

Subnational Population Projections: Summary of Part Two Consultation Response regarding projection variants

November 2008

1. Executive Summary

In March 2008 The Office for National Statistics (ONS) ran a consultation on the potential production of variants for subnational population projections. This report summarises the responses to that consultation and sets out the conclusions and actions that ONS intends to take.

The key conclusion from the consultation is that respondents favoured the production of subnational population projection variants, mainly to illustrate the uncertainty inherent in projections. ONS intends to include the production of subnational projection variants in its forward work plan. The priority of this development work will be assessed alongside other priorities in the improving migration and population statistics programme.

The first priority in the research and production of variants will be on the production of a small number of deterministic variants: high and low fertility and mortality assumptions, high and low migration, and zero net-migration. Despite the interest shown by respondents in housing based variants (projections constrained or determined by planned housing growth) the technical issues that need to be overcome for housing based variants mean that there are no plans to take this work forward in the short-term.

2. Introduction

As part of the biennial programme for Subnational Population Projections (SNPPs), ONS ran a two-part consultation. In addition to the usual consultation on initial migration assumptions, which is referred to as Part One of the consultation, subnational organisations were consulted on publication of outputs and projection variants. The consultation ran from 6 March to 17 April 2008.

Responses to Part One and the outputs sections of the consultation were reported separately and these reports can be found from here: www.statistics.gov.uk/snpp

This document summarises the responses to Part Two of the consultation on variants. It sets out the conclusions drawn from these responses, and what actions are proposed as a result. Consideration was given to demand and available resources in deciding the next steps.

Consultation responses reported here represent the views of the responding organisations and do not necessarily reflect the opinion of ONS. Where the view expressed is that of ONS this is clear from the context of the appropriate text.

This report covers who responded to the consultation, the case for variants and the uses made of them, views on centrally produced versus locally produced variants, methodological issues, priorities and views on housing based variants.

3. Consultation Responses

There were responses from 48 organisations. These are listed in the table below.

| Organisations responding to the consultation on subnational population projection variants | | |
|---|---------------------------------------|---|
| Barnet | Kent | Redbridge |
| Barnsley | Kirklees | Sheffield |
| Berkshire West PCT | Leeds | Shropshire |
| Birmingham | Leicestershire | Staffordshire |
| Braintree | Lincolnshire | Suffolk |
| Bristol | Manchester | Tameside |
| Calderdale | Newcastle-upon-Tyne | Torbay |
| Camden | Newham | Tower Hamlets |
| Cambridgeshire | Norfolk | Tyne and Wear |
| City of London | North Yorkshire | Waltham Forest |
| Durham (County) | Northampton | Warwickshire |
| Greater London Authority | Northamptonshire (CC, PCT and Police) | West Lindsey (via Lincolnshire) |
| Hampshire | Nottingham | Westminster |
| Haringey | Nottinghamshire | A Regional Development Agency |
| Hertfordshire | Oxfordshire | Department of Health |
| Islington | Plymouth | Department for Communities and Local Government |

3.1 Overall demand for population variants

The consultation responses were heavily in favour of production of some form of projection variant. To some degree this is to be expected, as those that do not have a significant interest in variants are less likely to respond to the consultation. Nevertheless there was a strong desire to see subnational projection variants. The uses suggested for variants are given in the next section.

Of those few organisations that argued against variants, the main reason quoted was the possible confusion they could cause. In response to this, and also other concerns expressed, ONS would be clear about the status and recommended use of any variants. This is addressed further in the ‘other issues’ section.

Another objection raised was that ONS should concentrate its efforts on the accuracy of estimates and the principal projection, especially on the measurement of migration that feeds into these. ONS will continue to focus efforts on developing improvements to the sources and methods of migration and population estimation.

The main objection to producing deterministic¹ variants was that effort should instead be concentrated on a probabilistic approach, one that would yield a set of confidence intervals. This is discussed in section 3.5, but the complexities involved in this approach mean that it is unlikely that this would be an improvement that could be delivered in the short-term and so this approach has been given a low priority.

In terms of the case for variant projections, this comes through clearly in the responses to the individual questions, in particular with reference to the uses of variants covered in the next section. The following quotes illustrate the importance of this issue to many organisations:

- “Variants would be very useful. High and low variants would be used to present likely future scenarios to decision makers ... By providing the likely extremes the projections would have more credence than a single projection ...”
- “Variant projections would be useful in getting policy-makers to more fully appreciate the importance of considering potentially different future scenarios.”
- “We support the use of variants and agree with you [ONS] that they are necessary to reinforce the message to potential users that uncertainty associated with population projections can be large and will grow with the length of the projection period.”

