Northumberland National Park
Demographic Forecasts

July 2016

For the attention of:
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Acknowledgements

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Table of Contents

Acknowledgements .............................................................................................................................................. i
Table of Contents ............................................................................................................................................... ii
1  Introduction .................................................................................................................................................. 1
2  Area Profile ................................................................................................................................................ 5
3  Demographic Scenarios .............................................................................................................................. 12
4  Summary .................................................................................................................................................. 18
Appendix A  POPGROUP Methodology ........................................................................................................ 21
Introduction

Context & Requirements

1.1 Northumberland National Park is the most northern national park in England, covering approximately 1,049 km$^2$ in the unitary authority of Northumberland. With a population of 2,016 (in 2014), it is the least populous national park in the UK.

1.2 The Northumberland National Park Authority is formulating its draft Local Plan, detailing housing demand, land supply and housing targets for the Park over an extended plan period. Evidence for the Local Plan will be compiled from a variety of sources, including demographic estimates and projections, workforce data, household income and house price, housing land supply, housing stock and affordable need estimates.

1.3 Whilst ONS regularly publishes population estimates for national parks, population projections are not routinely produced. The Northumberland National Park Authority has requested that a range of demographic evidence be produced to support the Local Plan, including the provision of demographic forecasts of population, household and housing growth for the 2017–2037 plan period.

Planning Policy Guidelines

1.4 The development and presentation of demographic evidence to support local housing plans is subject to an increasing degree of public scrutiny. The National Planning Policy Framework (NPPF)$^1$ and Planning Practice Guidance (PPG) provide guidance for local planning authorities on the appropriate approach to the objective assessment of housing need.

1.5 The PPG states that the Department for Communities and Local Government (DCLG) household projections should provide the “starting point estimate of overall housing need” (PPG paragraph 2a-015). Local circumstances, alternative assumptions and the most recent demographic

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1 [http://planningguidance.planningportal.gov.uk/blog/policy/](http://planningguidance.planningportal.gov.uk/blog/policy/)
evidence, including Office for National Statistics (ONS) population estimates, should also be considered (PPG paragraph 2a-017).

1.6 The use of demographic models, which enable a range of growth scenarios to be evaluated, is now a key component of the objective assessment process. The POPGROUP suite of demographic models, which is widely used by local authorities and planners across the UK, provides a robust and appropriate forecasting methodology.

**Approach**

1.7 A range of demographic scenarios have been developed for Northumberland National Park using POPGROUP (v.4) technology. This includes a scenario that aligns with the latest 2014-based sub-national population projection (SNPP) from ONS, plus alternative trend-based scenarios that use the latest demographic history to set migration trend assumptions.

1.8 Also included is a ‘zero population growth’ scenario, which presents the migration and dwelling growth implications of a stable population size, and a ‘natural change’ scenario, which evaluates population growth in the absence of migration (i.e. just births and deaths).

1.9 An additional ‘dwelling-led’ scenario has also been developed, in which future population change is determined by the growth in the number of dwellings. In this scenario, the rate of dwelling growth is consistent with that experienced between 2002/03 and 2014/15 in Northumberland National Park; an average of +5 dwellings per year.

1.10 Historical demographic statistics for the National Park have been derived from unitary authority-level (i.e. for Northumberland as a whole), ward-level, and Census Output Area statistics. Output Areas (OAs) are the smallest geographical unit to which Census data are published, nesting directly into the Northumberland Unitary Authority administrative boundary. A proportional split of the OAs has been calculated to estimate the extent to which each OA falls inside or outside the Northumberland National Park boundary. The resultant OA definition has been used as the basis for generating historical demographic statistics, used to develop forecasts for Northumberland National Park.

1.11 All scenarios are based on historical evidence for the period 2001–2014 and consider household growth using assumptions from the Department for Communities and Local Government’s
(DCLG) latest 2014-based household projections for Northumberland, scaled for consistency with the National Park geography.
This report provides a ‘demographic profile’ of Northumberland National Park, together with detail on the scenario definitions, methodology and forecasting outcomes. The report is structured in the following way:

- **Section 2** of this report presents a demographic profile of Northumberland National Park.
- **Section 3** provides a definition of the range of scenarios that have been considered and presents population, household and dwelling growth outcomes for each.
- In **Section 4**, a summary of the growth outcomes is provided.
- **Appendix A** provides an overview of the POPGROUP methodology.
2 Area Profile

Geography

2.1 Northumberland National Park is located at the western extent of Northumberland, bordered by the settlements of Wooler, Rothbury, Bellingham and Haltwhistle (Figure 1).

