

CENSUS ADVISORY GROUP

AG (09) 16 Allocation of follow up field staff

Allocation of follow up staff in 2011 Census field operation

Introduction

1. This paper sets out the Office for National Statistics' plans for efficient allocation of field staff/resources in the 2011 Census. This paper applies to the Census in England and Wales only, different methods are being employed in Scotland and Northern Ireland.
2. In response to changes in society, technological opportunities and issues encountered in the 2001 Census, the ONS is planning a different design for the field operation to 2001 and prior Censuses. The proposed changes we are making should ensure problems encountered in 2001 do not re-occur and we are better able to address new challenges (both anticipated and unanticipated) during the 2011 Census field operation. One challenge is the same as in previous Censuses: to achieve a high quality Census field operation within a finite budget.
3. This paper explains the high level design proposed to achieve this and details the plans for the non-response follow up (where most of the resource – some two-thirds – of the field budget is being spent). Some of the other design features are covered (such as the use of post out, development of an address list and plans for enumeration of Communal Establishments) to give context, but this paper does not fully cover these design components.
4. In order for the reader to assess these proposals, it is important to set out first what constitutes success for the Census field operation. This is essentially two things:
 - A high overall response rate
 - Low differentials between the response rates between and within Local Authorities
5. The Office will be publishing final Critical Success Factors (CSFs) in April 2010.

Background – 2001 and previous Censuses

1991 and before

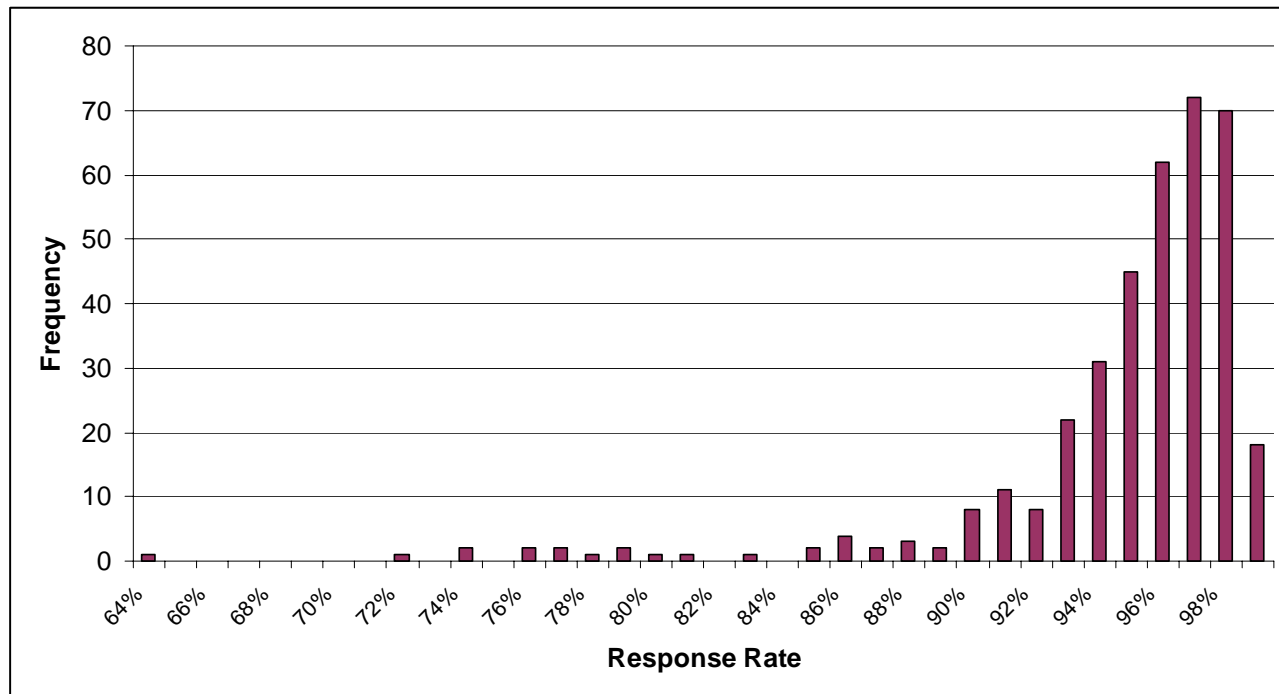
6. Up to and including the 1991 Census, the Census field operation was conducted using hand delivery and collection by a specially recruited and trained field force. England and Wales was divided up into some 110,000 Enumeration Districts (EDs) of around 200 addresses each and an enumerator was employed to 'enumerate' each ED by delivering a questionnaire to, and subsequently collecting it back from, every household in that ED. EDs were designed so that the workload was roughly equal; so rural areas had fewer addresses than urban areas and some allowance was made for the anticipated difficulty of gaining a response in that area.

