

Brian Doyle and Raymond Chambers, Australian Bureau of Statistics

1 General

Most discussions on census evaluation concentrate on studies that have been conducted after census day. This paper commences in a similar vein, with a discussion of the use made of the evaluation studies conducted after the 1976 Census. The emphasis then shifts to a discussion of the pre-census evaluation for the 1981 Census and covers two main aspects:

- i the procedures that were involved in evaluating whether a topic should be included in the 1981 Census; and
- ii once the topic was included, the processes of ensuring that accurate information would be collected.

These two aspects of pre-census evaluation are portrayed as separate steps for ease of explanation only. Obviously the decision to include a topic should be based on the knowledge that a "suitable" question can be developed and the two processes are therefore interrelated.

2 Use made of 1976 post census evaluation studies

Following the 1976 Census three major evaluation studies were undertaken.

- i a Dwelling Coverage Check (DCC) One percent of collection districts (ie about 2,500 CD's) were completely relisted to provide information on missed dwellings.
- ii a Person Coverage Check (PCC) Two thirds of one percent of households (about 30,000 households) were selected for reinterview to provide information on missed persons.
- iii a Census Content Check (CCC) A systematic sample of one in four of households in the PCC (about 7,500 households) were selected for reinterview on the content of the census (as well as being included in the PCC). Subsequently, one half of the selected households were processed.

Considerable reservations about the accuracy and usefulness of the DCC exist because of -

- . inadequate definitions as to what constituted a dwelling and
- . inadequate procedures adopted to determine whether the dwelling was occupied on census night or not.

Putting aside the PCC for the moment, the CCC relied on the matching of processed census records with the survey records. As a result, final census results were available before the evaluation studies were processed. Little use could therefore be made of the CCC in the early analysis of the 1976 census, with its main use being in the planning for the 1981 Census.

Following the production of the first preliminary results from the 1976 Census, it was realised from comparison with post-censal (1971) estimates, that the census had missed significant numbers of the population. The PCC conducted after the census confirmed this. After considerable analysis of other demographic information, it was decided that a "better" population estimate would be obtained if an adjustment was made to the "as counted" population for under-enumeration as measured in the PCC(1). The estimate so derived was, given the deficiencies

of the various collections, sufficiently close to the population derived from demographic analysis as to make the estimate acceptable.

It was realised that it would be unrealistic to use a small (two-thirds of one percent of households) survey to adjust all census results, especially those for small areas.

Therefore it was decided that:

- a A clearer distinction would need to be made by the ABS between "census results" and "population estimates". Population estimates are based on census results but are adjusted for under-enumeration. Population estimates are produced
 - . annually showing the total population for each Local Government Authority (LGA)
 - . annually showing the total population for each State by age and sex
 - . quarterly showing the total population for each State by sex

As well, a "civilian population 15 years and over" is produced for each State by sex and age on a monthly basis, for use in estimation in the monthly labour force survey. These are projected estimates and are superseded by the quarterly estimates when actual data become available.

- b Census results as such would not be adjusted for under-enumeration, and
- c that only the population estimates would include an adjustment for under-enumeration. Requests for under-enumeration adjustment for smaller areas or for other characteristics would be met by giving indications of under-enumeration but not "officially" providing estimates. That is, the ABS would be prepared to give qualitative results from the post-enumeration survey rather than quantitative.

The PCC was used only to produce the total adjusted population for the areas discussed above. The sex and age adjustments within these areas were produced by demographic studies.

It should be explained why the Australian Bureau of Statistics is prepared to place some reliance on PES measures of under-enumeration whereas other statistical organisations are not. The census in Australia is conducted using a self enumeration, drop off/pick up methodology, with pick up being completed within 3 weeks of census date. The PCC can therefore be completed very soon after the census date, avoiding many of the problems encountered in other countries in matching census and survey questionnaires.

3 Planning for the 1981 Census

Planning for the 1981 Census began in mid 1977 with the following objectives:

- a to provide an opportunity for public discussion of the topics recommended for inclusion prior to a final decision being made on the content of the 1981 Census;
- b to reduce the form filling burden on the public;
- c to investigate the possibility of conducting a census without asking each person's name;
- d to minimise invasion of privacy while still collecting accurate data; and
- e to improve the quality of census data (eg to reduce the number of people missed by the census

and the proportion of unanswered questions).

