RESULTS

Introduction

Different sub-periods

Two distinct time periods are distinguished in the presentation of the results, namely: the periods 2011-2021 and 2021-2041, respectively. Six population variants are given for both periods. These are M1F1, M1F2, M2F1, M2F2, M0F1 and M0F2. The one mortality assumption underlies all these projections. Three projections for the labour force are presented for the period 2011-2021 as fertility rates do not have any direct impact on the level of the workforce over such a relatively short period of time.

The results are set out in Tables 1 to 10 following this commentary.

Tables 1 to 6 give the projected population classified by five-year age group and sex at five-year intervals from 2006 to 2041.

The projected numbers of births, deaths and net migration under the six combinations of assumptions are set out for five-year periods from 2006 to 2041 in Table 7. This table also contains comparable historical inter-censal data from 1926 onwards in order to facilitate comparisons with past trends.

In Tables 8, 9 and 10 the projected labour force is classified by five-year age group, sex and female marital status for the years 2011, 2016 and 2021.

The period 2011 to 2021

Total projected population

The usually resident population according to Census 2006 was 4.23 million. Table K summarises the total projected population arising under the six combinations of fertility and migration.

Table K Projected population, 2011 to 2021

Year	High Fertility (F1)			Low Fertility (F2)		
	M1	M2	M0	M1	M2	M0
	Thousands					
2011	4,738	4,686	4,422	4,729	4,676	4,413
2016	5,233	5,094	4,607	5,188	5,050	4,568
2021	5,688	5,449	4,764	5,590	5,356	4,686

Under the highest variant (M1F1) the population is projected to grow by nearly one and half million between 2006 and 2021 - an average annual rate of population increase of almost 2 per cent, equivalent to that observed during the most recent inter-censal period 2002-2006. Under the lowest variant of zero net migration and low fertility (M0F2) overall population growth is projected to be 453,000 over the fifteen year period to 2021. The difference between the populations projected under the highest and lowest variants is therefore 1 million with migration being the predominant differentiating factor.

.. migration the key factor..

The difference in the impact of the high and medium migration assumptions on the level of the projected population in 2021 is between 234,000 and 238,000 depending on which fertility assumption is used. The difference between zero net migration and the high migration assumption on the other hand is over 900,000 clearly illustrating the impact which migration has on projected population growth. The fertility effect is between 77,000 or 97,000 depending on the migration assumption used. Migration, therefore, accounts for over 90 per cent of the total difference between the highest and lowest population levels projected for 2021.

Table L shows the population by broad age group under the various combinations of assumptions for five-year intervals from 2011 to 2021. It also distinguishes the derived young and old dependency ratios as well as the population of school-going age.

The young population

The number of persons aged 0-14 years reached a peak of 1,044,000 in 1981. The main reasons were the steady build up of births in the 1970s coupled with inward migration during the same period when complete families returned to Ireland. The number of children in this age group has, however, declined in every census between 1981 and 2002 mainly reflecting the sharp fall in births from the 1980 peak, which left the numbers in this age group at 827,000 in 2002, (a decrease of about 217,000 since 1981). The most recent inter-censal period has seen the population of this age group increase by 4.5 per cent to 865,000 mainly as a result of the resurgence in the number of births since 2002.

Those aged 0-14 years in 2006 will have aged fifteen years by 2021 and will, therefore, have been completely replaced by those born in the intervening period, with due allowance being made for migration and mortality. Comparisons between the number of persons aged 0-14 in 2006 and 2021 will vary, therefore, largely in accordance with the fertility assumption chosen.

Maintaining a total fertility rate of 1.9 (fertility assumption F1) would result in the projected number of 0-14 year olds exceeding the 1981 peak of 1,044,000 by 2016 under migration scenarios M1 and M2. Under the highest scenario M1F1 the young population is projected to increase to 1,167,000 in 2021 – up 35 per cent compared with 2006. In the absence of migration, the young population would experience no change under F2 and

