# Projected Population of Scotland (2018-based): Additional variants using alternative European Union migration assumptions

## 1. Introduction

This summary paper provides analysis showing the possible effect on the future population size of Scotland and the UK of changes in levels of EU migration. It was prepared as secondary analysis alongside the 2018-based National Population Projections (NPP).

The latest full publication summarising the principal (main) population projections for Scotland can be found in the **Population Projections Scotland** section of the NRS website. This also includes details about how the projections are produced and has access to the full range of standard variant[1] projections.

It is important to remember that population projections are based on a number of assumptions about future migration, fertility and mortality. These assumptions are based on past trends and are not intended to be forecasts. This means the projections do not attempt to predict the impact of policy or political circumstances, such as Brexit. However, because the shorter-term international migration assumptions use the very latest demographic information, they do reflect the changes in net international migration that have occurred since the Brexit vote in 2016.

Two additional variants have been produced which use alternative EU migration assumptions:

- a zero future EU migration variant
- a 50% future EU migration variant (50% less future EU migration).

These are intended to provide illustrations of the possible effect on the future population size in scenarios of reduced EU migration. They are provided for illustrative purposes only and are not intended to represent specific forecasts.

These variants are not designated as National Statistics as they are not produced using a standard method. More details on the method and assumptions used is provided in Section 6 of this paper.

[1] A number of standard variants are produced using alternative assumptions about future fertility, mortality and migration to illustrate plausible alternative scenarios.

## 2. Main Points

- **In the principal projection**, the population of Scotland is projected to rise from 5.44 million in 2018 to 5.54 million in mid-2028. Overall, in the 25 year period from mid-2018 to mid-2043 it increases by 2.5% to 5.57 million.

- **In a scenario of 50% less EU migration**, the population of Scotland is projected to rise to 5.49 million in mid-2043 – an increase of 1.0% from mid-2018. The population is projected to peak in mid-2033, at 5.52 million.

- **In a scenario of zero future EU migration**, the population of Scotland is projected to fall to 5.41 million by mid-2043, resulting in an overall decrease of 0.5% over the 25 year projection period. The population is projected to peak in mid-2028 at 5.49 million, and then decline after.

- Varying the level of migration has the greatest effect on the number of children and people of working age, as migration is concentrated amongst young adults. The number of people of pension age is less affected (Figure 3).

- The UK population is projected to grow faster than Scotland's in the principal projection and in both of the additional EU migration variants. In the principal projection, the UK population rises 9.0% from 66.44 million in mid-2018 to 72.42 million in mid-2043. In the 50% future EU migration variant it rises by 7.7%, and in the zero future EU migration variant it rises by 6.4%.

- 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 below.
  - Table A shows the differences over 25 years (mid-2018 to mid-2043)
  - Table B shows the differences over 10 years (mid-2018 to mid-2028).

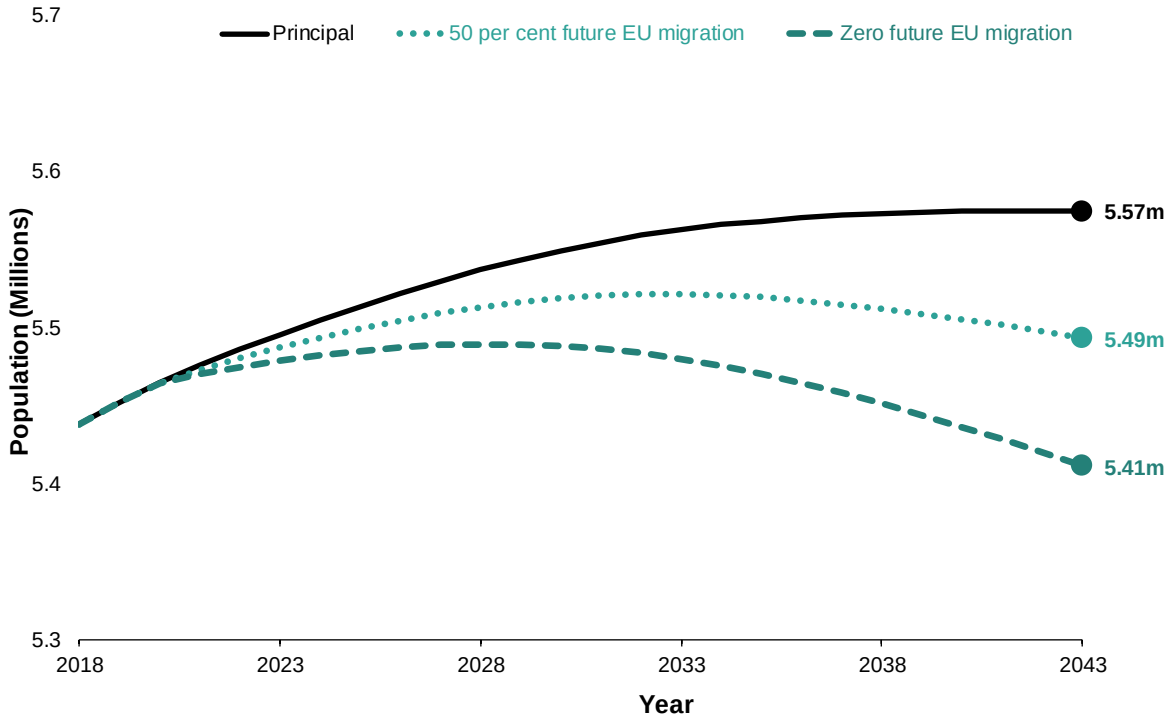
## Table A: Total population for the principal and EU migration variant projections, Scotland and the UK, mid-2018 and mid-2043 (25 years)

