NISRA STATISTICAL BULLETIN

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2016-based Population Projections for Northern Ireland

Key Points:

- In the first 10 years to mid-2026, the population is projected to increase by 4.2 per cent to reach 1.940 million; rising again to 1.966 million by mid-2031 (an increase of 5.6 per cent from mid-2016).
- The 1.9 million milestone is projected to be reached by mid-2021, with the 2.0 million milestone being reached by mid-2040.
- The Northern Ireland population is projected to increase to 2.003 million in the 25 year period from mid-2016 to mid-2041, an average annual rate of growth of 0.3 per cent. Natural growth is projected to be the main driver of this 141,300 population increase, with 127,300 more births projected than deaths.
- The population aged 65 and over is projected to increase by 65.1 per cent to 491,700 people from mid-2016 to mid-2041, with the result that almost one in four people (24.5 per cent) will be in this age category. The population aged 85 and over is projected to increase by 127.2 per cent to reach 82,800 people over the same period, which will see their share of the population doubling from 2.0 per cent to 4.1 per cent.
- These projections show the real impact of the marked increase in the size of the population at older ages. The proportion of the population aged 65 and over is projected to overtake that of children (those aged 0 to 15 years) by mid-2028 (20.1 per cent and 19.6 per cent respectively).
- While our overall projected population growth over the 25 year period to mid-2041 is lower than in the rest of the UK (7.6 per cent compared with 11.2 per cent), our population is projected to age faster. For example, our number of people aged 85 and over is projected to grow by 127.2 per cent, compared with 107.1 per cent for the rest of the UK.
- These latest projections result in population figures that are generally lower than those reported in the 2014-based population projections, with the 2016-based projection for mid-2041 being 25,300 people less (1.3 per cent) than the equivalent figure from the 2014-based projections.

More detailed figures and analysis are included in the bulletin.

Content

Note: Throughout the report figures have been presented in a rounded form to ease readability. For example population figures have been presented to the nearest 100 and percentage changes have been presented to 1 decimal place. However, all calculations have been undertaken on the basis of unrounded numbers which will, in some instances, give rise to apparent discrepancies.

1 Introduction

National population projections by age and sex are produced every two years for the UK and each of the UK constituent countries by the Office for National Statistics (ONS) on behalf of the National Statistician and the Registrars General of Scotland and Northern Ireland. Principal Projections are produced based on long-term assumptions about future fertility, mortality and migration levels, with variant projections being produced from various alternative assumptions – usually in the form of high/low variants and their combinations.

While variant projections are available (see Section 11), this bulletin focusses on the key findings from the 2016-based **Principal Population Projections**.

2 Background

National population projections provide an estimate of the future size and age structure of the population of Northern Ireland. Population projections are widely used in policy development in areas such as housing, healthcare and education. One such use is in projecting the growth of the population aged 65 and over in future years and how this will affect decisions in i) private and communal house planning, and ii) suitable levels of elderly health care. Population projections are also used as the base for other national statistics releases, such as population projections for areas within Northern Ireland and household projections.

These Population Projections for Northern Ireland were published on 26 October 2017. They are based on the 2016 mid-year population estimates and a set of underlying demographic assumptions regarding future fertility, mortality and migration levels (see Section 4 for a summary of the applied assumptions). They replace the 2014-based projections which were published in October 2015.

2016-based Population Projections for Areas within Northern Ireland are currently planned for publication in spring 2018.

3 Points to Note

It is important to note that these projections are not forecasts and do not attempt to predict the impact that future government policies, changing economic circumstances or other factors might have on demographic behaviour.

When considering these projections it should be noted that their degree of reliability is closely associated with their proximity to the base year (mid-2016). For example, long-term fertility assumptions are applied to a female population that hasn't been born yet in mid-2016, which

affects the number of births in the long run. Therefore, this bulletin will focus mainly on the intermediate projections in the 15 and 25 year[1] periods to mid-2031 and mid-2041.

Since there are many years within the projection period, tables within this bulletin will be limited to five year intervals in order to concisely present the statistics. However, the information may also be extended to include years of particular interest where, for example, trends reach a maximum or minimum.

4 Principal Projection Assumptions

The assumptions summarised below relate to those applied to the principal projection. Variant projections are also available, with further information provided in Section 11 of this bulletin.

Population projections are by definition based on long-term assumptions about future fertility, mortality and migration levels. Further information on the assumptions inherent in these projections is available in Section 12 of this bulletin. However, in summary the main assumptions are:

- Fertility – In the long-term, the hypothetical woman will have 2.00 children in her life time.
- Mortality – In the long-term, improvements in mortality rates are projected to be around 1.2 per cent per annum.
- Migration[2] – Net international migration will continue from observed levels in the year ending mid-2016 (i.e. 1,500 inflows) throughout the projection period.

These long-term assumptions are applied in order to calculate the projected number of births, deaths, and net migration occurring each year in the projection period. However, there is a transition period for fertility, mortality and migration to gradually move from current levels to the long-term assumptions.

Figure 1 shows that throughout the projection period both the number of births and deaths (and the difference between them - i.e. natural change), are projected to considerably exceed total net-migration. As such, overall population growth is projected to be mainly due to natural change with the projected number of births exceeding the projected number of deaths. For example, over the 25 year period between mid-2016 and mid-2041, the number of births is projected to exceed the number of deaths by 127,300.

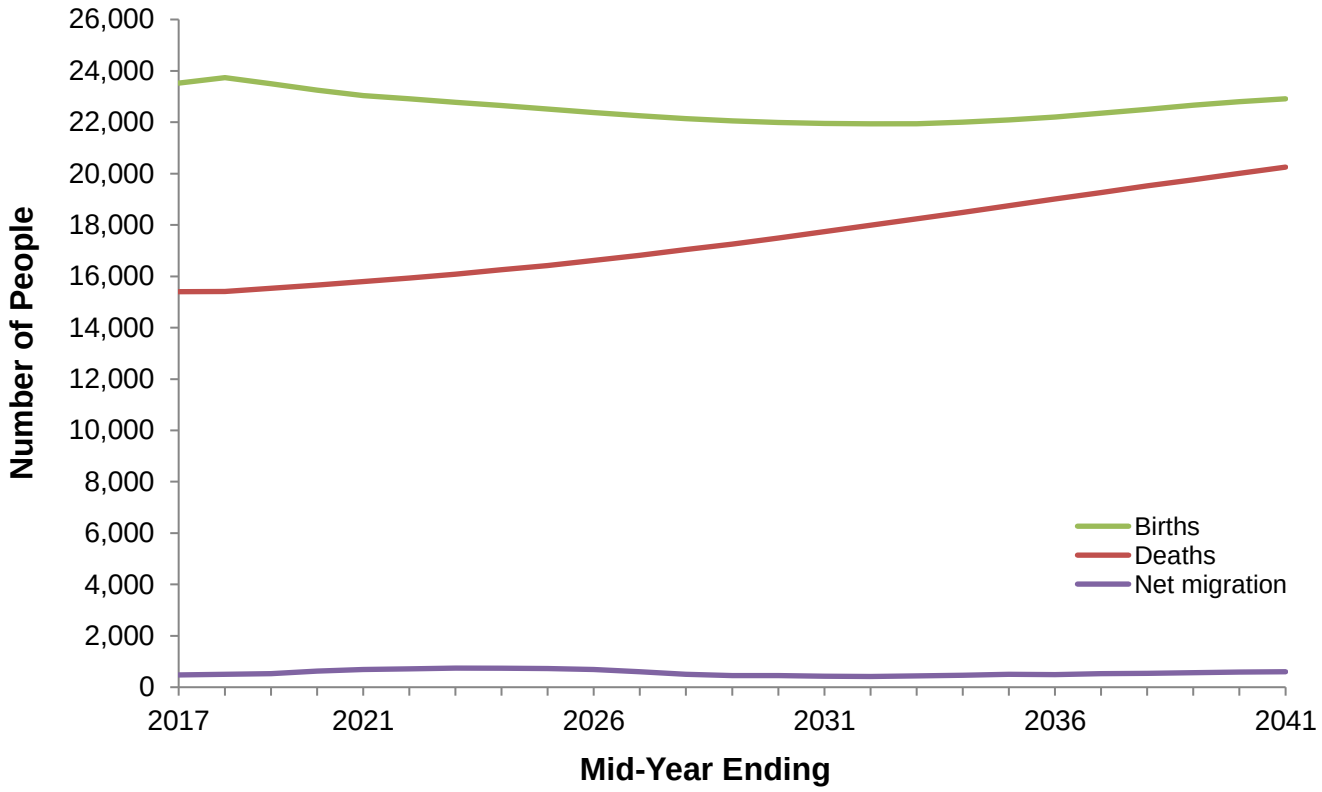
[1] NISRA has incorporated projections on a 25 year period in order to align with projections across the rest of the UK.

[2] These assumptions are based on recent trends in migration and do not attempt to predict the impact of the UK leaving the EU.

In terms of overall net migration, in the 25 years to mid-2041 there is projected to be an average annual net migration gain of 600 people. This differs from the net migration assumption above of +1,500 people per year because the assumption only relates to long-term international migration. Overall net migration also accounts for migration between Northern Ireland and the rest of the UK[3].

Within the 25 year projection period to mid-2041 there is projected to be an average annual net loss of 900 people to the UK, which when combined with the assumption of +1,500 people due to net international migration gives an overall average annual net migration gain of 600 people.

Figure 1: Projected number of births, deaths and total net migration, year ending mid-2017 to year ending mid-2041



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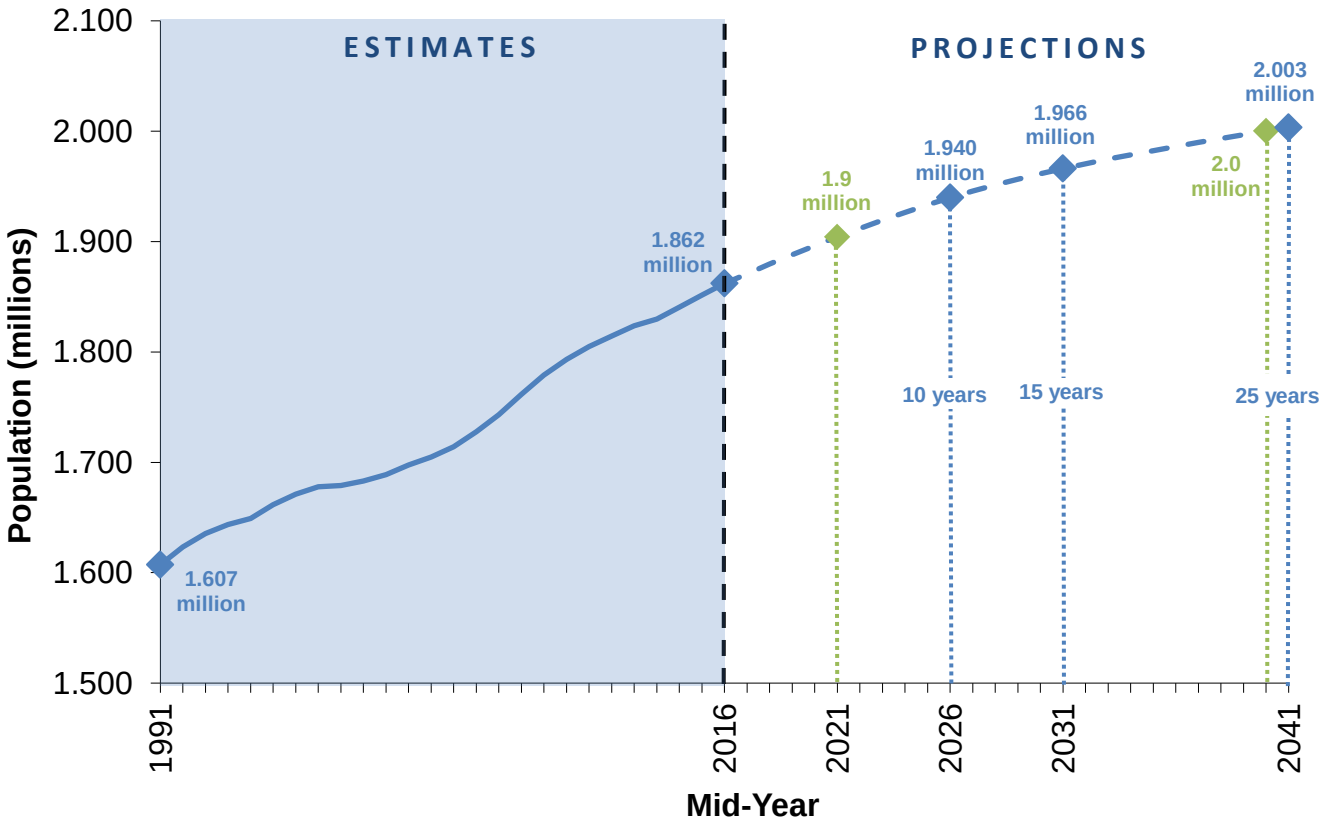
[3] Migration projections relating to flows to/from the rest of the UK are calculated by applying rates to the overall projected populations each year.

5 Population Projections for Northern Ireland

In mid-2016, the population in Northern Ireland was estimated to be 1.862 million people. The population projections show that this is projected to rise by 141,300 people to reach 2.003 million over the next 25 years to mid-2041 (see Figure 2). This equates to a 7.6 per cent increase, which is equivalent to an average annual growth rate of 0.3 per cent. By way of contrast, over the past 25 years (mid-1991 to mid-2016) the population grew by 254,800 people (15.9 per cent) which is equivalent to an average annual growth rate of 0.6 per cent.

Over the next 15 years from mid-2016 to mid-2031, the population in Northern Ireland is projected to increase by 104,000 people to 1.966 million. This equates to a 5.6 per cent increase, which is equivalent to an average annual growth rate of 0.4 per cent. As such, annual population growth is projected to slow down largely due to the gap between the number of births and the number of deaths narrowing.