The pursuit of these objectives formed the basis of a comprehensive program of field testing and analysis. Two aspects of this program are discussed in the following sections, viz the processes of topic selection and question design.

4 Topic Selection

a Background

The Census and Statistics Act 1905 requires that a census be conducted in 1981 and at least every five years thereafter. It also requires that the following information be collected in the Census:

a the name, sex, age, condition as to, and duration of, marriage, relation to head of the household, profession or occupation, religion and birthplace, and (where the person was born abroad) length of residence in Australia and nationality of every person abiding in the dwelling during the night of the Census Day;

b the material of the dwelling and the number of rooms contained therein;

If the government requires any further information to be collected, this needs to be prescribed by regulation. The Regulations need to be tabled in both Houses of Parliament, and are subject to disallowance within fifteen sitting days in either House.

The timetable for the printing and distribution of census materials required that the expiration of the fifteen sitting days occurred in early 1980.

b Procedure

In November 1977 the Australian Bureau of Statistics (ABS) advertised nationally requesting persons and organisations to forward submissions for topics they wished to be included in, or excluded from the 1981 Census. Users were asked to provide justification for the inclusion or exclusion of particular topics. Appendix 1 sets out the criteria issued to users to help them frame their submissions.

As well as advertising nationally, known Census data users, State Governments and Federal Government Departments were all approached directly as were civil liberty and privacy groups.

Over 1600 topic requests were received. Topics most frequently sought related to income, occupation, ethnic origin and religion. Of the 50 submissions received for the exclusion of topics, about 10 sought the exclusion of name.

Each submission was carefully examined to determine

. whether the topic was adequately justified in terms of the uses proposed to be made of the information sought

. whether information adequate for users needs was available from an alternative source

. whether the information was of a kind more suitable for obtaining from field interviewing of a small sample of persons and

. whether the information was required every five years.

Discussions were held with users to clarify requirements. Field tests of topics were conducted (these are discussed later) during 1978 and continued on during 1979. In February 1979 the ABS consolidated its thinking on the topics and released a publication entitled "Preliminary Views on the Nature and Content of the Census"(2). An example (racial origin) of the detail published for each topic is given in Appendix 2. Again the availability of the document was advertised

nationally as well as being distributed to all people or organisations who had made a submission.

Further discussions were held during March and April to allow users an opportunity to clarify their positions and, if necessary persuade the ABS to change its preliminary view.

Following these discussions and the availability of results from pilot tests conducted during this period, the ABS submitted its final recommendations to government. Following government agreement to the topics to be included, the required Regulations and a document entitled "Topic Evaluation and Proposed Questions"(3) were drafted and tabled in Parliament in November 1979. This document was made publicly available in the same way as previous documents.

c Conclusion

The topic selection procedure is considered to be a success for three main reasons

i topic selection was, and was seen to be, an open procedure whereby anyone could influence the content of the census.

ii user meetings were generally held with mixed groups (rather than having separate meetings for each topic) and were strongly constrained to keep the census form to the approximate size as shown in the Preliminary Views. Any request for an inclusion had to be "traded-off" with what would be excluded and

iii civil liberty and privacy groups were involved in the topic selection scheme from the start.

It is believed that this aspect of census evaluation has produced a set of topics for the 1981 Census that reflect users requirements and that are appropriate to a self enumeration census methodology.

5 Question and Questionnaire Design

a Background

The analysis of 1976 Census results and the CCC results revealed some considerable problems with the data from the 1976 Census. For example -

. 36.5% of the people required to answer the question on month and year of arrival in Australia (ie the overseas born) did not answer the question. Evaluation studies showed that these tended to be people who had been in Australia for some time or were from Southern European countries.

. Approximately 60% of the people who indicated in the census that they were handicapped answered in the evaluation survey that they were not handicapped.

. 8.4% of people failed to answer the question on racial origin. As Aborigines and Torres Strait Islanders represent 1.2% of the population, any imputation of the not stated would have a significant effect on the growth rate of the Aboriginal and Torres Strait Islander population (A and TSI).

While these problems may seem significant, it is ventured that similar examples could be obtained from most countries.

