

Local Authority Population Projections for Wales (2006-based)

Summary Report



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Introduction

On 30 June 2008, population projections for the 22 unitary authorities areas in Wales were published for the first time.


There is a high level of interest in population and migration data for Wales, and so a strong demand for projections at the local authority level. Those who plan for the future, to deliver services and to help frame sustainable policies, need to consider the population by age and sex. Population projections provide estimates of the size of the future population and are based on assumptions about births, deaths and migration.

This report provides summary information on the 2006-based population projections for local authorities. The report explains what population projections are, how they should and shouldn't be used, the approach taken and the broad methods used. This includes a summary section comparing and contrasting patterns across all local authorities.

This report forms part of a series of outputs on the local authority population projections. A separate Local Authority report has also been published which presents detailed analyses of the population projections in the form of charts, tables and text for each local authority. A short guidance leaflet on the projections has also been published, together a list of frequently asked questions (FAQs). These are available on the population statistics theme page at:

www.wales.gov.uk/statistics

Detailed data cubes have also been published on our StatsWales website. If a symbol appears next to a Table or Figure in this publication, this indicates that more detailed data is available on StatsWales:

www.statswales.wales.gov.uk 

As this is our first publication on local authority population projections, we would welcome feedback on its content and presentation. To provide feedback or for general queries, please contact:

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Background

What are population projections?

Population projections provide estimates of the size of the future population, and are based on assumptions about births, deaths and migration. The assumptions are based on past trends. The local authority projections only indicate what may happen should the recent trends continue. Projections done in this way do not make allowances for the effects of local or central government policies on future population levels, distribution and change.

The Office for National Statistics (ONS) produce national population projections for Wales, and the other UK countries. These are usually produced every two years. Further information on the national population projections is provided in the section on National and Local Projections.

The Welsh Assembly Government is responsible for producing population projections for local authorities in Wales.

Uses of population projections

There is a high level of interest in population and migration data for Wales, and so a strong demand for projections at the local authority level. Those who plan for the future, to deliver services and to help frame sustainable policies, need to consider the population by age and sex.

Population projections can be used for planning services and to estimate future need (for example - number of teachers/schools, social services provision). They can be used for housing planning purposes e.g. in Local Authority Development Plans. Population projections can identify trends that shape the context for future policy development.

There are similar demands for local authority household projections for planning purposes. Local authority population projections are the basis for producing household projections.

Limitations of population projections

Population projections have limitations. These local authority population projections only indicate what may happen should the trend-based assumptions become true. They are not policy-based forecasts of what may happen and they do not make allowances for the effects of local or central government policies on future population levels, distribution and change.

As the process of demographic change is cumulative, projections become increasingly uncertain the further they are carried forward. Demographic change affects some populations more rapidly and more seriously than others. Due to the size of migration flows, for some local authorities, migration assumptions are more critical than fertility and mortality assumptions. Therefore, migration assumptions can have a significant effect on certain areas in the long-term.

In order to illustrate the uncertainty associated with population projections, variant projections have also been published alongside the main (or principal) population projection. These include a no migration (natural change only) projection to illustrate the projected population of each local authority if there were no future inward or outward migration. Two variant projections have also been published.

Local authority population projections indicate the likely population size and profile, if existing trends continue. This may lead to new policies being introduced, which may result in the original projections not being realised. This means that the population projections will have met one of its prime functions – to illustrate the consequences of recent and current demographic trends, and allow policy makers and service delivery planners an opportunity to change this.

History of local authority projections in Wales

This is the first time that population projections have been published for the 22 local authorities in Wales.

The Welsh Office intended to produce 1996-based local authority projections; however they were unable to produce meaningful results at the local authority level.

The ONS were commissioned to produce 1998-based and then 2003-based local authority projections using the model used for local authority projections for England. Under the ONS methodology, assumptions about local fertility and mortality by age and sex were based on birth and death registration information for the previous five years. As part of the projection process, for each year projected forward, the local fertility and mortality rates were scaled, so that the national rates and the projected numbers of births and deaths were consistent with the national projections.

However, during the quality assurance process, for both sets of projections (1998-based and 2003-based), the decision was taken not to publish the projections at a local authority level, as the methodology had not produced consistent and meaningful results. Whilst the scaling of births and deaths ensured that the total births and deaths were consistent with the national projections, the local rates did not reflect recent, local trends. Scaling was also more significant with small areas such as the 22 local authorities in Wales. This led to the projections being published at a regional level.

Approach to producing local authority projections

A new approach has been used to develop the 2006-based local authority projections. This approach means using local data and local trends, but not forcing the local authority projections to sum to the national Wales level population projection.

The projections have been developed in close collaboration with local authorities and key users in Wales - through the Wales sub-national population working group (WASPP). The WASPP group was originally formed as a subgroup of the Welsh Statistical Liaison Committee. The WASPP group has met on a regular basis over the past two years, and has been a forum for technical discussion on the methodology, the base and historic data, and the launch of the population projections. Members of WASPP include local authority representatives with knowledge of and/or experience of demographic data and population projections.

Regular updates (papers and presentations) have also been provided at full meetings of the WSLC. Further information on the WSLC, including membership is provided at: www.dataunitwales.gov.uk/WSLC.asp

Results Overview

Total Population

Table1: Total Population and percentage change since 2006 by local authority, selected years

