



HEREFORDSHIRE  
COUNCIL

***POPULATION PROJECTIONS AND FORECASTS  
FOR THE COUNTY OF HEREFORDSHIRE***

*2006-based Herefordshire population forecasts:  
Focus on school-age children*

***June 2008***

**Version 1**

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## **INTRODUCTION**

This paper adds to the analysis in the *Overview of results*, looking in detail at forecast changes in the number of children living in Herefordshire over the period mid-2006 to mid-2026 and how these compare with recent trends. It explains the reasons behind the expected changes, along with the sensitivity of the forecasts to changes in the underlying assumptions.

Reasons behind forecast numbers of births are considered in detail in a separate report, *Focus on births and fertility*, so are not explained again here. The report, along with the full results of the forecasts and other related documents, is available on Herefordshire Council's website: [www.herefordshire.gov.uk/research](http://www.herefordshire.gov.uk/research).

## **BACKGROUND**

Children start compulsory primary school education in the September before they are five and move up through seven year-groups before starting at secondary school in the September before they are twelve, for a further five years of compulsory education. A further two years of voluntary 'sixth-form' education is offered by some local education authority schools.

For the purpose of mid-year estimates, 'age' relates to age at 30<sup>th</sup> June, so when using population data, 'primary school-age' is defined as those children aged 4-10 and 'secondary and sixth-form age' as those children aged 11-17. These two groups will be considered separately in this report.

However, it should be noted that numbers of school-age children do not equate to numbers of pupils attending local authority schools. For the latter, consideration must be given to cross-border flows i.e. children living in one local authority and attending a school in another and also likely numbers of children attending private schools.

**Definition:** the term "cohort" is used extensively throughout this report; this refers to a group of people who were born in the same year or years.

## **RECENT AND EXPECTED TRENDS IN NUMBERS OF CHILDREN**

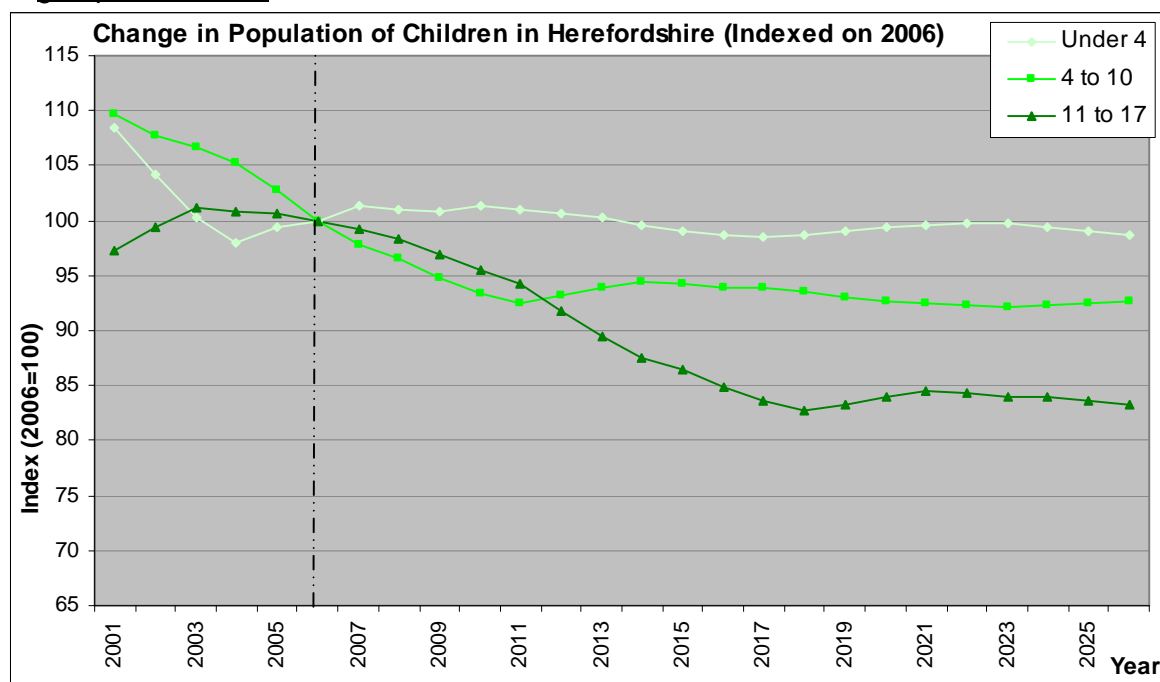
Figure 1 shows the recent and expected changes in numbers of children living in Herefordshire according to the Office for National Statistics' (ONS) mid-year estimates and the 2006-based principal population forecasts respectively. The figures are indexed on the 2006 mid-year estimates; by setting the number in each age-group in 2006 to the value of 100 it is possible to compare the relative changes, as the age bands are of different sizes.