Table L Population projections, 2011 - 2021

Scenario	Population of school going age		Population				Annual Average % change in total population in 5-year period	Dependancy ratios		
	"Primary" 5-12	"Secondary" 13-18	0-14	15-64	65+	Total		Young	Old	Total
	Thousands							Percentage		
Actual										
2006	450.5	342.3	865.1	2,905.5	462.4	4,232.9	0.00	29.8	15.9	45.7
M1F1										
2011	500.4	339.4	964.5	3,237.0	536.6	4,738.2	2.28	29.8	16.6	46.4
2016	558.8	374.5	1,074.4	3,510.3	648.6	5,233.3	2.01	30.6	18.5	49.1
2021	623.1	409.7	1,166.9	3,745.9	774.7	5,687.5	1.68	31.2	20.7	51.8
M1F2										
2011	500.4	339.4	954.9	3,237.0	536.6	4,728.5	2.24	29.5	16.6	46.1
2016	549.2	374.5	1,029.0	3,510.3	648.6	5,187.9	1.87	29.3	18.5	47.8
2021	578.7	408.8	1,069.5	3,745.9	774.7	5,590.1	1.50	28.6	20.7	49.2
M2F1										
2011	497.2	337.9	956.9	3,192.9	535.7	4,685.5	2.05	30.0	16.8	46.7
2016	548.7	370.1	1,048.8	3,399.1	645.9	5,093.8	1.69	30.9	19.0	49.9
2021	599.5	401.5	1,114.0	3,565.8	769.5	5,449.2	1.36	31.2	21.6	52.8
M2F2										
2011	497.2	337.9	947.4	3,192.9	535.7	4,676.0	2.01	29.7	16.8	46.4
2016	539.2	370.1	1,004.7	3,399.1	645.9	5,049.7	1.55	29.6	19.0	48.6
2021	556.3	400.6	1,021.2	3,565.8	769.5	5,356.4	1.19	28.6	21.6	50.2
M0F1										
2011	481.1	330.4	918.6	2,972.2	531.1	4,421.9	0.88	30.9	17.9	48.8
2016	511.2	354.2	951.3	3,019.6	636.0	4,606.9	0.82	31.5	21.1	52.6
2021	518.2	376.4	944.2	3,066.2	753.3	4,763.7	0.67	30.8	24.6	55.4
M0F2										
2011	481.1	330.4	909.7	2,972.2	531.1	4,413.0	0.84	30.6	17.9	48.5
2016	502.3	354.2	912.7	3,019.6	636.0	4,568.3	0.69	30.2	21.1	51.3
2021	480.5	375.5	866.9	3,066.2	753.3	4,686.4	0.51	28.3	24.6	52.8

an increase of about 9 per cent under F1, illustrating again how sensitive the projections are to the choice of migration assumption used.

..rise in numbers of "primary" school-going age..

The projected changes will directly impact on the population of school-going age. Taking the "primary" school population as being broadly represented by those aged 5-12 years, the numbers in this category are projected to increase progressively under all combinations of assumptions in the period 2006-2021. The projected increases vary from 106,000 under M2F2 to 173,000 under M1F1. Even in the absence of migration (M0) the "primary" school going population is projected to increase by between 30,000 and 68,000 over the period 2006-2021, depending on the fertility assumption chosen.

The numbers of children of "secondary" school age (i.e. persons aged 13-18 years[5]) under all combinations of assumptions are projected to continue to decline until 2011 and to then experience a recovery by 2016 due to the higher number of births from 2003 onwards. This increase is projected to continue on up to 2021 and range from 33,000 under M0F2 to 67,000 under M1F1.

It is instructive to put the likely changes in the young population in the context of projected changes in the rest of the population. The "young" dependency ratio is a measure which expresses the population aged 0-14 years as a percentage of the population aged 15-64 years. This ratio peaked at over 50 per cent during the 1960s and 1970s but has been in continuous decline since then to stand at around 30 per cent in 2006. Table L shows that this ratio is projected to remain largely unchanged in the range 28 to 32 per cent under all assumptions in the period to 2021.

..births on the increase..

The number of births averaged 70,000 in the ten-year period 1971-1981 with the peak number of births (74,000) occurring in 1980. Declines were observed in each inter-censal period up to and including 1991-1996 when the average fell to just 50,000 births per annum over the period. Since the mid-1990s the annual number of births recorded has increased progressively from a low of 48,000 in 1994 to 64,200 in 2006. As a result, in the most recent inter-censal period 2002-2006 the average annual number of births rose to 61,000.

