

Cumbria Popgroup Population Projections: 2018 Refresh

1. Aim

To report on the latest population projections for Cumbria based on a series of scenarios generated by the Cumbria Intelligence Observatory (CIO) using the Popgroup demographic forecasting software in September 2018.

2. What is Popgroup?

Popgroup is a tool designed to produce population projections based on varying assumptions about future demographic, housing and economic trends. Popgroup was developed by the Centre for Census & Survey Research at the University of Manchester, is maintained by Edge Analytics and is subscribed to by the CIO.

3. The Standard Cohort Component Methodology

Popgroup uses the 'standard cohort component methodology' for making projections. The equation below presents this method:

$$P_{y+1} = P_y (\text{Age}+1) + (B - D) + (\text{InUK} - \text{OutUK}) + (\text{InOV} - \text{OutOV})$$

P = Population; Y = Base Year; B = Births; D = Deaths;

InUK = UK Migration Inflow; OutUK = UK Migration Outflow;

InOV = Overseas Migration Inflow; OutOV = Overseas Migration Outflow

Following the above equation from left to right, firstly the known population (by age and sex) in a given base year is taken as a starting point (P_y).

The population in the year following the base year (P_{y+1}) can then be calculated by: Ageing the base population on one year (Age+1); Adding the expected number of births and subtracting the expected number of deaths (B - D); and, Adjusting for expected in and out migration from other parts of the UK (InUK - OutUK) and overseas (InOV - OutOV). This process can be repeated one year at a time to project future years.

Because the expected numbers of future births, deaths and migrants are not known, assumptions have to be made about what levels may be.

4. Office for National Statistics (ONS) Sub-National Population Projections (SNPPs)

The ONS produce SNPPs for Local Authorities (LAs) every two years using the standard cohort component methodology. The assumptions made by the ONS about what may happen in the future are based on past trends in the numbers of births, deaths and migrants. More specifically, the ONS assume that the average observed levels of fertility, mortality and migration in each LA over the five years prior to the projections will continue into the future. The ONS also make small adjustments to the SNPPs to fit with national population projections. This set of assumptions can be said to represent one potential future 'scenario'.

The most recent ONS SNPPs were published in May 2018. These projections took the mid-2016 population as the base and then projected this population forward based on assumed levels of fertility, mortality and migration observed over the five years to mid-2016 (2011/12 to 2015/16). These SNPPs are known as the 2016-Based SNPPs. For more information about ONS SNPPs, please see:

<https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationprojections/bulletins/subnationalpopulationprojectionsforengland/2016based>

5. Cumbria's Popgroup Projections

Whilst the ONS SNPPs provide a useful baseline scenario, Popgroup enables users to replicate those assumptions and then adjust them and/or add further assumptions to create alternative local scenarios that may consider for example: the continuation of longer/shorter term trends in birth, death and migration rates; the implications of local planning restrictions/developments/targets; and the decline/growth of the local economy. These factors can make a real difference to the way populations might look over a long period of time and so it is important that they are considered alongside the standard ONS projections.

In September 2018 the CIO used Popgroup to replicate the ONS 2016-Based SNPPs before adjusting the ONS assumptions to create a series of additional projection scenarios. All scenarios were updated to include the most recently available population estimates (mid-2017) as a base for projections to be built on rather than the mid-2016 population estimates used as a base by the 2016-Based SNPPs.

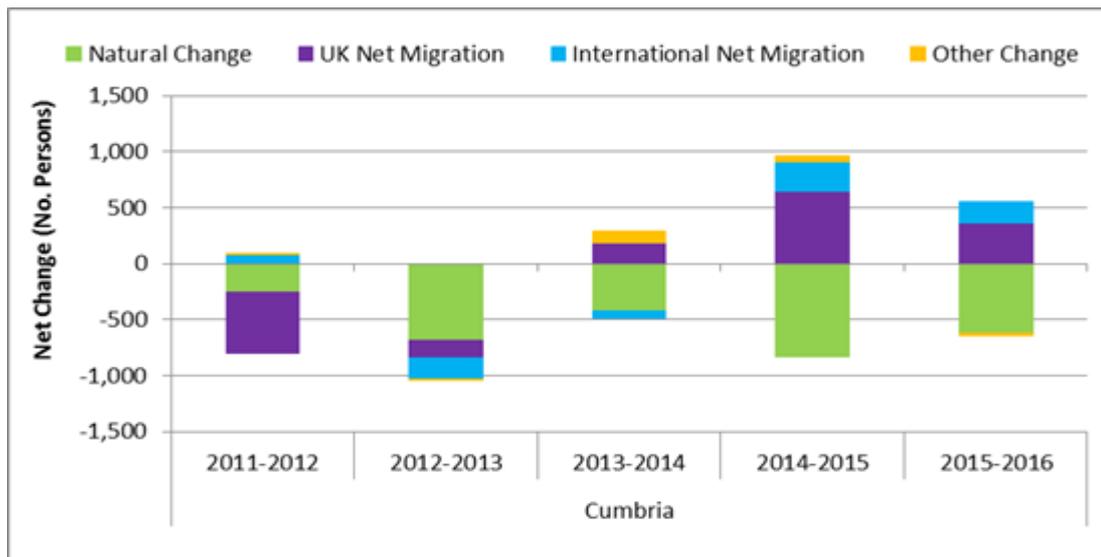
Further adjustments to ONS 2016-SNPP assumptions were made to create the following alternative scenarios:

