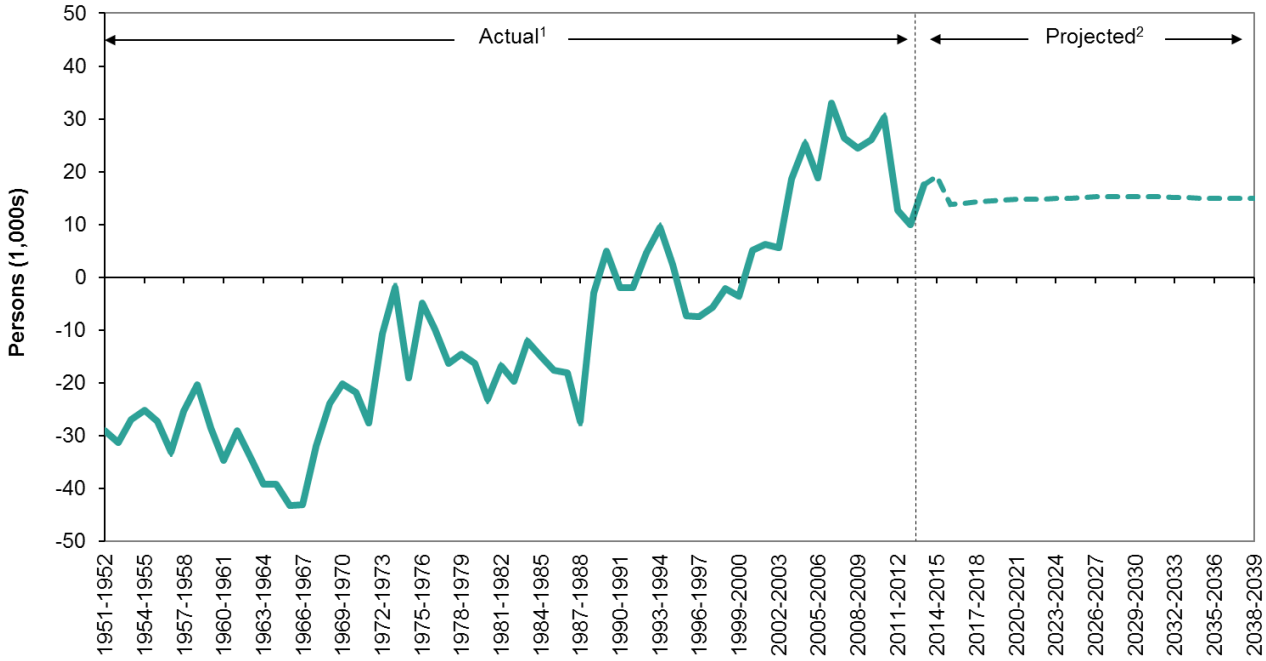
Figure 2: Births and deaths, actual[1] and projected[2], Scotland, 1951-2039



Footnotes
1) Calendar year.
2) 2014-based mid-year projections.

3.5. As Figure 3 shows, Scotland has historically been a country of net out-migration with more people leaving the country than coming in. However, since 2000-2001 Scotland has experienced net in-migration, and therefore these projections have assumed that Scotland will continue to experience a net inflow. The size of this net inflow is assumed to rise steadily to 15,000 by 2024-2025, and to stay around this level for the remainder of the projection period, peaking at 15,300 in the late 2020s and returning to 15,000 by the mid-2030s.

Figure 3: Estimated[1] and projected[2] net migration, Scotland, 1952-2039

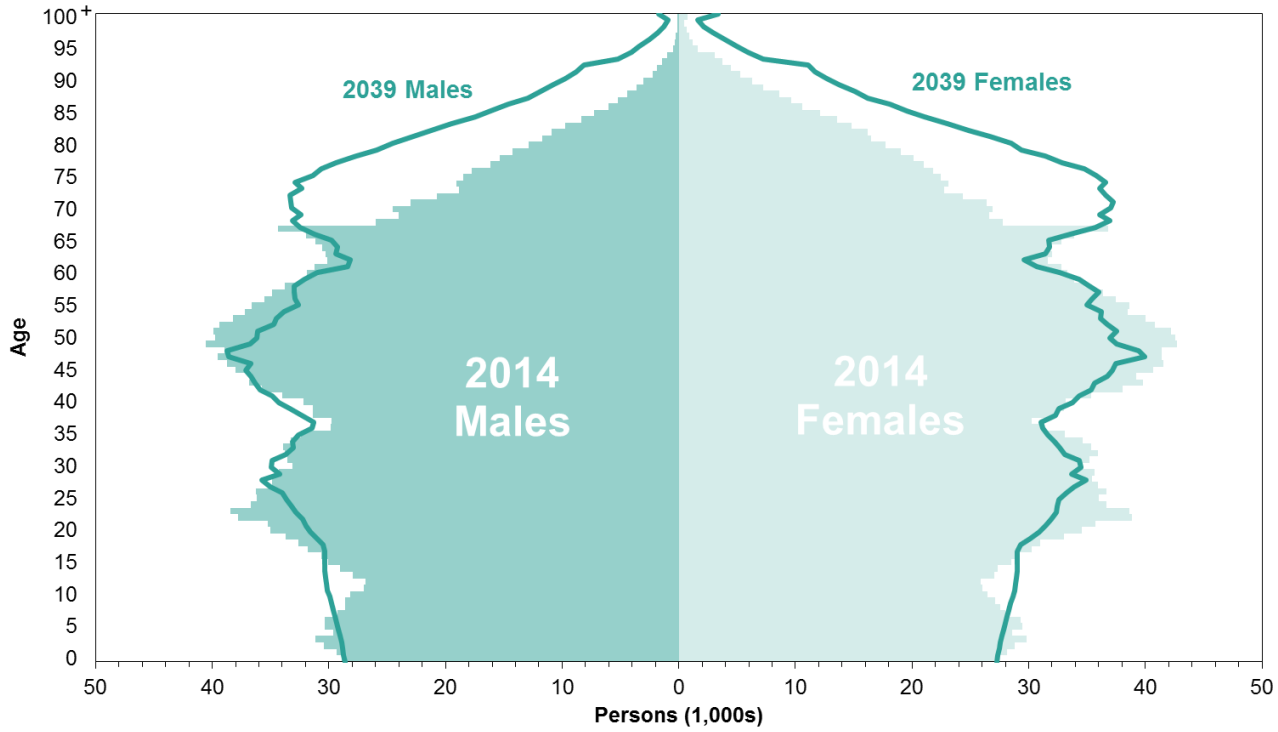


Footnotes
1) Mid-year to mid-year net migration estimates
2) 2014-based projections.

3.6. More detailed information on the fertility, mortality and migration assumptions leading to these results is given in Section 4 and Annex A, Annex B and Annex C.

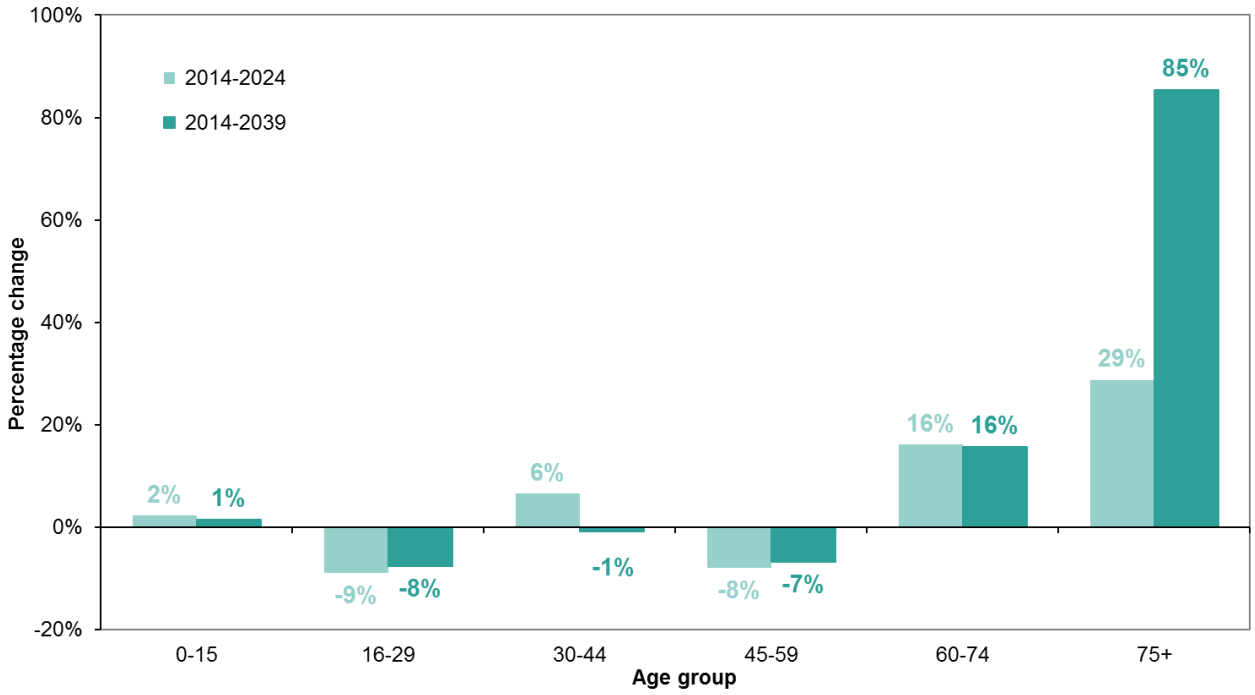
3.7. A population pyramid is a good way of illustrating the age and sex structure of the population. Figure 4 represents the population of Scotland as estimated in mid-2014 and projected for mid-2039 and shows that Scotland's population is projected to age. Each bar in the pyramid represents a single year of age and the length of the bar relates to the number of people of that age in the population. The size and composition of the population is determined by the pattern of births, deaths and migration which have taken place in previous years. The solid bars represent the estimated population for mid-2014 and the lines represent the projected population in mid-2039.

Figure 4: Estimated and projected age structure of Scotland's population, mid-2014 and mid-2039



3.8. A summary of projected populations in broad age groups is given in Table 3, and projected populations by sex and five year age groups are given in Table 6. These tables and Figure 5 show that the age structure of the population is projected to become noticeably weighted towards older ages between 2014 and 2039.

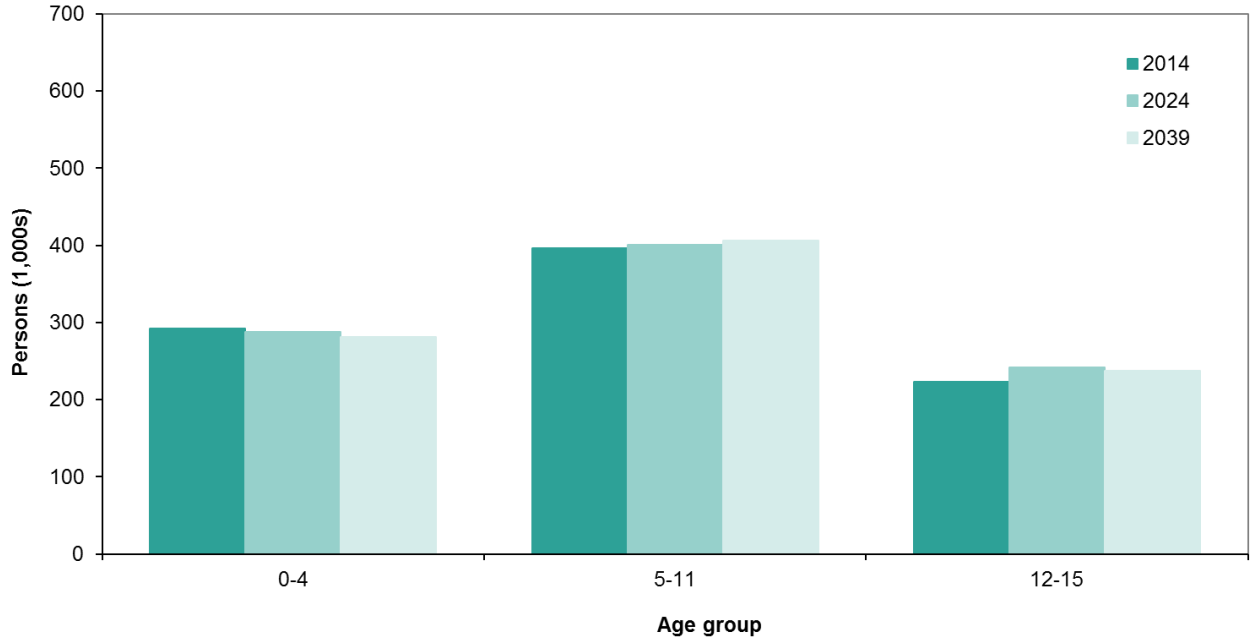
Figure 5: The projected percentage change in Scotland's population by age group, 2014-2039



3.9. Scotland's population is projected to increase by seven per cent between 2014 and 2039, however this increase is not spread evenly across all age groups of the population. As Figure 5 shows, the population aged 45-59 is projected to decrease by eight per cent by 2024 and seven per cent in total by 2039 and the population aged 16-29 is projected to decrease by nine per cent by 2024 and by eight per cent over the 25 year period. The number of older people is projected to increase significantly, especially in the 75+ age group.

3.10. Between 2014 and 2024 the number of children aged under 16 is projected to increase by two per cent from 0.91 to 0.93 million. The number of children is then projected to decrease to 0.92 million by 2039, resulting in an overall increase of only one per cent over the 25 year period from 2014 to 2039. Figure 6 shows that most of this increase is due to children in the 12-15 age group who are projected to increase from 222,700 in 2014 to 237,100 in 2039 (an increase of six per cent).

