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An Phríomh-Oifig Staidrimh

Population and Labour Force Projections

2006-2036

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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 2006 to 2036;
- labour force classified by age, sex and female marital status for 2006, 2011 and 2016.

The projections are based on assumptions relating to future trends in fertility, mortality, migration and labour force participation. Three sets of assumptions were chosen for fertility, one for mortality and two for migration trends up to the year 2036. 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 June to October 2004. 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 2002 Census of Population, information on births up to 2003, life tables for 2001/2003 and the results for the March-May 2004 quarter from the Quarterly National Household Survey (QNHS).

Methodology

The model used in the projections is the demographic component method which projects the base 2002 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 the previous projections covering 2001-2031¹. 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 2006 and 2036 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 intercensal periods.
- Tables 8 and 9 contain the projected labour force for 2006, 2011 and 2016 under the two migration assumptions.

More detailed results are available on the CSO website www.cso.ie (See Appendix 4).

¹ Population and Labour Force Projections 2001-2031. Pn. 7491 Stationery Office, Dublin, July 1999.

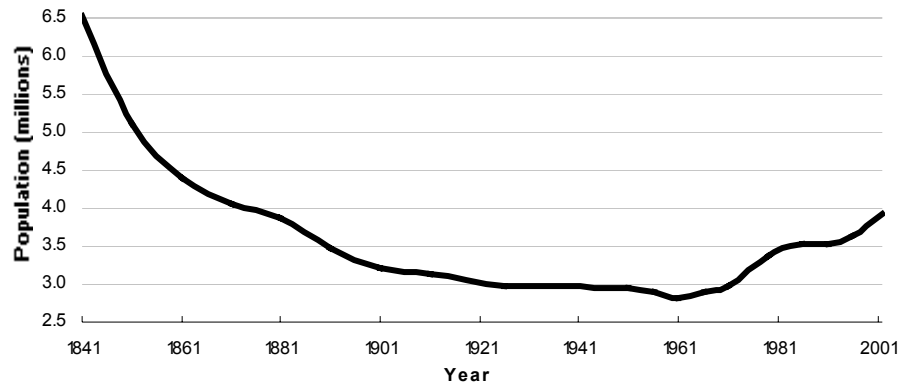
Appendix 5 contains a number of supporting tables which either informed the deliberations of the Expert Group or were derived from the results of the projection exercise.

HISTORICAL POPULATION TRENDS

The population 1841-2002

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 - 2002



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 which resumed in the early 1990s, strengthened in the most recent intercensal period. The 2002 population of 3.92 million is 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 intercensal period since 1926. The relevant components are:

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

Table A Average annual births, deaths, natural increase and estimated net migration for each intercensal period, 1926 - 2002

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

Lowest 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.

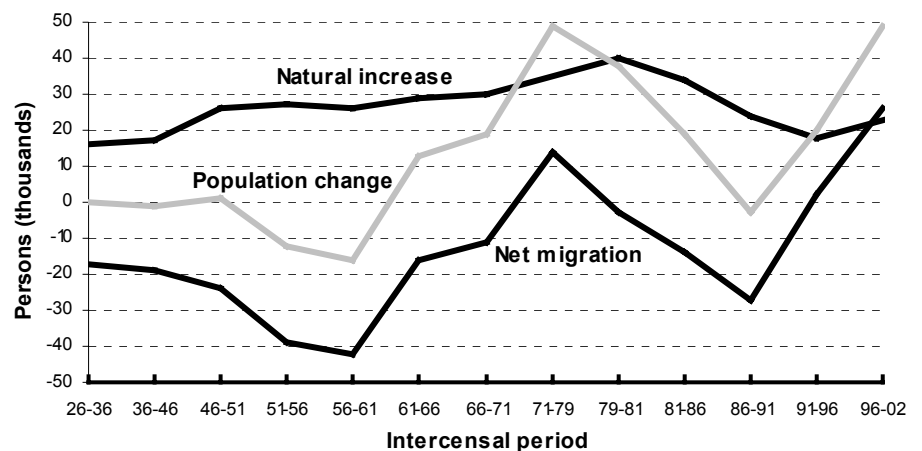
In the early 1990s there was a further decline in the average annual natural increase due to the declining birth rate. However, as a consequence of increased economic activity and employment growth there was a change around once again in the pattern of migration, with a small net inflow recorded between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

The most recent intercensal period has seen the average annual natural increase revert to the level attained during the late 1980s. Coupled with historically high net inward migration this has led to an average annual population increase on a par with that achieved during the 1970s.