- **Housing Targets Scenario:** Additional assumptions were added relating to the most recently available household composition rates (DCLG 2014 rates) and the most recently adopted district annual housing targets to consider what might happen to the population if housing completions follow current targets.
- **Business as Usual Baseline Jobs Scenario:** Additional assumptions were added relating to economic activity rates (2017 OBR economic activity rates) and baseline jobs projections from the Cambridge Econometrics' Local Economy Forecasting Model (LEFM) for Cumbria to consider what might happen to the population if the number of jobs follow the LEFM baseline jobs projection.
- **Zero Jobs Growth Scenario:** Additional assumptions were added relating to economic activity rates (2017 OBR economic activity rates) to consider what might happen to the population if there was no jobs growth (ie job levels remain unchanged from projected 2018 levels).
- **Two Percent Uplift on Business as Usual Scenario:** Additional assumptions were added relating to economic activity rates (2017 OBR economic activity rates) and LEFM baseline jobs projections with a two percent uplift applied to consider what might happen to the population if the number of jobs increased at two percent above the LEFM baseline jobs projection between 2018 and 2036.
- **UK Growth Scenario:** Additional assumptions were added relating to economic activity rates (2017 OBR economic activity rates) and LEFM baseline jobs projections with an uplift to consider what might happen to the population if local jobs growth matched the projected UK baseline jobs growth rate between 2018 and 2036.

6. ONS 2016-Based SNPP Scenario Assumptions

Figure 1 examines the net impact of births minus deaths (natural change) and migration to and from Cumbria each year between 2011/12 to 2015/16. While the information fed into the ONS SNPPs and Popgroup is much more detailed (data is input by district, single year of age and sex), figure 1 shows at a high level the demographic trends that have been fed into the 2016-Based SNPPs.

Figure 1: Cumbria: Mid-2011/12 to Mid-2015/16: Components of Change



Source: Office for National Statistics, 'Other Change' refers to effect of changes to prisoner, armed forces and their overseas based dependent populations.

The green bar in figure 1 shows the net impact of natural change. Between mid-2011/12 and mid-2015/16, Cumbria's natural change was negative (the green bars are below zero). This shows that there were more deaths than births. Overall, between mid-2011/12 and mid-2015/16, there were 24,300 births in Cumbria and 27,100 deaths; resulting in a net natural decrease of -2,800 persons.

The purple bar shows the net impact of internal migration (to and from other parts of the UK). Between mid-2011/12 and mid-2015/16, an estimated 83,900 people moved into Cumbria from other parts of the UK and an estimated 83,400 people moved out from Cumbria to other parts of the UK resulting in a net increase of 500 persons.

The blue bar shows the net impact of international migration (to and from overseas). Between mid-2011/12 and mid-2015/16, an estimated 7,100 people moved into Cumbria from overseas and an estimated 6,800 people moved out from Cumbria to overseas resulting in a net increase of 300 persons.

7. Housing Targets Scenario Assumptions

The following table presents the annual housing targets from adopted local plans for each district in Cumbria as at September 2018. The scenario models the population that could be supported if housing completions were to follow current targets, using DCLG 2014 household composition rates.