Figure 2: Population of Northern Ireland, estimated and projected, mid-1991 to mid-2041 (non-zero y-axis)



*Figures for mid-1991 to mid-2016 relate to mid-year estimates.

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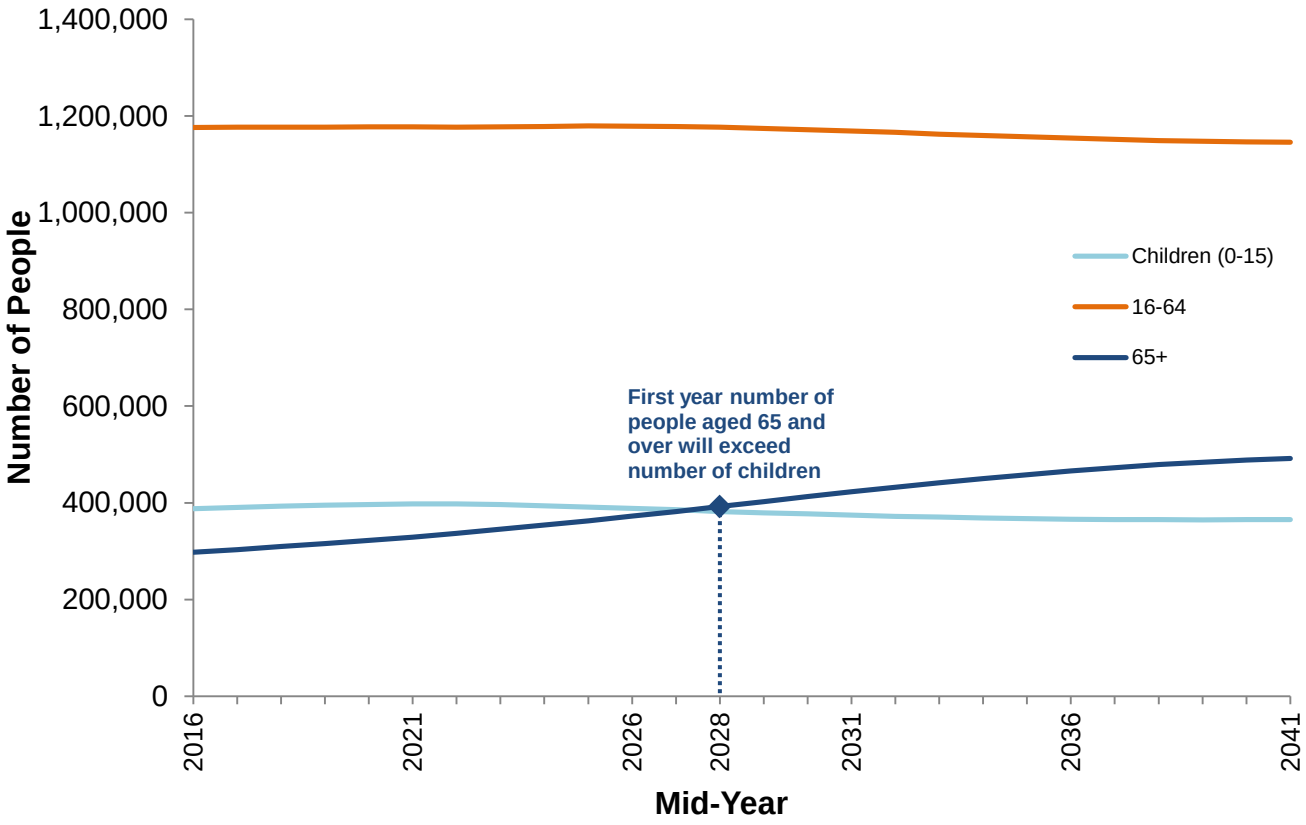
The population of Northern Ireland is projected to reach 1.9 million people by mid-2021, with the 2 million milestone being reached by mid-2040. In the year ending mid-2028, annual population growth is projected to fall below 0.3 per cent for the first time since mid-2000, due to a falling number of births and rising deaths as a result of an ageing population.

6 Population Projections by Age

As well as a projected growth in the overall numbers of people in Northern Ireland over the 25 year projection period, the age structure of the population is also projected to change.

Figure 3 below shows the projections for those aged 0 to 15 years (i.e. children), those aged 16 to 64 years and for those aged 65 and over.

Figure 3a: Projected population by age, mid-2016 to mid-2041



*Figures for mid-2016 relate to mid-year estimates.

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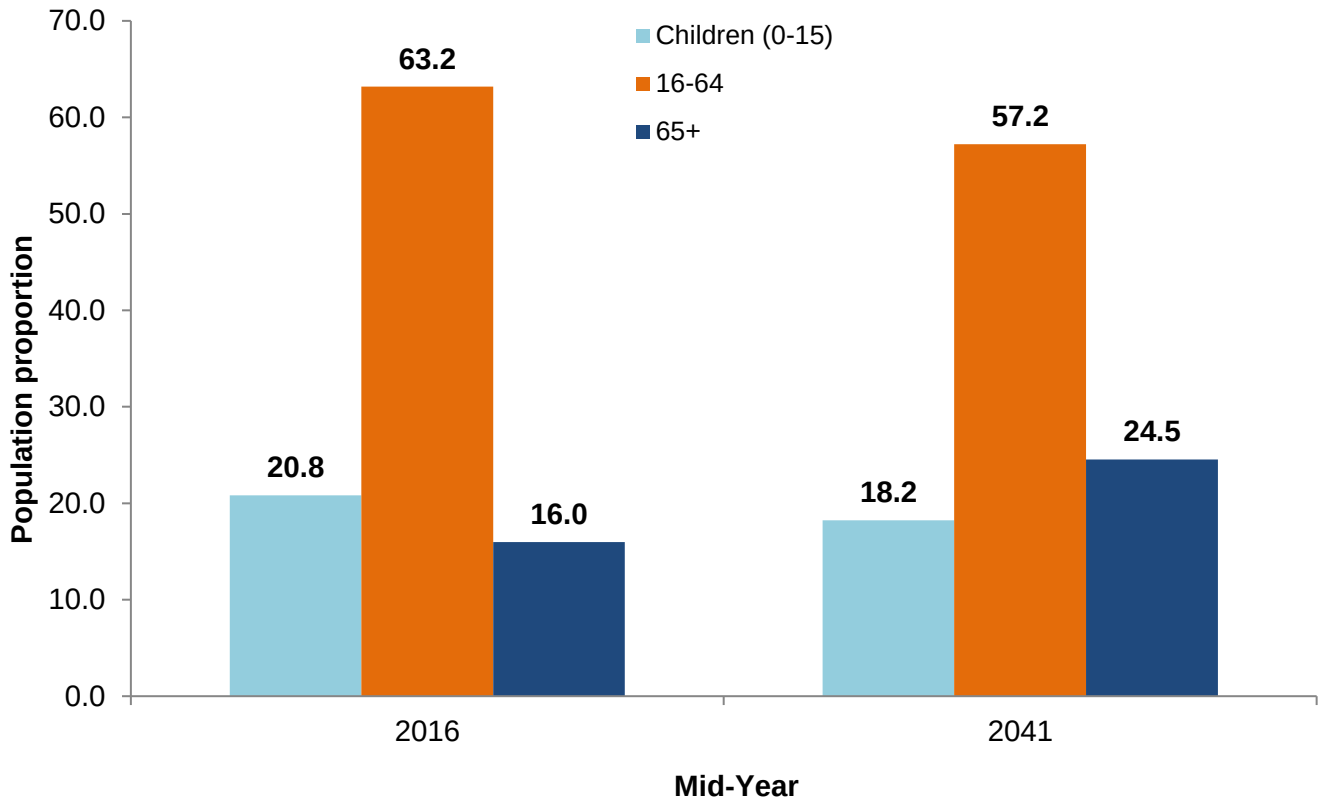
While the number of children and people aged 16 to 64 are both projected to decrease over the next 25 years, the number of people aged 65 and over is projected to increase. Figure 3a shows that from mid-2028 onwards, there is projected to be more people aged 65 and over than children, with the gap projected to widen.

Between mid-2016 and mid-2041, the population aged 65 and over is projected to increase by 65.1 per cent to reach 491,700 people. By mid-2041, it is projected that almost one in four of the population (24.5 per cent) will be aged 65 and over, whereas 18.2 per cent will be children (see Figure 3b).

Figure 3b: Estimated and projected proportion of population by age, mid-2016 and mid-2041



*Figures for mid-2016 relate to mid-year estimates.

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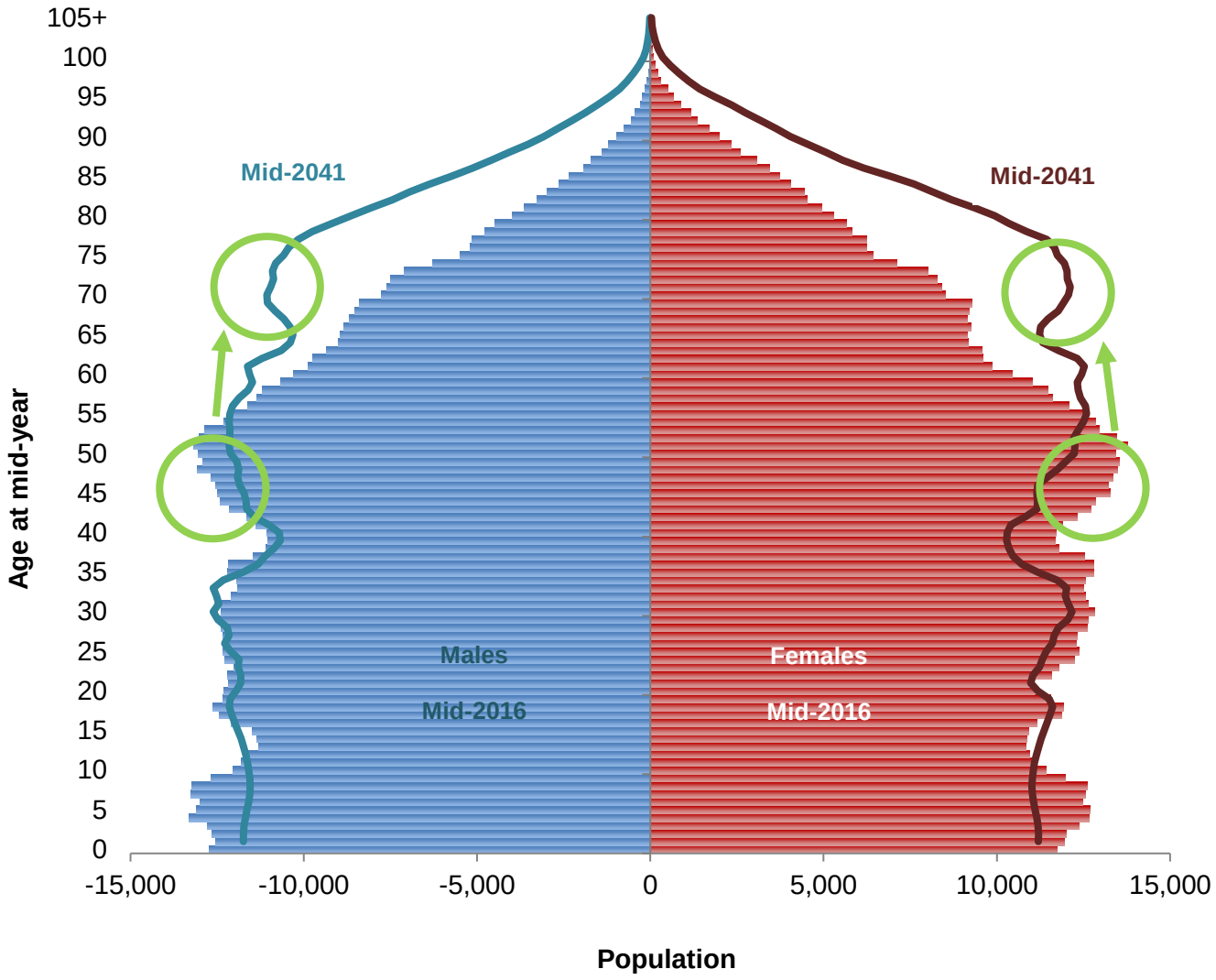
The projected change in age distribution over the 25 year projection period can be illustrated in a population pyramid (see Figure 4[4]), which shows the estimated mid-2016 and projected mid-2041 population by single year of age and sex.

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 and gender in the population. The horizontal bars represent the estimated population of mid-2016 and the lines represent the projected population for mid-2041.

[4] An Interactive Population Pyramid is also available.

Figure 4: Estimated and projected population by age and sex, mid-2016 and mid-2041



*Figures for mid-2016 relate to mid-year estimates.

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Figure 4 shows that the age profile of both the male and female population is projected to get older by mid-2041. Furthermore, an ageing population is also evident through the projected rise in the median age[5] from 38.3 years in mid-2016 to 43.5 years by mid-2041.

Figure 4 can also be used to illustrate the projected progression of the population as they age from mid-2016 to mid-2041. For example, those aged between 40 and 50 in mid-2016 (and therefore aged between 65 and 75 by mid-2041) have been identified for reference. The change in shape of the population pyramid to a more rectangular outline is evidence of an ageing population.

In terms of gender, although the life expectancy of females continues to be higher than that of males on average, the gap is closing, with the life expectancy of males projected to increase

[5] Median age is the age at which half of the population is older and half the population is younger.

from 79.0 years at birth in the year ending mid-2017, to 82.8 years at birth in the year ending mid-2041. This projected increase of 3.7 years for males marginally exceeds that for females (3.3 years over the same period). By mid-2041 it is projected that males will account for 42.9 per cent of the population aged 85 and over, rising from an estimated 33.2 per cent in mid-2016.