Changes in the number of under-4s are shown for completeness; these are primarily dependent on numbers of births in the year of interest and the previous three years. Numbers of under 4s fell by 10.7% between mid-2001 and mid-2004 (from 7,500 to 6,700), before starting to rise as a result of the upturn in the number of births in the county, reaching 6,900 by mid-2006. This rise is forecast to continue to mid-2007 before levelling off, as the number of births is expected to. Numbers will be broadly stable at 2006 levels over the course of the forecast period, fluctuating between 6,800 and 7,000 under 4s each year.

Numbers of 4-10 year-olds in Herefordshire fell by 9.4%, from 15,100 in mid-2001 to 13,800 in mid-2006. This reduction in the primary school-age group is expected to continue at a slightly slower rate over the next five years, reaching 12,800 by mid-2011 (a fall of 7.2% from 2006). Numbers are then expected to remain broadly stable to mid-2026, fluctuating between 12,700 and 13,000 – around 5-7% below mid-2006 levels.

The number of 11-17 year-olds living in Herefordshire increased by 3.8% (600 children) between mid-2001 and mid-2003, but then fell from 16,200 in mid-2003 to 16,000 in mid-2006. This decline is expected to continue until mid-2018, after which numbers of secondary and sixth-form age children in the county will remain broadly stable – fluctuating between 13,300 and 13,500 children for the remainder of the forecast period (around 15-17% below mid-2006 levels).

**Figure 1: Estimated & forecast change in number of children in Herefordshire by age-group, 2001-2026**



Sources: Mid-year population estimates, ONS © Crown copyright; 2006-based population forecasts, Hfds Council Research Team.

## UNDERSTANDING THE FORECAST CHANGES

The reasons behind the forecast changes are best explained by considering the age structure of the child population of Herefordshire in 2006, i.e. the starting point for the population forecasts. The bars in Figure 2 represent the number of children of each age, and will move one space to the right every year as children get older.

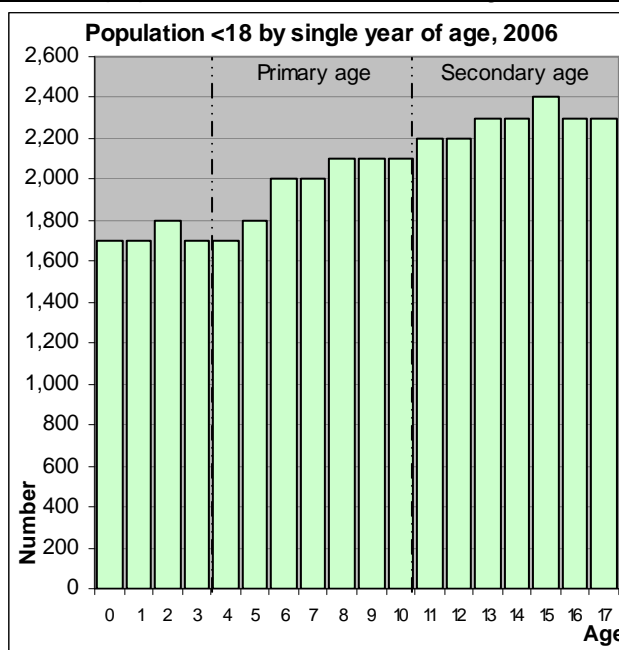
Over the next four years (to 2010), the cohort of children who are currently aged 0-3 will move into primary school-age, replacing the cohort who are currently aged 7-10. This older cohort is much larger than the one it will be replaced by, with at least 300 more children of each single year of age.