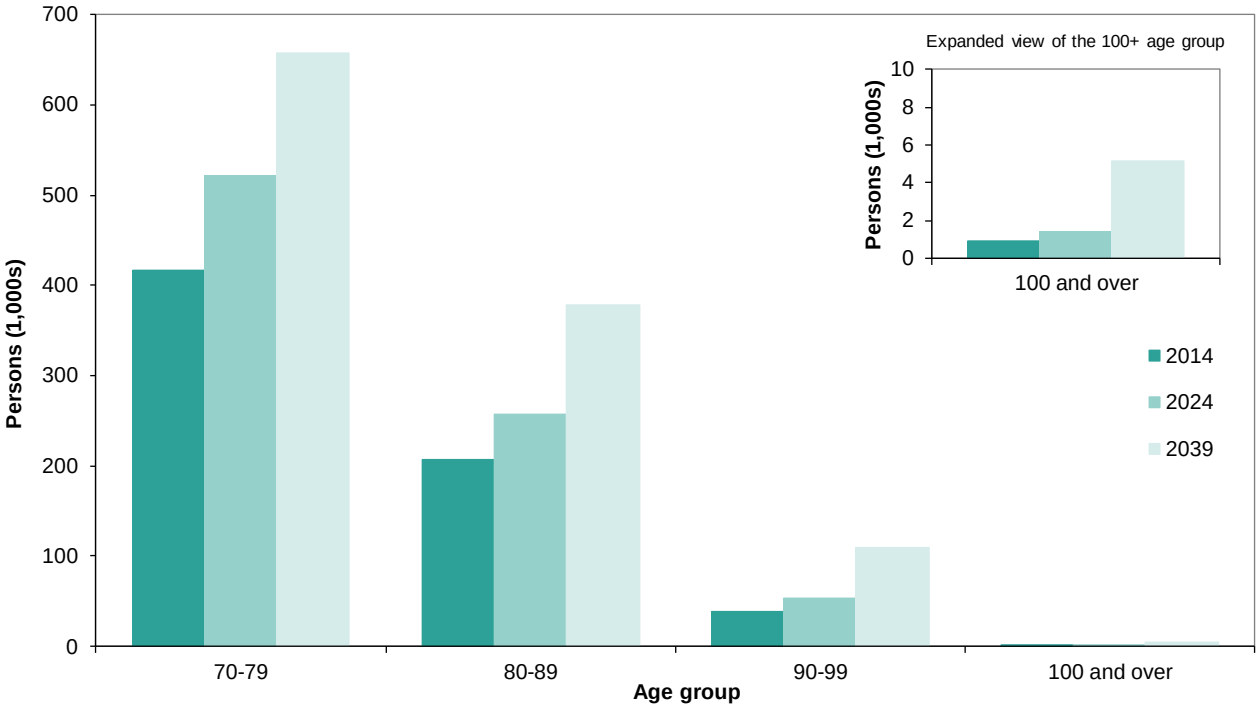
Figure 6: Estimated and projected numbers of children aged 0 to 15, Scotland, mid-2014, mid-2024 and mid-2039



3.11. The number of people aged 75 and over is projected to increase by around 29 per cent from 0.43 million in 2014 to 0.56 million in 2024. It is then projected to continue rising, reaching 0.8 million in 2039 – an increase of 85 per cent over the 25 year period. This is because mortality rates are projected to improve, increasing the population at older ages.

3.12. Figure 7 shows that Scotland's population aged 70 and over is projected to rise considerably over the next 25 years. The number of people aged 90 and above is projected to nearly triple by 2039 (an increase of about 190 per cent) including a projected increase in the number of centenarians (those aged 100 or more) from around 900 to 5,200 by 2039. Large increases are also projected in the 70-79 and 80-89 age groups, where increases of 58 per cent and 83 per cent are projected by 2039 respectively.

Figure 7: Estimated and projected population aged 70 and over, Scotland, mid-2014, mid-2024 and mid-2039



3.13. The figures for working age and pensionable age and over take into account the changes in the State Pension Age (SPA) as set out in the 2014 Pensions Act. Between 2014 and 2018, the state pension age will rise from 62 to 65 for women. Then between 2019 and 2020, it will rise from 65 years to 66 years for both men and women. A further rise in state pension age to 67 will take place between 2026 and 2028. Between 2044 and 2046, SPA will increase from 67 to 68. The UK Government plan to review state pension age every five years in line with life expectancy and other factors. Further information regarding these changes can be found on the gov.uk website in the new State Pension section and in the State Pension age timetables (PDF document).

3.14. The population of working age is projected to increase from 3.38 million in 2014 to 3.51 million in 2021 (an increase of four per cent). It is then projected to decrease to 3.49 by 2025, before rising to peak at 3.54 million in 2028. After this the working population is projected to decline, to 3.42 million in 2039. Overall there is a one per cent projected increase over the 25 year period.

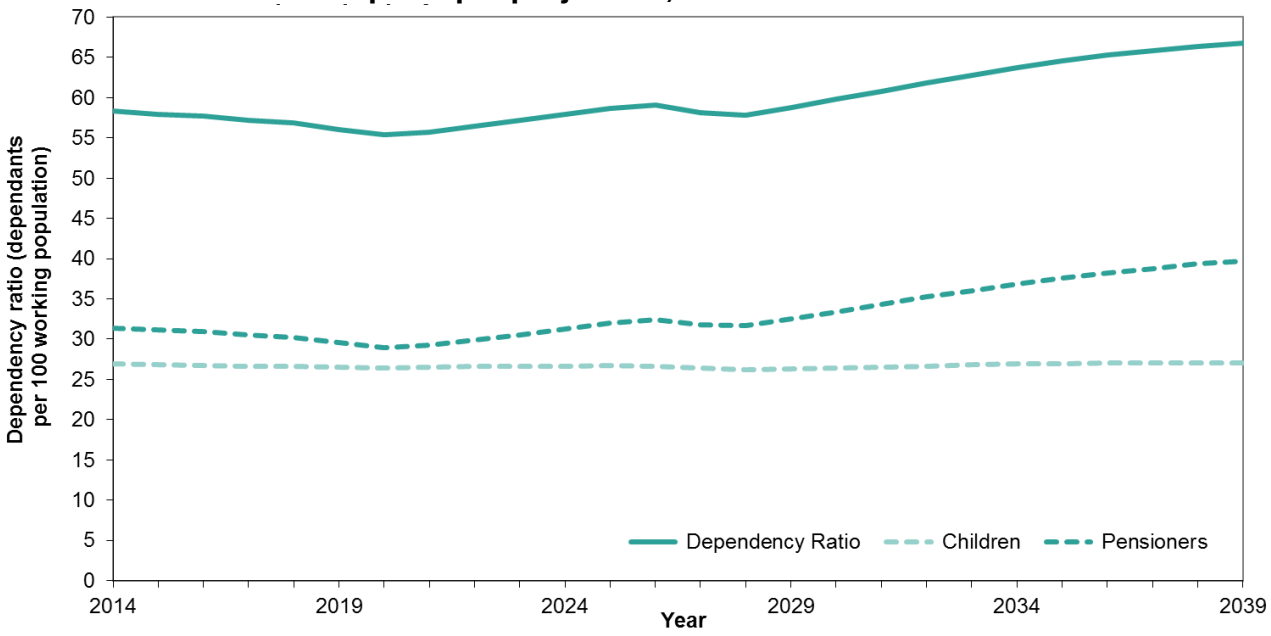
3.15. The number of people of pensionable age and over is projected to decrease slightly from 1.06 million in 2014 to 1.01 million in 2020 (a decrease of four per cent). It is then projected to increase, experiencing a small decrease around 2027, but reaching 1.36 million by 2039 (an increase of around 28 per cent compared with 2014). There are some noticeable changes in the projected population for this age group over the 25 year period but these are mostly due to the changes in state pension age.

3.16. The population of working age and pensionable age and over for selected years in the period 2014 to 2039 can be found in Table 3.

3.17. A useful summary measure of the age structure of a population is the dependency ratio which is shown in Figure 8. Dependency ratios can be defined in different ways, but here are defined as the number of children aged under 16 and the

number of people of state pension age and over per 100 people of working age. These ratios should be interpreted with care. For example, a simple interpretation is the number of older people or children who are 'dependent' on the working age population, the assumption being that most older people and children are not economically active. The reality is of course much more complex, since – to give just a few reasons – many people of typically working age are unemployed or economically inactive (e.g. at school or university), the age at which people retire varies greatly and many retired people are financially independent. However, these 'dependency' ratios provide a useful way to examine the relative age structure of the population.

Figure 8: Dependency ratio[1,2] (dependants per 100 working age population) under the 2014-based principal projection, 2014-2039



Footnotes
1) Dependency ratios can be defined in different ways, but here are defined as the number of children aged under 16 and the number of people of state pension age and over per 100 people of working age. These ratios should be interpreted with care.
2) Continuous line shows dependency ratio and the dashed lines show the number of children and pensioners per 100 working age population.

3.18. Table 4 and Figure 8 show that the dependency ratio is projected to decrease to around 55 per 100 by 2020. Between 2020 and 2026 the dependency ratio is projected to increase to 59 per 100 working age population. After a small decrease it then starts rising steadily, reaching 67 per 100 by 2039.

3.19. In 2014, the 58 dependants per 100 working age population were made up relatively evenly of children (27 per 100) and pensioners (31 per 100). By 2039 the number of pensioners per 100 population of working age is projected to increase to 40, while the ratio of children remains the same. Therefore, the increase in the dependency ratio can be mainly attributed to the increase in people of state pension age and over per 100 working age population over the 25 year period.

4. The base population and assumptions used in the projections

4.1. **The base population:** The projection is based on the National Records of Scotland's population estimates for mid-2014. The population covered includes all persons usually resident in Scotland, whatever their nationality. Members of HM forces and non-UK armed forces stationed in Scotland are included; HM forces stationed outside Scotland are excluded. Students are treated as being resident at their term-time address.

4.2. The assumptions about future patterns in fertility, mortality and migration are based on analysis of past trends. The final decisions on assumptions take into account the views of a range of groups who are consulted including a UK expert advisory panel and key users in Scotland. These consultations discussed the likely impact of, for example, increasing child obesity and the demographic effects of the economic downturn.

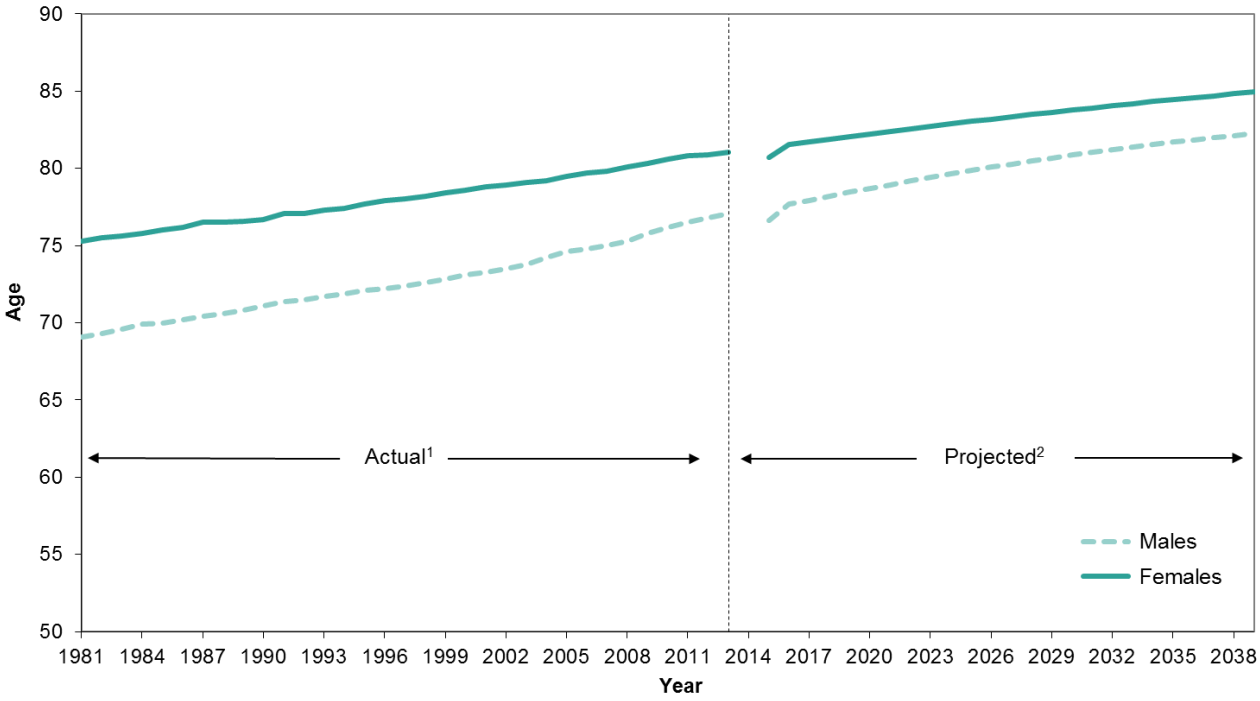
4.3. **Fertility:** The fertility rates used in the projection are based on assumptions about the average completed family size of successive cohorts of women. It has been assumed that the average completed family size will continue to decline from around 1.78 children per woman for those born in 1968 and reaching the end of their childbearing lives, before levelling off at 1.7 for those born in the 2000s and later. The number of births is expected to decrease initially from its 2013-2014 level of around 56,700 to around 55,300 in 2016-2017 and then to increase to a peak of around 57,500 in 2024-2025 before falling to around 55,700 by 2038-2039. More details on the fertility assumptions are available in Annex A.

