Australian Bureau of Statistics

✅ **Latest release**

# Census methodology

Information on data quality, processing and collection

**Reference period:** 2021

28/06/2022

**Content**
## Overview

As Australia's largest statistical collection, the information provided in the Census helps estimate Australia's population, is used to set electoral boundaries, underpins the distribution of billions of dollars in public funding and informs planning for services and infrastructure for every community in Australia.

To assist in interpreting data released from the Census, the ABS provides information about how we collect and process Census data, as well as important information about the data quality.

Key information about specific Census variables and concepts can be found in the 2021 Census dictionary (/census/guide-census-data/census-dictionary/2021), which includes a glossary of terms and definitions to give data users an understanding of the Census and Census topics.

More information about the background and planning of the Census can be found in Background and planning (/census/about-census/2021-census-overview/background-and-planning) documentation.

## Scope and coverage

The 2021 Census of Population and Housing aimed to count every person in Australia on Census Night, 10 August 2021.

The people counted in the 2021 Census include:

- People in the six states and six territories (Northern Territory, Australian Capital Territory, Jervis Bay Territory, Territory of Christmas Island, Territory of the Cocos (Keeling) Islands and Norfolk Island)

- People who leave Australia but are not required to undertake migration formalities (e.g. people who work on oil or gas rigs)

- People on vessels in or between Australian ports

- People on board long-distance trains, buses or aircrafts within Australia

- People entering Australia before midnight on Census Night

- Visitors to Australia (regardless of how long they have been in the country or plan to stay)

- Detainees under the jurisdiction of the Department of Home Affairs in detention centres in Australia

- People in police lock-ups and prisons.

The people not counted in the 2021 Census include:

- People in Australian external territories (minor islands such as Heard and McDonald Island)

- Foreign diplomats and their families (derived from the Vienna Convention (https://legal.un.org/ilc/texts/instruments/english/conventions/1_1_1969.pdf) )

- Foreign crew members on ships who remain on the ship and do not undertake migration formalities

- People leaving an Australian port for an overseas destination before midnight on Census Night.

The 2021 Census of Population and Housing also counted private dwellings (such as houses, apartments and caravans) and non-private dwellings (such as hotels, hostels and hospitals).

The dwellings counted in the 2021 Census include:

- All occupied and unoccupied private dwellings
- Occupied caravans in caravan parks and manufactured homes in manufactured home estates
- Occupied non-private dwellings, such as hospitals, prisons, hotels, etc.
- Unoccupied residences in retirement villages (self-contained)
- Unoccupied residences of owners, managers or caretakers of such establishments.

Unoccupied non-private dwellings are out of scope of the 2021 Census.

# How the data is collected

## How the data was collected

Census data is collected using a variety of methods and employs specific strategies to ensure the count on Census Night is as accurate as possible.

To collect Census data, the ABS contacts households in different ways. Letters and paper forms are delivered in some areas, and in other areas visits are made to households. Households complete the Census form and submit it online or send it back through the mail.

Counting each person and dwelling on Census Night takes a lot of planning and many people. The ABS engages a large, geographically dispersed temporary field workforce of about 32,000 ABS officers who have strict obligations under legislation to make contact with households and provide Census materials.

In the months leading up to a Census, field staff make sure businesses and services are prepared with enough forms for every person in every dwelling to participate. We enlist the help of hotels, motels, hospitals, aged care facilities, student accommodation and many other establishments to ensure guests, patients and residents are ready for the Census.

The bulk of field staff are employed to deliver Census materials to homes, or to visit homes after Census Night where we have not received a completed form. Specialist field staff are also recruited to support people who are hard to reach or who may need help completing their Census form.

## 2021 Census enumeration model

In 2016, the ABS developed a new digital approach to the Census enumeration model. This approach provided a faster, more efficient, environmentally friendly Census than any previous Australian Census. The 2021 Census enumeration model was based on the successful elements of the 2016 Census with additional improvements to the way Census materials were delivered and collected.

To maximise the public's ability to participate in the Census, the ABS divided Australia into three delivery areas, in most part based on the quality of the ABS Address Register (/statistics/research/abs-address-register-users-guide) and availability of mail services in that area. Each area had its own strategy for public engagement and collection of forms.

## 2021 Census enumeration model
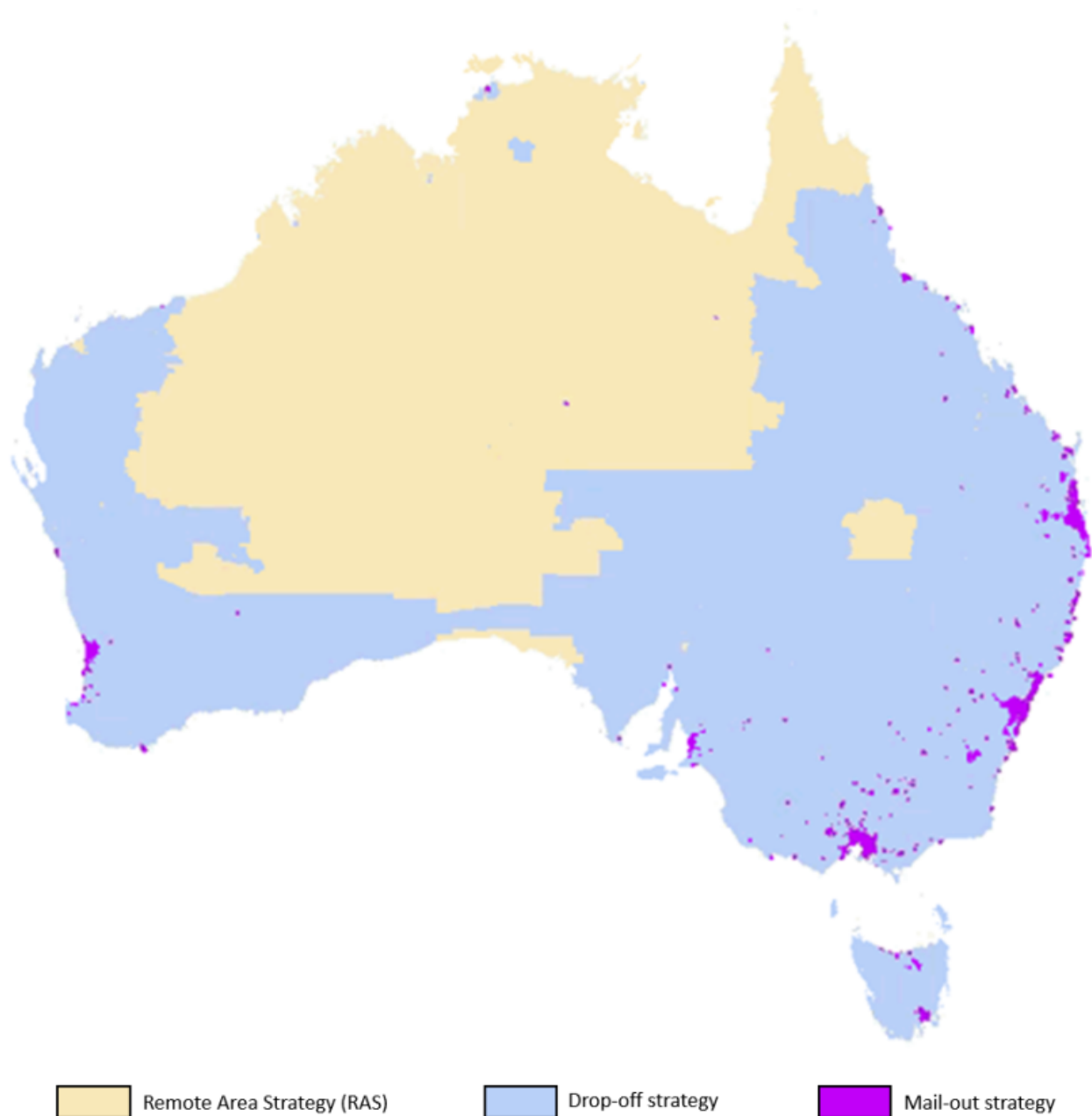
This map of Australia shows how the Census was delivered across Australia. It displays areas in different colours indicating where a Remote Area Strategy (RAS), Drop-off strategy and Mail-out strategy was required.

### 1. Mail-out areas

- Mail-out areas included known addresses, identified using the ABS Address Register (/statistics/research/abs-address-register-users-guide) . Most dwellings in these areas were delivered a Census instruction letter and some were delivered a paper form. Each letter had a unique login code which respondents could use to access an online form as well as information on how to request a paper form. In 2021, approximately 85% of dwellings were in mail-out areas.

### 2. Drop-off areas

- Drop-off areas were mostly rural areas, including small towns without street delivery service. Census field staff delivered paper forms to dwellings in these areas which in 2021, comprised approximately 15% of all dwellings. Paper forms also included unique login codes enabling these households to complete the form online.

### 3. Remote areas

- Representing 0.5% of all private dwelling, 46% of Australia's total land mass was treated as remote areas. This included most of the Northern Territory and large parts of Western Australia, Queensland and South Australia as well as overseas territories. Respondents participating in many remote areas were offered the opportunity to complete the Census through an interview or to self-respond using the online form or a paper form collected by a field officer.

If a dwelling had not received either a letter or paper form with a unique login code, households were able to request a login code via the Census Digital Service and complete the form online or request a paper form. Approximately 1.45 million Census forms were submitted through self-service.

Within each of the three area-based strategies, there were adaptations which enabled small areas to be treated such that Census response rates could be maximised according to the characteristics of each area. These included providing a paper form instead of a Census instruction letter and starting follow-up visits early to remind residents to complete their Census.

The 2021 Census was the first time that the ABS actively encouraged households to complete and submit their Census form as soon as they received their materials, meaning this could be done before Census Night on 10 August. The letters also emphasised 12 August as a date after which the household may receive contact from the ABS. This messaging was designed to provide a 'response window', where previous censuses highlighted Census Night only.

A range of operational information, including completed online and paper Census forms, call centre agents, the Census Digital Service and field staff observations, provided the ability to monitor progress in real-time at small area levels, and was used to highlight issues such as areas of low response, so that strategies could be enacted quickly to respond.

If a dwelling had not returned a Census form by Census Night, reminder and non-response procedures were carried out by Census field staff, which included house visits and reminder letters, to ensure everyone in Australia on Census Night was counted.

## Special collection strategies

The ABS uses a range of approaches for specific population groups to ensure the coverage of people in Australia is as complete as possible. These strategies are designed, in consultation and collaboration with relevant communities and service providers, to ensure these groups participate in the Census and accurate information is collected.

