



WARD LEVEL POPULATION ESTIMATES FOR THE 1999 INDEX OF LOCAL DEPRIVATION

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Consultation on the Population Estimates

We welcome any comments on the population estimates and the methodology used. If your comments draw comparisons with estimates of your own, please provide information about the date and boundaries to which your estimates apply, and the methodology and data sources used.

Our methodology is based on the apportionment of the Office for National Statistics (ONS) population estimates for local authority districts in mid 1997. Although ONS will shortly release the mid 1998 based estimates for districts, we are releasing figures now based on the 1997 estimates to allow sufficient time for consultation on the methodology used. **We will, however, update the ward level estimates to be consistent with the district estimates for mid 1998 and use the updated figures in deriving the measures for the Index.**

Because the methodology is based upon apportionment of the ONS estimates, **we take the district level totals to be fixed.** However, we are willing to discuss revisions to the proposed distribution of population between wards within a district where there is evidence on which to base any reallocation.

Obtaining the estimates

A spreadsheet (Excel 2.0 format) is available for every area containing the estimates for 1997 and equivalent figures for 1991. These do not currently contain the estimates of children under 16, but we will release these as soon as we have received data essential for their calculation. To obtain the estimates for your area, please contact us (see below) supplying an e-mail address to which we should send the estimates.

Responding to the consultation

Please send any comments on the population estimates to reach us by **FRIDAY, 3 SEPTEMBER** at the latest. However, we would welcome an earlier response particularly where there is a need to discuss any proposed changes.

We can be contacted by e-mail at: index99@ermine.ox.ac.uk, by fax on 01865 270324 or by post at the address on the front page. Alternatively, you could post your response on the open discussion page of the project website which is at <http://index99.apsoc.ox.ac.uk> .

1. The need for population denominators

1.1 There is substantial variation in the population size of local authority districts and wards. For example, the population of districts in 1997 ranged from less than 2,000 in the Scilly Isles to over 1 million in Birmingham. In 1991 wards ranged from less than 1,000 people in some districts to almost 32,000 in Birmingham Small Heath.

1.2 To control for these variations, the 1999 Index of Local Deprivation will use indicators in the form of rates and percentages which are independent of the population size of an area. It is therefore necessary to have appropriate population estimates to provide denominators for each indicator.

1.3 While the Office for National Statistics (ONS) publishes annual estimates of the population of each local authority district by sex and five year age groups, they do not produce inter-censal estimates of the populations of smaller areas (such as wards or enumeration districts (EDs)). Some local authorities do so, but no consistent methodology is applied and the coverage of the country is far from complete.

1.4 In the absence of any “off the shelf” population estimates we have therefore had to produce our own for the project. Since some areas have special characteristics which create problems in applying a national approach to small area estimation, we are keen to seek the views of local producers and users of demographic estimates. To inform this consultation process, this paper describes the methodology that has been used to produce the ward level estimates and discusses some of the issues involved.

2. What denominators are needed?

2.1 The population estimates which are needed for the Index depend on the indicators which are to be included. It is not necessary to produce full breakdowns by 5 year age group and sex, nor would this have been possible within the timescale of the project. The indicators which it is proposed to include in the Index are set out in our report: **Index of Deprivation 1999 Review. Report for Formal Consultation. Stage 1: Domains and Indicators.**¹ Based on these requirements the following population estimates are being produced for each ward:

- Total population
- Children aged under 16
- People of working age (16-59)
- People aged 16-59 who are economically active
- People aged 60 or over
- People of pensionable age (women aged 60 or over, men aged 65 and over)

¹ This is available for downloading from the project website <http://index99.apsoc.ox.ac.uk>.

