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Innovations planned for 2020 census round, and results of tests

Big crocs, big snakes and small Censuses - the story of Australia's digital-first Census

Note by the Australian Bureau of Statistics¹

Summary

The Australian Bureau of Statistics (ABS) will deliver Australia's first Digital Census in August 2016, a major change to the way we collect data, communicate with the public and manage our operations. The new model will collect higher quality data through smarter online forms, save money through increased online participation and reduce variability of response rates between areas and population groups through tailored approaches and real-time monitoring.

¹ Prepared by Duncan Young.

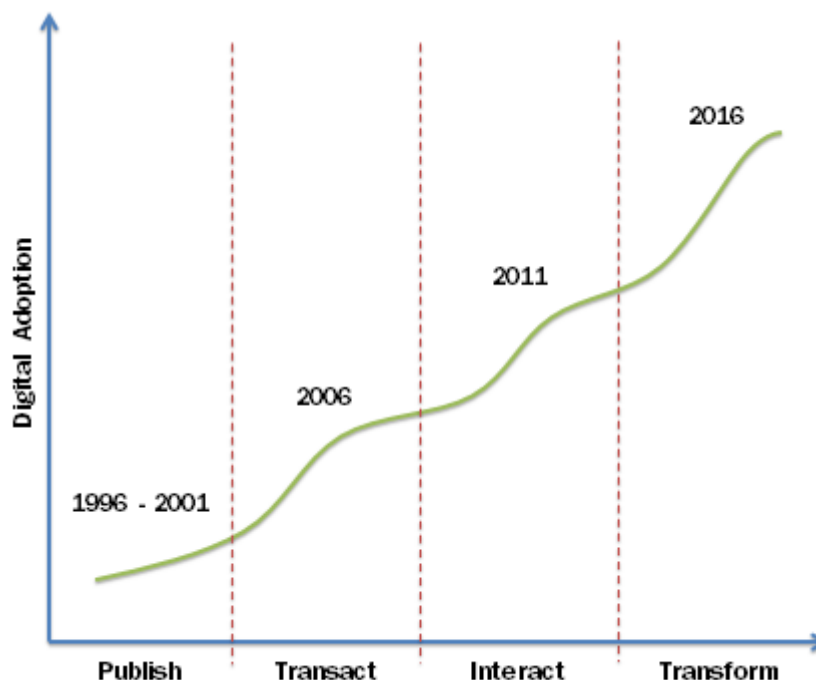
I. Background

1. Australia has some of the largest and most dangerous snakes and crocodiles in the world. As the sixth-largest country in the world, in terms of land mass, it also had one of the largest Censuses. Whilst there is little that the ABS can do about the size of our crocodiles or snakes, over the last three years the ABS has embarked on a major transformation of the Census program to make the Census much smaller.
2. As in most nations, the Census of Population & Housing is the largest statistical collection undertaken in Australia and arguably the largest logistical activity in Australia. Australia has conducted a long-form, five-yearly Census since 1961, and 2011 marked 100 years of Census-taking in Australia.
3. Despite incremental innovation, including the introduction of online forms in 2006 and a significant increase of online responses to 33% in 2011, it had become clear that the Australian Census was not sustainable. The Australian Census model, which had remained largely unchanged as an area-based, hierarchically-managed field enumeration, was reliant on an ever increasing field force and increasing enumeration costs. The effectiveness of doorstep contact by a legion of field officers was also reducing as the number of single person and dual worker households increased, as well as the increasing popularity of secure / gated buildings amongst other social changes.
4. The Australian Bureau of Statistics (ABS) decided that a significant change was required in order to address these challenges and received government support for a business case in 2012 to transform the Census program. The business case was based on achieving sufficient operational savings in 2016 to self-fund the investment required to transform the program, also deliver efficiencies to government and provide a more sustainable ongoing model for the Census program.
5. The operational savings would come from both the costs of field enumeration and in data capture and processing. The new model would reduce the number of census field staff through the use of mail to approach and remind households with their instructions on completing the Census rather than using field visits. The default response channel is online, with paper forms only available on request. Data capture and processing savings will come from the shift from paper form returns to online forms and collection of higher quality data through a smarter online form.