Figure 2: Annual Housing Targets

District	District Annual Housing Requirement	National Park Annual Housing Requirement	Total Annual Housing Requirement	Source
Allerdale	304	15	319	ABC Local Plan (Adopted) & LDNPA Local Plan (Adopted) – derived from the allocations distributed to distinctive areas.
Barrow	110	0	110	BBC Local Plan (Adopted)
Carlisle	565	0	565	CCC Local Plan (Adopted) – note housing target is phased but the annualised average is 565
Copeland	300	6	306	CBC Local Plan (Adopted) and – note that policy contains a phased target stepping from 230pa to 300pa in 2018 & LDNPA Local Plan (Adopted) – derived from the allocations distributed to distinctive areas.
Eden	239	5	244	EDC Local Plan (Adopted) & LDNPA Local Plan (Adopted)
South Lakeland	400	45 (35+10)	445	SLDC Local Plan (Adopted), LDNPA Local Plan (Adopted) & YDNPA Local Plan (Adopted)

8. Jobs-led Scenario Assumptions

These scenarios consider the population that would be associated with various different levels of employment growth assuming economic activity rates followed the OBR 2017 rates. The jobs projections were produced using Cambridge Econometrics' Local Economy Forecasting Model (LEFM) supplied to Cumbria Local Enterprise Partnership (LEP) in July 2018 and derived from their regional forecast of May 2018. The baseline assumptions were adjusted locally to take account of workforce data received from major local companies, the details of which are confidential. The four jobs-led scenarios are as follows:

- a) *Business as Usual Baseline Scenario* - what might happen to the population if the number of jobs follow the adjusted LEFM baseline jobs projection;
- b) *Zero Jobs Growth Scenario* - what might happen to the population if there were to be no change in job levels from 2018 levels. (NB It should be noted that in the case of Copeland, this results in a higher figure than the business as usual baseline as employment decline is projected in the baseline scenario due to the ending of a number of nuclear related projects.);
- c) *Two Percent Above Baseline Scenario* - what might happen to the population if the number of jobs increased at two percent above the LEFM baseline jobs projection;
- d) *UK Jobs Growth Scenario* - what might happen to the population if local jobs growth in all districts matched the projected UK jobs growth rate.

Figure 4: Projected Jobs Change 2018-2036

	2018 Level	% change from 2018 & level in 2036							
		Business as Usual (BAU)		Zero Jobs Growth		Two Percent above BAU		UK Growth	
	No	%	No	%	No	%	No	%	No
Allerdale	41,400	%	42,600	0.0	41,400	4.9	43,400	5.7	43,700
Barrow	35,100	2.9	35,400	0.0	35,100	2.8	36,100	5.7	37,100
Carlisle	63,200	0.8	63,700	0.0	63,200	2.8	65,000	5.7	66,900
Copeland	34,500	0.8	33,200	0.0	34,500	-1.9	33,800	5.7	36,500
Eden	31,000	-3.9	31,900	0.0	31,000	4.6	32,500	5.7	32,800
South Lakeland	62,600	2.6	65,100	0.0	62,600	6.0	66,400	5.7	66,200
Cumbria	267,900	4.0	271,900	0.0	267,900	3.5	277,200	5.7	283,100
National	35,114,800	1.5	37,117,400	0.0	35,114,800	7.7	37,819,700	5.7	37,117,400

Source: Cumbria LEP estimates developed with the aid of CE/IER LEFM software

9. Limitations and Caveats

Before considering the results of each projection scenario there are several important limitations and caveats that should be noted.

Firstly, all demographic projections, including the ONS SNPPs and Popgroup scenarios, are **simply a representation of what might happen in the future if the various assumptions fed into the model play out as expected.**

Secondly, **projections can only be led by one factor at a time** (population change, housing levels or jobs levels). However, in reality, these factors are inter-dependent upon one another so it is very unlikely that one factor will exclusively drive change in an area: i.e. if housing increases in an area, the population and job increases to fill this housing might not occur, however, projections will assume that housing is the only factor driving change and that the population and jobs growth needed to fill the housing will happen.

Furthermore, the jobs led scenarios **assume that economic activity rates will change in line with OBR estimates** in the future (i.e. the proportion of the adult population which is either in work or actively looking for work). Despite projected increases in economic activity, the majority of any additional labour needed to support jobs growth will still need to be derived from population growth. There are many factors which may influence economic activity in the next decade, for example: changes to the benefit system; increases to the retirement age; and new employment opportunities. Should economic activity levels increase above OBR estimates as a result of these factors, the population and housing requirement associated with job increases would reduce as the resident population would satisfy more of the jobs demand.

Furthermore, it is vital to understand that the jobs led scenarios **assume that the additional workforce will become available to fill any new jobs following employment growth.** However, it is possible that the availability of labour may act as a constraint on employment growth and therefore the population and number of dwellings that may be required.