The available evidence for the period since 2002 shows that the upward movement in the natural increase is continuing and also that net migration remains high, resulting in an average annual population increase of about 1.6 per cent.

Figure 2 shows average annual intercensal population change, natural increase and net migration for the period 1926–2002. The dominant influence which migration has exerted on the pattern of population change over the seventy-six year period can be clearly seen from the graph.

Figure 2 Components of population changes, 1926 - 2002



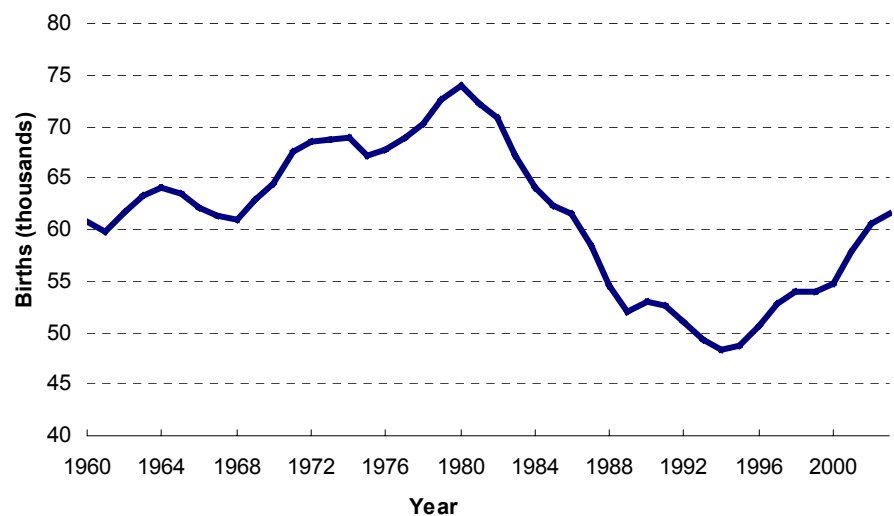
ASSUMPTIONS

Fertility

Births 1960 to date

From a fertility perspective the period from 1960 to 2003 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. Since then, births have increased each year to the 2003 level of 61,500. To summarise, annual births increased by 22 per cent between 1960 and 1980, declined by 35 per cent between 1980 and 1994 and then increased again by 27 per cent between 1994 and 2003. The situation is illustrated graphically in Figure 3.

Figure 3 Births 1960 - 2003



More women of child bearing age

To gain a deeper understanding of the trend in the number of births it is necessary to look at 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). Between the 1961 and 1981 Censuses 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. This pattern continued up to 1994, with a further 35 per cent fall in the annual number of births occurring despite an increase of over 16 per cent in the number of women aged 15-49.

The long-term decline in fertility rates has, however, been reversed with the total fertility rate increasing from 1.85 in 1994 to 1.98 in 2003. This 7 per cent increase in the fertility rate coupled with an increase of just over 20 per cent in the number of women aged 20-39 years has been responsible for the 27 per cent rise in the number of births between 1994 and 2003. In summary, while the number of women aged 20-39 has doubled between 1961 and 2003 the average number of children per woman has halved over the same period leading to a similar number of births in both years (60,000 in 1961 compared with 61,500 in 2003).

Table B contains age-specific and total fertility rates at five yearly intervals from 1960 to 1990 and for each year from 1990 to 2003.

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	19.6	53.0	93.6	134.3	79.9	14.7	0.6	1.98
2003	18.8	50.8	93.6	134.5	81.4	15.6	0.5	1.98

The five-year age groups 20-24, 25-29, 30-34, 35-39 together account for over 90 per cent of all births. 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 at that level. The fertility decline observed for women aged 25-29 years has been more gradual but has continued uninterrupted up to the present. Women aged 30-34 accounted for just over a third of all births in 2003. The long-term decline in the age-specific fertility rate of these women was halted in 1994 and has since followed an upward path. Similarly, the long-term decline in the age-specific fertility rate of women aged 35-39 was also halted in 1994 and has since increased by almost 40 per cent. Thus, over the last decade the fertility of women in their thirties has recovered to the level pertaining in the mid-1980s.