II. Digital transformation

6. The ABS has been considered a leader in the adoption of eGovernment with the early establishment of the ABS website in the early 1990s and the move to make this the primary channel to publish ABS products. The ABS moved from a one way publishing of information to public transactions with the successful use of online forms in the 2006 Census of Population and Housing. The ABS went further in 2011 with significant public interaction and business process integration with online form advancements, social media and an improved enumeration process.

7. The following diagram shows how digital adoption has stepped through the stages of publishing, transacting, interacting and then in 2016 – transforming.



8. The Census in 2011, whilst integrating a range of electronic channels, was conducted largely using a traditional Census model of starting with a clean sheet, geographically blocking the country and manage these blocks with a hierarchy of field officers. The use of technology was largely orientated around digitising current services, like the online form or the Census Manual, not on re-engineering.

9. The Census in 2016 will be the first Digital Census. As the first Census built digital first, it involves rethinking the business model to be orientated around data. The Digital Census starts with a national register of dwellings, with field operations designed to populate this register with dwelling and person characteristics.

III. Census 2016 Design

10. The 2016 Australian Census design embraces the fact that most people in Australia are willing and able to complete the Census with minimal assistance or prompting. The model aims to enumerate every household with the least marginal cost. In general, this means that the preferred return channel should be a self-completed online form, with a second preference being a self-completed paper form. The ABS looked to learn from and take advantage of the work conducted by other national statistical offices, in particular the work of Statistics Canada and the Office of National Statistics.

11. In order to support this design objective, the ABS has developed a suite of different enumeration approaches – a great enough number to tailor effectively and efficiently to the population, but a small enough number to be able to be deployed and managed without significant risk. These approaches have been divided into two categories – adaptive and responsive approaches. Adaptive approaches are determined before the commencement of Census enumeration based on the geographic, demographic, dwelling or behavioural characteristics of a particular area. Responsive approaches are determined during the

enumeration period, where based on response rates or other field intelligence a different approach is utilised.

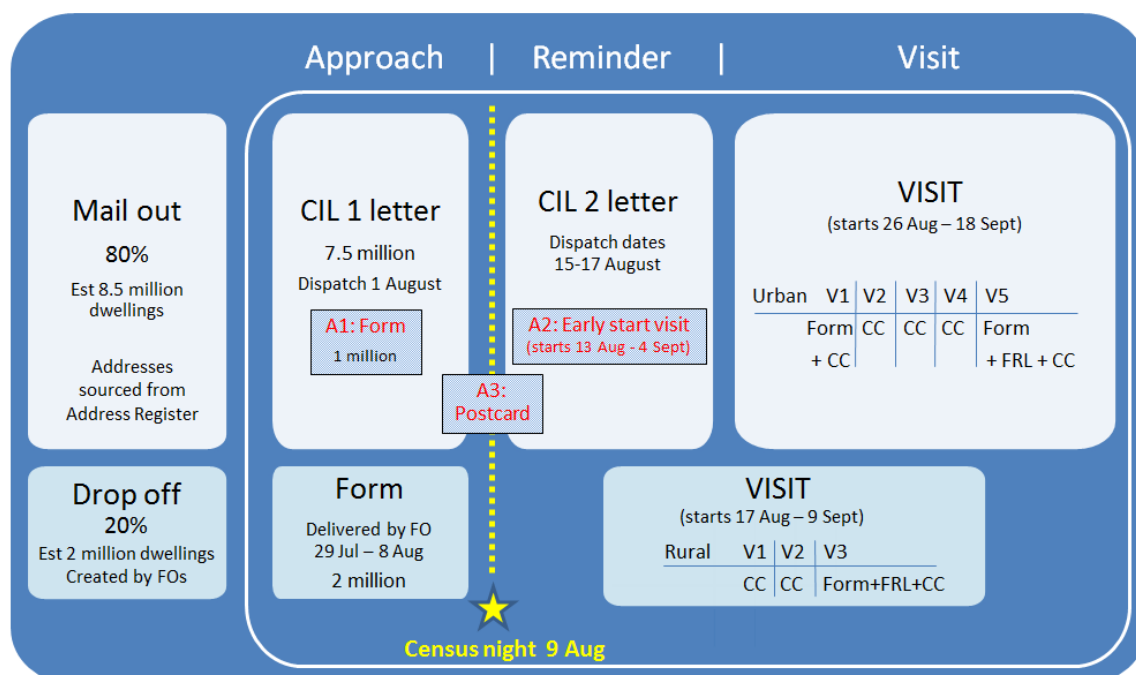
12. The default approach during the 2016 Australian Census is to use the national postage service to approach households, and to approach these households with a simple letter providing an online access code and instructions on how to complete the Census online. The letter will also provide detail on how to request a paper form. An automated telephone service will be in operation to receive these calls and automatically despatch Census forms.

