

Projected Population of Scotland (2016-based): Additional variants using alternative European Union migration assumptions

1. Introduction

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. The latest full publication is available in the [Population Projections Scotland](#) section of the NRS website.

Three additional variants using alternative European Union (EU) migration assumptions have been prepared by ONS. These additional variants are presented separately as they do not have National Statistics status and have been prepared for illustrative purposes only. The process for creating the EU migration assumptions has not been subject to the same rigorous assessment process as the principal projection and other variant projections included in the full publication. It is important to note, these additional variant projections are trend-based and are not policy based forecasts of what the government expects to happen, but they do provide illustrations of the possible effect on Scotland's population of changes in levels of EU migration.

The three additional variants that have been produced are:

- a zero future European Union migration variant;
- a 50% future European Union migration variant (50% less future European Union migration); and
- a 150% future European Union migration variant (50% more future European Union migration).

The variants produced use a number of assumptions about future patterns in fertility, mortality and migration based on analysis of past trends. For these additional EU migration variants, the assumptions for fertility and mortality are the same as for the principal projection. Further details of the assumptions for these three additional variants and the principal projection are included in [Table B](#).

More information on how the projections are produced is available in the [National Population Projections Methodology](#) section of the Office for National Statistics website.

2. Uses and 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.

3. Main Points

The key points in this report are as follows:

- The changes to overseas migration based on the differing assumptions about future levels of EU migration have been applied from mid-2018 onwards. This date has been used as it will be the first mid-year point prior to the date that the UK will leave the EU in March 2019. This means that each of these additional variants is exactly the same as the principal projection until mid-2018. They then diverge due to the different assumptions of future EU migration.
- In the principal projection, if current trends continue then the population of Scotland is projected to rise from 5.40 million in 2016 to 5.58 million in 2026, and to continue to rise to 5.69 million in 2041 – an increase of 5% over the 25 year period.
- In the zero future EU migration variant, the population of Scotland is projected to rise to 5.52 million in 2041, resulting in an overall increase of 2% – however, the population is projected to peak at 5.54 million in 2032 then decline after that point until 2041.
- For the 50% future EU migration variant, the population of Scotland is projected to rise to 5.60 million in 2041 – an increase of 4% from 2016. The population is also projected to peak prior to 2041 in this variant, although slightly later, in 2038 at 5.61 million.
- And for the 150% future EU migration variant, the population is projected to increase each year to 5.78 million in 2041, a 7% increase.
- As migration is concentrated amongst young adult ages, the effect of varying the level of migration is greater on the number of children and people of working age than on the number of people of pension age.
- Compared to Scotland, the UK's projected population increase is more rapid. The principal projection for the UK suggests that the population may rise from 65.65 million in 2016 to 72.90 million in 2041, an increase of 11%. The more rapid increase projected for the UK also occurs for each of the additional variants, with a 7% projected increase in population for the zero future EU migration variant, a 9% increase for the 50% future EU migration variant and a 13% increase for the 150% future EU migration variant.
- A summary of the total projected population for all of these additional variants and the principal projection for both Scotland and the UK is shown in [Table A](#).

Table A: Total population for the principal and EU migration variant projections, Scotland and the UK, 2016 and 2041

Variant	Scotland				United Kingdom			
	2016 Population	2041 Population	Population change		2016 Population	2041 Population	Population change	
			Number	%			Number	%
150 per cent future EU migration variant	5,404,700	5,781,900	377,200	7.0	65,648,100	74,291,000	8,642,900	13.2
Principal	5,404,700	5,693,200	288,500	5.3	65,648,100	72,904,500	7,256,400	11.1
50 per cent future EU migration variant	5,404,700	5,604,500	199,800	3.7	65,648,100	71,520,300	5,872,200	8.9
Zero future EU migration variant	5,404,700	5,515,900	111,200	2.1	65,648,100	70,134,700	4,486,600	6.8

4. Results

The results of these additional variants using alternative EU migration assumptions are illustrated in Figure 1, showing the total population of Scotland under each variant as well as the principal projection for comparison. Please note that the scale is not set to zero.

All of the variants show a population increase over the 25 years from 2016 to 2041, ranging from 111,200 (2.1%) for the zero future EU migration variant to 377,200 (7.0%) for the 150% future EU migration variant.

