

The Berkshire Unitary Authorities

Joint Strategic Planning Unit

2001 Census: Response rates for Unitary Authorities in Berkshire

Bracknell Forest Borough Council | Reading Borough Council |
Slough Borough Council
West Berkshire Council | The Royal Borough of Windsor and Maidenhead |
Wokingham Unitary

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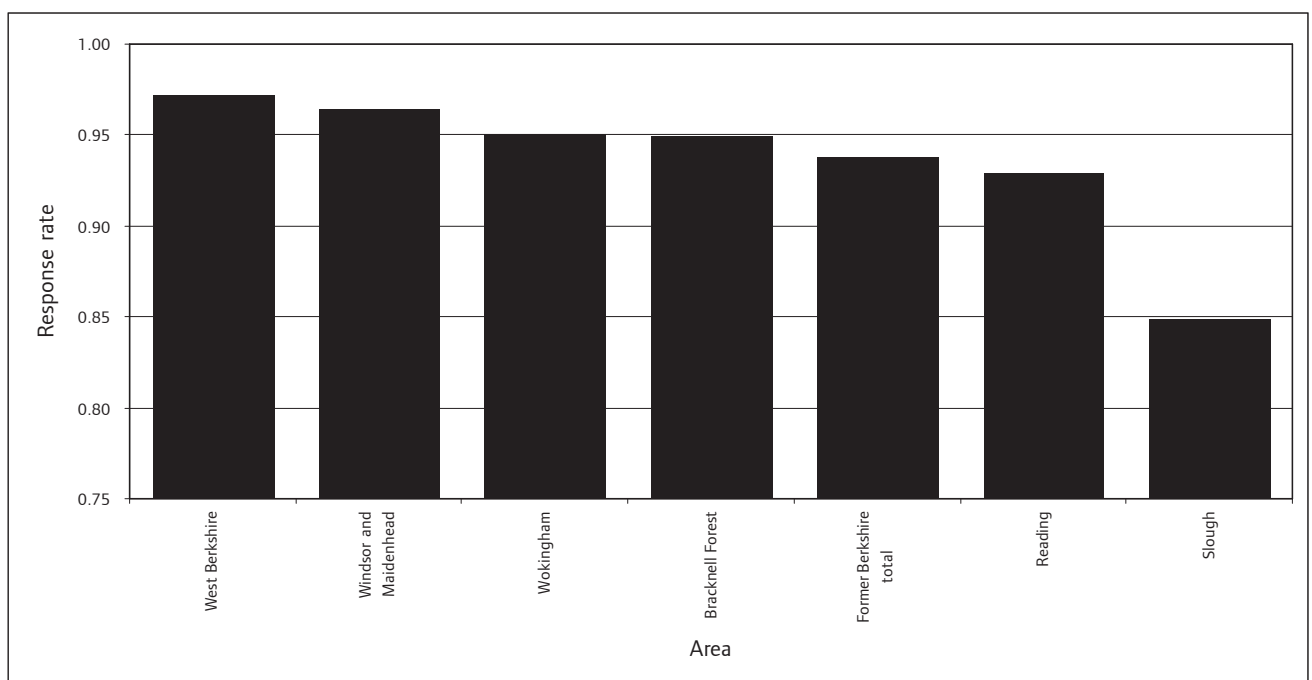
The One Number Census

The UK Census of Population is carried out in order to provide a snapshot of the entire population, including their characteristics and geographical distribution down to small areas across the country. The Office for National Statistics (ONS) report that every effort was made to ensure everyone was counted in 2001, and various initiatives were introduced to maximise coverage. These included encouraging people to post back their census forms to enable census staff to focus on those most likely to have difficulty filling in their forms, smaller workloads for staff in the more difficult areas, redesigned and carefully tested forms and questions, a community liaison programme including translation of census material into 26 languages, and a focused programme of awareness raising and publicity.