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. The TFR then increased slightly to 1.95 in 1998 before falling back to 1.90 in 2000. Over the past few years the TFR has increased again to a level of 1.98 in 2003.

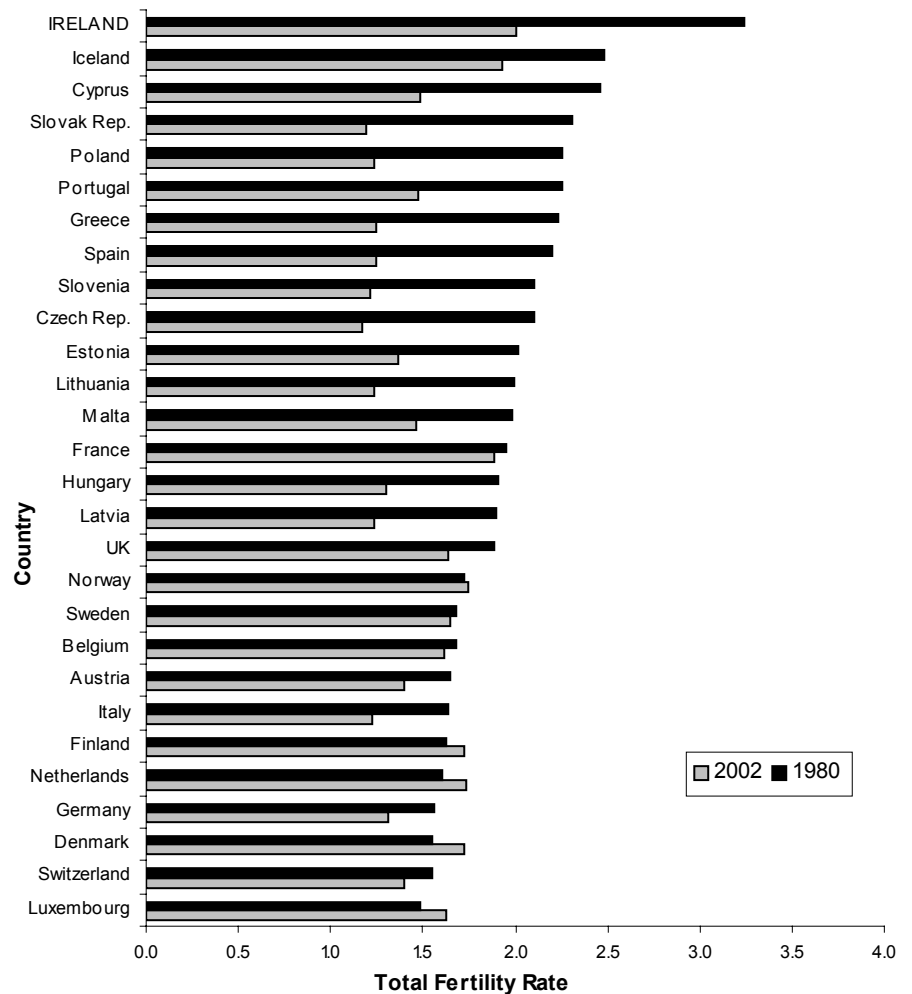
By calculating the theoretical number of births which would have occurred in 2003 if the age-specific fertility rates of 1965 still applied an indication can be obtained of the impact of the decrease in fertility rates between the mid-sixties and 2003. Using the 1965 rates, births in 2003 would have amounted to 126,000, which would have been more than double what they actually were, (i.e. 126,000 theoretical births as against an actual 2003 figure of 61,500 births).

International trends of selected countries

In Ireland the total fertility rate has declined by nearly 40 per cent between 1980 and 2002. Notwithstanding this decline Ireland continues to have the highest fertility rate in the EU. Figure 4 compares the TFRs for both years for the 25 EU countries as well as Iceland, Norway and Switzerland. A number of countries experienced greater relative declines in fertility than that

observed in Ireland. These include the Slovak Republic, Poland, Czech Republic, Slovenia and Cyprus along with Greece and Spain.