4.4. **Mortality:** Future improvements in mortality rates are based on the trend observed in the period 1961 to 2013. It is assumed that the reduction in mortality rates will tend towards a common reduction at each age of 1.2 per cent per year by 2039 for most ages and then continue to improve at this constant rate thereafter. Based on these rates, expectations of life at birth are projected to increase from 76.6 in 2014 to 82.4 in 2039 for males; and from 80.7 in 2014 to 85.1 in 2039 for females as shown in Figure 9. More details on the mortality assumptions are available in Annex B.

4.5. Figure 9 shows the estimates and projections for expectation of life at birth for males and females in Scotland. Figures to 2013 are based on three years of data, for example the 2013 figure uses data for 2012-2014. The projected figures from 2014 onwards are based on mid-year data.

4.6. The projected expectation of life (Eol) figure for 2014 has been controlled to the latest provisional deaths figures for the period in the projection. This explains the small dip in Eol at the start of the projection period (mid-2014 figure).

Figure 9: Expectation of life at birth actual[1] and projected[2], Scotland, 1981-2039



Footnotes
1) Figures to 2013 are based on three years of data. For example 2013 figure uses data for 2012-2014.
2) 2014-based mid-year projections. Projected data starts at mid-2015.

4.7. **Migration:** In the first year of the projection a higher net inflow is assumed, reflecting recent migration trends as described in Section 3.5. From 2025 onwards, it is assumed that there will be a net inflow of between 15,000 and 15,300 people per year to the end of the projection period, (that is the total number of people entering Scotland as migrants is assumed to be 15,000-15,300 greater than the number leaving Scotland). This assumption has been derived from analyses of trends in civilian migration to and from the United Kingdom as well as cross-border migration between the four constituent countries. Since the last round of projections, improvements have been made to the methods used to produce the migration assumptions. In particular, projected cross-border migration between Scotland and the rest of the UK is now calculated using rates applied to the population of the year in question, and now varies from year to year throughout the projection period. In previous sets of projections a long-term constant net migration assumption was used. More information on the review and the methods used can be found in the Population projections section of the ONS website. More details on the migration assumptions can be found in Annex C.

4.8. Projected natural change and assumed net migration are not independent of each other. The projected numbers of future births and deaths are themselves partly dependent on the assumed level of net migration.

4.9. Past international migration also has an indirect impact on the population through its effect on the numbers of births and deaths - for example, women who were born overseas but who give birth after migrating to the UK will increase the numbers of births, while the number of births will be decreased by women born in the UK but migrating overseas before giving birth. Assumptions of future fertility and mortality are based on past trends of all residents irrespective of where they were born.

4.10. Because migration is concentrated at young adult ages, the assumed level of future net migration has a much greater effect on the projected number of women of childbearing age, and hence the projected number of births, than on projected number of deaths over the 25 year period of the projection.

4.11. A natural decrease (more deaths than births) of 23,000 is projected between mid-2014 and mid-2039, and a natural decrease of nearly 134,000 would occur if net migration were zero (at each and every age) throughout the projection period. Thus the contribution indirectly attributable to future migration, through its effect on births and deaths, is 111,000.

4.12. Care should be taken in interpreting these figures as 'the indirect impact of migration'. A fuller assessment of this would consider:

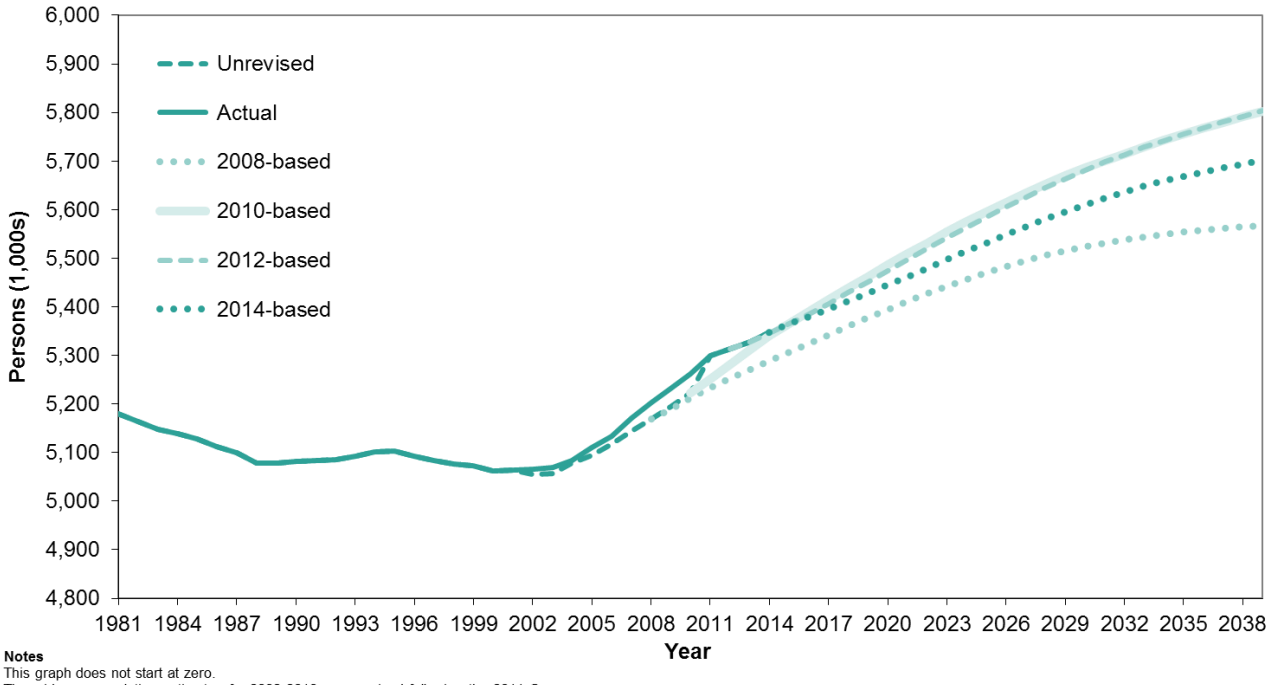
- births to, and deaths of, people who had migrated to the UK before 2014,
- how to account for births to, and deaths of, UK-born people who had emigrated and subsequently returned to the UK,
- how to account for births to, and deaths of, UK-born people who had parents (or grandparents etc.) who were themselves immigrants, and the corresponding figures for foreign-born people descended from UK emigrants.

5. Comparison with previous projections

5.1. The last set of projections, published in November 2013, were based on the mid-year population estimates for 2012. Previous projections were based on the mid-2010 population estimates, and the mid-2008 population estimates. The key changes from previously published projections in terms of births, deaths and total population are shown in Table 5a, Table 5b and Table 5c respectively. Section 5.5 looks at the differences in the migration assumptions between the projections.

5.2. Figure 10 compares the 2014-based projection with previous projections. These latest projections, based on the population estimate for mid-2014, vary from our last projections (based on 2012 data) and generally project a lower population by 2039. There have been some underlying demographic changes to note in the intervening two years. The birth rate has fallen slightly and there has been a decrease in net migration from the peak in 2011. Looking further ahead, the population is projected to rise continually until 2114 in line with the 2012 and 2010 based projections, whereas the 2008-based and 2006-based projections all showed the population declining at some stage during the projection period.

Figure 10: Actual and projected total population compared with previous projections, 1981-2039

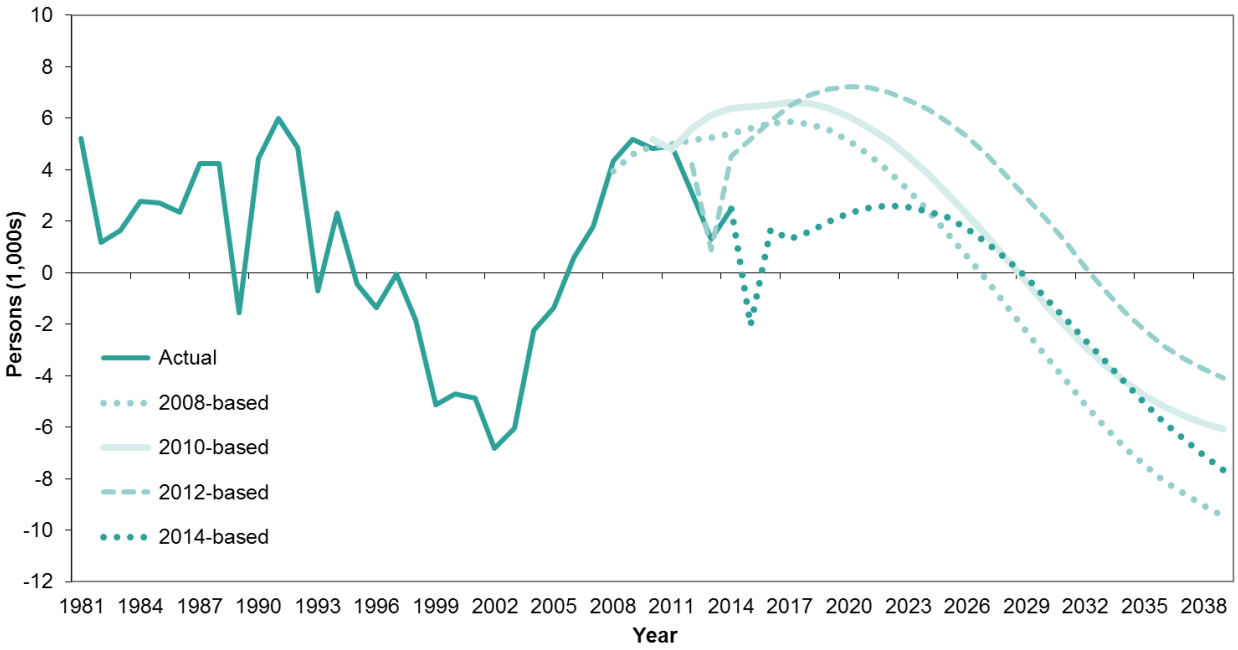


Notes
This graph does not start at zero.
The mid-year population estimates for 2002-2010 were revised following the 2011 Census.
The 2008 and 2010-based population projections were based on unrevised population estimates and vary from the revised population estimates in this period.

5.3. Figure 11 compares the natural change (the difference between the number of births and deaths) underlying the 2014-based projection with that underlying previous projections. Looking at the first 25 years of the projection period and comparing with the 2012-based projections, the number of births is projected to be lower (by an average of around 2,900 per year) and the number of deaths also slightly higher (by an average of around 800 per year). As a result there is a lower natural increase for the 2014-based projections. More information on the reasons for the differences is given in Section 4 and in Annex A, Annex B and Annex C.

5.4. The births and deaths for the first year of the projection period (2014) are based on trends in the years leading up to the base year (2014). These are then controlled to the latest available mid-year data. In this projection there is a noticeable increase in the number of deaths for 2015 due to controlling the figures to the provisional 2015 figures available at the time the projection was run.

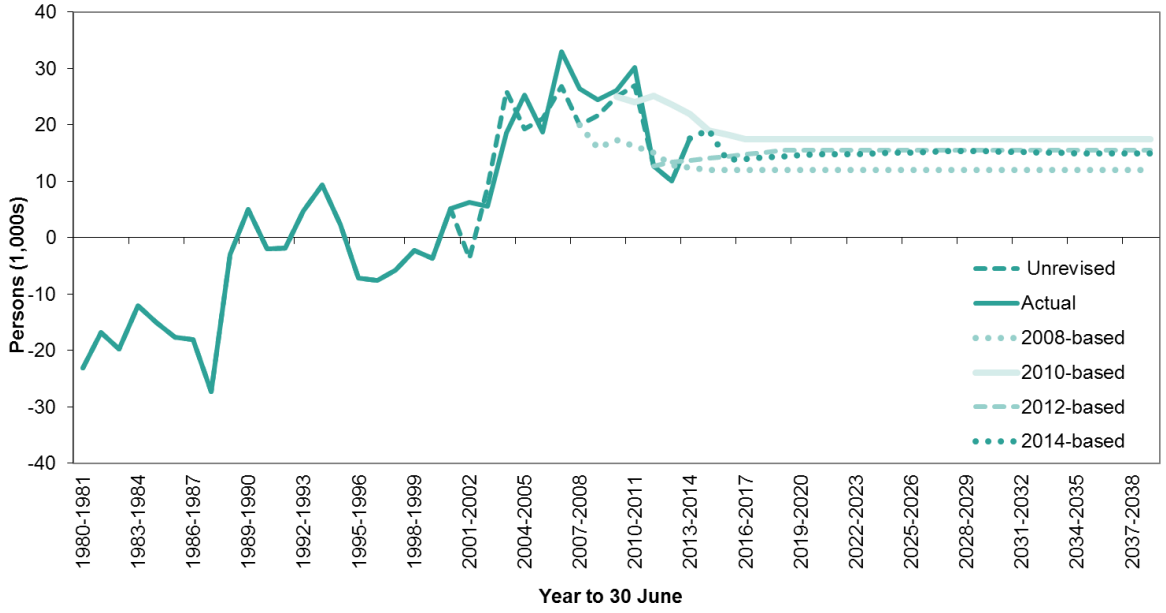
Figure 11: Actual and projected natural change (births minus deaths) compared with previous projections, 1981-2039



Notes
The mid-year population estimates for 2002-2010 were revised following the 2011 Census.
The 2008 and 2010-based population projections were based on unrevised population estimates and vary from the revised population estimates in this period.

