# Strategies to Handle Nonresponse in the Canadian Community Health Survey: Past, Present and Future

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## Introduction

The Canadian Community Health Survey (CCHS) is a Statistics Canada cross-sectional survey that collects information related to health status, health care utilization and health determinants for the Canadian population. It relies upon a large sample of respondents and is designed to provide reliable estimates at a regional level where the health system is managed, which is called the health region.

The survey covers Canadians twelve years and older. Collection for the CCHS is carried out in waves throughout the entire year. The interview has an average length of about 60 minutes. The CCHS also provides a way of addressing emerging health related issues by allowing the addition of short modules to the questionnaire for some of the collection periods.

## Past: Factors leading into the 2015 CCHS redesign

For its 2015 redesign, the CCHS had to achieve some savings while trying to maintain the level of quality of the estimates produced by the survey since 2001. In addition to this main objective, other factors had to be taken into consideration. We describe some of them below.

### Decline in response rates

Over the last 15 years, response rates for Statistics Canada’s household surveys have been steadily decreasing. CCHS is no exception and is the survey with the most noticeable decrease. As can be seen in Figure 1 below, from 86.9% at its beginning, the response rate for CCHS has gone down to 57.5% for 2015. The first collection cycle of 2016, which was the first one following the redesign year, showed a small improvement with a response rate of 61.2%.

**Figure 1 - Response rates for some of Statistics Canada's household surveys**

### Development of Household Surveys Frame Service

A new frame service has recently been developed at Statistics Canada. This service uses various sources of information including administrative files and billing information to provide an accurate list of dwellings along with up to date and valid contact information (address and phone number). The phone number information now includes cell phones. This improved contact information can only help reaching households.

### Increase of Internet penetration in Canada

According to Statistics Canada’s Canadian Internet Use Survey, the proportion of households having Internet access is now over eighty percent since 2012. Collection over the Internet would obviously constitute a much cheaper option than CATI or CAPI, but despite the Internet penetration rate indicated above, other modes of collection would still be required to ensure people without Internet connection can be surveyed.

### Data gap on children under twelve

Statistics Canada is currently not collecting health related information on children under twelve years old. Since the coverage of children aged twelve to seventeen has been problematic with the previous design of the CCHS, this is certainly something to take into consideration for the redesign.

## Present: Redesigned methodology

In order to help reducing the survey costs, the annual sample size was reduced from 117,460 to 108,310. This sample size reduction was made possible in part by the improved sample design. An important change impacting collection and response more directly is the change of the length of the collection period from two to three months. This change gives more time to collect the data on a slightly larger sample each collection period (26,500 cases in the provinces each three months instead of 19,000 per two months).

Before the redesign, samples were drawn from an area frame for CAPI collection, mostly, and from telephone lists for CATI collection. With time, an increasing number of cases from the area frame were collected through CATI. With two independent samples representing similar populations, a dual-frame methodology had to be used to integrate the two samples.

To take advantage of the newly available frame service and to simplify the sampling and estimation processes, it was decided to use a single dwelling frame to cover the population aged eighteen and over. The sample for this population is drawn from Statistics Canada’s area frame developed primarily for the Canadian Labour Force Survey (LFS). This approach makes it possible to minimize the overlap between the CCHS and LFS samples, as well as samples for other major Statistics Canada surveys using the area frame. It also allows for a synchronization of CAPI collection resources between surveys. The list of dwellings and their contact information are extracted from the Household Surveys Frame Service.

In order to deal with the decreasing response rates, as well as to account for changes in the frame and sampling strategy, the collection strategy was also modified. Collection for the population aged eighteen and over now starts as CATI when phone number information is available which is the case for over eighty percent of dwellings appearing on the frame. CAPI is used when no phone number is available. Even though the overall percentage of dwellings for which at least one phone number is available is fairly high, it varies between health regions. For some of these regions, one or more phone numbers are available for only fifty percent of the dwellings. For that reason, CAPI also needs to be used. Cases that start as CATI can be transferred to CAPI if all available phone number information turns out to be invalid. Also, at the end of the second month of collection, cases that have not been contacted through CATI from a subset of health regions with lower response, are transferred to CAPI in an attempt to improve response rates. As for the population aged twelve to seventeen, it is only collected through CATI as phone numbers are available for most of the cases. Overall, the proportion of cases completed in CATI increased from 61% in 2014 to 67% in 2015. This has been a key factor for cost reduction.

