

# The Canadian Census of Population Experience on Using Respondents' Feedback to Improve Collection

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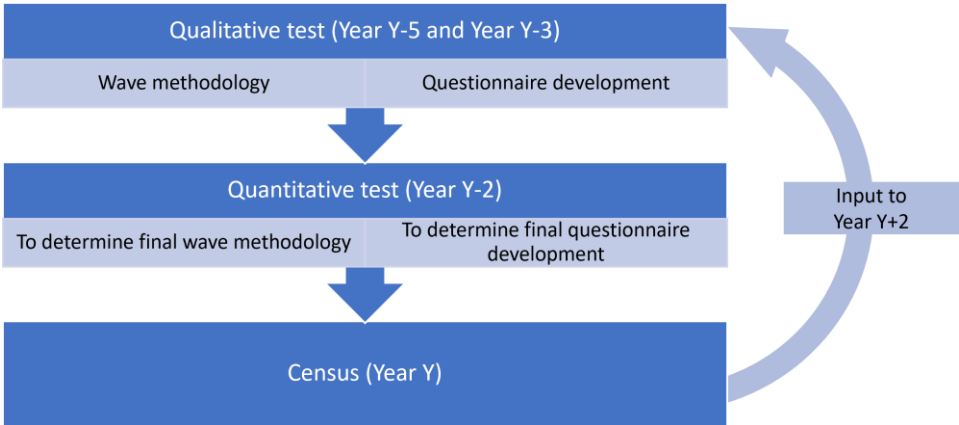
Statistics Canada

## Introduction

The Census of Population is conducted every five years in Canada. The most recent collection took place in the summer of 2021, with May 11 as the Census reference day. The Canadian Census of Population has a tradition of using the scientific approach to make continuous improvements (Rancourt, 2019). Since 2011, the wave methodology has been used to maximize response rates, especially self-response rates. It comprises a series of well-timed contacts with non-responding households to prompt response. It also encourages households to complete their questionnaire online, while mitigating the risk of a decline in overall response by also offering other response modes such as the possibility of ordering a paper questionnaire.

This paper describes how the Canadian Census of Population puts the respondents at the centre of the communication strategies by gathering their rich feedback to improve the wave methodology. It provides concrete examples of improvements made in the last cycle based on qualitative and quantitative tests involving respondents. In addition, insights from the current Census are used as inputs to the qualitative phase of the next cycle, so the process is iterative. Furthermore, the Canadian Census also seeks to fill data gaps and to reduce measurement errors by engaging respondents qualitatively and quantitatively before the next Census.

The overall process can be summarized in the following graph. The approximate time is presented in the paraphysis with year Y being the Census year.



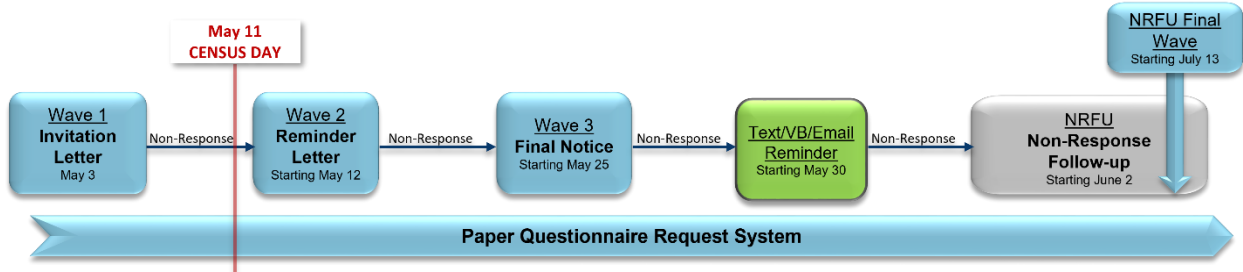
In the following article, section 1 introduces the wave methodology approach used in the Census. Section 2 details a series of qualitative tests conducted to improve the wave methodology and to guide the questionnaire development. Section 3 provides details of the quantitative test in the two areas. Section 4 summarizes the achievements of the 2021 Census, and Section 5 outlines the strategies leveraged in preparation for the 2026 Census. Conclusions are provided in Section 6.

### 1. Census collection wave methodology

The wave methodology is an approach to data collection that has been used since the 2011 Census. The method involves a series of household contacts, also called waves. Households are contacted at critical times to remind them to participate in the Census and to encourage them to complete the questionnaire. In each wave, households are provided with the information they need to respond. The method is designed to encourage people to respond online via an electronic questionnaire (EQ), while mitigating the risk of a decline in overall response (Mathieu et al., 2016).