	2011		2016		2021		2026		2031	
	Population	Change	Population	Change	Population	Change	Population	Change	Population	Change
Isle of Anglesey	69,700	1%	70,600	3%	71,400	4%	71,800	4%	71,800	4%
Gwynedd	121,000	2%	124,000	5%	127,100	8%	130,000	10%	132,300	12%
Conwy	114,300	3%	117,500	6%	120,900	9%	124,000	11%	126,500	14%
Denbighshire	99,800	4%	103,800	8%	107,800	12%	111,600	16%	114,800	19%
Flintshire	152,100	1%	154,100	3%	155,700	4%	156,700	4%	156,600	4%
Wrexham	135,100	3%	139,200	6%	143,000	9%	146,400	12%	149,400	14%
Powys	136,100	4%	141,100	8%	146,100	11%	150,600	15%	154,300	18%
Ceredigion	79,900	4%	82,900	7%	85,800	11%	88,500	15%	90,600	17%
Pembrokeshire	121,100	3%	125,100	7%	129,000	10%	132,300	13%	134,800	15%
Carmarthenshire	184,900	4%	192,100	8%	199,100	12%	205,300	15%	210,600	18%
Swansea	233,000	3%	240,200	6%	247,800	9%	254,900	12%	261,300	15%
Neath Port Talbot	141,500	3%	146,600	7%	151,700	11%	156,400	14%	160,700	17%
Bridgend	136,800	3%	141,400	7%	146,000	10%	150,100	13%	153,700	16%
Vale of Glamorgan	128,100	4%	133,300	8%	138,600	12%	143,600	16%	147,900	20%
Cardiff	330,200	4%	345,600	9%	362,300	14%	378,700	19%	394,200	24%
Rhondda Cynon Taf	238,400	2%	243,400	4%	248,100	6%	251,900	8%	254,900	9%
Merthyr Tydfil	55,500	0%	55,500	0%	55,300	0%	54,800	-1%	54,100	-3%
Caerphilly	174,400	2%	177,700	4%	180,700	5%	182,800	7%	184,200	7%
Blaenau Gwent	69,700	1%	70,500	2%	71,100	3%	71,300	3%	71,200	3%
Torfaen	92,000	1%	93,200	2%	94,100	3%	94,600	4%	94,700	4%
Monmouthshire	90,700	3%	93,400	6%	96,100	9%	98,500	12%	100,400	14%
Newport	143,500	2%	147,700	5%	152,000	8%	156,000	11%	159,400	14%

Between mid-2006 and mid-2031, it is projected that the majority of local authorities in Wales will experience an increase in their overall population. The only local authority projected not to experience an increase in population is Merthyr Tydfil, which is predicted to decline by around 3 per cent by mid-2031.

The majority of local authorities (15) are projected to see increases of above 10 per cent between mid-2006 and mid-2031. Cardiff is the local authority projected to have the largest population growth (24 per cent) by mid-2031.

Total Population by Gender

Between mid-2006 and mid-2031, it is projected that the majority of local authorities in Wales will see an increase in the number of men and the number of women. The only local authorities who are projected not to follow this trend are Merthyr Tydfil, with a projected decline of both the number of men and women and Blaenau Gwent, with only a small (under 1 per cent) projected increase in its number of men.

It is projected that across local authorities in Wales the number of men will increase by up to 30 per cent and the number of women will increase by up to 19 per cent. The average increase in the number of men in any local authority in Wales by mid-2031 is 17 per cent and the average increase in the number of women in any local authority in Wales by mid-2031 is 13 per cent.

In 2006, 48.7 per cent of the Wales population were male. Between mid-2006 and mid-2031, the majority (20) of local authorities are projected to see an increase in the percentage of their population that are men. This means that by mid-2031 most authorities are projected to have an even balance of men and women with 49.4 per cent of the population projected to be male. The 2 local authorities which are projected to see a widening gap between the percentage of their population that are males and female are Blaenau Gwent and Rhondda Cynon Taf.

Although the percentage of men is projected to increase, only 3 local authorities (Cardiff, Ceredigion and Swansea) are projected to contain more men than women by mid-2031.

Births, Deaths and Natural Change

Table 2: Number of births, deaths and natural change by local authority, selected years

	2010/11			2020/21			2030/31		
	Births	Deaths	Natural Change	Births	Deaths	Natural Change	Births	Deaths	Natural Change
Isle of Anglesey	800	800	0	700	800	-100	600	900	-200
Gwynedd	1,400	1,200	200	1,400	1,200	200	1,400	1,400	0
Conwy	1,100	1,400	-300	1,100	1,400	-300	1,100	1,600	-500
Denbighshire	1,000	1,100	-100	1,100	1,200	-100	1,000	1,300	-300
Flintshire	1,700	1,400	300	1,600	1,400	200	1,500	1,700	-200
Wrexham	1,700	1,300	400	1,600	1,300	300	1,600	1,500	100
Powys	1,300	1,500	-200	1,400	1,600	-200	1,300	1,900	-600
Ceredigion	700	700	0	700	800	-100	700	900	-200
Pembrokeshire	1,300	1,400	-100	1,300	1,400	-100	1,200	1,600	-400
Carmarthenshire	2,000	2,100	-100	1,900	2,200	-200	1,900	2,500	-600
Swansea	2,800	2,300	400	2,800	2,200	600	2,800	2,400	300
Neath Port Talbot	1,600	1,500	100	1,600	1,500	200	1,600	1,600	0
Bridgend	1,600	1,400	200	1,600	1,400	200	1,600	1,600	0
Vale of Glamorgan	1,400	1,200	200	1,500	1,200	200	1,400	1,400	0
Cardiff	4,700	2,600	2,200	5,100	2,400	2,700	4,900	2,500	2,400
Rhondda Cynon Taf	3,000	2,300	700	2,900	2,300	600	2,700	2,500	200
Merthyr Tydfil	700	500	100	600	500	100	500	600	0
Caerphilly	2,200	1,600	500	2,100	1,700	400	1,900	1,900	100
Blaenau Gwent	900	800	100	800	700	100	700	800	-100
Torfaen	1,200	900	300	1,100	900	200	1,000	1,000	0
Monmouthshire	800	900	-100	900	1,000	-100	800	1,100	-300
Newport	1,900	1,300	500	1,900	1,300	600	1,800	1,400	400

❖ Births

Overall, across Wales the births rates of women aged:

- 20-24 is expected to increase until 2007/08 and then remain fairly constant until 2030/31;
- 25-29 is expected to increase in the first few years of the projection and then remain fairly constant until 2030/31;
- 30-34 and 35-39 are expected to increase until 2010/11 and then decline to levels slightly below levels seen in 2005/06;
- 40+ are expected to increase until 2010/11 and then decline slightly but remain at levels higher than seen in 2005/06.

These age-specific patterns suggest that the number of births will increase during the first few years of the projection period, before decreasing until 2030/31.