Figure 4 Total fertility rates for selected countries, 1980 and 2002



Source: *Recent demographic developments in Europe 2003* (Council of Europe).

Of the countries shown in Figure 4, Ireland had the highest TFR in both 1980 and 2002. The lowest fertility rates (less than 1.3 in 2002) were experienced in a number of most recent EU accession countries: Czech Republic, Slovak Republic, Slovenia, Latvia, Lithuania and Poland as well as in the Southern European countries of Italy, Spain and Greece. The Scandinavian and Benelux countries as well as France, the United Kingdom, Iceland and Ireland were the only countries with fertility rates above 1.6 in 2002.

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 recent 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 has tended to level off. The Group considered that further significant increases were unlikely.

- The increased educational attainment and labour force participation by women are expected to exert downward pressure on fertility;
- Average family sizes will continue to decrease and childlessness will increase;
- Irish fertility rates are still very 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 1.7 to 2.0. Three variants were chosen: a high variant (F1), a medium variant (F2), and a low variant (F3):

- **F1:** TFR to increase from its 2003 level to 2.0 by 2011 and to remain constant thereafter
- **F2:** TFR to decrease to 1.85 by 2011 and to remain constant thereafter
- **F3:** TFR to decrease to 1.7 by 2011 and to remain constant thereafter

High fertility assumption

The high fertility assumption F1 assumes the total fertility rate will increase very slightly from its 2003 level of 1.98 to 2 by 2011 and then stabilise at this level until the end of the projection period (2036). This assumption allows the impact on the projections of fertility remaining at just under the theoretical replacement level to be monitored. The assumed age-specific and derived total fertility rates under assumption F1 are given in Table C.

Table C Assumed age-specific fertility rate and total fertility rate, 2006 - 2036 under fertility assumption F1

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	18.9	51.0	94.0	135.0	81.6	15.7	0.5	1.99
2011-2036	19.0	51.3	94.5	135.9	82.1	15.8	0.5	2.00

Medium fertility assumption

The medium fertility assumption F2 assumes the total fertility rate will decrease from its 2003 level of 1.98 to 1.85 by 2011 and then stabilise at this level until the end of the projection period (2036). The Group considered that this assumption would allow Ireland to remain close to the top of the EU fertility table while allowing for a gradual decrease to take place. In 2002 only France, Iceland and Ireland had a TFR greater than 1.85.

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 D.

Table D Assumed age-specific fertility rate and total fertility rate, 2006 - 2036 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	18.3	49.5	91.2	131.1	79.3	15.2	0.5	1.93
2011-2036	17.6	47.5	87.5	125.7	76.0	14.6	0.5	1.85

Low fertility assumption

The low fertility assumption F3 assumes the total fertility rate will decrease more sharply from its 2003 level of 1.98 to reach 1.7 by 2011. The maintenance of the TFR at 1.7, which is the average rate for northern European countries at present, illustrates the impact of persistent lower fertility levels on the projected population. The assumed age-specific and derived total fertility rates under assumption F3 are given in Table E.

Table E Assumed age-specific fertility rate and total fertility rate, 2006 - 2036 under fertility assumption F3

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	17.8	48.0	88.4	127.0	76.8	14.7	0.5	1.87
2011-2036	16.1	53.6	80.4	115.5	69.8	13.4	0.4	1.70

Previous projections

Three fertility assumptions were used in the last set of projections (published in 1999) covering the period 2001 to 2031. The high variant assumed the TFR would increase from its 1998 level of 1.93 to 2.0 by 2001 and then remain constant. The medium variant assumed the TFR would remain constant at its 1998 level to 2001, decrease to 1.75 by 2011 and remain constant thereafter, while the low variant assumed the TFR would remain constant at its 1998 level to 2001, decrease to 1.5 by 2011 and then remain constant.

The fertility rate assumed under the high variant in this last set of projections is quite similar to the out-turn to date, i.e. a steady increase in the TFR to 1.98 by 2002. Accordingly, the projected births under this scenario did not differ markedly from the actual births registered in the period.