3. Options for developing the estimates

3.1 In developing the population estimates to provide denominators four key criteria have been adopted. These are that the estimates should be:

- Appropriate** Denominators need to be appropriate for the purpose for which they are used. To achieve this the denominator for any indicator needs to reflect as closely as possible the population at risk of the particular form of deprivation.
- Consistent** At each spatial level the denominators need to be available on a consistent basis for the whole of the country. This has been a major challenge given the scale of changes in the administrative geography of England since 1991.
- Timely** The denominators need to relate as closely as possible to the date to which the indicators refer.
- Robust** The estimates must be sufficiently robust for use as denominators for indicators in the Index. A crucial part of the assessment of robustness is the acceptability of the estimates to users, given their local knowledge of the areas in which they work.

3.2 Various options were explored for producing estimates which meet these criteria:

- a. **Use 1991 based estimates** - The Estimating with Confidence project has produced ward level estimates of the population in mid 1991 which are consistent at a district level with the ONS mid year population estimates. However, these are increasingly out-of-date since in many areas there has been significant population change since 1991. Our view is that we cannot justify the use of 1991 based estimates for data which mainly relate to 1998 or early 1999. The exception is the measure of mortality in the health domain which requires more detailed age/sex breakdowns. For this we will need to use 1991 denominators, but also data for years around the census.
- b. **Use local authorities' own estimates** - A second alternative is to make use of locally produced population estimates. However, as was shown by the Estimating with Confidence project, small area estimates are not produced for every district, and no consistent method is used. Any compilation of local population estimates would therefore be incomplete, derived by inconsistent methods and subject to varying levels of uncertainty.
- c. **Derive independent small area population estimates** – Population estimation is a complex process. The ONS system for deriving district level population estimates uses a cohort survival model and incorporates information about a variety of factors including births, deaths, migration within the United Kingdom, international migration and boundary changes. To adopt a similar approach for small areas would involve analysing rates of population change within every district since 1991 (when the last small area estimates were produced). This would be a huge undertaking and, since obtaining denominators only forms part of the process of revising and updating the ILD, it

would clearly be wholly impractical to adopt such an approach within this project.

- d. **Apportion ONS mid year estimates to wards** – The final option involves apportioning the ONS district level mid year population estimates to wards. This approach has the advantage of avoiding the need to consider rates of population change, but requires information on the distribution of the population which can be used to apportion the mid year population estimates for districts to their constituent wards.

3.3 We chose to adopt this last approach. While no single, definitive source of data provides the necessary information, the sections below describe how we have used a variety of data sources relating to people in different age groups to apportion the ONS district level population estimates. These data include newly available information on children receiving Child Benefit and people receiving State Retirement Pensions, as well as the more familiar sources of the Census and Electoral Register. In developing the methodology, we have sought to take account of the strengths and limitations of the data from the different sources. The data sources used, and their strengths and limitations, are summarised in Appendix 1.

3.4 The following sections describe the various stages involved in producing the ward population estimates.

4. Stages in developing the population estimates

4.1 Standardising Geography

4.1.1 The aim is to produce population estimates for mid 1998 based on the administrative geography effective on 1 April 1998 (which includes all the unitary authorities created in recent years as well as other boundary changes since 1991). However, for the time being we are producing population estimates for mid 1997 as the ONS mid year estimates for 1998 are not yet available. The rest of this paper therefore refers to the mid 1997 estimates.

4.1.2 Since several of the stages described below involve the modelling of relationships from 1991, it was necessary to develop a system for converting 1991 data to the 1998 ward geography.

4.1.3 This was achieved by creating a lookup table which defines the relationships between 1991 Census EDs (and hence 1991 wards) and 1998 wards. To construct this, the 1998 ward boundaries were overlaid upon the 1991 Census ED boundaries within a Geographical Information System (GIS). Of the 8,619 wards at the 1991 Census, around 94% fall within a single 1998 ward (although they do not in all cases constitute the entire 1998 ward, for example in districts where several wards have been merged to form larger wards).

