



**Central Statistics Office**  
An Phríomh-Oifig Staidrimh

# **Population and Labour Force Projections**

**2011-2041**

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## BACKGROUND

### Background

This report provides projections of the:

- population classified by age and sex at five year intervals for the period 2011 to 2041;
- labour force classified by age, sex and female marital status for 2011, 2016 and 2021.

The projections are based on assumptions relating to future trends in fertility, mortality, migration and labour force participation. Two sets of assumptions were chosen for fertility, one for mortality and three for migration<sup>1</sup> trends up to the year 2041. For the labour force projections a single set of assumptions relating to future labour force participation rates was chosen.

The assumptions used for the projections were agreed by an Expert Group (see membership in Appendix 1) which met during the period May to October 2007. The Central Statistics Office is grateful to the members of the group for their input and advice during the discussions leading to the adoption of these assumptions. The most up-to-date information available was used in preparing the projections. This included the results of the 2006 Census of Population, information on births up to 2006, life tables for 2004/2006 and the results for the March-May 2007 quarter from the Quarterly National Household Survey (QNHS).

### Methodology

The model used in the projections is the demographic component method which projects the base 2006 population forward under the chosen assumptions governing births, deaths, migration and labour force participation. This is explained further in Appendix 2.

The methodology used in the present population projections is similar to that followed in previous projections reports. However, in line with the change introduced for the annual population estimates the projected population in the present report is on a usual residence basis rather than a de-facto basis. In practice the differences involved are quite small.

A glossary of technical terms is given in Appendix 3 to assist readers who may not be familiar with the terminology used in the report.

### Layout of the report

The report contains three sections:

- The first section contains a brief description of historical population trends and the factors influencing them.
- The projection assumptions chosen and the rationale for selecting them are covered in the second section under the four population components: *fertility*, *mortality*, *migration* and *labour force*. The assumptions used in the previous set of projections are reviewed against the out-turn for recent years.
- The main results are described in the third section focusing in turn on the young population, the population of working age and the old population.

The main results presented consist of nine tables:

- Tables 1 to 6 contain the projected population at five-year intervals between 2011 and 2041 under the six scenarios obtained from the different combinations of the fertility and migration assumptions.
- Table 7 gives the average annual numbers of projected births, deaths and net migrants for the corresponding inter-censal periods.
- Tables 8, 9 and 10 contain the projected labour force for 2011, 2016 and 2021 under the M1, M2 and M0 migration assumptions.

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<sup>1</sup> One of the three migration assumptions is a zero net migration scenario.

More detailed results are available on the CSO website [http://www.cso.ie/releasespublications/pr\\_pop.htm](http://www.cso.ie/releasespublications/pr_pop.htm) (See Appendix 4).

Appendix 5 contains a number of supporting tables which either informed the deliberations of the Expert Group or were derived from the results of the projection exercise.

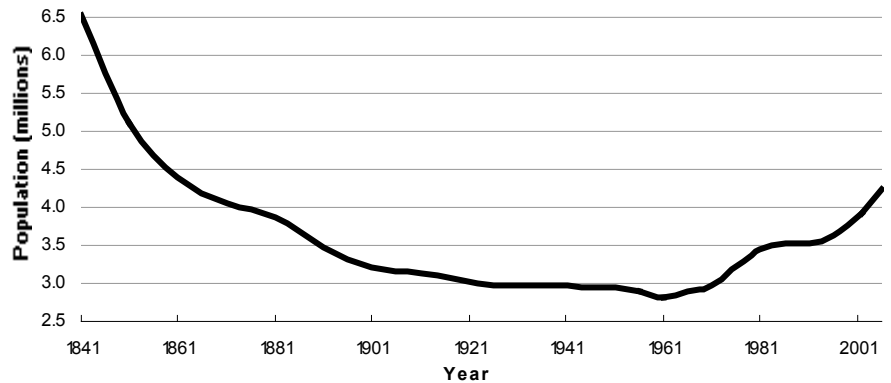
Appendix 6 provides a description of the method used to project mortality.

## HISTORICAL POPULATION<sup>2</sup> TRENDS

### The population 1841 to 1926

The area representing the Republic of Ireland registered a decline in population from just over 6.5 million in 1841 to 3.1 million in 1911 (see Table A1 in Appendix 5). The effects of the famine of 1846/1847 and the subsequent heavy population losses due to emigration in the latter half of the nineteenth century were the main contributing factors to this decline. A further fall of over 5 per cent occurred between 1911 and 1926 – the first year in which a census was held in the newly independent State. The continuing high level of emigration was again the main reason for this decline.

**Figure 1 Population, 1841 to 2006**



### The situation since 1926

The overall population level, which remained quite stable at just under three million between 1926 and 1951, declined to reach a low point of 2.8 million in 1961. The 1960s, 1970s and the first half of the 1980s witnessed a decline in emigration and a relatively high level of natural increase culminating in a population total in excess of 3.5 million in 1986. After a slight fall between 1986 and 1991, the upward trend in population resumed in the early 1990s. Both natural increase and significant net inward migration have contributed to record population growth with the result that the 2006 population of 4.24 million was 50 per cent higher than the low point of 1961 and was the highest recorded since the census of 1871.

Table A shows the components of population change, expressed in the form of annual averages, for each inter-censal period since 1926. The relevant components are:

- the natural increase, i.e. births less deaths; and
- net migration, i.e. inward less outward migration.

<sup>2</sup> The population figures quoted in this section relate to the de-facto concept i.e. those present in the State on Census night. The projected population is on the basis of the usual residence concept in line with changes introduced in the annual population estimates.