Special strategies were developed to optimise accessibility and inclusion of the following groups:

- people living in remote areas
- Aboriginal and Torres Strait Islander people
- defence personnel
- people with disabilities
- people experiencing homelessness
- people from culturally and linguistically diverse backgrounds
- people in communal types of accommodation or care, such as hotels, hospitals or hostels for the homeless
- people in dwellings co-located or grouped together, such as retirement villages and marinas
- people travelling or away from their home on Census Night
- people living in mining camps and fly-in/fly-out workers
- older Australians.

**Each of these strategies had one or more of the following components:**

### Specialised field staff

Specialised field staff were employed to undertake specialist collection tasks. For example, locating hard-to-find populations, managing the distribution and collection of forms in complex housing establishments, or conducting interviews with

respondents. A key objective when employing these field staff was to select people who were trusted by and knowledgeable of the people to be counted under this strategy.

### Alternative Census forms

Alternative Census forms were used as part of some strategies. An Interviewer Household Form (/census/guide-census-data/census-dictionary/2021/glossary/i#interviewer-household-form) was used in remote Aboriginal and Torres Strait Islander communities and in some urban areas. In some areas, a shortened version of the Census form was used to interview people sleeping rough as part of the Homelessness Enumeration Strategy (/census/guide-census-data/census-dictionary/2021/glossary/h#homelessness-enumeration) . Forms were also available with large print, in braille and translated into Auslan. In 2021:

- 7006 large print forms were returned
- 20 braille forms were returned
- Auslan videos were played 9166 times
- audio content was played 9257 times.

The ABS has worked to provide the online Census form as accessible to Level 2.0 AA and tested the form with screen-readers and other assistive technologies. The ABS website was awarded 'Government website of the year' in the 2021 Australian Access Awards.

### Targeted communication

The ABS recognises that some people have difficulty or face barriers to completing the Census. For example, they might be away from home on Census Night, live in a remote area or have difficulties understanding English. To overcome these barriers, a range of targeted communication strategies were developed to enable everyone to participate in the 2021 Census. For example, Census promotional and instructional materials were translated into a number of different languages, a phone based translation service was available and multilingual staff where engaged with specific communities.

### Community engagement

The ABS engaged with both national and local community organisations and stakeholders in order to understand the support needs of different communities, provide information on the importance of participation in the Census and to assist with completing Census forms. A number of community initiatives were employed including the introduction of more than 300 pop-up hubs across Australia in both urban and regional locations. These hubs provided a friendly and supportive environment for members of the public to have their questions answered and be encouraged to participate in the Census. The ABS also offered more than 100 general 'fill in the form' sessions at community centres where one-on-one support was offered to people to complete the Census.

## Conducting a Census during a pandemic

The 2021 Census was undertaken during a unique time in our history, when many areas across Australia were operating under lockdown restrictions due to COVID-19. Movement in and out of Australia was restricted, limiting overseas travel for Australians and the number of overseas visitors within Australia.The pandemic and the subsequent restrictions had many impacts on people's daily lives, including on employment, travel and education.

The ABS was prepared to conduct the Census during the pandemic, implementing robust contingency plans and testing them in a major test in October 2020. This included a COVID-safe plan, which detailed how we would deliver the Census, manage our staff in the field and keep the community safe in line with government health orders.

Census field officers were deemed authorised workers so they could deliver Census materials to households. In areas under restrictions, contactless procedures for field activities were enacted under the ABS Census COVID-safe plan, and face-to-face support activities like pop-up hubs and 'fill in the form' sessions were offered virtually where possible or cancelled. These changes may have impacted how people accessed Census support, before, after and on Census Night. Additionally, restrictions may have affected where people were on Census Night and their responses to the questions.

### Restrictions on geographic areas

Many areas experienced restrictions leading up to, on and after Census Night.

For example, parts of South Eastern Australia moved in and out of lockdown over the Census 'response window' in early August 2021:

- Leading up to Census Night, Victoria entered a state-wide lockdown. This remained in place for Greater Melbourne and Shepparton until after Census Night, while most of regional Victoria had restrictions lifted on 10 August.

- Greater Sydney and many parts of regional New South Wales experienced lockdown restrictions during the Census response period.

- South East Queensland was in lockdown shortly before Census Night, but this was lifted on 8 August. Cairns and Yarrabah however, were placed in lockdown on 8 August for a short period.

- The ACT was placed in lockdown shortly after Census Night on 12 August.

What was happening at the time was different for each state and territory and for different areas within those states and territories. For example, Western Australia did not experience the same restrictions as New South Wales or metropolitan Melbourne, so the data may look quite different when comparing trends at a state/territory level. To see an approximate guide to the restrictions in place during the Census enumeration period, see Downloads (/census/guide-census-data/census-methodology/2021/how-data-collected#downloads) .

People living with COVID-19 lockdown restrictions were still required to complete the Census. ABS provided advice to the public on how to respond to questions related to study and work impacted by the change of circumstances.

## Census Digital Service

The Census Digital Service was developed by the ABS (in partnership with PwC and Amazon Web Services) to provide a highly secure platform that included the website, online Census form, self-service and assistance.

The 2021 Census Digital Service offered a range of innovative online self-service options. People could:

- request a paper form (approximately 67,000 requests made)

- report they would not be at home on Census Night (over 94,000 notifications received)

- control their password, including a password reset

- login without a Census letter or request a Census number (approximately 1.75 million requests).

## Census forms

There were a number of ways information was collected from the Australian public. For most people, information was returned to the ABS via either an online form or a paper form.

The 2021 Census collected responses on two new topics – Long-term health conditions and Australian Defence Force service. These were the first significant changes to the information collected in the Census since 2006. Changes were also made to the way certain topics were collected. Notably, response categories of 'Aboriginal' and 'Torres Strait Islander' were added to the Ancestry question, respondents had the option of identifying as non-binary sex, and the Language question was updated to refer to language used (rather than language spoken) to enable inclusion of sign languages such as Auslan. The changes were designed based on the 2021 public consultation process, evaluation of the results of the 2016 Census, and the 2021 Census testing program.

### Online form

The 2021 Census online form was improved greatly from previous Censuses. Developments were made to make the form simpler for people to use and easier to complete. The improvements included:

- improved sequencing of respondents to only the questions relevant to them based on information they have provided

- increased use of automatically populating questions with previously entered information, such as address or language spoken at home, to make the question easier to respond to

- additional in-built edits to check for valid responses

- greater use of supplementary questions to improve accuracy of response for industry and occupation questions

The improved online form significantly reduced the time taken by the average household to complete the Census and delivered high quality data. Two thirds of Australians rated their online experience as good and many noted how easy it was to complete.

### Paper forms

The paper household form and personal form enabled people to fill out forms manually and post them back in the mail. The paper forms also included a unique login ID and instructions for completing online.

Other versions of paper forms were used for areas or populations where a different approach was required. For people experiencing homelessness, field officers used Special Short Forms to collect their information. For people living in remote Aboriginal and Torres Strait Islander communities, households had the option to provide information directly to a field officer using an Interviewer Household Form, or could complete their own paper or online form. Sample copies of the 2021 Census paper forms (/census/census-media-hub/resources/education#sample-copies-of-the-2021-census-paper-forms) can be viewed under resources.

## Mode of response

### How people in each state and territory completed their Census

In 2021, 83.5% of people in occupied private dwellings submitted the Census form online compared to 63.4% in 2016.

For private dwellings, 78.9% submitted their Census form online in 2021 suggesting that households with more people in them were more likely to use an online form.

Advancements in technology and the introduction of the Census Digital Service in 2021 made it easier for people and households to complete their Census form online and contributed to the increased shift towards an online mode of response.

### Mode of response for responding occupied private dwellings by state and territory, 2011, 2016 and 2021

|  | 2011 Paper form (%) | 2011 Online form (%) | 2016 Paper form (%) | 2016 Online form (%) | 2021 Paper form (%) | 2021 Online form (%) |
|---|---|---|---|---|---|---|
| New South Wales | 64.5 | 35.5 | 40.0 | 60.0 | 20.0 | 80.0 |
| Victoria | 67.3 | 32.7 | 41.1 | 58.9 | 20.2 | 79.8 |
| Queensland | 66.0 | 34.0 | 41.7 | 58.3 | 21.7 | 78.3 |
| South Australia | 69.3 | 30.7 | 48.0 | 52.0 | 29.0 | 71.0 |
| Western Australia | 62.9 | 37.1 | 38.5 | 61.5 | 17.6 | 82.4 |
| Tasmania | 68.9 | 31.1 | 55.0 | 45.0 | 38.7 | 61.3 |
| Northern Territory | 66.2 | 33.8 | 50.6 | 49.4 | 25.1 | 74.9 |
| Australian Capital Territory | 53.7 | 46.3 | 21.1 | 78.9 | 6.8 | 93.2 |
| Australia(a) | 65.7 | 34.3 | 41.2 | 58.8 | 21.1 | 78.9 |

(a) Includes Other Territories (Jervis Bay Territory, Territory of Christmas Island, Territory of the Cocos (Keeling) Islands and Norfolk Island).

In 2021, the majority of people in non-private dwellings submitted their Census information using a paper form. While this was also the case for the 2011 and 2016 Census, there has been an increase across all states and territories in the uptake of the online form option by people staying in non-private dwellings on Census Night.

One in three people in non-private dwellings on Census Night (33.3%) submitted their Census form online compared 9.5% in 2016.

## Mode of response for people enumerated in non-private dwellings by state and territory, 2011, 2016 and 2021

|  | 2011 Paper form (%) | 2011 Online form (%) | 2016 Paper form (%) | 2016 Online form (%) | 2021 Paper form (%) | 2021 Online form (%) |
|---|---|---|---|---|---|---|
| New South Wales | 92.1 | 7.9 | 89.7 | 10.3 | 62.4 | 37.6 |
| Victoria | 94.6 | 5.4 | 90.7 | 9.3 | 71.9 | 28.1 |
| Queensland | 93.6 | 6.1 | 91.6 | 8.4 | 67.3 | 32.7 |
| South Australia | 88.5 | 11.5 | 90.9 | 9.1 | 74.5 | 25.5 |
| Western Australia | 94.4 | 5.6 | 91.7 | 8.4 | 65.9 | 34.1 |
| Tasmania | 87.5 | 12.5 | 90.0 | 10.1 | 72.4 | 27.6 |
| Northern Territory | 96.6 | 3.4 | 91.6 | 8.4 | 52.1 | 47.9 |
| Australian Capital Territory | 74.7 | 25.3 | 80.5 | 19.5 | 59.1 | 40.9 |
| Australia(a) | 92.7 | 7.3 | 90.5 | 9.5 | 66.7 | 33.3 |

(a)  Includes Other Territories (Jervis Bay Territory, Territory of Christmas Island, Territory of the Cocos (Keeling) Islands and Norfolk Island).