The problems seemed to be of three types

. Questionnaire design faults; ie cases where non-responses or incorrect response could be reduced by changing question wording, instructions or positioning on the schedule,

. cases where response bias was significant, but no certainty existed as to whether the census answer, the survey answer or either answer was correct,

cases where possible edit rejects were high and where no information existed as to what was the correct response (eg inconsistent responses and some not stated). For example, in the example given above, it was not known whether the A and TSI population was more or less likely to respond to the question on racial origin.

The pilot testing strategy for the 1981 Census was designed to provide information about why people answered or did not answer the questions correctly.

b Procedure

Seven pilot tests of the questionnaire were conducted between May 1978 and November 1979. Each pilot test generally involved an experimental design to test alternative question wording, instructions or response formats. As well specially trained interviewers were employed to do intensive interviewing on pre-specified issues. Results of the interviews were recorded on pre-designed interview documents.

The issues to be followed up varied from test to test, but were generally of three types -

- . not stated to particular questions, to help in reducing the incidence of these or to help in formulating edits
- . identified minority groups (eg A and TSI's, one bedroom houses), to see whether these were being correctly identified
- . all people who should have answered a question, irrespective of the answer they gave in the self enumeration phase.

The size of the tests also varied, with the size varying between 500 and 1,000 dwellings for each alternative schedule.

Test schedules were "dropped off" in the normal census manner, and "picked up" by a collector or an interviewer. If a collector "picked up", the schedules would be examined to identify any issues being tested and, where necessary, these would be followed up by an intensive interview.

The introductory statement used by the interviewers was along the following lines:

"WHAT WE'RE DOING IS TESTING SOME QUESTIONS THAT MAY BE INCLUDED IN THE NEXT CENSUS. COULD YOU TELL ME WHO FILLED IN THE FORM? Record full details..... I WOULD LIKE TO TALK TO YOU ABOUT SOME OF THE QUESTIONS ON THE FORM WHICH WE THINK MIGHT NOT HAVE BEEN VERY CLEAR. WE NEED TO KNOW IF PEOPLE ARE HAPPY TO ANSWER THESE QUESTIONS AND IF ANYTHING CAUSES PEOPLE TO MISUNDERSTAND THEM. WELL FIRSTLY, COULD I ASK IF YOU HAVE ANY COMMENTS TO MAKE EITHER ABOUT PARTICULAR QUESTIONS OR THE FORM ITSELF? I'D NOW LIKE TO ASK YOU ABOUT A FEW QUESTIONS BUT PLEASE REMEMBER MY PURPOSE IS TO TEST THE QUESTIONS, AND NOT YOU."

Where not stated were being examined, the interviewers attempted to find out why the question was not answered, as well as to find out the correct answer, eg
USE OF ENGLISH
For those who said "Yes" in Q14a, but Q14b Not answered.

.Obtain full details of reasons for non-response

I'D LIKE TO ASK YOU ABOUT THIS QUESTION HERE (show question), WHICH I SEE HASN'T BEEN ANSWERED.....

COULD YOU TELL ME WHAT HAPPENED THERE..... WAS THERE A PROBLEM WITH THAT QUESTION, I MEAN, WHY COULDN'T THE QUESTION BE ANSWERED?

. Record full details to explain reasons for non-response, then obtain answer.

Similarly, where minority groups were being examined, the response was checked to see whether it was correct and if not, why not, eg
NUMBER OF ROOMS

For those who "Shared kitchen and/or bathroom" Check that shared use response is correct.
IT SAYS ON THE FORM THAT YOU SHARE THE USE OF THE (Kitchen and/or bathroom) WITH ANOTHER HOUSEHOLD. COULD YOU TELL ME ABOUT THAT?
.....I MEAN, HOW MANY OTHER HOUSEHOLDS DO YOU SHARE WITH?

.....SO HOW MANY PEOPLE, NOT COUNTING YOUR OWN HOUSEHOLD, DO YOU SHARE WITH?
.....AND WHERE DO THEY LIVE?

Obtain full details and if shared use response is incorrect find out why the incorrect answer was given on the census form.

Appendix 3 contains an example of a case where all possible responses were followed up.

Some questions required the adoption of special techniques in an attempt to obtain a "correct" response.

For example a question along the lines of the USA Census question on english proficiency was tested (and subsequently included in the 1981 Census).