The population forecasts assume that there will be a net in-flow of children of all ages due to migration every year, but these increases are not expected to be large enough to account for the differences in the size of cohorts.

Therefore, the number of children of primary school-age will only stop declining when the number of 3 year-olds turning 4 is no longer smaller than the number of 10 year-olds turning 11. This will not be until 2011-12, during which time the 1,800 children who are currently aged 5 will turn 11.

Similarly, those children aged 4-10 in 2006 will become 11-17 year-olds over the next seven years (to 2013). From Figure 2 again, differences between single year cohorts are too large to prevent a continued fall in the number of children of secondary and sixth-form age over these seven years at least. For example, 2,300 17 year-olds turning 18 during 2006-07 will be replaced by around 2,100 10 year-olds turning 11.

Figure 2: Age structure of population of Herefordshire aged under 18, mid-2006



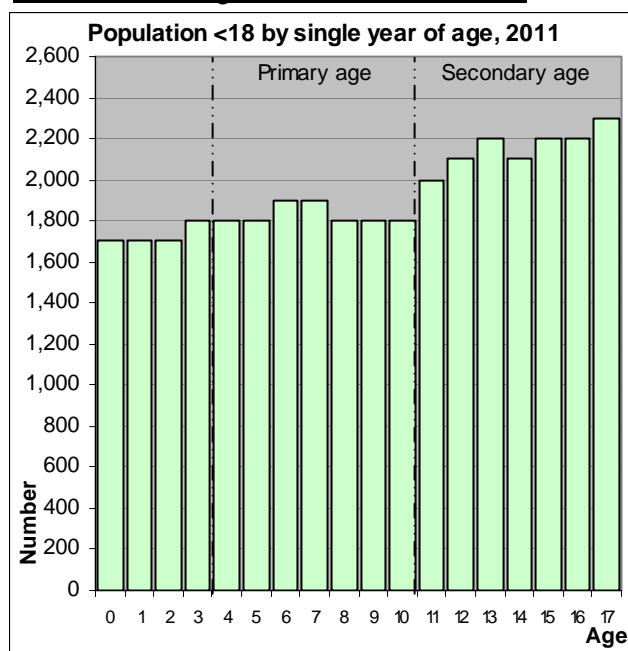
Source: 2006-based Herefordshire population forecasts, Hfcs Council Research Team

Figures 3 and 4 show how the age structure of the under-18s is expected to look according to the 2006-based principal population forecast in mid-2011 and mid-2018, respectively. These years are chosen as they are the points at which the numbers of first primary school-age and then secondary and sixth-form age children are forecast to stop falling.

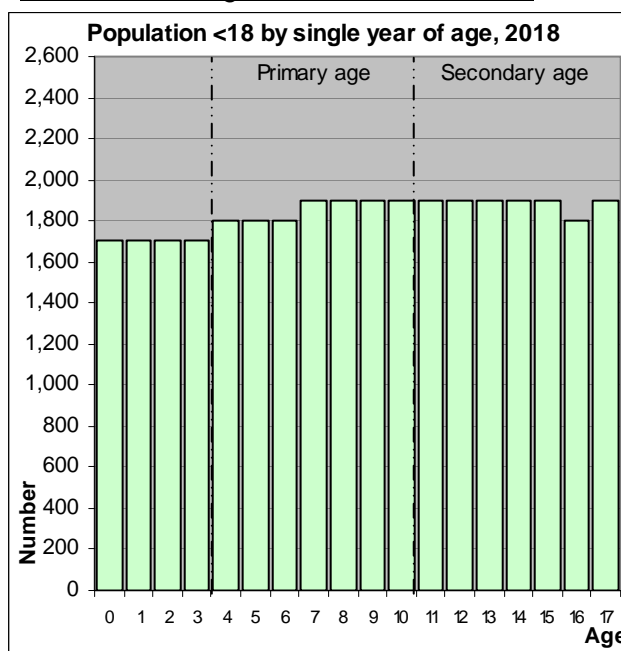
Other demographic changes, such as net in-migration and small numbers of deaths, are incorporated into these forecasted structures. However, the over-riding influences on the expected numbers of children are the ageing of existing cohorts (as described above) and the forecast numbers of births.