¹ Deterministic variants are the classical projection variants, where the assumptions fed into the projection model are varied to give an alternative scenario – e.g. high fertility. They contrast to probabilistic approaches where the likely range of components is estimated and these are used to give a range of possible projections with associated likelihoods; simplistically probabilistic methods can be thought of as giving a confidence interval to a projection.

- “At present, it’s felt that there’s a particular need for an alternative projection based on a lower level of future international migration.”
- “We would like to see the publication of the high and low population variants. This would serve to illustrate the uncertainty inherent in the projections and to emphasis the RANGE in figures associated with population projections. This will be helpful in presenting data to the users – it will be much easier to state that the figures are not absolute if we have a published range to stress the point.”

ONS has therefore concluded that the production of subnational population projection variants in some form is desirable and will be included into its work programme. This conclusion is supported further by the comments in the following section.

3.2 Likely use of subnational projection variants

The main likely uses of projection variants, in approximate order to the number of organisations that cited them are given in the table below.

| Likely use of subnational projection variants | |
|--|---------------------------------------|
| Use | Number of organisations citing |
| Geospatial planning | 15 |
| Planning for service provision | 11 |
| To illustrate uncertainty | 8 |
| To allow scenario planning | 8 |
| Comparison with other projections | 3 |
| Aid understanding of projections | 3 |

The number of organisations citing a particular use in the above table is approximate, as some interpretation was necessary in order to compile this list. Some organisations cited more than one use (in which case they will appear under each category). Finally, a number of responses replied that variants would be useful – but did not indicate what use might be made of them.

Geospatial planning was mainly cited with respect to house building (though location of new schools was also mentioned).

In addition to the above list of uses the following were cited by one or two organisations only: policy assessment; contextualise projections; contingency planning; resource allocation; since short term migrants are not included in projections; inform debate; assess impact of migration; and for boundary review.

It is important to highlight the uncertainty inherent in projections and ONS considers this the single most important reason for the production of variants. Current supporting material for subnational population projections stresses that projections are trend based and will give the likely future size and age/sex structure of the population should current trends continue. However, it is difficult to show how likely these assumptions are. There is an accuracy report² available at the subnational level which shows that projections are less accurate for smaller areas and the further into the future projections are made. The report includes an estimate of the average error a typical local authority will see in its projections three years ahead (1.4 per cent).³ Whilst this goes some way to quantifying uncertainty, it has some limitations. Experience gained at the national level suggests that subnational deterministic variants would help achieve a better understanding of uncertainty. The potential of a probabilistic approach is considered further below.

3.3 Respondent's views on ONS's role in local production of variants

Thirteen organisations favoured central production and eleven favoured local production of variants, with a small number explicitly supporting both and a number of neutral comments

Reasons cited by respondents to the consultation, for prioritising central production were:

- Central production would ensure consistency, and high standards of quality control.
- The weight an 'official' ONS 'stamp' would carry on a variant was seen as an advantage. It was suggested that locally produced variants could be perceived to be influenced by local concerns and of a lower quality and therefore might not carry sufficient weight in discussions, planning, and decision making.
- Comparison of areas under different variants would be greatly facilitated if centrally produced as a systematic approach to variation and a consistent methodology would be applied.
- Some organisations did not have sufficient knowledge, expertise, or resource to be able to produce variant productions.
- The production of consistent projections within a framework of national constraint will help to show the reality gap between current house-building plans and actual need for housing.

Reasons cited by respondents to the consultation, for supporting local production were:

- Local variants can be made more relevant to local needs and can more easily reflect locally important factors.

² This report can be downloaded from the Subnational Population Projections website – www.statistics.gov.uk/snpp

³ In technical terms this is the root mean square error –or RMSE.

- It is easier to examine variants at a local level.
- Local production could promote useful skills [in local or regional bodies].
- Local variants can better allow for systematic difference, for example between inner city and rural areas.
- Local variants would remove possible confusion generated if a variety of National Statistics were produced.