Under assumptions F1 and F2 the number of births is projected to continue its upward path with an average of 79,000 births projected for 2016-2021 under M1F1 and 69,000 under M1F2. For the lower migration scenario (M2) the number would be approximately 4,000-5,000 lower on each fertility assumption. Under the zero net migration assumption (M0) the number of births would be considerably lower in the range 51,000 to 59,000 depending on which fertility assumption is chosen.

The population of working age

In examining the population aged 15-64 in the period to 2021 reference only needs to be made to the migration effect as the different fertility assumptions have no impact on this age group. Three scenarios are considered, namely high (M1), medium (M2), and zero (M0). With nearly all of net migration estimated to affect the 15-64 age group the difference between the three migration assumptions impacts almost entirely on the this age group up to 2021.

The population aged 15-64 has increased at every census since 1961 from its then low point of 1,626,000 to 2,906,000 in 2006. Under M1 – the continuing high net migration assumption – the population aged 15-64 is projected to increase by 840,000 between 2006 and 2021 representing an average annual increase of about 1.7 per cent. Under M2 the increase

[5] Users should note these figures reflect the actual number of persons in this age group and not the numbers enrolled in secondary level schools as participation rates for those aged 16, 17 and 18 can vary over time, and are not taken into account.

during the period 2006-2021 would be 660,000 persons or 1.4 per cent per annum.

Both these projected population growth rates are lower than the 2.1 per cent rate recorded between 1996 and 2006. This high growth rate was due to two factors. On the one hand, the number of entrants to the age group was bolstered by the high births recorded in the early 1980s. On the other hand, the number of 65-year-olds leaving the age group was depleted due to emigration from this cohort during the 1950s.

In the absence of migration the population aged 15-64 is projected to increase by slightly over 160,000 between 2006 and 2021, representing an annual average increase of just 0.4 per cent. Under this scenario the average annual increase of around 10,000 represents the projected excess of entrants over exits impacting on the working age population over the period.

The Expert Group's assumptions concerning labour force participation rates translate these populations into their relevant labour force and non-labour force components. The results are given in Tables 8, 9 and 10.

Increasing labour force

Under migration assumption M1, which assumes net inward migration continuing at an average annual rate of 50,000 up to 2021, the labour force is projected to increase by three-quarters of a million, from 2.12 to 2.87 million between 2006 and 2021. This represents an average annual increase of 50,000 compared with 72,000 in the most recent inter-censal period (2002 -2006). The male and female components of the labour force are each projected to increase by 2 per cent per annum between 2006 and 2021 under M1 implying that the female share of the labour force will remain unchanged at just over 42 per cent during this period.

Under the M2 scenario the labour force is projected to increase at a slower average annual rate of 40,000 over the period to reach 2.72 million in 2021. The projected growth rates for males and females will be equivalent at 1.7 per cent per annum over the projection period. In the absence of migration the labour force is projected to grow at a modest annual average rate of 0.6 per cent for both males and females between 2006 and 2021. This would result in an average annual increase of under 13,000 in the labour force over the period.

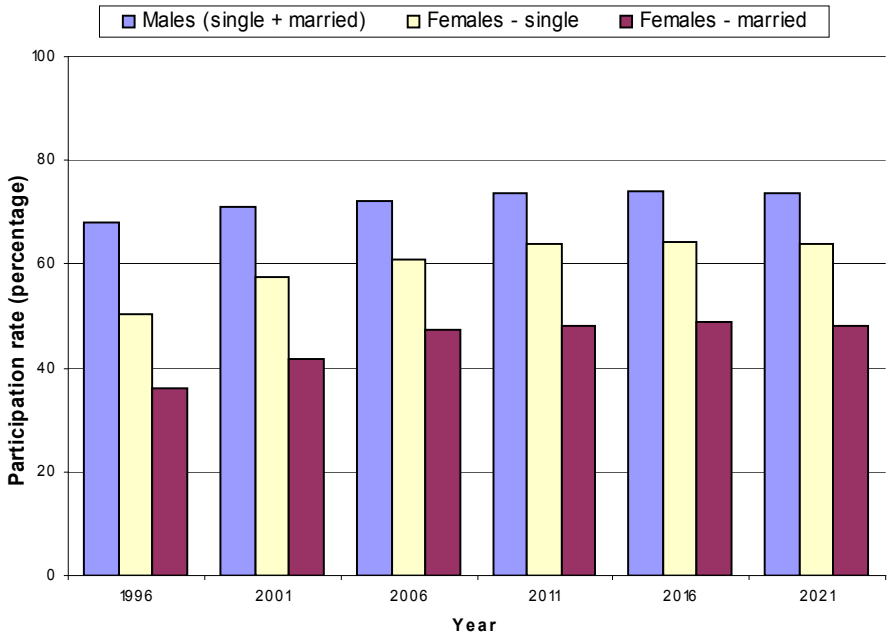
Table M compares labour force growth rates for the period 1996-2006 with those projected for 2006-2021. The projected average annual growth is less than that achieved during 1996 to 2006 for all categories. This is due to two main factors. First, the lower growth rate of the projected working age population will depress labour force growth rates. Secondly, the major gains in female labour force participation rates are assumed to moderate considerably.