As already mentioned, numbers of births are expected to remain fairly constant over the forecast period<sup>1</sup>, hence the much ‘flatter’ age structure by mid-2018 (Fig. 4) in comparison with both mid-2006 (Fig. 2) and mid-2011 (Fig. 3). During 2018-19 the number of 10 year-olds turning 11 is expected to be no smaller than the number of 17 year-olds turning 18 for the first time in the forecast period so that the number of secondary and sixth-form aged children will stop declining.

**Figure 3: Age structure of population of Herefordshire aged under 18, mid-2011**



**Figure 4: Age structure of population of Herefordshire aged under 18, mid-2018**



Source: 2006-based Herefordshire population forecasts, Hfds Council Research Team

<sup>1</sup> See the paper *Focus on births and fertility* for a full explanation of why this is expected to be the case. It is available at [www.herefordshire.gov.uk/research](http://www.herefordshire.gov.uk/research).

## **SENSITIVITY AROUND THE PRINCIPAL POPULATION FORECAST**

As explained in the *Overview of Results* paper, although the principal population forecast discussed above is the Research Team's prediction of what is most likely to happen to the population of Herefordshire between 2006 and 2026, a range of variant projections and forecasts have also been produced to facilitate understanding of the sensitivity around this forecast.

### **Differing assumptions**

The principal population *projection* forms the basis of the principal forecast; the projection is converted into a more realistic forecast by adjusting migration rates between Herefordshire and the rest of the UK (internal migration) to meet anticipated housing provision.

Variant *projections* of the county's population were produced by altering one or more of the demographic assumptions – i.e. fertility, mortality and migration. Full details of the variant assumptions are discussed in the methodology document, but they are in line with the alternative assumptions used for the Office for National Statistics' 2006-based variant population projections for England & Wales.

However, whilst variant projections can illustrate the sensitivity around the demographic assumptions, only variant *forecasts* can provide a realistic alternative picture of the possible future population. This is because future housing provision necessarily affects migration to the county.

Due to the amount of work involved, it is not feasible to convert every variant projection into a forecast, with migration constrained to the principal housing assumption of 16,600 new dwellings (net) between 2006 and 2026.

Therefore, 'high' and 'low' population forecasts have been produced to provide an indication of how sensitive the principal forecast is to changes in the demographic rates – although they are not intended as upper and lower limits of the possible future population. The 'high' variant forecast assumes high fertility rates and net immigration combined with low mortality rates; the 'low' assumes the opposite. The starting point for within-UK migration is the principal assumption of average age-sex-specific rates observed over the last three years; these are then adjusted to meet the anticipated housing supply.<sup>2</sup>

In addition, a 'high housing' variant forecast has been produced by adjusting the migration rates assumed for the principal population projection to meet a potential higher level of housing development in the county between 2011 and 2026: an additional 4,280 new dwellings (net). The derivation of this figure is explained in the *Overview of Results*, and in more detail in the full methodology; it is based on suggestions made by the National Housing and Planning Advice Unit (NHPAU) regarding higher housing numbers in the West Midlands region. However, final decisions on housing development post-2011 (the end of the Unitary Development Plan) will not be made until at least 2009.

### **Variant forecasts of 4-10 year-olds in Herefordshire**

Figure 5 shows numbers of 4-10 year-olds in Herefordshire from mid-2006 to mid-2026 according to the principal and three variant forecasts. The first point to note is

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<sup>2</sup> Net international migration to Herefordshire is relatively low (see methodology paper and appendix to *Overview of Results*), so it is assumed not to be affected by housing supply.

