

# The 2019 CE Data Quality Profile

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*Consumer Expenditure Surveys Program Report Series*



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## Overview

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In keeping with [Statistical Policy Directory No. 1](#), covering the Fundamental Responsibilities of Federal Statistical Agencies, the Consumer Expenditure Surveys Program (CE) is committed to producing data that are of consistently high statistical quality, i.e., accurate, objective, relevant, timely, and accessible. CE provides data users with a variety of metrics to assist them in evaluating overall data quality. [Official tables](#) provide standard errors, BLS provides [response rates](#) for all its household surveys (including CE), the program publishes [data comparisons](#) with other household survey estimates as well as the results of [nonresponse bias studies](#), and the datasets contained in the [public-use microdata](#) provide variables and flags necessary for users to create their own quality measures.

The Data Quality Profile (DQP) provides a comprehensive set of metrics that are timely, routinely updated, and accessible to users. For data users, the DQP metrics are an indication of quality, and cover both the CE Quarterly Interview Survey (CEQ) and the CE Diary Survey (CED). For internal stakeholders, they can signal areas for survey improvements. Since the quality of survey estimates is affected by errors that can occur throughout the survey lifecycle, we expect that the set of DQP metrics will evolve over time as the CE continually researches methods to monitor and improve data quality. For each metric, a brief description is provided along with the results, which are tabulated and graphed. The [DQP Reference Guide](#) (Knappenberger, Lee, and Tan, 2020) provides detailed descriptions of the metrics, computations, and methodology.

The metrics are reported in quarterly format, where the quarter is the three-month period in which the survey data were collected. For example, “2019q1” refers to all surveys collected in the months of January, February, and March of 2019. Where annual rates are used to describe metric trends in this report, the annual rate was computed as the weighted average of quarterly rates from the same calendar year.

Note: All the data in this report were collected in 2019, prior to the suspension of in-person interviews in 2020 due to the COVID-19 virus, also known as novel coronavirus.

## Highlights

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In this section, we highlight some of the metric trends from 2017 to the 2019 collection period. Subsequent sections describe the individual metrics with detailed data tables.

### Trends that are encouraging

- Declining rates of model-based imputation drove down income imputation rates for both CED and CEQ ([Section 5](#)).
- The increase in expenditure allocation rates in the CEQ beginning in 2017 is offset by an equal decline in the expenditure imputation rates ([Section 4](#)).<sup>1</sup>
- Overall expenditure edit rates declined from 2017 to 2019 due to declines in allocation rates in both CED and CEQ, and to declines in imputation rates in CEQ ([Section 4](#)).

### Trends that cause concern

- CED and CEQ response rates continued to decline ([Section 1](#)). This is largely attributable to the continuing rise in refusal rates for both surveys.
- Perceived burden ([Section 6](#)) increased for the CEQ ([Section 8](#)).
- Information Book usage declined for both CED and CEQ. A significant portion of CEQ cases report not having access to an Information Book at all ([Section 3](#)).<sup>2</sup>

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<sup>1</sup> This simultaneous increase in the allocation rate and decrease in the imputation rate resulted from a change to how CE processes cable, internet, and telephone bills. Since these services are often lumped into a single plan, CE asks respondents to break the total bill down into cable, internet, and telephone costs. If a respondent was unable to do this, CE previously used hot-deck imputation to replace the reported total bill along with the component costs. This was done to ensure that the component costs added up to equal the total bill, but the process needlessly discarded reported data. CE now preserves the total bill amount by allocating it to the different components using proportions calculated from complete reports.

<sup>2</sup> CE provides respondents with an information book to assist them while participating in one of the surveys. Both the CED and CEQ Information Books provide response options for demographic questions and the income bracket response options. The CEQ information book also provides examples of expenditures for each section.

## 1. Final disposition rates of eligible sample units (Diary and Interview Surveys)

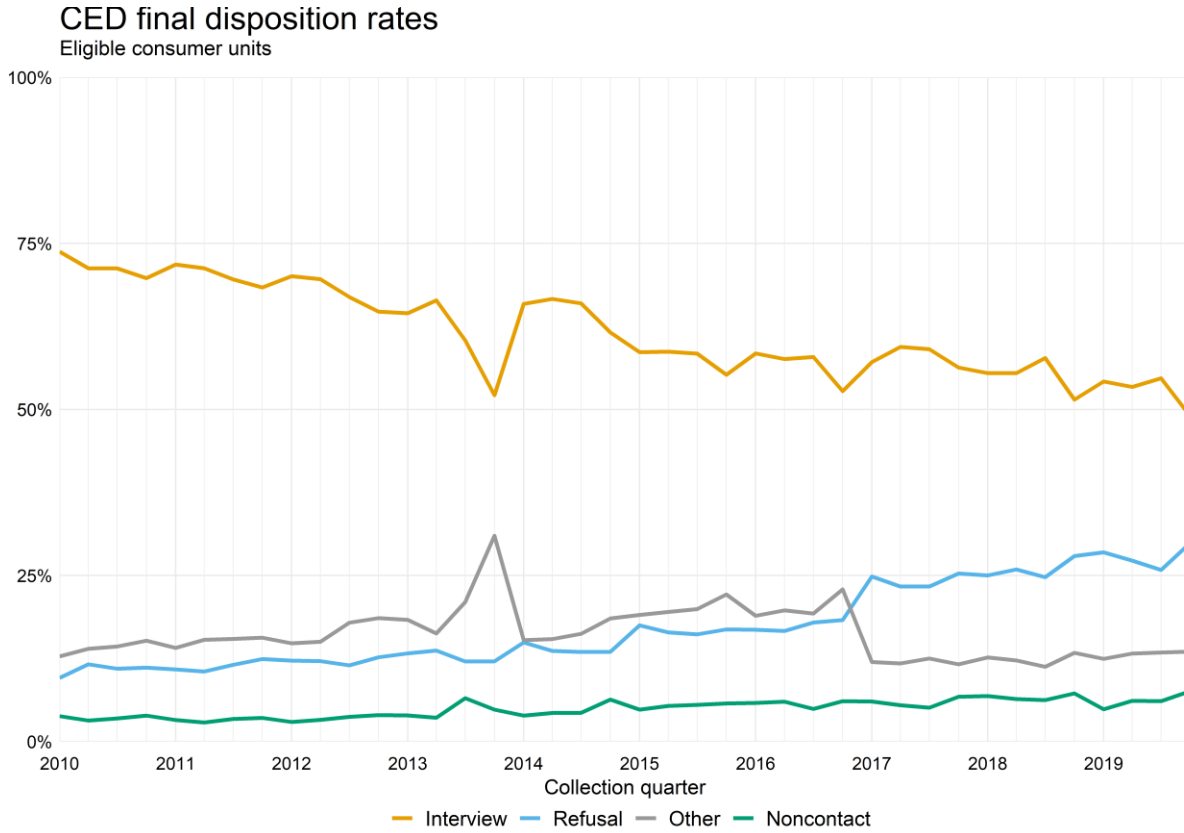
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Final disposition rates of eligible sample units report the final outcome of field staff's survey participation recruitment effort. The CE classifies the final outcome of eligible sample units into four main categories: *completed interview*, nonresponse due to *refusal*, nonresponse due to *noncontact*, and nonresponse due to *other* reasons. Completed interviews reclassified to a nonresponse by CE staff are included within the *other nonresponse* category and presented in the nonresponse reclassification tables (Table 1.2 and 1.4). More information on the non-response reclassification edit, along with information on how we calculate response rates can be found in the [DQP Reference Guide](#) (Knappenberger, Lee, and Tan, 2020).

Low response rates, examined with other indicators, may indicate non-response bias of an expenditure estimate if the nonresponse is correlated with that expenditure category. In addition, higher response rates are preferred for more precise estimates. We present unweighted response rates in this report.

### **CED**

- Response rates dropped from an annual rate of 58 percent in 2017 to an annual rate of 53 percent in 2019.
- The largest annual drop in response rates was in 2013 and is attributed to the shutdown of the federal government.
- Refusal rates increased by about 3.7 percentage points from an annual rate of 24.2 percent in 2017 to an annual rate of almost 28 percent in 2019.