5.5. New methods have been used to model migration trends in setting the migration assumptions for the 2014 based projections, more information can be found in the Population projections section of the ONS website. As Figure 12 demonstrates, the result is that long-term migration assumptions have been decreased from the +17,500 in the 2010-based projection and decreased further than the +15,500 in the 2012-based projections to fluctuate around +15,000 to +15,300 after 2025 for the 2014-based projections. This change reflects the most recent trends in international migration and in cross-border migration to Scotland. The migration variants in Section 8 show what would happen to the population under various different levels of migration.

Figure 12: Actual and projected net migration compared with previous projections, 1981-2039



Notes
The mid-year population estimates for 2002-2010 were revised following the 2011 Census.
The 2008 and 2010-based population projections were based on unrevised population estimates and vary from the revised population estimates in this period.

5.6. Table A and Table B below summarise the differences between the 2014-based and the 2012-based projections. The difference in results for the projected age structure of Scotland is fairly small. There is a slightly lower percentage of children in the 2039 population and a slightly higher percentage of pensionable age and over (both differences of one percentage point). The projection for the population of working age is the same in both cases. As a result the projected number of dependants per 100 of working age in 2039 is the same as the 2012-based projection, but a slightly larger proportion of dependants are projected to be of pensionable age and over.

Table A: Projected age structure of Scotland's population (percentage of total population)

Age Group	2012-based		2014-based	
	2014	2039	2014	2039
Children	17%	17%	17%	16%
Pension age	20%	23%	20%	24%
Working age	63%	60%	63%	60%

Table B: Projected number of dependants per 100 population of working age, Scotland

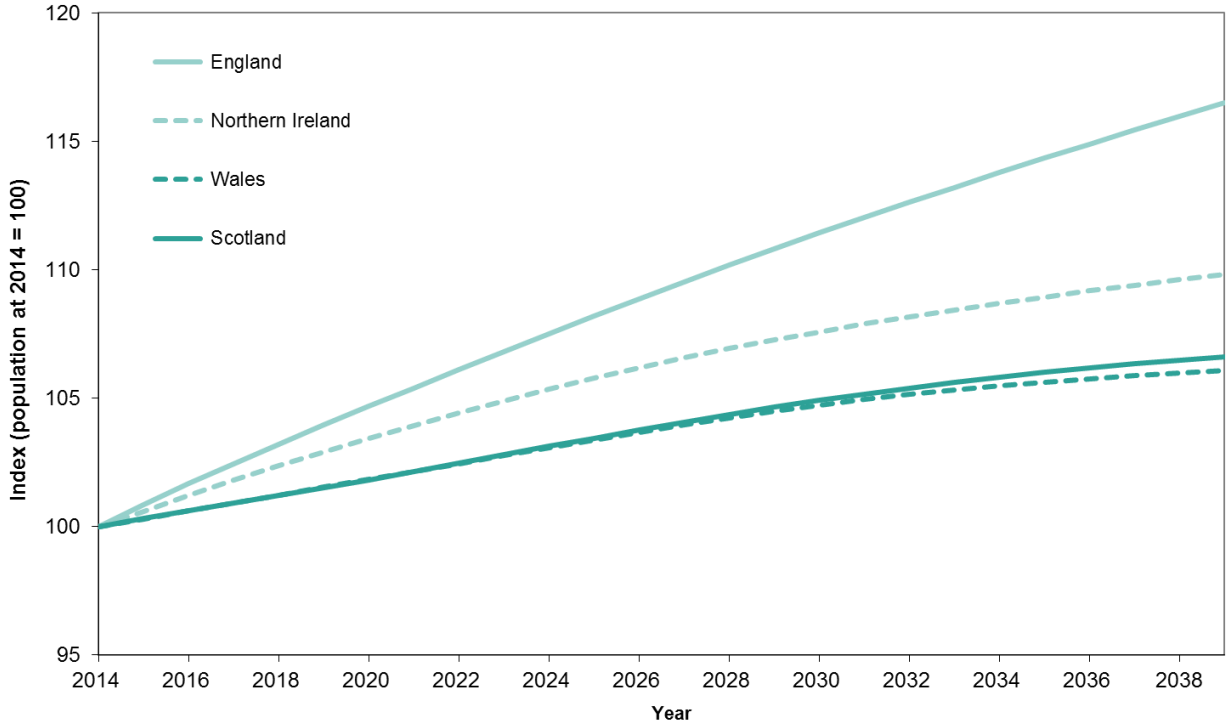
Age Group	2012-based		2014-based	
	2014	2039	2014	2039
Children	27	28	27	27
Pensioners	31	39	31	40
All dependents	58	67	58	67

6. Scotland's position within the United Kingdom

6.1. The United Kingdom population is projected to increase from an estimated 64.6 million in 2014, rising above 70 million in 2027 and reaching 74.3 million by 2039. Over the 25 year period this equates to a 15 per cent increase, an equivalent percentage increase to the 2012-based projection.

6.2. Figure 13 illustrates the projected change in the populations of the four countries of the United Kingdom from 2014 to 2039. It shows that the populations of England and Northern Ireland are projected to grow more quickly than those of Scotland and Wales, but that the population of Wales is projected to grow at a slightly slower rate than Scotland's population. By 2039 England's population is projected to be 17 per cent higher than in 2014, Northern Ireland's is projected to be ten per cent higher and Wales's six per cent higher. During the same period Scotland's population is projected to grow by seven per cent.

Figure 13: Comparison of population change for UK countries, 2014-2039

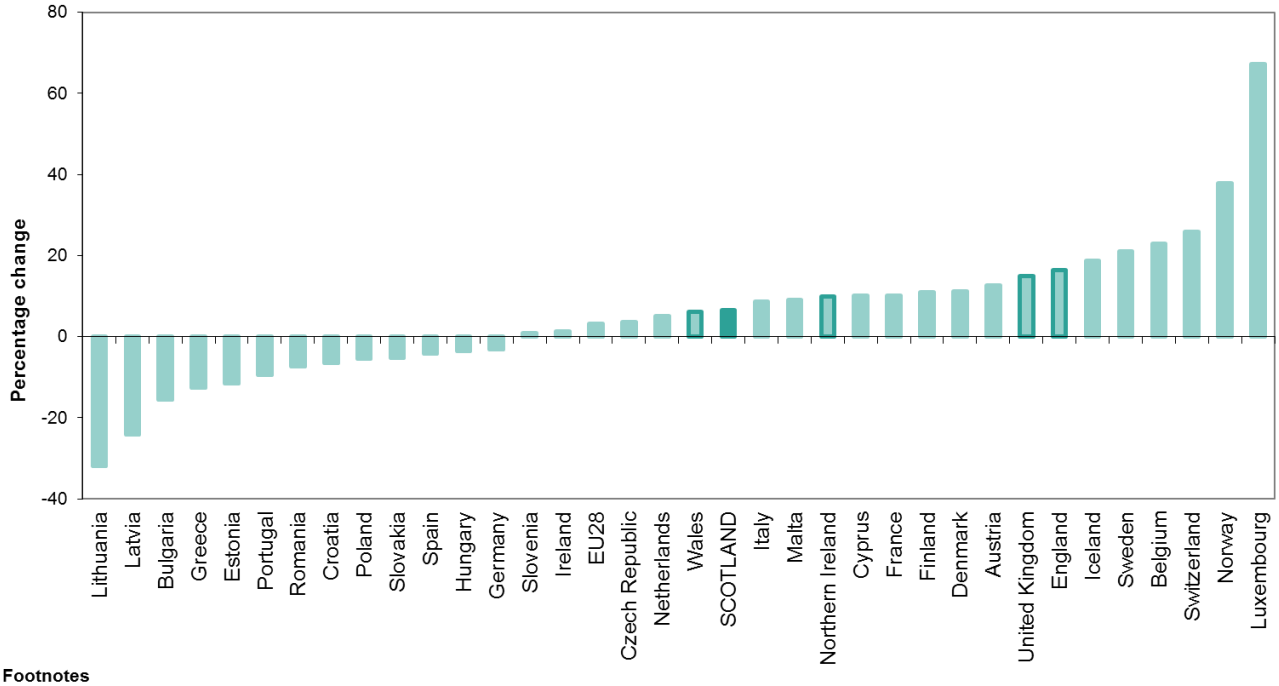


7. Scotland's position within Europe

7.1. There has not been a new set of projections published by Eurostat[4] from European countries since the 2013-based projections. Therefore it is not possible to find an appropriate comparable European Union (EU) projection for the 2014-based population projections. However, comparing the 2014-based projection with Eurostat's 2013-based convergence scenario projection[4] may still be informative.

7.2. Figure 14 compares the projected change in Scotland's population between 2014 and 2039 with that for other countries in Europe. For UK and its constituent countries these have been calculated using the 2014-based principal projection. For the other countries the figures are taken from Eurostat's 2013-based convergence scenario projection, which was the last set of projections produced at the European level. Countries such as Greece, Portugal, Spain, Germany and most of the more recent accession states in Eastern Europe are projected to experience a decline in population. The populations of Slovenia, Ireland, Czech Republic, Netherlands and Wales are all projected to increase but by less than in Scotland. The population of the remaining 11 EU member states, including the UK, are projected to increase by more than Scotland.

Figure 14: Projected percentage population change in selected European countries[1, 2], 2014-2039



Footnotes
1) The Eurostat projections of population in European countries (2013-based) are not directly comparable to the Office for National Statistics (ONS) projections of population in the countries of the UK (2014-based). The Eurostat projections are based on estimates of the population at 1 January while the ONS projections are based on estimates of the population at 30 June. The methodologies in determining the underlying fertility, mortality and migration assumptions also differ.
2) More information on the Eurostat projections can be found on the Eurostat website.

Footnote
4) More information on the Eurostat projections can be found on the Eurostat website.

8. Long term and variant projections

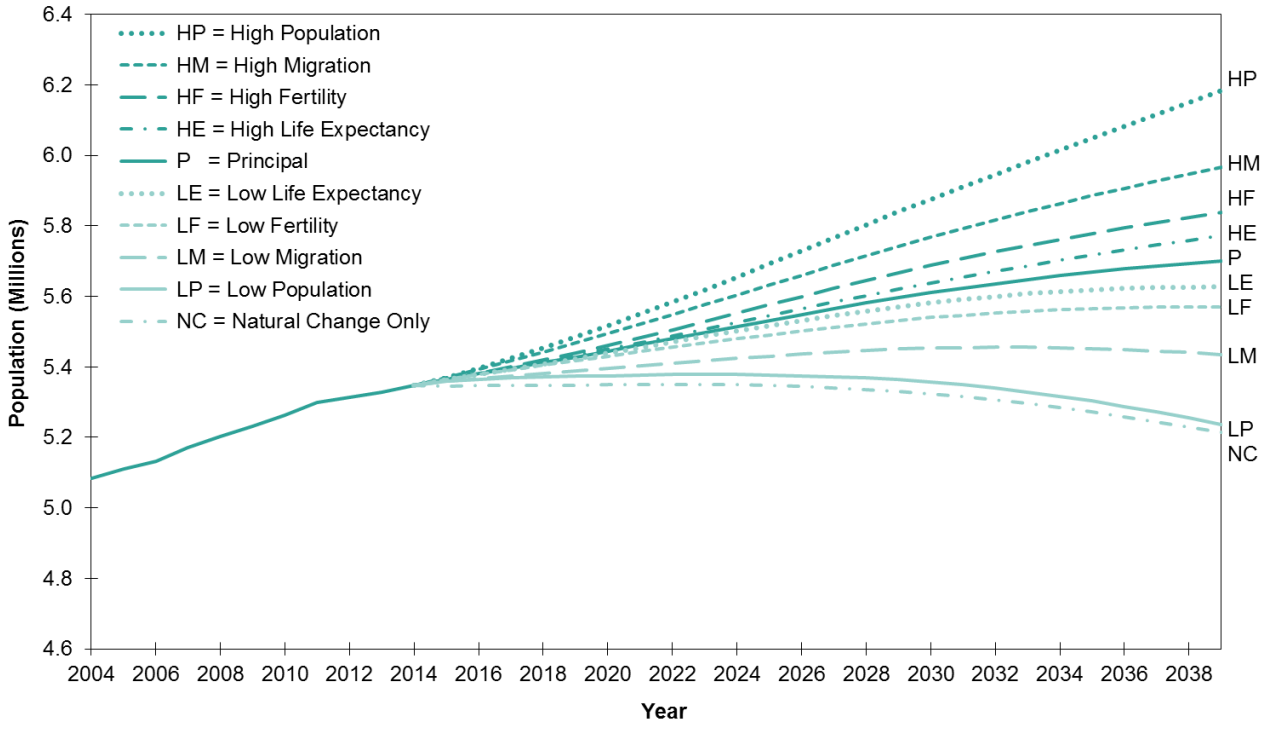
8.1. The Office for National Statistics (ONS) produces projections for Scotland for up to 100 years ahead. Projection results for the next 100 years for the principal projection are available from the Population projection section of the ONS website. The reliability of projections decreases as you go further into the future. Therefore projections far into the future should be treated with caution.

8.2. This report concentrates on the principal projection but ONS also produces a number of variant projections. These variant projections are based on alternative assumptions of future fertility, mortality and migration. The variants are produced to give users an indication of the inherent uncertainty of demographic behaviour, especially for the long-term projections. The purpose is to illustrate plausible alternative scenarios and not to represent upper or lower limits for future demographic behaviour. These projections are simply scenarios (the certain outcome of a given set of assumptions), rather than forecasts of the most likely course of future events.

8.3. The scenarios in this publication, in addition to the principal projection, are six standard high/low variants associated with the three components of fertility, life expectancy and migration, a special case zero migration variant (with natural change only), and the combination variants which produce the high and low population. These final two variants are produced by combining the high (or low) variant assumptions for fertility, life expectancy and migration. Annex D gives more information about these variants, and the remaining variants which will be released in November.