**Table A Average annual births, deaths, natural increase and estimated net migration for each inter-censal period, 1926 to 2006**

Period	Total births	Total deaths	Natural increase	Change in population	Estimated net migration
Thousands					
1926 - 1936	58	42	16	0	-17
1936 - 1946	60	43	17	-1	-19
1946 - 1951	66	40	26	1	-24
1951 - 1956	63	36	27	-12	-39
1956 - 1961	61	34	26	-16	-42
1961 - 1966	63	33	29	13	-16
1966 - 1971	63	33	30	19	-11
1971 - 1979	69	33	35	49	14
1979 - 1981	73	33	40	38	-3
1981 - 1986	67	33	34	19	-14
1986 - 1991	56	32	24	-3	-27
1991 - 1996	50	31	18	20	2
1996 - 2002	54	31	23	49	26
2002 - 2006	61	28	33	81	48

#### **Lowest population level in 1961**

The stability of the population level in the 1926 to 1951 period resulted from gains due to the natural increase being counterbalanced by losses due to net outward migration. The high emigration during the 1950s was responsible for the historically low population level of 2.8 million recorded in 1961.

Population levels began to rise again during the 1960s mainly as a result of the decline in net outward migration. The reversal in net migration from outward to inward during the 1970s alongside an increase in births led to an overall population increase of just over 465,000 between 1971 and 1981.

Net outward migration resumed again during the early 1980s and, coupled with a decline in births, resulted in a moderation in the rate of overall population increase. The sharp increase in net outward migration in the second half of the 1980s, along with a continued fall in the number of births, contributed to a small population loss between 1986 and 1991.

In the early 1990s there was a further decline in the average annual natural increase due to the declining birth rate. However, as a consequence of increased economic activity and employment growth there was a change around once again in the pattern of migration, with a small net inflow recorded between 1991 and 1996. Thus the population increased at an average annual rate of over 20,000 in the period 1991 to 1996.

#### **Recent high net inward migration**

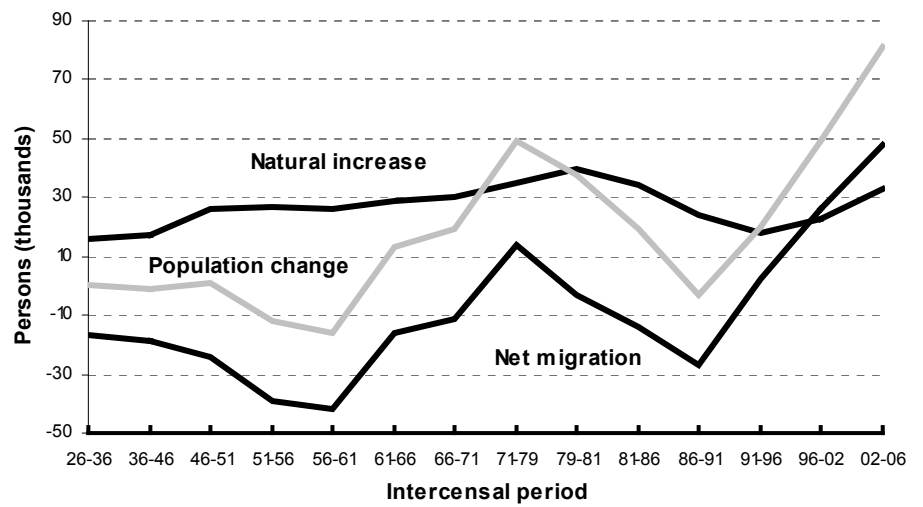
The 1996-2002 inter-censal period saw the average annual natural increase revert to the level attained during the late 1980s. When combined with high net inward migration this led to an average annual population increase on a par with that achieved during the 1970s.

The most recent inter-censal period (2002-2006) has seen the upward movement in the average annual natural increase continue. Historically high net inward migration combined with this natural increase has resulted in an unparalleled average annual population increase of over 80,000 or nearly 2 per cent per annum over this period.

### Components of population change

Figure 2 shows average annual inter-censal population change, natural increase and net migration for the period 1926 to 2006. The dominant influence which migration has exerted on the pattern of population change over the eighty year period can be clearly seen from the graph.

**Figure 2 Components of population changes, 1926 to 2006**





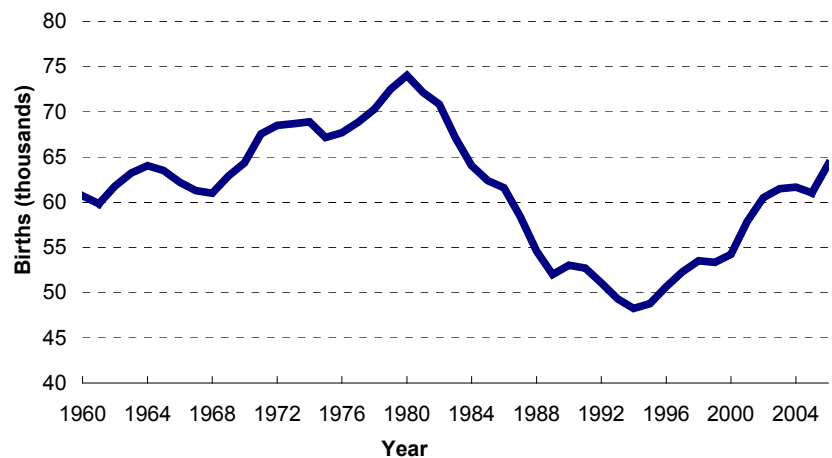
## ASSUMPTIONS

### Fertility

#### Births 1960 to date

From a fertility perspective the period from 1960 to 2006 has been a varied and interesting one. The underlying trend in the annual number of births during the 1960s and 1970s was steadily upwards, from 61,000 in 1960 to a peak of 74,000 in 1980, although there were some decreases during these years. From 1980 to 1994 the number of births fell steeply (apart from a slight pick-up in 1990) to reach a low point of 48,000 in 1994. The period since 1994 has seen the underlying trend in the annual number of births revert to its upward path and, as a result, the annual number of births has consistently exceeded 60,000 in recent years. The situation is illustrated graphically in Figure 3.

