

## National population projections, 2008-based



21 October 2009

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**Coverage:** UK

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### 1. 2008-based principal population projections

The United Kingdom population is projected to increase by more than 4 million to 65.6 million over the 10 year period to 2018. This increase is equivalent to an average annual rate of growth of 0.7 per cent between mid-2008 and mid-2018. The UK population is projected to increase from an estimated 61.4 million in 2008 to 71.6 million in 2033 (Table 1). It is projected that the population of the UK will exceed 70 million by mid-2029.

The 2008-based national population projections are based on the estimated population at the middle of 2008 and a set of demographic trend-based assumptions about future fertility, mortality and migration (see section 6). The 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. They provide the population levels and age structure that would result if the assumptions made were to be realised. The 2008-based national population projections replace the 2006-based projections published by ONS in October 2007.

**Table 1:**  
**Estimated and projected population of the United Kingdom and constituent countries, 2008-2033**

	<i>millions</i>					
	<u>2008</u>	<u>2013</u>	<u>2018</u>	<u>2023</u>	<u>2028</u>	<u>2033</u>
United Kingdom	61.4	63.5	65.6	67.8	69.8	71.6
England	51.5	53.3	55.3	57.2	59.1	60.7
Wales	3.0	3.1	3.1	3.2	3.3	3.3
Scotland	5.2	5.3	5.4	5.4	5.5	5.5
Northern Ireland	1.8	1.8	1.9	1.9	2.0	2.0

Note: Figures may not sum due to rounding

The populations of England and Northern Ireland are projected to increase by 7 per cent by 2018, whilst the population of Wales is projected to increase by 5 per cent over the same 10 year period. The projected increase for Scotland is 4 per cent, due to fertility and life expectancy levels for Scotland being assumed to remain lower than in the rest of the UK.

## 2. Births, deaths and net migration

Of the 4.3 million projected increase in the UK population over the next 10 years, some 2.4 million (56 per cent) is a result of projected natural increase (more births than deaths) while the remaining 1.9 million (44 per cent) is the assumed net number of migrants (Table 2). Similarly, of the 10.2 million projected increase in the population by 2033, 5.6 million (55 per cent) is due to projected natural increase and 4.6 million (45 per cent) is due to projected net migration.

**Table 2:**  
**Projected components of change, United Kingdom, 2008-2033**

	<i>millions</i>				
	2008	2013	2018	2023	2028
	-2013	-2018	-2023	-2028	-2033
Population at start	61.4	63.5	65.6	67.8	69.8
Births	3.9	3.9	4.0	4.0	4.0
Deaths	2.8	2.7	2.7	2.9	3.1
Natural change	1.1	1.2	1.3	1.1	0.9
Net migration	1.0	0.9	0.9	0.9	0.9
Total change	2.1	2.1	2.2	2.0	1.8
Population at end	63.5	65.6	67.8	69.8	71.6

Note: Figures may not sum due to rounding

The projected numbers of future births and deaths are themselves partly dependent on the assumed level of net migration. Because migration is concentrated at young adult ages, the assumed level of net migration affects the projected number of women of childbearing age and hence the projected number of births. Of the 5.6 million natural increase projected between 2008 and 2033, only 3.3 million would occur if net migration were zero (at each and every age) throughout the projection period (Table 3). Thus just over two-thirds of the projected increase in the population over the period 2008 to 2033 is either directly or indirectly due to migration (45 per cent directly attributable to future migration and a further 23 per cent indirectly due to future migration through its effect on natural change).

**Table 3:**  
**Projected population growth by component, United Kingdom, 2008 to 2033**

	<i>millions</i>
Total population increase between 2008 and 2033	10.2
Resulting from:	
Assumed net migration	4.6
Natural change assuming zero net migration	3.3
Additional natural change from assumed level of net migration	2.4

Note: Figures may not sum due to rounding

### 3. Children, ageing and older people

The number of children aged under 16 is projected to increase by 6.2 per cent from 11.5 million in 2008 to 12.2 million by 2018 and to nearly 12.8 million by 2033 (Table 4).