In general, the male population is projected to increase by more than the female population over the 25 year projection period (8.5 per cent for males and 6.7 per cent for females). This is reflected in the increase in the male/female sex ratio which is projected to increase from 96.7 males per 100 females to 98.3 over the 25 year period in question.

6.1 Children

In mid-2016 the number of children (i.e. those aged 0 to 15) was estimated to be 388,000 which represented 20.8 per cent of the population. The projections show that the population of children is projected to increase by 9,800 people in the 6 year period from mid-2016 to mid-2022, before decreasing by 23,300 people to mid-2031 and then by a further 9,100 people to mid-2041. Overall there is projected to be a 5.8 per cent decrease in the number of children over the 25 year period mid-2016 to mid-2041, with the population share decreasing from 20.8 per cent to 18.2 per cent (see Table 1).

Table 1: Projected population of Children, mid-2016 to mid-2041

Mid-year	Number of Children	Population Proportion	Change from Mid-2016	Total Population
2016	388,000	*20.8*	-	**1,862,100**
2021	397,600	*20.9*	*2.5*	**1,904,200**
2022	*397,800*	*20.8*	*2.5*	***1,911,900***
2026	388,600	*20.0*	*0.1*	**1,939,700**
2031	374,400	*19.0*	*-3.5*	**1,966,200**
2036	366,000	*18.4*	*-5.7*	**1,986,200**
2041	365,400	*18.2*	*-5.8*	**2,003,400**

*Figures for mid-2016 relate to mid-year estimates.

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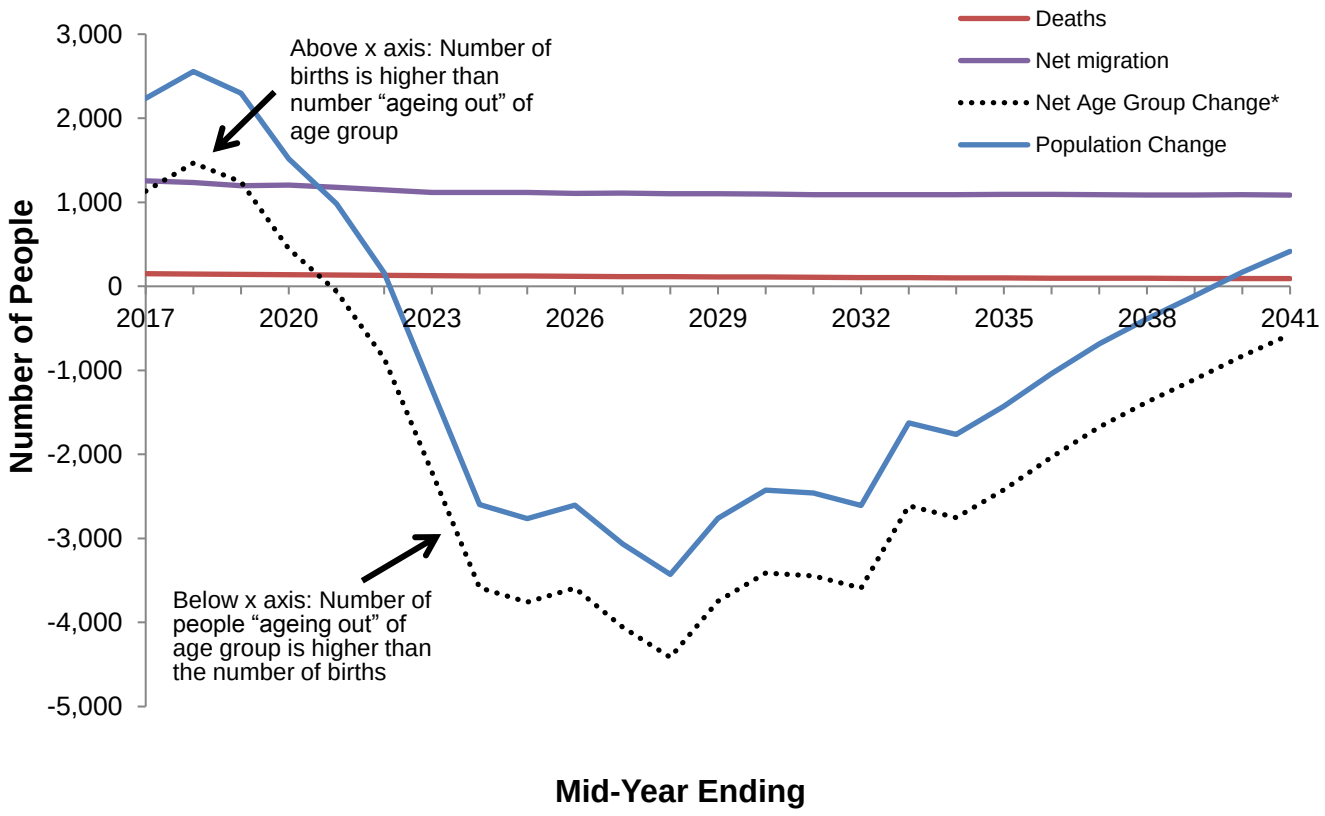
The number of deaths among children is projected to remain at around 100 per annum throughout the 25 year period. While there is projected to be a year-on-year net inflow of children in the projection period due to migration, this net inward migration is projected to decrease from 1,300 in the year ending mid-2017, to 1,100 in the year ending mid-2041. The relatively minimal role that deaths and net-migration have on the change in projections of children from year to year can be seen in Figure 5, where the red and purple lines follow a broadly level trend.

Since deaths are projected to have relatively little impact over the next 25 years, the projected change in the population of children during the projection period can be mainly attributed to (i)

the number of babies born each year minus the number of people turning 16 each year – referred to as “net age group change” and (ii) net inward migration of around 1,100 people per annum.

This is demonstrated in Figure 5 where the projected trend in “net age group change” closely follows the projected population change in children over the 25 year period.

Figure 5: Projected population change for children (aged 0-15 years), year ending mid-2017 to year ending mid-2041



*Net Age Group Change is defined as those 'ageing into' the age group (i.e. Births) minus those ‘ageing out’ (i.e. those turning 16).

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A combination of positive “net age group change” and net inward migration sees the projected population of children increase from 388,000 in mid-2016 to 397,800 by mid-2022. From mid-2022 onwards the projected number of children starts to decline to a low of 364,800 in mid-2039, largely due to the number of people “ageing out” exceeding the combination of births and net inward migration, before recovering slightly to 365,400 between mid-2039 and mid-2041.

6.2 People Aged 16 to 64

In mid-2016 the number of people aged 16 to 64 was estimated to be 1,176,400 which represented 63.2 per cent of the population. The projections show that the population of those aged 16 to 64 is projected to increase by 3,100 people in the 9 year period from mid-2016 to mid-2025, before decreasing by 10,600 people to mid-2031 and then by a further 22,600 people to mid-2041. Overall, a 2.6 per cent decrease in the number of people aged 16 to 64 over is projected during the 25 year period mid-2016 to mid-2041, with their population share decreasing by six percentage points from 63.2 per cent to 57.2 (see Table 2).

Table 2: Projected population of people aged 16 to 64, mid-2016 to mid-2041

Mid-year	Number aged 16-64	Population Proportion	Change from Mid-2016	Total Population
2016	1,176,400	*63.2*	*-*	**1,862,100**
2021	1,177,500	*61.8*	*0.1*	**1,904,200**
2025	*1,179,500*	*61.0*	*0.3*	***1,933,300***
2026	1,178,900	*60.8*	*0.2*	**1,939,700**
2031	1,168,900	*59.5*	*-0.6*	**1,966,200**
2036	1,154,500	*58.1*	*-1.9*	**1,986,200**
2041	1,146,300	*57.2*	*-2.6*	**2,003,400**

*Figures for mid-2016 relate to mid-year estimates.

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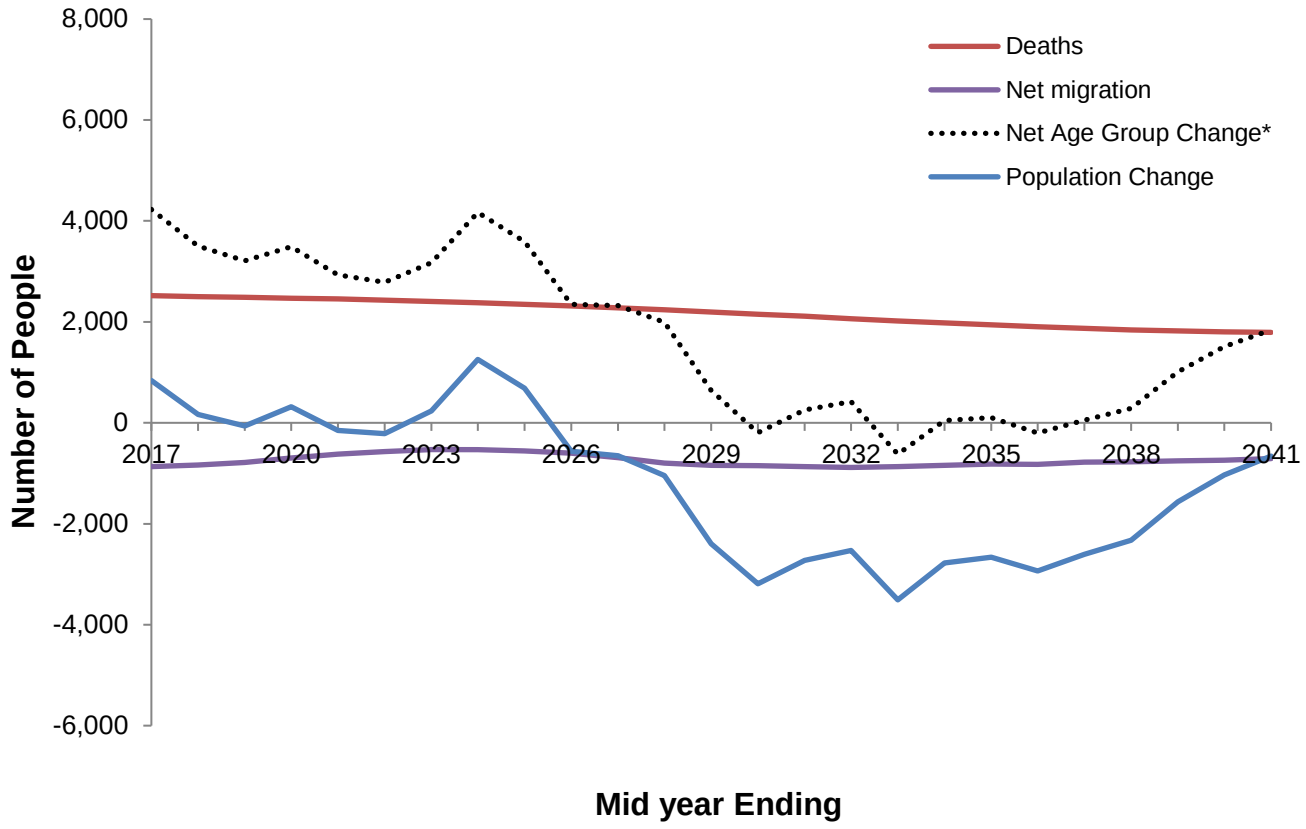
Over the projection period, the projected numbers of those aged 16 to 64 are affected by (i) an average annual net loss of 700 people due to migration and (ii) a decreasing number of deaths among people aged 16 to 64 (falling from 2,500 in the year ending mid-2017 to 1,800 in the year ending mid-2041; a decrease of 28.9 per cent).

As might be expected though, the projections closely follow the trend of the difference between the number of people “ageing into” and “ageing out of” this age group (i.e. those turning 16 and those turning 65 respectively).

Figure 6: Projected population change for people aged 16-64, year ending mid-2017 to year ending mid-2041



*Net Age Group Change is defined as those ageing into the age group (i.e. those turning 16) minus those 'ageing out' (i.e. those turning 65).

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Projected increases in the number of people ageing out of the 16 to 64 age group means that there will, in turn, be increases in the number of people ageing into the age group of those aged 65 and over. This, along with a general decrease in the population aged under 65, is indicative of an ageing population over the projection period.

6.3 People Aged 65 and Over

In mid-2016 the number of people aged 65 and over was estimated to be 297,800 which represented 16.0 per cent of the population. The projections show that the population of those aged 65 and over is projected to increase continually over the projection period. By mid-2031 the population aged 65 and over is projected to increase by 125,100 to 422,800 people, increasing by a further 68,900 to 491,700 people by mid-2041. In the 25 years to mid-2041, the population aged 65 and over is projected to have increased by 65.1 per cent, increasing its population share to 24.5 per cent (see Table 3). Interestingly, the number of people aged 65 and over is projected to exceed the number of children from mid-2028 onwards.

Table 3: Projected population of people aged 65 and over, mid-2016 to mid-2041

Mid-year	Number aged 65 and over	Population Proportion	Change from Mid-2016	Total Population
2016	297,800	*16.0*	-	**1,862,100**
2021	329,100	*17.3*	*10.5*	**1,904,200**
2026	372,300	*19.2*	*25.0*	**1,939,700**
2028	*392,100*	*20.1*	*31.7*	***1,951,300***
2031	422,800	*21.5*	*42.0*	**1,966,200**
2036	465,700	*23.4*	*56.4*	**1,986,200**
2041	491,700	*24.5*	*65.1*	**2,003,400**

*Figures for mid-2016 relate to mid-year estimates.