However, the number and age profile of women in any local authority will change year on year and so this will affect the number of births projected to occur.

❖ Deaths

Overall, across Wales the death rates across all ages are projected to decrease year on year throughout the projection period. However, if death rates are decreasing this means that more people will live to an older age (which have higher death rates) and therefore it is projected that from around 2015/16 the number of deaths projected will begin to rise.

❖ Natural Change

In 2005/06, there were 12 local authorities in Wales who had more births than deaths.

It is projected that:

- 14 local authorities will experience more births than deaths in 2010/11, and for the Isle of Anglesey and Ceredigion births and deaths will be in balance;
- The same 14 local authorities will also experience more births than deaths in 2020/21, however the Isle of Anglesey and Ceredigion will see deaths outstripping births;
- By 2030/31, only 6 local authorities will experience more births than deaths and an additional 6 authorities (Gwynedd, Neath Port Talbot, Bridgend, the Vale of Glamorgan, Merthyr Tydfil and Torfaen) will have births and deaths in balance.

The projected drop in the number of local authorities experiencing more births than deaths is due to the projected changes to the age and gender profile of each local authority - for example a smaller number of women in the age groups with higher fertility rates (e.g. aged 25 - 34) and a larger number of people in the age groups with higher death rates (e.g. aged 85+).

Total Fertility Rate

Table 3: Total Fertility Rate by local authority, selected years

	2005/06	2010/11	2020/21	2030/31
Isle of Anglesey	2.02	2.10	2.04	2.03
Gwynedd	1.90	2.00	1.92	1.92
Conwy	2.03	2.12	2.04	2.04
Denbighshire	1.96	2.05	1.98	1.98
Flintshire	1.86	1.94	1.88	1.87
Wrexham	2.00	2.09	2.01	2.01
Powys	2.05	2.16	2.08	2.08
Ceredigion	1.44	1.53	1.46	1.46
Pembrokeshire	2.13	2.22	2.15	2.15
Carmarthenshire	1.92	2.00	1.94	1.94
Swansea	1.75	1.83	1.77	1.76
Neath Port Talbot	1.91	1.99	1.93	1.93
Bridgend	1.96	2.04	1.98	1.98
Vale of Glamorgan	1.84	1.93	1.86	1.86
Cardiff	1.68	1.77	1.69	1.69
Rhondda Cynon Taf	1.87	1.94	1.89	1.88
Merthyr Tydfil	1.91	1.97	1.93	1.93
Caerphilly	1.94	2.01	1.95	1.95
Blaenau Gwent	1.90	1.96	1.92	1.91
Torfaen	2.05	2.13	2.07	2.07
Monmouthshire	1.93	2.03	1.95	1.95
Newport	1.97	2.05	1.99	1.98

The Total Fertility Rate (TFR) is the average number of children that women would bear if the female population experienced the age-specific fertility rates for the year in question throughout their childbearing lifespan.

Across Wales, TFRs are generally expected to increase until 2010/11 and then decline slowly until 2030/31, although still remaining at levels slightly higher than in 2005/06.

Between 2005/06 and 2010/11, the TFR is projected to rise in every local authority.

Between 2010/11 and 2020/21, the TFR is projected to decline in every local authority, but will still remain at levels higher than those seen in 2005/06.

Between 2020/21 and 2030/31, TFRs will remain constant in most local authorities, except for the Isle of Anglesey, Flintshire, Swansea, Rhondda Cynon Taf, Blaenau Gwent and Newport where they will decline slightly.

In 2030/31, the TFR is predicted to still be higher in every local authority in Wales compared with levels seen in 2005/06, therefore predicting that more births would be seen if the number and age profile of women remained the same.

Replacement level fertility (2.08) is the level of fertility required for the population to replace itself in size in the long term given constant mortality rates and the absence of migration. Over the course of the projection period, 5 local authorities in Wales are projected to see TFRs at or above replacement level fertility for one or more years. These are the Isle of Anglesey, Conwy, Powys, Pembrokeshire and Torfaen.

Expectation of life at birth

Table 4: Expectation of life at birth by local authority, selected years

	2005/06	2010/11	2020/21	2030/31
Isle of Anglesey	79.7	81.0	82.6	83.5
Gwynedd	79.9	81.3	82.8	83.7
Conwy	79.4	80.7	82.4	83.2
Denbighshire	79.1	80.5	82.1	83.0
Flintshire	79.1	80.6	82.2	83.1
Wrexham	79.3	80.6	82.3	83.1
Powys	80.5	81.8	83.3	84.1
Ceredigion	81.4	82.4	83.8	84.6
Pembrokeshire	78.9	80.4	82.0	83.0
Carmarthenshire	79.1	80.6	82.3	83.2
Swansea	79.3	80.7	82.3	83.2
Neath Port Talbot	78.8	80.1	81.8	82.8
Bridgend	78.9	80.3	81.9	82.8
Vale of Glamorgan	80.1	81.1	82.7	83.6
Cardiff	79.0	80.5	82.1	83.0
Rhondda Cynon Taf	78.8	80.1	81.8	82.7
Merthyr Tydfil	78.4	80.0	81.7	82.6
Caerphilly	78.5	80.1	81.7	82.7
Blaenau Gwent	77.5	79.3	81.0	82.0
Torfaen	80.6	81.1	82.7	83.5
Monmouthshire	80.9	82.0	83.5	84.3
Newport	78.9	80.2	81.8	82.8

Expectation of life at birth is the age until which a person is expected to live if they experience the age specific mortality rates of the particular local authority at the time of their birth, during the course of their life. An individual's life expectancy will therefore change as mortality rates change throughout their lifetime.

Across Wales it is projected that expectation of life will increase year on year throughout the whole projection period.

All local authorities are predicted to see continual increases in expectation of life until 2030/31.

In each of the selected years, the expectation of life across Wales is projected to be lowest in Blaenau Gwent and highest in Ceredigion. Between 2005/06 and 2030/31, it is predicted that the expectation of life will increase from between 77.5 years and 81.4 years (Blaenau Gwent and Ceredigion respectively) to between 82.0 years and 84.6 years (Blaenau Gwent and Ceredigion respectively).