**Table 1.1 CED: distribution of final dispositions for eligible CUs (unweighted)**

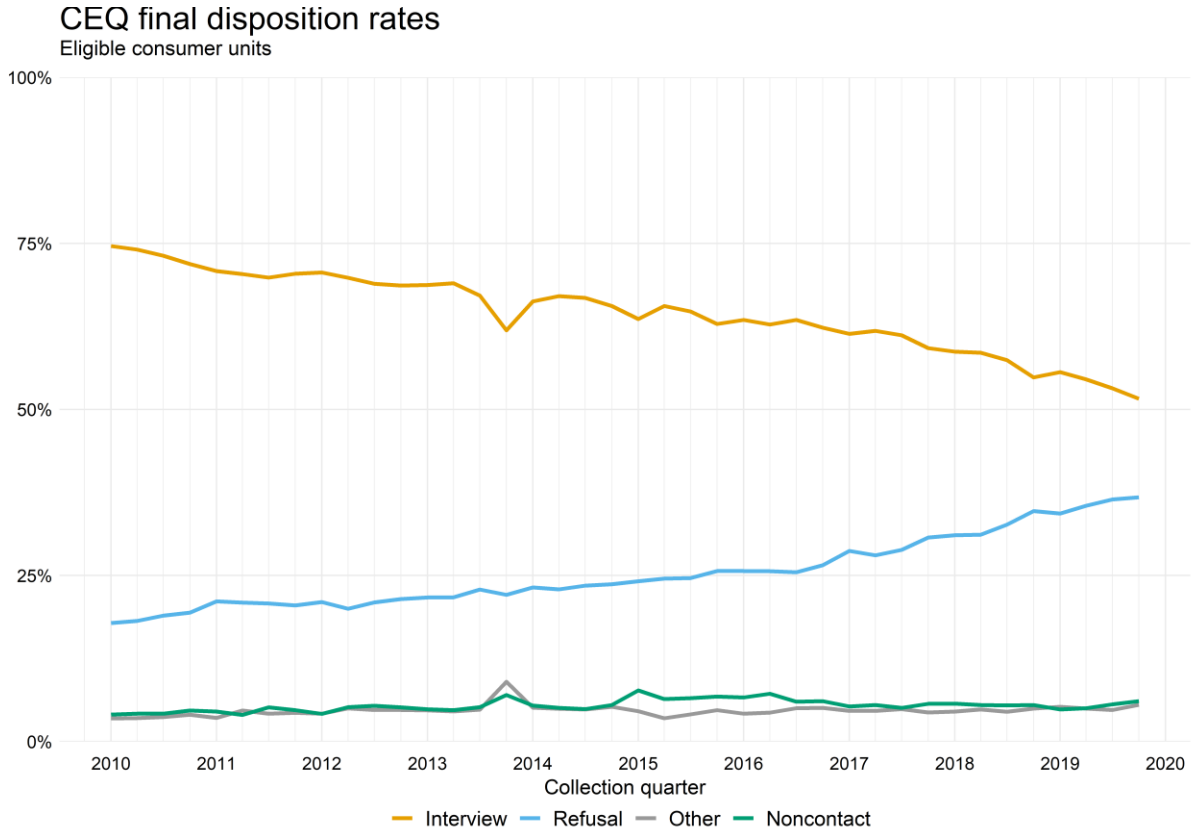
Quarter	Number of eligible CUs	Row percentage			
		Interview	Refusal	Noncontact	Other Nonresponse
2017q1	4,972	57.1	24.8	6.0	12.0
2017q2	5,054	59.4	23.3	5.5	11.8
2017q3	4,916	59.1	23.3	5.1	12.5
2017q4	5,168	56.3	25.3	6.8	11.6
2018q1	5,032	55.5	25.0	6.9	12.7
2018q2	5,015	55.5	25.9	6.4	12.2
2018q3	5,014	57.8	24.8	6.2	11.2
2018q4	5,072	51.5	27.9	7.3	13.3
2019q1	4,926	54.2	28.5	4.9	12.4
2019q2	5,082	53.4	27.2	6.1	13.2
2019q3	5,020	54.7	25.8	6.1	13.4
2019q4	5,216	48.9	29.9	7.6	13.5

**Table 1.2 CED: prevalence of nonresponse reclassifications (unweighted)**

Quarter	Number of eligible CUs	Number of other nonresponse	Nonresponse reclassifications		
			Number of CUs	Other nonresponse (%)	Eligible CUs (%)
2017q1	4,972	596	225	37.8	4.5
2017q2	5,054	595	250	42.0	4.9
2017q3	4,916	615	283	46.0	5.8
2017q4	5,168	601	227	37.8	4.4
2018q1	5,032	637	227	35.6	4.5
2018q2	5,015	613	241	39.3	4.8
2018q3	5,014	564	247	43.8	4.9
2018q4	5,072	677	205	30.3	4.0
2019q1	4,926	613	232	37.8	4.7
2019q2	5,082	673	243	36.1	4.8
2019q3	5,020	673	229	34.0	4.6
2019q4	5,216	706	188	26.6	3.6

**CEQ**

- Response rates dropped from an annual rate of 61 percent in 2017 to an annual rate of 54 percent in 2019.
- The dip in response rates in 2013 is attributed to the shutdown of the federal government.
- Refusal rates increased by about 7 percentage points from an annual rate of 29 percent in 2017 to an annual rate of almost 36 percent in 2019.



**Table 1.3 CEQ: distribution of final dispositions for eligible CUs (unweighted)**

Quarter	Number of eligible CUs	Row percentage			
		Interview	Refusal	Noncontact	Other nonresponse
2017q1	10,113	61.4	28.7	5.3	4.6
2017q2	9,988	61.8	28.0	5.5	4.6
2017q3	9,954	61.2	28.9	5.1	4.9
2017q4	10,138	59.2	30.7	5.7	4.4
2018q1	10,077	58.7	31.1	5.7	4.5
2018q2	10,075	58.6	31.1	5.5	4.8
2018q3	10,053	57.4	32.6	5.5	4.5
2018q4	10,161	54.8	34.7	5.5	5.0
2019q1	10,108	55.6	34.3	4.8	5.2
2019q2	10,075	54.5	35.5	5.0	5.0
2019q3	10,036	53.2	36.5	5.6	4.8
2019q4	10,170	51.6	36.8	6.1	5.5



**Table 1.4 CEQ: prevalence of nonresponse reclassifications (official tables, unweighted)**

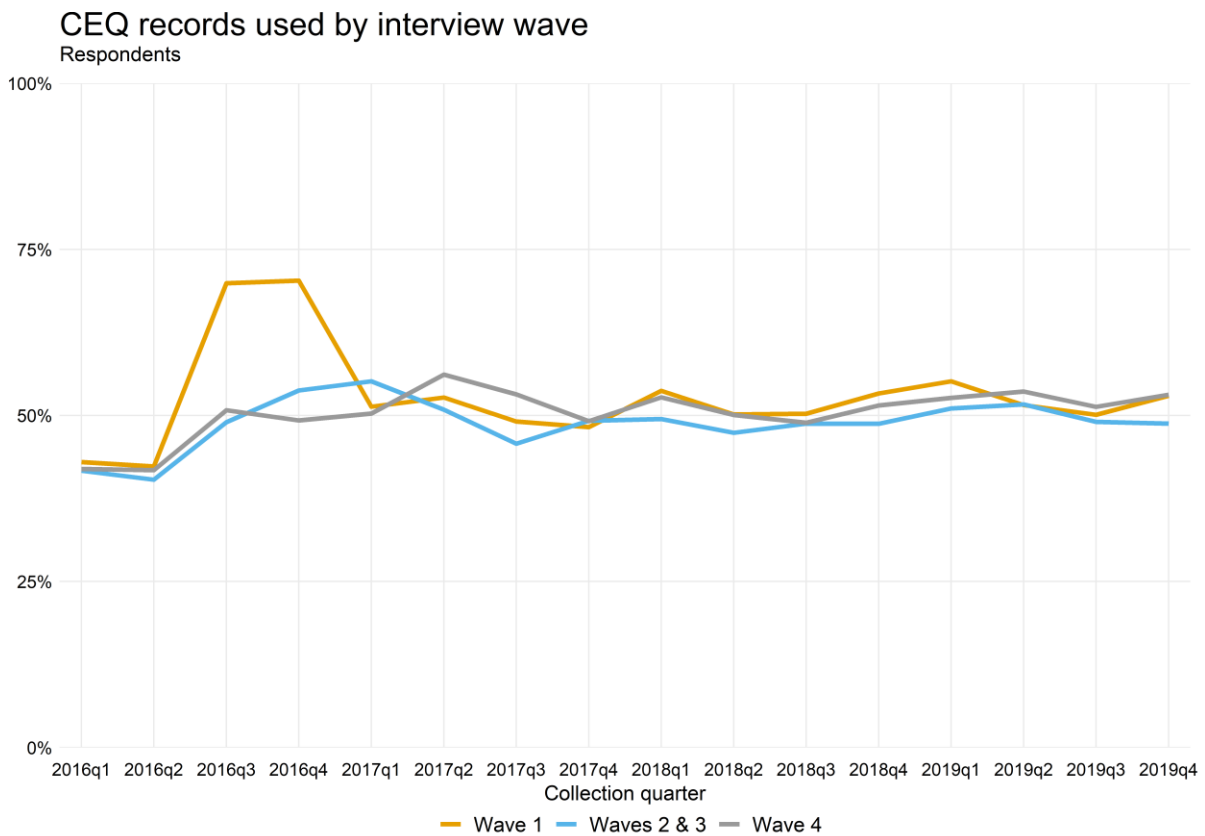
Quarter	Number of eligible CUs	Number of other nonresponse	Nonresponse reclassifications		
			Number of CUs	Other nonresponse (%)	Eligible CUs (%)
2017q1	10,113	467	1	0.2	0.01
2017q2	9,988	462	21	4.6	0.21
2017q3	9,954	487	21	4.3	0.21
2017q4	10,138	445	15	3.4	0.15
2018q1	10,077	454	1	0.2	0.01
2018q2	10,075	486	1	0.2	0.01
2018q3	10,053	450	8	1.8	0.08
2018q4	10,161	504	5	1.0	0.05
2019q1	10,108	528	8	1.5	0.08
2019q2	10,075	499	2	0.4	0.02
2019q3	10,037	477	8	1.7	0.08
2019q4	10,170	563	13	2.3	0.13

## 2. Records Use (Interview Survey)

This metric measures the proportion of respondents who used records while answering the CEQ survey questions. Examples of records include but are not limited to receipts, bills, checkbooks, and bank statements. Records use is retrospectively recorded by the interviewer at the end of the interview. Past research has shown that respondents who use expenditure records reported more items with lower missingness (Abdirizak, Erhard, Lee, and McBride, 2017), so a higher prevalence of records use is desirable.

### CEQ

- Records usage temporarily rose in 2016 for Wave 1 respondents, and this is likely a result of a field test conducted during this period that gave a subset of respondents monetary incentives to use records.
- From 2017 to 2019, records use has been stable across interview waves.