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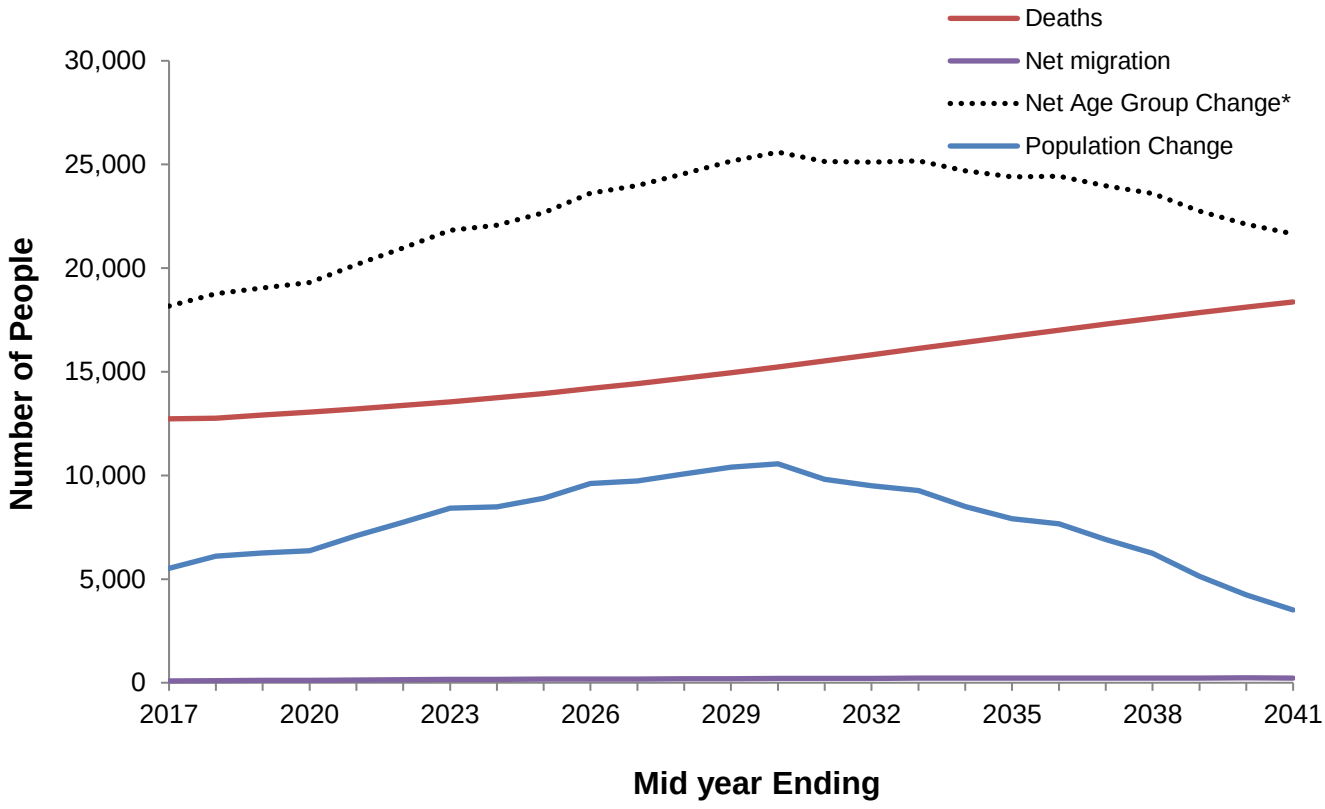
Over the 25 year projection period from mid-2016 to mid-2041, migration accounts for less than three per cent of the total increase of people aged 65 and over. Therefore, the population growth is due to more people ageing into this age group than deaths (see Figure 7).

Figure 7: Projected population change for people aged 65 and over, year ending mid-2016 to year ending mid-2041



*Net Age Group Change is defined as those ageing into the age group (i.e. those turning 65).

Download Chart (XLS Format 221KB)

6.4 People Aged 85 and Over

In mid-2016 the number of people aged 85 and over was estimated to be 36,500 which represented 2.0 per cent of the population. The projections show that the population of those aged 85 and over is projected to increase continually over the projection period. By mid-2031 the population aged 85 and over is projected to increase by 23,800 to 60,300 people, increasing by a further 22,600 to 82,800 people by mid-2041. In the 25 years to mid-2041, the population aged 85 and over is projected to have increased by 127.2 per cent, increasing its population share to 4.1 per cent. By mid-2037, it is projected that there will be more than twice as many people aged 85 and over than was the case in mid-2016 (see Table 4).

Table 4: Projected population of people aged 85 and over, mid-2016 to mid-2041

Mid-year	Number aged 85 and over	Population Proportion	Change from Mid-2016	Total Population
2016	36,500	*2.0*	-	**1,862,100**
2021	41,100	*2.2*	*12.8*	**1,904,200**
2026	47,900	*2.5*	*31.4*	**1,939,700**
2031	60,300	*3.1*	*65.3*	**1,966,200**
2036	72,600	*3.7*	*99.0*	**1,986,200**
2037	*74,300*	*3.7*	*103.9*	***1,989,800***
2041	82,800	*4.1*	*127.2*	**2,003,400**

*Figures for mid-2016 relate to mid-year estimates.

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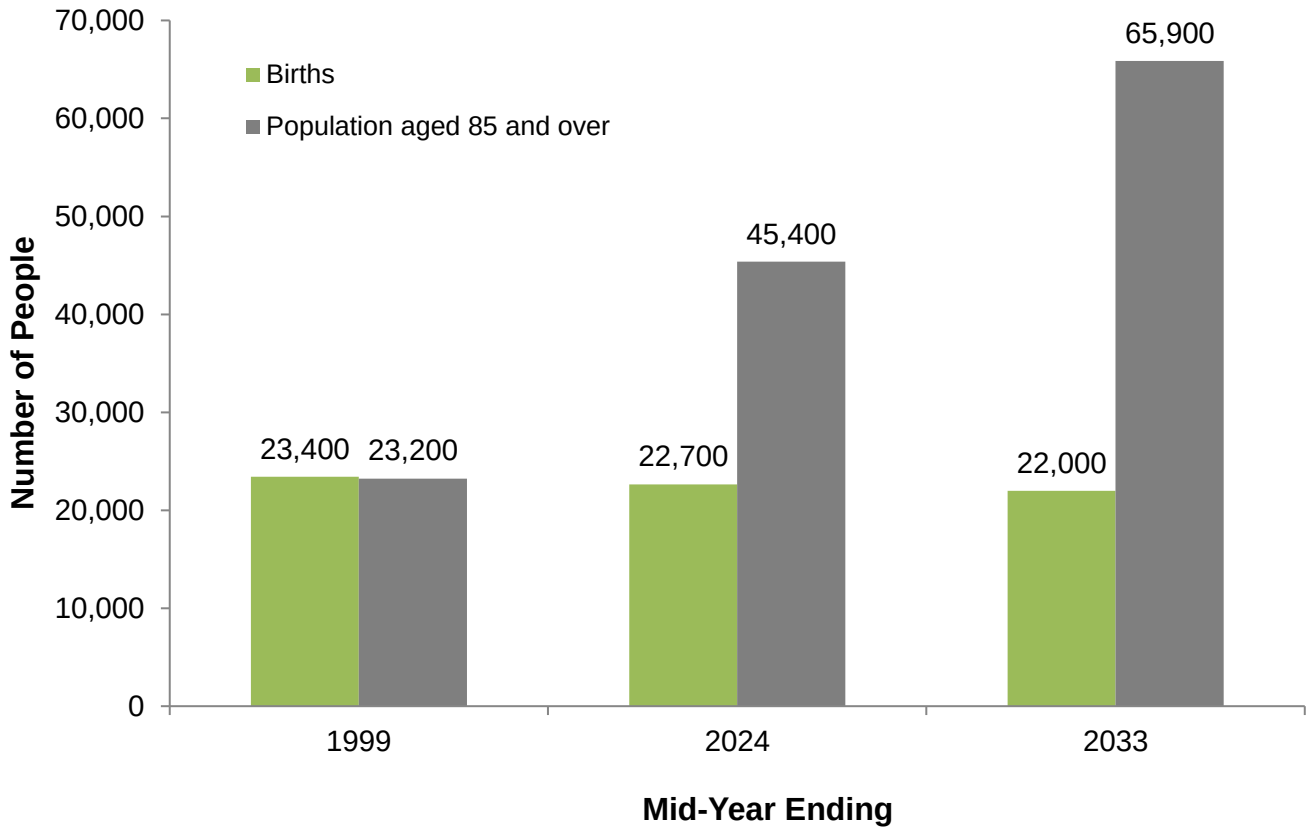
It is interesting to note that in mid-1999 the estimated number of people aged 85 and over was almost the same as the number of births in that year, while by mid-2024 (25 years later) there is projected to be twice as many people aged 85 and over than the number of births. Looking further ahead, it is projected to be only another nine years later (i.e. by mid-2033) before the number of people aged 85 and over becomes almost three times the number of births. These relationships between the number of births and the older population give a further indication of the ageing population of Northern Ireland.

Figure 8: Projected population aged 85 and over alongside the number of births, years ending mid-1999, mid-2024, and mid-2033



*Figures for mid-1999 relate to mid-year estimates.

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6.5 Working Age[6] Population

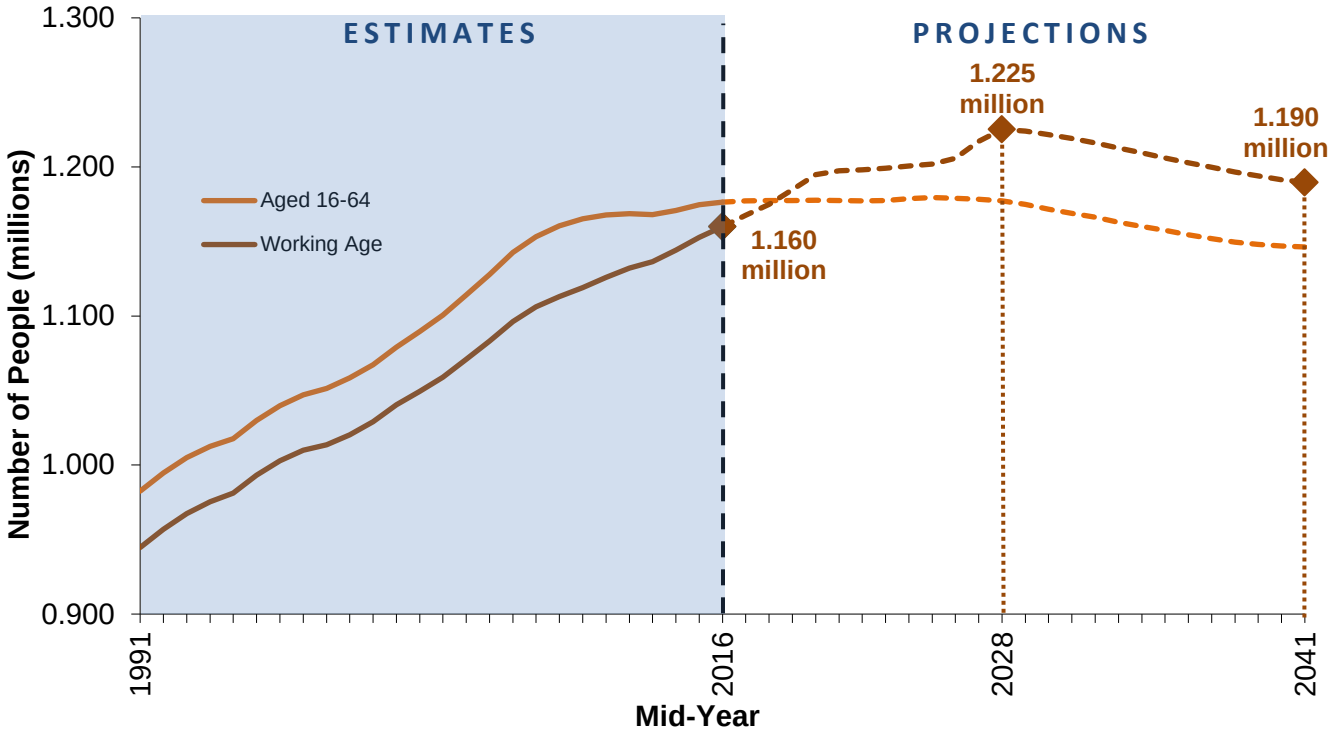
Since 6 April 2010, the state pensionable age for women has been gradually increasing from 60 to bring it in line with the state pensionable age of 65 for men[7]. Under current legislation, women's state pensionable age will reach 65 by November 2018. Furthermore, from December 2018, the state pension age for both men and women will start to increase to reach 66 by October 2020 and subsequently increase to 67 between 2026 and 2028.

Taking this into account, the number of people of working age in Northern Ireland is projected to rise by 5.6 per cent from 1,159,900 in mid-2016 to a peak of 1,225,200 people in mid-2028. Between mid-2028 and mid-2041, the population of working age is then projected to decrease by 2.9 per cent to 1,189,600 (see Figure 9).

[6] Working age population takes into account the changes in pensionable age resulting from the Pensions Act 2011 and the Pensions Act 2014.

[7] Further information on State Pension Age and a current timetable can be found here.

Figure 9: Estimated and projected population aged 16 to 64 and working age, mid-1991 to mid-2041 (non-zero y-axis)



*Figures for mid-1991 to mid-2016 relate to mid-year estimates.