13. Households that have not responded within a couple of days of the Census reference night (9th August 2016), will be posted a reminder letter. The approach and reminder letters, and the envelopes that they are sent in, have both been developed in collaboration with behavioural experts at the Commonwealth Scientific and Industrial Research Organisation (CSIRO) in Australia. An improvement in public response to the letter of close to 50% has been achieved through the application of behavioural psychology and iterative testing.

14. Households that have still not responded two weeks after the Census night will be visited by Census field officers. Census field officers will visit dwellings up to five times, consistent with our approach in Census 2011, in order to secure a response.

15. Approximately 65% of Australian dwellings will follow this approach. For the other 35% of dwellings there will be a pre-planned variation (some dwellings will receive more than one variation):

- In areas with poorer quality addressing or poorer postal service, dwellings will be approached by Census field officers using an area-based (as distinct from a register-based) approach in a very similar fashion to the Census in 2011. Field officers will attempt to make contact and deliver paper forms where required or where contact is not made. Field officers will follow up households more immediately after the Census reference night. This will be the case for approximately 20% of dwellings.
- In areas with poorer internet connection, forecast lower internet response rate or overall poorer response rate, dwellings will be posted a full Census paper form on first approach. The new 2016 Census paper form design incorporates a strong 'online first' message on the cover page and thus aims to still encourage online response where possible. This will occur for approximately 10% of dwellings.
- In areas with low levels of dwelling occupancy or at risk of high levels of non-response, field officers will be deployed immediately after the Census reference night to conduct more timely follow up and make assessments of dwelling occupancy. This will cover approximately 5% of dwellings.
- In areas at risk of high levels of non-response or high levels of register undercoverage, an unaddressed reminder postcard will be delivered to all dwellings and postal boxes immediately after the Census reference night. This is forecast to include approximately 5% of dwellings.
- In remote communities mobile teams will conduct interviews. These areas include less than 5% of dwellings.



Each Form will also include a replied paid envelope for mail back

The Paper Form Request Service will be available for householders who receive a letter to request a Form

When contact is made on delivery in Drop Off, householder will be encouraged to respond online with codes provided on front of form

Visit numbers are a guide to maximum number of visits only, not all non-responding dwellings will receive this many visits

Materials left when no contact is made on non-response visit are Calling card (CC) and Final Response Letter (no identifiers) (FRL) on last visit

CIL - Census Instruction Letter

A1 - Adaptive variation 1, 1 million Forms will be mailed out

A2 - Adaptive variation 2, Post Census Night, selected areas will commence non-response visits from 13 Aug rather than receive a reminder letter (may also include DO areas)

A3 - Adaptive variation 3, Selected areas may receive a postcard via Unaddressed Mail Service (UMS) around Census night

16. During the enumeration period a national enumeration management centre will be monitoring a range of management information, including online response rates, paper forms requests, paper form returns, contacts to the call centre, field activity, social media and traditional media activity. When the relativities between different areas pass a particular threshold (e.g. when an area has much higher or much lower response rate than other areas), a variation to the enumeration approach will be proposed. This proposal will be clerically reviewed and a decision will be made whether it will be actioned.

17. The responsive treatments that the ABS will apply during the Census are:

- Investment in targeted PR – in particular use of digital media where local targeting is easily deployed;
- Increase resources during visit phase to allow greater number or greater rate of visits in an enumeration area;
- Extend the visit phase by up to five days in an enumeration area;
- Stop the visits in an enumeration area; or
- Deploy a specialised mobile enumeration team to do intensive follow up.

IV. Expected results

18. The proposed Census design has the following success targets, which the ABS believes will be met based on testing conducted.