Mortality

National trends

Life expectancy at birth for males increased from 57.4 years in 1926 to 75.1 years in 2002, representing a gain of 17.7 years over the seventy six-year period. The corresponding female rates were 57.9 and 80.3 years, respectively, which represents a gain of 22.4 years. The differential between male and female life expectancy at birth has increased from 0.5 years in 1926 to 5.2 years in 2002. Table F shows that the gains achieved were not uniformly distributed by age.

Table F Gains in life expectancy at various ages 1926 - 2002

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
1926-2002	17.7	11.2	1.9	22.4	16.5	4.1

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 4.1 years for males between 1986 and 2002 while the increase for females over the same period was 3.7 years. The improvements have been most notable in the older age groups and have also been very marked in the period 1996 to 2002, with a gain of 2.1 years in life expectancy at birth for males and a corresponding gain for females of 1.7 years. Improved living conditions coupled with further developments in medical care are considered to be the main contributing factors.

International comparisons

Despite these improvements, life expectancy for both males and females in Ireland remains relatively low by comparison with many other European countries, as illustrated in Table G. Male life expectancy in Ireland ranks 15th highest of the 28 countries listed, while female life expectancy ranks 19th. When the same countries are ranked in terms of life expectancies in 1970, Ireland's position is essentially unchanged, despite the large improvements in life expectancy during the period 1970 to 2002.

Table G Life expectancy at various ages for selected European countries

Country	Year	Males				Females			
		0	1	15	65	0	1	15	65
Austria	2002	75.8	75.2	61.3	16.3	81.7	80.9	67.0	19.7
Belgium	2002	75.1	74.5	60.7	15.8	81.1	80.4	66.6	19.7
Cyprus	2000/2001	76.1	75.5	61.7	16.5	81.0	80.4	66.6	19.1
Czech Rep.	2002	72.1	71.5	57.7	14.0	78.7	78.0	64.2	17.4
Denmark	2002	74.8	74.2	60.3	15.4	79.5	78.8	64.9	18.3
Estonia	2002	65.3	64.7	51.1	12.7	77.1	76.5	62.7	17.3
Finland	2002	74.9	74.1	60.3	15.8	81.5	80.7	66.8	19.6
France	2001	75.5	74.9	61.1	16.9	82.9	82.2	68.4	21.3
Germany	2001	75.5	74.8	61.0	16.0	81.3	80.6	66.7	19.6
Greece	1999	75.5	75.0	61.2	16.3	80.6	80.1	66.2	18.7
Hungary	2002	68.4	67.9	54.1	13.1	76.7	76.3	62.4	17.0
Iceland	2000	78.0	77.3	63.5	18.1	81.4	80.5	66.7	19.6
Ireland	2002	75.1	74.6	60.8	15.4	80.3	79.7	65.8	18.7
Italy	2000	76.6	75.9	62.1	16.5	82.5	81.8	68.0	20.4
Latvia	2002	64.8	64.5	50.9	12.5	76.0	75.7	62.1	16.9
Lithuania	2002	66.3	65.8	52.2	13.3	77.5	77.1	63.3	17.7
Luxembourg	2002	74.9	74.3	60.7	15.9	81.5	80.9	67.1	19.9
Malta	2002	75.8	75.2	61.4	15.0	80.5	80.1	66.2	18.9
Netherlands	2002	76.0	75.4	61.6	15.6	80.7	80.1	66.2	19.3
Norway	2002	76.4	75.7	61.9	16.2	81.5	80.8	66.9	19.7
Poland	2002	70.4	70.0	56.2	14.0	78.7	78.2	64.4	17.9
Portugal	2002	73.8	73.2	59.5	15.6	80.5	79.9	66.1	19.0
Slovak Rep.	2002	69.9	69.4	55.6	13.3	77.8	77.4	63.6	17.0
Slovenia	2002	72.7	72.1	58.3	14.6	80.5	79.7	65.9	18.9
Spain	2000	75.7	75.0	61.2	16.5	82.5	81.9	68.0	20.4
Sweden	2002	77.7	77.0	63.2	16.9	82.1	81.4	67.5	20.0
Switzerland	2002	77.8	77.1	63.3	17.4	83.0	82.3	68.4	21.0
United Kingdom	2000	75.5	74.9	61.1	15.7	80.2	79.6	65.7	18.9

Source: *Recent demographic developments in Europe 2003 (Council of Europe)*.

