



METHODOLOGICAL NEWS

**A QUARTERLY INFORMATION BULLETIN FROM THE METHODOLOGY
AND DATA MANAGEMENT DIVISION**

December 2007

Changes in Methodology Division

Welcome to the final edition of MD News for the 2007 calendar year. This year has been busy and productive for MD, and has also seen some significant changes to the structure and functions of the division. In the first half of 2007, the Australian Statistician completed a review of the ABS' structure, and subsequently announced a new structure to take place from 2 July 2007 in order to help the ABS focus more effectively on achieving its goals. In the new structure, Methodology Division (MD) became Methodology and Data Management Division (MDMD, or MD²) as we welcomed the addition of two new branches: Data Management and Classifications Branch, and the National Statistical Service Leadership Branch.

The primary role of MDMD is to provide high quality, specialist services to the ABS, with the goal of ensuring that the methods and standards underlying ABS outputs are based on sound, defensible statistical principles and are cost effective.

The Data Management and Classifications Branch within MDMD aims to promote the comparability, integration and quality of ABS statistics through the use of standard concepts, definitions, classifications and procedures.

The National Statistical Service Leadership Branch aims to strengthen and extend the National Statistical Service, including the development of whole-of-government statistical policy, strategies and infrastructure.

The Statistical Services Branch supports the statistical collection process, providing advice on survey design and methods, and data quality, through all stages of the survey cycle.

The Analytical Services Branch develops and disseminates new analytical methods and products, including new databases and models which measure socioeconomic concepts, as well as producing a series of research papers which present the results of current research or analysis to encourage discussion and comment.

The integration of the two new branches into MDMD has created opportunities for the division to focus on further enhancing quality of service provision and methodological rigour to support the work of the ABS. I am looking forward to the opportunity for the new MDMD to further develop strong internal and external partnerships in 2008 and to maintain the high level of service the division provides to the ABS.

For more information about the new structure of the ABS, please visit the About Us section of the ABS website (www.abs.gov.au).

Geoff Lee
First Assistant Statistician
Methodology and Data Management Division

A Conference in Planning - NatStats Conference 08

The ABS is planning to host a conference in November 2008, to be called NatStats Conference 08. The conference will help connect users and producers of statistics from across government, public sector and academia and provide an opportunity to discuss strategies for measuring progress in Australian society and improving statistics for the nation. Professionals, researchers, policy makers, practitioners and academics will be invited to speak on topics relevant to the conference theme "Working together for a better informed and performed Australian Society".

Preliminary planning is underway. Subthemes and topics for the conference are being considered. Suggestions on topics or innovative case studies can be sent to inquiries@abs.gov.au or contact Mark Lound on (02) 6252 6325. Details of the conference will be available soon on the National Statistical Service website www.nss.gov.au

An Improved Seasonally-adjusted and Annual Total Estimates for Hours Worked Time Series

Last year the Australian Bureau of Statistics (ABS) produced improved estimates of total actual annual hours worked by Australians. The estimates were based on the monthly Labour Force Survey (LFS) which collects hours worked information from a reference week. The estimates were calculated by using time series intervention analysis to estimate observable holiday effects from the reference weeks and then imputing unobservable holiday effects for the non-reference weeks. The improved total actual annual hours worked estimates have been implemented in the Australian National Accounts and used as an input to Australian labour productivity measures.

Currently, there is strong demand from users for improved annual and quarterly seasonally adjusted actual hours worked estimates for each of the 17

industry divisions in the Australian and New Zealand System of Industry Classification (ANZSIC). These estimates will enable users to make better inter-industry comparisons of productivity growth. However, the methodology for Australian annual hours worked is unlikely to work well at each of the 17 divisions. The primary reason is that only quarterly LFS hours worked information is available at the ANZSIC division level. Very few holiday effects are observed in quarterly interval time series, therefore the observable holiday effects cannot be estimated reliably.

A proposed alternative methodology based on temporal and spatial reconciliation is being applied to the annual and seasonally adjusted quarterly series. This methodology preserves the additivity of quarterly seasonally adjusted and annual total estimates between the 17 divisions and the Australian total.

It is expected that the improved annual estimates will be published in the 2007-2008 Annual National Accounts (cat. no. 5204.0) while the improved seasonally adjusted quarterly estimates will be published in the December quarter edition of the quarterly national accounts (cat. no. 5206.0).