![Northumberland National Park Map](image)

Figure 1: Northumberland National Park

2.2 With a land area of 1,049 km$^2$ and a population of just over 2,000, Northumberland National Park is one of the most sparsely populated areas of the country. Each year, the Park receives approximately 1.5 million visitors with an estimated visitor spend of £190 million$^2$.

$^2$ [http://www.nationalparks.gov.uk/learningabout/whatisanationalpark/factsandfigures](http://www.nationalparks.gov.uk/learningabout/whatisanationalpark/factsandfigures)
Population Change 2001–2014

2.3 Over the 2001–2014 historical period, the population of Northumberland National Park has remained relatively stable, with an estimated population of 1,986 in 2001, compared to a population of 2,016 in 2014 (Figure 2).

![Northumberland National Park Population Change 2001–2014](image)

Figure 2: Population change 2001–2014 (source: ONS)

2.4 Compared to Northumberland as a whole, the National Park is estimated to have experienced a small decline in its population since 2011, following a low level of growth between 2001 and 2011 (Figure 3).

![Population Growth Index](image)

Figure 3: Population growth index 2001–2014 (source: ONS)
2.5 The growth and decline of the population of Northumberland National Park is reflected in the ‘components of change’ profile for the 2001/02–2013/14 period (Figure 4). Natural change is the annual balance between births and deaths; net migration is the balance between the inflow and outflow of population moving to and from the area.

![Figure 4: Components of population change 2001/02–2013/14 (source: ONS)](image)

2.6 The dominant driver of population change historically has been net migration, which contributed to population growth in the first half of the 2001/02–2013/14 period, and to population decline in 2011/12 and 2012/13. The population decline seen between 2011 and 2012 (see Figure 2) is attributed to a net outflow of people from Northumberland National Park. Natural change has fluctuated between being positive (i.e. a greater number of births than deaths) and negative (i.e. a greater number of deaths than births) over the historical period.

**Population Age Profile**

2.7 In the consideration of future housing needs for the Northumberland National Park, the ageing structure of the resident population is key. Over the 2001–2014 period, the profile of the National Park’s population has aged, with the proportion of the population in the older age groups increasing relative to the population in the younger age groups (Figure 5). Between 2001 and 2014, the proportion of the population aged 65+ living in Northumberland National Park increased from 16% to 24%.

2.8 Using the 2014 base year of the latest ONS projections, Northumberland National Park’s age profile is compared to the unitary authority as a whole, the North East region and to England in
total (Table 1). The National Park has an older age profile than each of these areas, with a median age of 52, compared to the unitary authority, regional and national median ages of 47, 42 and 40 respectively. The old age dependency ratio (38) is also higher in the National Park than the regional and national average (29 and 27 respectively), but is similar to that of the Northumberland Unitary Authority (36).

![Figure 5: Northumberland National Park population age profile 2001–2014 (source: ONS)](image)

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Northumberland National Park</th>
<th>Northumberland</th>
<th>North East</th>
<th>England</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage 65+</td>
<td>24%</td>
<td>23%</td>
<td>19%</td>
<td>18%</td>
</tr>
<tr>
<td>Percentage 80+</td>
<td>4%</td>
<td>6%</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Old age dependency ratio</td>
<td>38</td>
<td>36</td>
<td>29</td>
<td>27</td>
</tr>
<tr>
<td>Median age</td>
<td>52</td>
<td>47</td>
<td>42</td>
<td>40</td>
</tr>
</tbody>
</table>

Old age dependency ratio = Population aged 65+ / Population aged 15–64

**Household & Dwelling Growth 2001–2011**

Statistics from the 2001 and 2011 mid-year population estimates (MYEs) and Censuses illustrate the differences between the growth in the size of the population and the level of household and dwelling growth that has occurred in the Northumberland National Park (Figure 6).
2.10 An estimated 3% growth in the population of the National Park was paralleled by a 10% increase in the number of households and an 11% increase in the recorded number of dwellings. Between 2001 and 2011, the recorded number of dwellings in the National Park increased by 113. The differences between population, household and dwelling growth in the Park resulted in a reduction in the average household size and an increase in the dwelling vacancy rate, from 15% in 2001, to 17% in 2011 (Table 2). Northumberland National Park has a relatively high vacancy rate, due to the number of second/holiday homes in the area.