This table shows that the life expectancy of females is now 81 years or over in thirteen of these countries, while the life expectancy of males is 76 years or over in seven countries.

Mortality assumptions

There is a general consensus internationally among demographers that the improvements in life expectancy will continue for the foreseeable future. The Expert Group agreed with this and proposed that the average rate of improvement in life expectancy over the sixteen-year period 1986 to 2002 should be maintained over the life-time of the projections, with the exception of the 20 to 29 age group for both males and females. The period 1986 to 2002 showed a slight disimprovement in mortality rates for males and females aged 20 to 29 years while the period 1996 to 2002 showed a modest improvement. The Group considered that it was reasonable to assume that this modest improvement would continue and thus the time period used as the basis of the projection for this age group is 1996 to 2002.

These assumptions would result in a female life expectancy at birth of 86.9 years in 2036 and a male life expectancy at birth of 82.5 years. These projected rates are about four years higher than the current highest rates observed for the countries listed in Table G. 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.

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:

- 75.1 years in 2002 to 82.5 years in 2036 for males
- 80.3 years in 2002 to 86.9 years in 2036 for females

Previous projections

In the last set of projections life expectancy at birth was assumed to improve to 77.8 years for males and 84.0 years for females by 2031. The actual improvement between 1996 and 2002 significantly exceeded the projected level – by over 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 26,000 in the most recent intercensal period.

Following the large exodus in the 1950s, emigration declined rapidly in the 1960s leading to a reversal in the migration flow with a net average annual inflow of 14,000 being recorded in the 1970s. However, the trend of inward migration in the 1970s was short-lived. With the onset of the recession in the early 1980s large net outflows again materialised, particularly in the latter half of the decade when outflows on a par with those of the 1950s were again recorded. The first half of the 1990s saw net migration oscillating around zero. The main cause of the reduction in net outward migration on this occasion was the deterioration in foreign labour markets that deterred many from emigrating and also led to return migration of Irish people from abroad.

Table H shows the annual migration flows for recent years. Since 1996 there has been a downward trend in the number of emigrants, together with a strong rise in the number of immigrants, peaking in 2002. Net immigration in recent years reached a high point in 2002 of 41,000 but has fallen back somewhat to about 32,000 in 2004. These changes reflect the very strong performance of the Irish economy and of the labour market over this period.

Table H Estimated migration, 1995 - 2004

Year ending April	Out-migration	In-migration	Net migration
Thousands			
1995	33.1	31.2	-1.9
1996	31.2	39.2	8.0
1997	25.3	44.5	19.2
1998	28.6	46.0	17.4
1999	31.5	48.9	17.4
2000	26.6	52.6	26.0
2001	26.2	59.0	32.8
2002	25.6	66.9	41.3
2003	20.7	50.5	29.8
2004	18.5	50.1	31.6

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, particularly those assumed for the latter part of the projection period. In this context, the Group decided to focus on providing from a current perspective 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 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 very 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 high and 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 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 remaining at the current level of 30,000 in the period 2002 to 2016 followed by a slowing down to 20,000 in the period 2016 to 2026 and eventually to 15,000 per annum in the period 2026 to 2036. This would result in an average annual net inflow of 22,600 over the projection period. This scenario would be consistent with the Irish economy and labour market continuing to perform strongly relative to other countries over the long term.

Under migration scenario M2, average annual net migration is assumed to be 30,000 for the period 2002 to 2006, falling back to 20,000 in the period 2006 to 2011. Net migration is assumed to fall further to 10,000 during 2011 to 2016, falling again to 5,000 per annum for the period 2016 to 2036. This would result in an average annual net inflow of nearly 11,000 over the projection period. This scenario would be consistent with a more modest performance for the Irish economy and labour market, in line with current EU average growth rates, over the projection period.