8.4. Figure 15 and Table 7 show Scotland's population under each of the alternative variant projections.

Figure 15: Actual and projected total population of Scotland, under the 2014-based principal and selected variant projections, 2004-2039



8.5. The high fertility variant results in a 2039 population that is 0.14 million higher than the principal projection. This is due to the extra births associated with the higher fertility assumption. In contrast, the low fertility variant results in the population in 2039 being 0.13 million lower than the principal projection.

8.6. The high and low life expectancy variants project the population to be 0.07 million higher or lower than the principal projection respectively, due to the changes in the number of projected deaths.

8.7. In Figure 15 it can be seen that the single component variants which lead to the highest and lowest projected population for 2039 are the migration variants. Table 8 focuses on the migration variants, and shows the projected components of population change in the period to 2039 for the principal projection, the high and low migration variants and the zero migration variant. This shows the effect of different migration assumptions on the size of the future population. Under each of these projections the fertility and mortality assumptions are the same but the number of births and deaths change. This highlights the fact that the numbers of births and deaths are partly dependent on the assumed level of net migration. For the high migration variant the increase in the population over the 25 year period due to natural change is 0.03 million whereas with the principal projection natural change results in a decrease of 0.02 million.

8.8. The principal projection shows Scotland's population increasing by 0.35 million (seven per cent) between 2014 and 2039. By comparison, the zero migration projection variant indicates a 0.13 million (two per cent) decrease and the high migration variant projects a 0.62 million (12 per cent) increase. The total effect of migration in the principal projection summed over the first 25 years is to add 0.38 million people to Scotland's population by 2039 and, under the high migration variant, to add 0.59 million – and this does not take into consideration the increase in natural change as the result of increased migration. It is clear that the projected increase in Scotland's population between 2014 and 2039 under the principal projection is dependent on continuing migration into Scotland.

8.9. As Figure 16 shows, under all of the variant projections, and the principal projection, Scotland's age structure is projected to change dramatically between 2014 and 2039. In each case, the number of people aged 60 and over is projected to increase significantly (particularly the number of persons aged 75+). In most cases, the numbers in each of the age categories below 60 are projected to decrease except for the number of children aged 0-15 which are projected to increase under the principal and five other variants by 2039 and persons in the 16-29 age group in the high population, and the 16-29 and 30-34 age groups in the high migration variant. The ageing of the population is further demonstrated by Figure 17 which shows that the average (median) age of Scotland's population increases steadily across the projection period under all of the available variant projections.

Figure 16: Percentage change in age structure under the 2014-based principal and selected variant projections, 2014-2039

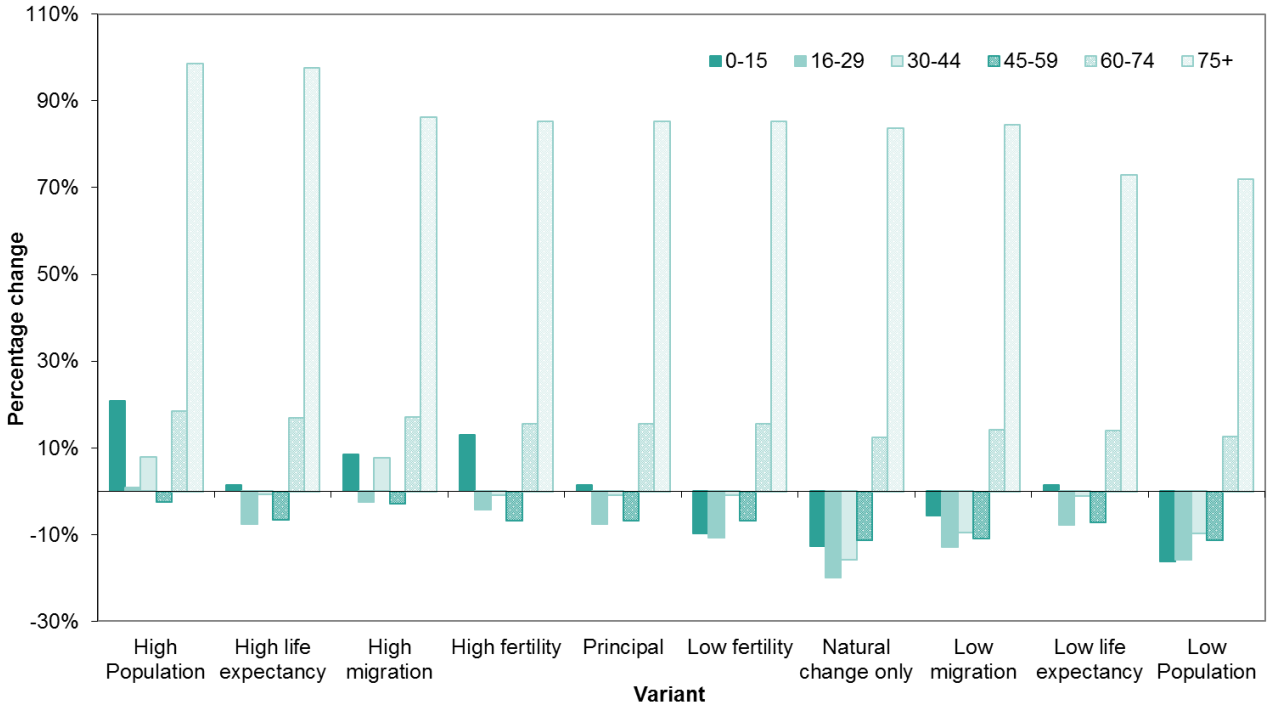
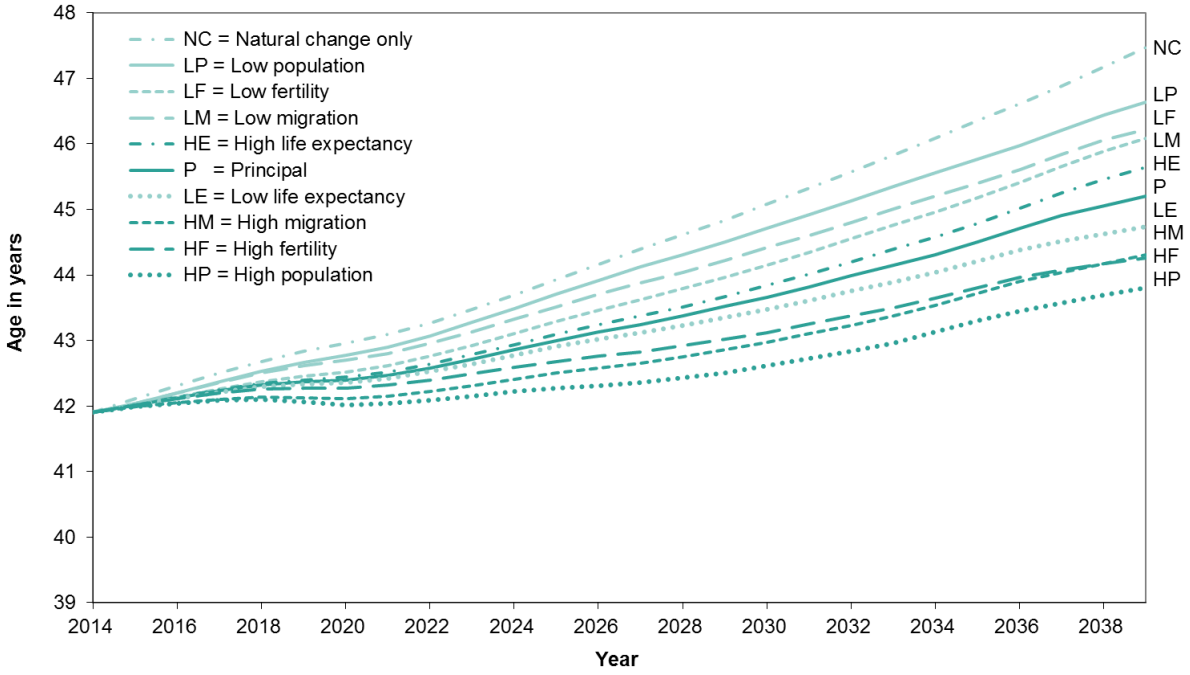


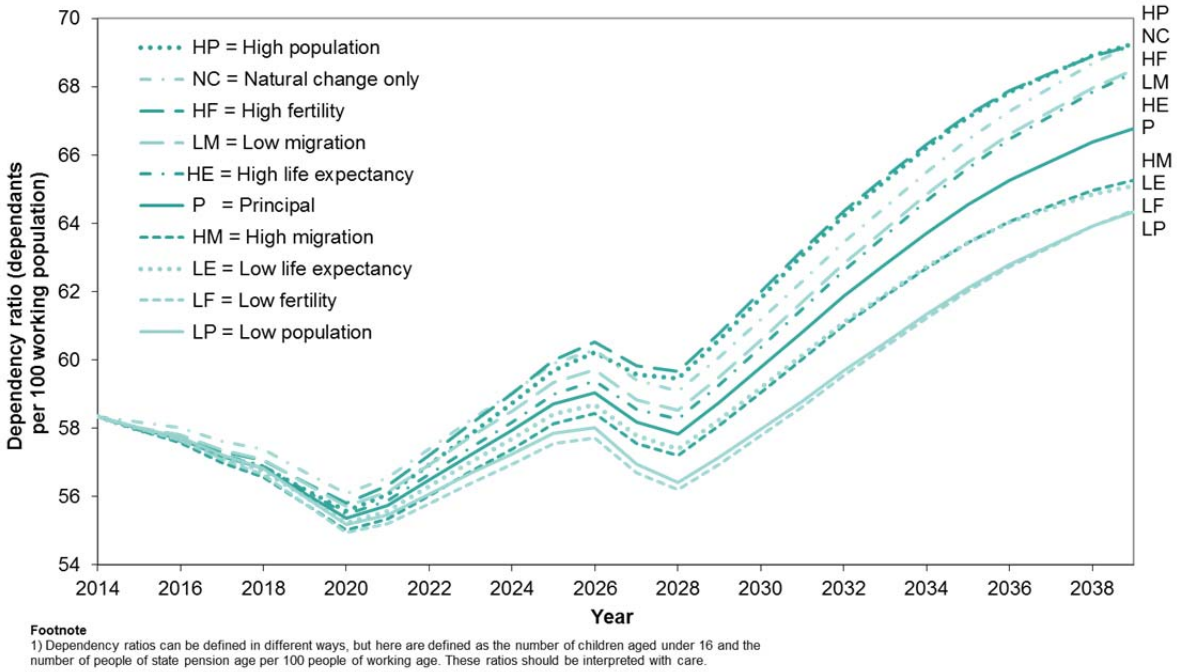
Figure 17: Average (median) age of Scotland's population under the 2014-based principal and selected variant projections, 2014-2039



8.10. Figure 18 shows that the dependency ratio (number of dependants per 100 people of working age population) will decrease under all available variant projections until around 2020 when it will begin to rise due to the increase in the state pension age to 66 for both men and women. The dependency ratio is then projected to increase year on year until 2026, when the pension age will rise to 67. Amongst the available variants, the biggest projected increase in the dependency ratio from 2014 to 2039 will occur under the high population, natural change only and the high fertility variant. In all three scenarios the dependency ratio is projected to increase from 58 to 69 per 100 working population over the 25

year period. The smallest increase over the period occurs under the low population variant as it increases to 64 per 100 working age population by 2039.

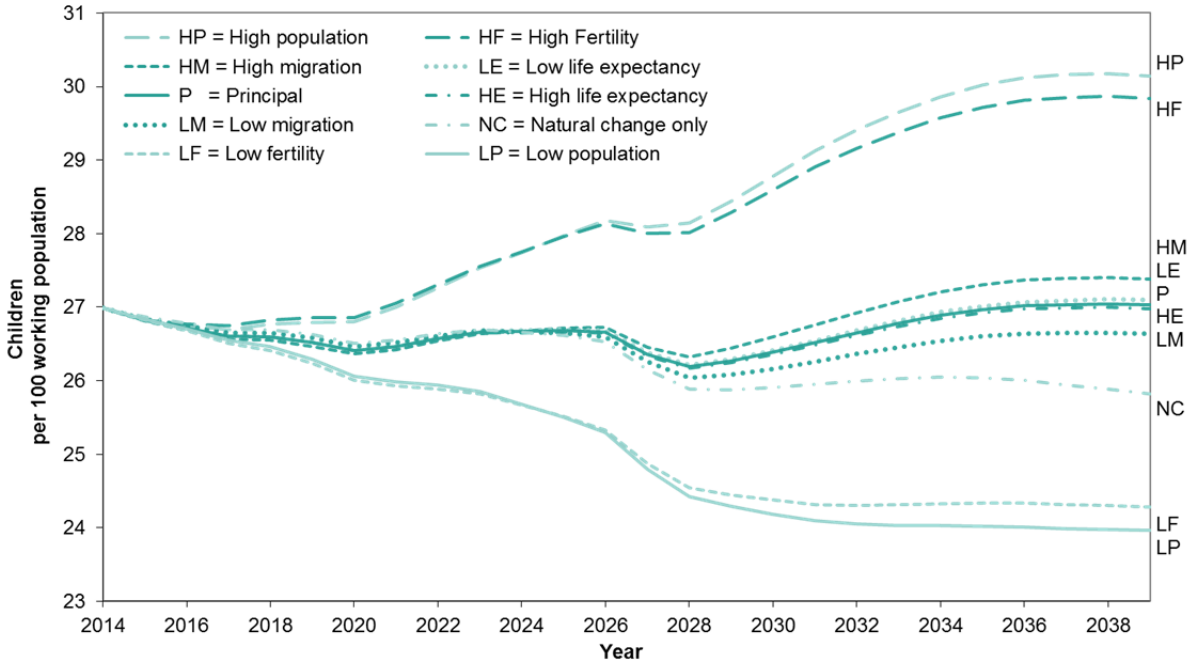
Figure 18: Dependency ratios[1] (dependants per 100 working age population) under the 2014-based principal and selected variant projections,2014-2039



Footnote
1) Dependency ratios can be defined in different ways, but here are defined as the number of children aged under 16 and the number of people of state pension age per 100 people of working age. These ratios should be interpreted with care.

