

CENSUS ADVISORY GROUP

AG (07) 10

Statistical Disclosure Control: update on methodological research

Background

- 1 As reported earlier this year in Advisory Group paper AG(07)03, the Registrars General (RsG) of England and Wales, Scotland, and Northern Ireland have agreed to aim for a common approach to Statistical Disclosure Control (SDC) for the 2011 Census. The work programme to decide which method to adopt consists of three stages:
 - evaluation of the process carried out for the 2001 Census;
 - high level qualitative evaluation of possible SDC methods for 2011 and agreement of a short-list of methods to undergo full evaluation; and
 - full quantitative evaluation of short-listed methods resulting in a recommendation to the United Kingdom Census Committee.
- 2 The Census Statistical Disclosure Control (SDC) Working Group, which has representatives from all UK Census Offices, has developed a short-list of SDC methods for the 2011 Census (thus completing the second stage of the work programme) that will undergo a full evaluation over the next year. The short-list was created by assessing the methods against a set of criteria that were in line with the policy statement made by the RsG. Formal quality assurance has been provided by the UK Census Design and Methodology Advisory Committee (UKCDMAC), and the individual Census Project Boards in the UK countries have been consulted, prior to formal sign-off by the UK Census Committee.
- 3 **Advisory Group members are invited to note the approach used to derive a short list of SDC methods, the forthcoming methodological research, and that user consultation will take place throughout the work programme, in particular that a Royal Statistical Society seminar on developments in statistical disclosure control has been organised for 10th December.**

Summary of approach used to derive a short-list of 2011 SDC methods

- 4 There are several SDC methods that could be used for the 2011 Census. At this stage it is necessary to create a short-list of these due to the effort required to carry out a full quantitative evaluation of each method.
- 5 There were 12 methods considered for short-listing:
 - (a) record swapping
 - (b) over-imputation
 - (c) data switching
 - (d) post randomisation method (PRAM)
 - (e) sampling
 - (f) conventional rounding
 - (g) random rounding
 - (h) controlled rounding
 - (i) semi-controlled rounding
 - (j) suppression
 - (k) barnardisation
 - (l) ABS cell perturbation method
- 6 Each method was assessed on whether they met, partly met or did not meet the 7 criteria listed below.

Criteria used

- 7 The criteria were split into primary and secondary criteria, and an additional requirement was that any method that did not meet one of the primary criteria would not be considered for short-listing. This short-listing was based on qualitative judgements; the quantitative assessment (which will quantify how much protection will be provided and how the data utility will be affected) will be made in the next stage of the evaluation.

Primary criteria

- 8 These were:
 - Will the method provide additive and consistent tables? (a priority for users)
 - Will users accept the method?
 - Does the method protect against differencing (both geographical and categorical differencing)?
 - Is the method practical, feasible to implement, and has it been used for protecting similar outputs to date?

Secondary criteria

- 9 These were that the method:
- should not restrict microdata releases;
 - should be simple to understand; and
 - should be easy to account for in analyses.

Proposed methods for short-listing

- 10 Following the second stage assessment, four methods were chosen for short-listing – three of the above:

- (a) record swapping;
- (b) over-imputation; and
- (l) ABS Cell Perturbation Method; plus

Small Cell adjustment with record swapping, which was included to provide a comparison with the 2001 Census.

- 11 All these methods passed the primary criteria, although it should be noted that small cell adjustment on its own would have failed as it did not protect against differencing. It was agreed to include it (with record swapping) in the final short-list in order to ensure that the other three methods could be compared against the 2001 method. Combinations of methods will also be considered for the quantitative evaluation.

Forthcoming methodological research

- 12 The third stage of research will be a quantitative evaluation of the short-listed SDC methods focusing on how much protection is provided by each, as well as the impact they have on the utility of the statistics. A report is currently being completed on further issues to be addressed in conducting this quantitative risk-utility assessment, along with a list of proposed Census tables to be used in the evaluation. This will receive appropriate quality assurance prior to commencement of this next stage of research.
- 13 The quantitative evaluation phase will be used to inform the recommended SDC method(s) for the 2011 Census for all types of census outputs, although the focus will be on tabular outputs. Findings from user consultations will be incorporated into the evaluation to ensure we take into account users views of desirable features of a disclosure control strategy. A draft report of high level user requirements is due to be produced in **April 2008**. The methodological research will be completed in **September 2008**, following further communication and consultation the UK SDC strategy for tabular outputs will be finalised in **spring/summer 2009**.

- 14 A further stage of research will be conducted to develop methods for the protection of 2011 Census microdata samples in accordance with the 2011 microdata strategy developed by the Census Microdata Working Group. This phase of the research will commence in **February 2009** and will run concurrently with user consultation and sign-off phase of SDC strategy for tabular outputs.

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