**Table 4:**  
**Projected population by age, United Kingdom, 2008 to 2033**

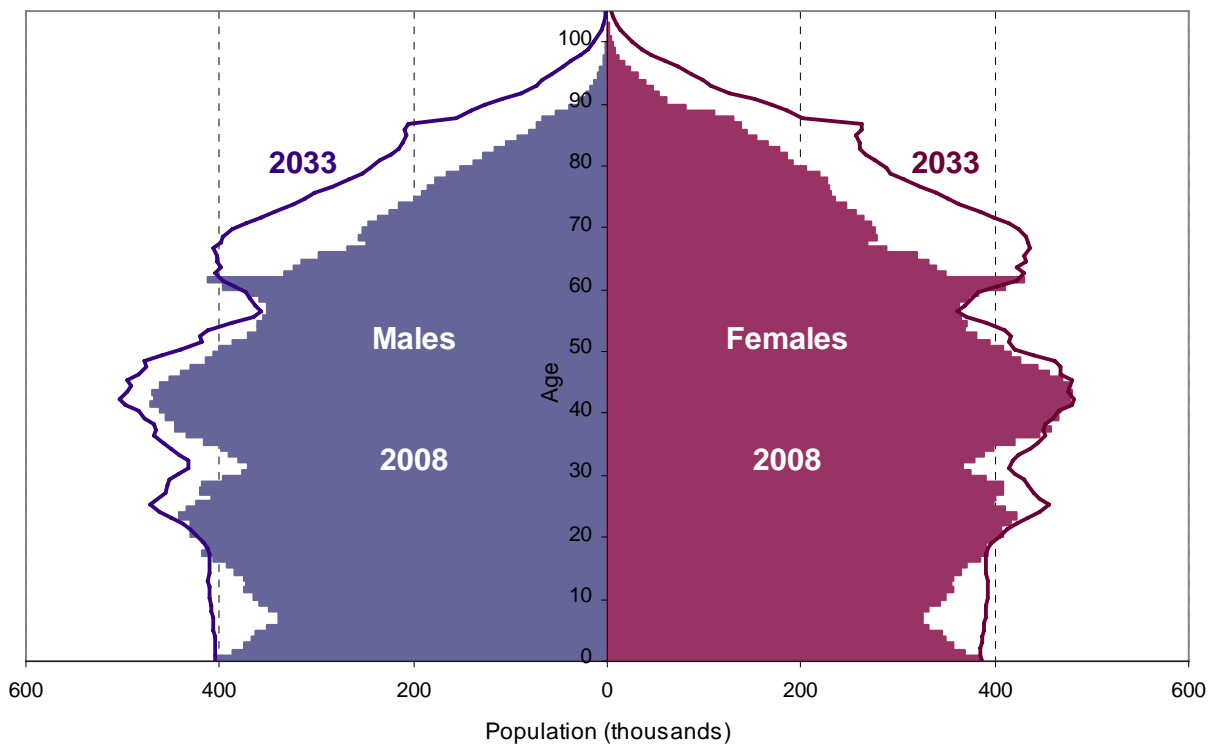
	<i>millions</i>					
Ages	<u>2008</u>	<u>2013</u>	<u>2018</u>	<u>2023</u>	<u>2028</u>	<u>2033</u>
0-14	10.8	11.0	11.5	11.9	11.9	12.0
15-29	12.3	12.7	12.3	12.1	12.3	12.8
30-44	13.0	12.5	12.8	13.8	14.2	13.8
45-59	11.8	12.7	13.2	12.6	12.2	12.5
60-74	8.8	9.4	10.0	10.5	11.4	11.9
75 and over	4.8	5.2	5.8	7.0	7.9	8.7
75-84	3.4	3.7	4.0	4.8	5.2	5.3
85 & over	1.3	1.5	1.8	2.2	2.6	3.3
All ages	61.4	63.5	65.6	67.8	69.8	71.6
Median age (years)	39.3	40.0	40.0	40.5	41.3	42.2
Under 16	11.5	11.7	12.2	12.6	12.7	12.8
Working age*	38.1	39.4	40.8	41.8	43.1	43.3
Under 40	19.8	20.1	20.6	20.9	20.9	21.0
40 & over	18.3	19.4	20.3	20.9	22.1	22.3
Pensionable age*	11.8	12.4	12.6	13.4	14.0	15.6
Old age support ratio* (working age/pensionable age)	3.23	3.19	3.25	3.11	3.07	2.78

\* Working age and pensionable age populations based on state pension age for given year. Between 2010 and 2020, state pension age will change from 65 years for men and 60 years for women, to 65 years for both sexes. Between 2024 and 2046, state pension age will increase in three stages from 65 years to 68 years for both sexes.