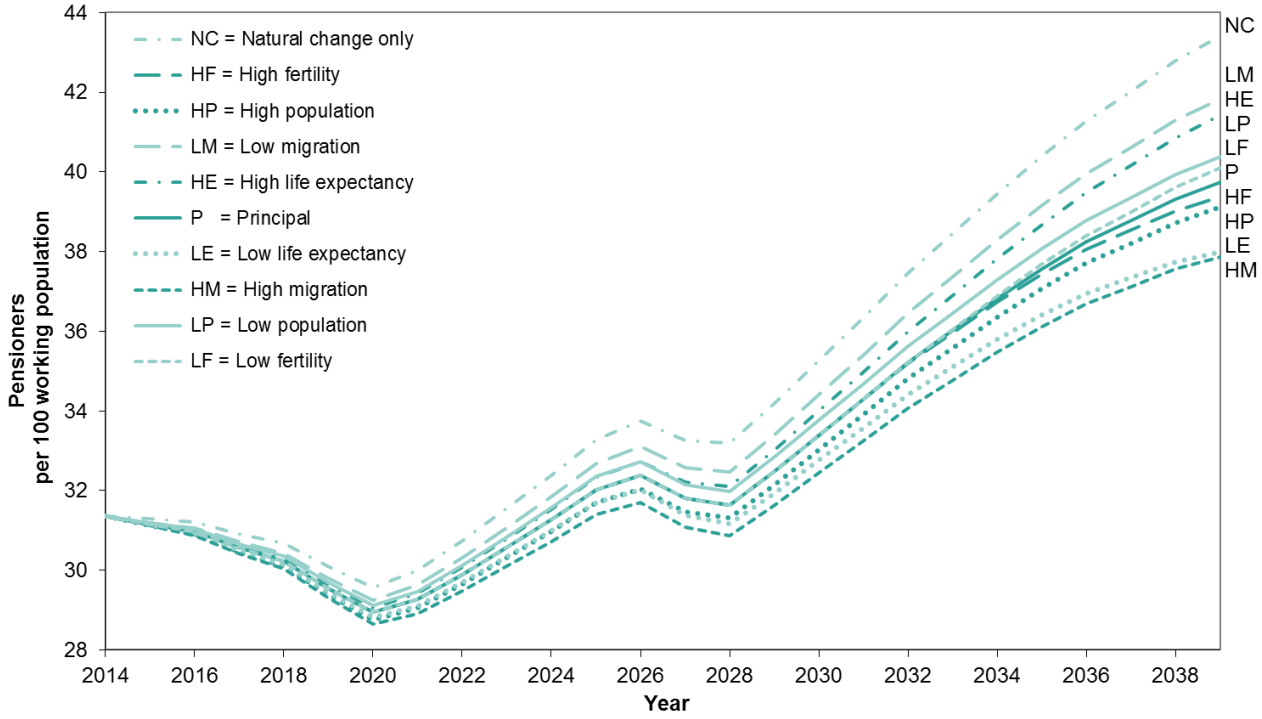
8.11. Figure 19 shows the ratio of the number of children per 100 working population under each variant projection. The high population and high fertility variant projection show the largest increase over the 25 year period reaching 30 per 100 working age while the low fertility and low population variants show the largest decrease to 24 per 100 working age.

Figure 19: Children per 100 working age population under the 2014-based principal and selected variant projections, 2014-2039



8.12. Figure 20 shows the ratio of the number of people of state pension age and over per 100 working population under each variant projection. In the principal and every variant projection there is an increase projected in the number of people of state pension age and over per 100 working age population. The natural change only variant shows the largest increase over the 25 year period reaching 43 people of state pension age and over per 100 working age by 2039 while the high migration variant shows the smallest increase to 38 per 100 working age by 2039.

Figure 20: Pensioners per 100 working age population under the 2014-based principal and selected variant projections, 2014-2039



8.13. As mentioned in previous sections of this report these dependency ratios should be interpreted with caution. For example, a simple interpretation is the number of older people or children who are 'dependent' on the working age population, the assumption being that most older people and children are not economically active. The reality is of course much more complex, since – to give just a few reasons – many people of typically working age are unemployed or economically inactive (e.g. at school or university), the age at which people retire varies greatly and many retired people are financially independent. However, these 'dependency' ratios provide a useful way to examine the relative age structure of the population.

9. Tables

Table 1: Projected population of Scotland (2014-based): 2014-2084

(1,000s)

							Longer term projections				
	2014 (base)	**2019**	**2024**	**2029**	**2034**	**2039**	**2044**	**2054**	**2064**	**2074**	**2084**
All Ages	5,348	5,428	5,514	5,596	5,659	5,701	5,732	5,767	5,798	5,853	5,913

Table 2: Projected components of population change, Scotland, 2014-2039

(1,000s)

	2014 -2015	2015 -2016	2016 -2017	2017 -2018	2018 -2019	2019 -2020	2020 -2021
Population at start	**5,348**	**5,365**	**5,380**	**5,396**	**5,412**	**5,428**	**5,445**
Natural change	-2	2	1	2	2	2	3
Births	56	56	55	56	56	57	57
Deaths	58	54	54	54	54	54	54
Net migration	19	14	14	14	14	15	15
Net international migration	14	8	9	9	9	9	9
Net cross-border migration	6	5	5	5	5	5	5
Population at end	**5,365**	**5,380**	**5,396**	**5,412**	**5,428**	**5,445**	**5,462**
Total change	17	16	15	16	16	17	17

Table 2 (continued) (1,000s)

	2021 -2022	2022 -2023	2023 -2024	2024 -2025	2025 -2026	2026 -2027	2027 -2028
Population at start	**5,462**	**5,480**	**5,497**	**5,514**	**5,532**	**5,548**	**5,565**
Natural change	3	3	2	2	2	1	1
Births	57	57	57	58	58	57	57
Deaths	55	55	55	55	56	56	57
Net migration	15	15	15	15	15	15	15
Net international migration	9	9	9	9	9	9	9
Net cross-border migration	5	5	5	6	6	6	6
Population at end	**5,480**	**5,497**	**5,514**	**5,532**	**5,548**	**5,565**	**5,581**
Total change	17	17	17	17	17	16	16

Table 2 (continued) (1,000s)

	2028 -2029	2029 -2030	2030 -2031	2031 -2032	2032 -2033	2033 -2034	2034 -2035
Population at start	**5,581**	**5,596**	**5,610**	**5,624**	**5,636**	**5,648**	**5,659**
Natural change	-0	-1	-2	-3	-3	-4	-5
Births	57	57	56	56	56	56	56
Deaths	57	58	58	59	60	60	61
Net migration	15	15	15	15	15	15	15
Net international migration	9	9	9	9	9	9	9
Net cross-border migration	6	6	6	6	6	6	6
Population at end	**5,596**	**5,610**	**5,624**	**5,636**	**5,648**	**5,659**	**5,669**
Total change	15	14	13	13	12	11	10

Table 2 (continued) (1,000s)

	2035 -2036	2036 -2037	2037 -2038	2038 -2039
Population at start	**5,669**	**5,678**	**5,686**	**5,694**
Natural change	-6	-6	-7	-8
Births	56	56	56	56
Deaths	61	62	63	63
Net migration	15	15	15	15
Net international migration	9	9	9	9
Net cross-border migration	5	5	5	5
Population at end	**5,678**	**5,686**	**5,694**	**5,701**
Total change	9	8	8	7

Table 3: Projected population of Scotland (2014-based), by age group, 2014-2039

(1,000s)

	2014 (base)	2019	2024	2029	2034	2039
All Ages						
0-15	911	922	931	926	929	924
16-29	976	938	889	884	900	902
30-44	1,019	1,020	1,085	1,093	1,051	1,010
45-59	1,157	1,151	1,065	1,009	1,012	1,078
60-74	851	923	987	1,058	1,059	984
75+	433	474	557	626	707	803
Median age(years)	41.9	42.4	42.9	43.5	44.3	45.2
Children	911	922	931	926	929	924
Working ages[1]	3,377	3,478	3,492	3,525	3,457	3,419
Pensionable ages[1]	1,059	1,028	1,092	1,145	1,273	1,359

Footnote

1) The figures for working age and pensionable age take into account the changes in the state pension age as set out in the 2014 Pensions Act. Between 2014 and 2018, the state pension age will rise from 62 to 65 for women. Then between 2019 and 2020, it will rise from 65 years to 66 years for both men and women. A further rise in state pension age to 67 will take place between 2026 and 2028. Between 2044 and 2046, SPA will increase from 67 to 68. The UK Government plan to review state pension age every five years in line with life expectancy and other factors.

Note: Not all figures will sum due to rounding.

Table 4: Projected number of dependants[1,2] per 100 population of working age, Scotland, 2014-2039

Age group	2014 (base)	2019	2024	2029	2034	2039
All dependents	58	56	58	59	64	67
Children under 16	27	27	27	26	27	27
Pensionable ages	31	30	31	32	37	40
Old age support ratio (working age / pensionable age)	3.19	3.38	3.20	3.08	2.72	2.52

Footnotes

1) The figures for working age and pensionable age take into account the changes in the state pension age as set out in the 2014 Pensions Act. Between 2014 and 2018, the state pension age will rise from 62 to 65 for women. Then between 2019 and 2020, it will rise from 65 years to 66 years for both men and women. A further rise in state pension age to 67 will take place between 2026 and 2028. Between 2044 and 2046, SPA will increase from 67 to 68. The UK Government plan to review state pension age every five years in line with life expectancy and other factors.

2) Dependency ratios can be defined in different ways, but here are defined as the number of children aged under 16 and the number of people of state pension age per 100 people of working age. These ratios should be interpreted with care.

Table 5a: Projected number of births[1], Scotland, 2018-2039

	2018-19	2023-24	2028-29	2033-34	2038-39
2014-based	56,100	57,500	57,000	55,900	55,700
2012-based	60,000	60,500	59,500	58,200	58,600
2010-based	60,200	59,200	57,400	56,500	57,400

Footnote

1) Rounded to nearest 100.

Table 5b: Projected number of deaths[1], Scotland, 2018-2039

	2018-19	2023-24	2028-29	2033-34	2038-39
2014-based	54,100	55,100	57,200	60,200	63,400
2012-based	52,900	54,200	56,600	59,700	62,700
2010-based	53,900	55,300	57,800	60,700	63,500

Footnote

1) Rounded to nearest 100.

Table 5c: Projected population[1], Scotland, 2019-2039

	2019	2024	2029	2034	2039
2014-based	5,428,000	5,514,400	5,595,800	5,658,700	5,701,500
2012-based	5,451,700	5,563,700	5,663,500	5,742,300	5,803,500
2010-based	5,462,300	5,575,000	5,669,400	5,742,700	5,802,800

Footnote

1) Rounded to nearest 100.

Table 6: Projected population of Scotland (2014-based), by sex and age group, 2014-2039

(1,000s)

Age	Sex	Estimated population	Projection year				
		30 June 2014	2019	2024	2029	2034	2039
All ages	**Persons**	**5,348**	**5,428**	**5,514**	**5,596**	**5,659**	**5,701**
	Males	2,596	2,643	2,693	2,738	2,774	2,800
	Females	2,751	2,785	2,822	2,858	2,885	2,902
0-4	**Persons**	**292**	**281**	**288**	**290**	**284**	**281**
	Males	150	144	148	148	146	144
	Females	143	137	141	141	139	137
5-9	**Persons**	**289**	**296**	**284**	**292**	**293**	**288**
	Males	147	151	145	149	150	147
	Females	141	145	139	143	143	141
10-14	**Persons**	**272**	**291**	**298**	**286**	**294**	**295**
	Males	139	148	152	146	150	151
	Females	133	142	146	140	144	144
15-19	**Persons**	**311**	**277**	**296**	**303**	**292**	**299**
	Males	159	141	151	155	149	153
	Females	152	136	145	149	143	146
20-24	**Persons**	**368**	**341**	**306**	**325**	**333**	**321**
	Males	183	172	154	164	168	162
	Females	184	169	151	161	165	159
25-29	**Persons**	**356**	**375**	**348**	**314**	**333**	**341**
	Males	176	188	177	159	168	173
	Females	180	187	172	155	165	168
30-34	**Persons**	**343**	**359**	**378**	**351**	**317**	**337**
	Males	168	178	189	178	160	170
	Females	176	182	189	174	157	167
35-39	**Persons**	**315**	**346**	**361**	**380**	**354**	**320**
	Males	155	168	178	189	178	161
	Females	160	177	183	191	175	159
40-44	**Persons**	**361**	**315**	**346**	**362**	**380**	**354**
	Males	175	154	168	178	189	178
	Females	186	161	178	184	191	176
45-49	**Persons**	**404**	**359**	**314**	**345**	**361**	**380**
	Males	196	174	153	167	177	188
	Females	208	185	161	178	184	192
50-54	**Persons**	**399**	**400**	**357**	**312**	**343**	**359**
	Males	194	194	172	152	165	175
	Females	204	207	185	160	177	184
55-59	**Persons**	**355**	**392**	**394**	**352**	**308**	**340**
	Males	173	190	190	170	150	164
	Females	182	201	204	183	159	176
60-64	**Persons**	**316**	**344**	**382**	**385**	**345**	**302**
	Males	154	167	185	185	165	146
	Females	162	177	197	200	180	156
65-69	**Persons**	**306**	**300**	**329**	**367**	**371**	**333**
	Males	148	145	158	176	177	159
	Females	158	155	171	190	194	174
70-74	**Persons**	**230**	**279**	**277**	**306**	**343**	**349**
	Males	106	133	132	145	163	165
	Females	123	147	145	160	180	184
75-79	**Persons**	**186**	**198**	**245**	**245**	**274**	**309**
	Males	82	89	114	115	128	145
	Females	104	109	131	130	146	164
80-84	**Persons**	**132**	**145**	**158**	**200**	**203**	**230**
	Males	54	61	69	90	93	105
	Females	79	84	89	109	110	124
85-89	**Persons**	**75**	**86**	**99**	**111**	**144**	**149**
	Males	27	33	40	47	63	66
	Females	48	53	59	65	81	83
90 & over	**Persons**	**40**	**45**	**56**	**70**	**87**	**115**
	Males	11	14	19	26	34	48
	Females	29	31	36	44	53	68

Note: Not all figures will sum due to rounding.