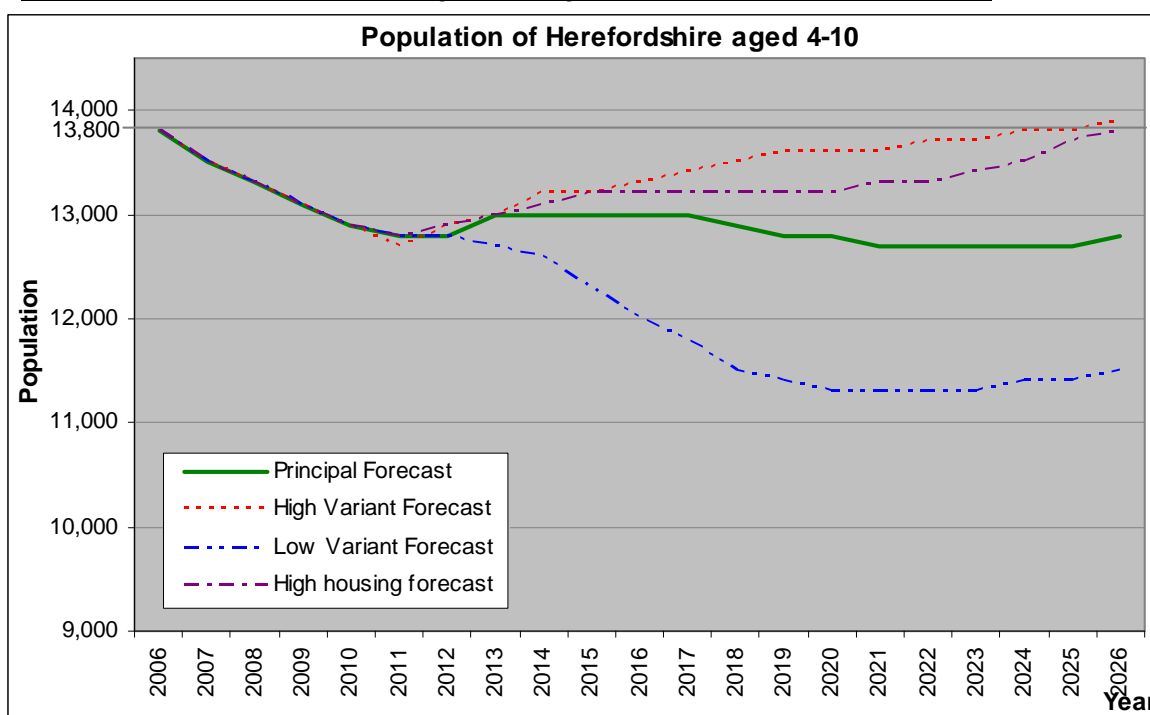
that changing the assumptions has little effect until mid-2011 - although this would be expected under the 'high housing' forecast as it's the same as the principal forecast until this point. This is because children who will be aged 4-10 up to mid-2011 have already been born, and the cohort effect described above dominates any variation in the migration assumptions – particularly as migration can only be varied to the extent that there are enough available houses.

Under all variants the number of 4-10 year-olds would decline until at least 2011. After this point numbers would be expected to increase more rapidly under the high fertility and net immigration and low mortality assumptions of the 'high' variant forecast and the higher numbers of dwellings under the 'high housing' forecast. However, numbers would remain below 2006 levels (13,800) until 2023 – and would only exceed this number under the 'high' variant forecast. The higher level of housing development under the 'high housing' forecast would not be expected to result in more children of primary school-age by the end of the twenty year period.

Under the low fertility and net immigration and high mortality assumptions of the 'low' variant, numbers would continue to fall past 2011, before becoming broadly stable between 2018 and 2026. With numbers between 11,300 and 11,500, the size of this cohort would be 16-17% below 2006 levels.

One final point to note is that the 'high' variant forecast for mid-2011 is lower than all others (by 100 children). This may appear counter-intuitive but is due to the way the within-UK migration rates are adjusted to convert the trend-based *projection* into its corresponding *forecast*. The demographic assumptions of the 'high' variant projection result in higher numbers of people in that projection than in others, for example the principal projection. Therefore within-UK migration rates don't have to be increased as much to meet the housing supply for the 'high' variant forecast as they do for the principal forecast, which can lead to apparent quirks like this in some age-groups.