Although predicted to experience the lowest expectation of life over the period until 2030/31, Blaenau Gwent, Merthyr Tydfil and Caerphilly are all predicted to experience the greatest increases in expectation of life (4.5 years, 4.2 years and 4.2 years respectively).

These changes reflect the expected falls in mortality rates expressed in the national population projections, which have been used in the sub-national population projections to predict future changes in mortality rates.

Migration

A constant level has been assumed for both in and out migration for each local authority, based on each local authority's in and out migration over the last 5 years.

Table 5: Assumed migration levels for the duration of the projection period by local authority, selected years

	Total migration			Internal migration			International migration		
	In	Out	Net	In	Out	Net	In	Out	Net
Isle of Anglesey	2,500	2,300	200	2,400	2,200	200	100	100	0
Gwynedd	5,400	4,900	400	5,000	4,700	400	300	300	100
Conwy	5,400	4,500	900	5,200	4,200	1,000	200	300	0
Denbighshire	5,000	4,100	900	4,800	3,900	900	200	200	0
Flintshire	5,000	4,900	100	4,800	4,600	100	200	300	0
Wrexham	4,100	3,700	400	3,800	3,400	400	400	300	100
Powys	5,900	4,700	1,200	5,700	4,500	1,200	300	300	0
Ceredigion	5,800	5,200	600	5,400	4,900	500	400	300	200
Pembrokeshire	4,500	3,600	800	4,200	3,400	800	300	200	100
Carmarthenshire	6,800	5,200	1,600	6,400	4,800	1,700	300	400	-100
Swansea	9,100	8,200	900	7,700	7,300	400	1,400	900	500
Neath Port Talbot	4,300	3,500	800	4,200	3,200	1,000	100	300	-200
Bridgend	4,100	3,500	700	3,900	3,200	700	200	200	0
Vale of Glamorgan	5,800	4,900	800	5,200	4,300	800	600	600	0
Cardiff	19,200	18,500	600	15,200	15,700	-600	4,000	2,800	1,200
Rhondda Cynon Taf	6,300	6,000	300	5,600	5,300	300	600	700	0
Merthyr Tydfil	1,200	1,400	-100	1,200	1,300	-100	100	100	0
Caerphilly	4,500	4,300	100	4,300	4,000	300	200	400	-200
Blaenau Gwent	1,500	1,500	0	1,500	1,500	0	0	0	0
Torfaen	2,300	2,300	0	2,200	2,200	0	100	100	0
Monmouthshire	4,500	3,900	600	4,400	3,700	700	200	200	-100
Newport	5,300	5,000	200	4,700	4,500	200	500	500	0

For the sub-national population projections, migration is considered as the movement of people into and out of a local authority.

Migration to or from the UK is defined as internal migration and is recorded for every move at the time of migration.

Migration to or from overseas is defined as international migration. However, a person is only classified as an international migrant if they intend to migrate for a period of 12 months or more. Migrants who, at the time of migration, do not intend to stay for 12 months or more are classified as short-term migrants and are not included in the migration figures. An adjustment is made each year for people who change their length of stay from their intentions at the time of migration (either under 12 months to over 12 months or vice versa).

In each year of the projection period it is predicted that:

- The majority (20) of local authorities within Wales will experience more people moving in than moving out. The exceptions are Merthyr Tydfil and Torfaen;
- Carmarthenshire will see the greatest net inflow of migrants (around 1,600 more people arriving than leaving each year).

Considering only migration **within the UK** (Internal migration), in each year of the projection it is predicted that:

- Cardiff will experience the highest number of migrants to and from the UK (15,200 and 15,700 respectively), but will experience negative net migration within the UK (around 600 more people leaving than arriving each year);
- Merthyr Tydfil will experience the lowest number of migrants to and from the UK (1,200 and 1,300 respectively);
- Only two local authorities (Cardiff and Merthyr Tydfil) will experience more people leaving for other parts of the UK than come into the authority from the rest of the UK (a net outflow of 600 and 100 respectively);
- Carmarthenshire will experience the greatest difference between people arriving than leaving (a net inflow of 1,700 people each year).

In terms of migration **from overseas** (International migration), in each year of the projection it is predicted that:

- Cardiff will experience the highest number of international in and out migrants each year (4,000 and 2,800 respectively);
- Blaenau Gwent will experience the lowest number of migrants both to and from overseas (around 50 people each way);
- Nine local authorities will experience more people arriving from overseas than leaving each year;
- Caerphilly will experience the greatest net outflow of migrants (around 200 more people leaving than arriving each year);
- Cardiff will experience the greatest net inflow of migrants (around 1,200 more people arriving than leaving each year).

Methodology and Assumptions

This section provides an overview of the broad methodology used in forming the assumptions. A full technical report including more detailed explanations of the methodology will be available later in 2008.

Population Estimates Methodology

In simple terms, population estimates are calculated by:

- Taking the previous year's population estimate;
- Taking out special population groups;
- Aging every person on one year;
- Adding births and subtracting deaths;
- Allowing for inward and outward migration;
- Adding back in the special population groups.

A similar approach is taken to calculate population projections. However, in order to produce population projections, assumptions need to be formed to project future levels of fertility, mortality and migration for each local authority. These assumptions are based on local trends in recent years.

The projections have been calculated by gender and single year of age (up to age 90 and over). This means that users can aggregate into age-groups of their choice.

Population Base

The population projections use the 2006 mid-year population estimates as the population base. The population estimates relate to age at last birthday. These population estimates were published by the ONS in August 2007. They are also available on the StatsWales website:

www.statswales.wales.gov.uk

The population estimates and population projections are based on the usually resident population. Usual residents away from home temporarily are included, but visitors are excluded. Students are counted at their term-time address. It should also be noted that the UN definition of an international migrant is used – those changing country of residence for a period of at least 12 months. Short-term migrants (e.g. migrant workers from Eastern European countries) are not counted in the population estimates and hence are not included in the population projections.

Fertility Assumptions

Long-term age-specific fertility assumptions for each local authority were produced by analysing age-specific fertility trends for each local authority during the most recent 5 years. Historic births data by age of mother for each local authority was obtained from the vital events registrations system (ONS).