Table 7: Principal and selected variant projections (2014-based), Scotland, 2014-2084

(1,000s)

							Longer-term projections				
	2014 (base)	**2019**	**2024**	**2029**	**2034**	**2039**	**2044**	**2054**	**2064**	**2074**	**2084**
Principal projection	**5,348**	**5,428**	**5,514**	**5,596**	**5,659**	**5,701**	**5,732**	**5,767**	**5,798**	**5,853**	**5,913**
High Migration	5,348	5,468	5,605	5,741	5,864	5,968	6,061	6,230	6,405	6,605	6,808
High Fertility	5,348	5,439	5,552	5,667	5,762	5,839	5,909	6,046	6,205	6,401	6,627
High Life expectancy	5,348	5,432	5,526	5,620	5,702	5,772	5,838	5,956	6,071	6,206	6,359
High population	5,348	5,484	5,655	5,839	6,015	6,184	6,355	6,719	7,124	7,571	8,067
Low Migration	5,348	5,388	5,424	5,450	5,454	5,435	5,403	5,304	5,191	5,100	5,020
Low Fertility	5,348	5,418	5,479	5,532	5,562	5,570	5,562	5,505	5,423	5,354	5,277
Low Life expectancy	5,348	5,423	5,502	5,571	5,613	5,627	5,620	5,569	5,519	5,489	5,456
Low population	5,348	5,373	5,378	5,363	5,316	5,237	5,133	4,866	4,577	4,306	4,034
Natural change only	5,348	5,349	5,349	5,331	5,284	5,214	5,128	4,918	4,686	4,466	4,254

Table 8: Projected population change for selected variant projections (2014-based), Scotland, 2014-2039

(1,000s)

	High migration variant	Principal projection	Low migration variant	Natural change only variant
Population at mid-2014	**5,348**	**5,348**	**5,348**	**5,348**
Population change (2014-2039)				
Natural change	33	-23	-79	-134
Births	1,472	1,410	1,349	1,291
Deaths	1,439	1,433	1,427	1,424
Net migration	587	377	167	0
Net international migration	447	238	30	0
Net cross-border migration	140	138	136	0
Population at mid-2039	**5,968**	**5,701**	**5,435**	**5,214**
Total population change between mid-2014 and mid-2039	**620**	**354**	**88**	**-134**

Note: Not all figures will sum due to rounding.

10. Further information

Corresponding data for the United Kingdom and its constituent countries, along with detailed information on the assumptions which are made, is available from the Office for National Statistics website or by contacting ONS at:

Office for National Statistics
Population Projections Unit
Room 2300
Segensworth Road
Titchfield PO15 5RR

Tel: 01329 444652
E-mail: projections@ons.gsi.gov.uk

More detailed age and sex breakdowns of the Scottish results are available from:
Population Projections section of the NRS website;
National Records of Scotland customer service team; or
Population Projections section of the Office for National Statistics (ONS) website.

The next set of sub-national projections for council and NHS Board areas in Scotland are due to be released in June 2016. These will be consistent with the latest 2014-based projection for Scotland. Further details can be obtained from:

Statistics Customer Services
National Records of Scotland
Statistics Information Services
Ladywell House
Ladywell Road
EDINBURGH EH12 7TF

Telephone: 0131 314 4299
E-mail: statisticscustomerservices@nrscotland.gov.uk

Annex A: Fertility assumptions

Fertility assumptions are agreed in two stages. The long term assumption is decided as part of the consultation process between the UK countries and the Office for National Statistics. Then there is detailed assumption setting to produce the age-specific fertility rates for each year of the projection period that are consistent with the long-term assumption.

The fertility assumptions for the long-term average completed family size have remained the same for each UK constituent country apart from Scotland since the 2012-based population projections. The assumption for Scotland was lower reflecting the lower numbers of births in recent years. The Scottish long-term assumption is still lower than the assumptions for other UK countries. The assumptions for Scotland and other constituent countries of the UK are given in Table A1.

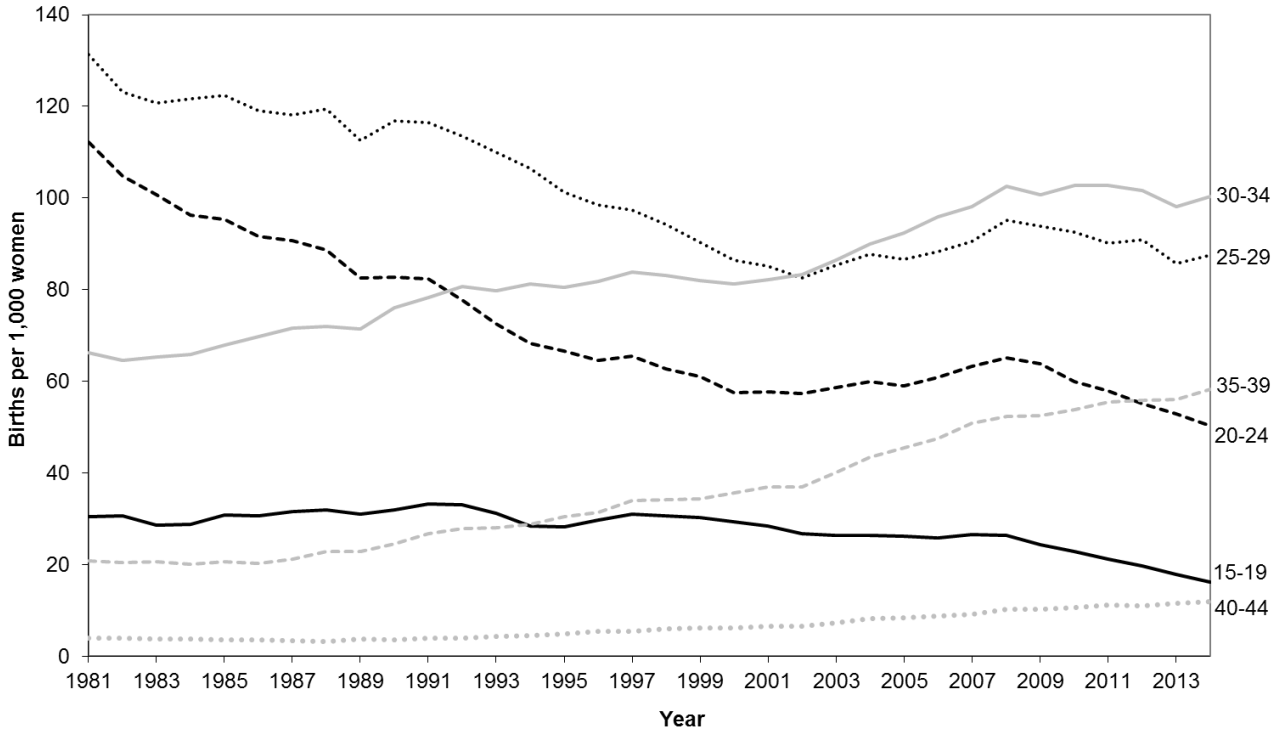
Table A1: Assumptions of long-term average completed family size, 2012 and 2014-based projections

	2014-based	2012-based
England	1.90	1.90
Wales	1.90	1.90
Scotland	1.70	1.75
Northern Ireland	2.00	2.00
United Kingdom	**1.89**	**1.89**

The trends in age specific fertility for Scotland are shown in Figure A1. Until 2002, there is a general pattern of falling fertility at younger ages coupled with rises in fertility at older ages.

Recent data have shown increases in fertility rates until 2008, and then a slight decrease in fertility in the younger age groups (those aged 34 and under) until 2013, with a slight rise in 2014, and continued increase in fertility rates for women aged 35 and over. The biggest increases in fertility rates are for women in their thirties. Fertility rates increased for women in their twenties from 2001 to 2008, but have fallen in recent years.

Figure A1: Scotland age specific fertility, 1981-2014



Fertility assumptions are formulated in terms of the average number of children that women born in particular years will have. This cohort measure of fertility is more stable than the analogous calendar year or period measure (the total fertility rate). This is because it is affected only by change in the total number of children women have and not by the timing of births within their lives. Period rates may rise or fall if births are brought forward or delayed for any reason.

The assumptions about completed family size are based on family building patterns to date and other relevant data. For the UK as a whole, among women who have completed their childbearing, average achieved fertility has fallen from 2.22 children for the 1945 cohort to 1.91 for the 1968 cohort. In terms of the average family sizes that women born in different years have achieved at certain ages, it appears that the previous steady decline (a clear pattern for the 1945 to 1965 cohorts) could be bottoming out among the most recently-born cohorts of women.

For Scotland, fertility rates are assumed to continue to increase for women in their 40s, and 30s, increase slightly for women in their 20s and fall slightly for women under 20.

The Total Fertility Rate (TFR) for Scotland is projected to increase until 2038 before reaching the long term level.

The high and low fertility variants assume long-term family sizes of 0.2 children per women higher or lower than the principal projection, that is, 1.9 and 1.5 children per women for Scotland.

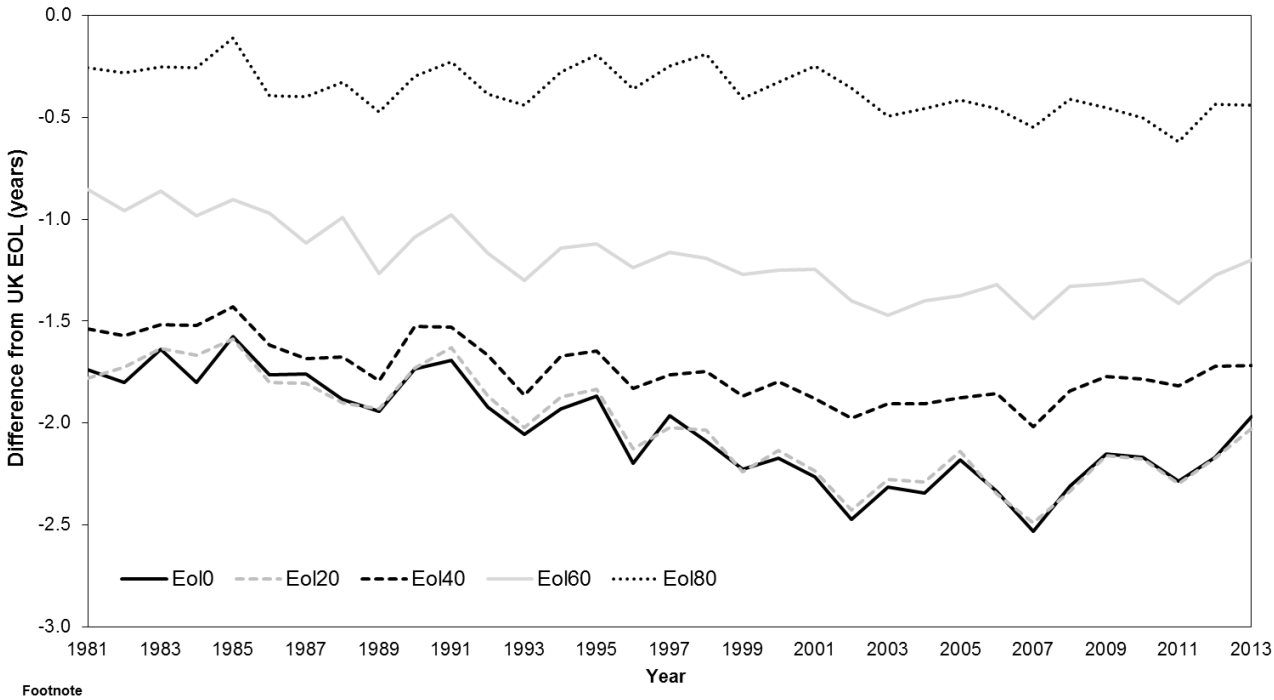
Annex B: Mortality assumptions

The mortality rates for the first year of the projection, mid-2014 to mid-2015, are based on the best estimates that could be made in the autumn of 2015 of the numbers of deaths at each age in 2014-15.

Assumed improvements in mortality rates after 2013-14 are based on trends in mortality rates before 2013. Improvements in mortality rates by age and gender in the base year of the projection are estimated from the trends in years from 1961 to 2014. It is assumed that annual rates of mortality improvement will converge to a common rate of 1.2 per cent per year in 2039 for most ages, and continue to improve at that constant rate thereafter. However, those born after 1922 and before 1939 have exhibited greater rates of improvement over the last 25 years than those born on either side.