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6.6 Dependency Ratios

A dependency ratio gives insight into the number of people of non-working age compared to the number of those of working age[8]. A high ratio means that those of working age, and therefore the overall economy, face a greater burden in supporting the greater number of people of non-working age (typically the elderly and/or young). The dependency ratios in this bulletin are defined as:

$$\textbf{Total} = \frac{\text{The number of people of non-working age}}{\text{The number of people of working age}} \times 1000$$

$$\textbf{Children} = \frac{\text{The number of people aged 0 to 15 years}}{\text{The number of people of working age}} \times 1000$$

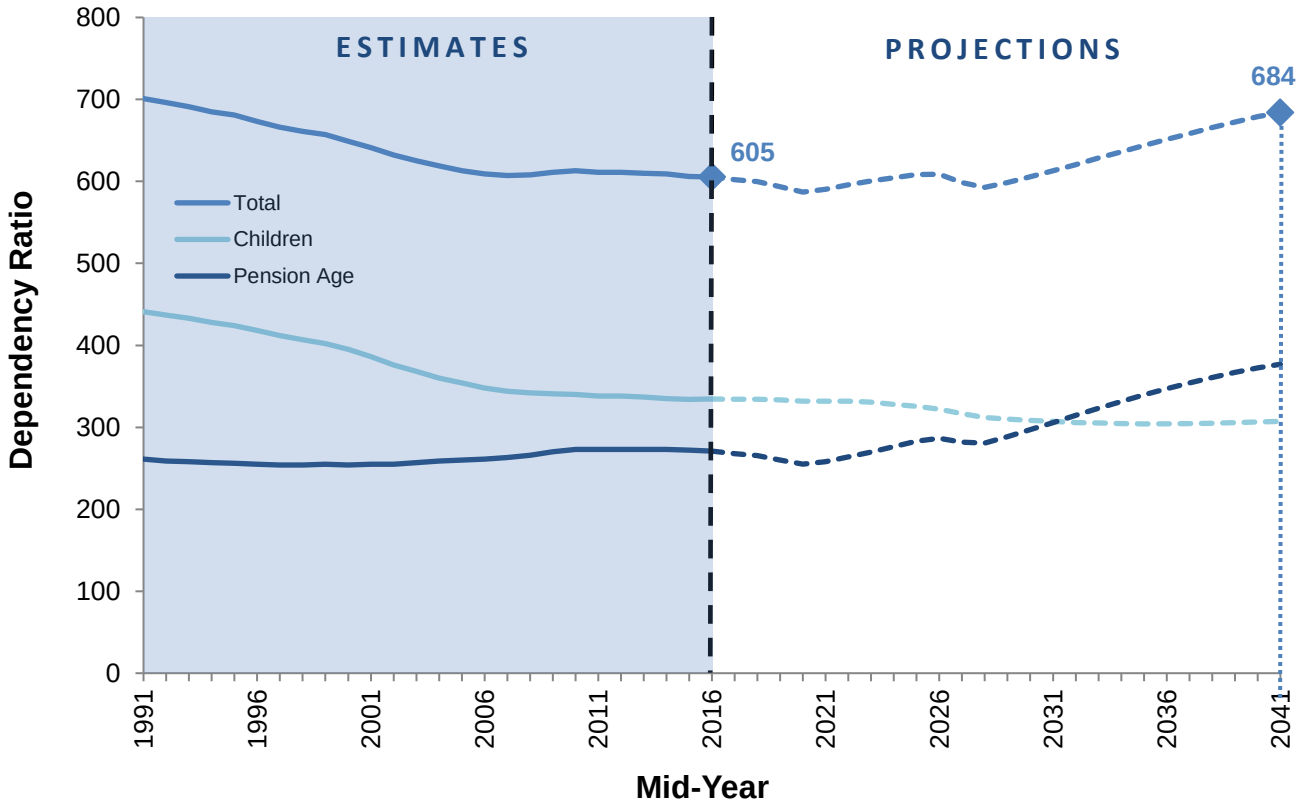
$$\textbf{Pension age} = \frac{\text{The number of people of pensionable age}}{\text{The number of people of working age}} \times 1000$$

[8] 'Working age' and 'pensionable age' take account of the changes resulting from the Pensions Act 2011 and the Pensions Act 2014.

It is important to note that dependency ratio figures should be used with care. For example, not all people of working age will be economically active or in full time employment (e.g. students). Furthermore, not all people who are eligible for retirement will leave their employment, or become dependent on others if they do retire. Despite these limitations, dependency ratios remain a useful tool for analysing the population's relative age structure.

Figure 10 shows that the total dependency ratio is projected to decrease between mid-2016 and mid-2020 before beginning to rise again. Between mid-2016 and mid-2041, an overall increase of approximately 80 children and people of pensionable age per 1,000 people of working age is projected (rising from 605 per 1,000 to 684 per 1,000). In mid-2039 the total dependency ratio is protected to reach the level it was in 1996 (673 people per 1,000 people of working age).

Figure 10: Estimated and projected dependency ratios for children and pension age, mid-1991 to mid-2041



*Figures for mid-1991 to mid-2016 relate to mid-year estimates.

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The composition of the total dependency ratio has been changing over the past twenty five years to mid-2016. In mid-1991 children accounted for just under two thirds (62.9 per cent) of the total number of "dependents" per 1,000 people of working age. This decreased to just over half (55.3 per cent) in mid-2016. Figure 10 shows that the reason for this change is mainly due to a decrease in the ratio of children per 1,000 people of working age. However, by mid-2008, the children's ratio dependency more or less stabilises. This stability is projected to continue, relative to the dependency ratio of people of pensionable age, which is projected to increase from 271

to 377 people per 1,000 people of working age between mid-2016 and mid-2041. By mid-2041, the change in total dependency ratio is projected to be largely attributed to an increase in the number of people of pensionable age per 1,000 people of working age.

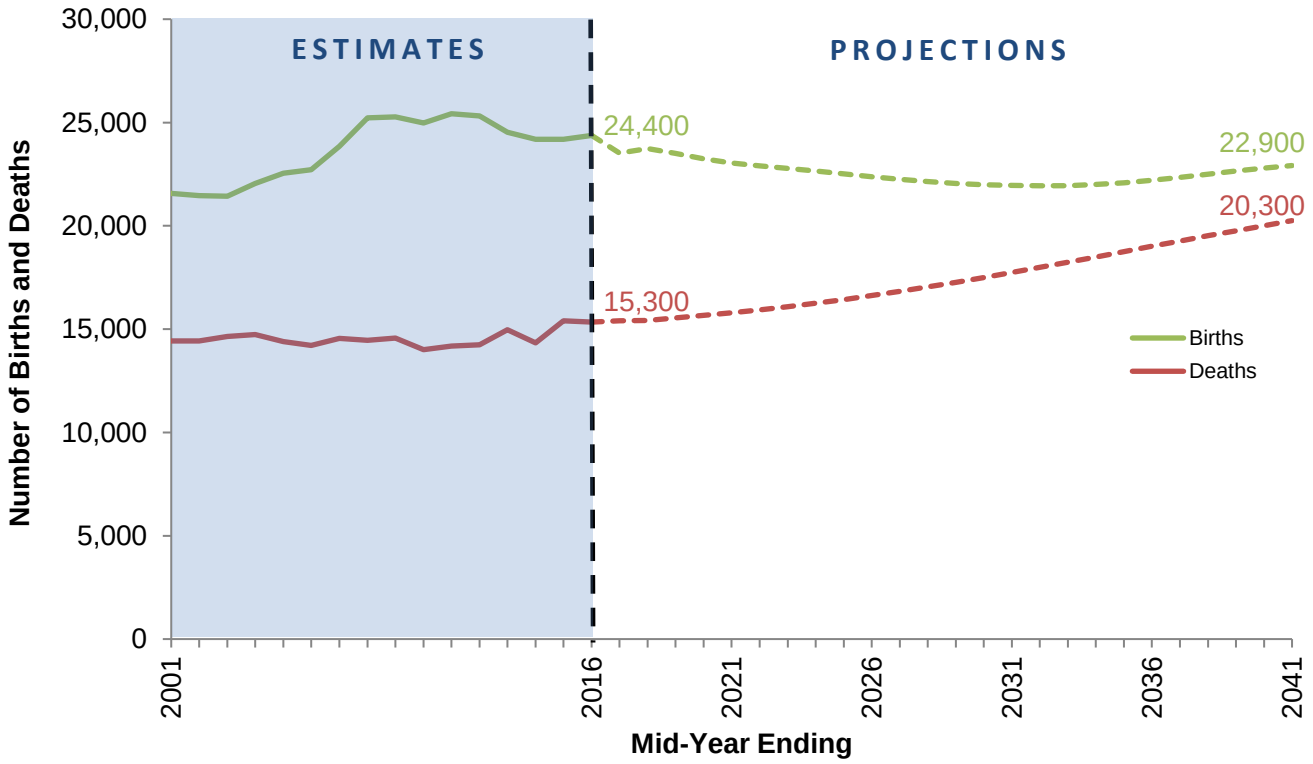
7 Projected Components of Change

7.1 Births and Deaths

The projected number of births and deaths results from the assumptions on age-specific fertility and mortality rates (see Section 12). As a consequence the projected size of the population each year has a direct impact on the number of projected births and deaths. For example, the projected number of annual births are determined by applying age-specific fertility rates to the projected female population of child bearing age (i.e. females aged 15 to 44 years) each year.

The number of births is projected to decrease to a low of 21,900 births in the year ending mid-2032 (down 10.0 per cent from the year ending mid-2016). After that the number of births recovers to 22,900 by the year ending mid-2041. Over the 25 year projection period to mid-2041 the number of births is projected to decrease by 6.0 per cent. In contrast, the number of deaths is projected to increase by 32.0 per cent during the same period (from 15,300 to 20,300) (see Figure 11).

Figure 11: Estimated and projected births and deaths, year ending mid-2001 to year ending mid-2041



*Figures for year ending mid-2001 to year ending mid-2016 relate to mid-year estimates.

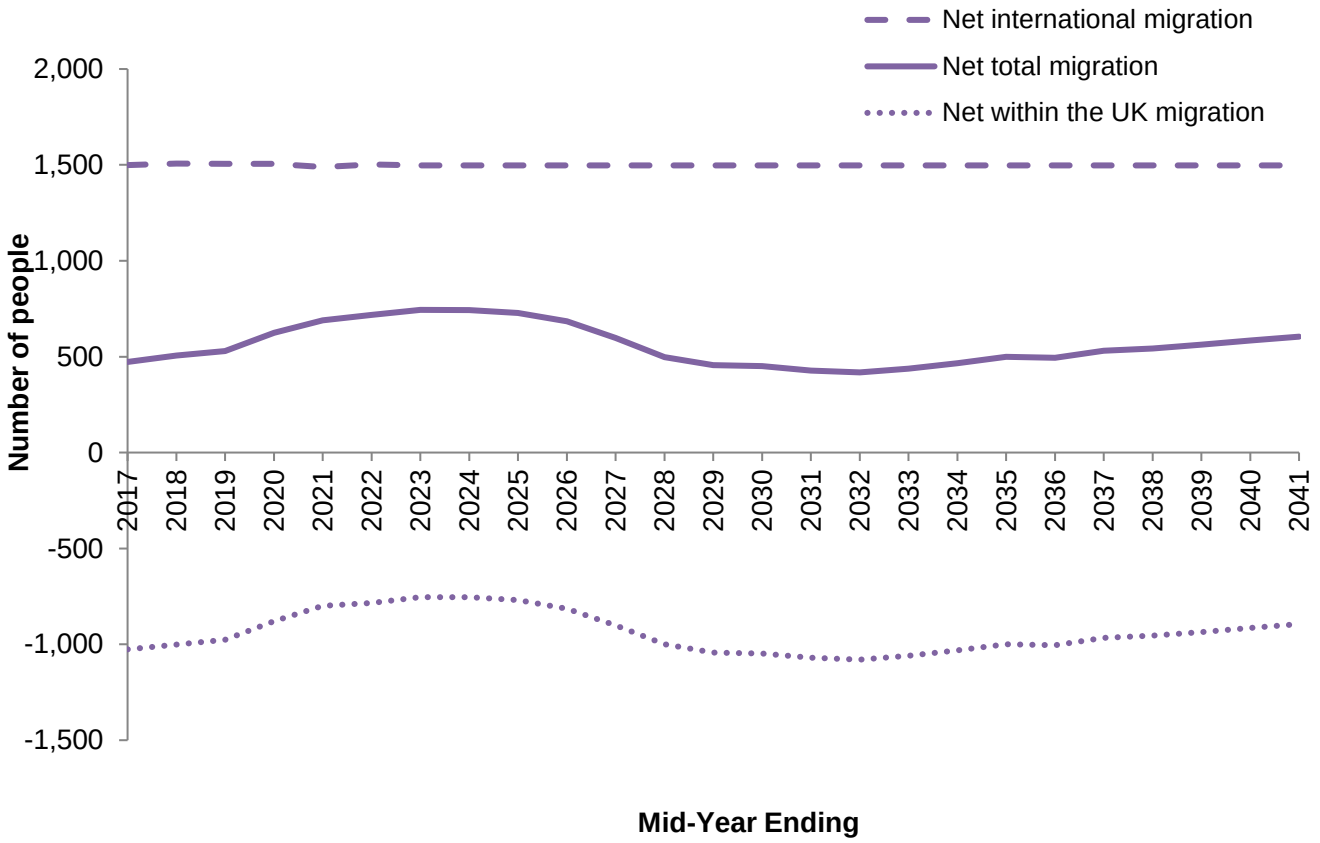
Download Chart (XLS Format 190KB)

7.2 Migration

Projected migration figures comprise of two components, namely (i) migration between Northern Ireland and countries outside the UK (referred to as 'international migration') and (ii) migration between Northern Ireland and the rest of the UK (referred to as 'within the UK migration').

The projections assume, based on past trends, that Northern Ireland will experience a net inflow of 1,500 international migrants each year. The within the UK migration component however varies throughout the projection period and is derived by applying agreed age-sex specific in and out migration rates to the projected population at the outset of each year. By way of contrast, the latter results in a net outflow to the rest of the UK throughout the projection period. The combination of these two components results in more people entering Northern Ireland over the projection period than are leaving on a year by year basis, giving rise to an overall position of net inward migration as depicted in Figure 12 below.