4.1.4 The remaining 6% of 1991 wards are split between one or more 1998 wards. In converting data for these wards it is necessary to estimate the proportion of the ward's population who live in the relevant 1998 wards. The simplest, though least precise, way to do this would have been to apportion the population in proportion to the area of the 1991 ward going into each different 1998 ward. However, this would have implicitly assumed that the population was distributed evenly throughout the ward which is typically not the case.

4.1.5 To take account of the distribution of the population within wards, apportionment was therefore carried out at the level of EDs. For each ED the GIS was used to estimate the proportion of the area falling into different 1998 wards. In the majority of cases EDs fell within a single 1998 ward. The proportion of the population of a 1991 ward going into different 1998 wards could then be calculated by summing across EDs.

4.1.6 In combining the results for EDs within a ward, it is necessary to weight EDs to take account of their different population sizes. Ideally, the weights would have been the ED populations in mid 1997, but these are not of course available. After exploring several possibilities, including the use of 1991 Census populations, it was decided to weight the ED populations by the number of residential postal delivery points they contain. This provides a proxy measure of the number of households which takes account of population change since 1991 resulting from the construction or demolition of housing.

4.1.7 The number of delivery points was derived from the 1999 Postal Address File (PAF) which contains an up-to-date count for each postcode. These were aggregated

to EDs using the 1998 Postcode / ED directory. While this only enables an ED to be assigned to postcodes in existence prior to 1998, information on postcodes that had been changed (as distinct from created) in recent years made it possible to greatly increase the allocation rate. This means that in postal areas such as York in which large numbers of postcodes have recently changed, it has still been possible to estimate the number of delivery points in each ED.

4.1.8 Overall, only 0.33% of the 1.16 million postcodes in England containing residential delivery points could not be matched to an ED. These contained only 0.23% of residential delivery points. The postcodes which could not be matched were largely those which had been created very recently.

4.1.9 The box below provides an example of the apportionment process for a 1991 ward split between two 1998 wards.

**Example of the apportionment for 1991 ward 27KMFB
(Haldens ward in Welwyn Hatfield)**

Of 26 1991 Census EDs containing a total of 5,644 residential postal delivery points:

- 13 EDs with a total of 2,800 delivery points fell entirely within 1998 ward 26ULFS (Haldens)
- 10 EDs with a total of 2,239 delivery points fell entirely within 1998 ward 26ULGC (Panshanger)
- 3 EDs with a total of 605 delivery points were split between the same two 1998 wards. Based on areas it is estimated that 446 delivery points should be allocated to Haldens ward and 159 to Panshanger.

In total, the estimated apportionment for 1991 ward 27KMFB in 1998 is:

26ULFS (Halden)	$(2,800 + 446) / 5,644 = 57.5\%$
26ULGC (Panshanger)	$(2,239 + 159) / 5,644 = 42.5\%$

4.1.10 Using the look-up table the following data were converted from 1991 to 1998 wards:

- 1991 ward electorates
- Estimating with Confidence (EwC) project ward level population estimates for 1991
- Numbers of people of working age and economically active for each ward in 1991 by age and sex.

4.1.11 The ONS mid year population estimates and Labour Force Survey data were available for 1998 districts. The Child Benefit and Retirement Pension data were converted to wards based on their postcodes using the 1999/1 Central Postcode Directory (CPD).

4.2 Estimating numbers of children aged under 16

4.2.1 Counts of the numbers of children receiving Child Benefit were used to distribute the number of children aged under 16 between wards. Child Benefit is a universal benefit, which is not means tested, and for which take-up is close to 100%. It is payable to the carer (usually the mother) of all dependent children, subject to restrictions on residence and immigration status. People who do not have indefinite leave to remain or 'settled' status (such as many asylum seekers) are not entitled to non contributory benefits such as Child Benefit. The other group who are likely to be excluded in significant numbers are the children of foreign nationals such as US military personnel. While these groups who are not eligible for Child Benefit constitute only a very small proportion of all children in England, they are highly concentrated in particular parts of the country.