**Figure 3 Births, 1960 to 2006**



#### More women of child bearing age

The factors which impact on the number of births are the number of women of child bearing age (15-49 years) and the fertility levels of these women (see Table A2 in Appendix 5 and Table B below). In analysing the period 1960-2006 it is instructive to distinguish three distinct sub-periods: 1960-1980, 1980-1994 and 1994-2006.

In the first sub-period the number of women aged 15-49 increased by over 30 per cent. However, of more significance was the increase of nearly 50 per cent in the number of women in the prime child bearing age groups, i.e. those aged 20-39 years. The increase of over 20 per cent in the number of births during this twenty-year period thus masked a significant decline in underlying fertility rates.

The number of women aged 20-39 years continued to grow between 1980 and 1994, albeit at a slower rate (12%) than during the previous sub-period, and taken in conjunction with a decrease of 43 per cent in the total fertility rate resulted in a decline of over a third in the number of births.

In the most recent period (1994-2006) the increase of 31 per cent in the number of women aged 20-39 years was the main contributor to the rise of about a third in the number of births i.e. there was little change in fertility rates.

Table B contains age-specific and total fertility rates at five yearly intervals from 1960 to 1990 and for each year from 1990 to 2006.

**Table B Age-specific fertility rate and total fertility rate, 1960 to date**

Year	Live births per 1,000 females at specified ages							TFR
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	
1960	8.8	103.9	209.6	213.1	156.3	56.0	4.2	3.76
1965	14.0	125.1	236.1	218.9	150.3	57.6	4.2	4.03
1970	16.3	145.5	228.7	201.9	131.9	45.3	3.7	3.87
1975	22.8	138.5	216.0	162.2	100.2	36.8	2.6	3.40
1980	23.0	125.3	202.3	165.7	97.3	29.6	2.3	3.23
1985	16.6	87.2	158.6	138.4	75.3	21.6	1.5	2.50
1990	16.7	63.3	137.6	126.2	63.1	15.4	1.1	2.12
1991	17.1	64.0	131.8	124.4	63.4	15.2	1.0	2.09
1992	16.9	58.9	123.9	122.3	61.3	14.4	0.8	1.99
1993	16.3	53.8	116.5	121.2	58.5	14.1	0.9	1.91
1994	15.0	50.7	112.5	119.8	58.6	12.8	0.7	1.85
1995	15.1	50.3	106.7	123.5	60.3	13.1	0.8	1.85
1996	16.7	52.2	105.3	127.1	63.9	11.8	0.6	1.89
1997	17.5	50.9	106.4	131.5	66.6	13.4	0.8	1.94
1998	19.2	52.5	103.1	131.5	69.3	13.4	0.6	1.95
1999	20.2	51.0	99.4	129.5	68.5	12.9	0.6	1.91
2000	19.5	51.6	95.1	129.3	71.3	13.6	0.5	1.90
2001	19.9	53.3	95.1	134.1	75.3	13.9	0.7	1.96
2002	19.4	52.8	93.7	134.5	80.0	14.5	0.6	1.98
2003	19.0	50.3	92.6	135.0	82.3	15.7	0.5	1.98
2004	17.6	49.1	87.9	133.4	84.6	15.8	0.6	1.95
2005	16.8	45.9	78.8	130.3	87.2	16.8	0.6	1.88
2006	16.6	49.2	81.1	128.1	87.6	17.7	0.7	1.90

The five-year age groups 20-24, 25-29, 30-34, 35-39 together accounted for 92 per cent of all births in 2006. The age-specific fertility rate for 20-24 year old women had declined to almost a third of its 1970 value by 1994 but has since remained close to that level. The fertility decline observed for women aged 25-29 years has been on a par with that of the 20-24 years olds but has occurred at a slower rate up to the present. Women aged 30-34 accounted for just over a third of all births in 2006. The long-term decline in the age-specific fertility rate of these women halted in 1994 and small increases were recorded over the next decade. Consistent decreases have been observed over the last three years but it is too early to conclude whether this is indicative of a new emerging downward trend of longer duration.

The long-term decline in the age-specific fertility rate of women aged 35-39 years also halted in 1994 but has since increased by almost 50 per cent over the following decade or so. Women aged 40-44 accounted for only 4 per cent of all births in 2006 but it is interesting to note that the age-specific fertility rate of this age group has also been climbing in recent years, with an increase of nearly 40 per cent since 1994.

### **Decline in total fertility**

At the overall level the total fertility rate declined from 4.03 in 1965 to 2.08 in 1989, which was the first year for fertility to fall below the replacement level of 2.1. After a slight upward movement in 1990 the TFR continued to decrease to a low point of 1.85 in 1994 and 1995. It has oscillated within the range 1.88 to 1.98 since then and stood at 1.90 in 2006.