**Figure 5: Population of Herefordshire aged 4-10 according to principal forecast; high and low variant forecasts and high housing forecast, mid-2006 to mid-2026**



Source: 2006-based population forecasts, Hfds Council Research Team.

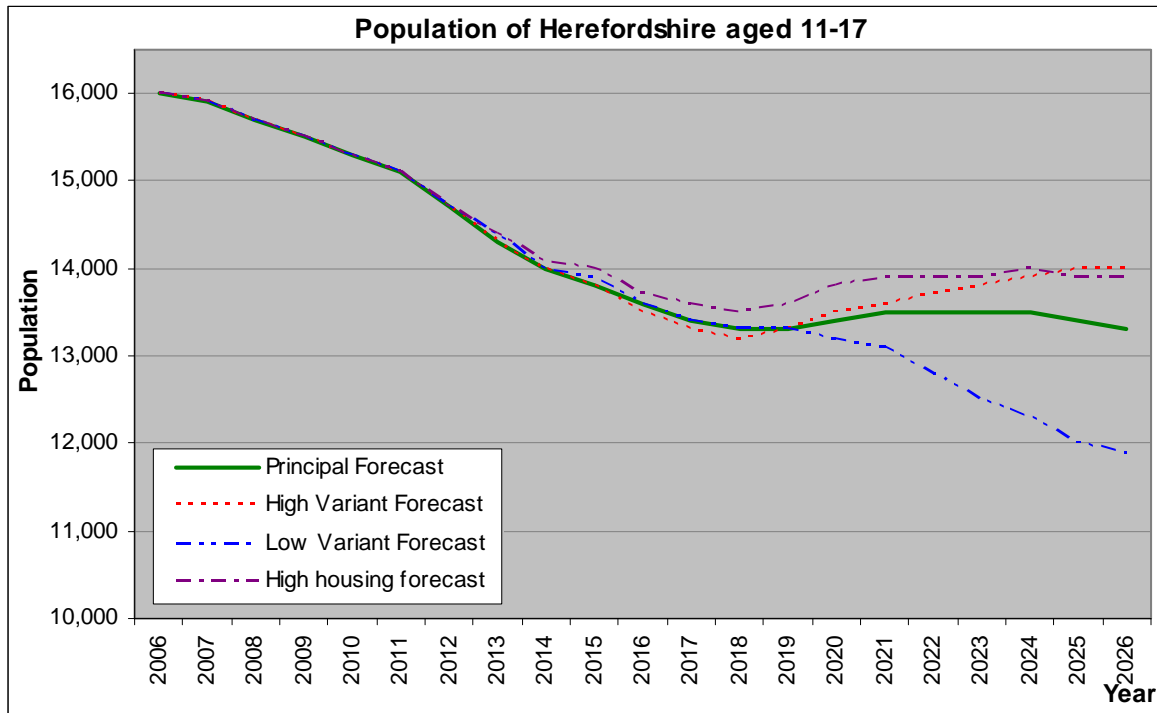
**Variant forecasts of 11-17 year-olds in Herefordshire**

Figure 6 shows numbers of 11-17 year-olds in Herefordshire from mid-2006 to mid-2026 according to the principal and three variant forecasts. There are similar patterns of differences between the variants and the principal forecast as for primary school-age children, but they occur seven years later. There is little divergence from the principal forecast prior to 2018, with all variants showing a continued decline in numbers, although slightly less rapidly under the ‘high housing’ forecast.

According to both the ‘high housing’ and ‘high’ variant forecasts, after 2018 numbers would rise more rapidly than the principal forecast suggests and level off at around 14,000 – although this would still be around 13% lower than the number in mid-2006.

Under the low fertility and net immigration and high mortality assumptions of the ‘low’ variant forecast, numbers of 11-17 year-olds would be expected to continue to fall past 2018, reaching 11,900 by mid-2026, 25.6% below 2006 levels.

**Figure 6: Population of Herefordshire aged 11-17 according to principal forecast; high and low variant forecasts and high housing forecast, mid-2006 to mid-2026**



Source: 2006-based population forecasts, Hfds Council Research Team.