The population is projected to become older gradually, with the average (median) age rising from 39.3 years in 2008 to 40.0 years in 2018 and 42.2 years by 2033.

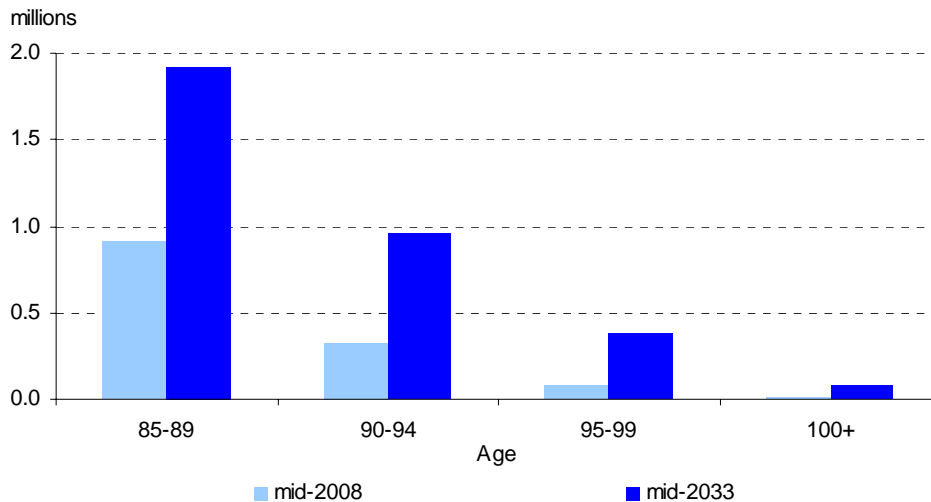
As the population ages, the numbers at the oldest ages will increase the fastest (Table 4, Figures 1 and 2). In 2008, there were 1.3 million people in the UK aged 85 and over; this number is projected to increase to 1.8 million by 2018 and to 3.3 million by 2033, more than doubling over twenty-five years.

**Figure 1:**  
**Estimated and projected age structure of the UK population, mid-2008 and mid-2033**



The number of people aged 90 and above is projected to more than triple by 2033, the number of people aged 95 and over is projected to more than quadruple, and the number of centenarians is projected to rise from 11,000 in 2008 to 80,000 in 2033, a more than sevenfold increase (Figure 2).