M1: Immigration continuing at a high level and then moderating

- +30,000 per annum in 2002/2006
- +30,000 per annum in 2006/2011
- +30,000 per annum in 2011/2016
- +20,000 per annum in 2016/2021
- +20,000 per annum in 2021/2026
- +15,000 per annum in 2026/2031
- +15,000 per annum in 2031/2036

M2: Immigration continuing at more moderate levels

- +30,000 per annum in 2002/2006
- +20,000 per annum in 2006/2011
- +10,000 per annum in 2011/2016
- + 5,000 per annum in 2016/2021
- + 5,000 per annum in 2021/2026
- + 5,000 per annum in 2026/2031
- + 5,000 per annum in 2031/2036

The gross flow components of these migration assumptions are given in Table I.

Table I Assumed average annual migration flows, 2002 - 2036

Scenario	2002-2006	2006-2011	2011-2016	2016-2021	2021-2026	2026-2031	2031-2036
Thousands							
M1							
Immigration	51	51	51	41	40	35	35
Emigration	21	21	21	21	20	20	20
Net migration	30	30	30	20	20	15	15
M2							
Immigration	51	41	30	25	25	25	25
Emigration	21	21	20	20	20	20	20
Net migration	30	20	10	5	5	5	5

Previous projections

The previous projections assumed that net migration would be 115,000 for the period 1996 to 2002 under the high (M1) scenario and 80,000 under the low (M2) scenario. Based on the results of the 2002 Census, the derived intercensal net migration figure was significantly higher at 154,000.

In the period 2002-2006 the previous projections had migration assumptions which varied from annual net migration of 15,000 (M1) to 5,000 (M2). Both of these are significantly at variance with the estimated net migration for the early part of this period: net migration in 2003 and 2004 is estimated to have been around 30,000 in each year.

Thus the new migration assumptions represent a substantial upward revision in the projected impact of migration on future population growth.

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 2002 to 2036.

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 2016.

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 2016, 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. 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 J shows the percentage of females who were married in each age group as measured by the 1991, 1996 and 2002 Censuses of Population along with the rates assumed for 2006, 2011 and 2016.

Table J Percentage of females married classified by age group, 1991 to 2016

Age group	Actual			Assumed		
	1991	1996	2002	2006	2011	2016
25-29 years	56.7	41.5	26.8	23.0	21.0	20.0
30-34 "	80.0	73.1	60.6	56.0	52.0	50.0
35-39 "	87.2	84.3	78.4	74.0	71.0	68.0
40-44 "	89.9	88.1	85.4	81.0	76.0	73.0
45-49 "	90.3	89.9	88.2	86.0	81.0	77.0
50-54 "	89.1	90.2	90.0	89.0	86.0	81.0
55-59 "	87.0	89.0	90.6	90.0	89.0	86.0
60-64 "	84.6	87.0	89.9	90.0	90.0	89.0
65 years and over	80.2	81.9	84.6	86.0	87.0	87.0

The trend in the number of marriages was steadily downwards from a level of 21,800 in 1980 to about 15,600 in 1997. Since then there has been a recovery in the number of marriages, with 20,300 recorded for 2003. The table above shows a sharp decline in the percentage of married females in the younger age groups, particularly those aged 25-29 years.

For the 25-29 age groups it is assumed that the downward trend in the proportion of married females will continue, albeit at a much more moderate pace. For females aged 30 to 54 the proportions married are assumed to drop by a further 9 to 12 percentage points up to 2016. The proportions are assumed to drop by about 5 percentage points for females aged 55 to 59 years and to remain about the same for older females.

Participation in education

In the 15-19 year age group 77 per cent of males were in education in 2002 compared with 86 per cent for females. The relevant proportions are assumed to increase to 84 per cent and 92 per cent, respectively, by 2016. Participation in education is less pronounced for 20-24 year olds. In 2002 the proportions were 26 per cent and 31 per cent for males and females, respectively. These are assumed to increase to 32 per cent and 36 per cent, respectively, by 2016, 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 historic education participation rates for 1991, 1996 and 2002 along with the projected rates for 2006, 2011 and 2016 are given in Table K.

Table K Education participation rates, 1991 - 2016 (%)

Age group	Actual			Assumed		
	1991	1996	2002	2006	2011	2016
Males						
15-19 years	70	77	77	80	82	84
20-24 "	17	23	26	28	30	32
Females						
15-19 years	77	84	86	89	91	92
20-24 "	17	26	31	33	35	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 10-11 per cent for males and about 12-13 per cent for females in 2002 and 2004. These rates are expected to remain largely unchanged up to 2016. The rates for 20-24 year olds were about 22-23 per cent for males and in the range 20-25 per cent for females in 2002 and 2004. These rates are expected to remain at around 25 per cent for both males and females up to 2016.