## How culturally and linguistically diverse communities completed their Census

People born outside Australia were more likely to participate online (89.1%) than people born in Australia (82.2%). Of the top 10 countries of birth in Australia, the highest online response was from people born in China (97.1%) and India (97.0%).

### Mode of response for people(a) by their country of birth(b), 2021
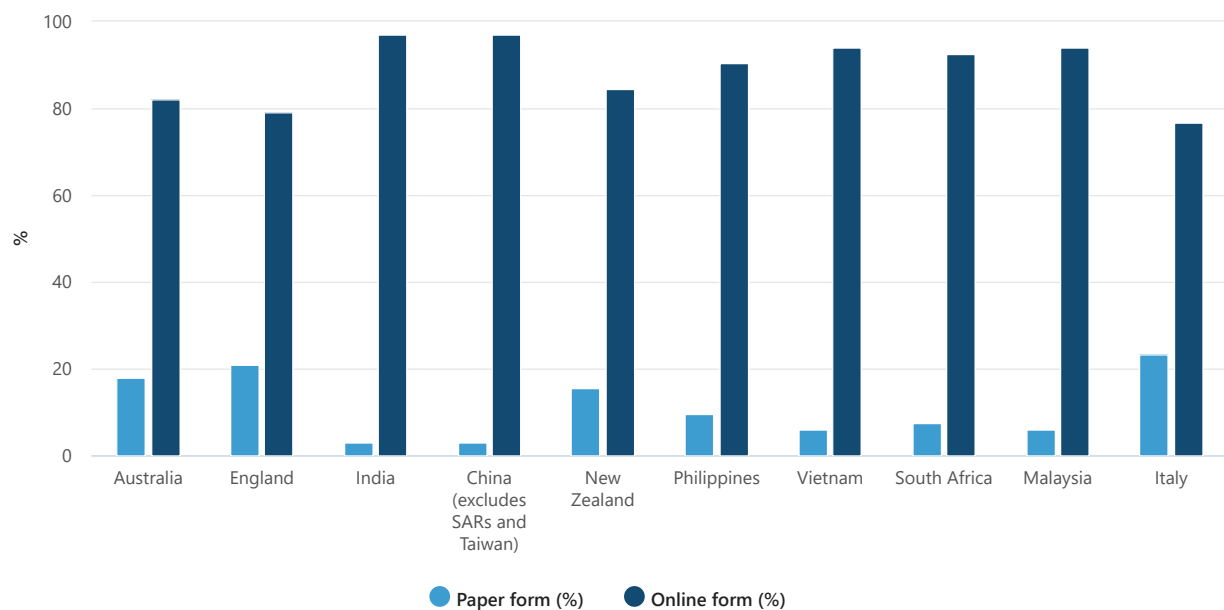


(a) Persons in occupied private dwellings only.

(b) Top 10 countries based on the 2021 Census.

People who only spoke English at home were least likely to participate online (80.9%), whereas people who could not speak English at all were the most likely to complete the online form (94.9%).

### Mode of response for people(a) by language spoken at home and proficiency in English, 2021
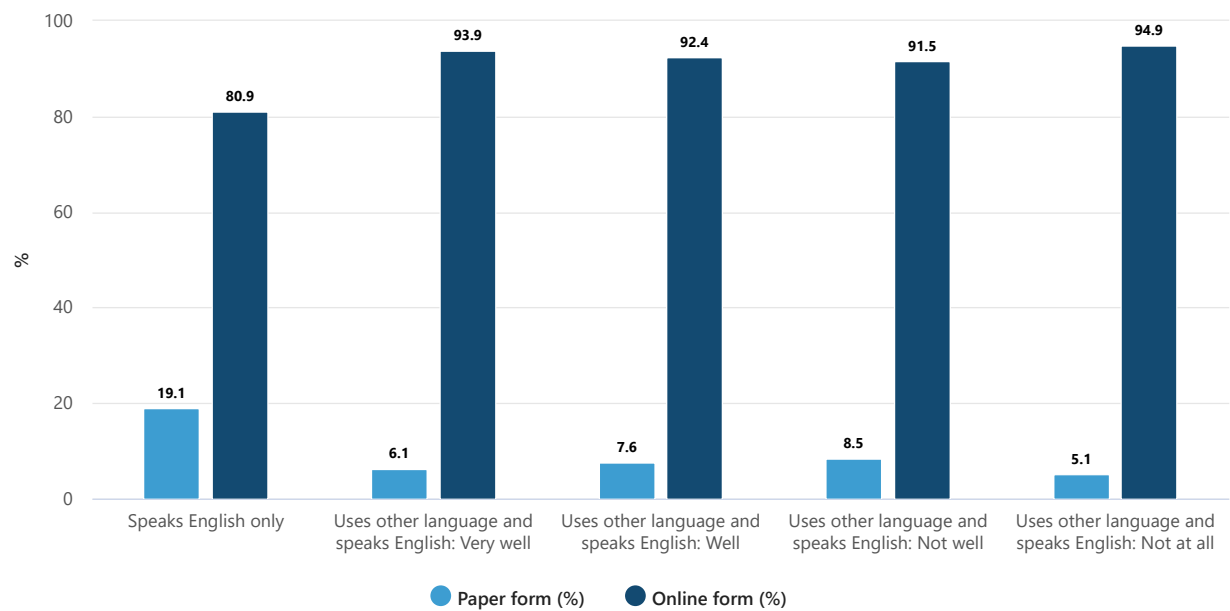


(a) Persons in occupied private dwellings only.

## How different ages completed the Census

Overall, the online response rate for all age groups increased when compared to 2016. Like 2016, the online response rate reduces in older age groups however, online participation for people aged 80 years and over increased by the greatest proportion in 2021 with the online response rate increasing from 28.4% in 2016 to 48.7% in 2021.

Online response rate for people(a) by age group, 2016 - 2021



○ 2016 Online form    ● 2021 Online form
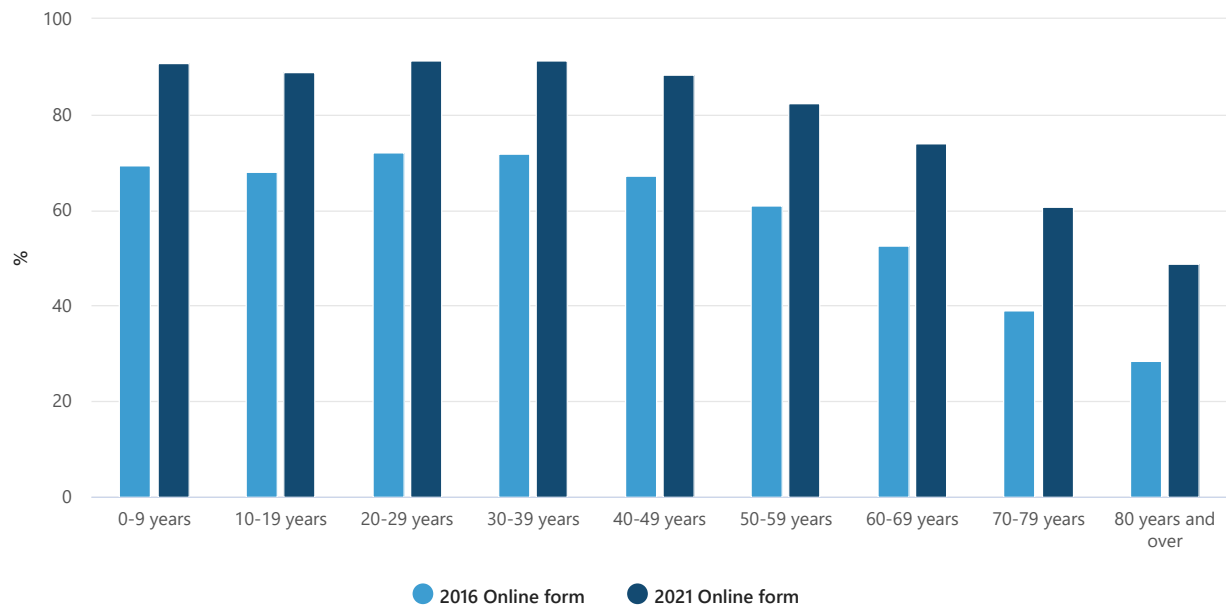
(a) Persons in occupied private dwellings only.

## Downloads

### COVID-19 restrictions by Local Government Areas

**Data files**
    **Download** xlsx [64.31 KB]

# How the data is processed

## Processing overview

The goal for processing the 2021 Census was to ensure the timely release of data while maintaining and improving data quality.

Data processing includes all steps from receipt of Census responses, either online or in paper form, through to the production of a clean Census data file. These steps include:

1. Data capture (/census/guide-census-data/census-methodology/2021/how-data-processed#data-capture)

2. Coding (/census/guide-census-data/census-methodology/2021/how-data-processed#coding)

3. Frame reconciliation (/census/guide-census-data/census-methodology/2021/how-data-processed#frame-reconciliation)

4. Derivation (/census/guide-census-data/census-methodology/2021/how-data-processed#derivation)

5. Imputation (/census/guide-census-data/census-methodology/2021/how-data-processed#imputation)

6. Editing (/census/guide-census-data/census-methodology/2021/how-data-processed#editing)

7. Quality assurance (/census/guide-census-data/census-methodology/2021/how-data-processed#quality-assurance)

8. Introduced random error/perturbation (/census/guide-census-data/census-methodology/2021/how-data-processed#introduced-random-error-perturbation)

## Data capture

For the 2021 Census, a Data Capture Centre (DCC) was established to register, scan and capture data from the paper and online Census forms.

Upon arrival to the DCC, paper Census forms had their unique form ID electronically captured. These forms were scanned and validated using [Intelligent Character Recognition (/census/guide-census-data/census-dictionary/2021/glossary/i#intelligent-character-recognition-icr-)](/census/guide-census-data/census-dictionary/2021/glossary/i#intelligent-character-recognition-icr-) . Similarly, after a respondent pressed 'submit' on the online Census form, the form ID was captured by the DCC. Information about form response status was communicated to field staff to ensure follow up activities for responding dwellings ceased.

A reconciliation process was conducted to ensure that all forms received at the DCC were captured.