The wave methodology is not applied uniformly across Canada. Approximately 90% of the dwellings are in the mail-out areas where invitation letters can be mailed directly using the postal system. This paper focuses on the wave methodology and the corresponding testing strategies used for the mail-out dwellings. Figure 1 provides an overview of the wave methodology used in the 2021 Census for mail-out dwellings. Appendix A depicts the materials used in each wave. The wave methodology is different for dwellings that are not in the mail-out areas (Statistics Canada, 2022).

Figure 1. 2021 Census wave methodology for mail-out dwellings



Wave 1 involved sending out a letter asking households to complete the questionnaire online using the secure access code (SAC) provided or to call an automated system on a toll-free line to have a paper questionnaire mailed to them. The Wave 1 letters were delivered by the postal system about one week before Census Day (i.e., on May 3, 2021).

Wave 2 was a reminder letter sent to households who were still non-respondents at that time. The letter reminded the households that they are required by law to respond to the Census and

delays increase Census costs. Like the Wave 1 letter, it also provided the SAC and the toll-free telephone number. It was delivered to households between May 12 and 20, i.e., starting the next day after Census Day. The reminder letters were received over a period of a few days because of the time needed to generate the letters for non-respondents and the different lengths of time that the postal system needed to deliver them to different parts of the country (Mathieu et al., 2016). The format of the Wave 1 and Wave 2 letters were self-mailer, which is a self-folded paper that can be sent by mail without insertion into an envelope as shown in the Appendix A.

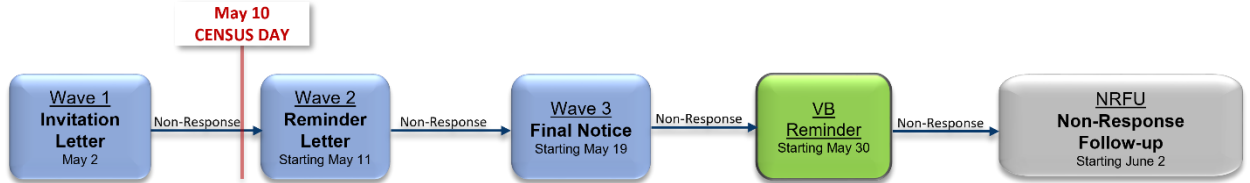
In Wave 3, a letter reminder inserted into a brown envelope (known also as the letter with envelope) was sent to non-respondent households. It was delivered to the households starting May 25. The households could still respond online using a SAC printed in the letter. The letter indicated that if they do not complete the Census questionnaire, Statistics Canada would contact the household by telephone, text message, email or in person to complete the questionnaire. It was also noted in the letter that if the household refused to answer the Census questions, a fine could be leveraged on the household.

Text message, voice broadcast<sup>1</sup> (VB) or email reminders were sent to non-respondent households between May 30 and June 1 based on the availability and type of phone number, and the availability of an email address for the household. Additionally, non-response follow-up (NRFU) began on June 2, 2021.

The NRFU Final Wave was a COVID contingency incorporated to the wave methodology because of concerns of productivity of in-person NRFU during the pandemic. Since COVID occurred after the qualitative and quantitative tests in preparation of the 2021 Census, this wave was not subject to these tests. However, Statistics Canada ensured its proper messaging by consulting with communication experts and the different Census partners.

Figure 2 shows the wave methodology used for mail-out dwellings in the 2016 Census. Self-mailers were used in Wave 1 and Wave 2. In contrast to the 2021 Census, the Wave 3 material in 2016 was a package containing a paper questionnaire. There was also no text nor email reminder. The following sections discuss how the 2021 wave methodology was finalized based on the suggested changes following the 2016 Census.

Figure 2. 2016 Census wave methodology for mail-out dwellings



<sup>1</sup> Voice broadcasts involve an automated system that delivers a pre-recorded message when the phone is either answered or when the call goes to an answering machine.

In terms of the questionnaire development, there were many milestones along the way to the 2021 Census (Statistics Canada, 2021). Evaluating and revising the content of the 2021 Census questionnaire through qualitative test and quantitative test ensured the continued relevance of the Census.

## **2. Qualitative testing**

As part of the scientific approach, qualitative tests are conducted before the larger scale quantitative Census test. Qualitative tests involve one-on-one cognitive interviews with participants to assess the effectiveness of the wave reminders, questionnaire content changes, and other possible improvements for future Censuses. These qualitative interviews allow the Census program to identify potential improvements to the wave material and questionnaire content, which could then be evaluated quantitatively. Participants are selected in a way to ensure that diverse sociodemographic profiles are represented.