4.2.2 The Department of Social Security (DSS) supplied counts of numbers of children aged under 16 for whom Child Benefit is payable. The addresses of all 10 million children had previously been matched against the postcode address file in order to validate their postcodes, and had then been allocated to wards using the CPD.

4.2.3 The total numbers of children under 16 were summed across all the wards in each district, and then scaled in proportion to the ONS mid year estimate of the number of children aged under 16 in the district.²

4.2.4 We have identified problems with the Child Benefit data and are awaiting a corrected data extract. **We are therefore not yet in a position to release the estimates for children under 16, but will do so as soon as possible.**

4.2.5 At a district level the number of children under 16 for whom Child Benefit is payable can be compared with the ONS population estimates for mid 1997. In most areas there is a very close correspondence between the two sources. However, in some districts there are significant differences between the figures resulting from the concentration of certain population groups. In particular, a small number of areas contain significant numbers of US military personnel which reduces the proportion of children on Child Benefit and biases the apportionment of children between wards.

4.2.6 A further problem relates to children whose home address and term-time address are different, perhaps because they are in a boarding school or other such institution. This problem arises because the Child Benefit figures relate to the address of the person to whom the benefit is payable, whereas the ONS population estimates count children at their term-time address. In the vast majority of areas this will not be an issue, but in a small number of wards the presence of, for example, a boarding school may significantly bias the estimates.

4.2.7 At this stage we are not adjusting the estimates in any way for these sorts of local issues. We would welcome advice on the most appropriate way to adjust the estimates in areas with these sorts of special populations.

² To enable this to be achieved ONS supplied unpublished estimates of numbers of children aged 15-19 by single year of age.

4.3 Estimating numbers of people aged 16 or over

4.3.1 The number of people aged 16 or over in each ward was estimated based on the number of electors in the ward in 1998. In doing this, account needs to be taken of the proportion of people of voting age who are registered to vote, since this varies significantly between wards. To achieve this the number of electors in 1998 in each ward was multiplied by the ratio of the population aged 16 or over to the number of electors in 1991. The ward totals in each district were then constrained to the ONS mid year population estimate.

4.3.2 The robustness of this procedure does not depend on the completeness of the Electoral Register in each ward and district remaining constant between 1991 and 1998. It does, however, assume that patterns of electoral under-registration have remained constant across wards within each district. For example, if the percentage of eligible people registered to vote in a district has risen since 1991, the percentage in each ward is assumed to have increased proportionally.

4.3.3 The method is vulnerable in areas which contain large concentrations of people who tend to be systematically excluded from the Electoral Register (particularly members of the armed forces) or who may be included at several addresses (particularly students). This may not be a problem if the proportion of the population belonging to such groups has remained relatively constant over time, but if a substantial change has occurred – such as the closure of a military base – this would systematically bias the results. We are keen to receive information from local practitioners about these sorts of special circumstances in their area which may necessitate some adjustment to the estimates.

4.3.4 Full details of the methodology are given below:

Obtain 1991 ward electorates

4.3.5 The 1991 electorate was obtained for each 1991 ward. It was not possible to separately identify “attainers” (17 year olds who will become 18 - and therefore eligible to vote- during the year). The electorate figures therefore provide an estimate of the number of people aged 17 or over in February 1991.

4.3.6 In a small number of districts³ new ward boundaries took effect in May 1991, but the Census was based on the old boundaries. In these cases the electoral data (which was based on the new boundaries) had to be converted back to the old boundaries used for the Census.

Estimate population aged 16 or over in 1991

4.3.7 The Estimating with Confidence project⁴ at the Universities of Southampton and Manchester has produced mid year population estimates for every ward in 1991.

³ These were the 1991 districts of Blyth Valley, Burnley, Langbaugh-on-Tees, South Herefordshire, South Somerset, Tonbridge & Malling, Warrington, Welwyn Hatfield and The Wrekin.