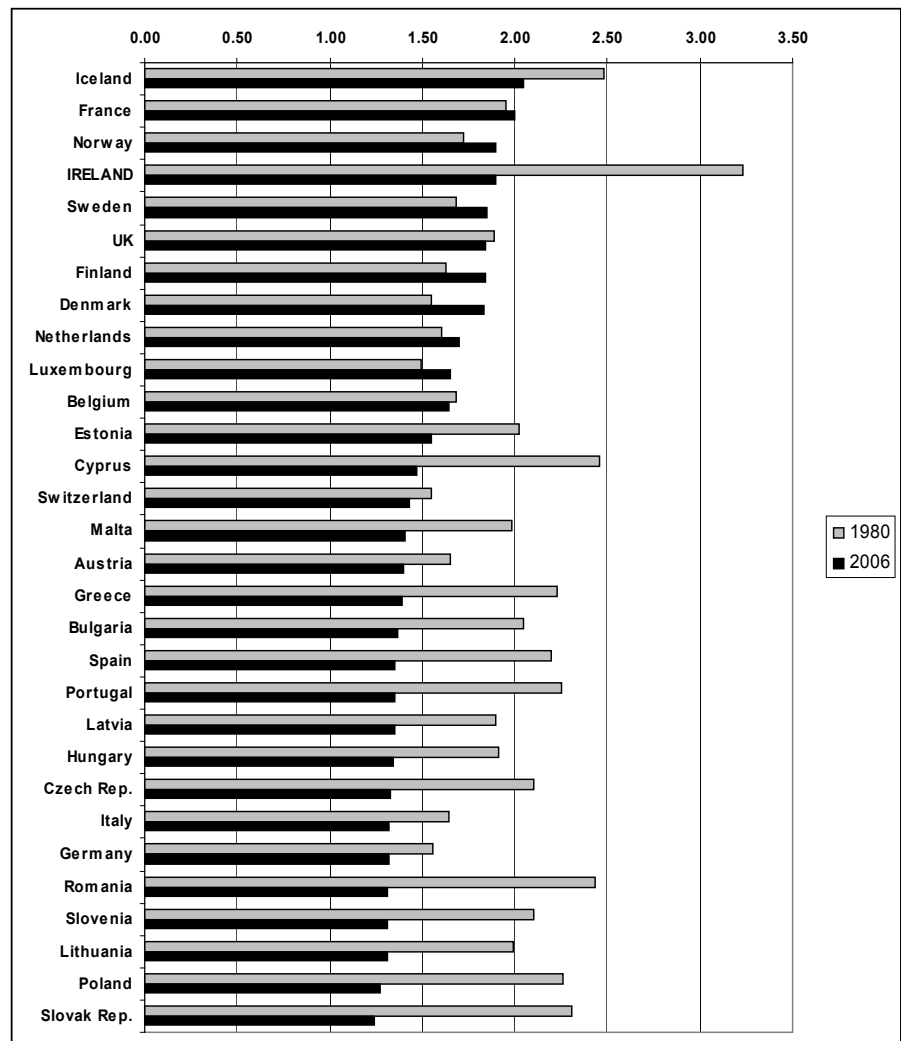
By calculating the theoretical number of births which would have occurred in 2006 if the age-specific fertility rates of 1965 still applied an indication can be obtained of the impact of the decrease in fertility rates between the mid-sixties and 2006. Using the 1965 rates, births in 2006 would have amounted to 137,200, which would have been more than double what they actually

were, (i.e. 137,200 theoretical births as against an actual 2006 figure of 64,200 births).

### International trends of selected countries

Figure 4 gives the total fertility rate (TFR) for the 27 EU countries as well as for Iceland, Norway and Switzerland in 1980 and 2006. The TFR has declined in Ireland by over 40 per cent between 1980 and 2006. Notwithstanding this decline Ireland continues to have one of the highest fertility rates in Europe (exceeded only by Iceland and France and on a par with Norway).

**Figure 4 Total fertility rates for selected countries, 1980 and 2006**



Source: Eurostat Statistics in Focus

In short, Ireland is now no longer an outlier in terms of having a markedly higher fertility than in other European states. In general terms the highest fertility rates occur in the Northern European states while the lowest occur in the East and South.

### Fertility assumptions

When deciding on the assumptions for future fertility the Expert Group took account of the recent trends in Ireland and developments in Europe. It concluded that the very recent slight upward trend in fertility in Ireland is unlikely to be maintained beyond the next few years and that the long-term decline can be expected to resume, albeit at a more moderate rate. In reaching this conclusion the Group considered the following factors:

- The recovery in recent years was to a significant extent due to an increase in the fertility rates of women in their thirties. This undoubtedly reflects a postponement effect whereby women are now giving birth at older ages. However, the data for the most recent years indicate that the upward movement in the fertility rates, especially of females aged 30-34, has tended to level off. The Group considered that further significant increases were unlikely.
- The increased educational attainment and labour force participation of women are expected to exert downward pressure on fertility.
- Average family size is projected to continue to decrease while childlessness among women will continue to rise.
- Irish fertility rates are still high when compared with those of other European countries, and the trends in Europe continue to be largely downward.

The Group considered that the most likely out-turn for overall average fertility over the projection period, as measured by the TFR, would be in the range 1.65 to 1.9. Two variants were chosen: a high variant (F1) and a low variant (F2):

- **F1:** TFR to remain at its 2006 level of 1.9 for the lifetime of the projections
- **F2:** TFR to decrease to 1.65 by 2016 and to remain constant thereafter

#### **High fertility assumption**

The high fertility assumption F1 assumes the total fertility rate will remain at the level observed in 2006 of 1.9 for the lifetime of the projections (i.e. until 2041). This assumption allows the impact on the projections of fertility remaining at just under the theoretical replacement level to be monitored.

#### **Low fertility assumption**

The low fertility assumption F2 assumes the total fertility rate will decrease from its 2006 level of 1.9 to 1.65 by 2016 and then stabilise at this level until the end of the projection period (2041). The Group considered that this assumption would allow Ireland to remain close to the top of the EU fertility table while still allowing a decrease to take place from the current level.

It is also assumed that the decline in fertility under F2 will be uniform across all age groups. As indicated previously, there has been wide variation in the rates at which the fertility of women in different age groups has evolved in recent years. While this variation is likely to persist into the future, it is not possible to predict it with any degree of confidence because of the impact of factors such as birth postponement and spacing of children.

In any event given that the principal purpose of the fertility assumptions is to generate the projected annual number of births to feed into the projection model, the distribution of these births according to the age of the mothers is considered to be a secondary factor. The assumed age-specific and derived total fertility rates under assumption F2 are given in Table C.