Figure 1 also shows that the projected total population for the zero future EU migration variant peaks in 2032 then declines after that point until 2041. The population is also projected to peak prior to 2041 in the 50% future EU migration variant, although slightly later in 2038.

Figure 1: Projected total population for the principal and alternative EU migration variant projections, Scotland, 2016 to 2041

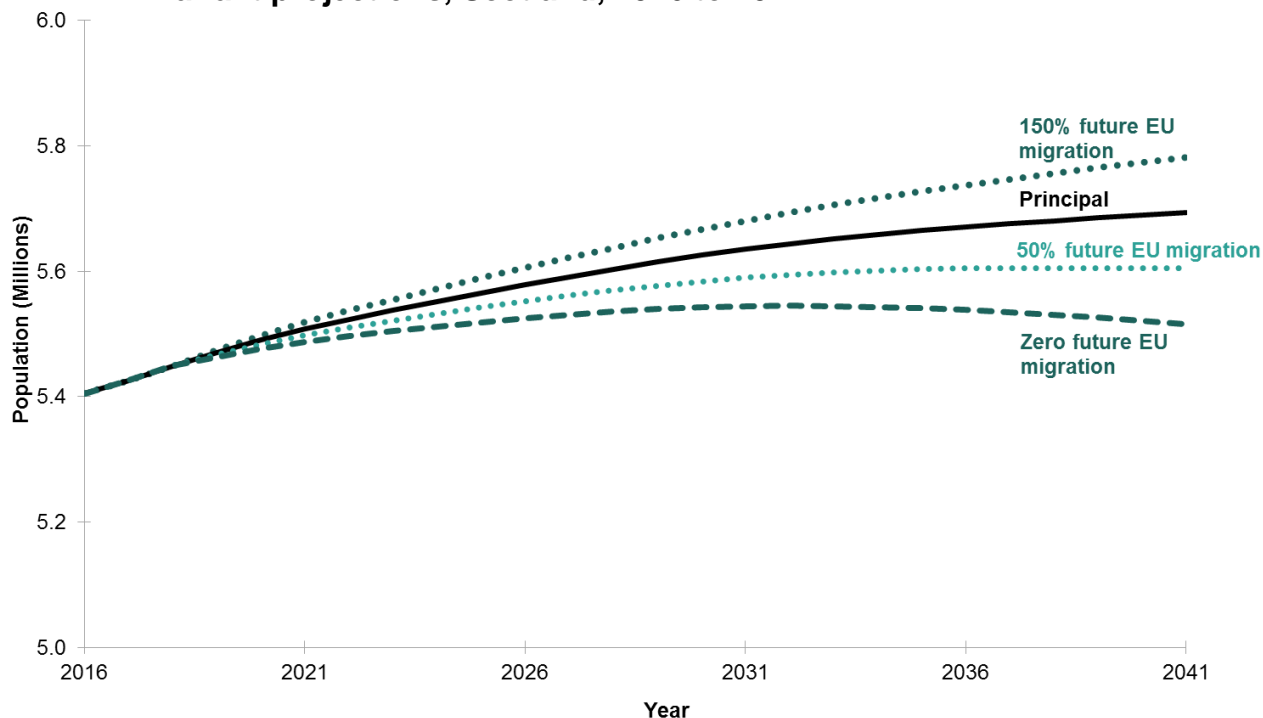


Table B provides information on the projected components of change between 2016 and 2041 for each of the variants. The table shows that for each of the variants net migration between Scotland and the rest of the UK and overseas is projected to be positive. However, in the zero future EU migration variant, net in-migration from overseas is projected to be 1,600 each year from 2022-23 onwards, as shown in Table C. This compares with the latest estimate for net in-migration from overseas of 22,900 in 2015-16.

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 150% future EU migration variant the decrease in the population over the 25 year period due to natural change is 91,000 whereas with the principal projection natural change results in a decrease of 114,400. Because migration is concentrated at younger ages, the effect of migration on births is much greater than on the number of deaths. For this reason, the number of deaths is fairly similar between each of the variants, but the number of births varies a lot more.