Age Specific Fertility Rates (ASFRs) were calculated for females aged 15 to 49 by single year of age for each local authority in Wales. ASFRs are calculated by dividing the number of live births to females aged X by the total number of females aged X and multiplying by 1,000.

The fertility rate assumptions for the population projections were calculated by:

- taking each local authority's total 2005/06 birth levels;
- distributing the total birth levels to the age groups (in order to calculate ASFRs) by using a 5 year ASFR average;
- applying the ONS fertility differentials calculated from data produced in the national population projections to take into account changes in fertility over time.

The resulting fertility assumptions for each local authority are given in the Results Overview section.

Mortality Assumptions

Long-term age-specific mortality assumptions for each local authority were produced by analysing age-specific mortality trends for each local authority during the most recent 5 years. Historic deaths by gender and age data for each local authority was obtained from the vital events registrations system (ONS).

Age Specific Mortality Rates (ASMRs) were calculated for males and females aged newborn to 90+ by single years of age for each local authority in Wales. ASMRs are calculated for each single year of age and gender by dividing the number of deaths at age X by the population aged X and multiplying by 1,000.

The mortality rate assumptions for the population projections were calculated by:

- taking each local authority's total 2005/06 deaths levels;
- distributing the total deaths levels to the age groups (in order to calculate ASMRs) by using a 5 year ASMR average;

- applying the ONS mortality differentials calculated from data produced in the national population projections to take into account changes in mortality over time.

The resulting life expectancies for each local authority are given in the Results Overview section.

Migration Assumptions

In order to produce the population projections, assumptions for internal (within UK) inward and outward migration were required. In addition to this, assumptions for international inward and outward migration were required.

Long-term migration assumptions for each local authority were produced by analysing age and gender specific migration trends for each local authority during the most recent 5 years. Historic migration by gender and age data for each local authority was obtained from the ONS. Internal migration estimates are based on information from GP registrations. International migration estimates are based on information from the International Passenger Survey (IPS) together with information from other sources (e.g. Asylum Seekers, etc).

Due to the volatility relating to migration figures year on year, the long-term internal and international (both in and out) migration assumptions are based on an average of the last 5 years of data. This means a static level migration assumption for both in and out migration.

The resulting internal and international, inward and outward migration assumptions for each local authority are given in the Results Overview section.

Special populations

Special population groups are sub-sets of the population that have specific age structures, which are fairly constant over time. Special population groups are not usually captured within migration (both internal and international) estimates. Such populations are also known as 'static populations'.

As these groups have fairly static age structures, the projections model of ageing-on would not be appropriate (e.g. a 17 year old boy at a boarding school would be 22 within 5 years but would not be living in the boarding school and would have been replaced by someone of similar age).

To prevent the ageing on of these populations:

- special populations (by age and gender) are removed at the start of each year of the projection
- the projections model is applied to the remaining population

- the special populations (by age and gender) are added back in at the end of the process for each year of the projection period.

To maintain consistency with the Mid-Year Estimates, the following have been considered as Special Population groups in the Wales sub-national projections:

- Home Armed Forces
- Prisoners
- School Boarders

Variant Projections

In order to illustrate the uncertainty associated with population projections, variant projections have also been published alongside the main (or principal) population projection.

A no migration (natural change only) projection has been produced to illustrate the projected population of each local authority if there were no future inward or outward migration.

A high and low variant projections have also been produced. The high variant is based on an assumption of high fertility and low mortality. The low variant is based on an assumption of low fertility and high mortality.

National and Local Population Projections

Background to National projections

The Office for National Statistics (ONS) produce national population projections for Wales, and the other UK countries. These are usually produced every two years. A statistical bulletin analysing the national population projections for Wales is available on the Welsh Assembly Government's website:

www.wales.gov.uk/statistics

Broad National Population projections Methodology

The assumptions underlying national population projections are demographic trend based. They are agreed by ONS in liaison with the devolved administrations, following consultation with key users of projections in each country and advice from an expert academic panel.

The fertility assumptions are derived separately for each country by analysing recent fertility trends, and completed family size for cohorts of women over a long period of time.

The mortality assumptions are derived by analysing the improvements in mortality rates for the UK as a whole over a long period. Future improvements are, generally, assumed to be the same across the UK, but are applied to the currently observed base mortality rates in each country. So, current life expectancy differentials between the four countries are maintained.

The international migration assumption for the UK is mainly derived on a model of IPS flows based on a long time-series but giving increasing weight to more recent data. Adjustments are made for switchers, asylum seekers and the Irish Republic. In general, the UK assumptions for each component are distributed between the countries according to their observed share over the last 10 years. Cross-border migration assumptions are based on the average of estimates for the last 10 years, based on NHSCR data.

History: attempts to produce local authority projections consistent with the national projections

In the past, attempts have been made to produce local authority population projections for the 22 unitary authorities in Wales which are consistent with (i.e. sum to) the Wales population projections.

The Welsh Office intended to produce 1996-based local authority projections, however they were unable to produce meaningful results at the local authority level.

The ONS were commissioned to produce 1998-based and then 2003-based local authority projections using the model used for local authority projections for England. Under the ONS methodology, assumptions about local fertility and mortality by age and gender were based on birth and death registration information for the previous five years. As part of the projection process, for each year projected forward, the local fertility and mortality rates were scaled, so that the national rates and the projected numbers of births and deaths were consistent with the national projections.

However, during the quality assurance process, for both sets of projections (1998-based and 2003-based), the decision was taken not to publish the projections at a local authority level, as the methodology had not produced consistent and meaningful results. Whilst the scaling of births and deaths ensured that the total births and deaths were consistent with the national projections, the local rates did not reflect recent, local trends. Scaling was also more significant with small areas such as the 22 local authorities in Wales. This led to the projections being published at a regional level.

A new approach has been used to develop the 2006-based local authority projections. The local authority population projections have not been constrained to the national projections (either overall or by component). The local authority projections are based on a different methodology for deciding the assumptions.