Figure 12: Projected migration, year ending mid-2017 to year ending mid-2041



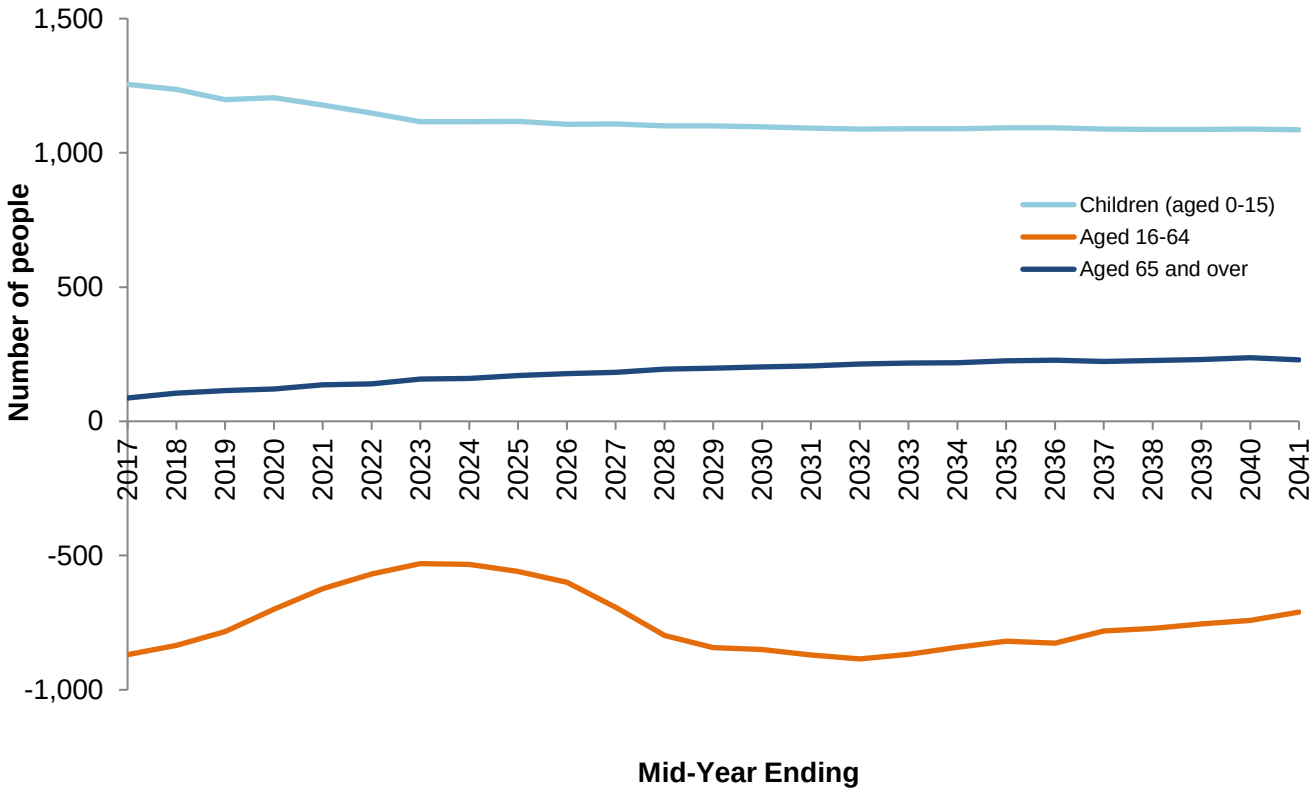
Download Chart (XLS Format 176KB)

In terms of the trend, Northern Ireland's level of net inward migration is projected to increase from 500 people in the year ending mid-2017 to 700 people in the year ending mid-2023, before falling to 400 in the year ending mid-2032. From mid-2032 onwards the positive net inflow will rise to 600 people by the year ending mid-2041. Against this background, it should be noted

that both the levels of in-migration and out-migration are projected to decrease over the projection period by 11.6 per cent and 12.4 per cent respectively.

Figure 13 below, which presents the projected net migration by age, points to a net positive inflow among both children and those aged 65 and over, with the former being noticeably larger than the latter. In contrast, an annual but variable net loss of people aged 16-64 is projected, ranging from a loss of 900 in the years ending mid-2017 and mid-2030 to mid-2033, to a loss of 500 in the years ending mid-2023 and mid-2024. This has implications for the labour market in Northern Ireland and contributes to the rise in dependency ratios discussed earlier.

Figure 13: Projected net migration by age, year ending mid-2017 and year ending mid-2041



Download Chart (XLS Format 176KB)

It should be noted that the projected migration flows have an indirect effect on the projected number of future births and deaths. For example, if people of childbearing age are leaving/entering Northern Ireland, this will affect the number of births projected to take place in the future. A similar relationship occurs with mortality rates.

8 Comparison of population projections within the UK

The Northern Ireland population projections are produced as part of the UK population projections. These include figures for each of the four UK countries (England, Wales, Scotland and Northern Ireland) and, as such, provide consistent comparable results for across the UK. Long-term assumptions are set for each country separately based on regional demographic trends.

8.1 Projected Population

Between mid-2016 and mid-2041, the Northern Ireland population is projected to grow by 7.6 per cent, compared to a growth of 11.2 per cent for the rest of the UK. The projected increase in the rest of the UK can be mainly attributed to England (a 12.1 per cent increase), which historically receives the vast majority of net migration and has the highest life expectancy of the four countries. Aided by relatively high fertility rates, the projected Northern Ireland population growth of 7.6 per cent is greater than that in Wales and Scotland (4.6 per cent and 5.3 per cent respectively). Having said that, Northern Ireland's share of the United Kingdom population is projected to decrease from 2.8 per cent in mid-2016 to 2.7 per cent in mid-2041.

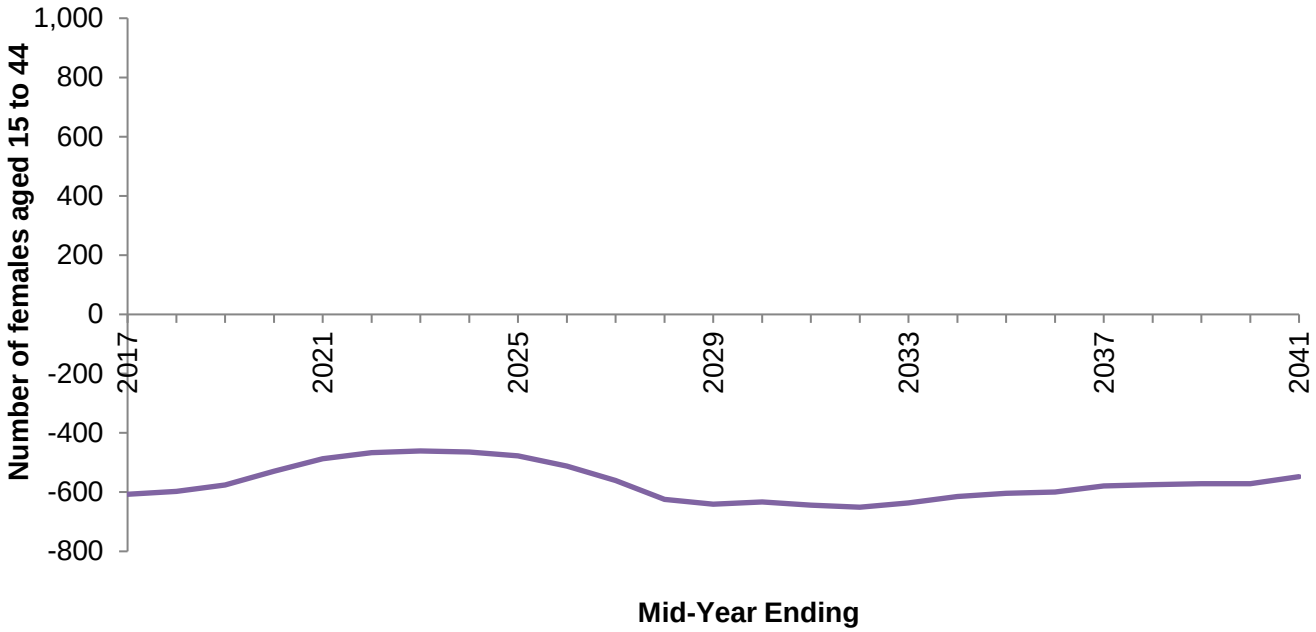
Out of all the UK countries, at 34.8 per cent Northern Ireland had the largest percentage growth of people aged 85 and over between mid-2006 and mid-2016[9]. This is projected to continue over the 25 year period between mid-2016 and mid-2041, with the number of people aged 85 and over projected to increase by 127.2 per cent in Northern Ireland, compared with 107.1 per cent for the rest of the UK.

8.2 Fertility and Births

Whilst Northern Ireland has the highest fertility assumption (with the total fertility rate (TFR) projected to reach 2.00 by mid-2041), it is the only country in the UK which is projected to experience a decrease in births from the year ending mid-2017 to the year ending mid-2041 (a 2.6 per cent decrease). This is due to a net outflow of women of child-bearing age projected to occur each year between mid-2017 and mid-2041 due to migration (see Figure 14).

[9] See Estimates of the population aged 85 and over 2016 for more information.

Figure 14: Projected net migration among women of child-bearing years (aged 15 to 44), year ending mid-2017 and year ending mid-2041



Download Chart (XLS Format 171KB)

Scotland's TFR is projected to reach 1.65 by mid-2041, the lowest of all UK countries, while the TFRs of both England and Wales are projected to reach 1.85 by mid-2041. All countries of the UK, with the exception of Northern Ireland, are projected to have overall increases in births between mid-2016 and mid-2041 (4.4 per cent in England; 2.9 per cent in Scotland; 2.2 per cent in Wales). This is partly because they are all projected to have annual net inflows of females of child-bearing age due to migration throughout the projection period.

8.3 Deaths and Life Expectancy

Northern Ireland is projected to have the largest increase in deaths between mid-2016 and mid-2041 (31.5 per cent), followed by England (23.7 per cent), Scotland (14.9 per cent), and then Wales (14.2 per cent). This may in part be related to the fact that Northern Ireland's population is ageing faster than in the rest of the UK. For example, growth among the Northern Ireland population aged 65 and over (65.1 per cent) is projected to exceed that in the rest of the United Kingdom (50.2 per cent).

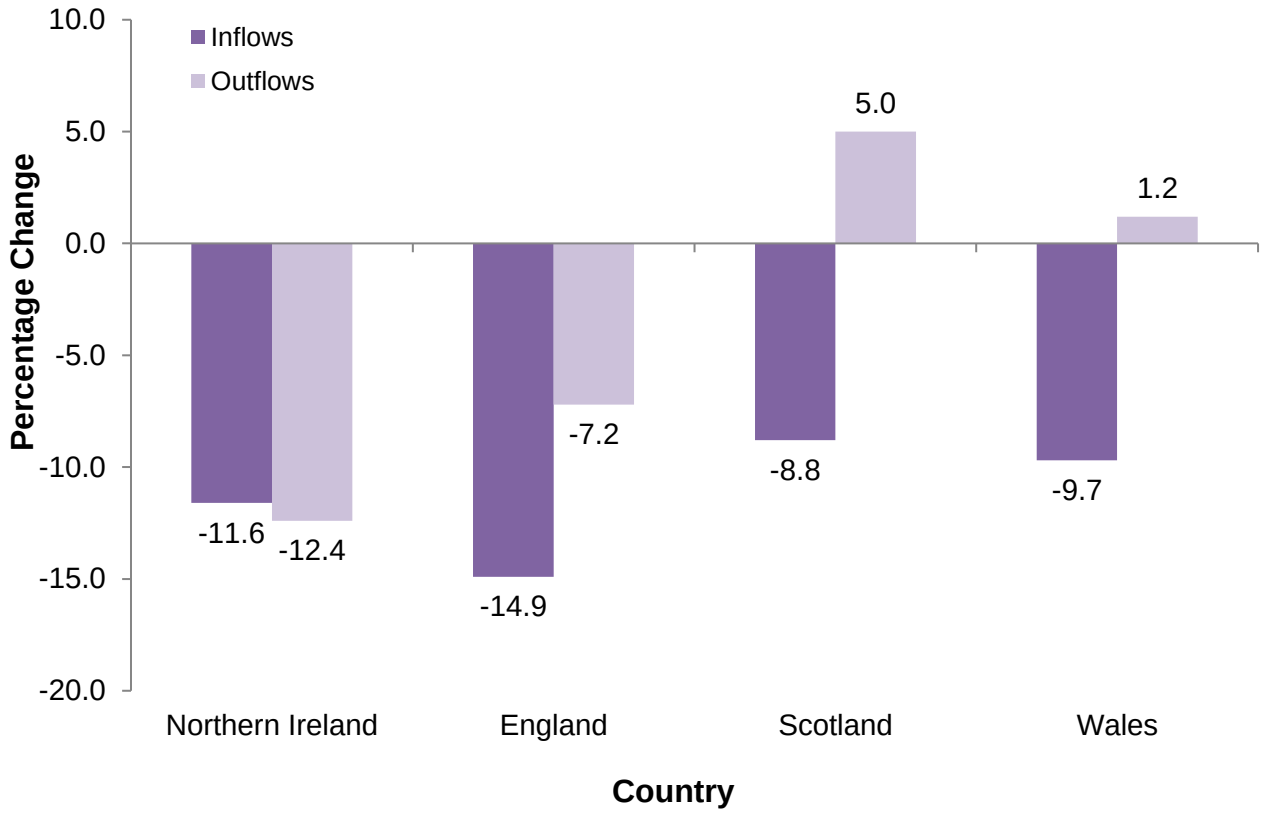
Life expectancy at birth for Northern Ireland is projected to be 79.0 years for males and 82.4 years for females in the year ending mid-2017. These are projected to rise to 82.8 years for males and 85.8 years for females in mid-2041 (rises of 3.7 years and 3.3 years respectively). Life expectancy at birth for the UK as a whole is projected to be 79.4 years for males and 83.0 years for females in the year ending mid-2017. These are projected to rise to 83.4 years for males and 86.2 years for females in mid-2041 (rises of 4.0 years and 3.2 years respectively).