**Table C Actual 2006 and assumed age-specific fertility rate and total fertility rate, 2011 to 2041 under fertility assumption F2**

Year	Live births per 1,000 females at specified ages							TFR
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	
2006	16.6	49.2	81.1	128.1	87.6	17.7	0.7	1.90
2011	15.5	45.8	75.6	119.4	81.6	16.5	0.7	1.78
2016-2041	14.4	42.7	70.4	111.2	76.1	15.4	0.6	1.65

**Previous projections**

Three fertility assumptions were used in the last set of projections (published in 2004) covering the period 2006 to 2036. The high variant assumed the TFR would increase from its 2003 level of 1.98 to 2.0 by 2011 and then remain constant. The medium variant assumed the TFR would decrease to 1.85 by 2011 and remain constant thereafter, while the low variant assumed the TFR would decrease to 1.7 by 2011 and then remain constant.

The medium scenario F2 was the closest fit of the three scenarios to the actual outturn for 2004 to 2006 – with a projected annual average number of births of 62,900 compared with 62,300 actual births over this period.

## Mortality

### National trends

Life expectancy at birth for males increased from 57.4 years in 1926 to 76.7 years in 2005, representing a gain of 19.3 years over the seventy-nine year period. The corresponding female rates were 57.9 and 81.5 years, respectively, which represents a gain of 23.6 years. The differential between male and female life expectancy at birth has increased from 0.5 years in 1926 to 4.8 years in 2005. Table D shows that the gains achieved were not uniformly distributed by age.

**Table D Gains in life expectancy at various ages 1926 to 2005**

Period	Males			Females		
	Birth	5 years	70 years	Birth	5 years	70 years
1926-1946	3.1	2.0	-0.8	4.5	3.3	-0.5
1946-1961	7.6	4.2	0.5	9.5	6.5	0.8
1961-1971	0.7	-0.2	0.0	1.6	1.0	0.5
1971-1981	1.3	0.6	0.0	2.1	1.5	0.7
1981-1986	0.9	0.7	0.1	1.1	0.9	0.4
1986-1991	1.3	1.2	0.7	1.2	1.1	0.9
1991-1996	0.7	0.6	0.2	0.8	0.6	0.3
1996-2002	2.1	2.1	1.3	1.7	1.7	1.1
2002-2005 <sup>3</sup>	1.6	1.4	0.9	1.2	1.1	0.9
1926-2005	19.3	12.6	2.9	23.7	17.7	6.1

**Note:** See Table A3 in Appendix 5 for the more detailed underlying figures.

The major gains in both male and female life expectancy were recorded in the immediate post-war period, i.e. 1946-1961. These resulted from improvements in living conditions as well as from advances in maternity services and medical treatment, including immunisation, which significantly improved survival rates. The reduction in mortality was most marked in the case of infant deaths.

The 1960s, on the other hand, marked a fall off in the rate of improvements and, in the case of older males, a marginal deterioration occurred in life expectancy over the decade. Two reasons are generally advanced for this. First, the rate of improvement in infant mortality began to taper off and, consequently, its influence on life expectancy at birth diminished. Secondly, an increase was experienced in the mortality of people of working age due to a rise in the incidence of deaths due to ischaemic heart disease and most forms of cancer.

The situation has improved again in recent years. Life expectancy at birth increased by 5.7 years for males between 1986 and 2005 while the increase for females over the same period was 4.9 years. The improvements have been most notable in the older age groups and have also been very marked in the period 1996 to 2005, with a gain of 3.7 years in life expectancy at birth for males and a corresponding gain for females of 2.9 years. Improved living conditions coupled with further developments in medical care are considered to be the main contributing factors.

<sup>3</sup> The 2005 Life Tables referenced here were produced by the CSO as a special exercise for this projections publication. A set of Life Tables for 2005-2007 using Census 2006 data will be published during 2008.

## International comparisons

Male life expectancy in Ireland ranks 13<sup>th</sup> highest of the 30 countries listed in Table E, while female life expectancy ranks 17<sup>th</sup>. The table also shows that the life expectancy of females is now 82 years or over in eleven of the countries shown, while the life expectancy of males is 77 years or over in five of the countries.

**Table E Life expectancy at various ages for selected European countries for years around 2004**

Country	Year	Males				Females			
		0	1	15	65	0	1	15	65
Austria	2004	76.5	75.8	62.0	16.9	82.1	81.4	67.5	20.2
Belgium	2003	75.9	...	...	...	81.7	...	...	...
Bulgaria	2004	69.1	69.0	55.4	13.2	76.2	76.0	62.3	16.2
Cyprus	2004	76.9	76.2	62.5	16.5	81.6	80.8	67.0	19.0
Czech Rep.	2004	72.6	71.9	58.1	14.3	79.2	78.5	64.6	17.7
Denmark	2004	75.4	74.8	60.9	15.9	80.3	79.6	65.7	19.0
Estonia	2003	66.2	65.8	52.1	12.8	77.2	76.6	62.9	17.4
Finland	2004	75.4	74.7	60.8	16.5	82.2	81.4	67.6	20.4
France	2003	75.9	75.3	61.4	17.1	83.0	82.2	68.4	21.3
Germany	2004	76.5	75.8	62.0	16.5	82.1	81.4	67.5	20.1
Greece	2003	76.6	75.9	62.1	16.8	81.3	80.6	66.7	18.8
Hungary	2004	68.7	68.2	54.4	13.3	77.1	76.6	62.8	17.2
Iceland	2004	79.3	78.5	64.6	18.0	83.6	82.8	69.0	21.3
<b>Ireland</b>	2004	76.3	75.7	61.9	16.0	81.1	80.5	66.6	19.3
Italy	2003	76.8	-	-	16.8	82.5	-	-	20.5
Latvia	2004	66.1	65.7	52.0	12.7	76.2	76.0	62.2	17.1
Lithuania	2004	66.4	66.0	52.3	13.5	77.7	77.2	63.5	17.8
Luxembourg	2004	76.3	75.6	61.7	16.6	82.5	81.8	68.0	20.7
Malta	2003	76.7	76.1	62.3	15.8	80.4	79.6	65.8	18.2
Netherlands	2004	76.8	76.2	62.4	16.2	81.4	80.7	66.8	19.8
Norway	2004	77.5	76.8	62.9	17.0	82.4	81.6	67.8	20.5
Poland	2004	70.6	70.2	56.4	14.2	79.1	78.6	64.8	18.3
Portugal	2004	74.9	74.2	60.4	16.2	81.4	80.7	66.9	19.6
Romania	2003	67.8	68.1	54.6	13.3	75.3	75.4	61.8	16.1
Slovak Rep.	2004	70.4	69.9	56.2	13.4	78.0	77.5	63.8	17.1
Slovenia	2004	73.6	72.9	59.1	15.1	80.8	80.1	66.2	19.3
Spain	2004	77.2	-	-	-	83.8	-	-	-
Sweden	2004	78.4	77.6	63.7	17.4	82.7	82.0	68.1	20.6
Switzerland	2004	78.5	77.9	64.1	18.0	83.6	82.9	69.1	21.4
United Kingdom	2003	76.1	75.6	61.7	16.2	80.5	79.9	66.1	19.1