A number of suggestions were made by respondents with respect to local production of variants. As elsewhere this is a summary of the responses made and ONS is not committed to the actions suggested for them:

- Use could be made of local experts, including Regional Statisticians.
- There could be mutual benefit in ONS and the Greater London Authority working together on GLA's alternative projections.
- ONS should facilitate a two tier solution.
- Local support could be achieved by support through POPGROUP.
- ONS should consider developing a web-based solution that enabled local scenario setting.

The weight of argument of the responses to this consultation favour variant projections produced centrally. Particularly important are the arguments for a central, definitive, comparable set of projections whose independence and quality can be assured. Also important are arguments for equality of access, a key principle underlying the work of ONS. Not all local bodies have facilities to produce variants.

Nevertheless there were strong arguments for ONS to support local production. Not all local factors or locally important potential scenarios can be taken into account in a centrally produced set of variants. Some respondents felt that enabling local bodies to produce their own variants based upon ONS methods and data would help improve the comparability and quality of locally produced variants and enable more efficient local production. ONS are not able to take forward support of local variants at this time. We will continue talking to users regarding the best way to develop local production of variants, taking advantage of appropriate opportunities to do so such as through the population sub-group of CLIP group.

3.4 Methodology

The consultation acknowledged that the issues raised in this section were technical and that responding organisations need not comment. As a consequence, the responses to this section were fewer in number but nevertheless provided a welcome indication of views and issues.

The consultation proposed an option of pursuing a small number of definitive deterministic population variants and then following these up with research into using a linear regression based approximate method to permit calculation of a wider range of variants.

The responses indicated a range of opinions. Nevertheless it was possible to categorise a number of responses as either for (or broadly for) or against (or mainly against) the outlined proposal. Fourteen respondents broadly favoured the proposal outlined and five respondents preferred alternative approaches.

The caveats raised by respondents related to uncertainty about the benefits that could be delivered using the regression based technique and the resource that this might require. Of those who were broadly supportive, some respondents indicated that they would prioritise production of confidence intervals or use of probabilistic methods over the use of regression based techniques.

ONS will consider future planning of further methodological research but note that this is unlikely to have a high priority in the short-term.

3.5 Stochastic forecasting and probabilistic approaches

The consultation highlighted that users would like confidence intervals for subnational projections and a number of responses specifically recommend further exploration of stochastic forecasts. At least 7 organisations recommended this line with just 3 cautioning against. Those cautioning against did so on the grounds of the difficulty involved in producing stochastic forecasts.

There are a number of probabilistic approaches, all of which involve simulation techniques. ONS has researched the use of stochastic forecasting in relation to the National Population Projections. UK level (only) stochastic forecasts are due to be published early in 2009. These stochastic forecasts represent the outcome of a significant research project.

Production of stochastic forecasts (or related techniques) at LA level would be a substantial undertaking. Therefore, ONS will continue to review emerging research, including research internally within ONS on national stochastic forecasts, with the possible production of confidence measures for subnational projections in mind. However there are no immediate plans to take forward this work at present.

3.6 Priorities for variants

In order to summarise consultation responses a scoring approach has been used. Where an organisation has cited a variant as high importance, or sole variant mentioned, or top of an

importance list we have scored this as 3; for those of medium importance or in the middle of a list we have scored it as 2; and those ranked as ‘useful’ or similar or towards the end of a list we have scored 1.

| Priorities given for production of variants | |
|--|-----------------------|
| Variant | Priority Score |
| Housing | 77 |
| High/Low (H/L) population | 50 |
| H/L migration | 47 |
| Zero migration (or natural change only) | 30 |
| H/L fertility | 20 |
| H/L mortality | 13 |
| Young/old | 8 |
| Replacement or constant fertility | 4 |
| Combination variants (various) | 2 |
| Dependency | 2 |
| No mortality improvement | 2 |
| No change | 1 |
| Other (‘non-standard’ variants) | 10 |

Housing-based variants are discussed in the next section.

When deciding which variants to pursue, ONS has balanced user requirements against development resources required.

ONS intend to pursue production of high and low fertility and mortality, high and low migration and zero migration variants.

3.7 Housing-based variants

3.7.1 Use of a housing-based variant

There is a strong demand for housing based variant(s) although this demand is not universal. Around six organisations were ambivalent or against ONS producing housing based variants and two stating there were already local alternatives.

The demand for housing based variants is illustrated by a selection of comments made in consultation replies:

- “The housing scenario variant is of vital importance to [LA] because the council is actively supporting the increase of the borough’s residential stock by 25% in the next 20 years.”

