Methodological News
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Articles

Symposium on the Confidentiality of Linked Data and Visits by Jörg Drechsler and Natalie Schlomo

A key objective of the ABS is to increase access to the data collected by Commonwealth government agencies. Large amounts of data are collected by government agencies that could be used in the development and evaluation of policy for the benefit of society. It is therefore no surprise that there is very strong demand from analysts, within business, government, universities, and other organisations, to access such data. Many important questions can only be answered by analysts if they are allowed to analyse linked micro-data, a key example of which is the linkage of personal or organisation level data that were collected by two commonwealth agencies. However, agencies are often legally obliged to ensure that such analysis is unlikely to disclose information about a particular person or organisation.

The ABS is developing the infrastructure and statistical methods required to link micro-data, to facilitate analysts' access to the linked data and to manage the associated disclosure risk. Linked micro-data often have complex (e.g. hierarchical and longitudinal) structures which require sophisticated models to analyse. To explore and promote discussion on these issues the ABS recently organised three key events.

1. The ABS hosted a symposium on "The Disclosure Risk of Linked and Longitudinal Data" on the 27th April at its Central Office in Canberra. The symposium was designed to draw speakers with a wide range of perspectives.

- Mr. Mike Camden, Senior Methodologist at Statistics New Zealand
- Dr. James Chipperfield, Australian Bureau of Statistics and Senior Research Fellow of University of Wollongong
- Dr. Tim Churches, Sax Institute
- Professor David Lawrence, Centre for Child Health Research, The University of Western Australia
- Dr. Christine O'Keefe, Science Leader for Privacy and Confidentiality in CSIRO
- Dr. Natalie Shlomo, Senior Lecturer, University of Southampton
- Ms. Nicole Watson, Deputy Director of Survey Methodology for the Survey of Household, Income and Labour Dynamics in Australia (HILDA)

2. During Natalie Shlomo's visit to ABS, she gave short courses on record linkage and statistical disclosure control and held discussions with staff. The courses and discussions were well received.

3. Jörg Drechsler from the Institute for Employment Research in Germany, presented a workshop on "Releasing Synthetic Data to Protect Confidentiality" at ABS' Central Office in Canberra on the 10th and 11th of May. While the ABS has not to date released synthetic data for public use, it is being considered for linked micro-data. The workshop and discussions with Jörg were particularly beneficial in this regard.

Further Information

For more information, please contact James Chipperfield (02 6252 7301, james.chipperfield@abs.gov.au)

Statistical Quality Incident Response Plan Information Paper - New on the ABS Website

The ABS has recently released a number of information papers and resources relating to the management of statistical quality. The latest in the series is the Statistical Quality Incident Response Plan information paper (cat. no. 1542.0).

The Statistical Quality Incident Response Plan is a systematic plan for resolving serious doubts about key statistical results by examining the processes that contributed to the results. The approach is designed to provide a quick and rigorous high level response to an identified serious statistical issue. The approach is based upon the formation of a dedicated multidisciplinary team to investigate and resolve the issue in a pragmatic way.

The paper provides information for conducting and creating a quality incident response plan. This is to enable statistical risks to be managed by having documented and accepted guidelines on what to do when a quality incident arises.

The Statistical Quality Incident Response Plan paper takes you through the process, from identifying a quality incident and assessing its level of risk to the organisation and data, to initiating a Quality Incident Response Plan (QIRP), followed by resolving the quality incident, and finally to implementing any required changes and learning from the quality incident.

To access the information paper, please go to the Statistical Quality Incident Response Plan.

Further Information

For more information, please contact Narrisa Gilbert (08 9360 5283, narrisa.gilbert@abs.gov.au)

Selection of an Area Master Sample for Special Social Surveys

A master sample of fine areas is being selected to provide the dwellings for many of the Special Social Surveys (SSSs) to be conducted over the next five years. Each SSS typically involves a detailed questionnaire on a specific topic such as health, income and expenditure or crime, and the standard mode of enumeration is face-to-face personal interview. A separate master sample of fine areas will provide dwellings for the Monthly Population Survey (MPS), which has the monthly Labour Force Survey as its core component.

With the exception of regions with low dwelling density, the selection of areas for the SSS master sample is not being explicitly tied to the new sample of areas providing dwellings for the MPS. Decoupling the MPS and SSS areas is a major shift from the past, as previously the sample areas for the MPS and SSSs were contained within a single master sample of Census collector districts. The key enabler for the decoupling has been the introduction of the Australian Statistical Geography Standard, which has allowed the creation of a frame of fine area sampling

units with well-defined boundaries. In remote regions of Australia and in small towns the SSS master sample areas have been paired with selections in the MPS master sample. This ensures the SSS selections in these areas can be enumerated by interviewers located close to the MPS sample areas.