To improve the coverage of the twelve to seventeen years old and prepare for the addition of children under 12 to the coverage of the health program, a new sampling frame was introduced. That population used to be covered using the same frame and sampling strategy as the adults and they ended up being underrepresented in the sample. To correct that problem, a sample of children is now taken from the Canadian Child Tax Benefit files. These files cover all children of parents who have claimed the benefit. The benefit was until recently available without consideration to the family income. That allowed for an excellent coverage of the children population. The coverage is above 90% for all provinces when looking at children one year and older comparing the 2005-2006 counts to those of the Canadian Census of Population (see Pantel (2010)).

## Future: Initiatives following the 2015 redesign

### Dealing with decline in response rates

As one of Statistics Canada’s flagship surveys, the CCHS is constantly evolving and is sometimes used to conduct testing. A few of these tests were recently conducted to address the still declining response rates issue. Throughout 2015, new formulations of the introduction letters were tested. Unfortunately these tests were not conclusive but the accomplished work still allowed to make the letters a better communication tool which. This also allowed the introduction to be shortened which helped the interviewers.

Another test was conducted in January 2016 to assess how the CCHS would perform as a mandatory survey. Because the decision to go ahead with that test was made in the fall of 2015, it was decided to use a very simple sampling approach. First, for logistic reasons, the test was only performed on the adult population portion of the survey. Second, no additional sampling process was added for the test; instead, surplus of dwellings obtained through the selection of primary sampling units unused due to collection capacity were used for the test sample. Remote areas and health regions with an insufficient number of remaining units were also excluded to lower collection costs for the test. Finally, one sensitive module was moved to the end of the survey and was clearly identified as voluntary. Otherwise, the collection strategy was the same as for the CCHS.

The results of the test were quite conclusive with an overall collection response rate of 78.2% compared to 62.7% for the CCHS on the same subset of health regions. It was also observed that response rates between health regions covered only by the CCHS and those common between the test and CCHS were comparable (63.4% vs. 62.7%). In addition, the improvement in response rates could be seen on both collection modes (14% for CAPI vs. 15.8% for CATI) and that even though the impact on the response rate varied by province, the improvement was above 10% for all provinces.

As could be expected, the move of the sensitive module to the end of the questionnaire had an impact on the response rate for that module; 12.7% of respondents completely refused to answer that module, and for respondents who accepted answering it, the number who ended up not completing it was twice the amount as for the regular volunteer-based CCHS (7% vs. 3.5%).

Based on these results, a decision was made to go ahead and make the CCHS a mandatory survey starting in January 2017. Changes will be made to the survey to ensure its content is about 45 minute long and that no sensitive questions are asked as part of a mandatory survey.

Some basic analysis was also done to assess whether the profile of respondents to the mandatory test differed from the one of the CCHS respondents and the Canadian population as a whole. No differences came out as statistically significant but as can be seen in table 1, the proportion of the first and last age group in the mandatory test sample are slightly closer to those in the Canadian population. But there is still a large overrepresentation of people aged sixty five or older and the two middle age groups are further away from the proportion in the population. Table 2 shows a small improvement of the overrepresentation of females currently in the CCHS. In Table 3, we can see that the mandatory test sample has a slightly higher proportion of regular smokers which is consistent with the idea that smokers have a higher probability of being late respondents (or not responding) to a survey as highlighted in Baribeau (2014). These results are all unweighted, and although adjustments performed to survey weights allow to correct for some of these potential biases (for example for age and sex which are accounted for during weight calibration), they cannot be fully eliminated; the expected increase in the response rate from making the survey mandatory is a good step into coping with these potential biases.

