



**Economic and Social  
Council**

Distr.  
GENERAL

CES/2005/12  
17 March 2005

Original: ENGLISH

---

**STATISTICAL COMMISSION and ECONOMIC COMMISSION FOR EUROPE**

**CONFERENCE OF EUROPEAN STATISTICIANS**

Fifty-third plenary session  
(Geneva, 13-15 June 2005)

**THE AUSTRALIAN CENSUS AND THE INTRANET: OPPORTUNITIES AND  
RISKS**

Invited paper submitted by the Australian Bureau of Statistics

**SUMMARY**

The role of the Australian Census of Population and Housing is to accurately measure the characteristics of all people in Australian territories on census night. The census aims to provide high quality data for small geographic areas and for small population groups.

This paper briefly outlines the processes that will be put in place to provide an Internet option to the Australian public at the 2006 Census and the experience to date with the testing of the proposed solution.

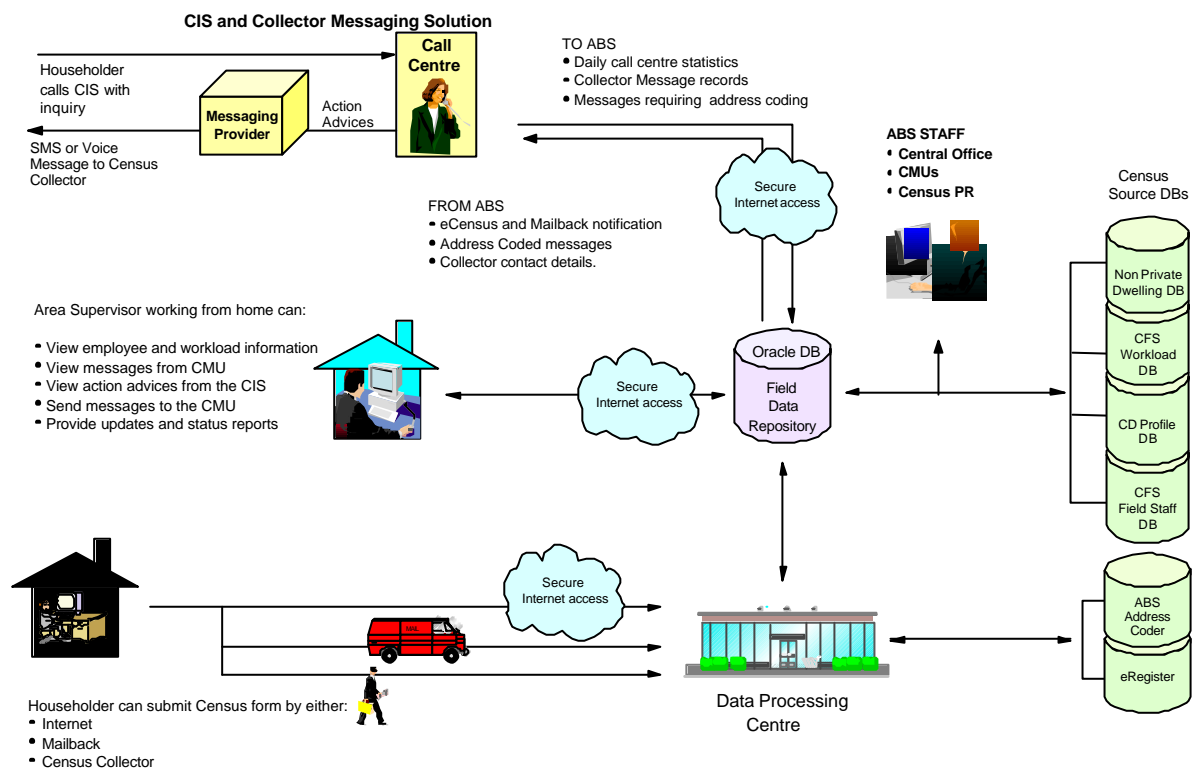
The use of the Internet provides new opportunities to reach out to geographic areas and population groups that were difficult to enumerate using traditional census methodology. As well there are a range of risks that need to be managed to ensure that the implementation of the Internet solution is both operationally sound and secure and the quality of the census is maintained.

**OUTLINE OF THE AUSTRALIAN E-CENSUS**

1. For the 2006 Census, Australia will continue to conduct a drop-off/pick-up (or list/leave) census. A collector will deliver a census form to each address within a designated area and return after the census to collect a form. For 2006 Census the householder will also

be given, in addition to the paper census form, a sealed envelope containing a unique 12 digit e-Census Number. If the person chooses to use the Internet rather than return a paper form they can log on to the census web site and with a combination of the Census Form Number contained on the paper census form and the e-Census Number to gain access to the e-Census form. Once the person has completed and submitted the census form, an SMS (short messaging service) message is generated to the cell phone of the relevant census collector, informing the collector that an electronic census form has been lodged and that the collector need not visit the house again.