**Table 2.1 CEQ: prevalence of records use among respondents**

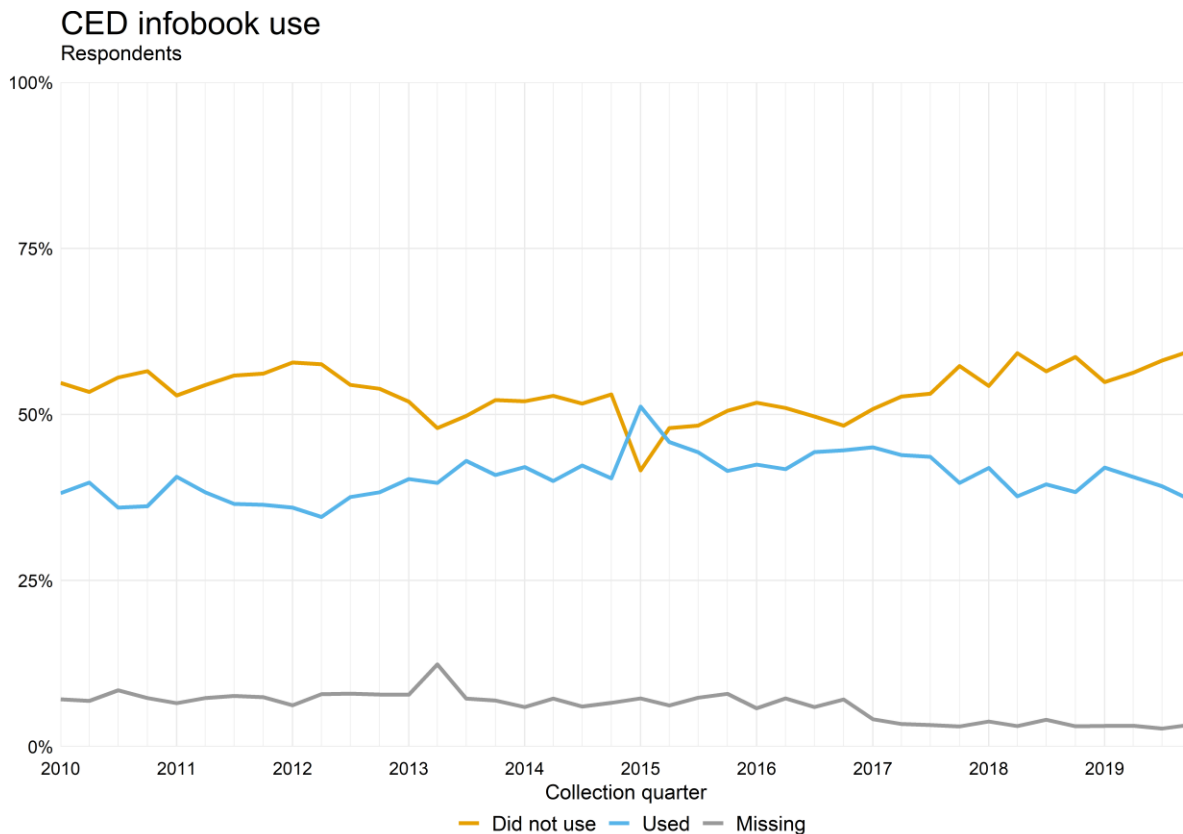
Quarter	Wave	Number of eligible CUs	Row percentage		
			Used	Did not use	Missing response
2017q1	Wave 1	1,557	51.3	47.4	1.3
2017q1	Waves 2 & 3	3,078	55.1	44.3	0.6
2017q1	Wave 4	1,573	50.3	49.0	0.7
2017q2	Wave 1	1,573	52.7	46.5	0.8
2017q2	Waves 2 & 3	3,003	50.9	48.6	0.5
2017q2	Wave 4	1,601	56.2	43.3	0.5
2017q3	Wave 1	1,581	49.1	50.1	0.8
2017q3	Waves 2 & 3	2,933	45.8	53.6	0.6
2017q3	Wave 4	1,576	53.2	46.0	0.8
2017q4	Wave 1	1,592	48.2	50.5	1.3
2017q4	Waves 2 & 3	2,935	49.2	50.3	0.5
2017q4	Wave 4	1,477	49.2	50.1	0.7
2018q1	Wave 1	1,501	53.7	45.2	1.1
2018q1	Waves 2 & 3	2,951	49.5	50.0	0.5
2018q1	Wave 4	1,464	52.7	46.4	0.9
2018q2	Wave 1	1,529	50.2	48.7	1.1
2018q2	Waves 2 & 3	2,884	47.4	52.0	0.6
2018q2	Wave 4	1,486	50.1	49.4	0.5
2018q3	Wave 1	1,494	50.3	48.9	0.9
2018q3	Waves 2 & 3	2,815	48.8	50.9	0.4
2018q3	Wave 4	1,464	48.9	50.2	0.9
2018q4	Wave 1	1,399	53.3	45.7	0.9
2018q4	Waves 2 & 3	2,782	48.7	50.8	0.4
2018q4	Wave 4	1,390	51.5	47.4	1.1
2019q1	Wave 1	1,465	55.2	43.8	1.0
2019q1	Waves 2 & 3	2,730	51.1	48.4	0.5
2019q1	Wave 4	1,428	52.7	46.9	0.4
2019q2	Wave 1	1,443	51.6	47.6	0.8
2019q2	Waves 2 & 3	2,653	51.7	47.9	0.4
2019q2	Wave 4	1,397	53.6	45.5	0.9
2019q3	Wave 1	1,401	50.1	48.7	1.2
2019q3	Waves 2 & 3	2,651	49.0	50.2	0.8
2019q3	Wave 4	1,285	51.3	48.1	0.6
2019q4	Wave 1	1,318	53.0	46.2	0.8
2019q4	Waves 2 & 3	2,637	48.8	51.0	0.2
2019q4	Wave 4	1,293	53.1	46.3	0.5

### 3. Information Book use (Diary and Interview Surveys)

The Information Book is a recall aide the interviewer can provide the respondent. There are separate Information Books for each survey, and each provides the response options for demographic questions and the income bracket response options. In addition, the CEQ Information Book provides examples that can clarify the kinds of expenditures that each section/item code is intended to collect. The Information Book use metric measures the prevalence of Information Book use among respondents during their interviews. For interviews conducted over the phone, the Information Book is typically not directly available to the respondent (although examples from it may be read over the phone), so this metric should be interpreted in conjunction with the rising prevalence of telephone interviews described in [Section 7](#). At the end of the interview, the interviewer is asked how often the respondent used the Information Book. Using the Information Book can improve reporting quality by clarifying concepts with concrete examples, and help recall. Therefore, higher rates of Information Book usage are preferred.

#### CED

- The prevalence of Information Book use among CED respondents has declined over 3 percentage points from an annual rate of about 43 percent in 2017 to about 40 percent in 2019.

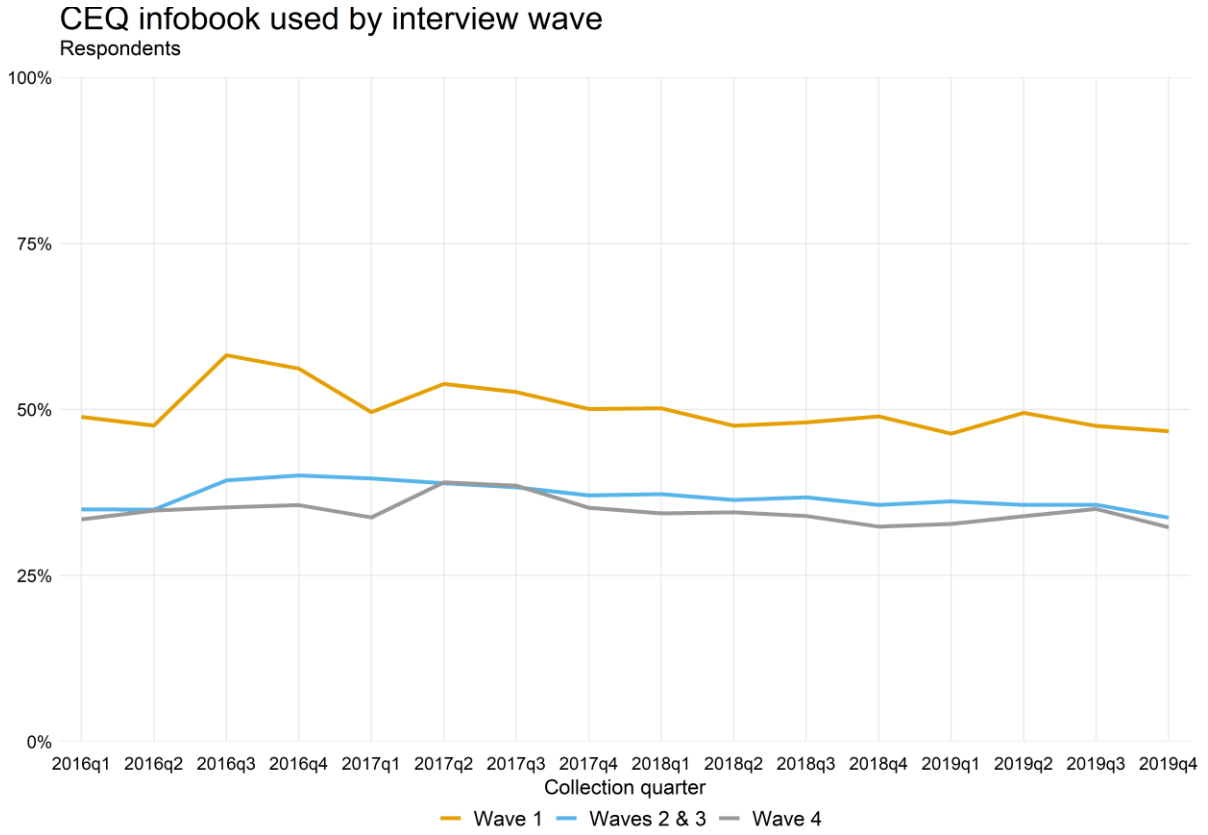


**Table 3.1 CED: prevalence of Information Book use among respondents**

Quarter	Number of eligible CUs	Row percentage		
		Used	Did not use	Missing response
2017q1	2,841	45.1	50.8	4.1
2017q2	3,003	43.9	52.7	3.4
2017q3	2,904	43.6	53.1	3.2
2017q4	2,910	39.7	57.3	3.0
2018q1	2,791	42.0	54.3	3.8
2018q2	2,781	37.7	59.2	3.1
2018q3	2,896	39.5	56.5	4.0
2018q4	2,611	38.3	58.6	3.1
2019q1	2,671	42.0	54.9	3.1
2019q2	2,713	40.6	56.3	3.1
2019q3	2,745	39.2	58.1	2.7
2019q4	2,553	37.1	59.6	3.3

