



## **Census: Traditional Census - a misnomer or an oxymoron**

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### **Abstract**

Australian Bureau of Statistics conducts what is often described as a ‘traditional Census’ with a point-in-time, complete enumeration of the nation’s population and housing. However, the ‘traditional Census’ of today would be unrecognisable to those that commenced the ‘tradition’ one hundred years ago in Australia but many centuries ago in some nations. The Census method and processes have significantly changed from the perspectives of the organisation, the employee and the citizen, but even more importantly there has been a change in the value proposition and utility of the Census as part of a broader, more integrated statistical system.

This paper will explore that the notion of a traditional Census is not just a misnomer, but an oxymoron. As the Census must maintain currency with both national capability and social change, the continuation and generally accepted acceleration of these changes means a traditional approach will never meet expectation.

**Keywords:** Census; Census 2011; Census 2016; United Nations Census Recommendations.

## **1. Introduction**

The third revision of the United Nations Principles and Recommendations for Population and Housing Censuses defines a traditional Census as being a full field enumeration of the individuals and dwellings in the country, and distinguishes this Census from a register-based Census where Census-like results are drawn from one or multiple integrated administrative registers (United Nations 2015). The word ‘traditional’ can refer to something that is long-established, something done habitually or something done according to a usual style (Oxford Dictionary 2015). Whilst in many countries Censuses are long-established, both their habitualness (frequency) and their style are evolving, such that even a full field enumeration Census in 2020 would be largely unrecognisable compared to one held in the past. This paper explores how the singular concept of a traditional Census is being challenged and how Censuses need to adapt to survive.

## **2. Drivers for change**

### **(a) Relevance**

The fundamental need for the Census has not changed significantly – the Census helps answer the key questions of ‘How many are we?’, ‘Who are we?’ and ‘Where do we live?’ (United Nations 2015), however not only do the possible answers for these questions evolve but also the underlying concepts that support these.

The ‘how many’ question was easier to answer in a time and construct where citizens lived and worked in one locality, however this construct often no longer fits as neatly with increasingly dynamic populations in many countries. Citizens may work and reside in two different localities with long-distance commutes in between and sometimes maintain residences in both locations. Increasingly this may also include the traversal of international borders.



The ‘who are we?’ question encompasses a seemingly continuing broadening spectrum of response categories across education, occupation, ancestry, relationship status or gender and biological sex. Not only are there an emergence of new possible answers, but also there is a growth in the complexity of a person’s characteristics, for example an individual can commonly have multiple employers or a large number of different ancestries.

‘Where do we live’ questions face a similar growth in the range of possibilities.

In Australia, the ‘Census tradition’ extends across the last 100 years and 16 Censuses. During this time the Census has covered over 80 topics, with only 19 topics staying consistent throughout all Censuses, and the majority of these have had major changes to the question during this period.

#### **(b) Responsiveness and timeliness**

Traditionally a country may conduct a Census every five or ten years, and be able to publish the results in twelve to twenty four months after Census night. Whilst this degree of timeliness of data, and responsiveness to changing information needs, was traditionally accepted and remains suitable in many nations for some purposes, like the setting of electoral boundaries, it has led to considerable criticism of the Census. This frequency limits the use of Census to design and evaluate government policy or more broadly the government as a whole, whom usually have significantly shorter periods of leadership. Without evolution, alternatives to the Census are sought and utilised.

#### **(c) Cost and burden**

The Census is one of the largest and costliest logistical exercises conducted in most countries, and certainly the most expensive statistical activity. Following a traditional approach this cost will increase as the number of dwellings increases, as the number of people increase, as the range of information to be collected increases and as the cost of labour increases. The cost of the Census has caused Censuses in some countries to be delayed, cancelled or reduced in quality (United Nations 2015).

In addition to cost, many nations are becoming more aware of the burden, sometimes referred to as a regulatory or compliance burden, imposed by the Census on its citizens, and thus the opportunity cost of this activity. In Australia, the Census is estimated to take between thirty five to thirty seven minutes per household, and thus with full enumeration and based on national median wages, the burden of the Census on society is \$145m AUD (approximately \$110m USD).

#### **(d) Public capability and expectations**

The form of the Census needs to evolve as the capability and expectations of the public do. The conduct of personal interviews, whilst necessary and favoured in a number of countries, in countries with high literacy and a common language, interviews are not only not necessary but may also be seen as undesirable due to privacy concerns or being less convenient than self-completing.

With an increasing adoption of and literacy in technology in households there can be an increased expectation that the Census can be completed online from the household.