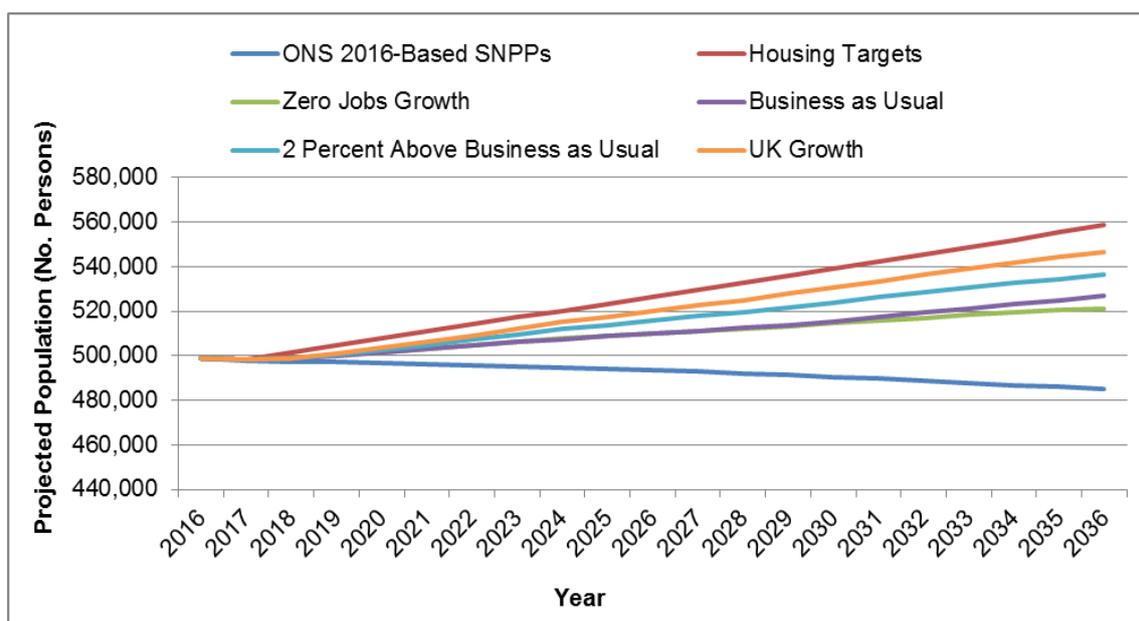
Finally, it is also important to note that **jobs scenarios are workplace based** and do not take account of where the workforce commutes from. Therefore the impact of employment change on the population and subsequent housing demand is attributed to the district where the employment is located.

As a result, **ONS SNPP and Popgroup projections cannot be relied upon as fact, and actual results may end up being significantly different to what the scenarios suggest will happen.** This should be kept in mind at all times when using the projections, and caution should be used when incorporating the projections into any decision-making processes. Instead figures should be viewed as a guide to indicate the potential parameters for population change and housing demand should various scenarios arise, and should be used alongside a range of other local intelligence: such as district based housing needs studies, to inform the levels of housing considered appropriate to each Local Planning and Housing Authority area.

10. Projected Total Population

This section reports on the projections made by the scenarios outlined above at a county level. Figure 5 plots Cumbria's projected population to 2036, while figure 6 provides the projected numerical and proportional population change between 2016 and 2036 for the county based on each of the projection scenarios described above.

Figure 5: Projected Total Population: Cumbria



Source: ONS 2016-Based SNPPs and CIO Popgroup 2018 (CIO)

Figure 6: Projected Total Population: Cumbria

Scenario	Estimated Population	Projected Population	Numerical Change	Percentage Change
	2016	2036	2016-2036	
ONS 2016-Based SNPPs	498,800	485,100	-13,700	-2.7
Housing Targets	498,800	558,500	59,700	12.0
Zero Jobs Growth	498,800	521,300	22,500	4.5
Business as Usual	498,800	526,900	28,100	5.6
2 Percent Above Business as Usual	498,800	536,300	37,500	7.5
UK Growth	498,800	546,800	48,000	9.6

Source: ONS 2016-Based SNPPs and CIO Popgroup 2018 (CIO)