2001 Census

7. In 2001, a major change was made. Instead of questionnaires being collected by the enumerator, the public were able to return their questionnaires through the post to their local Census manager. Enumerators only then needed to call to collect questionnaires from addresses that failed to respond or responded inadequately through the post.
8. This development was successful in terms of public take-up with some 88% of questionnaires being returned through the post. However there were some problems with incorrect sorting of mail and delays in the postal process which impacted on the follow up operation.
9. Given the anticipated reduced workload because of the use of post back, enumerators were typically allocated 2 EDs, with those in 'hard to count' areas being given only one. So a typical enumerator had to deliver questionnaires to around 400 addresses and collect them back from the minority of households that did not submit a postal return.

- This design led to an estimated 94% return rate overall but this response rate varied as the following graph shows:

Table 1: Distribution of Local Authority Under-enumeration



- This shows that although the majority of Local Authorities had high response rates, some had comparatively low ones, mainly in inner London. Problems arose during the enumeration process in places that had changed significantly since 1991 (the address list used was three years out of date) and in places where recruitment and retention of enumerators proved to be problematic. Failure to recruit and retain enumerators in the field affected the Census process in two ways: some households did not receive a Census questionnaire to complete; and many households who failed to return their questionnaires were not followed up. This was compounded by the fact that often these problems occurred in hard to count areas where we wanted staff to have smaller workloads not larger ones. Furthermore management information was poor so ONS was unaware of the extent of the problems until it was too late for remedial action. This combination of factors led to household response rates in certain parts of inner London being as low as 40%.

2011 Design

6. The issues identified above, along with other issues and technological developments led to the development of the 2011 field design. In many respects the design is similar to that successfully used in Canada's 2006 Census.
7. The design is as follows (in order of operation):

Address checking

8. We are working with address list providers (Ordnance Survey, Royal Mail, Local Government Information House) and Local Authorities to develop an address list that is as accurate and up to date as possible but are concerned this will not be accurate enough especially in areas with high multi-occupancy. In the summer of 2010, specially recruited address checkers will do a physical check of addresses in areas where we are concerned that our address register is not sufficiently accurate.

Questionnaire printing

9. Following the conclusion of the address checking, we will print some 25million household questionnaires in December 2010. Unlike previous Censuses each questionnaire will be pre-addressed, uniquely numbered, bar-coded and have a unique identifier on it enabling the household to complete an on-line version of the questionnaire. A supplementary print run will be done very shortly before Census Day to include late additions to the address register.

Delivery of questionnaires

10. In the weeks leading up to Census Day, the questionnaires will be delivered - the majority of households (some 95%) receiving theirs by post. Pre-addressing the questionnaires enables them to be posted out bringing savings to the office and overcoming some of the risks around hand delivery (lack of contact with householders, access control issues). This paper does not cover the full justification for this decision; the main point is that although post out reduces initial response relative to hand delivery, the cost saving from post out means that extra follow up activity can be afforded. This was concluded following the successful trial of post out in the 2007 Census Test.
11. The remainder of household questionnaires will be hand delivered in the traditional manner because we still have concerns about the quality of the address list and/or the area is anticipated to be particularly difficult and large amounts of extra materials (questionnaires, translation leaflets etc) are likely to be needed. All questionnaires for Communal Establishments (care homes, university halls of residence, military bases etc) will be hand delivered due to the more complicated nature of the enumeration.

Returns

12. The public will either be able to make their Census returns through the post or on-line. We have been working with Royal Mail since 2004 to design the post back process and, unlike in 2001, all postal returns will be to one central location not to local managers.
13. Residents of Communal Establishments will be able to complete on-line returns but completed paper questionnaires will be collected by hand.