⁴ Estimating with Confidence Project (1995) Mid-1991 population estimates for small areas **Population Trends** 82: p6.

These take account of census non-response and other factors to provide widely accepted “gold standard” population estimates for 1991.

4.3.8 Using the EwC data the number of people aged 16 or over was calculated for each ward. The only complication involved the estimation of the numbers aged 16-19, because the EwC data are for five year age groups. As advised in the user guidance for the EwC data, the number aged 16-19 were estimated using the unadjusted census figures by single year of age with the EwC student adjustment allocated to those aged 18-19 years.

Convert electorate and EwC data to 1998 ward boundaries

4.3.9 As described in section 4.1 above, the ward electorates and estimated population aged 16 or over in 1991 were redistributed to 1998 wards using the lookup table.

Calculate the ratio of (1991 population aged 16+ : Electors)

4.3.10 After converting the data to 1998 wards the ratio of (Estimated population aged 16 or over : Electorate) was calculated.

4.3.11 There is obviously an inconsistency between the electoral data (which relates to people aged 17 or older) and the estimates of the population (which relate to people aged 16 or over). By not addressing this directly, the method effectively assumes that within any ward the proportion of those aged 16 or over who are aged 16 has remained constant over time. While this will often not be the case, deviation from the assumption will only have a trivial impact on the estimates of all people aged 16 or over in 1997.

Apply the 1991 (population : elector) ratio to 1998 electorates

4.3.12 For each ward the 1998 electorate was multiplied by the ratio of the (Population : Electorate) in 1991 to obtain an initial estimate of the population aged 16 or over in each ward. As for 1991, the electoral data included attainers.

Scale to ONS population estimates for mid 1997

4.3.13 Finally, the estimated population aged 16 or over in each ward was obtained by scaling the initial estimates proportionally within districts, so that the total for the constituent wards equalled the ONS mid year population estimate for the district in 1997.

4.4 Estimating numbers of people of pensionable age and aged 60 or over

4.4.1 The number of people of pensionable age in each ward was estimated by apportioning the ONS mid year estimates for districts in proportion to the number of people in each ward in 1998 who received State Retirement Pensions, were retired partners of such pensioners not also receiving a pension in their own right, or who were of pensionable age and receiving Incapacity Benefit (IB) or Severe Disablement Allowance (SDA).⁵

4.4.2 Information on the number of people receiving these benefits was provided by the DSS as counts of the numbers in each ward. People receiving these benefits were allocated to wards based on the postcode of their home address.

4.4.3 Unfortunately the data were not supplied separately by gender, which creates a problem in estimating the number of people of pensionable age because of the different pensionable ages for men and women. While all people aged 60-64 receiving a pension must be women, recipients of IB and SDA can be either men or women. It was therefore necessary to assume that the national proportions of IB and SDA recipients aged 60-64 who were women (and therefore of pensionable age) applied to every ward.⁶

4.4.4 Within each district, the ward estimates of people of pensionable age receiving these benefits were summed, and then scaled proportionally so that they were consistent with the ONS mid year population estimates for districts in 1997.

4.4.5 Estimation of the numbers of people aged 60 or over was slightly more complex, because the number of men aged 60-64 also needed to be estimated and added to the population of pensionable age. Since the pensionable age for men is 65, the benefits data could not be used directly to estimate the number of men aged 60-64. However, the number of women aged 60-64 could be estimated using the benefits data, and this was combined with the sex ratio for people aged 60-64 in the ward in 1991 from the EwC data⁷ to estimate the number of men aged 60-64.

4.4.6 Altogether people of pensionable age receiving a pension, IB or SDA correspond to 96.4% of the ONS estimate of people of pensionable age in England in mid 1997. Although there is also a very close correspondence between the figures from the two sources in most districts, this is not the case in every area.