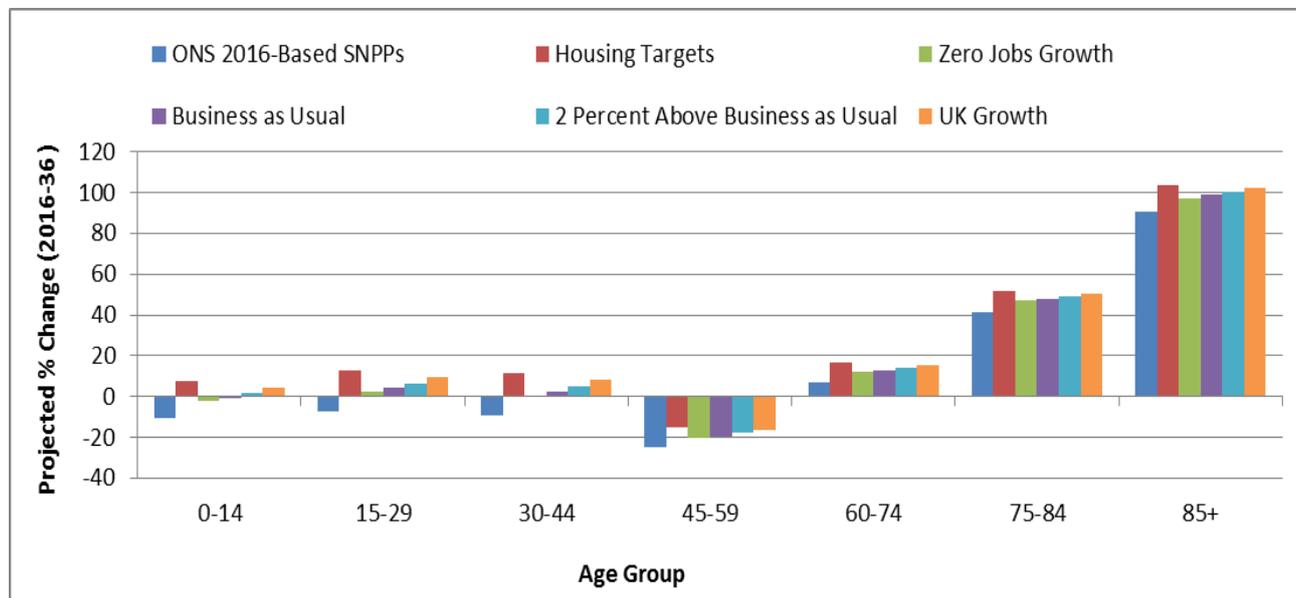
The populations projected by each of the scenarios differ considerably from one another. The 2016-Based SNPPs project that if Cumbria’s demographic trends continue as they have over the five years to 2016, the population could decrease slightly by 2036 (-2.7%). However, the Housing Targets scenario suggests that if housing targets are met, Cumbria’s population could increase by 12% to 2036.

The Zero Jobs Growth scenario suggests that if there was no net change in the number of jobs within the county, the population would still need to increase by 4.5% by 2036 to maintain a workforce large enough to fill existing jobs. This is due to the need to offset the projected ageing of the existing population. Furthermore, the Business as Usual Baseline scenario suggests that to meet the projected baseline number of jobs, Cumbria’s population would need to grow by 5.6% to 2036, while in order to fill the number of jobs projected by the more ambitious Two Percent Above Business as Usual and UK Growth scenarios the county’s population would need to increase by 7.5% and 9.6% respectively.

11. Projected Population by Age Group

Figure 7 provides the projected percentage change in population by age group for Cumbria between 2016 and 2036 in relation to each projection scenario.

Figure 7: 2016-2036 Projected Population Change: Cumbria



Source: ONS 2016-Based SNPPs and CIO Popgroup 2018 (CIO)

Again, the populations projected by each of the scenarios differ considerably from one another. The ONS 2016-Based SNPPs suggest that if past demographic trends continue, the number of residents in each of the four youngest age groups will decrease. However, the Housing Targets scenario and the jobs led scenarios suggest that in order to fill the houses created by current housing targets and/or to fill the projected level of jobs in the county, the number of residents in the youngest age groups would need to increase slightly to combat current demographic trends towards a decreasing working age population.

One trend that is projected by all scenarios is that the number of residents in the three oldest age groups will increase significantly over time.

12. Projected Housing Requirements

The Department for Communities and Local Government (DCLG) produced a set of 2014-based household membership rates. As well as being fed into Popgroup to create housing led population scenarios, these household membership rates can be applied within Popgroup to all population projection scenarios to estimate the number of dwellings and the type of households needed to support the populations projected by each scenario.

13. Further Information and Data Outputs

For more information about projection scenarios please contact the Cumbria Intelligence Observatory:

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