- Maintain 2011 Census response rate (96.5%) whilst reducing geographic and sub-population variability;
- Receive 50% of responses before commencing follow up visits;
- Receive 65% of responses via the online form;
- Reduction of field officer and area supervisor hours by 50%; and
- Reduce the operational cost of the Census by over \$100 million.

V. Enabling infrastructure

19. The transformation of the Australian Census has required a significant investment in enabling infrastructure, including new processes, methodologies and systems. The initial thinking commenced before the conduct of the Census in 2011 and major development commenced in mid-2012. The infrastructure has been delivered and tested incrementally through a range of field tests.

20. The ABS has developed a comprehensive, high quality Address Register for the mail out enumeration areas through integration of existing address files and the conduct of a nation-wide address canvassing exercise using handheld devices and a custom built application. The ABS has also developed an automated maintenance mechanism to process changes to the register using a variety of different administrative data sources.

21. The large legion Census field officers will utilise technology in all aspects of their role:

22. Recruitment will be conducted online;
- Employment administration will be online (signing employment contract, providing bank and superannuation details, submitting expense claims);
 - Training and assessment modules will be delivered online;
 - Knowledge base will be available online; and
 - Field work will be conducted primarily using their own (“Bring Your Own”) mobile device, but will be complemented with some ABS supplied devices and some use of paper/data entry (“Print Your Own”).

23. The digitisation of the Census field workforce means that the ABS is receiving near real time information on operational progress and can provide timely instruction back to the workforce in order to optimise their activity.

24. The enumeration management staff at the regional and national level have an operational management interface that provides visibility across enumeration operations. This operational management system provides automated, optimised allocations of visit work to field officers based on the field officers home location and availability, but also allows manual intervention and clerical adjustment.

25. The online Census form has been specifically designed to support mobile devices including smartphones, tablets and desktop computers in order to maximise its accessibility to all households. The online form contains new question design functionality to improve the quality of the data collected and reduce the expense of data coding during processing operations, including supplementary questions to seek further detail to assist coding when first answer provided is ambiguous.

26. Picture - Online Census Form used in the 2014 Major Census Test across three different devices:



VI. Quality Assurance

27. The ABS Census Program has undertaken a series of activities during 2014 to provide feedback and assurance of the program direction, development progress and operational preparedness. These activities included an international peer review (Census experts from UK, NZ and Canada), a domestic review using 2011 Census practitioners and a Major Test of 100,000 households (1% of Australia). These events provided a range of valuable feedback and insights into areas for continued focus, whilst providing overall validation of the program direction and ABS's ability to deliver on our objectives.

28. The Major Test of 100,000 households in August 2014 was the largest field test ever conducted by the ABS. It was designed to cover urban, rural and mixed areas. The test saw the execution of the four phased 'wave based' field model (Preparation, Approach, Reminder and Visit) and confirmed the ability for the ABS to execute the wave-based enumeration model using an ABS developed Address Register. It also showed that this enumeration model would be effective in enumerating both households and persons in Australia.

29. Field staff involved in both the delivery of forms in non-mail out areas, and in follow up operations, utilised a mobile application on a variety of different mobile devices. This confirmed the value of mobile devices to deliver and capture information from field officers. It has also confirmed that our field staff are able and willing to utilise technology both in the field, and in their home, enabling us to run a more flexible and efficient operation.

VII. Key learnings

30. Undertaking such a major change of our approach to the Census within one five-yearly cycle has presented some challenges, however we are well positioned at this stage.

31. The key learnings during this cycle in relation to our Census design, which have led to changes in our approach, have been:

- Favour simplicity wherever possible - original designs had a larger number of variations to our approach, however these have been refined down once the cost of the complexity was weighed up against the marginal benefit of the variation;
- Ensure field staff do not lose ownership over their work - a strength of the traditional model has been effectively utilising the judgement of a field staff member who has access to local information that can better inform a decision than any automated solution;
- Conduct sufficient tests to validate your assumptions;
- A consistent, accurate source of management information across all processes is vital to support centralised decision making;
- Social media has evolved since 2011 with a greater expectation of multi-directional engagement including technical support; and
- Technology dependence introduces new risks and a sufficient focus on the non-functional aspects of technology including usability, durability, scalability, security and performance should not be lost in the pursuit of the necessary functionality.