Table B: Components of change for the principal and EU migration variant projections for Scotland, 2016 to 2041

Variant	Estimated population 30 June 2016	Total Births 2016-2041	Total Deaths 2016-2041	Natural change (births minus deaths) 2016-2041	Net migration between Scotland and the rest of the UK 2016-2041	Net migration between Scotland and overseas 2016-2041	Estimated population 30 June 2041	Population change	
								Number	%
150 per cent future EU migration	5,404,700	1,409,100	1,500,100	-91,000	192,300	275,900	5,781,900	377,200	7.0
Principal	5,404,700	1,385,300	1,499,700	-114,400	191,300	211,600	5,693,200	288,500	5.3
50 per cent future EU migration	5,404,700	1,361,400	1,499,200	-137,800	190,200	147,500	5,604,500	199,800	3.7
Zero future EU migration	5,404,700	1,337,600	1,498,900	-161,300	189,000	83,500	5,515,900	111,200	2.1

Notes:

All figures relate to the cumulative projected totals from 2016 to 2041 and are summed to the nearest 100.

Totals may not sum due to rounding.

Additional variants using alternative EU migration assumptions have also been prepared for the UK as a whole (including Scotland). Figure 2 compares the projected population for each of the variants for both Scotland and the UK as a whole. As the UK has experienced more rapid population growth in recent years, this trend is projected to continue for each of the variants. The principal projection for Scotland shows a population increase of 5.3% from 2016 to 2041, whereas this figure is 11.1% for the UK.

The population increase projected by the zero future EU migration variant over the same period is 2.1% for Scotland and 6.8% for the UK. This is 3.3 percentage points lower for than in the principal projection for Scotland and 4.2 percentage points lower for the UK. The effect of future EU migration on the projected total population is therefore slightly higher in percentage terms for the UK than for Scotland.

Figure 2: Percentage change in population from 2016 to 2041, principal and alternative EU migration variant projections, UK and Scotland