### **2.1 Qualitative testing right after the 2016 Census**

Following the 2016 Census, a round of qualitative test was conducted in the summer of 2016 to discuss the wave materials. There were roughly 80 interviews.

The main objective was to obtain feedback from respondents on their overall impressions of, and reactions to, the Census approach, outreach, messaging, and the wave materials while the Census was still fresh in their minds. Another goal was to understand the behavior of late self-respondents and the factors that caused the delay. Insights that were obtained from the qualitative interviews were used to drive improvements for the design of the wave methodology, including the content of the letters. The proposed changes were tested in subsequent qualitative and quantitative tests.

One of the suggestions from participants was to consider putting the completion due date on the front of the Wave 1 self-mailer to catch the household's attention. Moreover, some participants suggested using a text message as an alternative means of contact. These recommendations were tested during subsequent tests before being incorporated into the wave methodology for the 2021 Census. Another comment from participants was that the Wave 3 package containing a paper questionnaire was excessively large, resulting in some damaged paper questionnaires. As a result of this comment as well as Statistics Canada's desire to increase EQ rates, alternative materials for Wave 3 were proposed and tested in subsequent qualitative and quantitative tests.

### **2.2 Qualitative testing in 2018 on wave methodology**

In February 2018, roughly 40 interviews took place for the qualitative testing of the wave methodology. The purpose of the interviews was to understand how the proposed wave material messaging is interpreted by participants and how it could influence their behavior towards completing their Census questionnaire. Also, feedback on the proposed changes that were made to the format of Wave 3 materials were gathered from the participants. Such discussions with

respondents provided valuable insights and aided in determining what should be tested later quantitatively.

For example, participants agreed that including the due date on the front of the Wave 1 self-mailer and moving the mention of paper questionnaire option lower in the letter would encourage them to respond earlier and to respond online. Furthermore, two formats of the proposed Wave 3 materials were discussed with participants: the self-mailer and the letter with envelope as shown in Appendix B. About half of the participants preferred the self-mailer, while the others preferred the letter with envelope. As such, both the self-mailer and letter with envelope were quantitatively tested against the paper questionnaire package to determine which format would maximize self-response for the 2021 Census. More information on this quantitative test will be provided in section 3.1 below.

### **2.3 Qualitative testing in 2018 on questionnaire development**

Consulting with Census data users and the Canadian public allows Statistics Canada to identify data gaps and to maintain the relevance of the Census data. A formal consultation is set at the start of each Census cycle. During that time, Statistics Canada invites data users, stakeholders, and the general public to provide feedback on what information they use, for what purpose and what, if any, data gaps Statistics Canada should consider addressing in the next Census cycle. Based on the findings from consultations, Statistics Canada modifies the questions asked in the Census (Statistics Canada, 2019).

In the summer of 2018, multiple rounds of qualitative tests on questionnaire development were carried out. Various versions of the proposed Census content were tested, and about 250 interviews took place. The main objective was to obtain feedback from respondents on their overall impressions of and reactions to the proposed content and questions, as well as to assess respondents' understanding of the concepts, terminology, questions, and response categories. In addition, these interviews aimed to test respondents' ability and willingness to answer the questions and the respondent-friendliness of the electronic questionnaire. Insights from participants helped to refine questionnaire wordings that would later be tested quantitatively.

Potential improvements to the wave methodology and questionnaire contents identified through qualitative tests were then evaluated quantitatively, as described in the next section.

## **3. Quantitative testing**

The next phase in the scientific process of the Canadian Census is to conduct a quantitative Census Test with the goal of making valid statistical inference for the mail-out areas. The test involves a large-scale representative sample of dwellings spread out across the country. The sample incorporates experimental design where panels are used to compare control version and

the treatment versions. Panels are set up so that statistical comparisons can be made between the different wave material versions and the different versions of the questionnaire (Statistics Canada, 2020). To enable valid statistical inference, weights and bootstrap weights are also created. This allows statistical comparisons between groups to determine which version maximizes response rates and EQ rates (for wave material) and which version of the Census questions provide better data. The results are used to make recommendation for the versions to be used in the Census. The last quantitative test took place between May and June 2019 with a sample size of 135,000 households across all 10 Canadian provinces.

### **3.1 Quantitative testing in 2019**

One example of the quantitative test on wave methodology is to test different formats of the Wave 3 materials. As highlighted above, the 2016 Wave 3 materials was the paper questionnaire so it is the control version. Since the qualitative test in 2018 indicated that some participants liked the self-mailer while others liked the letter with envelope, both the self-mailer and the letter with envelope were included as separate treatment versions. In other words, there were three panels for testing the Wave 3 material.