However, it has long been recognized that Census taking is difficult and is becoming more so, both in the UK and in other countries, with increased difficulties of contacting people and an increasing lack of co-operation from the general public. It was therefore expected that some people would be missed from the Census enumeration. It has become accepted practice in the UK and throughout almost all similar census-taking countries to assess the extent of any underenumeration, usually by means of a post-enumeration survey. This was done in Britain in 1981 and 1991. However, the small scale of the survey in 1991 meant that it failed to identify either the full extent of the underenumeration in the Census or the distribution of the undercount, either geographically or by population sub group.

Due to the difficulties encountered following the 1991 Census, and in the belief that enumeration in 2001 was likely to be more difficult than previously, ONS decided to institute a procedure to enhance the Census data to provide a full count of the population with detailed characteristics of all residents. This procedure became known as the One Number Census (ONC).

Figure 1 2001 Census response rates in London Boroughs, percentage of total population



In essence, this process consisted of taking the Census itself and a very large scale follow-up survey, known as the Census Coverage Survey (CCS), which was a complete re-enumeration of a sample of areas and comparing the results to get an estimate of those missed in the Census. Missed households and individuals were then imputed to the Census database to produce a fully adjusted Census database from which all Census statistics will be generated.

Response rates in the 2001, 1991 and 1981 Censuses

Nationally, response to the 2001 Census is reported as 94 per cent. A further 4 per cent of the population are estimated to be resident in households identified by enumerators but from whom no completed census form was returned, with the remaining 2 per cent being people who were not included on returned forms and people in wholly missed households. The ONC process took this into account, with the result that of the 58.8 million people in the UK Census database, 6 per cent (3.5 million) have been imputed.

These figures compare with 96 per cent of people included on returned forms in 1991, a further 2 per cent in households identified by enumerators and, as in 2001, the remaining 2 per cent being people who were not included on returned forms and people in wholly missed households. The main difference is that in the 2001 Census results, all people are included, whereas this final 2 per cent were missing from the final 1991 Census data. It should be noted that these figures are net, since some people may have been counted twice in the Census.

Table 1 2001 Response rates by age and gender, Slough and West Berkshire 2001

Local Authority	2001		Number responding ²	Number imputed ²	1991 Response rate ³
	Total Census population ¹	Response rate ¹			
Bracknell Forest	109,606	95%	104,084	5,522	97%
Reading	143,124	93%	132,906	10,218	94%
Slough	119,070	85%	101,058	18,012	95%
West Berkshire	144,445	97%	140,355	4,090	95%
Windsor and Maidenhead	133,606	96%	128,852	4,754	96%
Wokingham	150,257	95%	142,768	7,489	98%
Former Berkshire total	800,108	94%	750,023	50,085	96%

Note 1991 estimated from imputation and estimated 'missing population' at area type level, as defined in Census Validation Survey coverage report p43/4

*Non-met cities=2.6*imputation (1.8% imputation, 3% missing), Other non-met=2.25*imputation (1.6% imputation, 2% missing)*

Non-met cities applies to Reading, Other non-met applies to all other areas

Source 1: ONS Response Rate spreadsheet published 30 September 2002

2: GLA calculations based on ONS Response Rate spreadsheet published 30 September 2002

3: GLA calculations based on levels of imputation published in 1991 Census County Reports and Adjustment Factors published in 1991 Census User Guide 58

In 1981, households where no one was home on Census night were not counted, so around 2 per cent of the population was not included in 1981 Census results. Just 0.4 per cent of the present population were found in the Post Enumeration Survey to have been missed in private households in the 1981 Census.