Answer question 14a for all persons aged 5 years or more -

14a Does this person speak a language other than English at home?	No, only speaks English.....1
	Yes.....2

Answer question 14b for each person who speaks a language other than English?

14b How well does this person speak English?	Very well.....1
	Well.....2
	Not well.....3
	Not at all.....4

The interviewers were trained and tested in the application of an Australian Language Proficiency Rating Scale (ALPR) that had been designed to assist in the assessment of language training needs. People rated as 0-3 on the scale of (0-6) were defined, by the users, as requiring language training. This application allowed a partial validation of the respondent's perception of his ability against the interviewer's perception.

c Some Examples of Results

A question on racial origin has been asked in most Australian censuses. The question developed for the 1981 Census is:

"IS THE PERSON OF ABORIGINAL AND TORRES STRAIT ISLANDER ORIGIN?"

- . For persons of mixed origin, No.....1 indicate the one to which Yes, Aboriginal.2 they consider themselves to Yes, Torres Strait Islander...3 belong.

Results from the testing program, for use in editing, imputation or advice to users show that
i in metropolitan areas

- at least half of all respondents who were reported as being either an Aboriginal or Torres Strait Islander were neither;
- all No respondents (ie not A or TSI) were "correct";
- all Not Stated were neither A or TSI;

- ii in non metropolitan areas
- for all respondents recorded as being A or TSI, the answer was "correct";
- all (but one) respondents shown as No (ie not A or TSI) were "correct";
- about 20% of not stated were of A or TSI origin.

A question was tested on the number of trips to places 150 km (90 miles) or more away from home in the previous month. The follow up interview checked the accuracy of responses on the census test form (CTF). The 110 "business" trips reported on the CTF were more than $2\frac{1}{2}$ times the correct number of trips, while the 252 "private" trips was almost twice the number actually taken.

A number of attempts were made to obtain details on the number of households that shared kitchen or bathroom facilities with another household. Each such case reported in tests was followed up by interviewers. Less than 10% of cases were correct. The concept of sharing facilities was too complex. As well, all cases not reporting kitchen or bathroom facilities were followed up. In almost 100% of cases the not stated responses were found to have the facilities, ie no response should not be interpreted as mean-no facilities.

The approach to testing the language question has been stated above. The following table summarises the type of information generated by the study.

Table 1: Results of Language Test(1)

Category	Revised ALPR Values(2)		TOTAL
	'clients' 0-3	'not clients' 4-6	
Very Well	26	444	470
Well	135	185	320
Not Well	120	10	130
Not at all	80	-	80
TOTAL	361	639	1000

Notes: (1) The response patterns have been reweighted to be representative of the population and are presented for a base of 1000 persons.

(2) The Australian Language Proficiency Rating (ALPR) values have been grouped into ranges '0-3' - identified as clients for language training schemes, and '4-6' as not clients.

The table shows that all the 'not at alls' and almost all the 'not wells' were correctly perceived by respondents. However, these represent only slightly more than half the 'clients'.

The question does appear to correctly identify a base population who are in need of English language training and it is believed the use of the question can be improved in combination with other variables (ie birthplace, birthplace of parents, period of residence in Australia). For these reasons, the question has been included in the 1981 Census.

Conclusions

The types of test conducted in the development of the 1981 Census questionnaire have necessarily been small, intensive surveys. It is not possible to train and monitor a large panel of intensive interviewers. The results quoted above are only a sample of the findings of the developmental programme, but hopefully they give an overview of the approach taken.

The knowledge generated from the tests has been used extensively in designing the questionnaire for the 1981 Census, but will also be used in the designing of editing and imputation rules, and in advice to users on the accuracy of census information.

With this type of knowledge generated prior to Census day - admittedly on a small sample - the role of large, post-censal surveys to evaluate content is open to question. An Australia wide survey would be required to validate the findings of the pilot test programme, although it is difficult to envisage running an Australia wide intensive survey.

The ABS is still in the process of deciding the role of post-censal evaluation studies (apart from person coverage) for the 1981 Census.

APPENDIX 1

CRITERIA FOR 1981 CENSUS TOPIC SELECTION AND OTHER INFORMATION WHICH MAY HELP

Before you complete the green forms, you should be aware of the criteria ABS will use in examining your submission to ensure that the census is the appropriate method for collecting, processing and tabulating the information you require.