⁵ People can only receive one of a State Retirement Pension, Incapacity Benefit (IB) or Severe Disablement Allowance (SDA) at any time. People of pensionable age can receive the short-term rate of Incapacity Benefit (which lasts a maximum of 1 year) rather than the State Retirement Pension providing they are not more than 5 years over pensionable age. People of pensionable age can receive SDA providing they were entitled to it before they reached age 65. In some circumstances it may be financially worthwhile, for those who are entitled, to receive one of these benefits rather than a State Retirement Pension.

⁶ In England in November 1998, 5.1% of IB recipients and 59.5% of SDA recipients aged 60-64 were women (DSS, unpublished estimates).

⁷ Where necessary the ward estimates of the sex ratio for 60-64 year olds in 1991 used the lookup table to redistribute the Census data to 1998 wards.

4.4.7 The districts in which the ONS population estimates substantially exceed the number of people of retirement age receiving the various benefits are predominantly parts of Inner London, most notably Westminster and Kensington & Chelsea (by 40% and 36% respectively). There are fewer districts in which the numbers receiving the benefits substantially exceed the ONS estimates and the differences are much smaller. The most extreme differences are for Eastleigh in Hampshire and Blaby in Leicestershire (in both of which around 10% more people receive the benefits than are included in the ONS estimates).

4.4.8 Several factors may be creating these differences. The first is that people can defer receiving the state pension for up to 5 years and subsequently receive an enhanced pension. All areas will contain people who choose to defer retirement, but since these will predominantly be people in jobs which are both financially and personally more rewarding, they are likely to be concentrated in more affluent areas. This would be consistent with the observed differences in parts of central London and other areas such as Oxford and Cambridge.

4.4.9 Analysis of the proportion of people of pensionable age who were in work at the 1991 Census provides evidence of the importance of this factor. The districts in which a large proportion of people of retirement age were still working in 1991 are the same as those in which there is a shortfall in the number of people receiving pensions, IB or SDA relative to the ONS population estimates in 1997.

4.4.10 A second relevant factor relates to the notification of changes of address. The ONS population estimates incorporate assumptions about population migration derived from changes in the areas in which people are registered with a GP. It is possible that younger pensioners with good health might not immediately re-register with a GP if they moved address. In areas which typically experience net out-migration of older people (typically when they retire) this could introduce a small upward bias in the ONS population estimates. Conversely the ONS estimates might be biased downward in areas experiencing net in-migration of older people.

4.4.11 On the other hand, the reliability of the postcoding of the benefits data is dependent upon people notifying the DSS of any change of address. Those receiving benefits through a payment book rather than directly into a bank account would, of course, have a particular incentive to do so.

4.4.12 While we would welcome views on factors which may explain the differences in particular areas, we believe that the data are sufficiently robust to support the apportionment of the district level estimates to wards. We are, however, considering adjustments to the apportionment in districts where a substantial proportion of people defer retirement and the Census suggests it is much more common in certain wards. Again, we would welcome a local perspective on whether this is necessary.

4.5 Estimating numbers of people of working age (16-59 years)

4.5.1 People of working age are conventionally taken to be those aged 16 to pensionable age (60 years for women and 65 for men). However, our estimate of the number of people of working age is primarily required for the work domain of the Index. This is constructed from the numbers of people receiving various benefits including Income Based Job Seekers Allowance (JSA-IB). Because people aged 60 or over who are out of work can choose to receive Income Support rather than JSA-IB,⁸ the benefit figures under-estimate the number of older unemployed men. To allow for this, we are therefore taking people of working age to be those aged 16-59 years.

4.5.2 The estimated numbers of working age are simply derived by subtracting the number of people aged 60 or over from the number aged 16 or over. In assessing the reliability of these estimates in different areas, it is therefore important to consider the issues raised in both sections 4.3 and 4.4 above.

