

The Midyear CE Data Quality Profile - 2020

April 29, 2021

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Consumer Expenditure Surveys Program Report Series



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Overview

In keeping with [Statistical Policy Directive No. 1](#), covering the Fundamental Responsibilities of Federal Statistical Agencies, the Bureau of Labor Statistics (BLS) is committed to producing data that are of consistently high statistical quality, i.e., accurate, objective, relevant, timely, and accessible. The Consumer Expenditure Surveys Program (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. Prior DQPs are available on our [Data Quality and Data Comparisons page](#). BLS began providing DQPs every year beginning with the 2017 data, though prototype DQPs are available for 2013 and 2015, and began providing midyear DQPs with the 2020 midyear data release. For data users, the DQP metrics are an indication of quality, and cover both the Interview Survey and the Diary Survey. 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 BLS 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, Pham, and Armstrong, 2021) 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, “2020q1” refers to all surveys collected in the months of January, February, and March of 2020. Because the respondents to the Interview Survey are asked to recall their expenditures over the prior three months, the data collected in 2020q1 typically refers to expenditures made in 2019q4. Hence, this profile provides metrics up to 2020q3 for the Interview Survey and up to 2020q2 for the Diary Survey. Where annual rates are used to describe metric trends in this report, the annual rate was computed as the average of quarterly rates from the same calendar year weighted by the number of consumer units in that quarter.

Highlights

In this section, we highlight some of the metric trends from the past three years. This time frame covers the final quarters of the 2017 collection period to the first quarters of the 2020 collection period. Because the respondents to the Interview Survey are asked to recall their spending over the prior three months, data collected in 2020q1 refer to expenditures made in 2019q4. Hence the Interview Survey metrics in this profile cover the time period of 2017q4 through 2020q3. Respondents to the Diary Survey are asked to report their spending as it occurs, so Diary Survey metrics in this profile cover the time period of 2017q3 through 2020q2. Subsequent sections describe the individual metrics with detailed data tables.

Trends that are encouraging

- Roughly half of respondents used records, and this trend continues to be stable ([Section 2](#)).
- Overall expenditure edit rates declined due to lower allocation rates in both the Diary and Interview Surveys ([Section 4](#)).

Trends that cause concern

- Diary and Interview Survey response rates continued to decline prior to the onset of the COVID 19 pandemic, but saw their largest single-quarter declines with the beginning of the pandemic ([Section 1](#)).
- Information Book usage saw large declines for both the Diary and Interview Survey following the onset of the COVID 19 pandemic. A large portion of Interview Survey cases report not having access to the Information Book ([Section 3](#)).
- Perceived burden ([Section 6](#)) increased for the Interview Survey along with median time spent taking the survey ([Section 8](#)).

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

Final disposition rates of eligible sample units report the final outcome of field staff's survey participation recruitment effort. The BLS 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 BLS staff are included within the *other nonresponse* category and are 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, Pham, and Armstrong, 2021).

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. A nonresponse study conducted by the BLS showed no meaningful bias in survey estimates (King, Edgar, Gonzalez, Chopova, and Tan, 2009), but in a world of declining response rates, BLS continues to evaluate this risk. In addition, higher response rates are preferred for more precise estimates. We present unweighted response rates in this report.

Diary Survey

Pre-COVID 19 trends (2017q3 – 2019q4)

- Response rates declined 10.1 percentage points from 59.1 to 48.9 percent.
- Refusal rates rose 6.6 percentage points from 23.3 to 29.9 percent and accounted for the largest share of the decline in response rates.
- Noncontact rates rose from 5.1 to 7.6 percent and accounted for 2.5 percentage points of the decline in response rates.