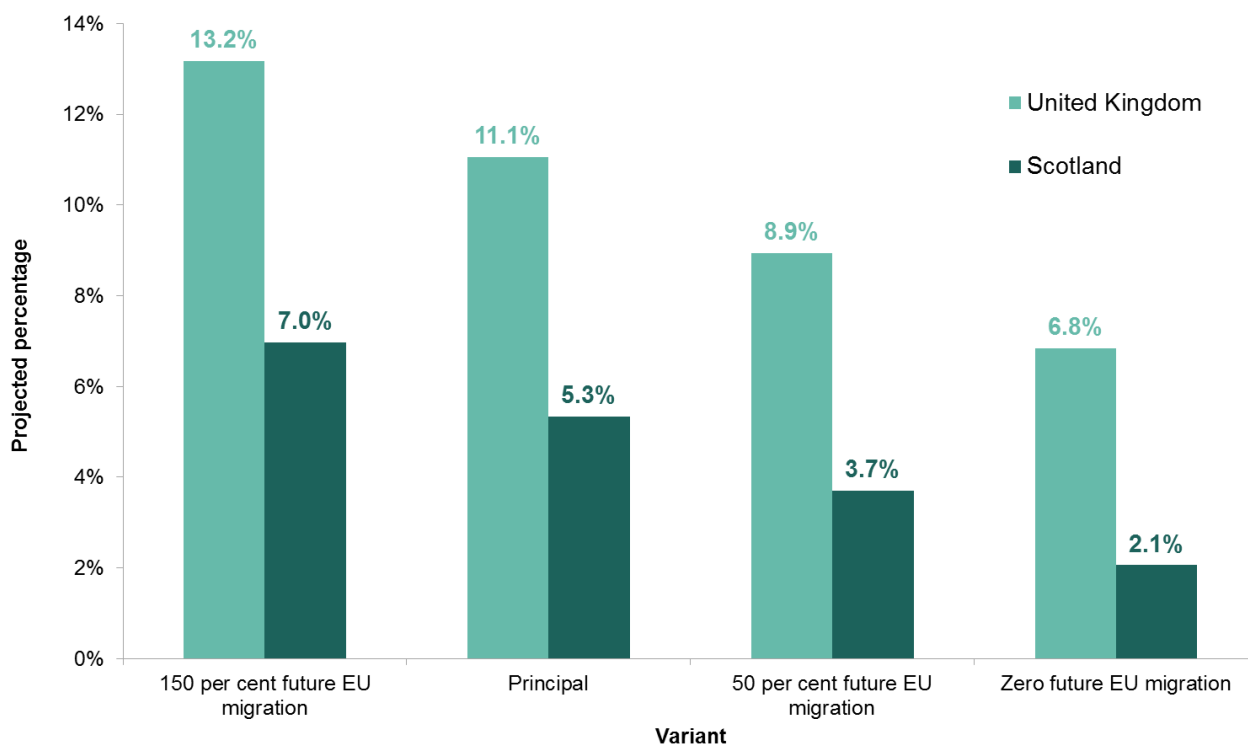


Figure 3 shows the breakdown of the projected change in the UK (pale green) and Scotland (in dark green) by age group for the principal projection and zero future EU migration variant between 2016 and 2041.

The effect of zero future EU migration has different impacts on the different age groups. In the principal projection, the number of children is projected to decrease by 2% over the next 25 years in Scotland compared with an increase of 2% in the UK. In the zero future EU migration variant the figures show a decrease of 7% for Scotland and a decrease of 3% for the UK.

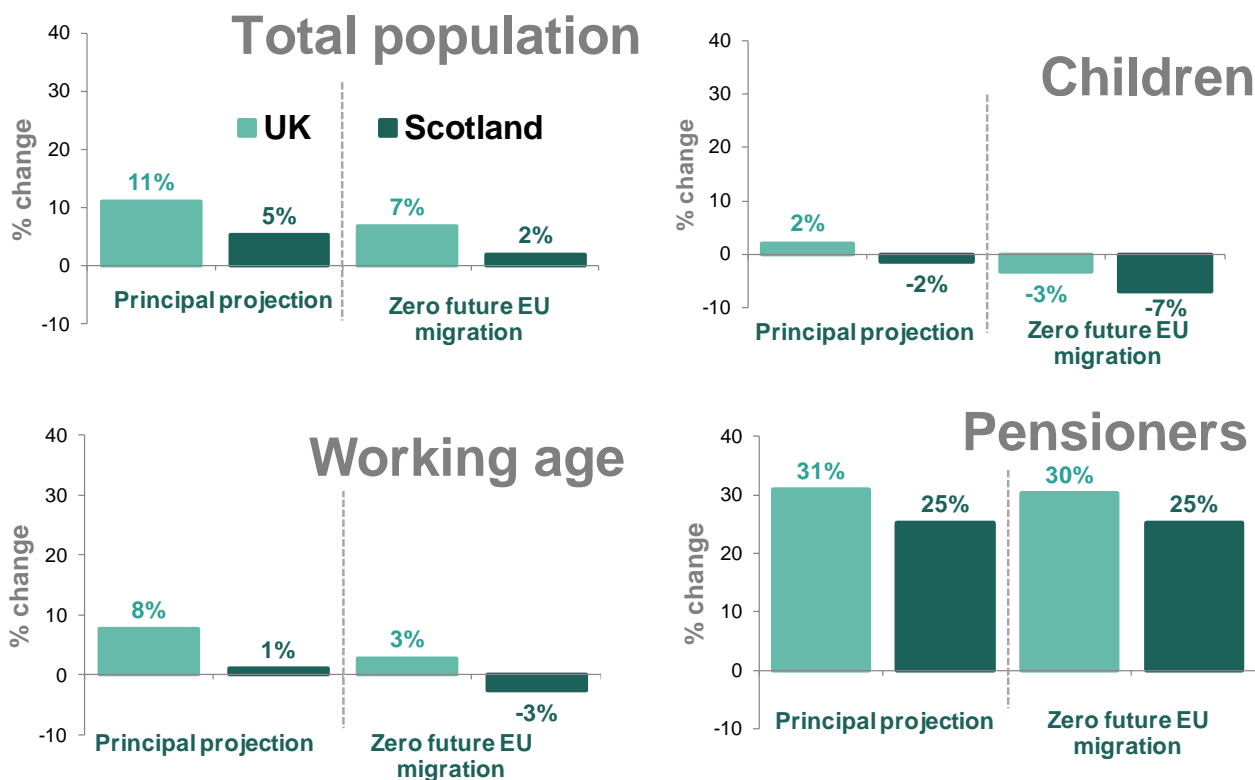
The working age¹ population is projected to increase by 1% for Scotland in the principal projection, compared with an increase of 8% for the UK. In the zero future EU migration variant, Scotland's working age population is projected to decrease by 3% whereas the UK's is still expected to increase by 3%.