Differences between the National Projections and the local authority projections

The key aim of this work is to produce robust local authority population projections for Wales, which reflect local trends in recent years. The main purpose of the national projections is to produce robust population projections for Wales which reflect national trends in recent years.

The national projections and the local authority projections are different for two main reasons:

- (a) assumptions
- (b) geographical level for which the assumptions are based and applied.

(a) Assumptions

The methodology used to produce assumptions in the local authority projections are different to those used in the national projections. Some of these are due to slightly different data sources. For example, ten years of within-UK migration trends were used to determine migration assumptions in the national projections, but only five years of migration data used in the local authority projections. This is because the source of information on migration at local authority level was not available for a 10-year time series.

Also, although one set of assumptions may fit well for a national trend, using similar assumptions may not always produce feasible results for all 22 local authority areas because of the different nature and trends between local authorities.

(b) geographical level for which the assumptions are based and applied

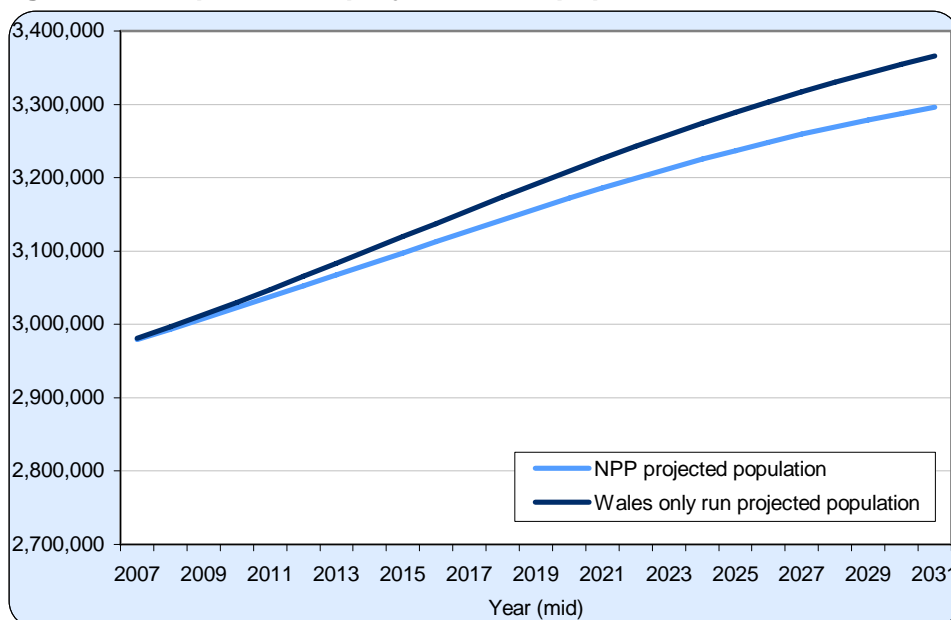
The geographical level for which the assumptions are based and applied is also important. For example, it is not appropriate to sum local rates (eg fertility) to derive a national rate, and therefore a model operating at different geographic levels (but using rates) will produce different results for the different geographic levels.

National Population projections and the sum of the 22 local authority projections

It is possible to quantify the differences observed as a result of using different assumptions by comparing the national population projections with a Wales level projection. The Wales level projection was produced by running the projection model at a Wales level, and using exactly the same methodology as used for producing the local authority projections. [Note that a Wales level projection is different to the sum of the 22 local authority projections].

For the Wales level projection, the results followed similar patterns and levels to the ONS produced national projections (see Figure 1).

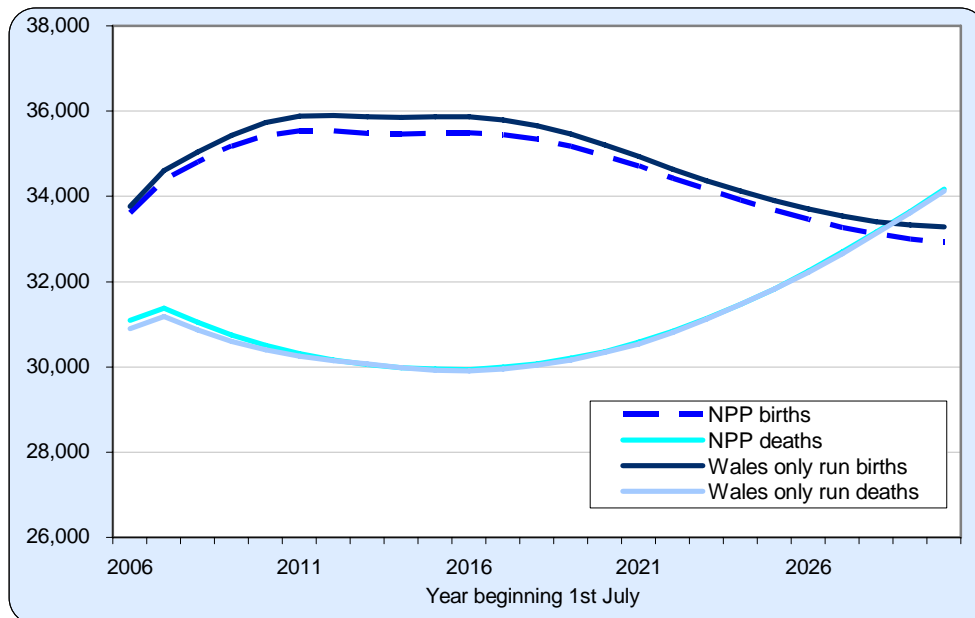
Figure 1: Comparison of projected total population, mid-2006 to mid-2031



The difference between the Wales level projection and the national population projection for Wales is fairly small in 2011 (around 10,000). The gap increases over the projection period to around 25,000 in 2016 and 70,200 in 2031 (around 2 per cent of the population).

Comparisons of the births and deaths components of each set also show only small differences (see Figure 2).