**CEQ**

- Information Book use in Wave 1 declined from an annual rate of about 51.5 percent in 2017 to 47.5 percent in 2019.
- The rate of Wave 1 respondents who did not have access to the Information Book increased from an annual rate of 31.2 percent in 2017 to 34.6 percent in 2019.
- In subsequent waves, the rate of Information Book use during interviews were at least 10 percentage points lower than in Wave 1, and about half of respondents did not have access to the Information Booklet.



**Table 3.2 Prevalence of Infobook use among CEQ respondents**

Quarter	Wave	Number of eligible CUs	Row percentage			
			Used	Did not use	No Infobook available	Missing response
2017q1	Wave 1	1,557	49.6	15.4	33.7	1.3
2017q1	Wave 2 & 3	3,078	39.6	12.7	47.1	0.6
2017q1	Wave 4	1,573	33.8	14.8	50.7	0.7
2017q2	Wave 1	1,573	53.8	17.0	28.4	0.8
2017q2	Wave 2 & 3	3,003	38.9	15.4	45.2	0.5
2017q2	Wave 4	1,601	39.0	13.4	47.1	0.5
2017q3	Wave 1	1,581	52.6	16.6	30.0	0.8
2017q3	Wave 2 & 3	2,933	38.3	16.2	44.9	0.6
2017q3	Wave 4	1,576	38.5	13.9	46.8	0.8
2017q4	Wave 1	1,592	50.1	15.9	32.8	1.3
2017q4	Wave 2 & 3	2,935	37.1	15.4	47.0	0.5
2017q4	Wave 4	1,477	35.2	14.8	49.3	0.7
2018q1	Wave 1	1,501	50.2	16.5	32.2	1.1
2018q1	Wave 2 & 3	2,951	37.2	14.5	47.7	0.5
2018q1	Wave 4	1,464	34.4	13.9	50.9	0.9
2018q2	Wave 1	1,529	47.5	17.7	33.6	1.1
2018q2	Wave 2 & 3	2,884	36.4	16.3	46.7	0.6
2018q2	Wave 4	1,486	34.5	16.8	48.1	0.5
2018q3	Wave 1	1,494	48.1	20.6	30.5	0.9
2018q3	Wave 2 & 3	2,815	36.8	15.9	47.0	0.4
2018q3	Wave 4	1,464	33.9	14.9	50.3	0.9
2018q4	Wave 1	1,399	49.0	17.3	32.8	0.9
2018q4	Wave 2 & 3	2,782	35.6	15.9	48.1	0.4
2018q4	Wave 4	1,390	32.4	16.7	49.9	1.1
2019q1	Wave 1	1,465	46.3	15.8	36.9	1.0
2019q1	Wave 2 & 3	2,730	36.2	14.0	49.3	0.5
2019q1	Wave 4	1,428	32.8	14.6	52.2	0.4
2019q2	Wave 1	1,443	49.5	17.3	32.4	0.8
2019q2	Wave 2 & 3	2,653	35.6	15.9	48.1	0.4
2019q2	Wave 4	1,397	33.9	16.7	48.5	0.9
2019q3	Wave 1	1,401	47.5	18.0	33.3	1.2
2019q3	Wave 2 & 3	2,651	35.6	15.2	48.4	0.8
2019q3	Wave 4	1,285	35.0	13.8	50.6	0.6
2019q4	Wave 1	1,318	46.7	16.5	35.9	0.8
2019q4	Wave 2 & 3	2,637	33.7	14.9	51.2	0.2
2019q4	Wave 4	1,293	32.3	15.3	51.9	0.5

#### 4. Expenditure edit rates (Diary and Interview Surveys)

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This metric measures the proportion of reported expenditure data that are edited. Expenditure data edits are changes made to the reported expenditure data during CE data processing excluding changes due to calculations (e.g. conversion of weekly value to quarterly value) and top-coding or suppression of reported values. Top-coding and suppression are done to protect respondent confidentiality in the public-use microdata and more information is available on the [CE Website](#). Expenditure edit rates for the CEQ are broken down into three categories:

Imputation, allocation, and manual edits:

- *Imputation* replaces missing or invalid responses with a valid value
- *Allocation* edits are applied when respondents provide insufficient detail to meet tabulation requirements. For example, if a respondent provides a non-itemized total expenditure report for the category of fuels and utilities, that total amount will be allocated to the target items mentioned by the respondent (such as natural gas and electricity).
- *Manual* edits occur whenever responses are directly edited by CE economists based on their analysis and expert judgment.

Expenditure edit rates for the CED are only broken down into two categories. Almost all edits in CED are allocations. The “other edits” category encompasses all other expenditure edits including imputation and manual edits, though as you can see below, these are rare.

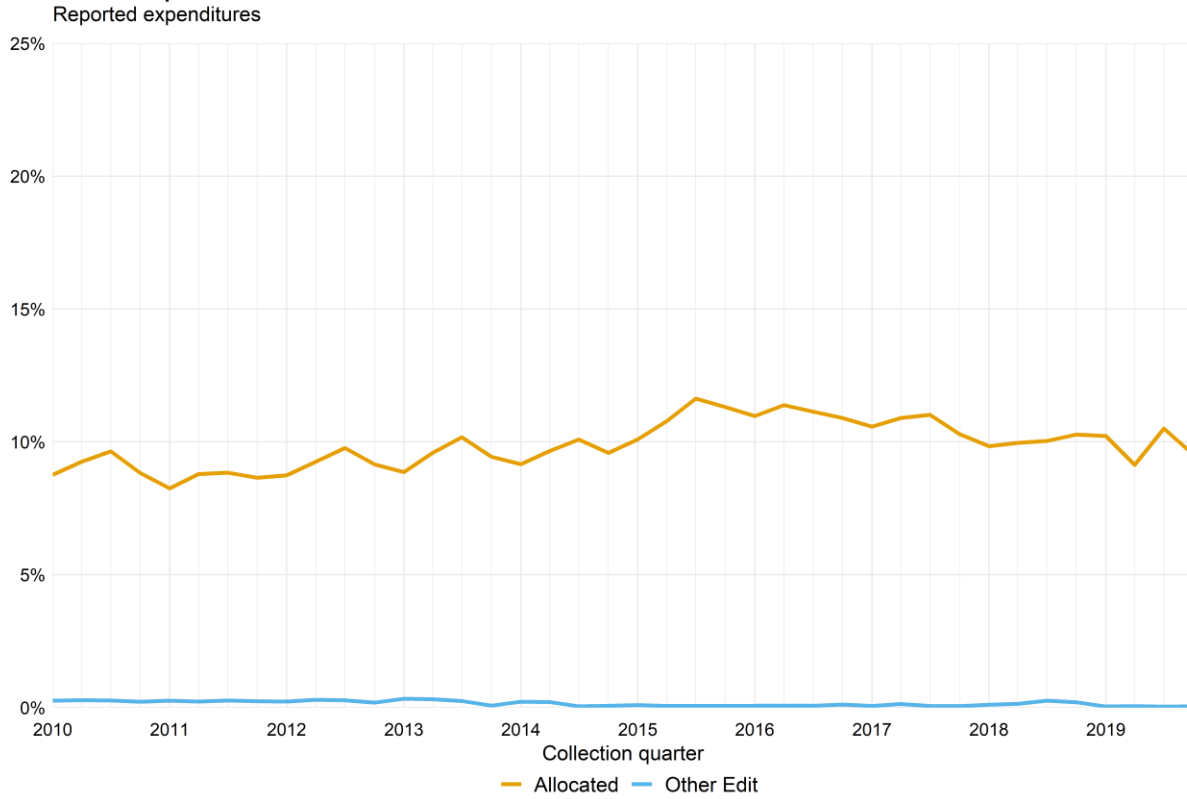
Lower edit rates are preferred in general since that lowers the risk of processing error. Imputation in CE results from expenditure amount nonresponse, and lower imputation rates are desirable. Allocation is a consequence of responses lacking the required details for items asked by the survey, and lower allocation rates are also preferred. However, edits based on sound methodology can improve the completeness of the data, and thereby reduce the risk of measurement error and non-response bias in survey estimates. Additional information on expenditure edits are available in the [DQP Reference Guide](#) (Knappenberger, Lee, and Tan, 2020).

##### **CED**

- The rate of edited reported expenditure records declined about 1 percentage point from an annual rate of 10.7 percent in 2017 to 9.9 percent in 2019.