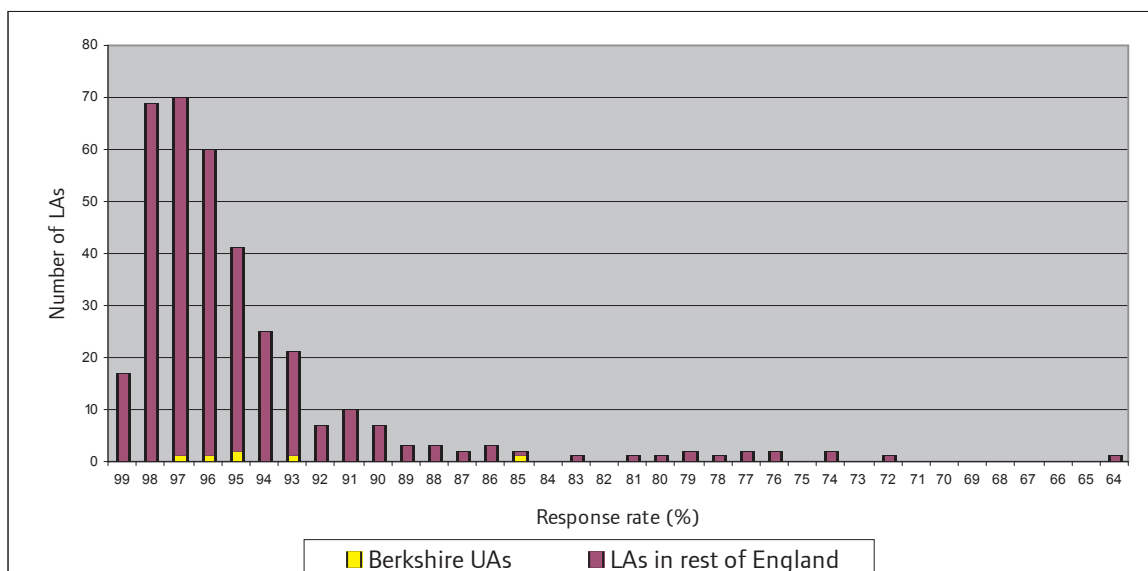
Geographical variation in response rates

There is a high level of geographical variation in these figures, ranging in 2001 from over 99 per cent response in some local authorities, mainly shire districts ranging from Durham to North Devon, down to just 64 per cent in Kensington and Chelsea in central London. The highest response rate of the Berkshire unitary authorities was for West Berkshire (97%), with the lowest response rate for Slough (85%). Figure 1 shows this variation in the response rates for Berkshire unitary authorities and the combined area - the figures are given in Table 1, along with the Census estimates and the numbers of respondents.

How the 2001 Census response rates for the Berkshire unitary authorities compare with those for local authorities in the rest of England is illustrated in Figure 2. Nearly all the very low response rates achieved were for London boroughs. The lowest response rate outside London was in Slough (85 per cent). The only other non-London authorities with response rates below 90 per cent were Luton (86 per cent), Rushmoor (88 per cent) and Liverpool (89 per cent). Figure 2 shows that the pattern of response rates for the other Berkshire unitary authorities were also a little below the national picture, particularly Reading (93 per cent).

The combined response rate achieved across the six unitary authorities in 2001 was 94 per cent, on a par with the national average. The Census itself found just over 750,000 residents in the combined area, with just over 50,000 more imputed - either counted in the Census Coverage Survey or estimated to have been missed altogether. Of these 50,000, over 18,000 were in Slough and over 10,000 in Reading.

Figure 2 Frequency distribution of 2001 Census rates in England



This geographical variation across the country was in some respects similar to that seen in earlier Censuses, in that local authorities in London, particularly Inner London had the highest proportion of missed residents. However, as noted above, the degree of under-enumeration was greater in 2001. For the Berkshire unitary authorities, the picture was a little different. Whereas the response rate in Slough was ten percentage points lower in the 2001 Census than in the 1991 Census, the same level of response was achieved in Windsor and Maidenhead at both dates. Response rates in 2001 for the other unitary authorities were just below those in 1991, as shown in Table 1.

The non-response in 1991 is made up of two parts - the imputed population, estimated from the Census Validation Survey results, and the population missing from the Census figures. The final 1991 Census figures were estimated to have missed two per cent of residents overall, including four per cent of residents in Inner London and the main metropolitan areas such as Birmingham, Bradford, Leeds and Liverpool and two per cent in Outer London. Two per cent of the population were also not enumerated, but were imputed, and so were part of the final 1991 Census figures.