Table 1 shows the overall response rate and EQ rates across the three panels. The success of the quantitative test relies on households' participation so the overall response rates of 72% - 75% (depending on panels) are quite high. Since the quantitative test is solely self-response (i.e., there is no follow-up operations aside from the wave reminders) without the publicity campaign associated with the Census, it is never expected to reach the response rate of the Census. The high response rates in the quantitative test allows Statistics Canada to draw meaningful conclusions that would be applicable to the Census.

Table 1 demonstrates that the households that received a self-mailer at Wave 3 had lower total response rates than those that received a questionnaire package or letter with envelope. This suggested that sending a letter in the same format as Waves 1 and 2 materials may not be ideal for Wave 3. The response rates for the questionnaire package and letter with envelope were comparable, though letter with envelope did have a slight improvement that was not statistically significant over the questionnaire package. However, the EQ response rates for the letter with envelope and self-mailer were higher than the one from the questionnaire package. The analysis showed about 5% improvement in EQ response rate for the letter with envelope and 2% improvement for the self-mailer. This suggested that the letter with envelope may be preferable over the questionnaire package because it resulted in a statistically significant improvement in EQ response rate while having a similar total response rate. As a result, sending the letter with envelope in Wave 3 was recommended for the 2021 Census.

*Table 1. Comparison of response rate among Wave 3 materials*

	Questionnaire Package (2016)	Letter With Envelope	Self-Mailer
Response rate (Global)	74.26%	74.98%	71.68%
		p-value = 0.1502	p-value < 0.0001
Response rate (EQ)	62.80%	67.67%	64.82%
		p-value < 0.0001	p-value = 0.0003

Besides testing the different wave materials, another dimension of the quantitative test is to compare multiple questionnaire versions. The goal is to determine the optimal questionnaire contents for the 2021 Census. To quantitatively assess the impact of modifications to content, three versions of the questionnaire were tested. The control version contained the 2016 Census content, with minor updates. This was the benchmark version of the questionnaire, without significant changes from the previous cycle. Two alternate versions were developed to test new and modified content. Comparisons between the various versions helped assess what questions, wording, skip patterns, verification messages and other features worked well and would provide reliable information (Statistics Canada, 2020).

#### 4. 2021 Canadian Census of Population

All the improvements made to the wave methodology as a result of analyzing the qualitative and quantitative tests contributed to a very successful 2021 Census during the pandemic. As shown in Table 2, the 2021 Census achieved a 98% national response rate, an 88.1% self-response rate, and a high EQ response rate of 84.1% (Statistics Canada, 2022). The 2021 Census self-response rate of 88.1% was comparable to the 2016 rate of 88.8% (Statistics Canada, 2017), despite the decreasing trend in response rates over time that is observed in other social surveys.

*Table 2. Response rates of the 2021 Census and 2016 Census*

Census Year	Response Rates (Global)	Self-Response Rates	Online Response Rates (EQ)
2021	98.0%	88.1%	84.1%
2016	98.4%	88.8%	68.3%

It is true that between 2016 and 2021, more Canadian households would naturally switch from completing a paper questionnaire to EQ without any change to the wave methodology. However,

the change in the Wave 3 format undoubtedly contributes to the observed 15.8% increase in EQ rate in 2021.

## **5. Strategy leveraged in preparation to the 2026 Census**

The iterative aspect of the scientific process is important for the Canadian Census. Concretely, it means information from the 2021 Census is also used to guide the qualitative phase of the 2026 cycle. For example, qualitative interviews were conducted in the summer of 2021 to obtain participants feedback on the communication strategy and the wave methodology in preparation for 2026. This round of testing is particularly important because contact is made with Census respondents shortly after they completed their questionnaire, which means their overall Census experience is fresh in their minds and they can provide very useful feedback to improve the next Census. Statistics Canada used the 2021 Census paradata to include a diverse list of participants such as those who responded early in the collection as well as those who responded after numerous reminders and finally those who did not self-respond at all. Doing so ensured the feedback obtained qualitatively account for diverse perspective so that an inclusive and general approach could be tested and implemented for the next cycle. During these interviews, some participants suggested the benefit of an earlier text message to inform Canadians to check their community mailboxes since some reported that they only check them every other week. This suggestion did not create concerns for other participants. As a result, during a subsequent qualitative test on wave methodology that took place in early 2023, participants' reactions to messaging of this new text message were gauged. For instance, they were asked how they would react to the text message and whether this would prompt them to retrieve their mailed invitation letter and complete their Census questionnaire.