**Source:** Recent demographic developments in Europe 2005 (Council of Europe).

## Mortality assumptions

There is a general consensus internationally among demographers that the improvements in life expectancy will continue for the foreseeable future. However, the major question to be addressed is how past experience is likely to inform future developments.

A further question which the Expert Group had to consider was the choice of methodology to be used in projecting mortality rates. Previous projection exercises used the logarithmic method whereby the log-linear trend in age specific mortality rates observed in the past was extrapolated into the future. The method had a number of drawbacks. First, the choice of the past period to be used was not entirely clear. Secondly, the method gave rise to a discontinuity in the first year of the projection period.

The Expert Group decided to adopt an alternative methodology for the current set of projections – a so-called targeting approach. This requires an estimate of short term mortality trends, an assessment of the likely long-term improvement in mortality rates from some point in the future and a method of interpolating between the current short-term trends and the long-term trends. The precise methodology used is described in Appendix 6.

The assumptions adopted result in a projected male life expectancy at birth of 86.5 years in 2041 and a projected female life expectancy at birth of 88.2 years – representing improvements in life expectancy of 9.8 and 6.7 years for males and females respectively over the full projection period. The projected life expectancy at birth for males is about 7 years higher than the current highest rates observed for the countries listed in Table E, while that for females is about 4.5 years higher. However, given that life expectancy in all EU countries is expected to continue to improve, and that the catching up process by Ireland should also continue, the projected rates for Ireland are considered to be reasonable. The projections also assume that the recent narrowing of the gap in life expectancy between males and females will continue over the projection period.

Table A4 in Appendix 5 shows the evolution of life expectancies at various ages over the projection period under the assumptions used.

Mortality rates are assumed to decrease which will result in gains in life expectancy at birth from:

- 76.7 years in 2005 to 86.5 years in 2041 for males
- 81.5 years in 2005 to 88.2 years in 2041 for females

### **Previous projections**

In the last set of projections life expectancy at birth was assumed to improve to 82.5 years for males and 86.9 years for females by 2036. The actual improvement between 2002 and 2005 significantly exceeded the projected level – by nearly one year in the case of males. The new assumptions, therefore, take account of this faster rate of improvement.



## Migration

### Historical trends

The dominant influence which migration has had on the profile of population change in the past can be seen clearly in Figure 2. Migration is also the most uncertain factor affecting the population. This is illustrated in Table A, which shows that net migration varied considerably from an average annual outflow of over 40,000 in the 1950s to an average annual inflow of around 48,000 in the most recent inter-censal period 2002-2006.

Table F shows the annual migration flows for recent years. The annual number of immigrants increased steadily between 1997 and 2002 and following a slight fall off in the years to April 2003 and 2004 experienced a major upsurge since then. This sharp increase in the period 2005 to 2007 was mainly as a result of labour migration following the accession of the ten new EU member states in May 2004. With the exception of 1999, outward migration has been in the range 20,000 to 30,000 annually between 1997 and 2005. The upward movement since then reflects a return to their home countries on the part of some recent immigrants. Immigration has been the main driver of net migration in the period since 1997 with a temporary peak of over 40,000 being experienced in the year to April 2002. Following a slight decline, the number increased significantly and reached a maximum of close to 72,000 in 2006 following which it fell back somewhat to 67,000 in the year to April 2007.

**Table F Estimated migration, 1997 to 2007**

Year ending April	Emigrants	Immigrants	Net Migration
Thousands			
1997	25.3	44.5	19.2
1998	28.6	46.0	17.4
1999	31.5	48.9	17.3
2000	26.6	52.6	26.0
2001	26.2	59.0	32.8
2002	25.6	66.9	41.3
2003	29.3	60.0	30.7
2004	26.5	58.5	32.0
2005	29.4	84.6	55.1
2006	36.0	107.8	71.8
2007	42.2	109.5	67.3

### Migration assumptions

Projecting migration involves assumptions about the magnitude and direction of future migration flows. The volatility in the historical flows described above clearly points to the uncertainty that must surround any such projections. In this context, the Group decided to focus on providing from a current perspective (i.e. Q4 2007) two contrasting scenarios to reflect the likely range of possible outcomes. While labour market trends and economic growth will have a significant bearing on future migration flows, no attempt was made to explicitly factor these into the definition of the scenarios in any detailed way. Instead the focus was kept on projecting forward recent migration trends having regard to broad expectations in relation to relevant national and international developments (see below). The sensitivity of the derived labour force projections to the choice of migration assumptions is, however, explored later on in the report.

In its consideration of likely future migration patterns, the Group recognised that the high economic and labour force growth experienced by Ireland in the past decade has radically changed the outlook in regard to migration. In short the country has moved from a long-standing pattern of emigration to a new pattern of relatively strong immigration and it is unlikely that this will be reversed to any sustained degree over the projection period. Accordingly,

the Group decided that its two scenarios should seek to contrast immigration continuing at close to the current high rate and at more moderate levels.