| Variant | Scotland | | | | United Kingdom | | | |
|---|---|---|---|---|---|---|---|---|
| | 2018 Population | 2043 Population | Population change Number | % | 2018 Population | 2043 Population | Population change Number | % |
| **Principal** | **5,438,100** | **5,574,800** | 136,700 | 2.5 | **66,435,600** | **72,418,000** | 5,982,400 | 9.0 |
| 50 per cent future EU migration variant | 5,438,100 | 5,493,100 | 55,000 | 1.0 | 66,435,600 | 71,563,600 | 5,128,000 | 7.7 |
| Zero future EU migration variant | 5,438,100 | 5,411,300 | -26,800 | -0.5 | 66,435,600 | 70,709,600 | 4,274,000 | 6.4 |

## Table B: Total population for the principal and EU migration variant projections, Scotland and the UK, mid-2018 and mid-2028 (10 years)

| Variant | Scotland | | | | United Kingdom | | | |
|---|---|---|---|---|---|---|---|---|
| | 2018 Population | 2028 Population | Population change Number | % | 2018 Population | 2028 Population | Population change Number | % |
| **Principal** | **5,438,100** | **5,537,100** | 99,000 | 1.8 | **66,435,600** | **69,397,400** | 2,961,800 | 4.5 |
| 50 per cent future EU migration variant | 5,438,100 | 5,513,300 | 75,200 | 1.4 | 66,435,600 | 69,124,700 | 2,689,100 | 4.0 |
| Zero future EU migration variant | 5,438,100 | 5,489,500 | 51,400 | 0.9 | 66,435,600 | 68,852,000 | 2,416,400 | 3.6 |

## Figure 1: Projected total population for the principal and alternative EU migration variant projections, Scotland, mid-2018 to mid-2043



## 3. Projected population of Scotland

Scotland's population is projected to **grow slower** in scenarios of reduced EU migration, and may decline over the next 25 years.

Figure 1 shows the projected population of Scotland under alternative EU migration assumptions, as well as the principal projection for comparison. Please note that the scale does not begin at zero.

The principal projection shows a population increase of 136,700 (2.5%) over the 25 years from mid-2018 to mid-2043. In comparison, the 50% future EU migration variant shows a smaller increase of 55,000 (1.0%), and the zero future EU migration variant shows a decrease of 26,800 (-0.5%).

The projected total population for the zero future EU migration variant peaks in mid-2028 then declines after that. In the 50% future EU migration variant the population peaks in mid-2033, and in the principal projection it peaks in mid-2042.

### Components of change

Table C provides components of the projected changes between mid-2018 and mid-2043 for the principal projection and the two variants. For all three projections, net migration is positive between Scotland and both the rest of the UK and overseas. However, net migration is still lower for both variants, particularly between Scotland and overseas.