2. This messaging system is integrated into an overall field communication system that also deals with inquiries from the public and the flow of management information between the census field staff and ABS (Australian Bureau of Statistics) management. An overview of this process is outlined in the diagram below:



3. Individuals within households and people in institutional dwellings will also be able to complete a census form on the Internet. These people will need to contact the Census Inquiry Service to obtain an e-Census Number.

4. In addition to standard Internet security (the same as used by banks etc), Internet transmissions will be encrypted and, as soon as the e-Census form is completed, the form will be moved behind the ABS firewall.

5. Systems are in place to monitor duplicate forms (a small number has been identified in each of the tests) and a decision process has been established to determine what form to accept. Ultimately, information from other ABS sources (such as number of dwellings within

each collection area) and information provided by the collector in the census collector record books can be used to check the validity of any particular census form or groups of forms.

6. Nothing will prevent attempts to lodge spurious forms. However, while the Census Form Number might be able to be derived by people who have knowledge of ABS processes, this is not the case with the e-Census Number. There is a one in one hundred thousand chance of correctly guessing a valid e-Census number. Furthermore, failed login attempts will generate a time delay, which increases exponentially with each failed attempt. These procedures will greatly reduce the likelihood of attempts to lodge a large number of spurious forms.

7. At this stage, the ABS intends to outsource both the Internet application and the infrastructure. A contract has been signed with IBM for this purpose and work has commenced on developing the applications as well as the infrastructure. This will be tested as part of the census Dress Rehearsal to be conducted in August 2005. Volume testing will be undertaken in the last quarter of 2005.

#### Test results

8. Several field tests have been conducted of the Internet processes using an ABS developed Internet form and ABS infrastructure. These tests have demonstrated the feasibility of the approach.

9. The most recent test, the 2006 Census Major Test was conducted in August 2004 covering approximately 21 000 households. There was a 6.7% take up of the Internet option. In one of the test areas, the census Internet option was actively promoted through the local press. The promotion appeared to have had absolutely no affect whatsoever.

10. Preliminary analysis of those using the Internet in the Major Test indicated almost equal numbers of males and females and a higher take-up rate by younger people and people with post secondary qualifications. Access to broadband did not appear to have much impact on whether the person used the Internet to return a census form or not.

11. A very small number of cell phone SMS messages appeared not to have been delivered to collectors. This is a great improvement on the messaging services used in previous censuses. These relied on voice mail direct to collectors (2001 Census), and messages relayed verbally by field management staff in the preceding censuses.

#### **MAINTAINING AND IMPROVING THE QUALITY OF THE CENSUS COUNT**

12. E-Census presents opportunities either to improve enumeration or contain costs. The following population groups have been identified and the use of the Internet to lodge the census form will be actively promoted:

- people in remote areas;
- people in secure apartment buildings;

- people with disabilities;
- young adults.

13. The communication infrastructure required to ensure the successful implementation of the e-Census will also enable better follow-up of non-responding households.

#### Remote areas

14. Many areas of Australia are logistically difficult and extremely expensive to enumerate. These include people in remote farms, mining settlements and off shore oil rigs. Special procedures are in place to deliver and collect census forms in these locations, including in the case of the Northern Territory, the use of the police.

15. In the case of the Australian Antarctic Territory, the paper forms were sent well in advance of the census by ship and not returned until seven months after census night.

#### People in secure apartment buildings

16. Secure apartment buildings present a number of difficulties for census collectors: gaining access to the building and to each residential level of the building and in ascertaining if each apartment is occupied. Associated with this is that many of these apartments are occupied by individuals who are working longer and irregular hours and eating out regularly. These factors greatly reduce the chance of contact by collectors.

17. This is an increasing problem as apartment style living grows in popularity. The 2001 Census saw a significant increase in “non contact” situations in areas with concentrations of these buildings.

18. A range of strategies will be implemented for the 2006 Census to improve collection in these buildings. One of these strategies will be to encourage the use of the Internet. These people are more likely than the general population to have access to the Internet.

19. Targeted promotion of the Internet option will be undertaken in areas where there is a high concentration of these buildings. Fliers and posters will also be present in the foyers and elevators of these buildings, and collectors will be trained to advertise the availability of the e-Census to SAB residents on contact.

#### People with disabilities

20. In previous censuses, people with impaired vision or motor skills may have required assistance from a carer to complete their census form. With the introduction of the e-Census form, these people may be able to complete a census form independently with the assistance of a screen reader or other assistive technologies.

21. ABS has approached a number of groups representing the disabled to assist in the design of an accessible Internet census form.

22. The availability of the Internet form will be promoted to these groups through disability service providers such as Department of Human Services and organizations such as the National Blind Society and through specialized media such as radio for the print handicapped.

23. A special census inquiry number will be established for people with disabilities. This will be promoted through the collector as required and through the disability service providers.

