



**ONS(ONC(SC))98/08**

**ONE NUMBER CENSUS STEERING COMMITTEE**

**Demographic Analyses for a One Number Census - Future Research Plans**

1. This paper assesses the research that remains to be carried out in order to meet the aims of the demographic analyses project in support of a One Number Census.
  
2. **The Steering Committee are asked to:**
  - a) **note the paper;**
  
  - b) **comment on the proposed research programme at the meeting on the 27 April 1998, or in writing by 10 May 1998.**

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## **Demographic Analyses for a One Number Census - Future Research Plans**

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1. This paper recaps the aims of the demographic analyses project and then assesses the research that remains to be done in order to meet those aims.

### **Aims of demographic analyses in support of the One Number Census**

2. The aims of the project are to:

- Provide a plausible range for the national population numbers in 2001, by age and sex, as benchmark for the 2001 census data.
- Establish whether the 1981 census was the most appropriate point from which to produce rolled-forward population estimates.
- Examine the extent to which sub-national demographic estimates could be used as part of the ONC strategy.

### **3. Progress towards meeting the aims of the demographic analyses project**

3.1 Work towards meeting these objectives is well in hand, and previous papers have reported progress on these issues for England and Wales (ONC(ONS(SC))97/15 and 04). This work is critical to the production of demographic based estimates against which the 2001 Census combined with results from the Census Coverage Survey will be compared. The work needs to be completed and extended to the whole of the UK. This is in hand and it is expected will be completed by mid 1998. Work on the error bands needs to be refined by including non-sampling errors for the International Passenger Survey (IPS). This is in hand in consultation with the survey unit which has responsibility for the IPS in the socio-economic division of ONS.

### **4. Future research**

4.1 One question that needs to be addressed is whether the work of the demographic analyses project needs to be extended to sub-national levels and, if so, what level of geography would be required or would be feasible. Should the geographical level be regions, counties, local authority districts or groupings of local authority districts? Would it be possible to do cohort analyses at this lower geographical level or produce error bands to this level? If possible would the results be of sufficient quality to be used?

- 4.2 The potential usefulness of a cohort analysis at sub-national level is limited by the quality of the migration data. In making a population estimate migration is the most difficult component to get right. It is recommended that cohort analyses should not be pursued at the sub-national level.
- 4.3 There is an ONS project within the Population and Vital Statistics Division that is examining the potential use of Family Health Service Registers (FHSA) to make estimates of migration at the county and sub-county level. This project will report at the end of June 1998 on the feasibility of using FHSA registers to estimate the migration component of the annual mid-year population estimates. However, even if ONS decides to use the FHSA registers in compiling the population estimates it would still not be feasible to use these to produce cohort analyses because there would be difficulty in obtaining these data for all the past years that would be required.
- 4.4 The first test of the validity of the Census and Coverage Survey will be based on comparing national data against national demographic estimates. Even if the figures agree there is still the need to validate the census results for smaller geographical areas. Rolled-forward population estimates and administrative sources may be used in combination as part of this procedure. However the error bands on the non-census figures at local levels will be much wider than those at the national level, because there is more migration between smaller areas than large ones, which is difficult to measure. An assessment will be made of the size of these errors, but there will be no attempt to assess the errors for each local authority individually. Rather a model will be developed which takes into account the size and type of local authorities and past problems with enumeration, and assessments will be made for broad age/sex bands for some 50 aggregates of local authority areas.
- 4.5 There needs to be a strategy that takes into account the levels of uncertainty in the three sources of population data. The error bands that are being constructed in the demographic analysis project and the error bands arising out of the CCS simulation project provide a good starting point for these. In comparing the Census and Census Coverage Survey with the demographic and administrative source estimates we will need to be able to judge whether or not the Census results are within a plausible range. A panel of experts will probably do this guided by an agreed strategy.
- 4.6 Work on the age distribution of the very elderly (those aged 90 and over) has been started. ONS do not publish population estimates by single year of age beyond age 90. Customers requiring such data would get them from the Government Actuary's Department. Although this is not regarded as high priority work, the ONC may find a need for reliable demographic estimates of the very elderly for assessing enumeration of this group by single year of age. Part of the work of the

demographic analyses project should be to keep abreast of the work being undertaken by GAD.

## **Conclusions**

5. The cohort analyses confirm that the adjusted 1981 census forms an appropriate base population for estimates up until the 2001 Census. For the national level, confidence intervals for the 2001 population estimates can be calculated based on the sampling error inherent in the International Passenger Survey. For the total population these amount to about  $\pm 50,000$ . Further work is required to quantify the potential extent of non-sampling errors. Quantified sampling and non-sampling error will enable plausible national population ranges to be constructed, against which the 2001 adjusted census results can be validated. The extent to which further demographic analyses are required at a sub-national level is currently under consideration.

## **Recommendations for future research**

6 The recommendations are that:

- the work at the national level on cohort analyses and error bands be completed and extended to cover the whole of the UK
- thought be given to developing a strategy which takes into account the uncertainty attached to demographic and administrative source estimates, including how the census results should be validated at the sub-national level.
- An assessment should be made of the size of errors in sub-national demographic and administrative estimates for some 50 areas “regions” that are aggregates of local authorities, without attempting to assess the errors for individual local authorities. This should be based on a model that takes into account the size and types of local authorities and past problems with enumeration, and is applicable for broad age/sex bands.
- the work on the very elderly age distributions be completed