Whereas the 'missing' population is only estimated for broad area types, such as metropolitan cities, non-metropolitan cities and other non-metropolitan areas, the level of the imputed population is available for local authorities. This shows a very different pattern to that in 2001 among the Berkshire authorities, with the highest levels of imputation in 1991 in Reading and West Berkshire, followed closely by Slough - these were all a little over 2 per cent of the total Census figure. The comparable figures for Bracknell Forest and Windsor and Maidenhead were around 1.5 per cent and for Wokingham just 1 per cent. Assuming that the missing population (three per cent in non-metropolitan cities, which includes Reading, and two per cent in other non-metropolitan areas) shows the same pattern as the imputed population (1.8 per cent in non-metropolitan cities, 1.6 per cent in other non-metropolitan areas), this would give actual Census response rates in 1991 as shown in Table 1.

In 1981, the best estimate of net under-enumeration (excluding people in households who were absent on Census night) was 0.3 per cent for non-metropolitan areas (no distinction between cities and other areas was made).

Response rates by age and sex

There was also a high degree of variation in response rates to the 2001 Census for different groups of the population, which is another reason for developing the ONC approach. As in 1991, the lowest response rates throughout the UK were for people in their twenties, particularly men. The differences between the published response rates for men and women of this age were much smaller in 2001 than in 1991, but with the expected revisions to the estimates of the age/sex structure for 1991, the disparity in the rates for young men and women would be smaller. The 2001 response rates for women in their twenties, men aged 30-34 and for pre-school aged children were only marginally higher than the rates for men in their twenties.

The 2001 Census response by age-sex group for England as a whole varied from 98 per cent for men and women aged 70-79 and women in their sixties, to 87 per cent for males aged 20-24. The extremes of the response rates by age and gender are shown in the figures for Slough and West Berkshire given in Table 2. In West Berkshire, 100 per cent response rates were achieved for some groups, with the lowest rates of just 92 per cent of men in their twenties. In contrast, a response rate higher than this in Slough was only achieved for

Table 2 2001 Response rates by age and gender, Slough and West Berkshire 2001

	Slough			West Berkshire		
	Persons	Males	Females	Persons	Males	Females
0-4	85%	85%	85%	97%	97%	97%
5-9	85%	84%	86%	97%	97%	96%
10-14	86%	83%	89%	99%	99%	99%
15-19	84%	81%	87%	99%	99%	98%
20-24	76%	79%	74%	93%	92%	94%
25-29	81%	79%	83%	94%	92%	96%
30-34	87%	87%	86%	96%	95%	97%
35-39	86%	86%	85%	97%	95%	98%
40-44	86%	82%	90%	97%	96%	98%
45-49	86%	87%	85%	98%	98%	99%
50-54	86%	81%	91%	98%	97%	98%
55-59	85%	81%	89%	98%	97%	99%
60-64	91%	90%	93%	98%	98%	98%
65-69	90%	88%	91%	98%	97%	98%
70-74	85%	85%	85%	100%	100%	99%
75-79	88%	88%	88%	100%	99%	100%
80-84	90%	88%	91%	99%	100%	98%
85+	83%	79%	84%	97%	100%	96%
All Ages	85%	84%	86%	97%	97%	98%

Source: GLA calculations based on ONS Response Rate spreadsheet published 30 September 2003

women aged 60-64. The lowest rate was just 74 per cent of women aged 20-24. For both Slough and West Berkshire, the response rates for children aged under 10 were similar to the average rates, unlike the national picture. Only in Windsor and Maidenhead were the response rates for young children (aged 0-4) clearly below those for other age groups, at 94 per cent, compared to over 97 per cent in most groups. However, the response rates for men in their twenties and women aged 20-24 in Windsor and Maidenhead were much lower than those for the very young children, at just 86-87 per cent.