**Table C: Components of change for the principal and EU migration variant projections for Scotland, 2018 to 2043**

| Variant | Estimated population 30 June 2018 | Total Births 2018-2043 | Total Deaths 2018-2043 | Natural change (births minus deaths) 2018-2043 | Net migration between Scotland and the rest of the UK 2018-2043 | Net migration between Scotland and overseas 2018-2043 | Estimated population 30 June 2043 | Population change | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Number | % |
| **Principal** | **5,438,100** | **1,255,100** | **1,588,700** | **-333,600** | **231,000** | **239,300** | **5,574,800** | **136,700** | **2.5** |
| 50 per cent future EU migration | 5,438,100 | 1,236,300 | 1,588,300 | -352,000 | 229,800 | 177,200 | 5,493,100 | 55,000 | 1.0 |
| Zero future EU migration | 5,438,100 | 1,217,400 | 1,587,900 | -370,500 | 228,500 | 115,200 | 5,411,300 | -26,800 | -0.5 |

**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.

In the zero future EU migration variant, net migration from overseas is projected to be +4,100 per year in the long term, and in the 50% future EU migration variant it is projected to be +6,800 as shown in Table D. The principal projection has net overseas migration of +9,500 per year in the long term. The latest estimate of net overseas migration is +10,900 in 2017-18.

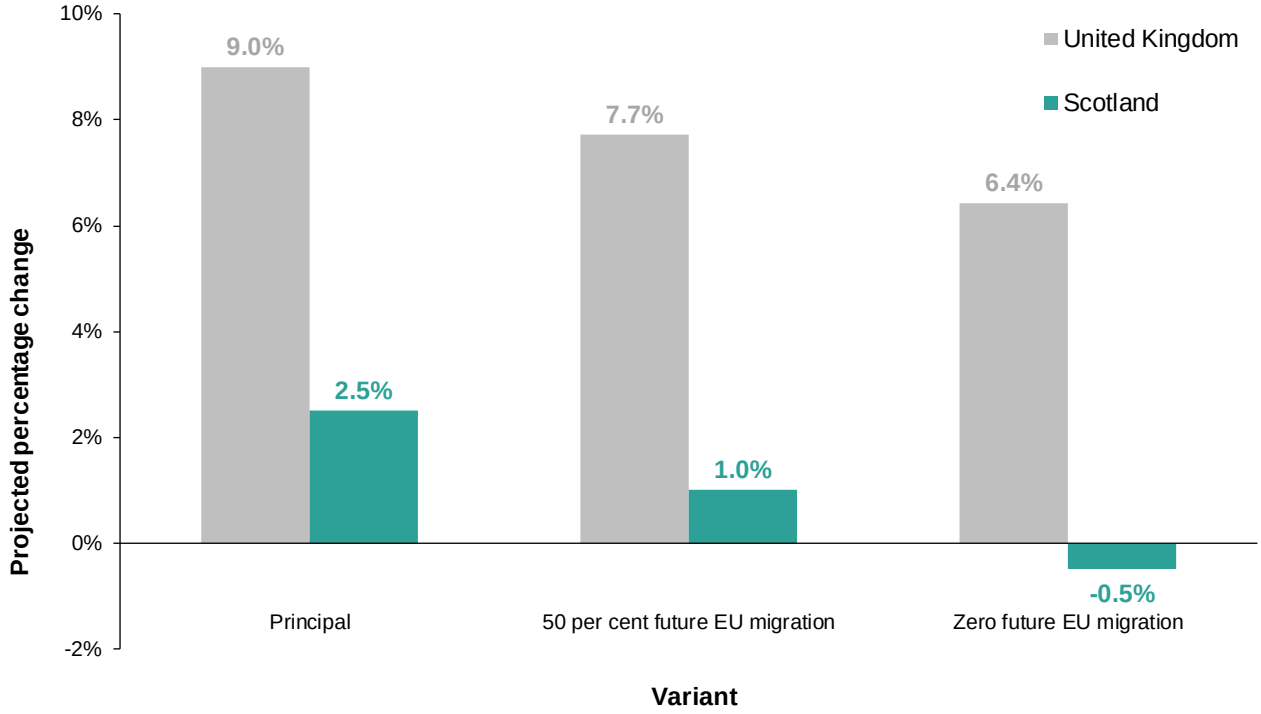
Over the 25 year period from mid-2018 to mid-2043, the decrease in the population due to natural change (births minus deaths) is 370,500 for the zero future EU migration variant, and 352,000 for the 50% future EU migration variant. Whilst for the principal projection the natural decline is 333,600.

The fertility and mortality assumptions for the EU migration variants are the same as the principal projection. However, these are measured using fertility rates and life expectancy, meaning the projected numbers of births and deaths are still affected by different levels of migration.

Because migration is concentrated at younger working ages, the effect of migration on births is much greater than on the number of deaths. This causes the number of deaths to be fairly similar between each of the variants, while the number of births varies a lot more.