### CED expenditure edit rates



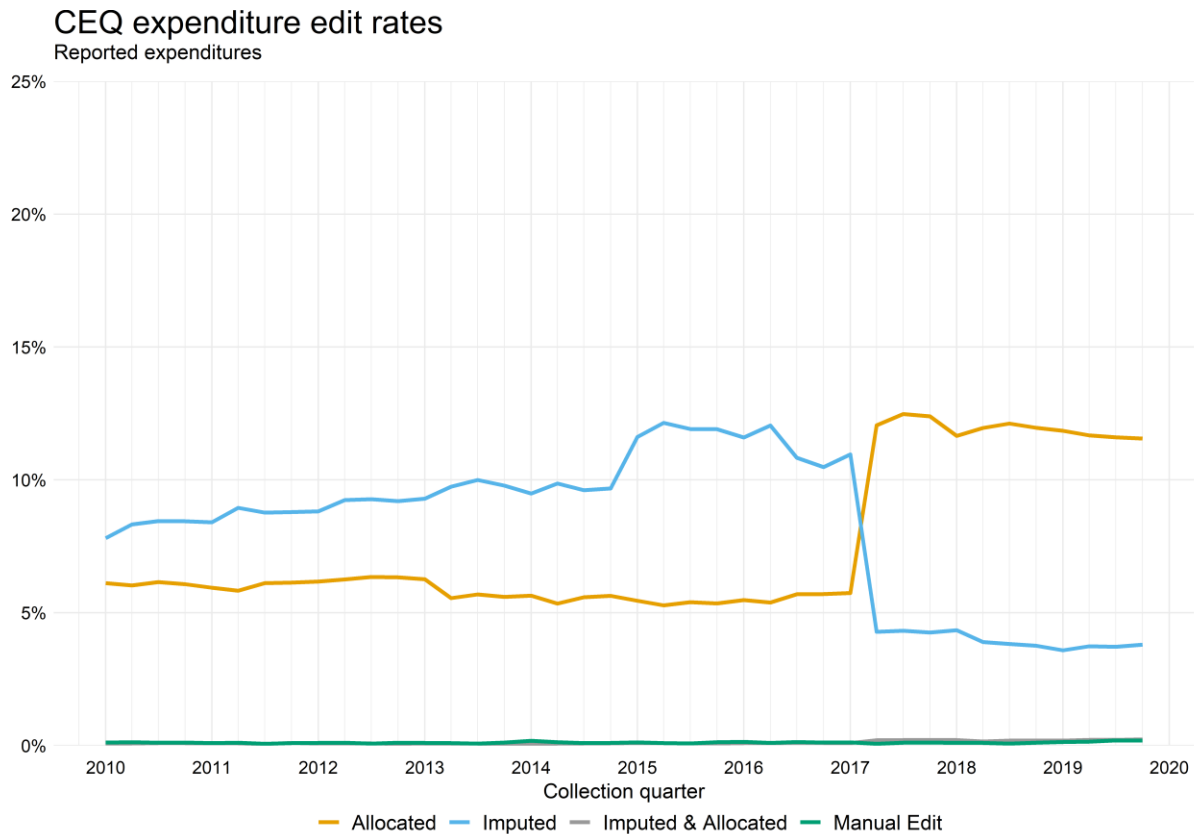
**Table 4.1 CED: reported expenditure records**

Quarter	Number of expenditures	Row percentage		
		Allocated	Other edit	Unedited
2017q1	88,654	10.6	0.1	89.4
2017q2	92,985	10.9	0.1	89.0
2017q3	89,370	11.0	0.1	88.9
2017q4	92,031	10.3	0.0	89.7
2018q1	86,798	9.8	0.1	90.1
2018q2	87,649	10.0	0.1	89.9
2018q3	88,342	10.0	0.3	89.7
2018q4	80,129	10.3	0.2	89.5
2019q1	79,626	10.2	0.0	89.7
2019q2	85,329	9.1	0.1	90.8
2019q3	83,639	10.5	0.0	89.5
2019q4	80,510	9.5	0.0	90.4

\* It is possible for a record to have been split into multiple records by allocation and the allocated records manually corrected to a single record without the allocation variable being reset to 0.

**CEQ**

- The total rate of unedited expenditure amounts increased about 1 percentage point from an annual rate of 83 percent in 2017 to 84 percent in 2019.
- Imputation rates declined 6.7 percentage points from 2017q1 to 2017q2 while allocation rates increased by 6.4 percentage points in the same quarter.<sup>3</sup>
- Allocation rates declined about 0.6 percentage points from a three quarter average of 12.3 percent in 2017q2 – 2017q4 to an annual rate of 11.7 percent in 2019.<sup>4</sup>
- Imputation rates also declined about 0.6 percentage points from a three quarter average of 4.3 percent in 2017q2 – 2017q4 to an annual rate of 3.7 in 2019.<sup>4</sup>



<sup>3</sup> Beginning in 2017q2, CE started allocating cable, internet, and telephone utility expenditures that had previously been imputed. This preserves more of the respondent provided data.

<sup>4</sup> A three quarter average is used here instead of the full year to evaluate the trend in expenditure edit rates after the 2017q2 processing change to cable, internet, and telephone utility expenditures.

**Table 4.2 CEQ: reported expenditure records**

Quarter	Number of expenditures	Row percentage				
		Allocated	Imputed	Imputed & allocated	Maual Edit	Unedited
2017q1	272,929	5.7	11.0	0.1	0.1	83.1
2017q2	276,568	12.1	4.3	0.2	0.1	83.4
2017q3	281,533	12.5	4.3	0.2	0.1	82.9
2017q4	277,032	12.4	4.3	0.2	0.1	83.0
2018q1	275,949	11.7	4.3	0.2	0.1	83.7
2018q2	270,726	12.0	3.9	0.2	0.1	83.9
2018q3	269,909	12.1	3.8	0.2	0.1	83.8
2018q4	259,508	12.0	3.8	0.2	0.1	84.0
2019q1	264,424	11.8	3.6	0.2	0.1	84.3
2019q2	255,037	11.7	3.7	0.2	0.1	84.2
2019q3	251,370	11.6	3.7	0.2	0.2	84.3
2019q4	244,834	11.6	3.8	0.2	0.2	84.2

## 5. Income imputation rates (Diary and Interview Surveys)

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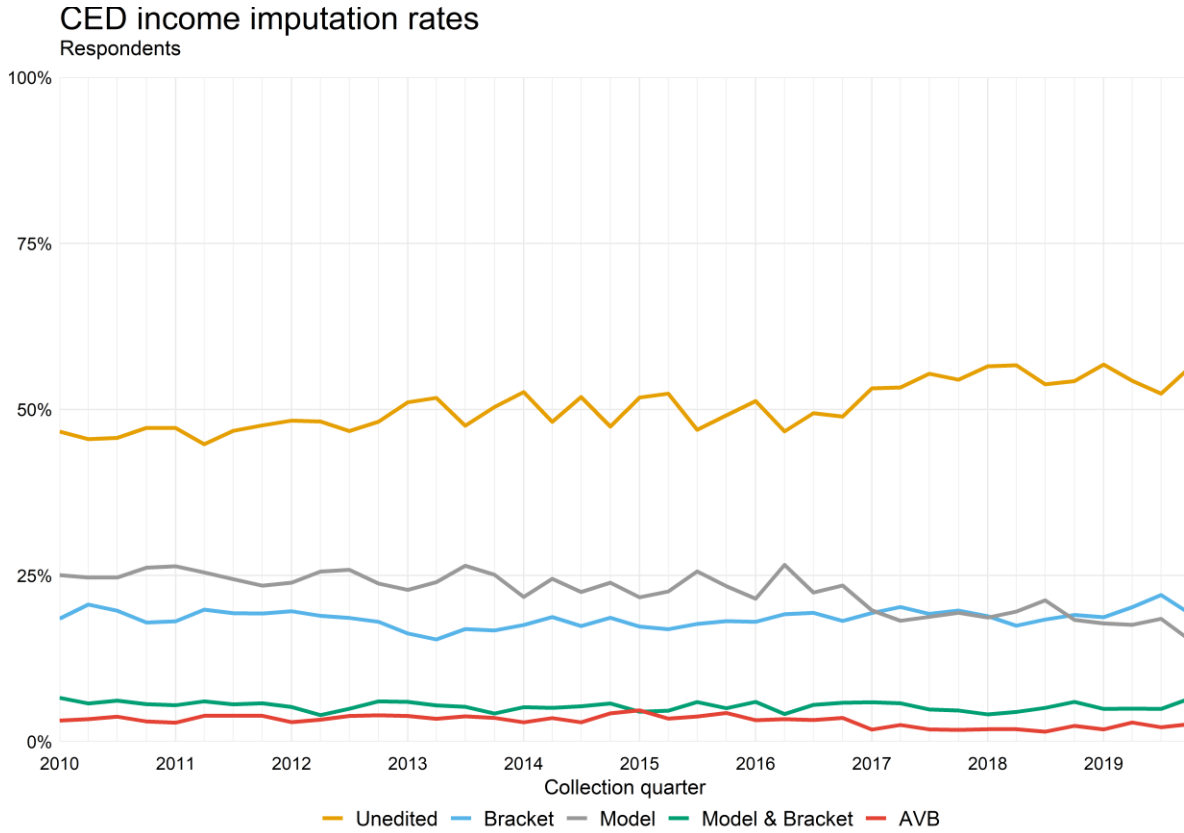
This metric describes the rate of editing performed on a consumer unit's nonresponse to at least one source of income. This edit is based on three types of imputation methods, applicable to both the CEQ and CED:

1. *Model-based* imputation: when the respondent mentions receipt of an income source but fails to report the amount.
2. *Bracket response* imputation: when the respondent mentions receipt of an income source but only reports that income as falling within a specified range.
3. *All valid blank conversion*: when the respondent reports no receipt of income from any source, but the CE imputes receipt from at least one source.