Table M Actual and projected average annual growth rates of the labour force (%)

Period	Males	Married females	Other females	Total females	Persons
1996/2006	2.8	4.0	4.9	4.4	3.5
2006/2021 (M1)	2.0	2.4	1.7	2.0	2.0
2006/2021 (M2)	1.7	2.1	1.2	1.7	1.7
2006/2021 (M0)	0.6	1.1	-0.1	0.6	0.6

Table A5 in the Appendix contains historic and projected labour force participation rate data, distinguishing males as well as single and married females from 1996 to 2021. The situation is illustrated graphically in Figure 5 and shows in particular the rapid rise in the participation of females in the period 1996 to 2006.

Figure 5 Actual and projected labour force participation rates for persons aged 15 years and over



Demographic effect dominates

By holding labour force participation rates constant at their 2006 level it is possible to apportion the overall projected increase in the labour force between its *demographic* and *participation rate* effects. Table N sets out the results under all three migration assumptions.

Table N Components of labour force change, 2006 to 2021

Scenario	Males	Females			Persons
		Married	Other	Total	
		Thousands			
M1					
Demographic	389.2	153.7	85.2	238.9	628.0
Participation rate	40.8	46.0	32.3	78.3	119.1
Total	430.0	199.7	117.5	317.2	747.1
M2					
Demographic	305.4	127.9	50.9	178.8	484.1
Participation rate	40.2	44.2	30.8	74.9	115.2
Total	345.6	172.0	81.7	253.7	599.3
M0					
Demographic	73.5	48.7	-34.4	14.3	87.8
Participation rate	38.3	38.6	26.8	65.4	103.7
Total	111.8	87.3	-7.6	79.7	191.5

Most of the labour force change in the case of males is accounted for by demographic effects with the impact intensifying from M0 (65.7%) through M2 (88.4%) to M1 (90.5%). For married females the demographic effect, though dominant, is not as pronounced as for males. For other females the demographic effect accounts for 72.5 per cent of the projected labour force change under M1, 62.3 per cent under M2 and has a negative impact under M0.

Migration and Labour Force Growth

The choice of migration assumption is critical in determining the projected labour force supply outcome up to 2021. The cumulative population difference due to net migration up to 2021 between assumptions M1 and M2 is 200,000 and Table N shows that this translated into a difference of just over 147,800 in the projected labour force.

Labour force demand will be a key determinant of migration over the projection period. Table O shows the relationship between migration and labour force growth for the period since 1996 and under each of the migration scenarios (M1, M2 and M0).

Table O Actual and projected average annual net migration and change in the labour force, 1996 to 2021

Period	Scenario	Average annual net migration	Average annual change in the labour force	Average annual change in the labour force
		Thousands		Percentage
Actual 1996/2006		37.0	61.1	3.5
Projected 2006/2021	M1	50.0	49.8	2.0
	M2	36.7	40.0	1.7
	M0	0.0	13.1	0.6

In the absence of migration (M0), the labour force is projected to grow at a modest 13,000 per annum over the fifteen year period 2006 to 2021, while the low migration scenario (M2) would result in an annual labour force growth of 40,000. Net immigration of 50,000 persons annually would result in an annual labour force growth rate of the same order of magnitude compared with the 61,100 average annual growth achieved between 1996 and 2006. While it is difficult to be precise about the magnitude of the likely future labour force demand, Table O illustrates that for every 10,000 shortfall/surplus in the projected labour supply an adjustment of up to 13,600 would be required to the underlying migration assumption to achieve balance between supply and demand in the labour market.