## 4. Comparison with UK projections

**Figure 2: Percentage change in population from mid-2018 to mid-2043, principal and alternative EU migration variant projections, UK and Scotland**



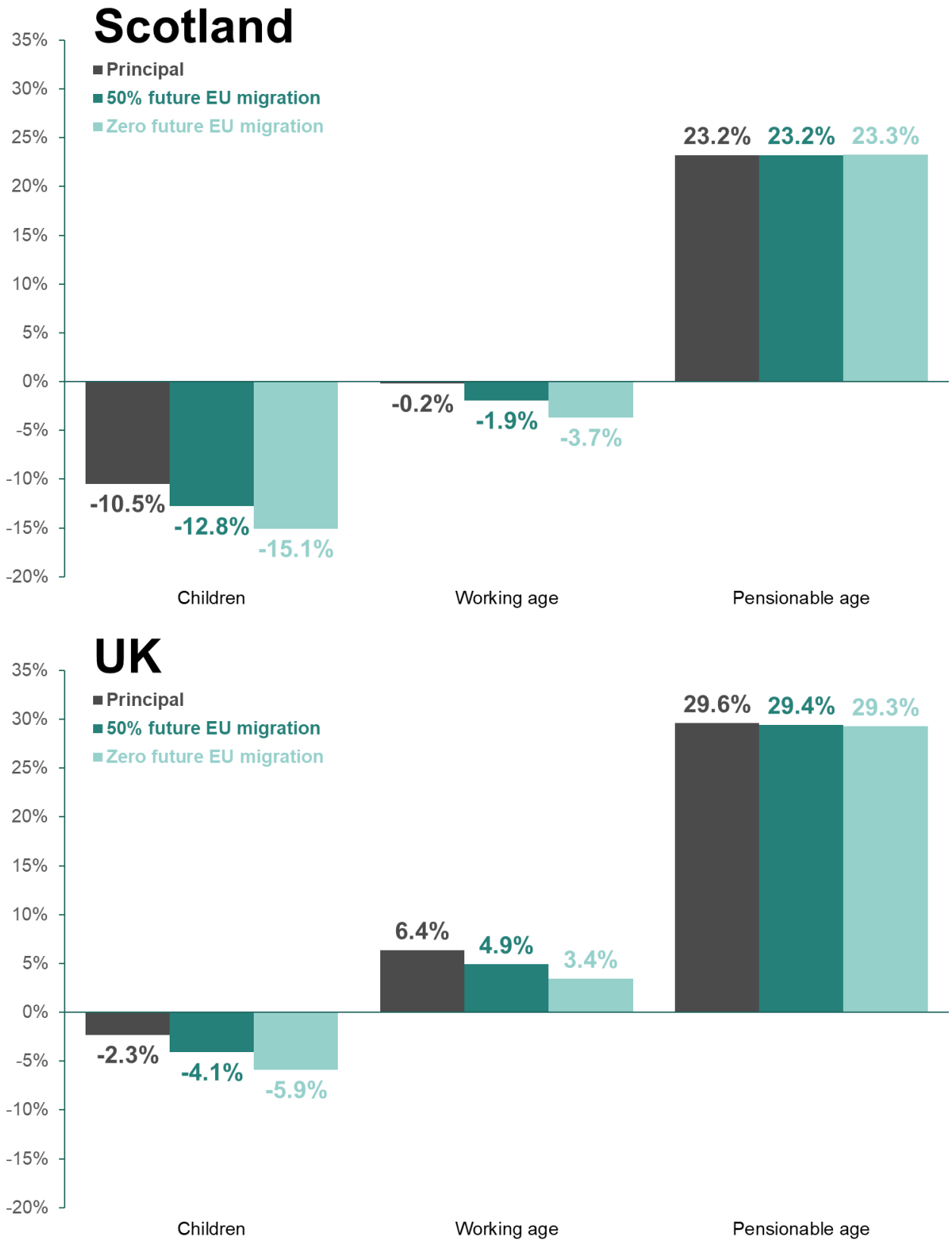

The alternative EU migration variants also include population projections for the UK (including Scotland). Figure 2 compares the projected population under each variant for both Scotland and the UK as a whole.

The UK has experienced more rapid population growth in recent years, and this trend is projected to continue for all three variants. The principal projection shows a population increase for Scotland of 2.5% from mid-2018 to mid-2043, compared to an increase of 9.0% for the UK.

For the 50% future EU migration variant, Scotland's population is projected to grow at a slower rate, up 1.0% over the 25 year projection period (mid-2018 to mid-2043), whilst the UK is projected to grow by 7.7%.

Over the same period, the zero future EU migration variant projects a 0.5% decrease for Scotland compared to a 6.4% increase for the UK. This is 3.0 percentage points lower than the principal projection for Scotland and 2.6 percentage points lower than the principal projection for the UK.