Since the need for imputation reflects either item nonresponse or that insufficient item detail was provided, lower imputation rates are desirable for lowering measurement error. However, imputation based on sound methodology can improve the completeness of the data and reduce the risk of nonresponse bias due to dropping incomplete cases from the dataset. Further details on the income imputation methodology can be found in the [Reference Guide](#) (Knappenberger, Lee, and Tan, 2020).

### **CED**

- Between 2017 and 2019, model-based imputation rates declined from 19.0 percent to 17.3 percent and this drove the rising rate of *unimputed* total income before tax.
- The rate of bracket response imputation slightly increased from an annual rate of 19.6 percent in 2017 to an annual rate of 20.1 percent in 2019.



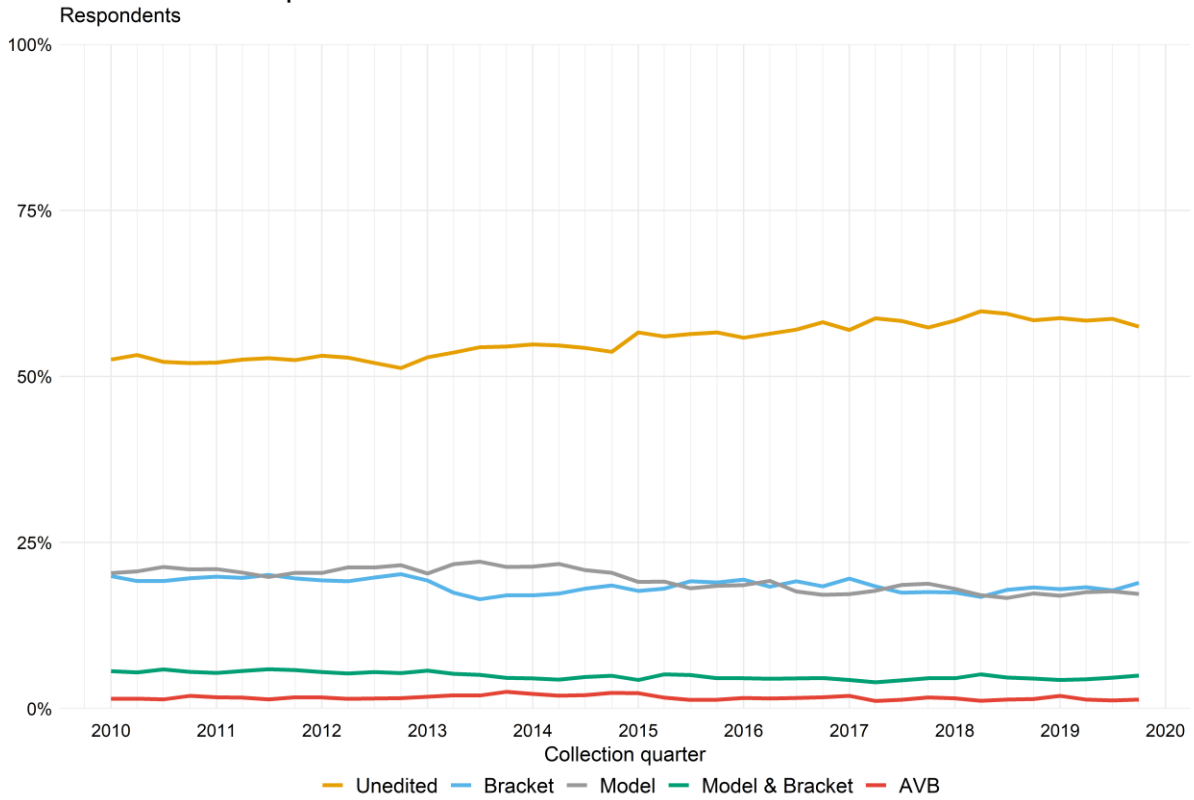
**Table 5.1 CED: income imputation rates for total amount of family income before taxes**

Quarter	Number of eligible CUs	Row percentage				
		Valid blanks converted (AVB)	Bracket imputation	Model imputation	Model & bracket imputation	Unedited
2017q1	2,841	1.8	19.4	19.7	5.9	53.2
2017q2	3,003	2.5	20.2	18.2	5.8	53.3
2017q3	2,904	1.8	19.2	18.8	4.8	55.4
2017q4	2,910	1.8	19.7	19.4	4.7	54.5
2018q1	2,791	1.9	18.9	18.7	4.1	56.5
2018q2	2,781	1.9	17.4	19.6	4.5	56.7
2018q3	2,896	1.5	18.4	21.3	5.1	53.8
2018q4	2,611	2.4	19.1	18.3	6.0	54.3
2019q1	2,671	1.8	18.7	17.8	4.9	56.8
2019q2	2,713	2.9	20.2	17.6	5.0	54.3
2019q3	2,745	2.1	22.1	18.5	4.9	52.4
2019q4	2,553	2.6	19.2	15.2	6.5	56.4

**CEQ**

- Between 2017 and 2019, model-based imputation rates declined from an annual rate of 18.1 percent to 17.3 percent and this drove the rising rate of *unimputed* total income before tax.
- The rate of bracket imputation for the CEQ was steady from 2017 to 2019.

**CEQ income imputation rates**



**Table 5.2 CEQ: income imputation rates for total amount of family income before taxes**

Quarter	Number of eligible CUs	Row percentage				
		Valid blanks converted (AVB)	Bracket imputation	Model imputation	Model & bracket	Unedited
2017q1	6,208	1.9	19.6	17.2	4.3	57.0
2017q2	6,177	1.1	18.4	17.7	4.0	58.8
2017q3	6,090	1.3	17.4	18.6	4.3	58.4
2017q4	6,004	1.7	17.6	18.8	4.6	57.4
2018q1	5,916	1.5	17.5	18.0	4.6	58.4
2018q2	5,899	1.2	16.8	17.1	5.2	59.8
2018q3	5,773	1.4	17.9	16.6	4.7	59.4
2018q4	5,571	1.4	18.2	17.3	4.5	58.5
2019q1	5,623	1.9	18.0	17.0	4.3	58.8
2019q2	5,493	1.4	18.3	17.5	4.4	58.4
2019q3	5,337	1.2	17.8	17.7	4.6	58.7
2019q4	5,248	1.4	18.9	17.2	5.0	57.5

## 6. Respondent burden (Interview Survey)

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Response burden relates to the respondent's perceived level of effort exerted to answer survey questions. Survey designers are concerned about response burden because it could negatively impact response rates and the quality of responses. Beginning in April 2017, the CEQ introduced a response burden question with response options describing different levels of burden at the end of the Wave 4 interview. The respondent burden metric is based on this question.<sup>5</sup>

A caveat to the interpretation of this metric is that since the burden question is only asked at the end of Wave 4, the metric likely underestimates survey burden due to self-selection bias. That is, respondents who have agreed to participate through the final wave of the survey are likely to find the survey less burdensome than sample units who had dropped out of the CEQ at any point prior to completing the final survey wave.

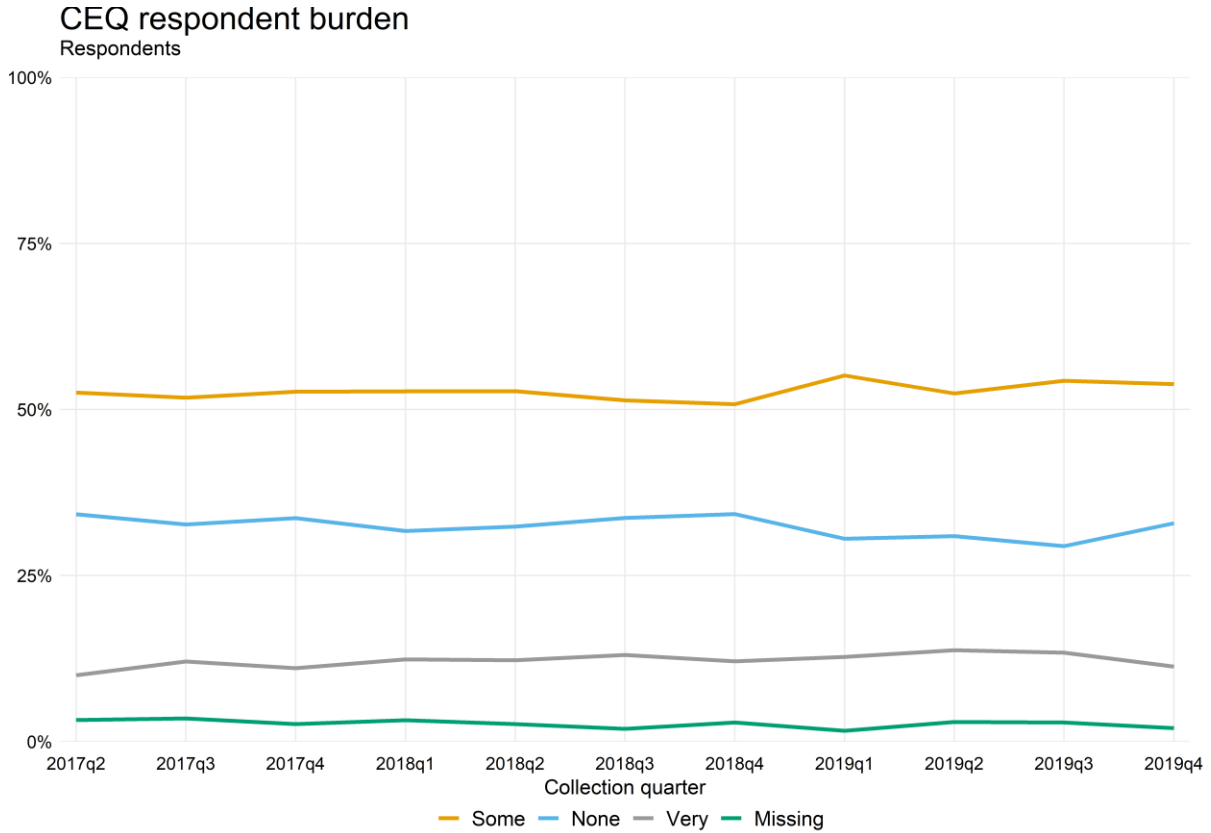
### **CEQ**

- Since the tracking of this metric began in 2017q2, the rate of respondents who report perceiving no burden has declined from an annual rate of 33.5 percent in 2017 to 30.9 percent in 2019.