For non-students aged 15-24 participation rates are assumed to remain close to 2004 levels in the period to 2016. The recent historic and projected participation rates for students and non-students aged 15-24 are given in Table L.

The actual participation rates for 1991, 1996, 2002 and 2004 as well as the assumed participation rates for 2006, 2011 and 2016 are given in Table A5 of Appendix 5 for males, married females and single females, respectively.

Table L Labour Force participation rates, 1991 - 2016 (%)

Category and sex	Age group	Actual			Assumed		
		1991	1996	2002	2006	2011	2016
Students							
Males	15-19 years	3.3	4.3	11.1	10.0	10.0	10.0
	20-24 "	3.5	6.8	21.7	24.0	25.0	25.0
Females	15-19 "	3.3	4.8	13.1	12.0	12.0	12.0
	20-24 "	8.4	6.2	20.3	25.0	25.0	25.0
Non-students							
Males	15-19 years	92.8	90.2	90.7	89.0	90.0	90.0
	20-24 "	94.8	95.1	94.7	95.0	95.0	96.0
Females	15-19 "	86.8	84.4	80.1	78.0	79.0	80.0
	20-24 "	84.6	87.7	85.9	85.0	86.0	87.0

It is assumed on the basis of recent trends that participation rates of males in the 25-54 age group, which accounts for over two-thirds of the male labour force, will remain largely unchanged over the projection period at the actual rates recorded in 2004.

There have been dramatic gains in the labour force participation rates of married females in the recent past. The average annual increase for married females aged 25-64 years over the period 1991 to 2004 ranged from 1.7 per cent for 25-29 year olds to 5.9 per cent for 50-54 year olds.

Notwithstanding these increases, Ireland still lags somewhat behind many countries of the EU in terms of the labour force participation rates of married females. It is, therefore, assumed that the catching up process will continue with increases for married females of all ages, and in particular for those aged 35-39 years and aged 50-59 years.

Minor increases are assumed in the participation rates of males aged 55 years and over reflecting a tightening of the labour market supply of younger people and the removal of some barriers to people continuing to work at older ages.

Males:

- Increase in LFPR of 20-24 year old students
- Minor increases in LFPR of males aged 55 and over because of tightening labour force supply

Females 15-24:

- Slight increases in the LFPR of non-students

Married females:

- Continued increases in LFPR of all married females

Other females:

- Slight increases in LFPR of other females

Summary of Assumptions

Fertility

- **F1:** TFR to increase from its 2003 level to 2.0 by 2011 and to remain constant thereafter
- **F2:** TFR to decrease to 1.85 by 2011 and to remain constant thereafter
- **F3:** TFR to decrease to 1.7 by 2011 and to remain constant thereafter

Mortality

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

- 75.1 years in 2002 to 82.47 years in 2036 for males
- 80.3 years in 2002 to 86.86 years in 2036 for females

Migration

M1: Immigration continuing at a high level and then moderating

- +30,000 per annum in 2002/2006
- +30,000 per annum in 2006/2011
- +30,000 per annum in 2011/2016
- +20,000 per annum in 2016/2021
- +20,000 per annum in 2021/2026
- +15,000 per annum in 2026/2031
- +15,000 per annum in 2031/2036

M2: Immigration continuing at more moderate levels

- +30,000 per annum in 2002/2006
- +20,000 per annum in 2006/2011
- +10,000 per annum in 2011/2016
- + 5,000 per annum in 2016/2021
- + 5,000 per annum in 2021/2026
- + 5,000 per annum in 2026/2031
- + 5,000 per annum in 2031/2036

Labour force

Males:

- Increase in LFPR of 20-24 year old students
- Minor increases in LFPR of males aged 55 and over because of tightening labour force supply

Females 15-24:

- Slight increases in the LFPR of non-students

Married females:

- Continued increases in LFPR of all married females

Other females:

- Slight increases in LFPR of other females