During the 2021 Census a toll-free Census Help Line was available for those who had questions or required assistance to complete their questionnaire. Analysis from the 2021 Census showed that the volume of calls exceeded capacity during peak periods leading to long wait times. This led the Census program to explore the use of an automated online chat option, a software that simulates human-like conversations with users via chat, to improve respondents' relations. As a result, during qualitative tests participants were asked for feedback regarding this initiative and the best way to communicate this tool during a Census.

During qualitative testing, participants were also asked to comment on new formats of the Wave 3 letter, to see which option would encourage them the most to complete their Census questionnaire. The letter in the envelope used in 2021 will no longer be operationally doable for 2026 and therefore an alternative must be identified. The two options are both self-mailer with the same color as the 2021 letter with envelope but with different sizes (see Appendix C for pictures). Very useful feedback was obtained from participants and the main takeaway from the discussions is that both options should be tested quantitatively in a large-scale Census Test, in order



to statistically assess the impact of both options on response rates. A caveat from cognitive interviews is that they are normally conducted with a relatively small number of participants and cannot be used to make statistical conclusions. Rather, they help guide decisions for larger scale testing.

Data from the 2021 Census is also used to guide questionnaire development that will be tested qualitatively. Some response categories are re-evaluated to ensure that the most prevalent answers are listed first. In addition, reviews are also done for the write-ins to see if new categories can be proposed.

## **6. Conclusion**

The Canadian Census is rigorous in using the scientific approach to make improvements to the wave methodology and to the questionnaire content. The center of both qualitative and quantitative testing lies in continuous engagement with respondents. Successful use of the scientific approach is one of the reasons contributing to high response rates and relevant Census data cycle after cycle. Such high data quality ensures that data users can continue to trust the Census data.

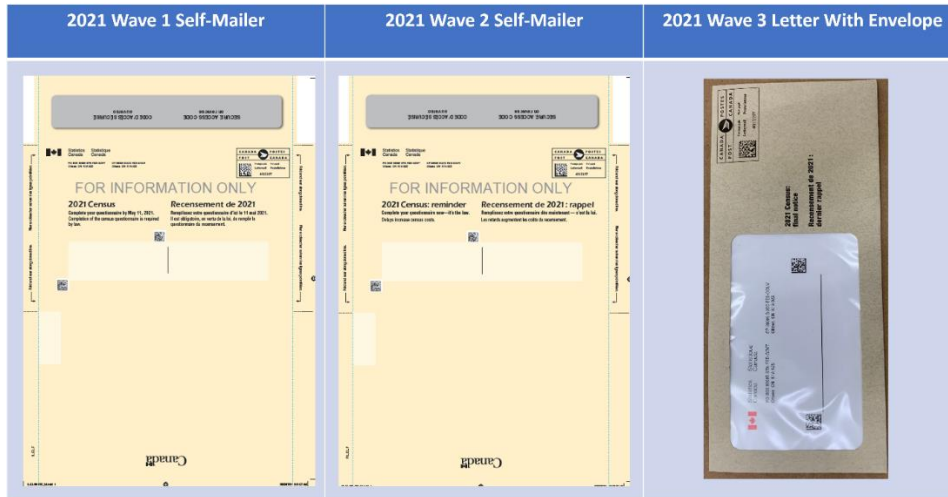
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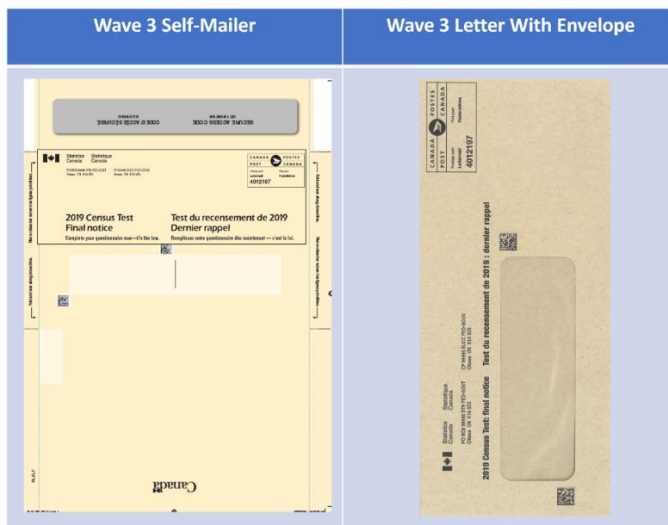
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## Appendix A: Wave materials used in the 2021 Census



## Appendix B: Alternative Wave 3 materials used in 2019 quantitative test



## Appendix C: Wave 3 materials for 2024 quantitative test