For more information on this project, please contact Noel Hansen on (02) 6252 7053 or Mark Zhang on (02) 6252 5132.

Enhancing the ABS SEASABS Seasonal Adjustment System for Chained Volume Measures

The Australian Bureau of Statistics (ABS) publishes economic indicators as both current price values (CPVs or "nominal") and as chained volume measures (CVMs or "real"), which discount the impact of price changes. Both of these measures may be released to the general public via ABS publications in seasonally adjusted terms.

CPV seasonally adjusted estimates are both produced and quality assured by the ABS SEASABS seasonal adjustment system. The present system for seasonally adjusting CVMs involves transferring the appropriate seasonal factors and prior correction factors from ABS' seasonal adjustment package, SEASABS, to the FAME based National Accounts compilation/processing system.

This dual system is often operationally inefficient, complicated, less transparent and problematic. This is particularly the case when Subject Matter Areas (SMAs), other than National Accounts, produce seasonally adjusted CVMs for their own economic time series, because they have to synchronise the two systems with assistance from Time Series Analysis (TSA) Section for seasonal adjustment and from National Accounts Branch (NAB) for CVM support. For example, if any changes are made to the seasonal adjustment of CPVs, such as to the methods of adjustment, aggregation structures, parameter settings or prior corrections, this needs to be reflected in the FAME code that produces the corresponding seasonal adjusted CVMs, via manual updates to this code. This process is

often problematic, especially in terms of synchronising the timing of these code changes with tight quarterly processing deadlines.

TSA, in conjunction with NAB and Statistical Information Technology Facilities Section (SITFS) have been developing an enhanced version of SEASABS, that has a demonstrated capability to reliably produce seasonally adjusted CVMs. With assistance from TSA (by constructing the CVM process structure in SEASABS), NAB staff have successfully trialled the enhanced SEASABS/CVM system on one of the most complicated structures in National Accounts - Inventories. The success of this trial paves the way for a new business model for SMA CVM processes/compilation, using only the SEASABS/CVM system.

TSA and SITFS staff are working together to enhance the SEASABS/CVM system by providing extra capabilities and flexibility to produce original CVMs, in addition to seasonally adjusted CPVs and seasonally adjusted CVMs estimates, in the same system. This new system will be released for testing in February 2008 and is expected to be released into production in April 2008.

Starting from early next year, TSA, NAB and SMAs will work together to begin to apply the new business model, in a production environment, to derive original CVMs, seasonally adjusted CPVs and seasonally adjusted CVMs estimates from the enhanced SEASABS/CVM system for a range of SMA clients.

For more information on this project, please contact Tom Outteridge on (02) 6252 6406 or Mark Zhang on (02) 6252 5132.

AIC Sample Design Launched and Estimation Strategy Developed

The Annual Integrated Collection (AIC) project was established in 2003 to construct an integrated strategy and business process environment for combining the then existing annual Economic Activity Survey, Manufacturing Survey, Mining and Utilities Survey managed through the New South Wales regional office (referred to as the AIC core), together with the Services Industry Surveys managed in Victoria and the Information and Communication Technology Industry Survey (ICTIS) managed in Western Australia (referred to as the AIC rolling program). This push towards greater integration of strategies and processes was driven by a very strong desire for greater consistency and the simplicity to be achieved by replacing a wide range of independent surveys with a single integrated system.

The main objective of the core collection is to provide key measures on the financial performance of Australian industries on an annual basis, while the rolling program provides more detailed industry activity and commodity data for specific sets of industries and with frequencies ranging from annual to nine-yearly. One of the key outcomes of the AIC project is the development of a sample design and selection strategies for the core component of the AIC that integrates well

with the sample requirement of the rolling program. Key benefits desired from this integrated strategy include improved data quality and coherence, increased client satisfaction, operational efficiencies, and reduced risk of anomalous output.

The scope for the core component of the AIC consists of all Australian based activities of business entities with a non-cancelled ABN and an active ITW or GST role; and operating for at least one day during the relevant financial year, except for those businesses classified to any of:

- Finance (ANZSIC 06 Subdivision 62);
- Insurance (ANZSIC 06 Subdivision 63);
- Public Administration (ANZSIC 06 Subdivision 75);
- Defence (ANZSIC 06 Subdivision 76);
- Private Households Employing Staff (ANZSIC 06 Subdivision 96); or
- General government (SISCA 3000), except those business classified to Water Supply, Sewerage and Drainage Services (ANZSIC 06 Subdivision 28).