Figure 2: Comparison of Births and Deaths, 2005/06 to 2030/31



Key points from Figure 2:

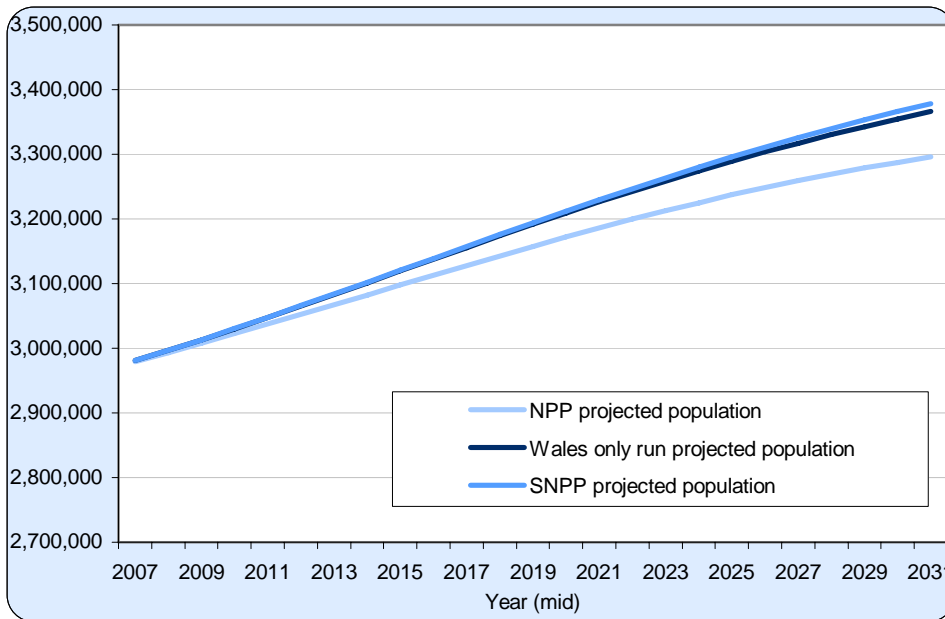
- The estimated number of births within Wales in the 25th year of the projection is around 360 higher than the national projection estimate.
- Death figures are close throughout the projection period.
- The net migration assumption in the national projections is +9,500. The equivalent figure in the Wales level projection is +12,200.

Using the same assumptions for a local authority and a Wales projection

It is possible to quantify the differences observed as a result of basing and applying assumptions at different geographical levels by comparing the sum of the 22 local authority projections with a Wales level projection. The Wales level projection was produced by running the projection model at a Wales level, and using exactly the same methodology as used for producing the local authority projections. [Note that a Wales level projection is different to the sum of the 22 local authority projections].

A Wales level projection follows very similar patterns and levels to the sum of the 22 local authority projections (see Figure 3).

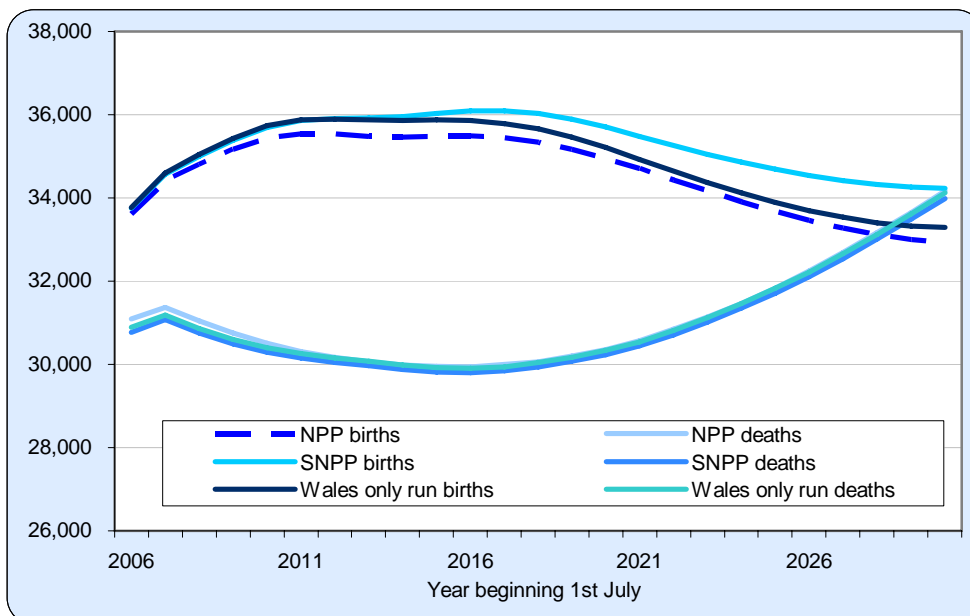
Figure 3: Total Population Comparison



The difference between the Wales level population projection and the sum of the 22 local authorities is around 1,200 in 2015 and around 12,500 in the 25th year of the projection.

Comparisons of the births and deaths components of each set show some differences – particularly in the projected number of births (see Figure 4). Age specific mortality rates are fairly similar between local authorities in Wales, however fertility rates vary considerably (the total fertility rate varying from around 1.4 in Ceredigion to around 2.1 in Pembrokeshire in 2006).

Figure 4: Births and deaths comparison, 2005/06 to 2030/31



The projected number of births by 2015/2016 in the sum of the local authority projections is around 200 higher than in the Wales level projections. The projected number of births is around 900 higher by the 25th year of the projection. Death figures are close throughout the projection period.

The projected number of births in the Wales level projection is close to the projected number of births in the national projections. This means that the geographical level of application of the model is the main reason for the difference between the projected number of births in the sub-national projections and the national projections.

Conclusion

By 2011, the 5th year of the projection period, the difference between the sum of the 22 local authority projections and the Wales level projection is small (400). By 2011, the difference between the Wales level projections and the national projection is around 10,000. The differences increase to 1,200 and 25,000 respectively by 2016. By 2031, the 25th year of the projection period, the difference between the sum of the 22 local authority projections and the Wales level projection is around 12,500, and the difference between the Wales level projection and the national projection is around 70,200.

Different assumptions account for the majority of the difference between the national and local authority projections. However, different assumptions are required due to data availability issues, and also, although one set of assumptions may fit well for a national trend, using similar assumptions may not always produce feasible results for all 22 local authority areas because of the different nature and trends between local authorities.