The selection of an exclusive area master sample for SSSs provides greater flexibility in options for the sample designs of individual SSSs. In particular, the SSS master sample will better support surveys in which sampling efficiency can be improved by targeting particular fine areas based on the characteristics of the dwellings within the areas. For example, the master sample could support a sample design in which areas with high prevalence of low income dwellings (as measured in the 2011 Census) are twice as likely to be selected. The SSS master sample can support such a sample design because the Census characteristics of fine areas are known and the number of fine areas available for selection will be significantly larger than previously the case (when the number of areas available for selection for SSSs was tied to the number of areas selected for the MPS).

To complement use of the new master sample, Household Survey Methodology aim to develop a systematic and streamlined approach for choosing the sample design parameters for individual SSSs. The fundamental household survey sample design parameters are the number of fine areas to select from the master sample and the number of dwellings to sample within each area. The envisioned streamlined approach involves choosing these parameters based on the geographic clustering of the key characteristics of interest for the SSS and by using a model for evaluating enumeration costs for samples with different degrees of geographic dispersion.

Further Information

For more information, please contact Julian Whiting (08 8237 7362, julian.whiting@abs.gov.au)

Investigating a List-based Sampling Approach for ABS Household Surveys

A major initiative underway at the ABS is the construction of an Address Register (AR) to increase our efficiency in producing Census and other population statistics, and to broaden our range of analytical and statistical products.

One particular area of gain is the potential for smarter and more flexible household survey sample designs. Currently, ABS household survey sample designs are constrained by the need to select geographic areas as the first stage of selection. Recently, Household Survey Methodology (HSM) conducted an investigation to explore the types of sample design efficiencies possible for household surveys under a list-based sampling framework. Three main areas of potential gain were investigated:

1. De-clustering our household samples
2. Using auxiliary information to stratify a sample by specific population characteristics, along with an optimal allocation to these strata

3. Using auxiliary information for targeting specific subpopulations of interest

The results from the HSM investigation show that a list-based sampling framework for household surveys is worth further investment, and would have major benefits for sample efficiencies if a list-frame was augmented by auxiliary information that could be used in design and estimation. While previously the use of auxiliary information has been constrained to the areal level, an AR enables us to also utilise address or person-level auxiliary data for design and estimation. Specific findings include:

- Reductions in sample size may be realised through de-clustering of our samples, however these need to be coupled with a modal change of enumeration (such as increased use of Telephone Interviewing or E-forms) to realise significant monetary gains.
- While reductions in sample size may be realised through de-clustering our sample, these reductions need to be balanced against increased cost of enumeration (or impacts to follow-up processes and contact rates) due to a more spread-out sample.
- There are potential benefits afforded by a list frame which has been augmented by auxiliary data that can be used in design (through stratification and allocation) and estimation.
- A major advantage to having auxiliary information available is that it facilitates the targeting of subpopulations of interest which typically have needed to be found through expensive techniques such as oversampling or screening. This leads to the potential of surveys reassessing their output requirement needs, rather than having outputs constrained by what could be collected under a cost-effective area based sample.
- The quality and type of auxiliary information attached to a list frame influences the magnitude of efficiency gains possible. For example, using auxiliary information that is highly correlated with variables of interest will provide greater gains. Similarly, inaccuracies in the auxiliary data (for example, by having out-of-date data) will reduce the gains possible.

It is believed that an AR can help the ABS Household Survey Program achieve ABS goals of reduced costs (and time) and growing the business through new statistical products and services. However, the implementation of the AR needs to be considered holistically along with other initiatives in the wider household program. For example, moves are afoot to introduce an internet mode of collection for the Monthly Population Survey, as well as the consideration of moving surveys to a more integrated approach (such as an omnibus survey vehicle). Other current areas of investigation across the wider household survey program could include an evaluation of a greater use of administrative data (across both the design and analysis phases).

Further Information

For more information, please contact Rebecca Farrow (07 3222 6467,

rebecca.farrow@abs.gov.au) or Lyndon Ang (02 6252 5279, lyndon.ang@abs.gov.au)

How to Contact Us and Email Subscriber List

Methodological News features articles and developments in relation to methodology work done within the ABS Methodology and Data Management Division. By its nature, the work of the Division brings it into contact with virtually every other area of the ABS. Because of this, the newsletter is a way of letting all areas of the ABS know of some of the issues we are working on and help information flow. We hope the Methodological Newsletter is useful and we welcome comments.

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Valentin M. Valdez
Methodology & Data Management Division
Australian Bureau of Statistics
Locked Bag No. 10
BELCONNEN ACT 2617

Tel: (02) 6252 7037
Email: methodology@abs.gov.au