The 06/07 rolling program of the AIC consists of all Australian based activities of business entities with a non-cancelled ABN and an active ITW or GST role; and operating for at least one day during the relevant financial year in one or more of the following criteria:

- Accommodation (ANZSIC 06 Subdivision 44);
- Cafes and Restaurants (ANZSIC 06 classes 4511, 4513);
- Film and Video Production (ANZSIC 06 classes 5511,5514);
- Television Services (specific businesses in ANZSIC 06 classes 5621, 5622));
- Music and Theatre Production (ANZSIC 06 class 9001); or
- Performing Arts Venues (ANZSIC 06 class 9003); or
- Non-Profit Institution (NPI) Satellite Accounts (SISCA 1000, 2000, 4000 and 5000) NPI's within scope of the AIC core; or
- Information and Communication Technology Industry (ANZSIC 06 Classes 1620, 2421-9, 3492-4, 5420, 5801-9, 5910, 5921-2, 7000 and 9422)

The new AIC sampling strategy has been based around adoption of an integrated set survey stratifications, use of the generalized regression estimator and the exclusion of all small non-employing businesses from direct collection. These last units are the smallest non-employers whose aggregate annual BAS turnover accounts for no more than 2.5% of total industry turnover at ANZSIC class level - approximately 720 000 non-employers in a population of approximately 2 million employers and non-employers. AIC core estimates for this segment of the business population will be compiled directly from BAS data.

In July, the first set of AIC core and rolling program samples were selected, realising the goals of improved

sample integration. Sample designs for the NPI, Accommodation, Cafes and Restaurants, and ICTIS surveys were highly integrated with the AIC core (in fact the NPI strata formed an exact subset of those for the AIC core).

Further work has been done by the AIC NSW and VIC teams to ensure that common core component set of edits and auto adjustments are applied to data, and by the SSB team developing imputation and outlier treatment strategies to ensure consistency in the approach. Systems development is currently underway by Technology Applications teams in NSW and Victoria.

Work for 07/08 and 08/09 will progress further integration of strategies, business processes and systems components, including sample design, imputation and estimation.

For more information on the integration of components the AIC sample design and estimation strategy, please contact Greg Griffiths on (02) 6252 6970.

Children and Youth Statistical Portal

The Children and Youth Statistical Portal was released on 8 October 2007. The Portal is a pilot project for the National Data Network (NDN), an online research and collaboration tool developed by an ABS-led consortium of federal government, state bodies and research organisations.

Contributions to the information resources available through the Portal came from a number of organisations including Medicare Australia, the Institute of Criminology, the Telethon Institute of Child Health Research, the Australian Transport Safety Bureau and the Australian Bureau of Statistics. There are currently over 500 information resources accessible through the Portal, and this number is expected to grow over the coming months as more organisations join the project.

The Portal also contains a discussion forum to enable custodians, researchers and users to identify, discuss and where possible, resolve issues impacting on the visibility and accessibility of statistical information resources in this field. Three discussion topics were released with the portal to initiate community discussion and activity.

The NDN aims to improve the accessibility and use of all Australian statistics - the Children and Youth Portal is just one of a number of similar, topic-based portals planned under the NDN.

"We want statistics to be widely available, and for Australians to be able to use or benefit from their use," said Steve Matheson, Branch Head, National Statistical Service Leadership Branch, "and we encourage people to try the portal and work with us to help decide its future direction".

The Children and Youth statistical portal is accessible from the link on the ABS home page

<www.abs.gov.au>, or go straight to:
<http://portals.nationaldatanetwork.org/childrenandyouth>

For more information about the Portal, contact Lorraine Cornehl on (02) 6252 6079. If you have any queries about the NDN, call the NDN Business Office on (02) 6252 5875.

Low Consumption Possibilities (LCP) Project

The Analytical Services Branch (ASB) is undertaking a project aimed at developing a framework for identifying Australian households experiencing economic hardship. 'Consumption possibility' refers to the potential consumption that a household could enjoy, based on all of its economic resources, including income and wealth. The purpose of the analytical component of the LCP project is to determine the feasibility of combining income and wealth into a single distribution for purposes of identifying households experiencing economic hardship.