#### Young adults

24. This group has both a high level use of the Internet as well as the highest measured level of under enumeration, particularly amongst males between 15 and 39 years old.

25. This age group also has the highest level of Internet use, with 54% having used the Internet in the week before the 2001 Census. This group accounted for 63% of all Internet users as reported in the 2001 Census.

26. Many of this group is living alone or in group households rather than in traditional family households. This is a particularly difficult group to target – as all advertisers have found and are somewhat skeptical of traditional marketing campaigns.

27. Targeting popular television talk shows watched by this group may be an option. Others include breakfast radio and radio networks aimed at this demographic. Promotion on university and technical college campuses will also be considered.

#### Following up non-responding households

28. The introduction of the Internet option and the associated communications infrastructure provides an opportunity to manage better the census field operations and contain the number of “non contact” dwellings. These are dwellings, which the collector has determined to be occupied, but for which no census form has been received. For the 2001 Census the proportion non-contact dwellings nearly doubled to around 2% of all dwellings. This is probably due to the increase in single person households and two person households with both partners working.

29. In previous censuses, the collector left a reminder note at each dwelling where a census form had not been collected requesting the householder to mail the census form back to the ABS and no further follow up was undertaken. There was no way of notifying the collector in a timely manner that a census form had been received from the dwelling.

30. For 2006 Census, collectors will be advised by SMS messaging to their cell phone whether a census form has been received either by Internet or by mail. Field managers will be able to organize to undertake intensive follow-up for those areas with large numbers of forms not received.

31. Other procedures will be implemented to contain the number of non-contact dwellings. These include requesting the non-responding household to either complete the census form or alternatively supply information about where the people in the dwelling were on census night.

## **CRITICAL SUCCESS FACTORS**

32. Some of the critical success factors are listed below:

### Capacity of final solution.

33. The final e-Census solution used for the 2006 Census may have a capped load capacity due to funding constraints. This will require targeting of the offering of the e-Census form to those people and areas that will provide the greatest benefit in terms of quality and cost of the census enumeration.

34. Public relations messages will be ready to inform the public of any capacity constraint on the e-Census site and that they may need to delay their completion of an e-Census form.

### Perceived security of the Internet in 2006.

35. Should an event such a widespread infection of a computer virus, or hacking on a broad scale, become prevalent in the lead up to the 2006 Census, the willingness of the public to provide personal information online may be diminished. This may lead to a reduction in the take up rate.

36. A stringent security plan is in place for the e-Census system. This will be subject to an independent audit that will examine all aspects of the security of the application, infrastructure and e-Census sites, including internal security within IBM and ABS. Once a completed census form is submitted, it will be moved behind the ABS firewall. Public relations messages need to assure the public of the security of the e-Census system.

### Levels of Internet connectivity in 2006

37. The amount of people regularly connecting to the Internet in 2006 will directly affect the take up rate of the e-Census, as those who do connect to the Internet on a regular basis are more likely to complete their census form online, in comparison to someone who only uses the Internet occasionally.

38. The load capacity of the e-Census system will be based on an estimation of internet connectivity rates for 2006, and connectivity rates will be monitored in the lead up to the census in order to avoid unexpected load during the census enumeration period.

### The capacity of Australian ISPs (Internet service providers) to handle increased levels of Internet traffic on and around Census night

39. An inability of Australian ISPs to handle high levels of Internet traffic generated by use of the e-Census will severely impact upon the take up rate of the e-Census. Should the services of a major ISP be unavailable, a large number of people will be unable to connect to the Internet, and therefore unable to log on to the e-Census form. This may result in respondents choosing to revert to a paper form, or not completing a census form at all.

40. A strategy for the notification of ISP's in the lead up to the 2006 Census will be implemented, in an attempt to manage some of the issues arising from increased internet traffic generated by the e-Census.

#### Malicious attacks on the e-Census web site

41. A denial of service attack would not only reduce the ability of people to lodge their census form on line but could also have an adverse affect on the image of the ABS and of the census.

42. ABS along with IBM will be implementing a range of measures to contain any such attacks. These include continuous monitoring to detect possible attacks with the options of locking out source ISPs for up to thirty minutes or provision of additional access routes to the census site. In cases where these attacks cannot be dealt with quickly, public relations messages will firstly assure the public that their census information is secure and secondly provide information about alternatives such as delaying using the e-Census system or using the paper census form.

#### Integration of e-Census into other census systems and procedures

43. The successful implementation of the e-Census is reliant on the successful integration of the e-Census system into existing census systems and procedures. This is to both maintain the quality of the census and the cooperation and support of the public.

44. For census field systems, this includes the successful operation of the Census Inquiry Service and the census field communication systems to ensure that every household and person is counted and that households that have completed an e-Census form are not followed-up unnecessarily.

45. Census processing will be required to accept e-Census forms and integrate them into the processing streams. Importantly, processing will be required to undertake additional checks for duplicated records and determine which of the records is to be retained.

\* \* \* \* \*