The following issues were taken into consideration in framing the two scenarios:

- future expectations of growth in the economy and labour force;
- the availability of a large pool of labour particularly from the Eastern European countries which acceded to membership of the EU since 2004;
- the capacity of our infrastructure to cope with continuing high population growth;
- reduced labour supply due to the decline in births in the 1980s and 1990s;
- demographic “pull” factors arising from a more rapidly ageing population structure in other European countries;
- sharply decreased pool of Irish migrants living abroad.

Under migration scenario M1, the Group assumed annual net migration of 60,000 in the period 2006 to 2011 followed by 50,000 in the period 2011 to 2016. Net migration is assumed to fall further to 40,000 in the period 2016 to 2021, before settling at an average 30,000 per annum for the period 2021 to 2041. This would result in an average annual net inflow of nearly 39,000 over the projection period compared with the 35,000 per annum recorded for the 1996-2007 period.

Under migration scenario M2, average annual net migration is assumed to be 50,000 for the period 2006 to 2011, falling back to 35,000 in the period 2011 to 2016 and then to 25,000 during 2016 to 2021. It is then assumed to settle at 10,000 per annum for the period 2021 to 2041. This would result in an average annual net inflow of 21,400 over the entire projection period. This scenario would be consistent with a more modest performance for the Irish economy and labour market over the projection period.

**M1: Immigration continuing at a high level and then moderating**

- +60,000 per annum in 2006/2011
- +50,000 per annum in 2011/2016
- +40,000 per annum in 2016/2021
- +30,000 per annum in 2021/2026
- +30,000 per annum in 2026/2031
- +30,000 per annum in 2031/2036
- +30,000 per annum in 2036/2041

**M2: Immigration continuing at more moderate levels**

- +50,000 per annum in 2006/2011
- +35,000 per annum in 2011/2016
- +25,000 per annum in 2016/2021
- +10,000 per annum in 2021/2026
- +10,000 per annum in 2026/2031
- +10,000 per annum in 2031/2036
- +10,000 per annum in 2036/2041

The gross flow components of these net migration assumptions are given in Table G incorporating a long run outward migration assumption of 20,000 per annum.

**Table G Assumed average annual migration flows, 2006 to 2041**

Scenario	2006- 2011	2011- 2016	2016- 2021	2021- 2026	2026- 2031	2031- 2036	2036- 2041
Thousands							
M1							
Immigration	80	70	60	50	50	50	50
Emigration	20	20	20	20	20	20	20
Net migration	60	50	40	30	30	30	30
M2							
Immigration	70	55	45	30	30	30	30
Emigration	20	20	20	20	20	20	20
Net migration	50	35	25	10	10	10	10

In addition to migration assumptions M1 and M2 a zero net migration scenario has been introduced to allow a full assessment of the impact of migration to be made. The zero net migration scenario consists of assumed annual inflows of 20,000 being offset by corresponding annual outflows for the entire projection period.

#### **Previous projections**

The previous projections assumed that net migration would be 120,000 for the period 2002 to 2006 under both the high (M1) scenario and the low (M2) scenario. Based on the results of the 2002 Census, the derived inter-censal net migration figure was significantly higher at 191,000.

Thus the new migration assumptions represent a substantial upward revision in the projected impact of migration on future population growth i.e. projected average annual net inward migration of 39,000 compared with 23,000 under M1 and 21,400 compared with 11,400 under M2 over the relevant 35 year projection periods.

## Labour Force

### Methodology

The population projections provide estimates of the population classified by single year of age and sex under different assumptions for the period 2007 to 2041.

Applying labour force participation rates to the resulting data gives the relevant labour force projections. However, because of the uncertainty involved in projecting labour force participation rates in the longer term, the labour force projections are restricted to the period up to and including 2021.

The labour force comprises persons who are either employed or unemployed. The classification used in the present set of projections is that of the International Labour Organisation (ILO) as used in the Quarterly National Household Survey (QNHS).

The starting point is the projected population aged 15 years and over. As fertility does not impact in any way on the size of this population sub-group in the period to 2021, the only variants which are relevant are those under the different migration assumptions. The target variable for projection is the participation rate, i.e. the proportion of the relevant sub-population in the labour force. This is analysed at the level of five-year age groups for men and women. The age groups 15-19 and 20-24 have been split between those in the education system and those outside it. Separate labour force participation rates are applied to the assumed future populations of these two sub-categories for males and females. Similarly, women aged 25 years and over are classified by marital status (i.e. married and single) and separate participation rates are projected to reflect the different labour force participation and development profiles of the two groups.

It would have been preferable to distinguish separately women with and without dependent children (especially young dependent children) from the point of view of their labour force participation rates<sup>4</sup>. However, this would have entailed the added complication of making assumptions concerning future trends in the number of childless women and the timing and spacing of births to women with children. It was, therefore, decided to continue to use a breakdown of women according to whether they were married or not as an alternative while recognising that the single category contains a growing number of lone parents and partners in cohabiting couples.

### Marriage rate assumptions

The projected female population aged 25 years and over is first divided into two categories – married and single. Table H shows the percentage of females who were married in each age group as measured by the 1996, 2002 and 2006 Censuses of Population along with the rates assumed for 2011, 2016 and 2021.

**Table H Females married classified by age group (%), 1996 to 2021**

Age group	Actual			Assumed		
	1996	2002	2006	2011	2016	2021
25-29 years	41.5	26.8	23.7	22.0	21.0	20.0
30-34 "	73.1	60.6	55.0	53.0	51.0	49.0
35-39 "	84.3	78.4	73.4	72.0	71.0	70.0
40-44 "	88.1	85.4	82.2	80.0	78.0	76.0
45-49 "	89.9	88.2	86.3	84.0	83.0	82.0
50-54 "	90.2	90.0	88.6	88.0	88.0	88.0
55-59 "	89.0	90.6	89.9	90.0	90.0	89.0
60-64 "	87.0	89.9	90.2	90.0	90.0	89.0
65 years and over	81.9	84.6	85.4	86.0	87.0	87.0

<sup>4</sup> Table A7 of Appendix 5 provides such an analysis for 2000, 2002, 2004 and 2006.

