

Summary Quality Report for Subnational Population Projections

1 Introduction

This report is part of a rolling programme of quality reports being introduced by the Office for National Statistics (ONS). The full programme of work being carried out on [Statistical Quality](#)¹ is available on the National Statistics website. Summary Quality Reports are overview notes which pull together key qualitative information on the various dimensions of quality as well as providing a summary of methods used to compile the output.

The report covers Subnational Population Projections (SNPPs), which provide indicative figures of likely levels of future population and structure at the local authority level that might result if recent demographic trends were to continue. They are mainly used for planning and resource allocation purposes.

2 Summary of Quality

2.1 Relevance

The degree to which the statistical product meets user needs for both coverage and content.

What it measures	Projected usually resident population of England (projections for other countries of the UK are the responsibility of the devolved administrations), broken down by age and sex for each local authority, Government Office Region (GOR) and strategic health authority
Frequency	The projections are produced every two years and cover population for each year of the twenty-five year projection horizon from the base year
Survey Design	The projections are a secondary analysis; they are derived using data from several sources. As well as administrative sources such as life event registrations and Patient Register Data System (PRDS) data they also rely on surveys such as the Census and the International Passenger Survey (IPS)
Periods available	Annual mid year projections for twenty-five years from base year
Method	Estimation of future population sizes and structure based on cohort component methodology. Uses assumptions derived from levels of components of change observed over a five-year reference period up to base year
Imputation	Not applicable – see above
Outliers	Quality assurance process identifies any local authorities with outlying projections. Manual adjustments are made to assumptions to counter these

Summaries of Conceptual Issues

Definition: The projections estimate the ‘usually resident’ population only. This is the standard [United Nations \(UN\) Definition](#)² of ‘usually resident’: it includes only people who reside in the country for 12 months or more and excludes short-term migrants.

Areas covered: The projections cover a number of different geographies. At the top they are fully consistent with the National Population Projections ([NPP](#)³) for England. These are

broken down to GOR, Strategic Health Authority, Primary Care Organisation and local authority level.

Discontinuities: Each new set of projections supersedes any previous sets and so the notion of series discontinuity doesn't really apply. However, there have been some changes to the level of projection and the methodology between successive sets in the past. Notably the 2004-based projections incorporated a change to the way in which international migration was distributed to the local authority level to bring it in line with that used in the mid-year estimates methodology. This method changed again with revisions to the 2004-based projections published in September 2007 to incorporate improvements to the distributions.

Further information is available in the [Guide to SNPPs](#)⁴ that gives a summary of what the projections are, what purpose they serve and brief general background information of which to be aware.

Key Users and Uses of the Data

Department of Communities and Local Government (DCLG) use projections as the key population driver for their three-year grant formulation to local authorities. The projections (for up to three years from base year) are used to share out the central government grant to local authorities. Advantages of using projections for this are that the time element is built in, for example: if an area is increasing or decreasing in population over time then this will be accounted for, which it otherwise wouldn't be if estimates were used. However, there is a limitation in that the projections are demographic and trend based, taking no account of growth policies of an area and so may not accurately reflect precisely what future population levels are going to be. They simply provide an indication of population levels arising if the underlying assumptions were realised.

DCLG also use projections as an input into the official Household Projections (HOPS), used to help regional house planning and monitoring. The HOPS themselves are trend-based projections and so the SNPPs are adequate for this purpose.

Department of Health (DH) use SNPPs for resource planning and healthcare provision. The age and sex structure is important for this purpose and SNPPs provide both. Currently SNPPs are supplied at strategic health authority level and Primary Care Organisation level for DH purposes. A limitation is that the SNPPs are only currently available to age 85+. With an increasingly older population there is a requirement to extend this upper boundary to 90+, and probably beyond.

Local authorities use SNPPs as a starting point for local level planning and monitoring. They form the denominators for a number of local rates and measures. Many LAs would like a product that better reflects the likely impact of growth policy of an area for this purpose.

Other users include academic researchers, private companies for market research and other private individuals.

With the 2006-based projections users have been consulted on different aspect of the SNPPs:

1. [Migration assumptions](#)⁵
2. [On outputs](#)⁶

Following the publication of the 2006-based projections there has also been consultation on [potential production of variants for subnational population projections](#)⁷.