Online forms were encrypted and sent securely to ABS processing systems. These forms were then decrypted and loaded into systems alongside paper forms.

## Coding

The Census forms collect information from respondents in a number of different ways including written text responses, radio buttons and multi mark check boxes. Sometimes it can be a combination of all three options for a single question, such as the Ancestry question. Just like there are different ways of collecting information from respondents, there are also different ways of coding data to a classification.

While responses collected through a radio button are assigned directly to a classification code during data load processes, text responses are processed through coding systems. This process includes:

- Automatic (auto-coding) – most text responses have sufficient information for a computer to code the response directly to a classification without clerical involvement.

- Computer assisted – computer programs are used by coding specialists to assign classification codes to like text responses in bulk. This reduces the amount to records requiring manual coding.

- Manual – Census coding staff review text responses for each individual to determine the best fit to a classification and assign a code.

Census also undertakes a coding quality assessment process, whereby a sample of manually coded records are re-coded by another member of the coding staff. Where a record is coded differently, it is forwarded to a coding specialist for adjudication on which code is correct. For Census 2021, the sample rate was 10%.

## Frame reconciliation

The frame refers to the list of units (e.g. persons, households, businesses) in a survey population. The aim of frame reconciliation for Census is to finalise the list of Australia's dwellings and assign the correct people to these dwellings for the Census reference night. The ABS does this by reconciling Census form data with units from the Census frame by reviewing their information and addresses. This involves:

- ensuring Census forms are linked to the correct address

- removing duplicate forms and people

- removing invalid people and dwellings

- verifying the dwelling's occupancy when no Census form was received

- moving dwellings and persons to their correct area if they have been placed in the wrong location.

This process ensures the correct person and household information is represented in the correct location in the Census data. This allows the ABS to produce more accurate statistics for both small and large geographical areas.

## Derivation

Following on from coding and frame reconciliation, the next step in the Census processing cycle is to apply derivations. This involves assigning values based on responses to other questions where no response has been provided. Census derive these

responses based on responses from other family members present in the same dwelling.

Variables that may be derived from responses given by other family members present in the same dwelling are:

- Country of birth of person (BPLP (/census/guide-census-data/census-dictionary/2021/variables-topic/cultural-diversity/country-birth-person-bplp) )

- Country of birth of father (BPMP (/census/guide-census-data/census-dictionary/2021/variables-topic/cultural-diversity/country-birth-father-bpmp) )

- Country of birth of mother (BPFP (/census/guide-census-data/census-dictionary/2021/variables-topic/cultural-diversity/country-birth-mother-bpfp) )

- Language spoken at home (LANP (/census/guide-census-data/census-dictionary/2021/variables-topic/cultural-diversity/language-used-home-lanp) )

If there is insufficient information provided to derive a response for these items, they are determined to be 'not stated'.

In addition, the derivation process is used to create new variables by combining responses from several questions. Variables which are created this way include:

- Tenure type (TEND (/census/guide-census-data/census-dictionary/2021/variables-topic/housing/tenure-type-tend) ) - derived from responses to the Tenure type question

- Mortgage repayments (monthly) dollar values (MRED (/census/guide-census-data/census-dictionary/2021/variables-topic/housing/mortgage-repayments-monthly-dollar-values-mred) ) - derived from Tenure type and Housing costs questions

- Rent (weekly) dollar values (RNTD (/census/guide-census-data/census-dictionary/2021/variables-topic/housing/rent-weekly-dollar-values-rntd) ) - derived from Tenure type and Housing costs questions

- Labour force status (LFSP (/census/guide-census-data/census-dictionary/2021/variables-topic/income-and-work/labour-force-status-lfsp) ) - derived using responses to questions on full/part-time job, job last week, hours worked, looking for work and availability to start work

- Core activity need for assistance (ASSNP (/census/guide-census-data/census-dictionary/2021/variables-topic/disability-and-carers/core-activity-need-assistance-assnp) ) - derived using four Census questions related to assistance needed for self-care, movement or communication activities.

## Imputation

Imputation is a statistical process for predicting values where no response was provided to a question or where a response could not be derived. The ABS imputes Census data to reduce non-response bias and deliver a robust dataset.

The key demographic variables that require a response and are imputed if no response is given are:

- Age (AGEP (/census/guide-census-data/census-dictionary/2021/variables-topic/population/age-agep) )

- Sex (SEXP (/census/guide-census-data/census-dictionary/2021/variables-topic/population/sex-sexp) )

- Marital status (MSTP (/census/guide-census-data/census-dictionary/2021/variables-topic/household-and-families/registered-marital-status-mstp) )

- Place of usual residence (PURP (/census/guide-census-data/census-dictionary/2021/variables-topic/location/place-usual-residence-purp) )

- Place of work (POWP (/census/guide-census-data/census-dictionary/2021/variables-topic/location/place-work-powp) )

The primary imputation method used for the 2021 Census is known as hotdecking. This involves randomly selecting a donor record and copying the relevant responses to the record requiring imputation. The donor record will have similar characteristics and must also have the required variables stated. In addition, the donor record will be located geographically as close as possible to the location of the record to be imputed. In 2021, administrative data was used in hotdecking imputation to improve the selection of donors.

**Imputation occurs in two situations:**

1. Where no Census form was returned – all five key demographic variables are imputed. The remaining variables are coded 'not stated'.

2. Where a partially completed Census form was returned – only the key demographic variables that did not have a response are imputed. For example, if a person responded to all key demographic questions except Age, only the Age (AGEP (/census/guide-census-data/census-dictionary/2021/variables-topic/population/age-agep) ) variable is imputed.

## 1. No Census form returned

Where a private dwelling was identified as occupied on Census Night but a Census form was not returned, the number of people normally in the dwelling and their key demographic variables are imputed. In these cases, the non-demographic variables are set to 'not stated' or 'not applicable'.

For these private dwellings, the hotdecking imputation process is performed. The non-responding dwellings are matched with donor dwellings and the count of people and their key demographic variables are copied from the donor record to the imputed record. The donor records must meet several conditions:

- they must be occupied private dwellings where a form was returned, contain a maximum of 6 persons, and all of those persons responded to the key demographic questions

- they must have a similar Dwelling structure (STRD (/census/guide-census-data/census-dictionary/2021/variables-topic/housing/dwelling-structure-strd) ) and Dwelling location (DLOD (/census/guide-census-data/census-dictionary/2021/variables-topic/housing/dwelling-location-dlod) ) to the record to be imputed

- they must be located geographically as close as possible to the location of the record to be imputed

- where available, they have similar sex and age group counts from administrative data.

For 2021 Census data, improvements were made to the imputation of non-responding private dwellings. Administrative data was used to help choose the donor dwellings with similar numbers of people and ages to those that did not respond. For example, administrative data may show that two males aged 30–34 years live in a house that was determined to be occupied of Census Night. We would then choose a donor house from the Census where administrative data also shows that there were two males aged 30–34 years. The key-demographic Census variables from this donor dwelling are copied across for the non-responding dwelling. This method aims to give us counts of people in the right age group rather than just choosing a random household in a similar dwelling type in the same geographical area.

Where a person in a non-private dwelling did not return a form, their demographic characteristics are copied from a randomly selected person in a similar non-private dwelling using Type of non-private dwelling (NPDD (/census/guide-census-data/census-dictionary/2021/variables-topic/housing/type-non-private-dwelling-npdd) ).

## 2. Partially completed form returned

Where a partially completed form was returned, some or all of the demographic characteristics may require imputation. Characteristics are imputed using a combination of hotdecking and probability techniques.

### Age (AGEP)

Where date of birth or age details are incomplete or missing, the variable Age (AGEP (/census/guide-census-data/census-dictionary/2021/variables-topic/population/age-agep) ) is imputed based off distribution patterns found in the responding population. Variables used in the imputation of age include:

- Sex (SEXP (/census/guide-census-data/census-dictionary/2021/variables-topic/population/sex-sexp) )

- Relationship in household (RLHP (/census/guide-census-data/census-dictionary/2021/variables-topic/household-and-families/relationship-household-rlhp) )

- Registered marital Status (MSTP (/census/guide-census-data/census-dictionary/2021/variables-topic/household-and-families/registered-marital-status-mstp) )

- Indigenous status (INGP (/census/guide-census-data/census-dictionary/2021/variables-topic/aboriginal-and-torres-strait-islander-peoples/indigenous-status-ingp) )

- Type of education institution attending (TYPP (/census/guide-census-data/census-dictionary/2021/variables-topic/education-and-training/type-educational-institution-attending-typp) )

- Type of non-private dwelling (NPDD (/census/guide-census-data/census-dictionary/2021/variables-topic/housing/type-non-private-dwelling-npdd) )

Additional variables may also be used where they are shown to correlate with age.

### Sex (SEXP)

If there is not enough information on the form to determine the Sex (SEXP (/census/guide-census-data/census-dictionary/2021/variables-topic/population/sex-sexp) ) of the person (or it is not appropriate to do so) then each record is randomly allocated a male or female sex.

### Registered marital status (MSTP)

Where Registered marital status (MSTP (/census/guide-census-data/census-dictionary/2021/variables-topic/household-and-families/registered-marital-status-mstp) ) is missing, this variable is imputed by finding a similar person in a similar responding dwelling based on the variables:

- Sex (SEXP (/census/guide-census-data/census-dictionary/2021/variables-topic/population/sex-sexp) )

- Relationship in household (RLHP (/census/guide-census-data/census-dictionary/2021/variables-topic/household-and-families/relationship-household-rlhp) )

- Age (AGEP (/census/guide-census-data/census-dictionary/2021/variables-topic/population/age-agep) )

- Dwelling type (DWTD (/census/guide-census-data/census-dictionary/2021/variables-topic/housing/dwelling-type-dwtd) )

- Type of non-private dwelling (NPDD (/census/guide-census-data/census-dictionary/2021/variables-topic/housing/type-non-private-dwelling-npdd) )

Registered marital status is only imputed for people aged 15 years and over and set to 'not applicable' for people aged under 15 years.