Non response follow up

14. This part of the process is where the most resource will be spent and most of the field staff will be employed. Ten days after Census Day, we will commence non response follow up. All households that have yet to complete a response will be visited by field staff to either help them complete a return (if otherwise unable) or persuade them to do so (if unwilling).
15. All the questionnaires will be uniquely bar-coded and internet returns will have a unique access code, so we will be able to quickly receipt returns (through either route). A 'Questionnaire Tracking' system will keep an up to date record of responses made and identify those addresses that need to be 'followed up' to the field staff. This follow up will carry on from ten days after Census Day until six weeks after Census Day when it will cease just before the Census Coverage Survey commences. This is three weeks longer than in 2001 allowing more time to overcome any problems with low response rates.
16. Non compliance activity for active refusals will continue for some six months after the Census Day involving a small number of specialist staff.
17. The challenge we face is to allocate the follow up staff efficiently to meet the objectives outlined above. **By use of post out, post back and internet capture we will have cost-effectively counted all the people that are willing and able to complete a return unprompted. The field force is then effectively left with all those where an intervention is needed.** How we deploy this resource to best effect is the question – and content of the remainder of this paper

Allocation of follow up staff

18. With a post out and post back model, the role of the Census Enumerator has changed from its traditional role of both delivering and collecting questionnaires in 1991 to being solely about getting responses from non-responding households in 2011. This and other design changes have important consequences for allocation of enumerators (or 'collectors' as they shall be titled in 2011, partly to reflect these changes), notably:

- The number of initial non responses is likely to be higher than in the past due to post out and societal reasons:
 - Changing living patterns –for example more single person households makes contact with the public increasingly hard
 - Reduced willingness to complete forms
 - Access control issues
- The job is around visiting identified addresses rather than being responsible for an area (the responsibility for listing and delivering to all addresses within a defined area no longer sits with the enumerator/collector)
- The job is less physically demanding: it is predominantly about assistance and persuasion of the public rather than physical delivery of questionnaires.
- The job will involve a greater proportion of more difficult situations as it will be involve dealing solely with members of the public yet to complete a questionnaire (for whatever reason).

19. The consequences of this for field staff allocation are:

- We will need to put more resource into the non response follow up stage than in the past.
- Resource needs will be driven by volumes of non responding households rather than total number of households (both nationally and locally) and so the relative allocation between different areas of the country may be very different to in the past.
- It is no longer necessary to link staff to a certain area throughout the operation; they can be deployed more flexibly.

20. To achieve an efficient staff allocation that meets our success criteria, we need to do three things:

- I. Have a robust method for estimating initial non response (response rates before the follow up)
- II. Good estimates of the resources we need to increase Census responses from the initial levels to ones that meet our CSFs
- III. Have processes to manage and redeploy the field staff to achieve CSFs when, as is inevitable, our estimates for 1 and 2 are not correct; or other factors impact the operation (for example, in 2001 we had foot and mouth and postal strikes to overcome).