2.2 Accuracy

The closeness between an estimated result and the (unknown) true value.

The projections are demographic, trend based projections that show likely levels of population arising if the underlying assumptions about future levels of components of change were

realised. These assumptions are based on levels of births, deaths and migration observed over a five year reference period leading up to the base year.

The projections take no account of local development or growth policy, of the capacity of a given area to accommodate population change, or of economic factors likely to impact on population in the future. Additionally, if an area is experiencing a sudden change in its population during the latter part of the reference period then this might not be fully reflected in the assumptions being used for future years. The five-year averaging process has a dampening affect on the projection of such sudden changes. This stabilises projections over the twenty-five year horizon and makes them more robust but may generate short-term inaccuracies if the sudden change is the start of a continuing trend.

Therefore we cannot expect the projections to predict precisely what happens at the local level for all areas as an economic forecast might aim to do. Nevertheless some comparisons of previous sets of projections have been carried out to examine how they differ from the final mid-year estimates for a given year.

For example the revised 2006-based SNPP for 2007 for England was 2,147 (0.004 per cent) higher than the corresponding Mid-Year Population Estimate (MYE). However the differences at GOR level were generally greater, as would be expected. Table 1 shows the differences and percentage differences between the SNPPs and MYEs.

Table 1: Differences between 2007 Mid-Year Population Estimate and first year projected population

GOR	SNPP 2007	MYE 2007	Difference	Percentage Difference (%)
North East	2,561,356	2,564,486	3,130	0.12
North West	6,879,336	6,864,275	-15,061	-0.22
Yorkshire and The Humber	5,184,676	5,177,218	-7,458	-0.14
East Midlands	4,405,908	4,399,637	-6,271	-0.14
West Midlands	5,389,913	5,381,845	-8,068	-0.15
East	5,657,803	5,661,034	3,231	0.06
London	7,556,071	7,556,930	859	0.01
South East	8,290,958	8,308,650	17,692	0.21
South West	5,168,158	5,177,957	9,799	0.19
England	51,094,179	51,092,032	-2,147	0.00

97 per cent of local authorities were different from the MYE by less than 1 per cent.

Generally, SNPPs from a given base year are not revised. Rather, a new set of projections from a later base year supersedes and replaces all previous sets. However, for 2007 there was a slightly different approach.

It is recognised that the hardest part to estimate and predict is the international migration element, and particularly the local distribution of this. Therefore ONS has completed a programme of work to improve the allocation of in-migrants to local authorities. ONS has used Labour Force Survey (LFS) data to improve the allocation of IPS immigration numbers to local authorities and has developed a migration model that uses PRDS data to predict migration between local authorities. These improvements have been incorporated into the 2006 MYEs and 2002-2005 back series. ONS has also revised the 2004-based SNPPs to take account of these methodological and quality improvements. These revisions were made primarily to help a key customer, DCLG, who needs the most accurate projections available as an input into their three-year settlements to local authorities.

2.3 Timeliness and Punctuality

Timeliness refers to the lapse of time between publication and the period to which the data refer. Punctuality refers to the time lag between the actual and planned dates of publication.

Subnational population projections are typically published two years after the base year. A typical timetable for production might look like that shown in Table 2.

Table 2: Timetable for Production of SNPPs

Time	Action
Mid-year (end August) of the reference (base) year	Determine the timeframe to which population estimates and projections apply
August 27, base year +1	Local level MYEs published for base year
October 31, base year+1	National Population Projections for England, Scotland, Northern Ireland and Wales published for base year and 50 years forward. Base year data are fully consistent with the MYEs.
March-April, base year+2	Consultation with local authorities on first year migration assumptions being proposed for SNPPs from the base year.
July, base year +2	Publication of final SNPPs from the base year fully consistent with the corresponding NPPs from the base year and the Mid-Year Population Estimates for the base year.

Such a timetable means that the projections are available to the two key customers, DCLG and DH, in good time for their onward processing and use in resource allocation and planning procedures. The timetable is not unlike population projection timetables used in other countries.

In terms of punctuality, all previous sets of projections have been published to time on pre-announced dates.