The method being used involves converting the amount of net worth owned by a household or individual into an annuity that pays a constant amount over the remaining lifetime of the annuitants. This annuity is then added to disposable or final income to yield estimates of wealth-adjusted income (WAI). The estimated distribution of WAI can be modelled using a variety of statistical methods.

Annuityisation of net worth involves a number of assumptions, considerations and data adjustments, including the types of assets to be annuitised, inter-generational wealth transfer, rates of return on assets and liabilities, the period of annuityisation, equivalisation of income and of wealth, avoiding double counting of investment income, and the inclusion or exclusion of superannuation in the value of assets to be annuitised. Several sets of estimates of WAI were produced based on these assumptions and considerations.

Examination of the estimated WAIs has shown that the method is reliable, and is robust and insensitive to minor variations in the assumptions underlying the method. When tested for their reliability and validity as indicators of economic hardship, the estimates of WAI were found to be consistent with both subjective and objective measures of economic hardship, such as financial stress and households reporting low economic resources. Analysis of the results also shows that if identification of households experiencing economic hardship or low consumption possibility were based only on income, then households identified as experiencing economic hardship would be different from those identified if identification was based on the estimated WAIs. The analysis may provide answers to questions relating to the discrepancy between income and expenditure, such as why some households in the lowest income deciles appear to have expenditure levels far in excess of their income and also have higher expenditure levels than some households in higher income deciles.

For more information on this project, contact Tetteh Dugbaza on (02) 6252 7221.

New Section on Data Collection Methodology (DCM)

The new Data Collection Methodology (DCM) section in the Statistical Services Branch (SSB) was announced on 20 August 2007. This new section combined the Survey Research and Effectiveness Unit (SREU) Questionnaire Design Team (QDT) staff with staff from the Forms Consultancy Group (FCG) into a single unit.

DCM provides expert advice, assistance and training on questionnaire design and evaluation methods, and on other interaction with respondents. As part of this support and leadership role, DCM also conducts literature reviews and experimental and observational research, maintains ABS research infrastructure, and maintains the Forms Design Standards and Evaluation Manuals.

Having completed the merge, DCM has a busy and exciting work program for the year ahead. Some highlights from this program include:

- business survey support, including usability testing of Blaise CATIs for several collections;
- household survey support, including advice on the collection strategy for the 2011 Census, non-response research and assistance in the development and testing of CAI instruments for household surveys;
- standards and infrastructure support including redevelopment of Standard Question Wording (SQW) and revision of Population Standards;
- research supporting the Multi-Modal Data Collection project, including Email Letter Standards, Web Form Standards, Interactive Voice Response implementation and a Mode Suitability Framework;
- research for additional chapters for the Forms Development and Evaluation Manual, including chapters on Behaviour Coding and Response and Error Analysis; and
- increasing the visibility and accessibility of the Forms Design Standards and Evaluation Manuals by publishing them to the ABS website.

For more information on the DCM work program, please contact either Kettie Hewett on (02) 6252 7295 for business surveys or Emma Farrell on (02) 6252 7316 for household surveys.

Progress Update on the Quality Infrastructure System (QIS) and Quality Gates

In the September 2007 edition of Methodological News, it was reported through the Making Quality Visible (MQV) initiative that the first production Quality Infrastructure System (QIS) was launched in August 2007. This article details further developments and

future directions for the QIS, and also provides an update of the progress that has been made in recent months on various aspects of the Quality gates initiative.

Progress Update on QIS - Quality Information Monitoring tool

The QIS was released as a production tool in August 2007. This is the first version release of the full production system, which is inclusive of a production release of the output reporting tools, SAS BI. A number of demonstrations of the new release have since been given to various economic survey areas in the ABS.

The first version of this production release is primarily focused on economic survey data, and consists of 13 quality measures (QMs): 12 measures from the ABS Survey Facilities (SF) tool and one measure from the Provider Information Management System (PIMS). The measures from ABSSF are focussed around survey frame quality measures, measures of accuracy, and adjustments to data. They include information about contribution to estimates from imputed and outlier values, and business provisions; standard errors, and relative standard errors; and live and dead units, and proxies on the survey frame. The measure coming from PIMS is the form receival rate.

As part of the release, there is a production release of a client interface that will allow formatted sending of the above quality measures to the production version of the Collection Management System (CMS), which is currently used by economic survey areas in their survey or collection sign-off procedures.