Table 2: Dwelling vacancy rates (source: 2001 and 2011 Census)

<table>
<thead>
<tr>
<th>Area</th>
<th>Vacancy Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2001</td>
</tr>
<tr>
<td>Northumberland National Park</td>
<td>15%</td>
</tr>
</tbody>
</table>

Housing Completions

2.11 Since 2002/03, 62 dwellings have been built in the Northumberland National Park, with the majority completed between 2005/06 and 2009/10 (Figure 7). Whilst the size of the population resident in the National Park has remained relatively stable over the historical period (see Figure 2 on page 6), there was a small amount of population growth between 2005/06 and 2007/08 (see Figure 4 on page 7), following the spike in dwelling completions in 2005/06.
2.12 On average, the net increase in the number of dwellings completed over the 2002/03–2014/15 time period is 5 per year.

![Net Housing Completions](image)

*Figure 7: Northumberland estimated net dwelling completions (source: NNPA)*

**Commuting Flows**

2.13 In terms of travel-to-work commuting flows, the 2011 Census recorded 1,049 workers aged 16–74 living in Northumberland National Park and 825 people aged 16–74 working within the Park. This imbalance between the number of resident workers and the number of workplace-based employed in the National Park results in a net out-commute, at a ratio of 1.27 (Table 3).

<table>
<thead>
<tr>
<th>Table 3: Northumberland National Park 2011 travel-to-work statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2011 Census</strong></td>
</tr>
<tr>
<td>Resident workers</td>
</tr>
<tr>
<td>Workplace-based employment</td>
</tr>
<tr>
<td>Commuting Ratio</td>
</tr>
</tbody>
</table>

*Source: 2011 Census*

2.14 Of the 1,049 resident workers, 50% work within the National Park (including those who work at or from home), 30% commute to the rest of Northumberland for work, with the remaining 19% working elsewhere in the UK, offshore or abroad. Of the 825 people working in the National Park, 63% also live in the Park, with 23% coming from the rest of Northumberland (Figure 8).
Figure 8: Northumberland National Park Travel-to-Work dynamics (source: 2011 Census)
3 Demographic Scenarios

Approach

3.1 There is no single definitive view on the likely level of growth expected in the Northumberland National Park. Ultimately, a mix of demographic, economic and local policy issues will determine the speed and scale of change.

3.2 POPGROUP v.4 has been configured for the area of Northumberland that is covered by the Northumberland National Park (see Figure 1 on page 5). A range of scenarios has been developed for the 2017–2037 plan period. These scenario forecasts incorporate mid-year population estimates for 2001–2014, plus counts of births and deaths for the same period. Key assumptions have been drawn from the ONS 2014-based sub-national population projection and the DCLG 2014-based household projection for the Northumberland Unitary Authority. Additional evidence has been drawn from the 2011 Census on the National Park’s dwelling vacancy rate.

3.3 The data listed above have provided the inputs to the calibration of demographic assumptions for the Northumberland National Park geography, and the basis for the development of the range of growth scenarios.

Scenario Definition

3.4 For a unitary authority-level analysis, the ONS 2014-based SNPP from ONS would provide the ‘benchmark’ growth outcome against which other scenarios could be compared. With no equivalent projection for the Northumberland National Park, a different approach has been required.

3.5 Population growth associated with the 2014-based SNPP has been disaggregated into two geographical areas: the part that sits within the Northumberland National Park, and the part that sits outside the Park. This disaggregation has been implemented in POPGROUP, using fertility,
mortality and migration assumptions for these two ‘sub-district’ areas. The migration assumptions upon which the 2014-based SNPP has been disaggregated have been derived from a thirteen-year historical period (2001/02–2013/14). The resulting scenario is referred to here as the SNPP-2014.