### Place of usual residence (PURP)

Where a complete Place of usual residence (PURP (/census/guide-census-data/census-dictionary/2021/variables-topic/location/place-usual-residence-purp) ) on Census Night is not provided, the information that is provided is used to impute an appropriate area, in this instance a Mesh Block as well as Statistical Area Level 1 and Statistical Area Level 2. A similar person in a similar dwelling is located and missing usual residence fields are copied to the imputed variable. These are based on the variables:

- Dwelling type (DWTD (/census/guide-census-data/census-dictionary/2021/variables-topic/housing/dwelling-type-dwtd) )

- Dwelling location (DLOD (/census/guide-census-data/census-dictionary/2021/variables-topic/housing/dwelling-location-dlod) )

- Type of non-private dwelling (NPDD (/census/guide-census-data/census-dictionary/2021/variables-topic/housing/type-non-private-dwelling-npdd) )

- Residential status in a non-private dwelling (RLNP (/census/guide-census-data/census-dictionary/2021/variables-topic/housing/residential-status-non-private-dwelling-rlnp) )

### Place of work (POWP)

Where a complete Place of work (POWP (/census/guide-census-data/census-dictionary/2021/variables-topic/location/place-work-powp) ) is not provided, the information that is provided is used to impute an appropriate Destination Zone (/census/guide-census-data/census-dictionary/2021/glossary/d#destination-zone) (as well as Mesh Block). A similar person is

located, and missing Place of work fields are copied to the imputed variable. Depending on the level of imputation required, place of work imputation may use the following variables (where available) in its method:

- Place of usual residence (PURP (/census/guide-census-data/census-dictionary/2021/variables-topic/location/place-usual-residence-purp) )

- Industry of employment (INDP (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/income-and-work/industry-employment-indp) )

- Method of travel to work (MTWP (/census/guide-census-data/census-dictionary/2021/variables-topic/transport/method-travel-work-mtwp) )

**Records that have required imputation can be identified using the imputation flags:**

- Imputation flag for number of males and females in dwelling (IFNMFD (/census/guide-census-data/census-dictionary/2021/variables-topic/household-and-families/imputation-flag-number-males-and-females-dwelling-ifnmfd) )

- Imputation flag for age (IFAGEP (/census/guide-census-data/census-dictionary/2021/variables-topic/population/imputation-flag-age-ifagep) )

- Imputation flag for sex (IFSEXP (/census/guide-census-data/census-dictionary/2021/variables-topic/population/imputation-flag-sex-ifsexp) )

- Imputation flag for registered marital status (IFMSTP (/census/guide-census-data/census-dictionary/2021/variables-topic/household-and-families/imputation-flag-registered-marital-status-ifmstp) )

- Imputation flag for place of usual residence (IFPURP (/census/guide-census-data/census-dictionary/2021/variables-topic/location/imputation-flag-place-usual-residence-ifpurp) )

- Imputation flag for place of work (IFPOWP (/census/guide-census-data/census-dictionary/2021/variables-topic/location/imputation-flag-place-work-ifpowp) )

## Editing

Editing is a process that looks to correct errors in the data and is undertaken as part of the validation strategy to produce a consistent, valid dataset. The kinds of error which editing procedures can detect are limited to responses and codes which are invalid, or which do not align with Census definitions.

For example, if someone mistakenly states that they are 5 years old and in a registered marriage, their record is flagged for investigation and a resolution is established to ensure it aligns with the definition of 2021 Census variables.

## Quality assurance

Quality assurance practices are applied across the various Census systems and processes to monitor and review data quality and ensure the accuracy, consistency and coherence of final Census outputs.

These practices include:

- comparison of the data with previous censuses

- comparison of the data with other sources of information including (but not limited to) Survey of Income and Housing, Construction statistics and Estimated Resident Population

- assessing and validating the data with real world changes (for example, where new suburbs were developed between censuses, or where natural disasters impacted dwellings in specific areas).

For more information about data quality, see Managing Census quality (/census/guide-census-data/census-methodology/2021/managing-census-quality) .

## Introduced random error / perturbation

Under the *Census and Statistics Act 1905* it is an offence to release any information collected under the Act that is likely to enable identification of any individual or organisation. To minimise the risk of identifying individuals in aggregate statistics, a

technique has been developed to randomly adjust values.

Random adjustment of the data, known as random error or perturbation, is considered to be the best technique for avoiding the release of identifiable data while maximising the range of information that can be released.

Many classifications used in ABS statistics have an uneven distribution of data throughout their categories. For example, the number of people who are Anglican or born in Italy is quite large (3,101,187 and 174,042 respectively in 2016) while the number of people who are Buddhist or born in Chile (563,675 and 26,082 respectively in 2016) is relatively small. When religion is cross-classified with country of birth, the number in the table cell who are Anglican and who were born in Italy could be small, and the number of Buddhists born in Chile even smaller. These small numbers increase the risk of identifying individuals in the statistics.

Even when variables are more evenly distributed in the classifications, the problem still occurs. The more detailed the classifications, and the more of them that are applied in constructing a table, the greater the incidence of very small cells.

When random error is applied, all values are slightly adjusted, including the totals values in tables, to prevent any identifiable data being exposed. These adjustments result in small introduced random errors where the true value has been either increased or decreased by a small amount. These adjustments have a negligible impact on the underlying pattern of the statistics. The technique allows very large tables, for which there is a strong client demand, to be produced even though they contain numbers of very small cells.

For tabular outputs, these adjustments may cause the sum of rows or columns to differ by small amounts from totals. The counts are adjusted independently in a controlled manner, so the same information is adjusted by the same amount. However, tables at higher geographic levels may not be equal to the sum of the tables for the component geographic units.

It is not possible to determine which individual figures have been affected by random error adjustments, but the small variance which may be associated with derived totals can for the most part, be ignored.

**Caution when aggregating finely classified data**

No reliance should be placed on small cells as they are impacted by random adjustment, respondent and processing errors.

Many different classifications are used in Census tables and the tables are produced for a variety of geographical areas. The effect of the introduced random error is minimised if the statistic required is found direct from a tabulation rather than from aggregating more finely classified data. Similarly, rather than aggregating data from small areas to obtain statistics about a larger standard geographic area, published data for the larger area should be used wherever possible.

When calculating proportions, percentages or ratios from cross-classified or small area tables, the random error introduced can be ignored except when very small cells are involved, in which case the impact on percentages and ratios can be significant.

See also the Data confidentiality guide (/about/data-services/data-confidentiality-guide) .

# Managing Census quality
## Overview

The ABS is committed to helping users understand all aspects of data quality so they can assess the usefulness of data for their needs. To achieve high quality data from the Census, extensive effort is put into addressing sources of error through quality control measures across Census processes and products, including how the ABS informs users about Census data quality.

For details on how the Census addresses each of the elements of the ABS's quality framework, see the 2021 Census Quality Declaration (/census/guide-census-data/census-methodology/2021/quality-declaration) .

There are four principle sources of error in Census data: respondent error, processing error, non-response and undercount. Quality management of the Census program aims to reduce error as much as possible and to provide a measure of the remaining error to data users to allow them to use the data in an informed way.

## Respondent error

The Australian Census is self-enumerated. This means that people are required to complete the Census form themselves, rather than having the help of a trained interviewer. Self-enumeration carries the risk that wrong answers could be given, either intentionally or unintentionally. Error can be introduced if the respondent does not understand the question or does not know the correct information about other household members. The ABS has a number of ways to minimise respondent error.

### Choosing suitable content

Census topics have simple questions and the total number of questions is managed to ensure reliable responses. Some topics, such as sex, age, registered marital status, indigenous status, usual residence and internal migration, are included in the Census to meet legislative requirements to provide information for electoral purposes and the distribution of government funds. Other topics are selected for inclusion in the Census following extensive community consultation. These topics are selected for their national importance, need for data at a small population or area level, if the data is not available elsewhere or there is an ongoing need for data on this topic.

### Question and form design

The Census form is designed so that questions are easily understood and simple for respondents to answer. Questions are tested through focus groups and cognitive interviews to ensure they are clear, well worded and can be answered on behalf of others. Field tests with these questions are conducted in various cities and rural locations and specific tests are also conducted on the usability and functionality of the online form.

### Raising public awareness

To achieve high quality Census data, it is essential that people understand the importance of being counted and of giving the right answers on the Census form. Raising public awareness through advertising and community briefings contributes to high levels of participation in the Census. It also draws attention to the assistance that is available for people who may have problems filling out their Census form.

For more information on planning and running a Census see Planning the 2021 Census (/statistics/research/planning-2021-census#how-we-plan-to-conduct-the-2021-census) .

## Processing error

Most Census data is recorded through the online Census form. Data on paper Census forms is recorded using automatic processes, such as scanning, Intelligent Character Recognition (/census/guide-census-data/census-dictionary/2021/glossary/i#intelligent-character-recognition-icr-) and other automatic processes. Quality assurance procedures are used during Census processing to ensure processing errors are kept at an acceptable level. Sample checking is undertaken during coding operations, and corrections are made where necessary.

### Repair for paper forms

Once paper forms are received they are checked for damage and errors, such as tears, multi-mark responses and illegible handwriting. Where required, these problems are fixed manually to assist the automatic coding processes.

### Coding errors

Most responses are coded automatically using official classifications with legal value checks built into the system. Errors are more likely to arise during automatic coding of written text answers. Clerical staff resolve problems that arise if text responses cannot be automatically matched to the index of possible responses. Their work is subject to a quality management process where a 10% random sample of coded records are re-coded by a different coder and differences are evaluated by specialist coders. This ensures that systematic errors are detected and remediated.

### Validation

The completed data is put through a series of automated checks to ensure internal consistency. The data is also scrutinised for changes over time by comparison with previous Census data and other data sources, and across categories, where expected trends can be identified and unexpected trends investigated.

In preparing Census data for output, various derivations and re-codes are applied to the data to produce the variables listed in the 2021 Census dictionary (/census/guide-census-data/census-dictionary/2021) . Data is processed further to create the range of Census data tools and products. A series of checks occur at each stage of the output process to ensure data consistency and accuracy.

## Non-response

The Census does not receive Census forms from a small proportion of households. The Census aims for a response rate from private dwellings greater than 95% to minimise the risk of non-response bias in Census data.

Additionally, when completing Census forms some people do not answer all the questions which apply to them. While questions of a sensitive nature are generally excluded from the Census, all topics have a level of non-response. This level can be measured and is generally low.

In instances where a household fails to answer a question, a 'not stated' code is allocated during processing, with the exception of non-response to age, sex, marital status, place of usual residence and place of work. These variables are imputed for non-responding dwellings based on a similar responding dwelling. See Imputation (/census/guide-census-data/census-methodology/2021/how-data-processed#imputation) for more information.

## Undercount

The goal of the Census is to obtain a complete measure of the number and characteristics of people in Australia on Census Night and the dwellings in which they live. However it is inevitable that a small number of people will be missed and some will be counted more than once. In Australia more people are missed from the Census than are counted more than once. The net effect is an undercount.