The output reports are displayed using the production environment of SAS Business Intelligence (BI) tools. These output reports are delivered via a QIS Portal (accessed from the user's desktop) within the SASBI environment, and show the relevant quality measures in a prepared report, hence allowing clients to view some aspects of quality for their survey without any work by the user.

On the household survey side, the Business Activity Monitoring (BAM) group have established a SASBI portal, which they are using for monitoring the MPS and SSS surveys. QIS and BAM have set-up a shared portal so that both economic and household quality information can be found by accessing the same reporting tool.

It is planned to have a second version of the production release of QIS in April 2008, which will contain more functionality in the output reports (such as a drill-down function for reports of measures, and the functionality of running user-specified SAS programs using QIS data) and the inclusion and breadth of more quality measures, including a broader range of users. The high priority quality measures on the horizon are live response rate, frame quality measures and linkage of more survey areas sending their quality measures to QIS.

Progress Update on Quality Gates

Recently workshops have been held with various economic and social survey managers to progress the initiative of quality gates for minimising statistical risks. These workshops have focused primarily on the role of quality gates in mitigating statistical risk, as well as prompting discussion as to what clients perceive to be risk areas in their collections and subsequently, where quality gates could be used. Discussions have also been held with the Economic Statistics Data Centre (ESDC), who have already put forward a list of quality gates, to assist them in furthering the implementation of their quality gates. In particular, assistance will be provided on the aspects of setting tolerances and remedial actions, based on their expectations of what is acceptable quality for their measures. Discussions have also been broadening the quality framework to include aspects (or show the synergies with) project management, monitoring processes, continuous improvement and more general risk assessment. Future work in this area will be focussed on assisting (and advising) more clients with creating and implementing quality gates, as well as work on broadening the framework as specified above.

For more information on either of these updates please contact Rebecca Cassidy on (02) 6252 6022 or Bruce Fraser on (02) 6252 7306.

Updates on the Census Data Enhancement Project

The Australian Bureau of Statistics is conducting a Census Data Enhancement project to add value to the data collected in the five-yearly Census of Population and Housing.

The central feature of the project is the creation of a Statistical Longitudinal Census Data set (SLCD), which is based on a 5% sample of the population. The aim is to link records for this sample from each population census by statistical techniques which do not involve the use of name and address. It is intended that the sample will be augmented at each census with a 5% random sample of people who have been born or migrated to Australia since the preceding census.

The whole 2006 Census data set may be used for quality studies. During the period of Census processing, names and addresses as well as other variables have been used to link Census data and other selected data sets for these quality studies. The quality studies that were proposed for the 2006 Census are of two types. The first type is to assess the feasibility and quality of linking without name and address, while the second is to help improve ABS statistical outputs.

Analytical Services Branch has undertaken the linkage work for four of these quality studies as shown in the table below. The linkage method used was probabilistic and implemented using a modified version of Febrl (Christen and Churches, 2005). The linkage runs have now been completed and analysis of the linked data sets is underway. Now that Census processing has been completed, all names and addresses provided by Census

respondents have been removed from linked data sets. The datasets will not leave the ABS, nor be accessible to anyone other than those ABS officers involved in the quality studies. These linked data sets will be destroyed after use.

Quality Studies for which probabilistic linkage has been conducted by Analytical Services Branch

In the areas of assessing feasibility and linkage quality:

- Simulated SLCD formation - linking data sets for Census Dress Rehearsal 2005 and Census 2006
 - with the aim of assessing the feasibility of forming the SLCD without names and addresses; and
 - making defensible statements about the quality of the linked data;
- Migrant Settlements - linking data sets for Migrant Settlements since 2000 and Census 2006
 - with the aim of assessing the feasibility of a subsequent statistical study to investigate outcomes for immigrants admitted under different entry visas.

In the areas of improving ABS statistical outputs:

- Indigenous Mortality - linking data sets for Deaths between August 2006 & June 2007 and Census 2006
 - with the aim of estimating the under-coverage of reported Indigenous status on death certificates; and
 - investigating the use of correction factors for improving estimates of Indigenous mortality;
- Investigate Possible Improvements to the 2011 Post Enumeration Survey - linking datasets for Post Enumeration Survey 2006 and Census 2006
 - with the aim of assessing the feasibility of replacing the current clerical matching with an automated procedure; and
 - widening the search area for people who give vague addresses.