The citizenry can also have expectations around the efficiency of government expecting not only the reductions of cost, but the effective use of information across government and that information that the government holds will be used and not collected multiple times.



### 3. Emerging opportunities

#### (a) Technology opportunities and expectations

A purely traditional Census would have had little reliance on technology, with hand-drawn maps, paper questionnaires, manual data compilation and paper-based publishing of Census results. Very few, if any countries, have not started to evolve their Census on from this point whether this is through the introduction of computers to support data compilation and validation, Geographic Information Systems to produce digital maps or electronic questionnaires to collect data more efficiently.

The effective use of technology in a Census can lead to cost reductions, improved consistency and quality of data, improved timeliness, reduced operational risk, better data retention and greater data use and the meeting of evolving public expectations. In organising a Census, consideration of the benefit the technology can provide to the nation, needs to be considered against the skill of the organisation and the suitability of the technology for the nation, along with an assessment of its safety, stability, security and scalability (United Nations 2015).

#### (b) Information opportunities

The 21<sup>st</sup> Century is recognised as both an information age and a digital age. The depth and range of information both collected and accessible and the computational power of computers available to process this information has offered significant opportunities for social transformation. The information age presents opportunities for national statistical offices to consider the use of alternative data sources rather than the full field enumeration of a Census.

In most societies this may begin with the digitisation of administrative data sets such as the registrations of births, deaths and marriages or international population movements; thus making a regular set of information on population changes available.

Beyond these data sets, the digitisation of other citizen transactions such as use of health or education services, or even commercial data sets from the use of mobile phones or banking facilities, create even richer sets of information on the 'who' and 'where' of the population. Successfully tapping into the richness of this information not only presents opportunities for increased timeliness of Census like information, but also allows the exploration of topics that are too complex and detailed to be asked in a questionnaire.

Even in countries without centralised registers of the population, the growth in digital data presents many opportunities for the statistical system.

### 4. The "Modern Census"

To respond to the need for Censuses to meet the needs of relevance, timeliness, reduced cost and embracing technological and information opportunities, most nations evolve their Census every iteration and conduct not a 'traditional census' but a 'modern census'. Modern means using the most up-to-date techniques, ideas or equipment (Oxford Dictionaries 2015), and is contextual to the nation conducting the Census. A modern Census in one nation may resemble a more traditional Census in another. The United Nations recommendations for Census highlight the importance of evaluating each Census in order to identify opportunities for change and improvement for the next Census (2015).

This modernisation of the Census occurs across two significant domains use of technology and use of the information age. This modernisation is sometimes characterised as a binary choice - is this a digital Census or not - but changes in these domains are best seen as positions on a continuum.



In Australia, technology has been adopted progressively over the last one hundred years from the early adoption of mechanical tabulation in 1921, to the first use of computer technology in 1966, to the introduction of CD ROMs in 1986 and ultimately to the first electronic questionnaires in 2006. In 2016 the Australian Census is being heralded as a 'digital-first' Census as the majority of households will complete the Census online, the online form was designed first and then adapted to paper (rather than visa-versa) and the majority of field operations will be digitally based. However, despite this extent of modernisation and digitisation, the Census will continue to approach households using letters written on paper, still support paper forms for up to 35% of the population and still have manual/paper-based backups for most operations. The 2021 Census in Australia will provide even further opportunities for digital-adoption and a shift further along the digital continuum.

The use of information from sources outside of the Census questionnaire in Census results can also be considered as a continuum. At one extreme you have the use of the Census as a completely stand-alone source of information on the population and its dwellings and at the other extreme you would have Census-like results being produced completely from registers without any field enumeration of the public. Whilst the vast majority of countries (85%) reported that their Census was of the traditional kind (United Nations 2013), there are few countries completely at either end of this continuum and most rest in between.