4.6 Estimating the number of people of working age who are economically active

4.6.1 The number of people of working age who are economically active is required for the work domain of the Index. As is discussed in the consultation paper on Domains and Indicators (p16), including people receiving IB and SDA among those who are workless is problematic in creating a suitable denominator. The usual denominator for those excluded from work is the economically active population, and people unable to work due to sickness or disability are conventionally classed as economically inactive. We therefore propose to use a denominator for the work domain comprising economically active people aged 16-59 plus people aged 16-59 receiving IB or SDA.

4.6.2 The following paragraphs describe the process of estimating the number of economically active people. These are taken to be people who are employed, self employed, unpaid family workers, on a government employment or training scheme, or unemployed according to the International Labour Organisation (ILO) definition.⁹ The numbers on IB and SDA will simply be added to this to produce the denominator for the work domain.

4.6.3 Only the Census provides information about economic activity rates for small areas throughout the country. More up-to-date information about changes in the labour force is provided by the national Labour Force Survey (LFS), but this is not available below district level and the estimates for smaller districts have large sampling errors. The procedure for estimating the economically active population therefore combines information from these two sources. The ward rates of economic

⁸ Although there is no financial advantage to doing this, it removes the need to “sign on” every fortnight and removes any risk of being sanctioned for not complying with the Job Seekers agreement.

⁹ These are people who are out of work and want a job, have actively looked for work in the last four weeks, and are available to start work within a fortnight or have accepted a job which they are waiting to start within the next fortnight.

activity from the 1991 Census were applied to the estimated 1997 populations, with the estimates scaled to be consistent with county level estimates of economic activity for 1996-98 from the LFS.

4.6.4 The economically active population was estimated in two parts: the economically active population aged 16-59 of districts, and the apportionment of this to wards.

District level estimates of the economically active population aged 16-59

4.6.5 For each district, economic activity rates by age and sex from the 1991 Census¹⁰ were applied to the mid 1997 population estimates to produce a total estimated economically active population aged 16-59.

4.6.6 These district estimates were then summed within counties¹¹ and compared with county level estimates of the economically active population from the Labour Force Survey for 1996-98. These were derived using rates of economic activity from the LFS and the ONS mid year population estimates for 1997.

4.6.7 The district level estimates were then scaled proportionally within counties to be consistent with the county level estimates from the LFS. This process therefore takes account of demographic change since 1991 and changing rates of economic activity at a county level, but effectively assumes that the pattern of change in the economic activity rates is the same in each district within a county.

Ward level estimates of the economically active population aged 16-59

4.6.8 For each ward, the economic activity rate of people aged 16-59 from the 1991 Census¹² was applied to the estimated population aged 16-59 in mid 1997 (derived in 4.5 above). The ward level estimates were then scaled proportionally within districts to be consistent with the district level estimates derived as described above.

4.6.9 The ward level estimates therefore take account of changes in the number of people aged 16-59 in each ward since 1991, and in the rate of economic activity within the district as a whole. However it is assumed that the pattern of change in activity rates is the same for all wards within a district.

¹⁰ The Census defined people as economically active if they were: employed, self employed, on a government employment or training scheme, waiting to start a job they had previously accepted, or unemployed and looking for a job. This is similar to the ILO definition although the Census did not ask specific questions about job search or the availability of work of unemployed people.

¹¹ In aggregating the LFS data the Isle of Wight was included within Hampshire, and Herefordshire and Worcestershire were combined. Inner London and Outer London were treated as separate counties. After aggregation the smallest county was Northumberland with an estimated population of around 180,000 people aged 16-59.

¹² Where ward boundaries have changed since 1991, the lookup table was used to reallocate the Census data to the 1998 ward boundaries.

5. Consultation on the estimates

5.1 While we believe that the methodology has performed well in most parts of the country, we recognise that there are areas in which the nature of the population makes estimation problematic. In these areas it is therefore vital that we can draw upon local knowledge about the distribution and composition of the population. The validation of the estimates, through consultation with local producers and users of demographic estimates, is therefore an integral part of the process for developing the estimates.