Estimating non-response

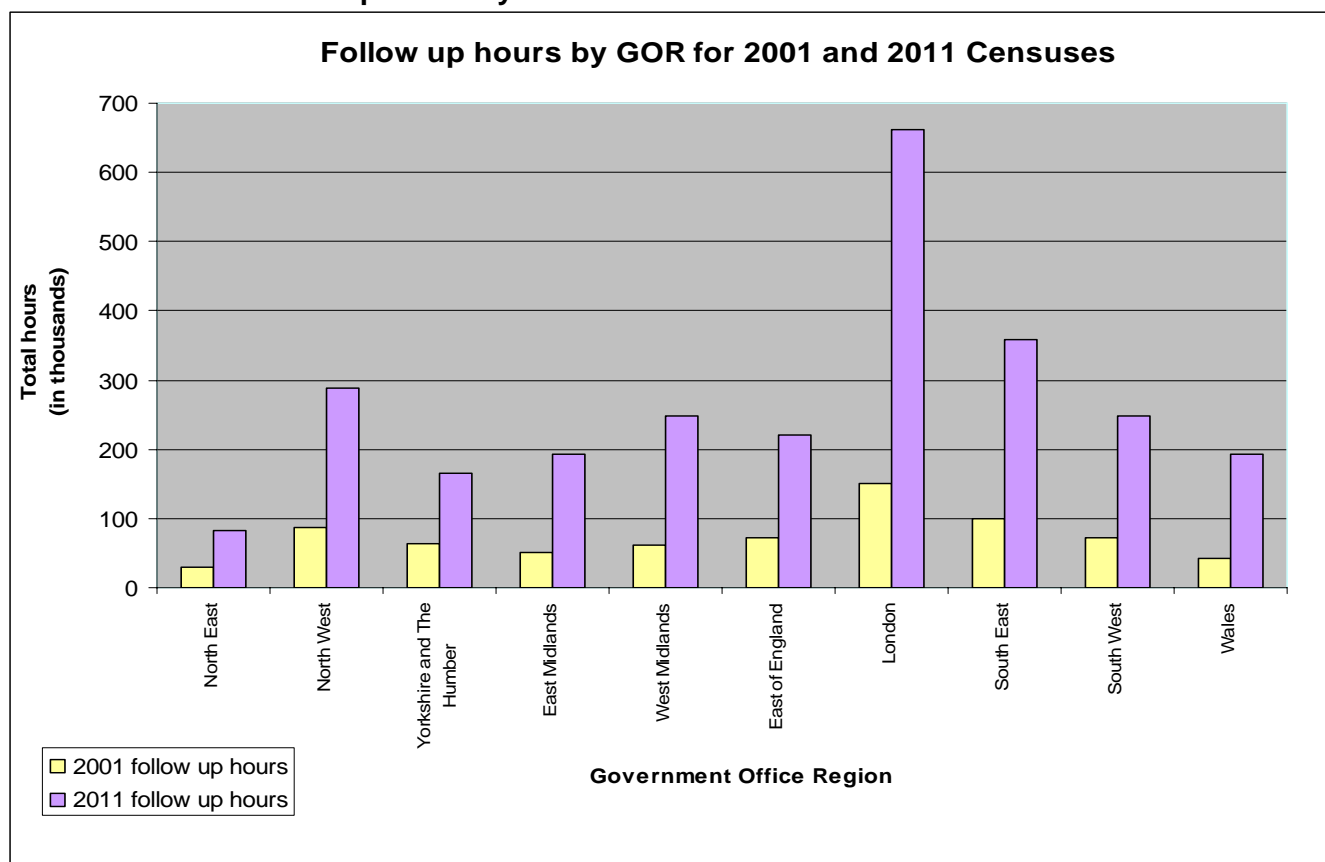
21. The first stage is to produce estimates of household non-response in the 2011 Census at a time ten days following Census day: the point the non-response follow-up will start. The purpose of the task is to enable the allocation of the 2011 Census field force at day ten to match the amount of work required as closely as possible. The estimates will be at the LSOA (Lower Level Super Output Area; approximately 600 households) level and will take into account societal change since 2001.
22. Due to limitations of the data, it is not possible to model day 10 non-response rates directly. An unexpectedly high postal return rate in 2001 caused major operational difficulties which affected the quality of return rate data such that rate of return data is only available as aggregates of large geographical areas. At this aggregated level, the rate of postal return behaves as a function of the overall final return so it is possible to model final response rates, from which day 10 return rates can be derived.
23. Final response rates in 2001 were obtained by the 2001 One Number Census project, which aimed to produce accurate population counts for each Local Authority by making an adjustment for under-coverage. Though the design of the 2001 One Number Census was to provide accuracy at the Local Authority level, there was a high correspondence between the numbers of 'dummy forms' produced for each Local Authority and the numbers of households to be imputed. This suggests that the household imputation rate by LSOA in 2001 may also be an accurate reflection of the household non-response rate in the 2001 Census.
24. Our approach to estimating future Census response rates is to analyse area factors for their ability to explain differences in final 2001 Census response rates between LSOAs. The feasibility of this approach requires that there are area factors that we can measure and that the final 2001 Census response rates by LSOA is accurate. Combinations of these factors can then be used to create a model to explain final 2001 Census response rates. Under the assumption that the model will hold for future Censuses, response rate estimates can be provided by obtaining up to date measurements of these factors and using the model to estimate how the current combination of these factors will affect response rates.
25. In order to take into account as much societal change as possible, the model of census household non-response exclusively uses variables derived from administrative data sources that are measured at least yearly. These variables include:
 - Unemployment/low income: the proportion of individuals claiming Income Support or Jobseeker's Allowance (Department for Work and Pensions data);
 - Ethnicity: the proportion of pupils in state maintained schools that are non-'White British' by LSOA (Department for Communities Schools and Families - school census data);
 - House price data: (Land-Registry);
 - Housing density (Department for Communities and Local Government).

26. Within the model are fixed effects for each Local Authority. These represent differences between Local Authorities not explained by the other variables in the model. Some of the Local Authority fixed effects are substantial and may be due to factors outside of the intrinsic characteristics of the area, including operational failure during enumeration in 2001.
27. This approach is highly dependent on the assumption that a model produced from 2001 data will continue to be valid in 2011. We can have confidence that determinants of 2001 Census non-response will continue to be determinants in 2011. However, we are less certain about the stability of the strength of the relationship of these determinants to household non-response over time. To overcome this uncertainty, we are performing sensitivity tests to determine how dependent the success of the field operation is on the accuracy of the estimates and designing measures into the field strategy to reduce that dependency. Also, the model is being used to estimate the response/non response rates in the 2009 Rehearsal. Although analysis will be influenced by the voluntary nature of the Rehearsal, some verification of the model will be possible.