3.6 For comparison with the derived SNPP-2014 scenario, three alternative ‘trend’ scenarios have been developed, using the latest historical population statistics for the Northumberland National Park geography:

- **PG³ Short Term**: migration assumptions have been derived from a six-year period prior to 2014 (i.e. the latest year for which sub-district population statistics are available).
- **PG Long Term**: migration assumptions have been derived from a 13-year period prior to 2014 (i.e. from 2001).
- **Natural Change**: in this scenario, migration inputs are removed, providing an estimate of dwelling growth driven solely by natural change (the balance between births and deaths).

3.7 A further demographic scenario has also been developed, in which the population of the National Park remains fixed at its 2014 value (i.e. 2,016). This Zero Population Growth scenario provides an indication of the migration and dwelling growth impact of a stable population, given Northumberland’s ageing demographic profile.

3.8 For comparison with the scenarios listed above, a Dwelling Growth scenario has also been produced. In this scenario, population growth from 2014/15 to 2036/37 is determined by the annual growth in the number of dwellings. The historical net completions data for Northumberland National Park (see Figure 7 on page 10) suggests that an average of 5 dwellings per year were completed over the 2002/03–2014/15 period. In the Dwelling Growth scenario, the number of completions in the year 2014/15 (i.e. 1) has been applied, with an annual growth target of 5 dwellings per year applied from 2015/16 onwards.

3.9 In all scenarios, household growth has been estimated using household headship rates and communal establishment assumptions from the latest 2014-based DCLG household projection model, scaled for consistency with 2011 Census household totals for the Northumberland National Park area.

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³ Note that ‘PG’ stands for POPGROUP
Scenario Results

3.10 The population growth trajectories for all scenarios are compared in Figure 9 for the 2001–2037 time-period. In Table 4, each of the scenarios is summarised in terms of population and household growth for the 2017–2037 plan period, together with the annual average net migration and dwelling growth outcomes.

Northumberland National Park Scenario Outcomes

![Figure 9: Northumberland National Park scenario outcomes: 2001–2037](image)

Table 4: Northumberland National Park scenario outcomes 2017–2037

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Change 2017–2037</th>
<th>Average per year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Population</td>
<td>Population</td>
</tr>
<tr>
<td></td>
<td>Change Change %</td>
<td>Change Change %</td>
</tr>
<tr>
<td>SNPP-2014</td>
<td>12</td>
<td>0.6%</td>
</tr>
<tr>
<td>Dwelling Growth</td>
<td>40</td>
<td>2.0%</td>
</tr>
<tr>
<td>Zero Population Growth</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>PG Long Term</td>
<td>-104</td>
<td>-5.2%</td>
</tr>
<tr>
<td>Natural Change</td>
<td>-203</td>
<td>-10.1%</td>
</tr>
<tr>
<td>PG Short Term</td>
<td>-286</td>
<td>-14.4%</td>
</tr>
</tbody>
</table>

Note that household growth has been calculated using 2014-based headship rates and the dwelling growth figures using a fixed 17% vacancy rate. Scenarios are ranked in order of the annual average dwelling growth estimate.
Population change over the 2017–2037 plan period ranges from a 14.4% decline under the PG Short Term scenario, to a 2.0% growth under the Dwelling Growth scenario.

In all but the SNPP-2014, Dwelling Growth and the Zero Population Growth scenarios, the population of the Northumberland National Park is forecast to decline over the plan period. With minimal (or negative) net migration, this decline is a reflection of the ageing population of the National Park. Even with a small positive annual net migration in the PG Long Term scenario, the impact of the ageing population still results in an overall population decline.

Both the PG Short Term and the PG Long Term scenarios result in negative population growth over the 2017–2037 plan period, with the PG Short Term scenario resulting in a greater decline in the population than the PG Long Term scenario. This is a reflection of the historical periods from which their respective migration assumptions have been derived. Over the 6-year historical period, net migration was predominantly negative (see Figure 4 on page 7), whereas towards the beginning of the 13-year historical period, net migration was positive. Despite this, the resulting levels of net migration are insufficient to counter the impact of the ageing population.