8.4 Migration

Figure 15 shows that between year ending mid-2017 and year ending mid-2041, all UK countries are projected to experience a proportional decrease in the number of inflows into their territories, with Northern Ireland having the second largest proportional decrease in inflows at 11.6 per cent. Scotland and Wales are the only countries projected to experience a proportional increase in outflows (5.0 per cent and 1.2 per cent respectively).

Overall, while each country is projected to have positive annual net inward migration throughout the projection period, they are all projected to have decreases in inflows between mid-2016 and mid-2041.

Figure 15: Projected change in migration* inflows and outflows by Country, year ending mid-2017 to year ending mid-2041



* The International Passenger Survey (IPS) is used by England, Wales and Scotland to estimate international migration, while in Northern Ireland Medical Card data[10] are used. More details are available in the Limitations Section of this bulletin.

Download Chart (XLS Format 182KB)

[10] In previous reports, medical card data was referred as “health card” data.

9 Comparison of population projections with the Republic of Ireland

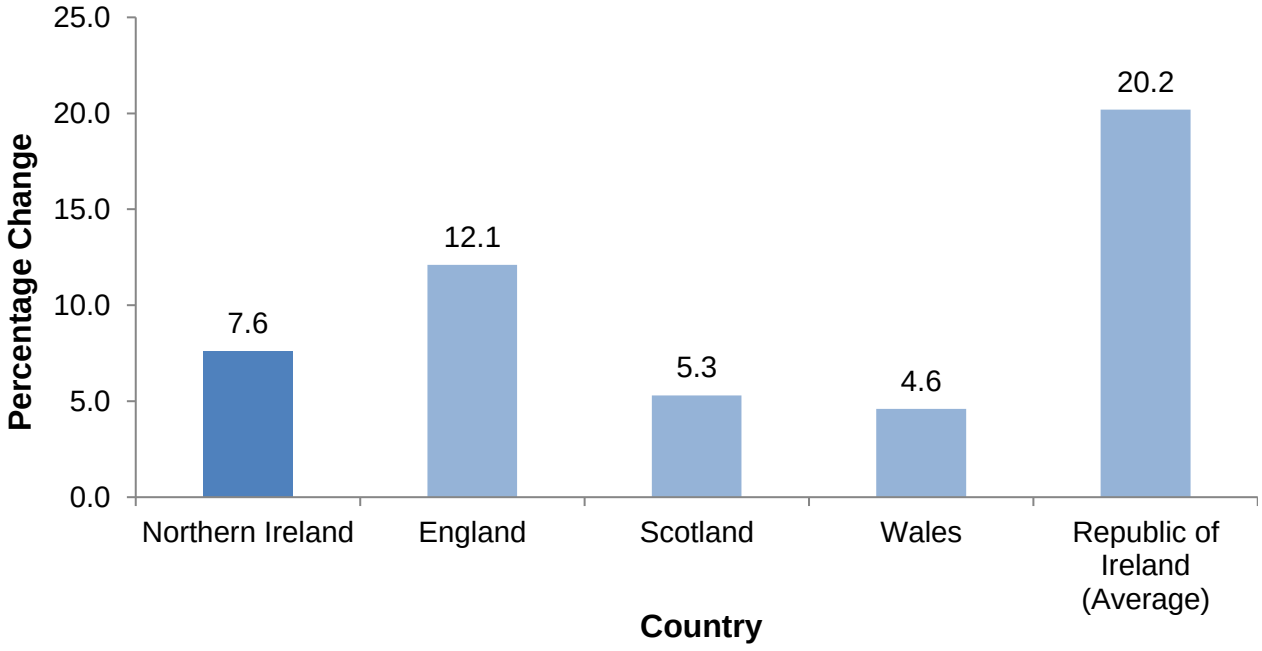
Population projections for the Republic of Ireland (RoI) are produced by the Central Statistics Office Ireland (CSO). Unlike UK projections, the CSO does not produce a principal projection; whilst there is a single assumption on life expectancy, there are two variant fertility assumptions (high/low) and three migration scenarios. In addition, projections relate to April of each year while the UK projections relate to 30 June each year.

For the purposes of comparing the Republic of Ireland population projections with those of the UK, an average has been taken of the six Republic of Ireland projection variants. No adjustment has been made for the differing timescales of the data.

When averaged in this way, the most recent population projections published by the CSO (Population and Labour Force Projections 2016-2046) suggest a population growth of 20.2 per cent in the Republic of Ireland between 2016 and 2041. This average increase is higher than projected for all four UK countries over the same period (see Figure 16).

Part of this increase may be linked to a high fertility rate in the RoI. For instance, RoI's long-term high fertility assumption is that the TFR remains at 2.10. In contrast the low fertility variant assumes that the TFR will decrease to 1.80 by 2026. This low fertility assumption is still higher than the principal long-term fertility assumption of 1.65 for Scotland (which is the lowest for the UK countries).

Figure 16: Projected population change by UK countries and RoI, 2016 to 2041



* Projections for the UK relate to mid-years (i.e. 30 June each year). Projections for the Republic of Ireland relate to April each year.

Download Chart (XLF Format 178KB)

10 Comparison with 2014-based Population Projections

The 2014-based population projections were published two years ago in October 2015[11]. They were based on the mid-2014 estimates and assumptions around future fertility, mortality and migration which were determined from trends available at that time. This section provides a brief comparison of the differences between the old 2014-based projections and the new 2016-based projections.

10.1 Assumptions

As mentioned, both sets of projections had assumptions applied to them relating to future fertility, mortality and migration. The assumptions applied to the 2014-based projections were mainly determined from historical population estimates data that were available at that time, with the 2016-based projections having assumptions which account for an extra two years of data. Therefore, there are two main reasons why the 2014-based and the 2016-based population projections might differ, namely:

1. Updated population estimates data between mid-2014 and mid-2016, which have a direct impact on the starting point for the projections; and

2. Changing trends in fertility, mortality and/or migration between mid-2014 and mid-2016, which can have an impact on the assumptions set for the projections.

The table below provides a high-level comparison between the assumptions applied to both sets of projections.

Assumption	2014-based Projections	2016-based Projections
Fertility	In the long-term, the hypothetical woman will have 2.00 children in her life time	In the long-term, the hypothetical woman will have 2.00 children in her life time
Mortality	In the long term, improvements in mortality rates are projected to be around 1.2 per cent per annum	In the long term, improvements in mortality rates are projected to be around 1.2 per cent per annum
Migration	Net international migration will reduce linearly from 3,000 inflows to the long-term assumption of 1,000 inflows from mid-2020 onwards	Net international migration will continue from observed levels in the year ending mid-2016 (i.e. 1,500 inflows) throughout the projection period

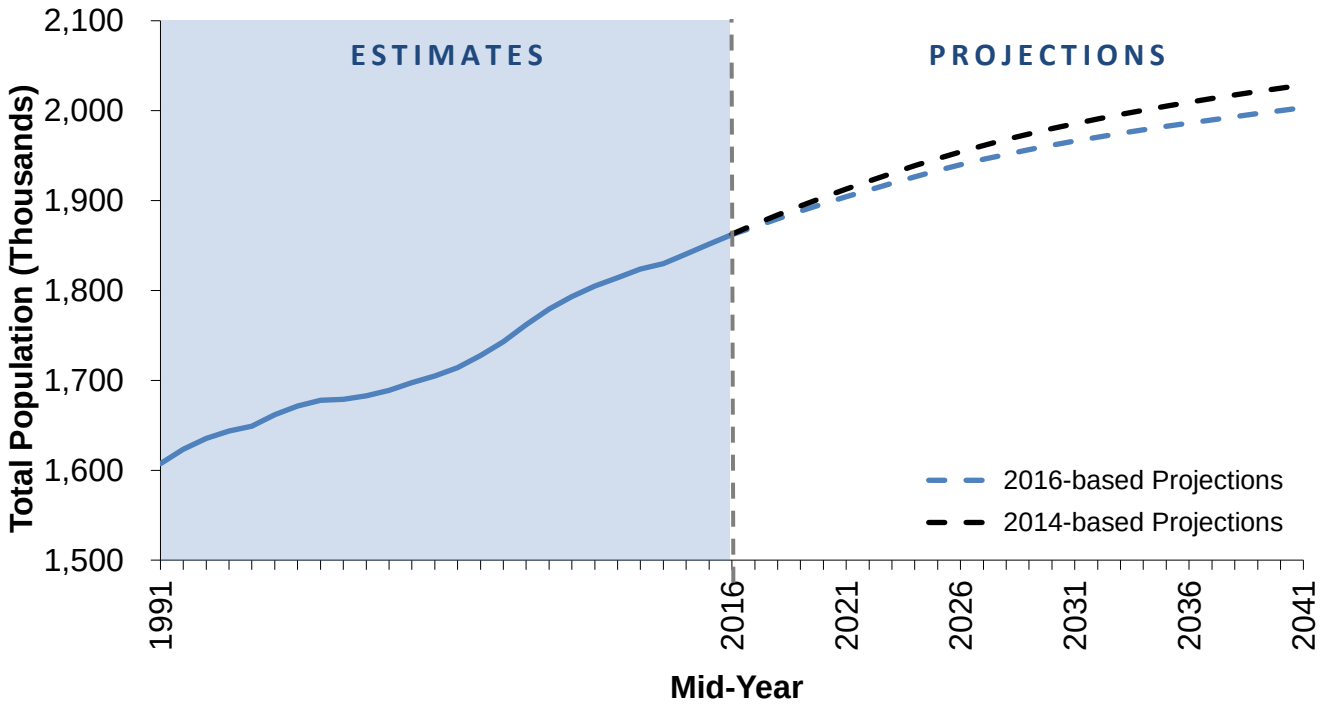
[11] Further information and statistics relating to the 2014-based projections is available on the NISRA website.

While the table above shows that the fertility and mortality assumptions are the same, at the detailed level there are some differences which may have an impact on the overall projections. For example, while both sets of projections assumed a long-term fertility rate of 2.0, the 2016-based projections assumed an initial dip in the TFR before recovering to the long-term assumption of 2.0. In the 2014-based projections the TFR was assumed to make its way from base-year levels to the long-term assumption of 2.0 without any initial dip. The table also highlights the difference in the net international migration assumptions deployed in the 2014 and 2016 based projections.

10.2 Projected Populations

The 2014-based population projection for mid-2016 was 500 people (0.03 per cent) above the mid-2016 population estimate. Therefore, when projecting forward from mid-2016, both 2014 and 2016 based projections started from roughly the same figure. The difference between the projections then gradually increases over the next 25 years with the mid-2016 based projections generally being lower than the 2014-based projections. The 2016-based projection for mid-2041 is 25,300 people less (1.3 per cent) than the equivalent figure from the 2014-based projections (see Figure 17).

Figure 17: Estimated and Projected Population (mid-2014 and mid-2016 based), mid-1991 to mid-2041 (non zero y-axis)



*Figures for mid-1991 to mid-2016 relate to mid-year estimates.

Download Chart (XLS Format 199KB)

Whilst the net migration assumption between the two sets of projections was different, net migration in Northern Ireland accounts for a fraction of the overall annual population change and therefore tends to have less of an impact here. The main reason for the difference in the two

sets of projections can be attributed to the difference in growth determined by natural change (i.e. births minus deaths).

Despite the mortality assumptions being broadly the same between the two sets of projections, the number deaths between the mid-2014 and mid-2016 population estimates had increased, leading to a higher projected number of deaths in 2016-based projections. In addition, the slight changes in projected TFRs between the two sets of projections has led to a lower projected number of births in the 2016-based projections.

Less projected births and more projected deaths has resulted in lower growth due to natural change within the 2016-based projections. For example, between mid-2016 and mid-2041 the projected growth due to natural change within the 2016-based projections is 127,300 people, while the equivalent projected growth within the 2014-based projections was 24.2 per cent higher at 158,000 people.

11 Variant Projections

Projections are uncertain and become increasingly so the further they are carried forward in time. In addition to the principal projection, variant projections are produced based on alternative, but generally plausible, assumptions of future fertility, mortality and net migration. These variant projections are intended to provide an indication of uncertainty and sensitivity to alternative assumptions. They do not represent upper or lower limits of future demographic behaviour.

Variant projections for the UK and constituent countries are produced by ONS. Full details and figures can be found on the ONS website, with variants specific to Northern Ireland also available on the NISRA website. The following is a brief summary of how some selected variant assumptions affect the population projections for Northern Ireland.

11.1 Life expectancy

There are four variant projections related to life expectancy, namely:

- High life expectancy;
- Moderately high life expectancy;
- Moderately low life expectancy; and
- Low life expectancy.

Each of these variant projections have different assumptions regarding future mortality, resulting in population projections which differ from the principal projection. For example, the low life expectancy variant assumes that there is no continued improvement in mortality rates. Although

this assumption has a moderate effect on the total population with 6.4 per cent growth between mid-2016 and mid-2041 compared to 7.6 per cent in the principal projection, its impact on the older population is markedly different with the population aged 65 and over growing by 58.5 per cent, compared to 65.1 per cent under the principal projection.

11.2 Net Migration

Another example of variant projections relates to changing net migration assumptions and how they affect the population projections. For Northern Ireland there are five variant projections that relate to differing assumptions on net migration, namely:

- High migration;
- Low migration;
- Northern Ireland medium high migration;
- Northern Ireland medium low migration; and
- Zero net migration.

It is important to note that with the exception of the 'Zero net migration' variant, all migration variants relate to the assumptions around future net international migration, i.e. migration to/from the rest of the UK still occurs under these variants and is calculated in the normal way (i.e. using rates). Migration under the 'Zero net migration' variant assumes no loss or gain due to migration from anywhere within or outside of the UK (see table below).