The table shows a sharp decline between 1996 and 2006 in the percentage of married females, particularly those aged 25-34 years. It is assumed that the observed downward trend will continue, albeit at a much more moderate pace. For females aged 35 to 54 the proportions married are assumed to drop by up to a further 6 percentage points up to 2021. The proportions are assumed to remain about the same for females aged 55 years and over.

### Participation in education

In the 15-19 year age group 77 per cent of males were in education in 2006 compared with 87 per cent for females. The relevant proportions are assumed to increase to 84 per cent and 91 per cent, respectively, by 2021. Participation in education is less pronounced for 20-24 year olds. In 2006 the proportions were 22 per cent and 29 per cent for males and females, respectively. These are assumed to increase to 31 per cent and 36 per cent, respectively, by 2021, in line with a greater emphasis on participation in third level education and the knock-on effect of higher participation by 15-19 year olds. The historical education participation rates for 1996, 2002 and 2006 along with the projected rates for 2011, 2016 and 2021 are given in Table I.

**Table I Education participation rates, 1996 to 2021 (%)**

	Actual			Assumed		
	1996	2002	2006	2011	2016	2021
<b>Males</b>						
15-19 years	77	77	77	80	82	84
20-24 "	23	26	22	25	27	29
<b>Females</b>						
15-19 years	84	86	87	89	90	91
20-24 "	26	31	31	32	34	36

### Labour force participation rate assumptions

The labour force participation of students is largely a reflection of the extent to which they are involved in part-time work while continuing in full-time education. The rates for 15-19 year olds were about 11-12 per cent for males and about 13-14 per cent for females in 2002 and 2006. These rates are projected to increase up to 2021. The rates for 20-24 year olds were about 22-28 per cent for males and in the range 20-30 per cent for females in 2002 and 2006. These rates are also projected to increase for both males and females up to 2021.

For non-students aged 15-24 participation rates are assumed to remain close to 2006 levels in the period to 2021. The recent historical and projected participation rates for students and non-students aged 15-24 are given in Table J.

The actual labour force participation rates for 1996, 2001 and 2006 as well as the assumed participation rates for 2011, 2016 and 2021 are given in Table A5 of Appendix 5 for males, married females and single females, respectively.

**Table J Labour Force participation rates, 1991 to 2016 (%)**

Category and sex	Age group	Actual			Assumed		
		1996	2002	2006	2011	2016	2021
Students							
Males	15-19 years	4.3	11.1	12.2	12.0	13.0	14.0
	20-24 "	6.8	21.7	28.0	31.0	32.0	33.0
Females	15-19 "	4.8	13.1	14.0	18.0	19.0	20.0
	20-24 "	6.2	20.3	30.4	34.0	35.0	36.0
Non-students							
Males	15-19 years	90.2	90.7	90.5	91.0	91.0	91.0
	20-24 "	95.1	94.7	94.9	95.0	95.0	96.0
Females	15-19 "	84.4	80.1	81.0	81.0	82.0	83.0
	20-24 "	87.7	85.9	86.2	86.0	87.0	88.0

It is assumed on the basis of recent trends that participation rates of males in the 25-44 age group will remain largely unchanged over the projection period at the actual rates recorded in 2006 while in the case of males aged 45 years and over it is assumed that there will be some slight upward movement reflecting a greater propensity to remain in the labour force.

There have been major gains in the labour force participation rates of married females in the recent past, with the increases averaging over two percentage points annually during 1996 to 2006 in the case of females aged 45-49, 50-54 and 55-59.

The Expert Group considered that the scope for additional gains in the labour force participation rates of married females, especially older married females, is somewhat limited. It assumed that further gains will be achieved in the case of younger married females. The Group also considered that there was scope for a moderate increase in the labour force participation rate of other females in the period to 2021.

**Males:**

- LFPR of 25-44 year old males largely unchanged
- Minor increases in LFPR of males aged 45 and over reflecting a greater propensity to remain in the labour force

**Married females:**

- Further LFPR gains for married females aged 25-49 years
- Moderate gains in LFPR of married females aged 50 years and over

**Other females:**

- Moderate increases in LFPR of other females

## Summary of Assumptions

### Fertility

- **F1:** TFR to remain at its 2006 level of 1.9 for the lifetime of the projections
- **F2:** TFR to decrease to 1.65 by 2016 and to remain constant thereafter

### Mortality

Mortality rates are assumed to decrease which will result in gains in life expectancy at birth from:

- 76.7 years in 2005 to 86.5 years in 2041 for males
- 81.5 years in 2005 to 88.2 years in 2041 for females

### Migration

**M1:** Immigration continuing at a high level and then moderating

- +60,000 per annum in 2006/2011
- +50,000 per annum in 2011/2016
- +40,000 per annum in 2016/2021
- +30,000 per annum in 2021/2026
- +30,000 per annum in 2026/2031
- +30,000 per annum in 2031/2036
- +30,000 per annum in 2036/2041

**M2:** Immigration continuing at more moderate levels

- +50,000 per annum in 2006/2011
- +35,000 per annum in 2011/2016
- +25,000 per annum in 2016/2021
- +10,000 per annum in 2021/2026
- +10,000 per annum in 2026/2031
- +10,000 per annum in 2031/2036
- +10,000 per annum in 2036/2041

### Labour force

#### Males:

- LFPR of 25-44 year old males largely unchanged
- Minor increases in LFPR of males aged 45 and over reflecting a greater propensity to remain in the labour force

#### Married females:

- Further LFPR gains for married females aged 25-49 years
- Moderate gains in LFPR of married females aged 50 years and over

#### Other females:

- Moderate increases in LFPR of other females