Under the Zero Population Growth scenario, maintaining a stable population has a different effect, as net in-migration is required to replace population lost through natural change (i.e. an excess of deaths over births). This results in a dwelling growth estimate of 4 per year over the plan period.

With an annual dwelling growth target of 5 applied under the Dwelling Growth scenario, the population grows by 2.0% over the 2017–2037 plan period. This is a higher rate of population growth than under the SNPP-2014 scenario (at 0.6% 2017–2037). However, the SNPP-2014 scenario results in a higher dwelling requirement, at 7 per year. The reason for the differences between the scale of population and dwelling growth can be explained by the population age profiles of these two scenarios. The SNPP-2014 scenario results in a more ‘elderly’ population profile by the end of the forecast period. This leads to an increased number of one-person households when compared to the Dwelling Growth scenario, thereby increasing the overall dwelling requirement, through a reduction in the average household size. The age structure and household growth outcomes of the benchmark SNPP-2014 scenario are examined in more detail below.
Population Age Structure

3.16 The ageing population of the Northumberland National Park is a key factor when considering the future housing requirements of the area. The population age profiles for the benchmark SNPP-2014 scenario in 2017 and 2037 are presented in Figure 10.

3.17 Over the 2017–2037 plan period, the proportion of the population aged 65+ is projected to increase from 27% to 46%, with the median age increasing from 54 to 63. The result of this ageing is an increase in the old age dependency ratio, from 44 to 101, meaning that by 2037, the size of the population aged 65+ is larger than the population aged 15–64.

![SNPP-2014: Population Age Profile 2017 & 2037](image)

Figure 10: Population age profile of the Northumberland National Park.
OAD = Old Age Dependency Ratio = (Population aged 65+ / Population aged 15–64)

Household Growth Profile

3.18 In all but the Natural Change and PG Short Term scenarios, household growth in the Northumberland National Park over the 2017–2037 plan period is positive, ranging from an additional 29 to 114 households, under the PG Long Term and SNPP-2014 scenarios respectively (see Table 4 on page 14). Under the PG Long Term scenario, this level of household growth occurs even with a population decline, again a reflection of the ageing population, in combination with an expected reduction in average household size.

3.19 Using the latest 2014-based household projection model from DCLG, the age profile and types of household that are estimated for the plan period under the SNPP-2014 scenario have been calculated (Figure 11). The largest increase is seen in the ‘Couple no child’ category, with the
greatest decrease in the ‘Two children’ category (i.e. households with two dependent children). The increase in the number of ‘One person’ households, in combination with the growth in the number of ‘Couple no child’ households, is a reflection of the ageing population of the Park. This is further reflected in Figure 12, in which household growth over the 2017–2037 plan period is viewed by age. The oldest age groups have experienced the highest levels of growth, with an expected decline in all age-groups under 65.

**Figure 11:** Northumberland National Park SNPP-2014 household growth by type 2017–2037

**Figure 12:** Northumberland National Park SNPP-2014 household growth by age group 2017–2037

The 8 different household categories from the 2014-based DCLG model are:

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>One person male</td>
<td>One person households: Male</td>
</tr>
<tr>
<td>One person female</td>
<td>One person households: Female</td>
</tr>
<tr>
<td>Couple no child</td>
<td>One family and no others: Couple: No dependent children</td>
</tr>
<tr>
<td>Cple+adlts no child</td>
<td>A couple and one or more other adults: No dependent children</td>
</tr>
<tr>
<td>One child</td>
<td>Households with one dependent child</td>
</tr>
<tr>
<td>Two children</td>
<td>Households with two dependent children</td>
</tr>
<tr>
<td>Three+ children</td>
<td>Households with three or more dependent children</td>
</tr>
<tr>
<td>Other households</td>
<td>Other households</td>
</tr>
</tbody>
</table>

4 The 8 different household categories from the 2014-based DCLG model are:
4 Summary

Approach

4.1 The Northumberland National Park Authority is formulating its draft Local Plan, detailing housing demand, land supply and housing targets for the Park over an extended plan period. A range of demographic scenarios has been produced, to support the preparation of the demographic evidence required by the Local Plan.