The Period 2021 to 2041

Total projected population

The population projections for the years 2021, 2026, 2031, 2036 and 2041 classified by five-year age groups and sex are given in Tables 1 to 6. The more distant the projection period from the reference year of the base population the more unreliable the assumptions are likely to be. Therefore, the projections for the period beyond 2021 are of a more conjectural nature than those for the period up to and including 2021. However, they do convey a good indication of the likely changes in the population both in terms of structure and magnitude.

Table P shows the projected population under all six scenarios.

Table P Projected population, 2021 to 2041

Year	High Fertility (F1)			Low Fertility (F2)		
	M1	M2	M0	M1	M2	M0
	Thousands					
2021	5,688	5,449	4,764	5,590	5,356	4,686
2026	6,068	5,695	4,883	5,920	5,556	4,771
2031	6,417	5,901	4,976	6,220	5,719	4,829
2036	6,748	6,080	5,056	6,497	5,852	4,870
2041	7,072	6,247	5,122	6,759	5,965	4,896

The difference in population between the highest and lowest outcomes by 2041 is 2.2 million. Maintaining the TFR at 1.9 over the entire period to 2041 coupled with strong net migration - albeit declining in magnitude in the latter part of the projection period - would result in an increase in population of 67 per cent between 2006 and 2041. Under this (M1F1) scenario the projected population for 2041 would be around 7 million. At the other extreme, zero net migration (M0) allied to decreasing fertility in the period to 2016 followed by continuing low fertility in the following twenty five-year period would result in a population level of just under 5 million in 2041.

Table Q contains the population classified by broad age groups, the derived young and old dependency ratios and the population of school-going age, under the various combinations of assumptions at five-year intervals from 2021 to 2041.

Young population

The young population post 2021 is effectively determined by births occurring after 2006. Average annual numbers of births will decline under all projection combinations in the period 2021-2031 and then experience a small recovery by 2041. Projected births will be lowest under M0F2, falling to an average of 45,000 per year between 2026 and 2031 and remaining at about that level during 2031-2041.

The effect of these trends on the young population can be seen in Table Q. Under M1F1 the population 0-14 years is projected to peak at 1,203,000 in 2026 and to decline to 1,182,000 by 2041. Scenario M2F2 would yield a peak young population of 1,021,000 in 2021 with projected decreases thereafter to reach a level of 857,000 by 2041. With zero net migration and low fertility (M0F2) the young population would be 687,000 in 2041, almost half a million less than that under the M1F1 scenario.

The old population

The old population (i.e. those aged 65 years and over) is projected to increase very significantly from its 2006 level of 462,000 to around 1.4 million by 2041 under the two positive migration assumptions and to 1.3 million under the zero migration scenario. The very old population (i.e. those aged 80 years of age and over) is set to rise even more dramatically, showing a four-fold increase regardless of the scenario chosen (see Tables 1-6).