### Field procedures

Every effort is made to ensure that all households receive a Census form and that these are completed and returned. Information is mailed to households in most areas of Australia on how to complete the Census online, with paper forms mailed or delivered to other areas. Returned Census forms are matched back to the Census frame (list of units, e.g. persons, households, businesses) to register that the household has completed the Census. All forms are registered to the dwelling they were delivered to so that data processing staff can account for forms received as well as those still to be returned by mail or online.

Those households who do not respond receive reminder letters and visits by Census field officers. Ensuring all dwellings are contacted and all persons have provided a response is a critical measure of the completeness of the Census.

Some groups of people in the population are at greater risk of being undercounted in the Census than others. Targeted enumeration strategies have been developed to ensure a more complete count of these groups, dwellings and areas. Strategies are also in place to ensure accessibility to Census forms through the most appropriate means for people with disabilities.

### Post Enumeration Survey

The Census Post Enumeration Survey (PES) is run shortly after the Census to independently assess the completeness of the Census count. The survey is collected from a sample of households and asks basic demographic details as well as location on Census Night. This information is used to determine if and where a person should have been counted in the Census. It also supports the matching of PES person records to Census records to establish the number of times they were actually counted. Results from the PES can help evaluate the effectiveness of Census collection procedures and data processing so improvements can be made for future censuses.

The 2021 Census counted 25,417,999 usual residents of Australia (excluding other territories) who were in the country on Census Night (including 898,484 persons who were imputed into non-responding dwellings assumed to be occupied on Census Night). This was 190,044 persons fewer than the PES estimate of the usual resident population who were present in Australia on Census Night. This equates to a total net undercount rate of 0.7%, down from 1.0% in 2016. Census PES results are discussed in

more detail in 2021 Census overcount and undercount (/statistics/people/population/2021-census-overcount-and-undercount)
.

# Understanding data quality

## Dwelling response rates

The dwelling response rate measures the number of private dwellings that returned a completed Census form as a proportion of all private dwellings believed to be occupied on Census Night.

The private dwelling response rate for the 2021 Census was 96.1%. In the 2016 Census this response rate was 95.1%, and in 2011 it was 96.5%.

The increased response rate between 2016 and 2021 is thought to be positively influenced by, but not limited to, the implementation of a 'window of time' enumeration period which gave respondents flexibility about when they completed their Census form. The 'no log in code' pathway accessible on the Census website allowed respondents to participate in the Census when they had not received or misplaced the log in code sent in the mail. The impact of COVID-19 lockdowns and various border restrictions also meant there were simply more people at home.

The table below provides a breakdown of dwelling response by state and territory across the last three censuses.

**Dwelling response rate by state and territory, 2011-2021**
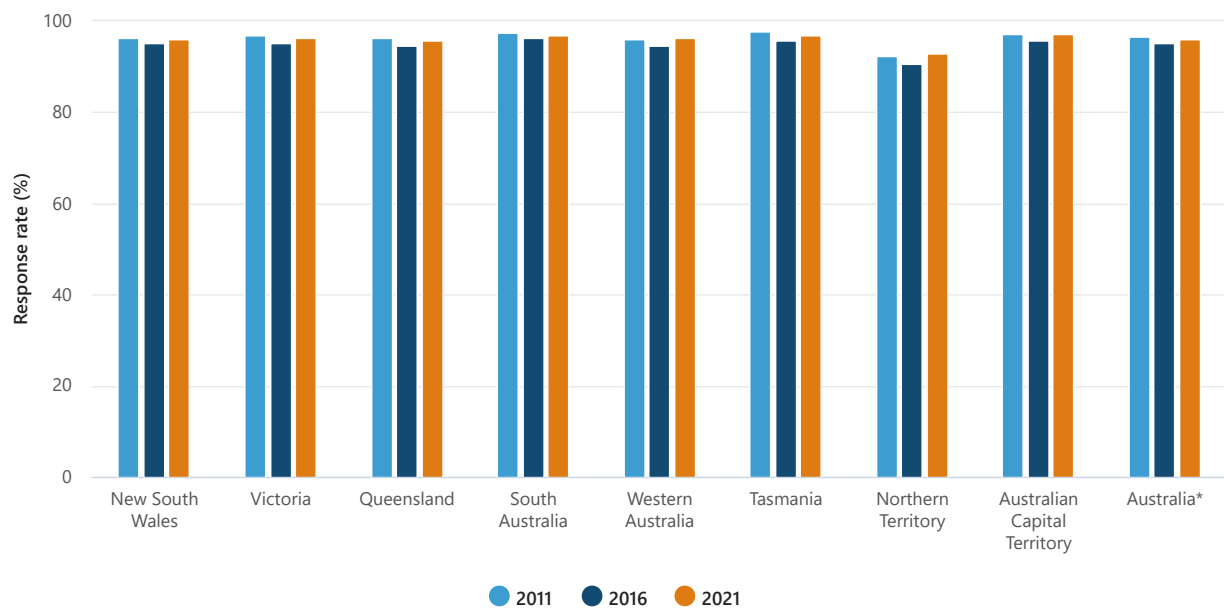


*Includes Other Territories (Jervis Bay Territory, Territory of Christmas Island, Territory of the Cocos (Keeling) Islands and Norfolk Island).

## Person response rates

The person response rate measures how many people are included on a returned Census form as a proportion of all people (responding and non-responding) in Australia on Census Night.

Private dwellings that were occupied but did not return a Census form contribute to the number of people who are considered non-responding. Similarly, people present in non-private dwellings (hotels, hospitals, boarding houses, etc.) but who did not

complete a Census form also contribute to the number of non-responding people.

There are several reasons why person non-response occurs in the Census. People may indicate a desire to mail back a Census form or to complete the form online but may forget to do so, while some people may refuse to complete a Census form altogether.

The dwelling response rate is only calculated for private dwellings, while the person response rate includes all people regardless of whether they are in a private or non-private dwelling.

The person response rate was 95.8% in the 2021 Census. In the 2016 Census it was 94.8% and in the 2011 Census it was 96.3%.

Where people have not responded to the Census, some data items are imputed for those that were missed. This includes key demographic characteristics such as age, sex, marital status, usual address and place of work. Imputation occurs to ensures a full and accurate dataset is produced for the Census (see Imputation (/census/guide-census-data/census-methodology/2021/how-data-processed#imputation) ).

### Person response rate for all dwellings by state and territory, 2011 – 2021
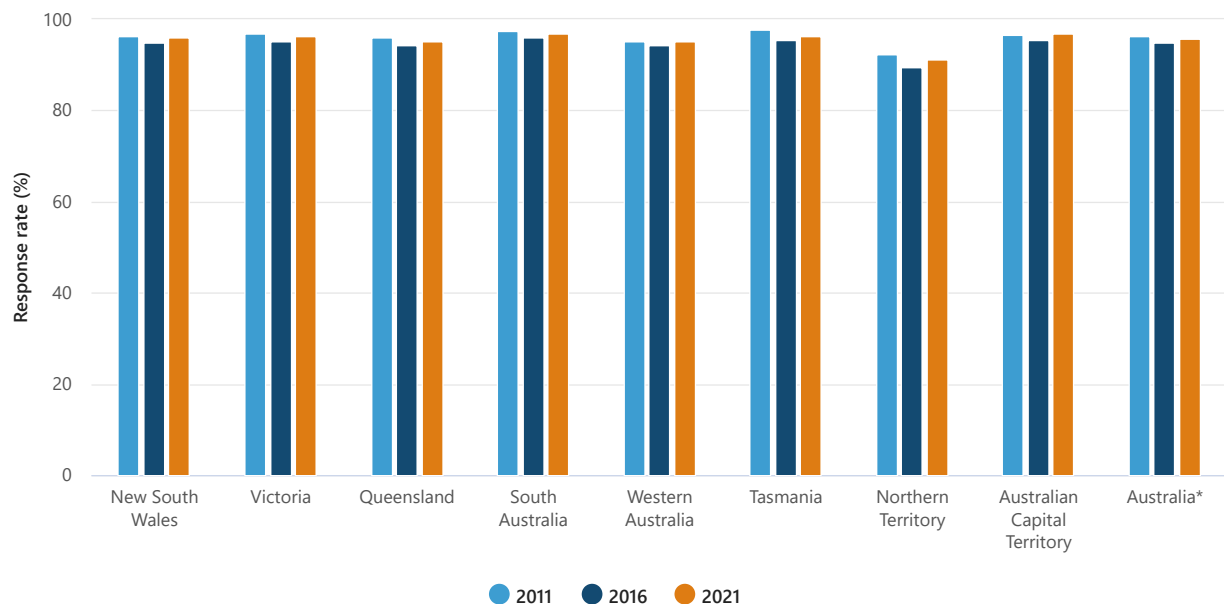


*Includes Other Territories (Jervis Bay Territory, Territory of Christmas Island, Territory of the Cocos (Keeling) Islands and Norfolk Island)

## Item non-response rates

The majority of item non-response is attributable to the people who did not respond to the Census at all. These people have records created for them and while key demographic data items are imputed for them, the remaining data items are left as 'not stated'.

The second and smaller contributor to item non-response is when people return a Census form but may not answer a particular question or questions. This is referred to as item non-response.

Item non-response rates measure the number of people or dwellings that did not respond to a particular question on the Census as a proportion of the total number of people the question was applicable to. In this instance the response is left as 'not

stated'.

It is calculated by dividing the number of persons or dwellings who did not provide a response to a particular question (item) by the number of persons or dwellings for whom the question (item) would have been applicable and is expressed as a percentage.

Item non response rate (%) = Number of persons or dwellings who did not provide a response to a Census question / Total of all persons or dwellings for whom the Census question item was applicable × 100

Depending on the type of question, item non-response is categorised into Person variables and Dwelling variables.

## Person variables

Person item non-response rates only apply to variables that directly reflect responses to individual questions on the Census form, including imputed persons (those that did not respond to the question because they did not return a Census form).

For example, responses to the question, 'What is the highest year of primary or secondary school the person has completed?', were directly coded to the Highest year of school completed (HSCP (/census/guide-census-data/census-dictionary/2021/variables-topic/education-and-training/highest-year-school-completed-hscp) ) variable. Comparatively, the variable, Level of highest educational attainment (HEAP (/census/guide-census-data/census-dictionary/2021/variables-topic/education-and-training/level-highest-educational-attainment-heap) ), does not have a non-response rate as it was not coded from an individual question on the Census form. It was derived from the variables HSCP and Non-school qualification: level of education (QALLP (/census/guide-census-data/census-dictionary/2021/variables-topic/education-and-training/non-school-qualification-level-education-qallp) ).