**Table 1 – Proportion of respondents by age group**

|  |  |  |  |
| --- | --- | --- | --- |
| Age group | CCHS(% of respondents) | Mandatory test(% of respondents) | Canada |
| 18-34 | 21.5% | 22.3% | 28.8% |
| 35-49 | 21.8% | 20.4% | 24.9% |
| 50-64 | 26.9% | 28.2% | 26.5% |
| 65+ | 29.9% | 29.1% | 19.8% |

**Table 2 – Proportion of respondents by sex**

|  |  |  |  |
| --- | --- | --- | --- |
| Sex | CCHS(% of respondents) | Mandatory test(% of respondents) | Canada |
| Male | 45.8% | 47.0% | 49.2% |
| Female | 54.2% | 53.0% | 50.8% |

**Table 3 – Proportion of respondents by smoking status**

|  |  |  |
| --- | --- | --- |
| Smoking | CCHS(% of respondents) | Mandatory test(% of respondents) |
| Daily | 13,15% | 14,98% |
| Occasionally | 4,62% | 4,15% |
| Not at all | 82,18% | 80,88% |
| Not stated | 0,04% | 0,00% |

### Taking advantage of the increase in Internet penetration

As noted earlier, the proportion of households having access to Internet is now over 80%. Since collection over the internet is less costly than the two current collection modes, CCHS will introduce an electronic questionnaire (EQ) as the preferred mode of collection with its next redesign scheduled to go in production in 2021. This change was scheduled for the previous redesign but delays in the delivery of the new Statistics Canada collection management system have forced the survey to postpone that change.

As mentioned, since some households still don’t have Internet access, other collection modes will still be required. Therefore, CATI will be used for follow up and CAPI will be used as a third mode of collection for cases with no phone number information and to help improve response rates in problematic areas like it is currently done. The initial EQ approach will likely be similar to the one used by the Canadian Census of Population where an invitation letter is sent with a Secure Access Code (SAC) that allows access to the EQ for the respondent to complete it online. For cases where the respondent has not completed the EQ online or where it was not possible to mail the invitation letter, the same EQ will be used but will be read to the respondent over the phone or in person.

Since no email information is currently available from our frame services, dwellings for which we can’t mail an invitation letter will start in CATI if at least one phone number is available or CAPI otherwise. A strategy for transferring cases from CATI to CAPI similar to the one currently being used for CCHS will be implemented. The details of the follow up strategy for cases that start as EQ will need to be developed. It can be expected that some cases will have to be followed up through CAPI if no phone numbers are available.

An EQ pilot is scheduled for early 2020. In the meantime a new health survey on children and youth is currently being developed and its main mode of collection will be an EQ. A pilot for that new survey is to take place this coming fall. Since the new Statistics Canada’s collection management system will not be available in time, the pilot will use a simplified strategy with three weeks of EQ-only collection followed by three weeks of CATI collection/follow-up. This should still provide a good estimate of the EQ participation rate and allow for identification of potential issues prior to the CCHS EQ pilot (2020) and full EQ transition (2021).

## Conclusion

Even though a lot of effort was put into maintaining quality for the CCHS during its last redesign we have seen that the decline in response rate is continuing. Even though making the survey mandatory is likely to increase the response rate to a comparable level to what it used to be in 2003, it can be expected that the decline will continue. It is therefore important to keep this issue in mind. Other changes will be necessary. Some of them will be implemented when making the survey mandatory in 2017 like a shortened content and the removal of sensitive modules. More changes are to come with the 2021 redesign like the addition of Internet collection. Hopefully this will help with the response rate but more innovative options may be necessary.

## References

Baribeau, B. (2014). Could Nonresponse Be Biasing Trends Of Health Estimates? *Proceedings of the Joint Statistical Meetings of the American Statistical Association.*

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