2.4 Accessibility and Clarity

Accessibility is the ease with which users are able to access the data, also reflecting the format(s) in which the data are available and the availability of supporting information. Clarity refers to the quality and sufficiency of the metadata, illustrations and accompanying advice.

SNPPs are published at 9:30 am on the pre-announced publication day at the official [SNPP Product Page](#)⁸ on the internet. Table 3 details all the tabulated information available from this site.

Table 3: Available Information on the [SNPP Product Page](#)⁸

Table No(s).	Title of Table for 2006-2031 Population Projections
1	Government Office Regions (GORs) by sex and quinary age
2	Local authorities and counties within North West, North East and Yorkshire and The Humber GORs by sex and quinary age
3	Local authorities and counties within East Midlands, West Midlands and East GORs by sex and quinary age
4	Local authorities and counties within London, South East and South West GORs by sex and quinary age
5	All local authorities, counties and GORs by sex and quinary age
6	Natural change and migration summaries for local authorities & higher administrative areas
7	Primary Care Organisations and Strategic Health Authorities by sex and quinary age
9	Local authority broad age-groups and old age dependency ratios

Also available from the product page are a number of supporting documents:

- a [Methodology Guide for SNPPs](#)⁹ providing an overview of the cohort component methodology used as well as outlining the various data sources used in population projection processing

- an issues paper that accompanies each release. This specifies particular issues and caveats that apply to the projections and should be read by all customers to ensure they are aware of the limitations that might apply to the output
- the [Guide to SNPPs](#)⁴, referenced in section 2.1 of this report
- previous (superseded) sets of projections for comparison/archive/reference purposes

For commissioned outputs, custom tables, queries about licensing and copyright of the data, contracts and general queries email snpu@ons.gsi.gov.uk, or alternatively contact:
Subnational Population Projection,
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Tel: 01329 444669

For technical queries about methodology or the statistical implications of the projections, the statistician responsible for the projections is Andy Bates, contactable:

- at the above address
- via email: andrew.g.bates@ons.gsi.gov.uk
- by telephone: 01329 444662

There is no paper version of the SNPP tables published, it is electronic dissemination only.

2.5 Comparability

The degree to which data can be compared over time and domain.

Comparability over Time

Each new set of subnational population projections released supersedes previous sets. However, projections are broadly comparable over time, indicating how future population might change under different sets of assumptions and updated base year populations.

At present, the following sets of SNPPs are readily available:

- 1996-based long term projections (25 year horizon)
- 1998-based short term projections (10 year horizon)
- 2000-based short term projections (10 year horizon)
- 2002-based short term projections (10 year horizon)
- 2003-based interim projections (25 year horizon)
- 2004-based projections (25 year horizon)
- revised 2004-based projections (25 year horizon)
- 2006-based projections (25 year horizon)

The following issues apply when comparing different sets of projections:

1. up until 2003-based projections, the full twenty-five year horizon was only available every four or five years. In intervening years short-term ten-year projections were produced using the same assumptions on levels of components of change as the previous set of long-term projections but updated the base-year populations to take account of latest MYEs
2. the 2003-based projections were an interim set that were produced when methodological changes in the MYEs resulted in a revised back series
3. the 2004-based projections used a different methodology for the distribution of international migration than previous sets of projections. The method used was brought more into line with that used for the production of the official Mid-Year Population Estimates
4. the revised 2004-based projections update the 2004-based projections to take account of improved methodology for the distribution of international migration as developed as part of the ONS [Improving Migration and Population Statistics Project](#)¹⁰ (IMPS)

International Comparability

In terms of international comparability, the definition of population used is in line with the [UN Definition](#)² of usually resident population. Also, the cohort component methodology used is an internationally recognised and widely used standard approach.

2.6 Coherence

The degree to which data that are derived from different sources or methods, but which refer to the same phenomenon, are similar.

The SNPPs are fully consistent with the [Mid-Year Population Estimates](#)¹¹ which form the starting point for projecting forward. They are also fully consistent with the [NPP](#)³ for a given base year.

“Fully consistent” in this instance means that the total population, components of change and assumption rates across all subnational areas of England sum to those presented in the national population projection for England.