Person item non-response rates (that are not the key demographic imputed variables) exclude overseas visitors. Only key demographic variables are processed for overseas visitors.

The table below compares the 2021 item non-response rates for person variables to 2016 rates.

## Item non-response rates(a) for first release person variables, Australia(b), 2021

| | 2016 Item non-response (%) | 2021 Item non-response (%) |
|---|---|---|
| Age (AGEP (/census/guide-census-data/census-dictionary/2021/variables-topic/population/age-agep) / AGE5P (/census/guide-census-data/census-dictionary/2021/variables-topic/population/age-five-year-groups-age5p) / AGE10P (/census/guide-census-data/census-dictionary/2021/variables-topic/population/age-ten-year-groups-age10p) / IFAGEP (/census/guide-census-data/census-dictionary/2021/variables-topic/population/imputation-flag-age-ifagep) )(c) | 5.6 | 4.4 |
| Ancestry 1st response (ANC1P (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/cultural-diversity/ancestry-1st-response-anc1p) )(d) | 7.0 | 6.2 |
| Australian citizenship (CITP (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/cultural-diversity/australian-citizenship-citp) ) | 6.9 | 5.1 |
| Australian Defence Force service (ADFP (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/service-australian-defence-force/australian-defence-force-service-adfp) )(e) | n/a | 6.0 |
| Core activity need for assistance (ASSNP (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/disability-and-carers/core-activity-need-assistance-assnp) ) | 7.1 | 5.9 |
| Count of selected long-term health conditions (CLTHP (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/health/count-selected-long-term-health-conditions-cthp) )(e) | n/a | 8.1 |
| Country of birth of father (BPMP (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/cultural-diversity/country-birth-father-bpmp) ) | 6.9 | 5.7 |
| Country of birth of mother (BPFP (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/cultural-diversity/country-birth-mother-bpfp) ) | 6.7 | 5.6 |
| Country of birth of person (BPLP (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/cultural-diversity/country-birth-person-bplp) ) | 6.9 | 5.3 |
| Full-time/part-time student status (STUP (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/education-and-training/full-timepart-time-student-status-stup) )(f) | 6.8 | 5.6 |
| Highest year of school completed (HSCP (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/education-and-training/highest-year-school-completed-hscp) )(g) | 8.6 | 6.6 |
| Indigenous status (INGP (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/aboriginal-and-torres-strait-islander-peoples/indigenous-status-ingp) ) | 6.0 | 4.9 |
| Language used at home (LANP (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/cultural-diversity/language-used-home-lanp) ) | 6.5 | 5.7 |
| Number of children ever born (TISP (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/population/number-children-ever-born-tisp) )(h) | 8.0 | 6.7 |
| Place usual residence on Census Night (SA1 Level) (PURP (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/location/place-usual-residence-purp) / IFPURP (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/location/imputation-flag-place-usual-residence-ifpurp) )(c) | 5.5 | 4.4 |
| Place usual residence on Census Night (SA2 Level) (PURP (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/location/place-usual-residence-purp) / IFPURP (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/location/imputation-flag-place-usual-residence-ifpurp) )(c) | 5.4 | 4.3 |
| Proficiency in spoken English (ENGLP (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/cultural-diversity/proficiency-spoken-english-englp) )(i) | 6.4 | 5.5 |
| Registered marital status (MSTP (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/household-and-families/registered-marital-status-mstp) / IFMSTP (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/household-and-families/imputation-flag-registered-marital-status-ifmstp) )(c) | 6.9 | 5.5 |
| Religious affiliation (RELP (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/cultural-diversity/religious-affiliation-relp) )(j) | 9.1 | 6.9 |
| Residential status in a non-private dwelling (RLNP (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/housing/residential-status-non-private-dwelling-rlnp) )(k) | 27.6 | 42.0 |
| Sex (SEXP (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/population/sex-sexp) / IFSEXP (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/population/imputation-flag-sex-ifsexp) )(c) | 5.8 | 4.7 |
| Total personal income (weekly) (INCP (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/income-and-work/total-personal-income-weekly-incp) )(g) | 9.0 | 7.2 |
| Type of educational institution attending (TYPP (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/education-and-training/type-educational-institution-attending-typp) )(l) | 2.7 | 0.8 |
| Unpaid assistance to a person with a disability, health condition, or due to old age (UNCAREP (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/disability-and-carers/unpaid-assistance-person-disability-health-condition-or-due-old-age-uncarep) )(g) | 8.9 | 6.7 |
| Unpaid child care (CHCAREP (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/unpaid-work-and-care/unpaid-child-care-chcarep) )(g) | 8.3 | 6.4 |
| Unpaid domestic work: number of hours (DOMP (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/unpaid-work-and-care/unpaid-domestic-work-number-hours-domp) )(g) | 8.8 | 6.6 |
| Voluntary work for an organisation or group (VOLWP (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/unpaid-work-and-care/voluntary-work-organisation-or-group-volwp) )(g) | 8.2 | 6.4 |

| | 2016 Item non-response (%) | 2021 Item non-response (%) |
|---|---|---|
| Year of arrival in Australia (YARP (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/cultural-diversity/year-arrival-australia-yarp) )(m) | 3.5 | 2.4 |

This table is based on place of enumeration(n).

a. Includes imputed persons. Excludes overseas visitors (unless stated otherwise), Australian residents temporarily overseas and non-applicable persons.

b. Includes Other Territories (Jervis Bay Territory, Territory of Christmas Island, Territory of the Cocos (Keeling) Islands and Norfolk Island).

c. The variables, Age (AGEP), Registered marital status (MSTP), Place of usual residence (PURP), and Sex (SEXP) are calculated as 'imputation rates' rather than non-response rates. This is because 'not stated' is not a category within these variables. When a person has not responded to the Census at all, these key demographic variables are imputed. Imputation rates include overseas visitors.

d. For 2016 and 2021, Ancestry 1st response (ANC1P) and Ancestry 2nd response (ANC2P) were used to record responses separately. Prior to the 2006 Census, both ancestry responses were coded to a single variable, Ancestry (ANCP).

e. These variables were not available in 2016.

f. Includes people who responded to the Type of educational institution attending (TYPP) question, but not the Full-time/part-time student status (STUP) question.

g. Applicable to persons aged 15 years and over.

h. Applicable to females aged 15 years and over.

i. Applicable to people who did not respond to both the Language used at home (LANP) and Proficiency in spoken English (ENGLP) questions.

j. Answering this Census question was optional in 2016 and 2021.

k. Applicable to persons in a non-private dwelling.

l. Applicable to persons attending an educational institution. Excludes non-respondents to the Full-time/Part-time student status (STUP) question.

m. Applicable to persons born overseas, but excludes overseas visitors.

n. The place of enumeration count refers to the count of people in the state or territory where they are located on Census Night.

## Item non-response rates(a) for second release person variables, Australia(b), 2021

| | 2016 Item non-response (%) | 2021 Item non-response (%) |
|---|---|---|
| Engagement in employment, education and training (EETP (/census/guide-census-data/census-dictionary/2021/variables-topic/education-and-training/engagement-employment-education-and-training-eetp) )(c) | 7.5 | 6.3 |
| Hours worked (HRSP (/census/guide-census-data/census-dictionary/2021/variables-topic/income-and-work/hours-worked-hrsp) )(d) | 1.9 | 1.7 |
| Imputation flag for place of work (POWP (/census/guide-census-data/census-dictionary/2021/variables-topic/location/place-work-powp) /IFPOWP (/census/guide-census-data/census-dictionary/2021/variables-topic/location/imputation-flag-place-work-ifpowp) )(e) | 10.0 | 11.1 |
| Industry of employment (INDP (/census/guide-census-data/census-dictionary/2021/variables-topic/income-and-work/industry-employment-indp) )(d) | 1.2 | 1.3 |
| Labour force status (LFSP (/census/guide-census-data/census-dictionary/2021/variables-topic/income-and-work/labour-force-status-lfsp) )(d) | 6.7 | 5.8 |
| Method of travel to work (MTWP (/census/guide-census-data/census-dictionary/2021/variables-topic/transport/method-travel-work-mtwp) )(d) | 1.0 | 0.5 |
| Non-school qualification: field of study (QALFP (/census/guide-census-data/census-dictionary/2021/variables-topic/education-and-training/non-school-qualification-field-study-qalfp) )(f) | 2.0 | 2.3 |
| Non-school qualification: level of education (QALLP (/census/guide-census-data/census-dictionary/2021/variables-topic/education-and-training/non-school-qualification-level-education-qallp) )(f) | 2.8 | 2.3 |
| Number of employees (EMPP (/census/guide-census-data/census-dictionary/2021/variables-topic/income-and-work/number-employees-empp) )(g) | 1.2 | 0.4 |
| Occupation (OCCP (/census/guide-census-data/census-dictionary/2021/variables-topic/income-and-work/occupation-occp) )(d) | 0.7 | 0.8 |
| Place of usual residence one year ago (PUR1P (/census/guide-census-data/census-dictionary/2021/variables-topic/location/place-usual-residence-one-year-ago-pur1p) )(h) | 8.6 | 6.0 |
| Place of usual residence five years ago (PUR5P (/census/guide-census-data/census-dictionary/2021/variables-topic/location/place-usual-residence-five-years-ago-pur5p) )(i) | 8.0 | 6.9 |
| Public/Private employer indicator (GNGP) (/census/guide-census-data/census-dictionary/2021/variables-topic/income-and-work/publicprivate-sector-gngp) (d) | 1.2 | 1.3 |
| Status in employment (SIEMP (/census/guide-census-data/census-dictionary/2021/variables-topic/income-and-work/status-employment-siemp) )(d) | 1.0 | 0.7 |
| Usual address one year ago indicator (UAI1P (/census/guide-census-data/census-dictionary/2021/variables-topic/location/usual-address-one-year-ago-indicator-uai1p) )(h) | 8.3 | 5.7 |
| Usual address five years ago indicator (UAI5P (/census/guide-census-data/census-dictionary/2021/variables-topic/location/usual-address-five-years-ago-indicator-uai5p) )(i) | 7.3 | 6.2 |

This table is based on place of enumeration(j).

a. Includes imputed persons. Excludes overseas visitors (unless stated otherwise), Australian residents temporarily overseas and non-applicable persons.

b. Includes Other Territories (Jervis Bay Territory, Territory of Christmas Island, Territory of the Cocos (Keeling) Islands and Norfolk Island).

c. Applicable to persons aged 15 years and over.

d. Applicable to employed persons aged 15 years and over.

e. Place of work applies to employed persons aged 15 years and over and is calculated as an imputation rate rather than a non-response rate as 'Not stated' is not a category for this variable. When a person has not responded to the Census at all, their response is imputed.

f. Applicable to persons aged 15 years and over who stated a completed qualification.

g. Applicable to persons aged 15 years and over who are owner managers of incorporated or unincorporated enterprises.

h. Applicable to persons aged 1 year and over.

i. Applicable to persons aged 5 years and over.

j. The place of enumeration count refers to the count of people in the state or territory where they are located on Census Night.