**Figure 2:  
Estimated and projected population aged 85 and over, United Kingdom, 2008 and 2033**



#### 4. People of working age and state pension age

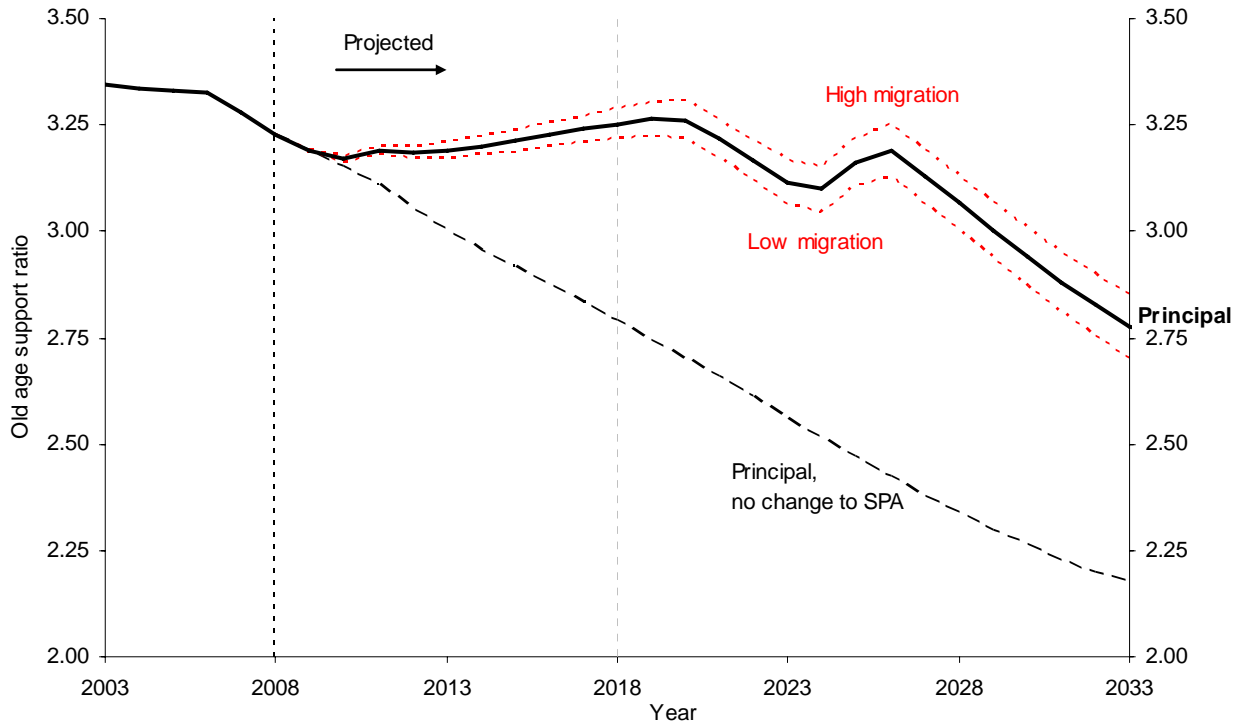
Despite the forthcoming increases to state pension age (see Background Note 9), the number of people of state pensionable age (SPA) is projected to increase by 32 per cent from 11.8 million in 2008 to 15.6 million by 2033 (Table 4). Over the same period, the number of people of working age is projected to rise by just 14 per cent from 38.1 million in 2008 to 43.3 million by 2033. In 2008, there were 0.3 million more people of SPA than children aged under 16, by 2033 this difference is projected to exceed 2.8 million.

The working age population will also become older. In 2008, there were 1.5 million (8.3 per cent) more working age adults aged below 40 than aged 40 and above (Table 4). However, by 2033, when state pension age will have increased to 66, the working age population aged 40 and above will outnumber those aged under 40 by 1.4 million (6.5 per cent).

There were 3.23 people of working age for every person of SPA in 2008. By 2018, allowing for the change in women's state pension age, this 'old age support ratio' is projected to rise slightly to 3.25 before declining to 2.78 by 2033 (Table 4). Without the planned changes in state pension age, it is projected that the old age support ratio would decline to 2.79 by 2018 and to 2.18 by 2033 (Figure 3).

Comparison of the principal projection with some of the variant projections (see section 5) shows how future net migration will impact upon the old age support ratio (Figure 3).

**Figure 3:**  
**Actual and projected old age support ratio, United Kingdom, 2003 to 2033**



Note: Old age support ratio defined as number of people of working age per person of SPA. For information on future changes to SPA, see Background Note 9. High and low migration variants assume net migration to be 60,000 higher and lower for principal projection.

If annual net migration to the UK were to be 60,000 lower than assumed for the principal projection (that is, 120,000 rather than 180,000), the old age support ratio would fall to 2.70 by 2033 even after the forthcoming changes to state pension age are taken into account. In contrast, if annual net migration to the UK were to be 60,000 higher (that is, 240,000 rather than 180,000), the old age support ratio would be 2.85 by 2033.