Other SNPPs exist. For example some local authorities, particularly those in London, produce their own sets of projections. These differ from the ONS projections in methodology and therefore output numbers. Key methodological differences include:

- they do not use a multi-state model as ONS does. That is, they do not take account of moves from one area to another in the same way (internal migration for England as a whole in the NPPs has a net value of zero)
- they sometimes try and take account of economic factors or local policy decisions in the future population levels or housing development
- they do not need to apply a methodology that is consistent and objective for all areas within England
- there is no need to constrain to NPPs or follow the assumptions associated with them.
- definitions of migration and population can vary

3 Summary of Methods Used to Compile the Output

Key data sources include administrative data:

- Registrations of births and deaths from ONS
- Home and Foreign armed forces data from the Defence Analytical Services Agency (DASA)
- PRDS from NHS
- Asylum seekers information from Home Office

Survey-based data:

- 2001 Census information
- IPS
- LFS

And other secondary analyses:

- Mid-Year Population Estimates

The basic method involves:

1. starting with the Mid-Year Population Estimates for a given year
2. ageing on the population by one year
3. applying assumed birth rates to the aged on population. Assumptions are based on observed values from the five year reference period leading up to the base year. This gives a projected number of births which are added to the population as 0 year olds
4. applying assumed mortality rates to the new population. Again these are derived from the reference period registration data. The projected deaths are removed from the population

5. making an adjustment for international migration. This is based on IPS data, asylum seeker information, flows to and from Eire, and migrant switchers (people who enter a country intending to become usual residents, but who leave after a short time) and visitor switchers (people who enter a country intending to visit, but stay to become usual residents) information. Inflows and outflows are applied at the local level
6. modelling moves within England using PRDS data to work out a propensity to migrate by age profile. As well as numbers of moves, an origin/destination matrix based on the PRDS data is also applied to assign new areas for the projected internal moves
7. constraining all components of change to the England NPP by scaling
8. repeating this process for the twenty-five years from the base year

Fuller information on the methodology is published and can be found in the [Methodology Guide for SNPPs](#)⁹.

At all stages rigorous quality assurance is carried out. Specifically:

- input data are scrutinised to ensure there are no abnormal values
- output projections are compared with previous sets to see where large changes are taking place, and what reasons lie behind large changes
- trends projected over time in the components of change and total population are scrutinised for plausibility
- internal migration profiles are examined to ensure the modelling process has succeeded and converged on an appropriate pattern
- sex ratios are examined to find any areas of imbalance

Part of the process involves full consultation with local authorities over the first year migration assumptions proposed for each area. This gives authorities the opportunity to have an input into the projection process. Authorities are in a better position to judge what is happening “on the ground” and if the averaging process of the reference period data has produced an implausible assumption for future levels they are able to identify this and raise it as an issue for possible adjustment. However, such adjustments are made objectively and are not done without sound evidence to back them up.

4 References

	Title of Reference	Website Location
1	Statistical Quality Programme	http://www.statistics.gov.uk/about/data/methodology/quality/default.asp
2	UN Definition	http://www.unece.org/stats/documents/statistical_standards_&_studies/49.e.pdf
3	NPP	http://www.gad.gov.uk/Population/index.asp
4	Guide to SNPPs	http://www.statistics.gov.uk/cci/nugget.asp?id=995
5	Summary of Part One Consultation Response Analysis and Changes Implemented in the Projections	http://www.statistics.gov.uk/downloads/theme_population/SNPP-2006/Response_Part1Consultation_Mig.assumptions.pdf
6	Summary of Part Two Consultation response regarding proposals for outputs	http://www.statistics.gov.uk/downloads/theme_population/SNPP-2006/Response_Part2Consultation_Outputs.pdf
7	Subnational Population Projections: Summary of Part Two Consultation Response regarding projection variants	http://www.statistics.gov.uk/downloads/theme_population/Variants-Consultation-report.pdf
8	SNPP Product Page	http://www.statistics.gov.uk/snpp
9	Methodology Guide for SNPPs	http://www.statistics.gov.uk/downloads/theme_population/2004_Methodology_Guide.pdf
10	Improving Migration and Population Statistics Project	www.statistics.gov.uk/imps
11	Mid Year Population Estimates	http://www.statistics.gov.uk/popest

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