Reference: Christen, P. and Churches, T. (2005a) Febri - freely extensible biomedical record linkage - release 0.3.1, Australian National University, Canberra, available at:
<http://cs.anu.edu.au/~Peter.Christen/Febri/febri-0.3/febri doc-0.3>.

For further information about this project, please contact Glenys Bishop on (02) 6252 5140.

How to Contact Us and Subscriber Emailing List

The Methodological Newsletter features articles and developments in relation to work done within the ABS Methodology 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 welcome comments.

If you would like to be placed on our electronic mailing list, please contact:

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Methodology & Data Management Division

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Current at December 2007

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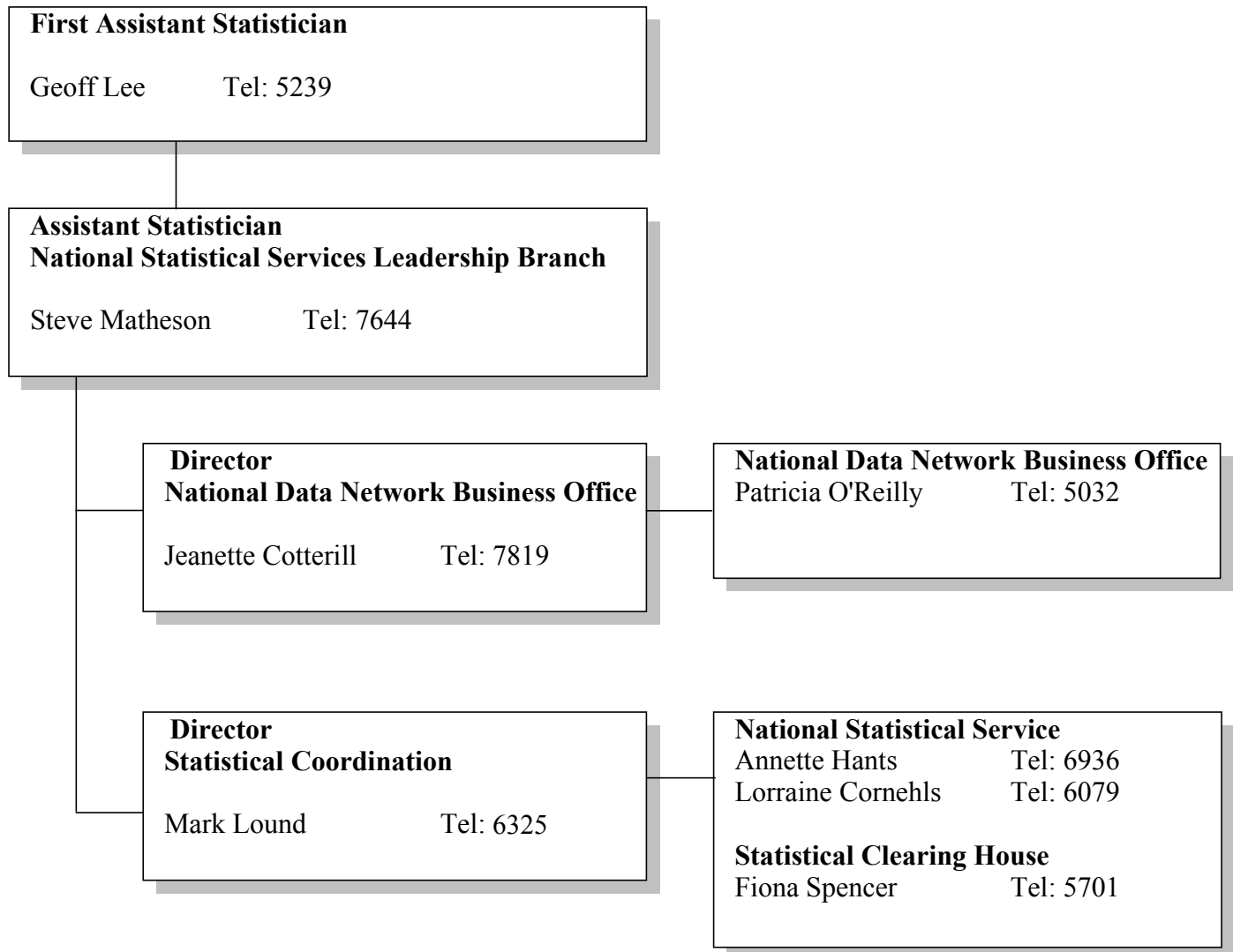
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