The migration assumptions for these variants are summarised in the table below:

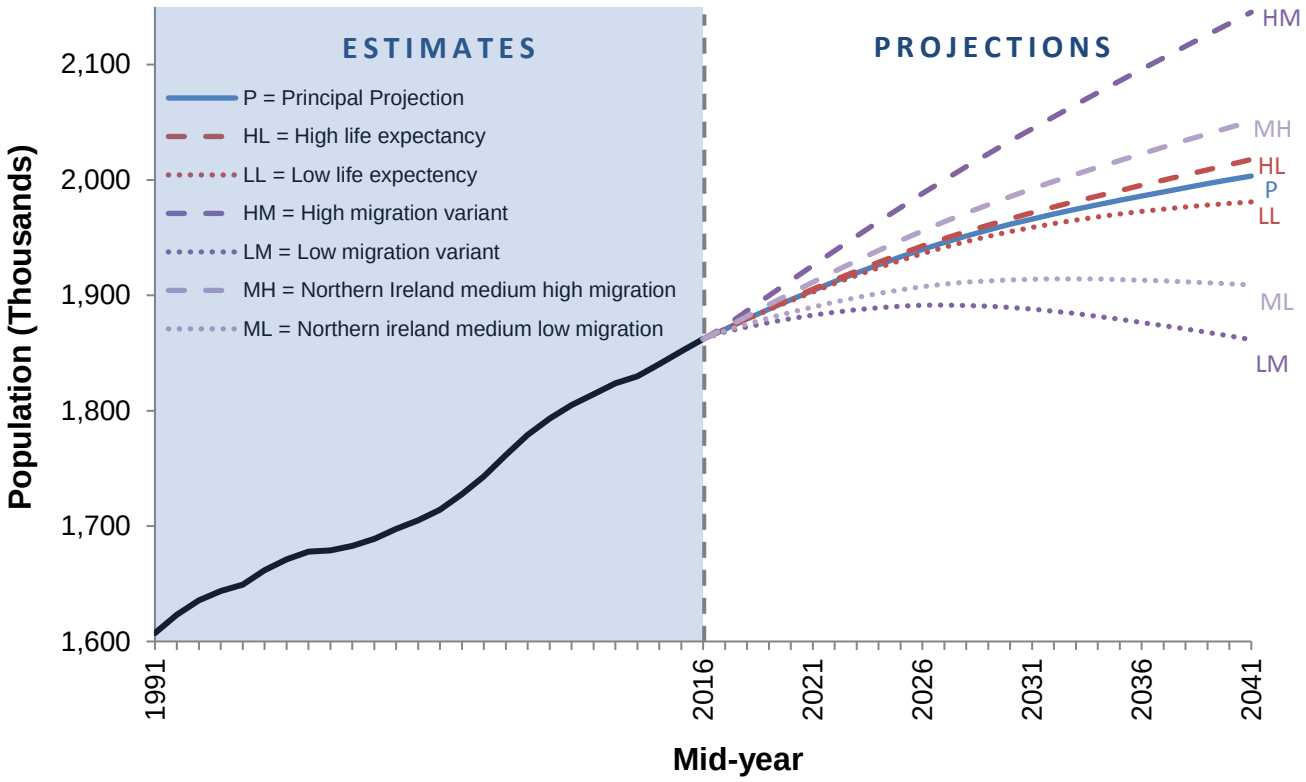
Projection	Net migration assumption	Relates to:
Principal Projection	+1,500	Net international migration only
High migration	+6,000	Net international migration only
Low migration	-3,000	Net international migration only
Northern Ireland medium high migration	+3,000	Net international migration only
Northern Ireland medium low migration	-1,500	Net international migration only
Zero net migration	0	All migration

The high migration variant results in a projected population growth over the 25 year period from mid-2016 to mid-2041 of 15.2 per cent – markedly higher than the projected growth of 7.6 per cent under the principal projection. In contrast the low migration variant projects a 0.03 per cent decrease in the projected population by mid-2041. The Northern Ireland medium high and medium low variants project growth of 10.1 per cent and 2.5 per cent respectively between mid-

2016 and mid-2041, with the zero net migration variant producing similar growth to the principal projection at 7.7 percent.

Figure 18 below shows the projected trajectory of a selection of variant projections for illustrative purposes. Further variant projections are available on the NISRA website.

Figure 18: Selected Northern Ireland Variant Projections, mid-1991 to mid-2041 (non zero y-axis)



*Figures for mid-1991 to mid-2016 relate to mid-year estimates.

Download Chart (XLS Format 218KB)

12 Methodology

Population projections are produced using the cohort component methodology, akin to the mid-year population estimates. Population projections use a base population, i.e. the most recently published mid-year estimates (currently the mid-2016 population estimates). Recent years' information on births, deaths and migration flows are used to create future assumptions on the number of children each woman will have (fertility), the chance of dying (mortality) and movement of people into and out of Northern Ireland (migration). Each year the population is "aged on" by one year and these assumptions on future fertility, mortality, and migration are applied to the resulting projection figures. More information on how the population projections are produced can be found in the accompanying Quality and Methodology Information report.

12.1 Projection Assumptions

As mentioned, population projections are by definition based on assumptions about future fertility, mortality and migration levels. It should be noted that there is a transition period for fertility, mortality and migration to gradually move from current levels to the long-term assumptions. In these population projections it is assumed that:

Fertility - There will be an initial dip in the current fertility levels in Northern Ireland, after which fertility will move gradually to the long-term assumption that applies from mid-2040 onwards, i.e. that the hypothetical woman will have 2.00 children in her life time.

Mortality - Annual improvement in mortality rates of 1.2 per cent per annum for most ages for both males and females. Lower annual rates of mortality improvement will be assumed for those born before 1924. These rates of improvement will remain constant beyond mid-2041.

Migration - Net international migration flows will remain steady at a net inflow of 1,500 more people entering Northern Ireland than are leaving throughout the projection period. Migration estimates between the UK countries are set as age-sex-specific rates and the gross flows will vary by year depending on the underlying population data.

Further details on the assumptions inherent in these projections is available in the 2016-based National Projections Assumption Papers.

13 Data Quality

Population projections for the UK and the four constituent UK countries are calculated by ONS, and figures for each UK country are sent to their respective statistical organisations for quality assurance. This process includes such exercises as analysing the future fertility, mortality and migration figures (and associated assumptions) to make sure they are plausible, and calculating and analysing sex ratios. In addition, as seen in Section 10, the latest population projections are also compared with the previous projections (in this case 2014-based) in order to analyse the differences between them and any impacts these may have on the figures[12].

The following sections take each element of the projections in turn and provide information relating to data quality.

13.1 Base Population – Population Estimates for Northern Ireland (2016)

Mid-year population estimates are created using a variety of administrative data sources. A brief outline of these sources, and how quality is assured for each one, is detailed in the population estimates and projections data quality document.

The estimates of the population aged 85 and over provide a further age breakdown of those aged 90 and over, by single year of age up to 104 years, and for those aged 105 and over. A brief outline of the data used to create these figures, and how quality is assured for each one, is detailed in the Estimates of the Population Aged 85 and over, Northern Ireland (2016) methodology and quality paper.

13.2 Assumptions – Births and Deaths

Information supplied at birth / death registration is generally believed to be correct since wilfully supplying false information may render the informant liable to prosecution for perjury. Birth and death figures by sex (and also by single year of age for deaths) are obtained from registrations with the General Register Office (GRO). All such events which occurred in the year between 1 July and 30 June are included in the mid-year population estimates.

During registrations, information provided is first checked by the informant before being finalised on the GRO's electronic system. Appropriate validation checks are embedded within the system to help the Registrar with this process. Statistics are extracted directly from the system and are subjected to further checks by the Vital Statistics team in NISRA's Demography & Methodology Branch, and again by the Population and Migration team when the relevant data are supplied to them.

[12] Further comparisons with historical projections can be found in the ONS National Population Projections Accuracy Report

Quality Assessment Reports are available online and contain further details on the quality of birth and death statistics.

13.3 Assumptions – Migration

Migration is the most difficult component of population change to measure, as unlike births and deaths, there is no complete system for registering migration. Migration is estimated using transfers observed in medical cards, detailing the list of patients registered with a family doctor:

- inflows (people who come to live in Northern Ireland for a period of at least one year) are estimated by counting the number of people who registered or re-registered with a family doctor
- outflows (people who leave Northern Ireland for a period of at least one year) are estimated by counting the number of people who de-registered with a family doctor.

Medical card data[13] are collated by the Business Service Organisation (BSO) and validation checks are undertaken by the statisticians within that organisation. When the data are then sent to NISRA further checks are carried out, including data cleansing and comparisons with previous years' data. When the medical card data are processed to calculate migration estimates, figures for migration to / from Great Britain are agreed between the different UK administrations to provide as much accuracy and comparison between UK administrations as is possible for users.

13.4 Assumptions – Final Figures

The projection assumptions are based on the best and most recent births, deaths, and migration data available. Data for Northern Ireland, Scotland, and Wales are sent to the Office for National Statistics (ONS) by the country's corresponding statistics agency: Northern Ireland Statistics and Research Agency (NISRA), National Records of Scotland (NRS), and Welsh Government (WG). ONS liaises with NISRA, NRS, and WG in order to produce provisional assumptions. An expert academic advisory panel is involved in analysing the assumptions in order to advise ONS on current and emerging demographic trends and their possible implications for the national population projections. The expert panel provides advice only. The responsibility for final decisions on the assumptions remains with ONS, NISRA, NRS, and WG.

Each statistical organisation also issues consultation papers to key stakeholders detailing the provisional agreed assumptions. Any issues brought up at this point are addressed where possible, before the final assumptions are agreed by the four UK countries. The consultation papers issued, as well as papers containing more in-depth information on the final agreed assumptions on future fertility, mortality, and migration, are available on the ONS website.

[13] In previous reports, medical card data was referred as "health card" data.

13.5 National Statistics

National Statistics are produced to high professional standards set out in the Code of Practice for Official Statistics. They undergo regular quality assurance review to ensure they meet customer needs. They are produced free from any political interference. The United Kingdom Statistics Authority has designated these statistics as National Statistics, in accordance with the Statistics and Registration Service Act 2007 and signifying compliance with the Code of Practice for Official Statistics.

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.

In line with the Statistics and Registration Service Act 2007, and signifying compliance with the Code of Practice for Official Statistics in 2011, the United Kingdom Statistics Authority (UKSA) appointed this publication as a National Statistics publication. Population estimates and projections for Northern Ireland statistics were re-assessed by the Statistics Authority in July 2015 (UK Statistics Authority Assessment Report). Following work to address recommendations that emerged from the assessment (Assessment Action Plan), UKSA confirmed the re-designation of these statistics as National Statistics in August 2016 (see letter of designation).

14 Limitations

Population projections are based on assumptions derived from recent observed trends in fertility, mortality and migration. Therefore, these projections are not forecasts and do not attempt to predict the impact that future government policies, changing economic circumstances or other factors might have on demographic behaviour (e.g. the UK leaving the EU). While future policy changes are not taken into account, projections do reflect the impact of past policy and economic changes.

The future population of an area is often strongly influenced by the initial base population. The reliability of projections decreases over time due to the cumulative process of population change, as well as the inherent uncertainty of demographic behaviour.

Figures for the number of children are more difficult to project than for the number of adults, due to assuming fertility levels and parental migration. In contrast, the number of older adults are relatively more straightforward to project as they are not affected by fertility assumptions, and are less likely to be affected by migration assumptions (the numbers of inflows and outflows decrease with age).

The International Passenger Survey (IPS) is used by England, Wales and Scotland to estimate international migration. NISRA is unable to use this source due to issues relating to the use of the IPS in Northern Ireland. The main issues are i) that the IPS does not cover the land border between Northern Ireland and the Republic of Ireland, and ii) there is uncertainty introduced when "Ireland" is given in response to survey questions – some people stating "Ireland" as their origin or destination may be referring to Northern Ireland. This means there is a methodological inconsistency for the international migration statistics of Northern Ireland and the rest of the UK. Northern Ireland migration statistics have been previously assessed by the UK Statistics Authority, who found them to be fit for purpose[14] .

NISRA
October 2017

[14] UKSA Assessment Report - Statistics on Demography and Vital Events in Northern Ireland (2011)

Background Notes

1. Statistics for Northern Ireland population projections are available on the NISRA Website. An infographic highlighting the important figures and trends in the data has also been released, as well as an interactive population pyramid.

2. Northern Ireland population projections provide an estimate of the future size and age structure of the population of Northern Ireland which is used as a common framework for national planning in a number of different fields.

3. Projections are the result of applying long-term assumptions based on recent trends in fertility, mortality and migration to the base population. These projections use the mid-2016 population estimates as the base population. See the Quality and Methodology Information report for further Information.

4. These projections are not forecasts and do not attempt to predict the impact that future government policies, changing economic circumstances or other factors might have on demographic behaviour. If different assumptions are used, different statistics would result: a series of alternative population projections (variants) are also available on the NISRA Website.

5. The Office for National Statistics (ONS) calculates national population projections for the UK and UK countries at the request of the Registrars General for England and Wales, Scotland, and Northern Ireland. National population projections are calculated in collaboration and agreement with statistical organisations for Northern Ireland (Northern Ireland Statistics and Research Agency [NISRA]), and National Records of Scotland [NRS]). The calculation of population projections for all UK countries at the same time ensures that the many users of population projections can work on consistent assumptions.

6. Full results of the 2016-based national population projections for the United Kingdom and all UK countries, including variant projections, are available on the ONS website. Population projections and additional analyses specific to Scotland can be found on the NRS website.

7. 2018-based national population projections are expected to be published around Oct/Nov 2019.

8. The revisions policy for Northern Ireland migration statistics is available here.

9. We welcome feedback from users on the content, format and relevance of this release. Users can send feedback directly to census@nisra.gov.uk.

10. Follow NISRA on Twitter and Facebook.

11. All media inquiries should be directed to the DoF Communications Office:

    Telephone: 028 9016 3389

12. Further statistical information can be obtained from NISRA Customer Services:

    Telephone: 028 9025 5156
    E-mail: census@nisra.gov.uk
    Responsible Statistician: Brian Green