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<sup>5</sup> Previously, the CEQ had intermittently collected information on respondent burden for research purposes, but these data are not available to the public.





**Table 6.1 CEQ: respondents' perceived burden in the final survey wave**

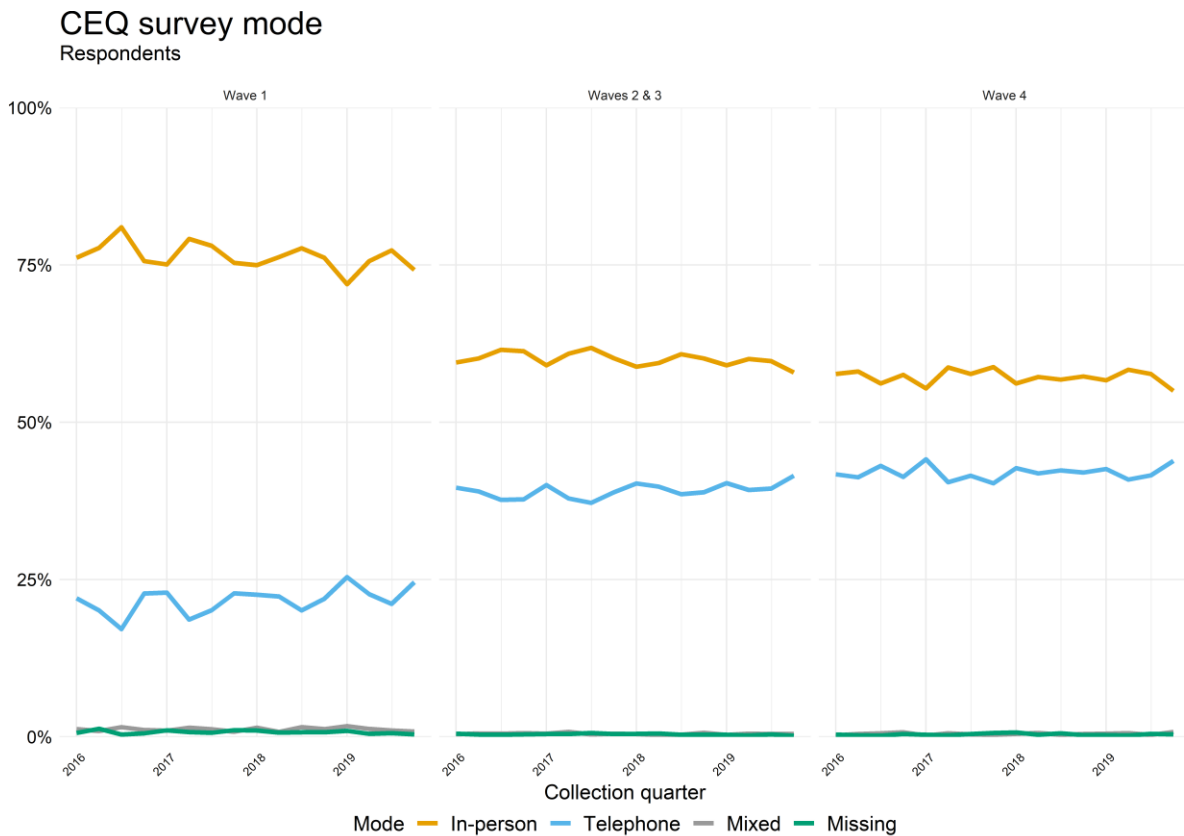
Quarter	Number of eligible CUs	Row percentage			
		Not burdensome	Some burden	Very burdensome	Missing response
2017q2	1,601	34.2	52.5	10.0	3.2
2017q3	1,576	32.7	51.8	12.1	3.5
2017q4	1,477	33.6	52.7	11.0	2.6
2018q1	1,464	31.7	52.7	12.4	3.2
2018q2	1,486	32.4	52.8	12.2	2.6
2018q3	1,464	33.7	51.4	13.0	1.9
2018q4	1,390	34.2	50.8	12.1	2.9
2019q1	1,428	30.5	55.1	12.7	1.6
2019q2	1,397	30.9	52.4	13.7	2.9
2019q3	1,285	29.4	54.3	13.4	2.9
2019q4	1,293	32.9	53.8	11.3	2.0

## 7. Survey mode (Interview Survey)

This metric measures the prevalence of the mode of data collection. The CEQ was designed to be an in-person interview. However, the interviewer can also collect data for the CEQ over the phone, or by a combination of the two modes. Higher prevalence of in-person data collection is preferred since the interviewer can actively prompt the respondent, as well as encourage the use of recall aids, thereby reducing the risk of measurement error. Conducting first wave interviews in-person is important because this is typically the respondent’s first interaction with the survey.

### CEQ

- The rate of in-person data collection in Wave 1 has gradually declined from an annual rate of 76.9 percent in 2017 to 75.6 percent in 2019, reflecting an increase in Wave 1 phone interviews.
- In subsequent waves, the rate of in-person interviews declines further, to an annual rate of 58.4 percent in 2019.



**Table 7.1 CEQ: survey mode**

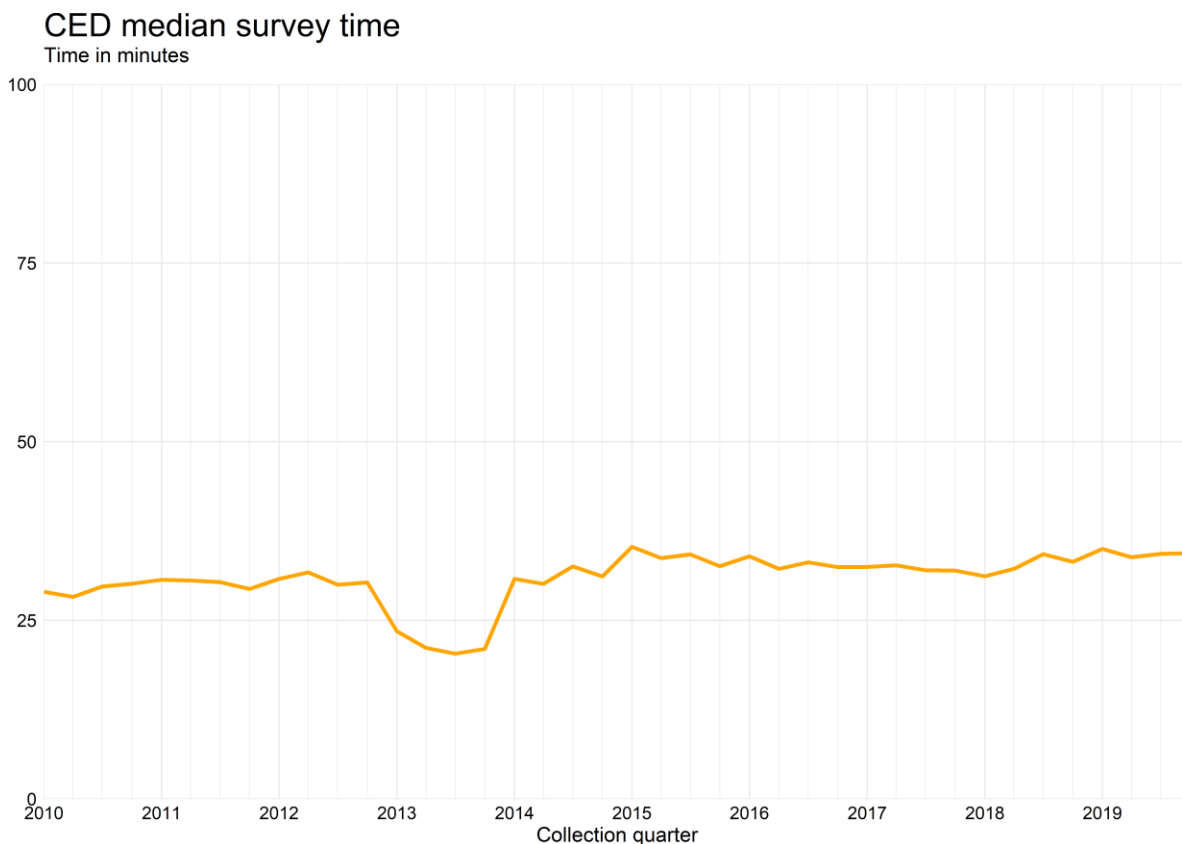
Quarter	Wave	Number of eligible CUs	Row percentage			
			In-person	Telephone	Mixed	Missing
2017q1	Wave 1	1,557	75.1	22.9	1.0	1.0
2017q1	Waves 2 & 3	3,078	59.0	40.0	0.5	0.5
2017q1	Wave 4	1,573	55.4	44.1	0.2	0.3
2017q2	Wave 1	1,573	79.1	18.6	1.5	0.8
2017q2	Waves 2 & 3	3,003	60.9	37.9	0.8	0.4
2017q2	Wave 4	1,601	58.7	40.5	0.6	0.2
2017q3	Wave 1	1,581	78.1	20.1	1.2	0.6
2017q3	Waves 2 & 3	2,933	61.8	37.2	0.4	0.6
2017q3	Wave 4	1,576	57.7	41.5	0.4	0.4
2017q4	Wave 1	1,592	75.3	22.8	0.8	1.1
2017q4	Waves 2 & 3	2,935	60.2	38.9	0.5	0.4
2017q4	Wave 4	1,477	58.8	40.3	0.3	0.6
2018q1	Wave 1	1,501	75.0	22.6	1.5	1.0
2018q1	Waves 2 & 3	2,951	58.8	40.3	0.4	0.5
2018q1	Wave 4	1,464	56.1	42.7	0.5	0.7
2018q2	Wave 1	1,529	76.3	22.3	0.8	0.7
2018q2	Waves 2 & 3	2,884	59.4	39.8	0.3	0.5
2018q2	Wave 4	1,486	57.2	41.9	0.6	0.3
2018q3	Wave 1	1,494	77.6	20.1	1.5	0.7
2018q3	Waves 2 & 3	2,815	60.8	38.5	0.3	0.3
2018q3	Wave 4	1,464	56.8	42.3	0.3	0.5
2018q4	Wave 1	1,399	76.1	21.9	1.2	0.7
2018q4	Waves 2 & 3	2,782	60.1	38.9	0.6	0.4
2018q4	Wave 4	1,390	57.3	42.0	0.4	0.3
2019q1	Wave 1	1,465	71.9	25.4	1.7	1.0
2019q1	Waves 2 & 3	2,730	59.0	40.3	0.3	0.3
2019q1	Wave 4	1,428	56.7	42.6	0.5	0.3
2019q2	Wave 1	1,443	75.6	22.7	1.2	0.5
2019q2	Waves 2 & 3	2,653	60.0	39.2	0.5	0.2
2019q2	Wave 4	1,397	58.3	40.9	0.6	0.2
2019q3	Wave 1	1,401	77.3	21.1	1.0	0.6
2019q3	Waves 2 & 3	2,651	59.7	39.5	0.5	0.4
2019q3	Wave 4	1,285	57.7	41.6	0.3	0.5
2019q4	Wave 1	1,318	74.2	24.6	0.8	0.4
2019q4	Waves 2 & 3	2,637	57.9	41.5	0.5	0.2
2019q4	Wave 4	1,293	55.0	43.9	0.8	0.4