## 5. Variant population projections

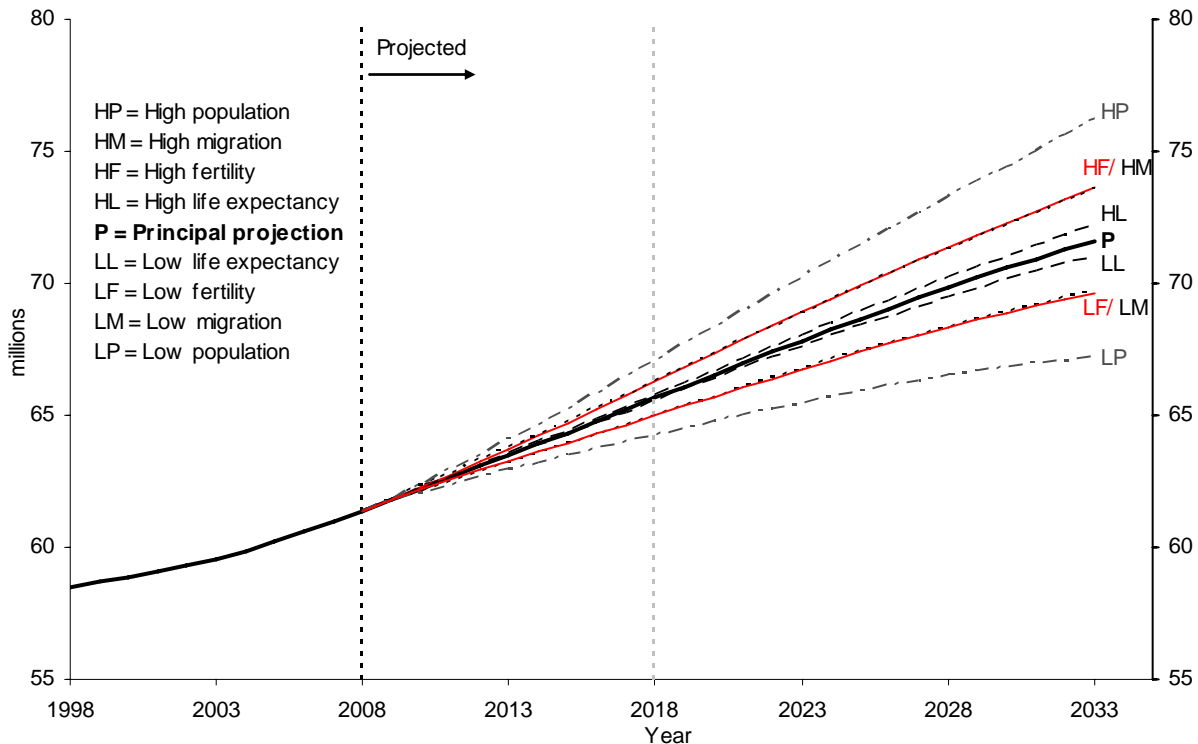
Projections are uncertain and become increasingly so the further they are carried forward in time. In addition to the principal (or central) projection, variant projections are produced based on alternative, but still plausible, assumptions of future fertility, mortality and net migration. These variant projections are intended to provide an indication of uncertainty; they do *not* represent upper or lower limits of future demographic behaviour. They do, however, allow users to consider the impact upon the population if future fertility, mortality and migration differ from the assumptions made for the principal projections (see section 6). Six 'single component' variant projections are available, where only one component of

population change is varied from the principal assumptions. In addition, three further variant projections are also available (see Background Note 7):

- the 'high population' variant which assumes a combination of high fertility, high life expectancy and high net migration;
- the 'low population' variant which assumes a combination of low fertility, low life expectancy and low net migration; and
- the 'zero net migration' (or 'natural change only') variant which assumes the same levels of fertility and life expectancy as the principal projection, but that there will be zero net migration (that is, migration inflows and outflows are exactly equal at every age)

Varying the fertility assumption to the levels assumed in the high and low fertility variants would increase or decrease the population of the UK by about 650,000 by 2018 and by about 2 million by 2033; a similar range also results if the migration assumption is varied to the levels assumed in the high and low migration variants. With combinations of the higher or lower assumptions for each component of population change (high population and low population variants), the possible range for total population size is considerably wider, increasing or decreasing the population by about 1 million by 2018 and 4 million by 2033.

**Figure 4:**  
**Population of the United Kingdom according to 2008-based principal and variant projections, 1998 to 2033**



## 6. Assumptions underlying the 2008-based projections

The 2008-based national population projections are based on the estimated population at the middle of 2008 and a set of demographic trend-based assumptions about the future. The assumptions of future fertility, mortality and migration underlying the 2008-based national population projections are similar to those used for the 2006-based projections (Table 5).