Table Q Populations projections, 2026 - 2041

Scenario	Population of school going age		Population				Annual Average % change in total population in 5-year period	Dependancy ratios		
	"Primary" 5-12	"Secondary" 13-18	0-14	15-64	65+	Total		Young	Old	Total
	Thousands							Percentage		
Actual										
2006	450.5	342.3	865.1	2,905.5	462.4	4,232.9	0.00	29.8	15.9	45.7
M1F1										
2026	655.2	458.7	1,202.9	3,947.3	918.1	6,068.2	1.30	30.5	23.3	53.7
2031	647.0	494.7	1,189.8	4,151.8	1,075.7	6,417.2	1.12	28.7	25.9	54.6
2036	624.6	499.4	1,169.8	4,335.1	1,243.0	6,747.9	1.01	27.0	28.7	55.7
2041	623.7	481.3	1,181.7	4,456.2	1,434.4	7,072.2	0.94	26.5	32.2	58.7
M1F2										
2026	578.5	438.0	1,064.5	3,937.7	918.1	5,920.2	1.15	27.0	23.3	50.4
2031	565.2	443.1	1,037.5	4,106.4	1,075.7	6,219.6	0.99	25.3	26.2	51.5
2036	544.8	437.3	1,016.1	4,237.9	1,243.0	6,496.9	0.88	24.0	29.3	53.3
2041	540.4	421.2	1,016.2	4,308.5	1,434.4	6,759.0	0.79	23.6	33.3	56.9
M2F1										
2026	611.2	441.9	1,113.8	3,672.9	908.8	5,695.4	0.89	30.3	24.7	55.0
2031	583.0	463.5	1,065.3	3,774.9	1,060.5	5,900.7	0.71	28.2	28.1	56.3
2036	543.5	452.5	1,014.8	3,846.4	1,219.0	6,080.3	0.60	26.4	31.7	58.1
2041	528.5	420.5	1,000.2	3,850.3	1,396.6	6,247.1	0.54	26.0	36.3	62.2
M2F2										
2026	538.7	421.6	984.6	3,663.4	908.8	5,556.8	0.74	26.9	24.8	51.7
2031	508.1	414.2	927.1	3,730.9	1,060.5	5,718.5	0.58	24.8	28.4	53.3
2036	472.9	394.8	879.3	3,753.8	1,219.0	5,852.1	0.46	23.4	32.5	55.9
2041	456.2	366.8	856.8	3,712.0	1,396.6	5,965.4	0.38	23.1	37.6	60.7
M0F1										
2026	489.9	392.7	889.1	3,109.0	884.9	4,883.0	0.50	28.6	28.5	57.1
2031	447.2	380.0	828.9	3,121.7	1,025.6	4,976.3	0.38	26.6	32.9	59.4
2036	422.2	348.3	798.6	3,090.4	1,166.5	5,055.5	0.32	25.8	37.7	63.6
2041	425.4	320.7	804.2	3,004.5	1,313.3	5,122.0	0.26	26.8	43.7	70.5
M0F2										
2026	431.2	374.2	785.6	3,100.1	884.9	4,770.6	0.36	25.3	28.5	53.9
2031	389.3	338.8	720.5	3,083.2	1,025.6	4,829.3	0.25	23.4	33.3	56.6
2036	366.8	303.3	690.9	3,013.3	1,166.5	4,870.7	0.17	22.9	38.7	61.6
2041	366.5	279.2	687.4	2,892.4	1,313.3	4,893.0	0.09	23.8	45.4	69.2

The average annual number of deaths is projected to increase steadily from the current figure of 27,000 to over 41,000 in the period 2036-2041. The natural increase in the population (i.e. the excess of births over deaths) is projected to decline only slightly under the most aggressive population growth assumption, from an annual average of 41,000 to 35,000. Under the most pessimistic scenario (M0F2), the natural increase, though still projected to be positive, will fall to just 4,000 per annum in the period 2036-2041.

The young population (865,100) was considerably higher than the old population (462,400) in 2006 and this excess of young over old is projected to continue under M1F1 and M2F1 up to 2031 after which it will begin to reverse. The dominance of the old population will occur earlier in the case of the other four scenarios. By 2036 it is projected that there will be more older persons than younger persons under all scenarios. The excess will widen further by 2041 at which stage it is projected that there will be almost twice as many old persons (1,313,300) as young (687,400) under M0F2.

Population structure

The changing population structure is best illustrated by comparing the breakdown of the population by five-year age groups and sex in 2006 and 2041 as depicted by their respective population pyramids. Figures 6 and 7 contain the relevant population pyramids for 2006 and 2041, for M1F1 and M0F2, respectively – the two extremes of the projections. Both graphs illustrate the major expansion projected to take place in the number of persons aged 50 years and over. In the M1F1 scenario all age groups are projected to increase – the result of strong though declining net inward migration and the maintenance of a fertility rate of just under two children per woman. Under M0F2 the projected decline in fertility to a Northern European level of 1.65 children per woman coupled with zero net inward migration would see a very sharp fall in the number of young persons.

Figure 6 Population pyramids for 2006 and 2041 (M1F1)