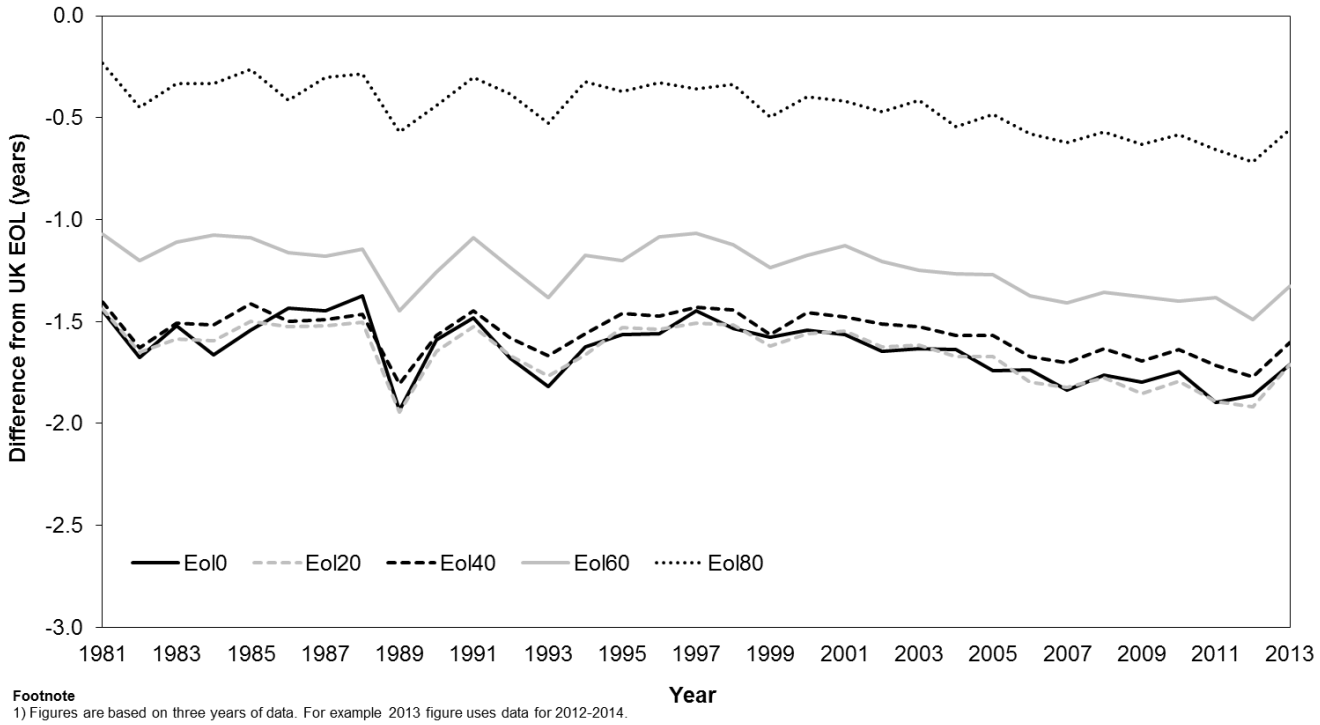
A comparison of period expectations of life (Eol) for Scotland with the UK as a whole (Figure B1) suggests there has been a gradual widening in the difference in expectations of life for males under the age of 80, since the early 1980s. There have also been increases in divergence for females since 2000 (Figure B2).

Figure B1: Period expectations of life (Eol) for Scotland less respective expectation of life for UK – for males at birth and ages 20, 40, 60 and 80, 1981-2013[1]



Footnote
1) Figures are based on three years of data. For example 2013 figure uses data for 2012-2014.

Figure B2: Period expectations of life (EoI) for Scotland less respective expectation of life for UK – for females at birth and ages 20, 40, 60 and 80, 1981-2013[1]



Footnote
1) Figures are based on three years of data. For example 2013 figure uses data for 2012-2014.

Although there has been a decrease in the differentials between Scotland and the UK in 2013, this is not sufficient evidence to suggest a change in the overall trend. Therefore, following further analysis (and as similarly done in previous sets of projections), lower rates of improvement were adopted in Scotland for males aged 25 to 89, and for females aged 25 to 50, 56 to 65 and 67 to 89, than for the UK as a whole. At all other ages the UK levels have been used. By 2039 all improvement rates are projected to converge to the same annual rates of improvement as for the UK.

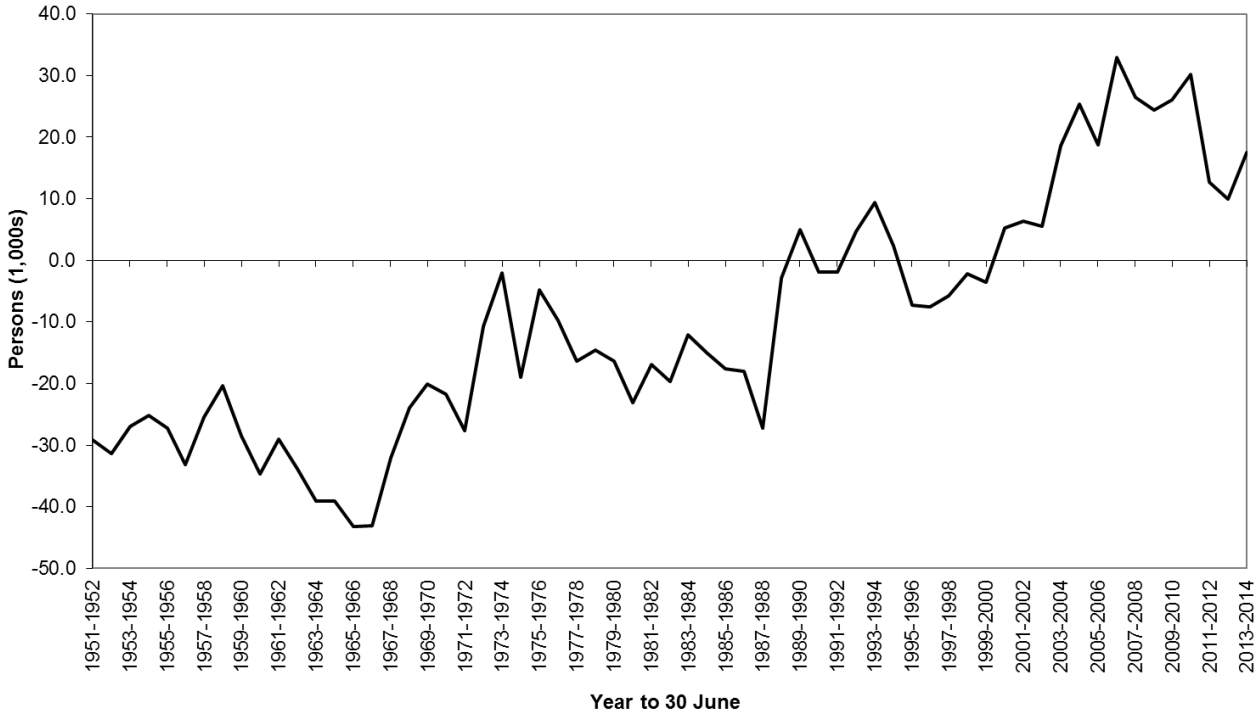
The impact of these assumptions can be summarised using the period expectation of life at birth, based on the mortality rates for the given year. Life expectancy is assumed to rise from 77.1 years in 2013 to 82.3 years in 2039 for men, and from 81.1 years in 2013 to 85.0 years in 2039 for women. The 2014-based projection assumes a lower increase in life expectancy for women than in the 2012-based projection reflecting recent mortality rates for females.

Annex C: Migration assumptions

New methods have been used to model migration trends in setting the migration assumptions for the 2014-based projections. International migration assumptions have been modelled using moving averages and a long-term assumption is used in the seventh year after a six year run in period. Cross-border migration between the four countries of the UK are modelled using rates based on migration trends from the previous five years. These average rates are calculated by individual age and sex for each intra-UK country flow. These rates are applied to the annual projected population during production of the 2014-based projections. An adjustment is applied to the rates to ensure that net migration levels between countries of the UK are stabilised over the course of the projection. More information can be found on the Population projection section of the ONS website.

Due to these changes the long-term assumption for migration now varies from year to year and in the 2014-based projections varies between +15,000 and +15,300 from 2025 onwards. This is lower than the long-term constant net migration assumption of +15,500 used in the 2012-based projections. This decrease is due to lower levels of migration estimated from 2012-2014. Figure C1 illustrates the trends since 1951.

Figure C1: Natural Change and Net migration, 1952 to 2014



The long-term assumption for net international migration to Scotland is assumed to be +9,500, which is lower than the long-term net international migration assumption of +12,000 used in the 2012-based projections. The international net migration assumptions used in the 2014-based projections are:

2014-2015	+13,600
2015-2016	+8,400
2016-2017	+8,600
2017-2018	+8,900
2018-2019	+9,100
2019-2020	+9,300
2020 onwards	+9,500

The high and low migration variants assume long-term international net migration to Scotland to be 8,500 persons higher or lower than the principal international migration assumptions (that is, +18,000 and +1,000).

Assumptions for net cross-border migration between Scotland and the rest of the UK are calculated by applying rates to successive projected populations for each year. Therefore assumed cross-border net migration between Scotland and the rest of the UK fluctuates between +5,300 and +5,800 for the years 2015 to 2039.

Annex D: Variant projections and assumptions

Every two years the Office for National Statistics (ONS), in consultation with the Registrars General, produces a principal population projection and a number of variant projections, based on alternative assumptions of future fertility, mortality and migration, for the UK and its constituent countries. The variants are produced to give users an indication of the inherent uncertainty of demographic behaviour. There are two distinct types of variant produced: standard variants and special case scenarios.

As well as the principal assumptions, high and low assumptions are prepared for each of the components of population change (fertility, life expectancy and net migration). These are used to generate what are referred to as the standard variants. There are 27 possible combinations of these sets of assumptions although, besides the principal projection, only 10 are published by ONS. These are the six possible single component variants and also four selected combination variants. The single component variants vary one component at a time from the principal assumptions, the purpose being to illustrate plausible alternative scenarios rather than to represent upper or lower limits for future demographic behaviour. The combination variants which are published are those which produce the largest/smallest total population size and the oldest/youngest age structure.

As well as producing the standard variants ONS produce special case scenarios or what if projections to illustrate the consequences of a particular, but not necessarily realistic set of assumptions. Three sets of special case scenarios are prepared:

- Replacement fertility
- Constant fertility
- No mortality improvement.

In addition a special case projection, based on combinations of these assumptions, will be prepared:

- No change projections – shows what would happen if fertility, mortality and net migration were to remain at current levels

More details on the variants referred to in this paper and their assumptions are contained in Table D1 and Table D2 on the next page.

On the date of the publication of this paper (29 October 2015) only the six standard variants, the high and low population combination variants and the zero migration variant were published. The remaining variants will be published on the ONS website on 26 November 2015. More details about all the variants mentioned in this paper can be obtained from the Population Projections section of the ONS website.

Table D1: Assumptions for the 2014-based principal and nine variant projections for Scotland

	Assumptions	Long-term Fertility (Total Fertility Rate - TFR)	Life Expectancy Males (2039)	Life Expectancy Females (2039)	Net Migration (2039) (rounded to the nearest 100)
Standard variants	High variant	1.90	84.3	86.8	24,100
	Principal	**1.70**	**82.3**	**85.0**	**15,000**
	Low variant	1.50	80.2	83.1	5,900
Special case scenario	Zero migration	1.70	82.3	85.0	0

Table D2: Variants and Scenario

		Fertility	Life expectancy	Migration
1	Principal projection	Principal	Principal	Principal
Standard 'single component' variants				
2	High fertility	High	Principal	Principal
3	Low fertility	Low	Principal	Principal
4	High life expectancy	Principal	High	Principal
5	Low life expectancy	Principal	Low	Principal
6	High migration	Principal	Principal	High
7	Low migration	Principal	Principal	Low
Combination variants				
8	High population	High	High	High
9	Low population	Low	Low	Low
Special case scenario				
10	Zero migration	Principal	Principal	Zero

11. Notes on statistical publications

National Statistics

The United Kingdom Statistics Authority (UKSA) has designated these statistics as National Statistics subject to meeting the requirements in the latest assessment report, in line with the Statistics and Registration Service Act 2007 and signifying compliance with the Code of Practice for Official Statistics (available on the UKSA website).

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.

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 we have applied to any of our statistics. These revisions and corrections are clearly marked on the webpage of the publication as well on our revisions and corrections page available on the NRS website.

Enquiries and suggestions

Please contact our 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:

Kirsty MacLachlan
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Ladywell Road
Edinburgh
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12. Related organisations

Organisation	Contact
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.	Office of the Chief Statistician Scottish Government 3WR, St Andrews House Edinburgh EH1 3DG Phone: 0131 244 0442 Email: statistics.enquiries@scotland.gsi.gov.uk Website: www.gov.scot/Topics/Statistics
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	Customer Contact Centre Office for National Statistics Room 1.101 Government Buildings Cardiff Road Newport NP10 8XG Phone: 0845 601 3034 Minicom: 01633 815044 Email: info@ons.gsi.gov.uk Website: www.ons.gov.uk/
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.	Northern Ireland Statistics and Research Agency McAuley House 2-14 Castle Street Belfast BT1 1SA Phone: 028 9034 8100 Email: info.nisra@dfpni.gov.uk Website: www.nisra.gov.uk