Confidence intervals

Because the ONC process builds on the responses received to create population estimates, there is a level of uncertainty in the resulting figures. The degree of this uncertainty is given by the confidence interval. A wider confidence interval means less certainty in the accuracy of the estimate. The published confidence intervals are at the 95 per cent level. This means that assuming that the 'sample' of results obtained (ie the Census and CCS combined results) were a random sample, then the chances of the true population figures being in the given range are 95%. Table 3 gives the confidence intervals for the ONC estimates for each of the Berkshire unitary authorities.

Table 3 - 2001 confidence intervals, upper and lower bounds

95% confidence interval

Local Authority	Total Census population	+/-	Lower bound	Upper bound
Bracknell Forest	109,606	1.8%	107,633	111,579
Reading	143,124	1.2%	141,407	144,841
Slough	119,070	2.2%	116,450	121,690
West Berkshire	144,445	1.1%	142,856	146,034
Windsor and Maidenhead	133,606	2.0%	130,934	136,278
Wokingham	150,257	1.8%	147,552	152,962

Source: ONS 95% confidence intervals spreadsheet, incorporating correction published 15 November 2002

There is relatively little variation in the confidence intervals, from ± 1.1 per cent for West Berkshire to ± 2.2 per cent for Slough. However, the confidence interval is not simply a reflection of the Census response rate. The calculation of confidence intervals takes into account not only the size of the population and the response rate to the Census, but also the sample size and variability of response within the CCS sample and the proportion of the population missed by the Census, but found in the CCS. The confidence interval for Windsor and Maidenhead, at ± 2.0 per cent, is almost as large as that for Slough and substantially more than that for Reading, which has a lower response rate and larger population size. The relatively large confidence interval for Windsor and Maidenhead is therefore probably due to a high degree of variation in the response rates for the Census and/or CCS across and within the age groups. For example, the response rate among an age group such as males aged 25-29 in one part of the borough may have been quite high, in another part of the borough, or among another population sub-group, eg unemployed people or Armed Forces personnel, the response rate may have been much lower. This sort of variation in response rates leads to a larger confidence interval overall. Across the country, the variation in confidence intervals is quite substantial, varying from ± 6.1 per cent for Luton to ± 0.6 per cent for a single local authority area such as Redcar and Cleveland unitary authority, although the confidence intervals for larger areas - counties and regions - are smaller.

Quality assurance of the Census estimates

An essential part of the ONC process was the quality assurance checking. The population estimates for each local authority by age and sex resulting from the ONC process itself were compared with figures from a range of administrative sources such as Child Benefit records, pension records, health records, birth records and school census data and with demographic estimates (2000 Mid Year Estimates (MYEs) extrapolated to 2001). Information on particular population sub groups was also obtained, such as university records for students and data on armed forces to compare with the ONC estimates for these groups. Other qualitative information derived from the Census fieldwork and from the ONC estimation process itself, along with any other information such as feedback regarding the rolled forward MYEs and data on underenumeration in 1991 was also used to ensure that the estimates were acceptable.

Imputation

Once the ONC estimates, including the quality assurance procedures, were completed for local authorities, the next stage was adjusting the Census database by imputing people up to the level of the population estimates. While the ONC population estimates define the number of people to be imputed along with some basic information about coverage patterns for other characteristics, it is important that the detailed characteristics of those households and individuals missed by the Census are also included.

Some of the people missing were in households for which there was no Census form returned, ie the whole household was missed, while other people were missing within households for which details of other people in the household were provided, such as where children were missed from Census forms. The characteristics of people within entirely missed households differ from those missed from within otherwise counted households and from the characteristics of enumerated people. Careful matching of Census and CCS data provided information about these key characteristics, so that imputation of people and their characteristics could be carried out as accurately as possible.

In the database, imputed data on households, and therefore the people in them, were placed into either a gap with a physical location identified by census enumerators where no response was received (e.g. absent household, refusal, non-contact), or into areas where similar households already existed. The second stage of the process imputed characteristics for additional people to real households, resulting in a database consistent with the ONC population estimates, representing the best estimate of what would have been collected had the 2001 Census not been subject to underenumeration. Tabulations derived from this database will automatically include compensation for underenumeration for all variables and all levels of geography.

Unitary authorities in Berkshire