Using a bottom up approach (i.e. using local trends at local level) is also a contributory factor in the difference. A bottom-up approach is an important factor if considering the projected number of births in particular – this is due to the very different fertility patterns across local authority projections in Wales.

When to use National and Local Authority projections

The local authority population projections produced by the Welsh Assembly Government should be used when looking at the projected population of one or more local authorities in Wales. They should also be used when comparing population projections for local authorities.

The sum of the local authority projections should only be used when looking at the projected population of one or more local authorities as a proportion of the Wales total.

The national Wales population projections produced by ONS are based on a different methodology from the local authority population projections produced by the Welsh Assembly Government. Both sets of projections are based on trends in birth, death and migration estimates, but the methods for deciding on the assumptions are different. Therefore, the sum of the local authority projections is different from the national Wales level population projection.

The national population projections produced by ONS should be used when looking at the projected population of Wales as a whole. The national population projections should also be used if comparing the projected population of Wales with the other UK countries.

Further Work

This is the first time that population projections for the 22 local authorities in Wales have been produced. Population projections are continuously evolving – as new data is collected and improved methods for estimating the population introduced, the methods for projecting the population are thus also improved.

As part of the work on developing the local authority population projections, a number of issues/methodologies were identified for ongoing investigation.

Students

Due to their specific characteristics (low fertility, high migration), consideration was given as to whether students could be regarded as a special population in the population projections. This proposal was rejected because it was not possible to remove students (and subsequently graduates) from the migration estimates. This was due to limited data availability from alternative sources.

Further work on the feasibility of treating students as a special population group will be undertaken. This work will assess the usability of new data available from the Higher Education Students Agency.

Propensity to migrate models

Using propensity to migrate models were considered as part of the process for producing migration assumptions. Such models consider the probability of a person moving from area X to area Y.

Further work will be undertaken to assess the feasibility of using propensity to migrate models in future.

Differentials for fertility and mortality

Further work will be undertaken on the age differentials used in the fertility and mortality assumptions.

Household Projections

Population projections form the basis of household projections. Work is also underway on producing household estimates and projections for Wales. It is expected that these will be published in late 2008.

Quality Information

Information on quality is provided throughout this publication. A selection of key quality information is also provided below. A full technical report will be published in late 2008.

Definitions

The projected population is for 30 June each year. The projected components (births, deaths and migration) are based on a 1 year period (middle of year to middle of year).

Base Population

The 2006 mid year estimates of population have been used as the base population for these projections.

Population Estimates

These are based on the usually resident population. Usual residents away from home temporarily are included, but visitors are excluded. Students are counted at their term-time address. It should also be noted that the UN definition of an international migrant is used – those changing country of residence for a period of at least 12 months. Short-term migrants (e.g. migrant workers from Eastern European countries) are not counted in the population estimates and hence are not included in the population projections.

Age-specific Fertility Rates (ASFR)

ASFRs refer to the total number of births per 1,000 women of a given age (calculated for women aged 15-45 only).

Total Fertility Rate (TFR)

The TFR is the average number of children that would be born per woman if women experienced the age-specific fertility rates for the year in question throughout their childbearing lifespan.

Replacement Level Fertility

Replacement level fertility is the level of fertility required for the population to replace itself in size in the long term given constant mortality rates and the absence of migration.

Age-specific Mortality Rates (ASMR)

ASMRs refer to the total number of deaths per 1,000 people of a given age.

Expectation of life at birth

The 'expected years of life' is the average future lifetime, which would be lived by persons of a particular age, if they were subject throughout their lives to the average recorded death rate of the year in question.

Internal Migration

Internal (or within-UK) migration refers to the movement of people moving within the UK, for example, from one local authority to another. Each Health Authority holds a register of patients registered with its GPs, called the Patient Register Data System (PRDS).

Combining every patient register in England and Wales and comparing with the register from the previous year identifies people who have changed their postcode.

International Migration

International Migration refers to the movement of people to or from countries outside the UK. The UN definition of an international migrant is used – those changing country of residence for a period of at least 12 months. International migration movements are estimated by combining data from the International Passenger Survey (IPS), Home Office data on asylum seekers and visitor switches, with estimates of migration between the Republic of Ireland and Wales from the Irish Labour Force survey.

Working Age and State Pension Age

All figures presented in this report for working age and pensionable age populations are based on the state pension age for the given year. Between 2010 and 2020, state pension age will change from 65 years for men and 60 years for women, to 65 years for both sexes. Between 2024 and 2046, state pension age will increase in three stages from 65 years to 68 years for both sexes.

Geographies and Boundaries

The population projections are for local authority areas, and are based on the boundaries used for the 2006 mid-year estimates of population. Historic data used to produce assumptions may have been based on slightly different boundaries.

Frequency

Most of the base data is available on an annual basis. It is anticipated that the local authority projections will be published every two years (as with the national projections).

Revisions

The 2006-based local authority projections are not subject to planned revisions. It is, however, possible that the base population (2006 mid-year estimates) will be revised in future. This will also impact on historic fertility and mortality rates.

Charts

Note that the charts used throughout this document do not always start at 0, and are based on different scales.

Symbols

The following symbol has been used throughout the publication:
- the data item is not exactly zero, but rounds to zero.

Further Information

Local Authority Population Projections

A local authority report, guidance leaflet, frequently asked questions and further information on the 2006-based local authority population projections can be found at: www.wales.gov.uk/statistics

Data cubes are available on the StatsWales website (Population and Migration / Population / Projections / 2006-based local authority) www.statswales.wales.gov.uk

National Population Projections for Wales

Analysis of the 2006-based national population projections for Wales is available in Chapter 4 of the 'Wales's Population, 2008' demographic report: www.wales.gov.uk/statistics

Data cubes are available on the StatsWales website (Population and Migration / Population / Projections / 2006-based national) www.statswales.wales.gov.uk

Further detailed information can be found on the GAD website: www.gad.gov.uk

Population and Migration Data

Information on how and where to access population and migration data for Wales is available in the Welsh Assembly Government's Population Statistics theme page: www.wales.gov.uk/statistics

Contact details

For queries on the 2006-based local authority projections, or for general queries on demographic data, please contact:

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