The effect of the different assumptions of future EU migration have a smaller impact on the projections for people of pension age¹. This is because migration from overseas is concentrated at younger age groups. Scotland's pension age population is projected to increase by 25% in both the principal projection and zero future EU variants, with the figures for the UK being higher at an increase of 31% and 30% respectively.

Footnote

- 1) The figures for working age and pensionable age and over take into account the changes in the state pension age as set out in the 2014 Pensions Act. Between 2016 and 2018, the state pension age will rise from 63 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. At the time of publication, the state pension age is due to rise to 68 years between 2044 and 2046. However, a Pension Age Review published in March 2017 by the UK Government recommends bringing the rise to 68 forward to between 2037 and 2039. However, this recommendation has not yet been passed into legislation, so the figures presented here do not include this change. More information is available in the [Pension Age Review final report](#) on the UK Government website.

Figure 3: Projected percentage change in population across the UK, principal and alternative EU migration variant projections, by age structure, 2016-2041



5. Assumptions

Most of the assumptions used in these additional variants are the same as those used for the principal projection. [Table C](#) provides further details of the assumptions used by each additional variant and the principal projection. Alternative EU migration assumptions are used which affect the overseas migration component of the additional variants.

In these additional projections, any change in EU in or out migration will be reflected uniformly across all single years of age and sex for Scotland, i.e. a 50% reduction will result in a 50% reduction in migration across all ages and both sexes. The age and sex distributions that have been adjusted by these additional variants are the same age and sex distributions that were assumed in the principal projection for overseas migration.

The changes in EU migration were calculated by examining recent trends (over the previous three years) in the proportion of EU citizens in the International Passenger Survey migrating to and from Scotland. This proportion was then either removed from the overseas migration assumption (zero future EU migration variant), 50% of it removed (50% future EU migration variant) or 50% of it added to the overseas migration assumption (150% future EU migration variant).

The outputs from the projections only provide a breakdown of migration into cross-border (to and from the rest of the UK) and overseas components. There is no further detail available of the origin and destination of migrants that move between Scotland and overseas. However, in [Table C](#) you can see that the overseas migration component is different from the principal projection in each of the additional variants

due to the adjustment that was applied to this component to account for different levels of migration to and from the EU. This then has a knock-on effect on the total net migration assumption for each variant.

For the purposes of these projections, the alternative migration assumptions were assumed to start affecting the level of migration from mid-2018 onwards. This is based on the assumption that this will be the first mid-year point prior to the UK leaving the EU in March 2019.

Each of the variants uses the same assumptions as the principal projection up until mid-2018 and are therefore exactly the same up until this point. However, at this point they diverge as different overseas migration assumptions are applied from mid-2018 onwards. The overseas migration is then adjusted for each of the three additional variants after this point to account for different scenarios regarding future migration between Scotland and EU countries after the UK leaves the EU.

The fertility and mortality assumptions are assumed to be the same as for the principal projection for each of the additional variants.

The effect of the changes in the migration assumptions are also reflected in the projected number of births and deaths. If there are fewer women of child-bearing ages, then we would expect fewer births.

Table C: Assumptions for the principal and additional EU migration variant projections for Scotland

Assumptions	Total Fertility rate - TFR (2041)	Life expectancy males (2041)	Life expectancy females (2041)	Net migration from the Rest of the UK (2041) (rounded to the nearest 100)	Net migration from overseas (2041) (rounded to the nearest 100)	Total Net migration (2041) (rounded to the nearest 100)
150 per cent future EU migration variant	1.65	81.7	84.5	7,700	9,700	17,400
Principal	1.65	81.7	84.5	7,600	7,000	14,600
50 per cent future EU migration variant	1.65	81.7	84.5	7,500	4,300	11,800
Zero future EU migration variant	1.65	81.7	84.5	7,300	1,600	8,900

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