- “A housing scenario variant is of primary interest to [LA], given the scale of housing change that is currently taking place, and which a trend based model does not adequately reflect. A housing variant is much more believable, and is more likely to be used than current projections.”
- “Housing scenario variants are very important in the context of spatial planning ... They are also important in the context of service planning for the Council and its partners. Due to our tight boundaries, the future levels of population shown by trend-based projections are extremely unlikely to occur in reality. Being able to project population for the most likely level of housebuilding is very important.”
- “[LA] would like to re-iterate the support expressed at its meeting with the ONS earlier in 2008 for ONS production of a housing capacity variant projection. Trend-based projections are of limited use in the Government’s Growth Areas because there is a significant delay between population growth and its implications and this being reflected in future projections. This has significant implications for public sector finance. A housing capacity variant would provide a projection that has much greater immediate and long-term value to corporate, finance and service planners in Growth Areas such as [area] because it is likely to reflect what is actually happening to a greater degree than a trend-based projections would.”

The table below shows a summary of the uses cited.

| Potential uses of a housing variant | |
|---|---------------------------------------|
| Use | Number of organisations citing |
| Use housing plans to inform projections <i>or</i> because using housing will be more ‘accurate’ | 15 |
| Monitoring/evaluating housing/planning policy | 10 |
| Spatial planning | 7 |
| Comparison (with other projections) | 6 |
| Service planning | 5 |
| Allowing for policy | 4 |
| To use in government funding allocations | 3 |

In addition one or two organisations cited the following: electoral reviews; replacement for ‘Chelmer’ model; understand the relationship with household projections; to meet customer demand.

3.7.2 Experience of modelling the relationship between population and housing

There were around ten organisations that have specific local experience of running population projections linked to housing. Notable amongst these is the Greater London

Authority (GLA), who were specifically cited by five organisations as experts in this field. If the ONS were to consider making a projection constrained to housing plans, these organisations would be involved to draw upon their experiences.

As well as these local models, around five organisations cited use of the Chelmer model and four cited the use of POPGROUP/HOUSEGROUP.

Around ten organisations cited issues they considered important when modelling the relationship between housing and population. These issues (some organisations raised more than one issue) can be summarised as:

- The type of housing (flat, house, etc.) will have an impact;
- The size of housing (no. of bedrooms) will have an impact;
- The tenure of housing (owner occupied, social or private rented etc.) will have an impact;
- Different types of migration will be attracted to different sorts of housing;
- Household composition should be taken into account;
- That net-growth in housing (i.e. allowing for demolitions, conversions, etc.) is the important driving factor;
- That the relationship between housing and population growth should be approximately linear – as factors will tend to cancel out;
- That there should be a relationship between household projections and council-tax based projections;
- That ‘unauthorised’ accommodation may particularly affect certain areas; *and*
- That the institutional population needs to be taken into account.

Two organisations suggested that the issues raised in the consultation relating to the relationship between housing and population were overstated. Four organisations stated that they had experience which suggested that there was no, or a very weak, relationship locally between housing growth and population growth.

3.7.3 Use of regional plans for housing data

The consultation sought views on the appropriateness of using Regional Spatial Strategy (RSS) plans for providing data on housing plans for use in a housing variant(s). Twenty-one organisations agreed that RSS plans were the best option for consistent data on housing plans. Three organisations suggested that that RSS plans should not be used.

Five organisations cited housing supply data or housing trajectories as a superior source to RSS, with three stating that problems (principally consistency) meant that these sources should not be used.

Three organisations suggested that monitoring reports could be used for short term data as a supplement to RSS data. Four organisations suggested that the more comprehensive data held by the Greater London Authority should be used in addition or in preference to RSS data within London.

A number of issues were cited as needing to be addressed for RSS plans. Many of these were noted by organisations that nevertheless concluded that RSS plans were ultimately the best option. These issues are summarised below, together with an indication of whether these were raised by three or more organisations:

- RSS plans can be at different stages of production (6 organisations);
- A shorter projection period than 25 years will be required if RSS plans are to be used (three organisations) but this should not necessarily be a barrier;
- RSS plans do not include information on tenure, housing size, HMOs (houses in multiple occupation), or communal establishments;
- Emerging reports may be able to be used;
- That ONS should liaise with regional government about what plans are used;
- That using housing trajectories would remove circularity problems within the modelling; *and*
- That the RSS says what is possible – but what is needed is an indication of what is likely.