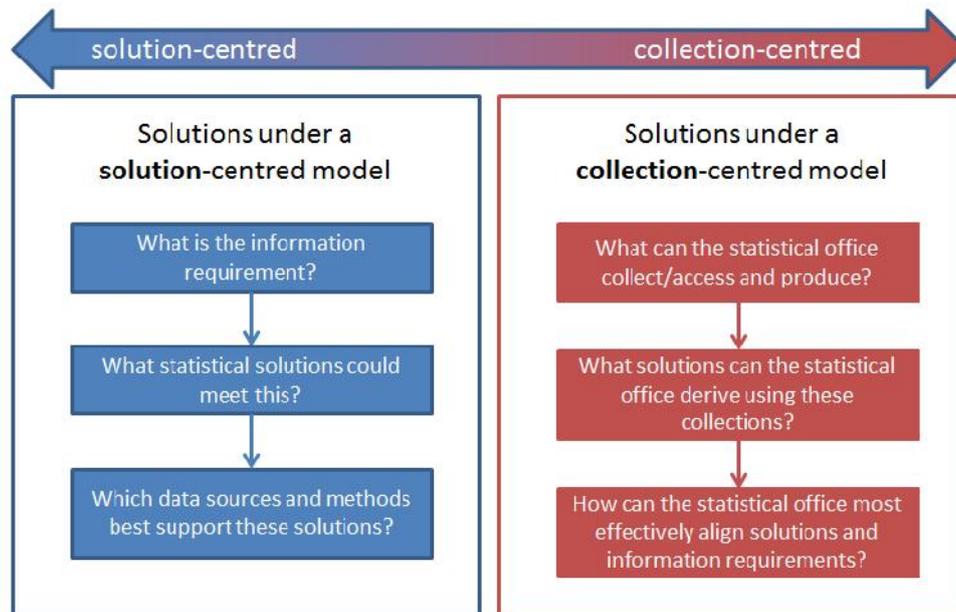
In a number of countries the Census is now considered alongside a household survey program, which uses more regular sample surveys to provide intercensal data or data in greater detail on particular topics. The American Community Survey in the United States of America is a strong example of a survey that is complementary and co-designed with the Census. In many other nations, there may be looser connections and no integrated design, however both surveys and Census contribute the understanding of the people and households in the country and consider each other in their design.

In many of these same countries and a number of others, administrative data is being used in a variety of ways alongside Census data. Administrative data is used to produce intercensal estimates of the population or produce other data on the population (education enrolment, use of health services). Administrative data is also being integrated with Census data to replace the need to include questions on the Census form (eg questions on individual income may be sourced from national revenue/taxation department) or to extend Census data into new areas (eg understand past or future events for an individual or household).

Whilst the rate of adoption of alternative data sources to supplement, complement or replace directly enumerated Census data will vary across countries dependent on data availability, cost barriers, public acceptability and capability of the statistical office, like the adoption of technology most countries are making progress on this continuum each Census.

#### **4. Solutions Orientation**

This paper has highlighted the drivers that are forcing the need to innovate and evolve the Census, and described how the Census is evolving across the domains of both technology adoption and the use of the information age. In order to more directly address the key theme of 'What is a Census during times of changing methodologies and technologies?', this paper will now introduce a concept that is central to the Australian Bureau of Statistics (ABS) current thinking of how the complete program of statistics across economics, population and social subject matter needs to be transformed. The ABS is looking to shift from taking a traditional collection focus to our statistical program to a new solutions focus.



Under our traditional collection-centred model, we commence by looking inwards at what the ABS can collect, access or produce, and then looking at how this can be leveraged to meet the actual information requirements. This anchors us in current and traditional approaches, and provides no guarantees that an information requirement will be met. Under the solution-centred model we start with an outward focus of considering the information requirements, and then looking at what solutions can meet this need.

In Australia, and probably across many nations, we have approaches the Census in a collection-centred model with the initial assumption that a full, long-form Census will be conducted – and then consideration is given to how this collection can best meet information requirements and provide public value. For future Censuses, the Australian Bureau of Statistics is taking a holistic national view of the social and population statistics needs in terms of the range, detail, accuracy and timeliness of information requirements and then weighing up the relative merits of different methods and sources that could meet these needs. Through this exercise a design for a Census, if required, is able to be formed to be part of the answer not just conducted traditionally as a solution retro-fitted to a range of problems.

For any national statistical office, the change to a solution-orientation will be characterised by an increased focus on information requirements rather than statistical collections. It will introduce a greater appetite for multi-source rather than single-source statistics, and will shift the organisation's value proposition more towards statistical leadership rather than information supply. The national statistical organisation will be more defined by its value add activities in analysing and interpreting data rather than by its infrastructure and collection management capabilities.



## 5. Conclusion

Whilst there are various forms of Censuses conducted across the world, with some reliant on field enumeration and others on use of registers, it is argued that there is not and should not be the concept of a traditional Census. Society and government expect the continual evolution of the Census to meet needs and expectations of the times and the national context, and thus the design and conduct of a modern Census somewhere along the continuum of technology adoption and use of the information age.

The design of the modern Census should be evolved further by not thinking about the conduct of a Census but rather by considering the breadth of national information needs and then determining the design of an integrated systems of administrative data, sample surveys and the Census that best meets these needs.

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