See Downloads  (/census/guide-census-data/census-methodology/2021/understanding-data-quality#data-downloads) section to view person non-response rates for each state and territory as well as non-response rates for Aboriginal and Torres Strait Islander persons.

## Dwelling items/variables

Item non-response for dwelling data items can only be calculated based on place of enumeration. Dwelling item non-response rates are only applicable to occupied private dwellings, except for Dwelling structure. The non-response rate for Dwelling structure includes both occupied and unoccupied private dwellings and is primarily sourced from the ABS Address Register (/statistics/research/abs-address-register-users-guide) . A field officer may also provide a response but a person completing their Census form is not able to.

The table below compares the 2021 item non-response rates for dwelling variables to 2016 rates.

## Item non-response rates(a) for first release dwelling variables, Australia(b), 2021

| | 2016 | | | 2021 | | |
|---|---|---|---|---|---|---|
| | Dwellings for which the question was relevant | Dwellings for which there was no response | Non-response rate(%) | Dwellings for which the question was relevant | Dwellings for which there was no response | Non-response rate(%) |
| Dwelling structure (STRD (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/housing/dwelling-structure-strd) )(c) | 9,901,498 | 47,021 | 0.5 | 10,852,208 | 34,871 | 0.3 |
| Landlord type (LLDD (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/housing/landlord-type-lldd) )(d) | 2,606,632 | 47,041 | 1.8 | 2,992,943 | 26,419 | 0.9 |
| Mortgage repayments (monthly) dollar values (MRED (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/housing/mortgage-repayments-monthly-dollar-values-mred) )(e) | 2,871,414 | 121,907 | 4.2 | 3,258,967 | 194,079 | 6.0 |
| Number of bedrooms in private dwelling (BEDD (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/housing/number-bedrooms-private-dwelling-bedd) ) | 8,861,621 | 654,206 | 7.4 | 9,808,429 | 525,094 | 5.4 |
| Number of motor vehicles (VEHD (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/transport/number-motor-vehicles-vehd) ) | 8,861,621 | 742,470 | 8.4 | 9,808,429 | 528,216 | 5.4 |
| Rent (weekly) dollar values (RNTD (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/housing/rent-weekly-dollar-values-rntd) )(d) | 2,522,972 | 87,511 | 3.5 | 2,894,788 | 114,130 | 3.9 |
| Tenure type (TEND (https://www.abs.gov.au/census/guide-census-data/census-dictionary/2021/variables-topic/housing/tenure-type-tend) ) | 8,861,621 | 680,972 | 7.7 | 9,808,429 | 530,210 | 5.4 |

This table is based on place of enumeration(f).

a. Dwelling item non-response rates are only applicable to occupied private dwellings (unless stated otherwise).

b. Includes Other Territories (Jervis Bay Territory, Territory of Christmas Island, Territory of the Cocos (Keeling) Islands and Norfolk Island).

c. Includes both occupied and unoccupied private dwellings. Information is primarily sourced from the ABS Address Register. A Field Officer (but not a householder), may also provide a response.

d. Applicable to occupied private dwellings being rented. Includes dwellings being occupied rent free.

e. Applicable to occupied private dwellings being purchased. Includes dwellings being purchased under a shared equity scheme.

f. The place of enumeration count refers to the count of people in the state or territory where they are located on Census Night.

## Item non-response rates(a) for second release dwelling variables, Australia(b), 2021

| | 2016 | | | 2021 | | |
|---|---|---|---|---|---|---|
| | Dwellings for which the question was relevant | Dwellings for which there was no response | Non-response rate(%) | Dwellings for which the question was relevant | Dwellings for which there was no response | Non-response rate(%) |
| Household one year mobility indicator (MV1D (/census/guide-census-data/census-dictionary/2021/variables-topic/location/household-one-year-mobility-indicator-mv1d) ) | 8,286,077 | 509,668 | 6.2 | 9,275,217 | 175,351 | 1.9 |
| Household five year mobility indicator (MV5D (/census/guide-census-data/census-dictionary/2021/variables-topic/location/household-five-year-mobility-indicator-mv5d) ) | 8,286,077 | 240,750 | 2.9 | 9,275,217 | 233,356 | 2.5 |

This table is based on place of enumeration(c).

a. Dwelling item non-response rates are only applicable to occupied private dwellings (unless stated otherwise).

b. Includes Other Territories (Jervis Bay Territory, Territory of Christmas Island, Territory of the Cocos (Keeling) Islands and Norfolk Island).

c. The place of enumeration count refers to the count of people in the state or territory where they are located on Census Night.

See Downloads (/census/guide-census-data/census-methodology/2021/understanding-data-quality#data-downloads) section to view dwelling non-response rates for each state and territory.

## Data downloads

### Item non-response rates, 2021

Item non-response rates for first release:

1. First release Person variables by state and territory - 2016 and 2021

2. Second release Person variables by state and territory - 2016 and 2021

3. First release Dwelling variables by state and territory - 2016 and 2021

4. Second release Dwelling variables by state and territory - 2016 and 2021

5. First release Person variables for Aboriginal and Torres Strait Islander people - 2016 and 2021

6. Second release Person variables for Aboriginal and Torres Strait Islander people - 2016 and 2021

**Data files**
    **Download** xlsx [72.36 KB]

## Indicators of data quality

Response rates, for both dwellings and people, and item non-response rates are internationally recognised measures that indicate the quality of Census data. Response rates give an overall indication of the number responses to the Census while item non-response rates are an indicator of a response to specific questions. The Post Enumeration Survey provides an additional, independent measure of Census coverage through its estimate of overcount and undercount.

The key indicators for the 2021 Census of Population and Housing support that the Census data is fit for purpose, with a high private dwelling response rate (96.1%) and the lowest recorded net undercount rate for an Australian Census (0.7%).

Data on this page was updated on 12 October 2022.

# Quality declaration

This quality declaration details how the Census addresses each of the elements of the ABS's quality framework, covering relevance, timeliness, accuracy, coherence, interpretability, and accessibility.

## Institutional environment

For information on the institutional environment of the ABS, including the legislative obligations of the ABS, financing and governance arrangements, and mechanisms for scrutiny of ABS operations, please see ABS Institutional Environment (/about/legislation-and-policy/abs-institutional-environment) .

## Relevance

The Australian Census of Population and Housing is a count of population and dwellings and collects details on age, sex and other characteristics of the population.

The Census aims to measure the number and key characteristics of dwellings and people in Australia on Census Night. All people in Australia on Census Night are in scope, except foreign diplomats and their families. Visitors to Australia are counted regardless of how long they have been in the country or how long they plan to stay. Australian residents not in the country on Census Night are out of scope of the Census.

Topics collected by the Census change from time to time. There must be a demonstrated national need for Census data for policy development, planning and program monitoring. Details on the changing content of Censuses from 1911 to 2021 can be found in Background and planning (/census/about-census/2021-census-overview/background-and-planning) documentation. A copy of the 2021 Census Household Form (/census/census-media-hub/resources/education#sample-copies-of-the-2021-census-paper-forms) is included in educational resources.

In 2021, two new questions on long-term health conditions and Australian Defence Force service were included in the Census. In addition, a third response category was added to the sex question to allow people to identify as non-binary sex. The ancestry question was also expanded to allow for more detailed responses for people of Aboriginal and Torres Strait Islander ancestry.

Updated classifications were used for the coding of geographical units, occupation, industry, cultural and ethnic groups, language, religion, and countries. For more detail see the 2021 Census dictionary (/census/guide-census-data/census-dictionary/2021) .

## Timeliness

The *Census and Statistics Act 1905* requires the Australian Statistician to conduct a Census on a regular basis. Since 1961, a Census has been held every 5 years. The 2021 Census was the 18th national Census and was held on 10 August 2021.

The 2021 Census has two main releases:

1. The first comprehensive Census dataset released in June 2022 provides community level Census data for a wide range of topics, including information on small population groups and for small geographic areas such as suburbs and local government areas.

2. Detailed Census data released in October 2022 contains data on employment, qualifications and population mobility including journey to work and internal migration data.

An additional wave of Census-related data released from 2023 onwards adds further value to the main data releases in 2022.

## Accuracy

The ABS aims to produce high quality data from the Census. To achieve this, extensive effort is put into Census form design, collection procedures and processing. There are four principal sources of error in Census data which quality management aims to reduce as much as possible. They are respondent error, processing error, non-response and undercount. For more detail, see Managing Census quality (/census/guide-census-data/census-methodology/2021/managing-census-quality) .

The Census is self-enumerated and respondents sometimes do not return a Census form or fail to answer every applicable question. Persons are imputed into dwellings for which no form was returned, together with some demographic characteristics

for these people (age, sex, marital status, usual address and place of work). These same demographic characteristics are imputed if not provided by respondents on a returned form. However, the majority of output classifications include a 'not stated' category to record the level of non-response for that data item. Data use considerations are produced for each Census variable and include non-response rates where relevant, along with a comparison of non-response rates for the 2016 Census and a brief outline of any known data quality issues. Data use considerations are included in the 2021 Census dictionary (/census/guide-census-data/census-dictionary/2021) .

## Coherence

It is important for Census data to be comparable and compatible with previous Censuses and also with other data produced by the ABS and wider community. Changes to existing questions on the Census are tested and evaluated to manage any impacts on data, and new Census questions are carefully designed to ensure that differences with other data sources are explainable. The ABS and the Census also use Australian standard classifications, where available and appropriate, to provide data comparability across statistical collections. These include for example, standards for occupation and geographic areas. For more details regarding classifications used in the Census, see the 2021 Census dictionary (/census/guide-census-data/census-dictionary/2021) and the relevant entries for each classifications.

## Accessibility

An extensive range of online products are available on the ABS website. The ABS works to ensure all products are as accessible and usable as possible, undertaking testing of colours, images, navigation and language. See more about accessibility (https://www.abs.gov.au/website-privacy-copyright-and-disclaimer#accessibility) .

If the Census information you require is not available as a standard product or service, ABS Consultancy Services (https://www4.abs.gov.au/web/survey.nsf/contactform/) can help you with customised services to suit your needs.