4.2 Scenarios have been developed in POPGROUP v.4, configured for the area of Northumberland that is covered by the Northumberland National Park. Demographic statistics have been derived from unitary authority, ward-level, and Census Output Area statistics.

4.3 The latest 2014-based sub-national population projection (SNPP) from ONS has been considered, plus alternative trend-based scenarios that have derived their assumptions from the latest statistics on demographic change. Also included is a ‘dwelling growth’ scenario, in which population growth is determined by the growth in the number of dwellings, linked to historical housing completions, at a rate of +5 dwellings per year. A ‘zero population growth’ scenario presents the migration and dwelling growth implications of a stable population size. A ‘natural change’ scenario has also been included, which evaluates population growth in the absence of migration (i.e. just births and deaths).

4.4 All scenarios are based on historical evidence for the period 2001–2014 and all consider household growth using assumptions from the Department for Communities and Local Government’s (DCLG) latest 2014-based household projections for Northumberland, scaled for consistency with the National Park.
**Growth Outcomes**

4.5 Population change ranges from -14.4% under the **PG Short Term** scenario, to 2.0% under the **Dwelling Growth** scenario, which aligns with the latest population projection from ONS. The average annual dwelling requirement ranges from -3 under the **PG Short Term** and **Natural Change** scenarios, to 7 per year under the **SNPP-2014** scenario (Figure 13).

![Northumberland National Park: Scenario Outcomes 2017–2037](image)

**Figure 13:** Northumberland National Park scenario outcomes 2017–2037

4.6 The alternative trend scenarios, **PG Long Term** and **PG Short Term**, are reflective of the historical time periods over which their migration assumptions were calibrated. Over the 6-year historical period, net migration was predominantly negative, whereas towards the beginning of the 13-year historical period, net migration was positive. Despite this, the resulting levels of net migration are insufficient to counter the impact of the ageing population.

4.7 To maintain the current size in the population (as in the **Zero Population Growth** scenario), an additional 4 homes would be required each year. This is a reflection of the level of net migration needed to sustain the size of the population, countering the impact of natural change.

4.8 The majority of the Northumberland National Park population is aged over 50, with 24% aged 65+ in 2014. With higher life expectancies, coupled with a continuation of its existing migration
trends, the ageing profile of the resident population of the Northumberland National Park will become more exaggerated over the plan period.

4.9 Household growth is projected to be most pronounced in the oldest age groups, with a reduction in the number of households for all ages under 60. This has important implications for the level and type of service provision in the area, particularly in relation to housing.
Appendix A

POPGROUP Methodology

Forecasting Methodology

A.1 Evidence is often challenged on the basis of the appropriateness of the methodology that has been employed to develop growth forecasts. The use of a recognised forecasting product which incorporates an industry-standard methodology (a cohort component model) removes this obstacle and enables a focus on assumptions and output, rather than methods.

A.2 Demographic forecasts have been developed using the POPGROUP suite of products. POPGROUP is a family of demographic models that enables forecasts to be derived for population, households and the labour force, for areas and social groups. The main POPGROUP model (Figure 14) is a cohort component model, which enables the development of population forecasts based on births, deaths and migration inputs and assumptions.

A.3 The Derived Forecast (DF) model (Figure 15) sits alongside the population model, providing a headship rate model for household projections and an economic activity rate model for labour-force projections.

A.4 For further information on POPGROUP, please refer to the Edge Analytics website: http://www.edgeanalytics.co.uk/.
Figure 14: POPGROUP population projection methodology.
Figure 15: Derived Forecast (DF) methodology

\[ D_{a,s,u,y,d,g} = \frac{P_{a,s,u,y,g} \cdot R_{a,s,u,y,d,g}}{100} \]

- \( D \): Derived Category Forecast
- \( P \): Population ‘at risk’ Forecast
- \( R \): Derived Category Rates
- \( a \): Age-group
- \( s \): Sex
- \( u \): Sub-population
- \( y \): Year
- \( d \): Derived category
- \( g \): Group (usually an area, but can be an ethnic group or social group)