**Table 5:**  
**Long-term principal assumptions for the 2008-based national population projections compared with assumptions for the 2006-based projections**

		United Kingdom	England	Wales	Scotland	Northern Ireland
Fertility - Long-term average number of children per woman						
	<b>2008-based</b>	<b>1.84</b>	<b>1.85</b>	<b>1.85</b>	<b>1.70</b>	<b>1.95</b>
	2006-based	1.84	1.85	1.85	1.65	1.95
Mortality - Expectation of life at birth in 2033 (years) <sup>1</sup>						
Males	<b>2008-based</b>	<b>83.1</b>	<b>83.4</b>	<b>82.7</b>	<b>80.7</b>	<b>82.2</b>
	2006-based	82.9	83.1	82.6	80.6	82.4
Females	<b>2008-based</b>	<b>86.9</b>	<b>87.1</b>	<b>86.6</b>	<b>85.2</b>	<b>86.6</b>
	2006-based	86.4	86.6	86.1	85.0	86.2
Net migration <sup>2</sup> - Annual long-term assumptions						
	<b>2008-based</b>	<b>+180,000</b>	<b>+157,000</b>	<b>+10,500</b>	<b>+12,000</b>	<b>+500</b>
	2006-based	+190,000	+171,500	+9,500	+8,500	+500

<sup>1</sup> Expectations of life at birth for 25 years ahead given as specimen year. Note these are *period* expectations of life based on the mid-year mortality rates assumed for the year 2033 and do not take account of the continuing improvement in mortality projected beyond 2033. Cohort life expectancies at birth in the 2008-based projections, allowing for the assumed further mortality improvement, will be about 8.6 years higher for a boy born in the UK in 2033 and about 8.1 years higher for a girl born in 2033 than the period figures shown in the table

<sup>2</sup> Net migration includes international migration and cross-border migration between the four countries of the United Kingdom.

### Fertility

The long-term assumption of completed family size for the UK for the principal projection is unchanged from the 2006-based projections (1.84 children per woman), and the corresponding assumptions for England, Wales and Northern Ireland are also unchanged. However, the long-term assumption of average family size for Scotland has been increased by 0.05 to 1.70 children per woman in order to maintain the current differential between fertility in Scotland and England. Compared with the principal assumptions, the high and low fertility variants assume long-term family sizes of 0.2 children per woman higher or lower (that is, 2.04 and 1.64 children per woman for the UK).

### *Mortality*

As for the 2006-based projections, it has been assumed for the principal projection that over the first 25 years of the projection period (by 2033), annual rates of mortality improvement will converge to a common rate of 1.0 per cent a year for most ages, with those born in the years 1923 to 1940 assumed to experience higher rates of improvement. Projected period life expectancies at birth for the year 2033 are around 0.2 years higher than in the previous projections for males and 0.5 years higher for females. These differences are mainly due to differences in the initial 2008 age-specific mortality rates and rates of mortality improvement between 2008 and 2009 for each country compared to those projected for the same period in the 2006-based projections. The differences are generally higher for females than for males because female mortality has improved more rapidly over the last two years compared to previous projections.

Compared with the principal assumptions, the high and low life expectancy variants assume annual rates of mortality improvement from 2033 to be 1.0 per cent higher or lower (that is, 2.0 per cent and 0.0 per cent for most ages). Thus the variant projections assume life expectancy at birth in 2033 to be 1.9 years higher or lower for males and 1.2 years higher or lower for females.

### *Net migration*

The new long-term assumption for net migration to the United Kingdom is +180,000 each year, compared with +190,000 a year in the previous projections. The assumed level of annual net migration to England is 14,500 lower than for the previous projections, whilst the assumed levels of annual net migration to Wales and Scotland are 1,000 and 3,500 higher respectively. These changes reflect the most recent trends in both international migration and cross-border migration between the four countries of the UK. Compared with the principal assumptions, the high and low migration variants assume long-term annual net migration to the UK to be 60,000 persons higher or lower (that is, +240,000 and +120,000).