3.7.4 Constraining of housing variant

Responding organisations were split on whether to constrain housing variants to regional totals from the principal trend based projections. Twelve organisations said we should constrain to regional totals, and twelve organisations said that there should be no constraining. A further five organisations said that national constraining only should be used.

The following were included in reasons for constraining at the regional level:

- Consistency across country;
- Independence of projections (from local influence);
- Avoiding inflation of figures; *and*
- To avoid aspirational issues in regional plans having an impact.

The following were included in reasons for not constraining:

- To reflect regional issues;
- To avoid distortion;
- To enable comparison with other areas;

- So that due account can be taken of growth areas; *and*
- Constraining prevents policy changes informing the figures.

The following were included in reasons why national constraining only should be used:

- To prevent circularity causing problems;
- To avoid distortion of projections; *and*
- Because housing pressures straddle regional boundaries.

Given the complexities of producing a housing-based variant there are no plans to take this work forward at present. However, ONS will revisit the findings of this consultation when considering a housing-constrained variant in future.

3.8 Constraining: standard (non-housing) variants

This part of the consultation elicited fewer comments than other sections. Seven organisations were in favour of constraining (or broadly so) and four organisations against or broadly against.

The need for internal consistency or consistency with national variants was cited as the main reason for constraining.

Constraining (at least for standard non-housing based variants) need not involve significant resource. Therefore, ONS will consider an approach that constrains some variants but not others.

3.9 Assumption Setting for variants

This section of the consultation attracted a relatively low number of contributions.

Three organisations agreed that using a proportional scaling approach provided a suitable approach. A further two organisations said that assumptions should be as simple as possible. Proportional scaling is considered by the ONS to be a simple approach.

Three organisations suggested an expert panel and/or the CLiP (Central Local information Partnership) population committee should be consulted upon assumptions. A further four organisations suggested consultation with local or regional bodies.

ONS will initially produce assumptions in partnership with an expert panel, which can include members from the population subgroup of CLiP. These assumptions should then inform production of subnational projection variants on an experimental basis. On publication, ONS will invite comments on the variants (and underlying assumptions) and will give further consideration to including a formal consultation as part of a regular production process.

ONS are considering whether consultation processes can be used more effectively in the process of producing principal subnational projections. Consideration is being given to adapting the existing consultation process, and whether this can be better aligned with other consultation processes on population and demography issues.

3.10 General issues and comments

This section summarises other issues raised during the consultation which were not directly relevant to other sections of this report.

3.10.1 Clarity of variants

Many contributors raised issues around the need for clarity. In particular some organisations noted that variants may confuse users, particularly those that are inexperienced. Some organisations suggested that having too many variants might lead to confusion. ONS support the need for clarity and will ensure that there is clear supporting information for variants which will address the following issues:

- **Status:** it is important to be clear about the status of variant projections, stressing that these do not represent what we consider to be the best central estimate of projected population. If the single best estimate of likely future population is required then the existing principal projection should be used;
- **Assumptions:** clear and precise information is required on how the variant assumptions have been calculated, these should be specific for each variant projection;
- **Guidance:** a plain English guide is required to explain when it would be appropriate to use variants, and which variants would be most suitable. This guide needs to be understandable to a general audience. This guide would also need to explain differences between housing based variants and the principal variant;
- **Limitations:** a clear guide to the limitations of variant projections in general and the limitations of specific variants in particular is required;

3.10.2 Source data

Some comments were received on the data used to produce the subnational population projections. These included comments on the mid-year population estimates, migration estimates and estimates of short-term migrants.

Improvements to these sources are being taken forward as part of the Improving Migration and Population Statistics project.

4. Conclusions

It is clear from the consultation that there is a need to gain a better understanding of the uncertainty in projections.

It is important that any work on variants does not compromise other work on improving migration estimates. Therefore any development work will be subject to available resources. Within these constraints efforts will be focussed on producing a small number of subnational projection variants. These variants are likely to be high and low fertility/mortality assumption variants; high and low migration and zero net migration assumptions.

The consultation confirmed the requirement for a housing constrained variant. However, producing such variants is likely to involve significantly more resource than production of 'standard' variants and therefore there are no plans to take this work forward at present.

Any variant projections produced will be published with clear supporting information on how and when they should be used.