CONSIDER:

WHAT CAN'T THE CENSUS DO?

The census cannot provide

- . perfect counts of special groups of the population eg social workers, single parents. Because of the vast size of the census there are many sources of error.

- . up to date figures. It normally takes about 12 months to process census results before actually starting to produce the tabulations required by users. Limited preliminary data is usually made available earlier.

- . data about individual persons. The Bureau has an unblemished record in maintaining confidentiality. This is essential to ensure the public has faith in the Bureau and that the statistics collected are of high quality.

WHO IS COUNTED AND WHERE?

The way in which the census is collected may affect its applicability to the information you require from it.

Most importantly all persons are counted where they spend census night, regardless of where they usually live. Special provisions are made for persons who were in the open, at work, travelling by long distance train, bus or plane or on board vessels plying between Australian ports.

The census does not count Australians who are overseas but does count people who are visiting Australia. Diplomatic representatives and their dwellings are excluded.

WHAT ARE THE ALTERNATIVES TO THE CENSUS?

In some cases the information you are looking for may already exist. It may be collected by another organisation, there may have been surveys conducted, or some form of administrative records may provide the data required.

Sample surveys are preferable if results are required quickly and a high degree of cross-classification or geographical detail is not required.

DOES THE INFORMATION YOU NEED REQUIRE -

tabulation at the small geographic area level.

Information required at the State or national level may be better obtained by other means (eg sample surveys) depending on the cross-classification required. Also if the need is restricted to information about one or two specific small areas, the census is not an appropriate vehicle for collection.

- . cross-classification with a number of the other characteristics collected at the census.
- . comparability with data from previous censuses.
- . benchmark data for the whole population to produce estimates from sample surveys.
- . basic data to allow sample surveys to be designed efficiently.
- . small groups obtained by cross-classification.

TOPICS SHOULD NOT -

- . upset people by invading their personal privacy to an unacceptable degree. The information you will get from such a topic could be subject to bias and will affect other data used and collected in conjunction with it.
- . seek information not generally known such as "where was your maternal grandmother born?"
- . present major coding problems or need excessive processing. You should look at the way answers would need to be classified.
- . require people to remember things they are unlikely to be able to, for example "Did your family take a holiday lasting at least 7 days, 5 years ago ... 1 year ago ...?"
- . seek opinions, attitudes; nor should they require more than one or two questions to obtain the required information.
- . require an overlong explanation or instruction to ensure an accurate answer. If the type of question needed on the census schedule cannot be understood with a minimum of explanation, it is not suitable for a census.

PRIORITY WILL BE GIVEN TO TOPICS WHICH -

- . provide information not readily available from other sources.
- . will have a national benefit rather than a localised one.
- . concern important issues about which little is known.

THEREFORE, if you are seeking to have a topic included in the census it should be clear from details you supply that -

- . you have a specific purpose for which the information will be used.
- . 1981 is a suitable year to include the suggested topic in a census, taking into account the time lapse - could be up to 12 months delay - between collecting, processing and final release.
- . the topic submitted by an organisation reflects the overall need of the organisation rather than an isolated need within the organisation.

APPENDIX 2

TOPIC: RACIAL ORIGIN

Required by present Act	NO
Asked in 1976	YES
Asked in 1971	YES

Submissions received

INCLUSION	Cwlth	7	State	18	Other bodies	2
			Individual	1		
EXCLUSION	Cwlth	1	State	-	Other bodies	-
			Individual	1		

Justifications advanced by users

The major reason for asking a question on racial origin is to identify the number and location of Aboriginals and Torres Strait Islanders in Australia. However, data on other racial origins available from previous censuses have been used by demographers and community groups and these users asked that the 1981 Census include other racial groups (eg Indian, Asian). Because of some adverse public reaction to the question on racial origin in the 1976 Census, and because of the difficulty of obtaining adequate response, attention is being directed to obtaining information on Aboriginals and Torres Strait Islanders only.

The data on the number of Aboriginals and Torres Strait Islanders are used to:

- (a) determine the characteristics and locations of Aboriginals and Torres Strait Islanders;
- (b) enable policies to be developed for meeting the special needs of these people, such as housing, medical services, education and special assistance programmes; and
- (c) study Aboriginal mortality and fertility.