## **7. Comparison with previous projections**

The projected total population of the United Kingdom at 2018 is 0.2 million (0.3 per cent) lower than in the previous (2006-based) projections (Table 6). This is due to slightly lower levels of net migration to the UK being assumed for the latest projections. The projected populations of England and Wales in 2018 are also slightly lower than for the 2006-based projections (by 0.5 per cent and 0.2 per cent respectively), but the projected population of Scotland is 1.2 per cent higher and that of Northern Ireland is 0.3 per cent higher.

The 2008-based projections for England are lower than the previous projections throughout the projection period due to the long-term annual net migration assumption for England being lower than for the 2006-based projections (Table 5). In contrast, the projections for Scotland are higher than the 2006-based projections due to both higher long-term fertility and net migration being assumed than for the previous projections.

**Table 6:**  
**Comparison of 2008-based and 2006-based principal projections, United Kingdom**  
*millions*

	Population at mid-2018			
	2008-based projections	2006-based projections	Difference	
			millions	%
United Kingdom	65.6	65.9	-0.2	-0.3%
England	55.3	55.5	-0.3	-0.5%
Wales	3.1	3.1	0.0	-0.2%
Scotland	5.4	5.3	0.1	1.2%
Northern Ireland	1.9	1.9	0.0	0.3%

## 8. Cohort life expectancy

Period and cohort life expectancies by age and sex from 1981 to 2058 for the UK and its constituent countries have also been produced. The tables are based on unsmoothed calendar year mortality rates from 1981 to 2008 and projected mortality rates from the 2008-based national population projections.

## 9. Data and further information

2008-based national population projections for the UK and constituent countries are available at: <http://www.statistics.gov.uk/StatBase/Product.asp?vlnk=8519>

2008-based cohort and period life expectancies for the UK and constituent countries are available at: <http://www.statistics.gov.uk/StatBase/Product.asp?vlnk=15098>

## Background Notes

1. National population projections are prepared by the Office for National Statistics on behalf of the National Statistician and the Registrars General of Scotland and Northern Ireland. The assumptions are agreed in liaison with the devolved administrations, following consultation with key users of projections in each country and advice from an expert academic advisory panel.
2. A new set of projections is normally made every second year, based on a full-scale review of the trends affecting the underlying assumptions about fertility, mortality and migration. The last set of national projections, issued in October 2007, was based on the estimated population at the middle of 2006.
3. The projections for the UK and its constituent countries are based on estimates of the population at the middle of 2008. These estimates for England and for Wales differ slightly from the population estimates published in August 2009 (available at: [www.statistics.gov.uk/statbase/product.asp?vlnk=15106](http://www.statistics.gov.uk/statbase/product.asp?vlnk=15106)) as they include an adjustment for the expected national impact of a package of improvements to population and migration estimates due to be implemented in May 2010. Details of the adjustment to the projections base are available at: [www.statistics.gov.uk/downloads/theme\\_population/NPP2008/NatPopProj2008.pdf](http://www.statistics.gov.uk/downloads/theme_population/NPP2008/NatPopProj2008.pdf) (see section 1, Base population); further details of the package of improvements are available at: [www.statistics.gov.uk/about/data/methodology/specific/population/future/imps/updates/default.asp](http://www.statistics.gov.uk/about/data/methodology/specific/population/future/imps/updates/default.asp)
4. Projections are made of the resident population of the UK and its constituent countries, as defined for the mid-year population estimates. The population includes all usually resident persons, whatever their nationality. Members of HM Armed Forces in the UK are included, but members of HM Armed Forces and their families who are abroad are excluded. Members of foreign armed forces in the UK are also included, as are any accompanying dependents.
5. Full details of the results from the 2008-based principal and key variant national population projections are available on the National Statistics website at <http://www.statistics.gov.uk/statbase/Product.asp?vlnk=8519>. Details of previously published sets of projections are available on the Government Actuary's Department (GAD) website at [www.gad.gov.uk](http://www.gad.gov.uk). An article on these projections will be published by ONS in *Population Trends* 139 in March 2010.
6. A summary quality report for national population projections can be found at <http://www.ons.gov.uk/about-statistics/methodology-and-quality/quality/qual-info-economic-social-and-bus-stats/quality-reports-for-social-statistics/index.html>. This report describes in detail the intended uses of the statistics presented in this publication, their general quality and the methods used to produce them.



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