**Figure 3: Projected percentage change in population for principal projection and alternative EU migration variants, by age group, mid-2018 to mid-2043, UK and Scotland**



## 5. Variant projections by age group

Lower EU migration has the greatest effect on the numbers of **children** and those of **working age.**

The projected effect of different levels of EU migration varies by age group. Figure 3 shows the breakdown of the projected change between mid-2018 and mid-2043 by age group in Scotland and the UK for the principal projection and the two alternative EU migration variants. The population is split by children (0-15), those of working age, and those of pensionable age[2].

In the principal projection, the number of children decreases by 10.5% over the next 25 years in Scotland, and decreases by 2.3% in the UK. In the 50% future EU migration variant, this decreases by 12.8% in Scotland, and decreases by 4.1% in the UK. In the zero future EU migration variant, the figures show a decrease of 15.1% for Scotland and a decrease of 5.9% for the UK.

The working age population stalls for Scotland in the principal projection (decreasing slightly, by 0.2%), while it increases by 6.4% for the UK. For the additional EU migration variants, Scotland is projected to experience decreases to its working age population whilst the UK continues to see projected increases. In the 50% future EU migration variant, the working age population decreases by 1.9% in Scotland while it increases by 4.9% in the UK. In the zero future EU migration variant, Scotland's working age population is projected to decrease by 3.7% while the UK's is expected to increase by 3.4%.

The projections for people of pensionable age are less affected by different assumptions of EU migration, as migration from overseas is concentrated at younger age groups. Scotland's pension age population is projected to increase by 23.2% in the principal projection and 50% future EU migration variant, and by 23.3% in the zero future EU variant. The figures for the UK are higher at an increase of 29.6%, 29.4% and 29.3% respectively.

## 6. Assumptions

Population projections show what happens to the population under certain assumptions about future fertility, mortality and migration. The assumptions are based on past trends and do not take into account any future changes that may be caused by policy initiatives.

The assumptions for fertility and mortality are the same for these additional EU migration variants as for the principal projection. As these assumptions are expressed as rates, projected numbers of births and deaths are still different (as shown in Table C) due to the different populations.

The main differences in the alternative EU migration variants are the overseas migration components. The EU migration variant assumptions are produced by applying percentage changes by single year of age and sex to the principal

[2] 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. In 2018, SPA reached 65 for women, meaning it was the same as for men. Between 2019 and 2020, SPA 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.

international migration assumption. The percentage changes are calculated based on the proportion of all migration that was to and from the rest of the EU during the last three years of long-term international migration estimates. These changes take effect from the year ending mid-2021 onwards.

Further details of the assumptions for these variants and the principal projection are included in Table D.

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

| Assumptions | Total Fertility rate - TFR (2043) | Life expectancy males (2043) | Life expectancy females (2043) | Net migration from the Rest of the UK (2043) (rounded to the nearest 100) | Net migration from overseas (2043) (rounded to the nearest 100) | Total Net migration (2043) (rounded to the nearest 100) |
|---|---|---|---|---|---|---|
| **Principal** | **1.50** | **80.6** | **83.8** | **9,000** | **9,500** | 18,500 |
| 50 per cent future EU migration variant | 1.50 | 80.6 | 83.8 | 8,900 | 6,800 | 15,700 |
| Zero future EU migration variant | 1.50 | 80.6 | 83.8 | 8,700 | 4,100 | 12,800 |

The adjustments to the migration assumptions are applied uniformly across all single years of age and sex for Scotland. For example, a 50% reduction in migration from the principal projection will result in a 50% reduction across all ages and both sexes.

The changes in EU migration are based on trends from the International Passenger Survey over the last three years in the proportion of EU citizens migrating to and from Scotland. This proportion has been either removed from the overseas migration assumption (zero future EU migration variant), or 50% of it has been removed (50% future EU migration variant).

Net migration between Scotland and the rest of the UK also changes, as this is affected by the populations of these areas – which will be different under different levels of migration.

For the purposes of these projections, the alternative migration assumptions were assumed to start having an effect from mid-2021 onwards. Up to mid-2021 each of the variants are exactly the same, as they use the same assumptions as the principal projection. After mid-2021 they diverge as different overseas migration assumptions are applied. The overseas migration is then adjusted for each of the two variants after this point to account for different scenarios regarding future migration between Scotland and EU countries after the UK leaves the EU.

The levels of migration in the projections are only broken down 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.

More information on how the national population projections are produced is available in the National Population Projections Methodology section of the Office for National Statistics website.