## 8. Survey Response Time (Diary and Interview Surveys)

For the CEQ, survey response time is the median length of time to complete the interview. For the CED, survey response time is the median length of time to complete the personal interview component that collects information about income and demographics. Survey response time has been used as an objective indicator for respondent burden: the longer the time needed to complete the survey, the more burdensome the survey. Fricker, Gonzalez, and Tan (2011) find that higher respondent burden negatively affects both response rates and data quality. However, survey response time could also reflect the respondent's degree of engagement. Engaged and conscientious respondents might take longer to complete the survey because they report more thoroughly or use records more extensively. Finally, tracking the median survey response time can be useful for assessing the effect of changes in the survey design.

### **CED**

- The time to complete the personal interview component for income and demographics in the CED remained just over one-half hour from an annual average of 32.3 minutes in 2017 to an annual average of 34.4 minutes in 2019.



**Table 8.1 CED: median length of time to complete the interview components (income and demographics)**

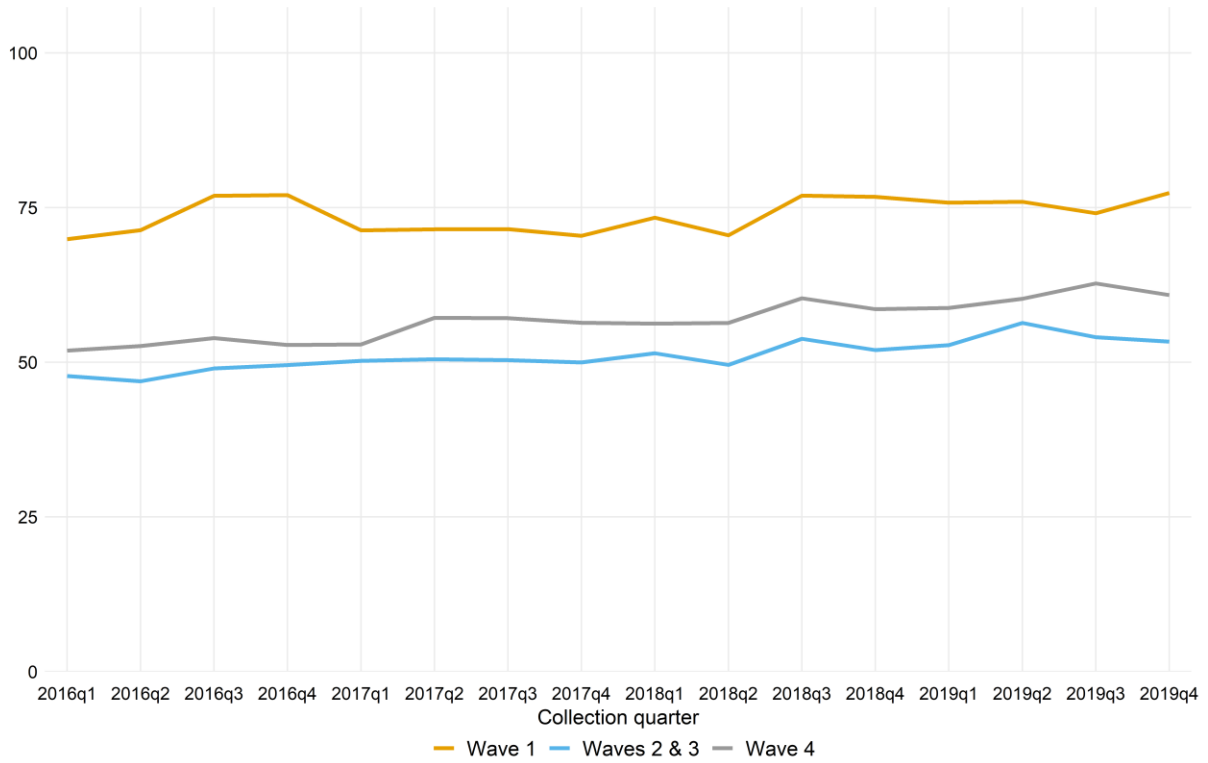
Quarter	Number of eligible CUs	Minutes
2017q1	2,841	32.5
2017q2	3,003	32.7
2017q3	2,904	32.0
2017q4	2,910	32.0
2018q1	2,791	31.2
2018q2	2,781	32.2
2018q3	2,896	34.2
2018q4	2,611	33.2
2019q1	2,671	35.0
2019q2	2,713	33.8
2019q3	2,745	34.3
2019q4	2,553	34.4

### **CEQ**

- Annual averages of median time to complete the CEQ rose each year between 2017 and 2019 in every wave – from 71.2 minutes to 75.8 minutes in Wave 1, 50.3 minutes to 54.1 minutes in Waves 2 and 3, and 55.9 minutes to 60.7 minutes in Wave 4.
- The increase in survey response time can in part be explained by the addition of point of purchase and veteran status questions in 2018q3.

### CEQ median survey time by interview wave

Time in minutes



**Table 8.2 CEQ: median length of time to complete survey**

Quarter	Number of eligible CUs	Minutes		
		Wave 1	Waves 2 & 3	Wave 4
2017q1	6,202	71.3	50.2	52.9
2017q2	6,163	71.5	50.5	57.2
2017q3	6,081	71.5	50.4	57.1
2017q4	6,003	70.5	50.0	56.4
2018q1	5,910	73.4	51.5	56.2
2018q2	5,894	70.5	49.6	56.4
2018q3	5,771	77.0	53.8	60.3
2018q4	5,570	76.7	52.0	58.6
2019q1	5,618	75.8	52.8	58.8
2019q2	5,486	75.9	56.4	60.2
2019q3	5,332	74.1	54.0	62.8
2019q4	5,239	77.4	53.3	60.8

## Conclusion

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CE is committed to producing data that are consistently of high statistical quality. As part of that commitment, CE publishes the DQP and its accompanying [Reference Guide](#) to assist data users as they evaluate CE data quality as they judge whether CE data fit their needs. DQP metrics therefore cover both surveys (CED and CEQ), multiple dimensions of data quality, and several stages of the survey lifecycle. Additionally, CE makes use of these metrics internally to identify areas for potential survey improvement, evaluate the affects of survey changes, and to monitor the health of the surveys.

Some trends are encouraging. From 2017 to 2019, income imputation rates and expenditure edit rates declined for both CED and CEQ. On the other hand, some trends warrant concern. Over the three year period of 2017 to 2019, response rates continued to decline, information book use declined, and perceived respondent burden increased for the CEQ. Finally a few metrics either showed little change over the 2017 to 2019 period, or the trend has an uncertain impact on data quality. Records use in CEQ was stable over the three year period despite a one-time boost around the time CE incentivized using records in a field test. Survey time for CED remained stable around just over half-an-hour. Survey time did increase for CEQ, but CE believes that this is related to the addition of new survey questions requested by our customers to improve CE's fitness for their use. In-person interviews also declined in each wave of CEQ, but conducting an interview by phone is preferable to losing the case entirely.

CE will continue to monitor these trends, and the next issue of the CE Data Quality Profile will be released in 2021, with metrics incorporating data through 2020.

## References

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