5.2 We greatly regret that it has not been possible to initiate this consultation at an earlier stage. This has resulted from delays in obtaining administrative data needed for the estimation process.

5.3 In carrying out our own evaluation of the estimates we have sought to identify areas in which there appear to have been substantial changes in the size, composition or distribution of the population. While these may reflect genuine demographic changes since 1991, they also potentially indicate areas in which the methodology has not performed well. We will be contacting local authorities in the areas about which we have concerns to seek their views. However, we of course welcome comments on the estimates for all parts of the country.

5.4 Please note that, since the estimation methodology is based on apportionment of ONS district level estimates, **we take the district level totals for each age group to be fixed**. We will, however, consider revisions to the proposed distribution of population between wards within a district where there is evidence on which to base any reallocation.

5.4 A spreadsheet containing the ward level estimates is available for each area. To assist those wishing to comment on the estimates it also contains comparable estimates for 1991 (where necessary converted to 1998 wards), and details of the data used in the estimation process. A spreadsheet is also available summarising the estimates and data used for all districts in England. All figures for wards are rounded to the nearest 25 and for districts to the nearest 100.

5.5 To obtain a copy of the spreadsheets please contact us supplying an e-mail address to which the estimates should be sent. Those requesting the spreadsheets will automatically receive an update containing the estimates of numbers of children aged under 16 as soon as they are available.

Future work on small area population estimates

5.6 A team at the University of Manchester have submitted a proposal for funding to the Economic and Social Research Council to develop the methodology for producing population estimates for small areas. They propose to build on the work of this project, as well as developing the use of other data sources such as patient registers. If their proposal is successful, it is intended to pass to them the material developed as part of this project. In responding to the consultation please indicate, therefore, if you are not willing for your comments to be passed to the University of Manchester team to inform their work in developing methods of small area population estimation.

APPENDIX 1

DATA SOURCES USED IN PRODUCING POPULATION ESTIMATES

Data	Source	Geography	Strengths	Limitations
1991 Census	Office for National Statistics	1991 wards and districts	Level of detail available at all spatial levels e.g. age/sex breakdown, economic activity.	Differential under-enumeration Out-of-date
“Estimating with Confidence” project population estimates for wards and districts in 1991	Universities of Manchester and Southampton	1991 wards and districts	“Gold standard” estimates of 1991 population for wards and districts taking account of census under-enumeration	Only broken down by age and sex Out-of-date
Mid year population estimates for LA districts, mid 1991 and 1997 data on 1998 boundaries	Office for National Statistics, unpublished data	1998 districts	Provides up-to-date population estimates for districts on an accepted and consistent basis	Not available below district level No detail of economic activity
Total Ward Electorates for 1991 and 1997	Boundary Commission	Wards in relevant year converted to 1998 boundaries where necessary	Available for all years	Problems of both incompleteness and inclusion of some former electors who have died or moved. Extent of these errors may vary over time and between areas
Children for whom Child Benefit is in payment, August 1999	Department of Social Security (Ad hoc scan of data)	Postcodes assigned to wards using Central Postcode Directory	Near complete count of children aged under 16. Up-to-date Available for wards	Some addresses may be out of date Excludes small number of children for whom Child Benefit is not payable
Recipients of State Retirement Pension, or people of pensionable age receiving Incapacity Benefit or Severe Disablement Allowance, February 1999	Department of Social Security (Ad hoc scan of data)	Postcodes assigned to wards using Central Postcode Directory	Near complete count of people of retirement age. Up-to-date Available for wards	Some addresses may be out of date Excludes small number of elderly people not eligible for pension or who have deferred retirement.
Labour Force Survey, Annual Local Area Database 1996- 1998 combined	Office for National Statistics via Data Archive	Aggregated to county level	Up-to-date Detail on economic activity	Subject to sampling error.