Non-census data available

The National Survey of Income conducted by ABS in 1973 on behalf of the Commission of Enquiry into Poverty asked a question on racial origin and there is a question to identify Aboriginals and Torres Strait Islanders in the ABS September 1979 Labour Force Survey. The question is not asked in any other ABS collection.

Some data on Aboriginals and Torres Strait Islanders are available from relevant State government authorities.

Extent to which additional sample survey(s) could meet user requests

Surveys could not satisfy user requirements for data for small areas and extensive cross-classifications.

Question evaluation

Results of the 1976 Census race question indicate that the quality of the data is suspect. In particular the number of people in Tasmania claiming to be Aboriginal or Torres Strait Islander rose by nearly 340% compared with the 1971 Census. Increases were recorded of over 200% in the ACT and over 130% in Victoria.

A redesigned question was included in the September 1978 test: 'Is this person an Aboriginal or a Torres Strait Islander?' The number of replies obtained was not satisfactory and it will be necessary to examine more closely the reaction of Aboriginal people to this question.

ABS preliminary view

Include question on Aboriginals and Torres Strait Islanders subject to further testing.

APPENDIX 3

HOUSEHOLD'S MOTOR VEHICLES

1 or more motor vehicles

I SEE THAT ON WEDNESDAY NIGHT, THE 8th AUGUST, THERE WERE (number) MOTOR VEHICLES GARAGED OR PARKED HERE.

COULD YOU TELL ME ABOUT THESE (number) MOTOR VEHICLES, I MEAN, WHAT TYPE OF VEHICLES WERE THEY

Record full details*-

- . cars, vans, trucks, motor bikes, tractors, etc.
- . company/government vehicle
- . owned by household member/visitor
- . garaged or parked, and where

ARE THESE(number) VEHICLES CURRENTLY REGISTERED*?
ARE THERE ANY OTHER MOTOR VEHICLES OF THE HOUSE-
HOLD GARAGED OR PARKED HERE THAT AREN'T
REGISTERED? (record full details)
APART FROM THE MOTOR VEHICLES YOU'VE MENTIONED,
ARE THERE ANY OTHER MOTOR VEHICLES OF THE HOUSE-
HOLD THAT ARE USUALLY GARAGED OR PARKED HERE AT
NIGHT?

If yes, ask:

COULD YOU TELL ME ABOUT THOSE VEHICLES? WERE ANY
OF THOSE VEHICLES PARKED HERE ON WEDNESDAY NIGHT,
THE 8th AUGUST?

* If any motor vehicles mentioned that were
incorrectly included or excluded from the Census
form, then ask:

I THINK THERE MIGHT BE SOMETHING WRONG WITH THIS
QUESTION AS I'M SURE IT MEANT YOU (to count...../
not to count.....), CAN YOU EXPLAIN HOW YOU FIRST
WORKED OUT YOUR ANSWER.

"None"

DOES ANYONE IN YOUR HOUSEHOLD OWN A MOTOR VEHICLE?

. If yes, then ask:

WELL COULD I ASK YOU ABOUT THIS QUESTION HERE
(show question), WHERE IT SAYS THAT NO MOTOR
VEHICLES WERE GARAGED OR PARKED HERE ON WEDNESDAY

NIGHT.....COULD YOU EXPLAIN THAT.....?

Not answered

I SEE THAT THIS QUESTION ABOUT MOTOR VEHICLES
OWNED BY THIS HOUSEHOLD HASN'T BEEN ANSWERED
(show question). WAS THERE A PROBLEM WITH THAT
QUESTION, I MEAN, WHY COULDN'T THE QUESTION BE
ANSWERED?

Record reasons for non-response, then obtain
answer.

NONE 1 2 3 4 or more

FOOTNOTES:

(1) For a fuller discussion of the decision to
adjust and the procedures involved, see DOYLE,B.F.
"Adjustment for census under-enumeration - the
Australian situation", Conference on the Undercount
Feb 25-26, 1980 US Bureau of the Census.

(2) Copies can be made available from the ABS on
request.

(3) This document was similar to the Preliminary
Views but showed the final decision by the
Government on the topics to be included. Again
copies can be made available on request.