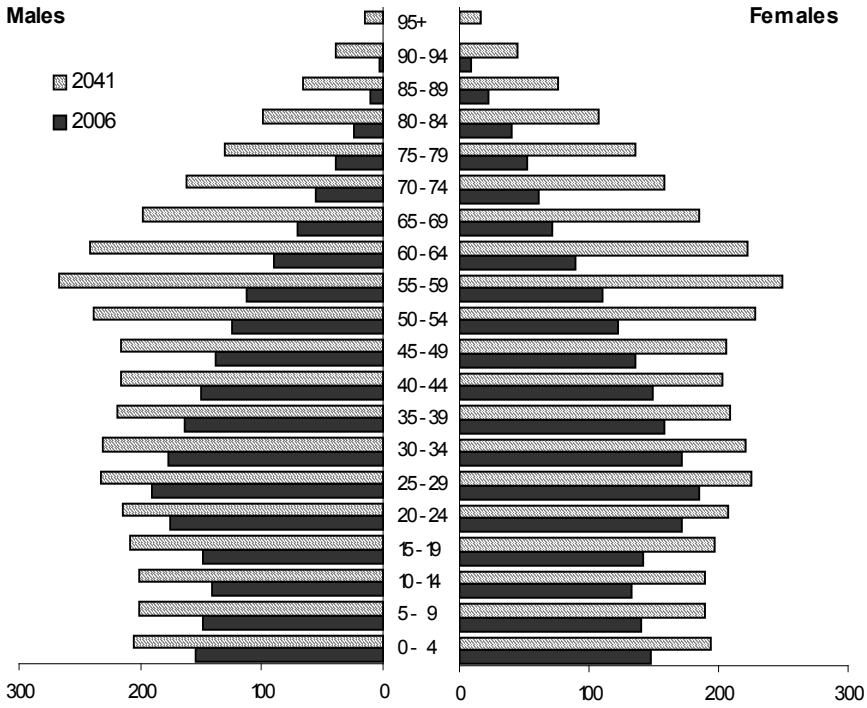
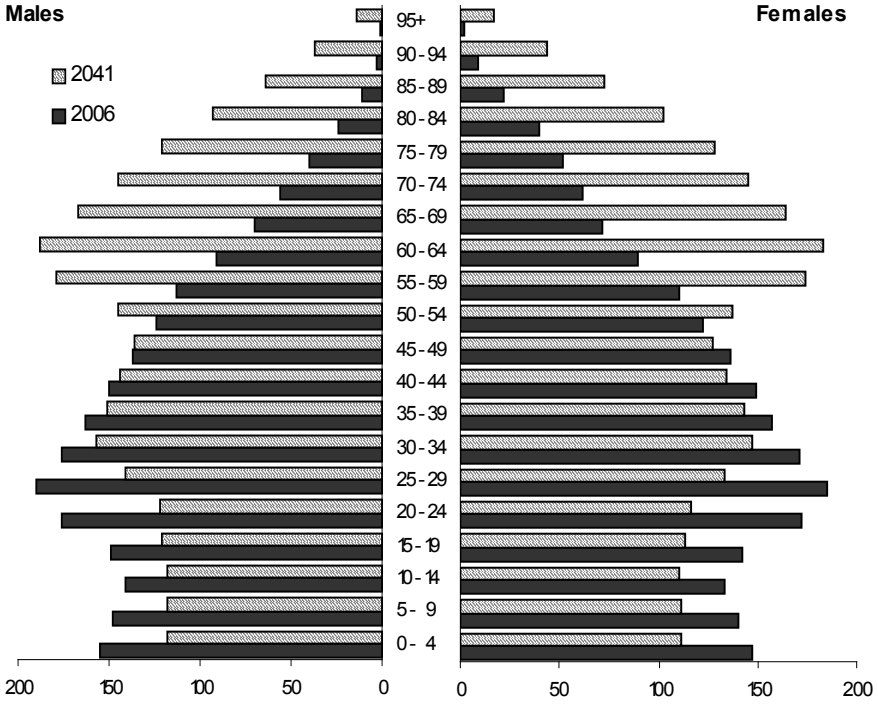


Figure 7 Population pyramids for 2006 and 2041 (M0F2)



Dependency ratios

As previously mentioned the young dependency ratio is projected to be in the range 28 to 32 per cent in the period up to 2021. Thereafter it will decline under all scenarios and finish in the range 23-27 per cent by 2041. The old dependency ratio is projected to progress in the opposite direction; it will increase steadily from 2006 onwards with the rate of increase quickening after 2011. By 2041 it will be more than double that of 2006 under all scenarios. The two ratios combined give the total dependency ratio. This has declined steadily since 1966 to reach a low point in 2006 but it is now projected to increase under all combinations of assumptions to reach values of between 57 per cent (M1F2) and 71 per cent (M0F1) by 2041. A representative picture is given in Figure 8, which contains the young, old and total dependency ratios for the period 1926-2006 and forward to 2041 under the M2F1 scenario.

Figure 8 Actual and projected (M2F1) dependency ratios