Resources needed to meet Critical Success Factors

28. Having derived estimated initial response rates, we need to determine how much resource is needed to increase the response rates to levels that meet our CSFs.
29. We have constructed a model to do this, the variables being:
 - The initial response rate
 - The target response rate
 - The likelihood of making contact with a householder at successive visits
 - The likelihood of that contact resulting achieving a Census return
 - The rate at which success at gaining a return diminishes over time – a follow up attempt two weeks after Census Day is more likely to get a successful outcome (all other things being equal), than one four weeks after Census day for reasons such as public recall of receiving the questionnaire or householders having moved.
 - The number of households that can be visited in an hour
30. All these factors vary according to area type: typically in a rural area, initial response will be high, contact and subsequent additional responses fairly high but the number of addresses that can be visited in an hour low. In an inner city area, the speed at which addresses can be visited is higher (they are closer together anyway and visiting a higher proportion) but contact and conversion is likely to be lower. So, average individual workloads in terms of number of outstanding addresses will vary depending on the area type. Over the course of the operation a Collector may have around 200 in total in a hard to count inner city area or a very rural area, but up to 400 in a more straightforward suburban area.
31. Modelling all this for the whole country gives an allocation of staff that is somewhat different to in the past as the following table shows:

Table 2: Follow up Hours by GOR for 2001 and 2011 Censuses



32. The figures are quoted as percentages because this is more comparable. The absolute number of field staff we are looking to recruit in 2011 is much lower (less than half) than it was in 2011. However based on the modelling outlined above, we estimate that **we will deploy around three times as many hours on the non-response follow up in 2011 than we did in 2001.** In 2001, we estimate 750,000 hours were spent on follow up; in 2011 we are planning 2,750,000. The average Collector will spend 112 hours on follow up compared to 12 by the average enumerator in 2001.

33. In some Local Authorities, we may budget for collectors to have sufficient time to make up to ten attempts to contact a household and get a return.

34. Although we have calculated staff numbers in a formulaic way based on factors such as expectations of response and contact success, the staff will not be working in this way. They will be allocated a workload (which may change – as detailed in section 7 below) and contracted for an agreed number of hours per week; staff will be paid by the hour (unlike in previous Censuses staff were paid in stages based on estimates of the hours needed) and instructed to do their best to get a response from those addresses within their allotted hours calling at different times of day and days of the week as necessary to make contact.

Risks/issues

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35. The approaches outlined above are largely new to the Census field operation and, as such, do bring risks (although of course, keeping the same traditional model given changes to society brings risks too).

36. The following table sets out the main risks and mitigations/contingencies:

Risk	Mitigation	Contingency
Estimates of initial response rates incorrect.	<p>Previous experience and other ONS survey response rates tell us we will get differences in response rates across the country. We may not capture all the variation correctly but we are likely to capture more of it by basing it on estimates than if we allocate resources more or less evenly.</p> <p>The model is being based on updatable data sources.</p> <p>Extensive QA/sensitivity testing of model.</p>	<p>The length of time being allowed for follow up is longer than in past so there is more time to take corrective action where estimates prove incorrect.</p> <p>Resources being put into follow up are much greater than in 2001.</p> <p>Flexibility to move staff</p>
Success rates of conversion of non responders to responses are incorrect	Data has been produced from 2001 Census, Social Surveys, 2007 Census Test. 2009 Rehearsal data will be incorporated.	<p>We will allow for a minimum level of staff in each area.</p> <p>We have a requirement to achieve both a high overall response rate and low differentials. This means if we can close differentials everywhere, it matters less where we achieve higher and lower absolute rates as long as all areas achieve a minimum threshold and the national average is high.</p>
Role of enumerator/collector more challenging than in the past as it concentrates on harder areas and non responders	<p>Clear explanation of role up front.</p> <p>Staff will be paid by the hour so staff working in tougher areas will not lose out financially relative to those with easier areas.</p>	<p>Management needs to be supportive of staff.</p> <p>Staff can be moved to different areas – to overcome any vacancies.</p> <p>Moving staff could be used</p>

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	<p>ONS has responsibility to deliver value for money, we can't justify paying people to enumerate areas we could enumerate by post at lower cost.</p> <p>Reduction in "carrying forms" element of job in favour of more doorstep interaction may suit some people more.</p>	<p>to give variety or to move people to areas more suited to them if needed.</p>
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