COVID 19 impacts (2020q1 and 2020q2)

- In mid-March 2020, all in-person interviews were suspended, causing response rates to drop 22.8 percentage points from 2019q4 to 2020q2.
- Refusal and noncontact rates also declined in the first two quarters of 2020 but this was offset by large increases in other nonresponse rates.
- The other nonresponse rate rose 45.6 percentage points and nonresponse reclassifications increased by 3,205 cases as the BLS reclassified a large number of interviews from ineligible to eligible nonrespondents.¹

¹ Many respondents could not be reached by telephone because interviewers did not have a working telephone number for the respondent. Interviewers were instructed to classify these cases as ineligible nonrespondents and BLS elected to reclassify the majority as eligible other nonrespondents. For more information on this nonresponse reclassification please see the DQP Reference Guide (Knappenberger, Lee, Pham, and Armstrong, 2021).

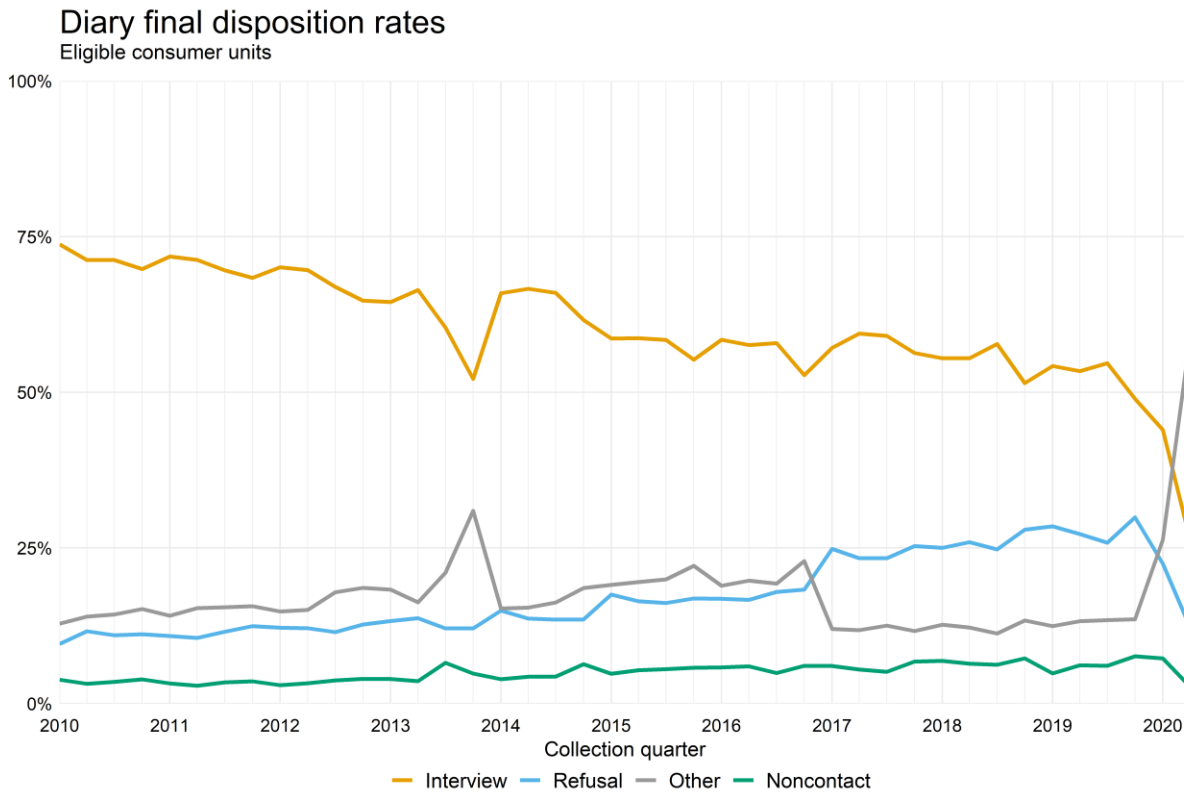


Table 1.1 Diary Survey: distribution of final dispositions for eligible sample units (unweighted)

Quarter	Number of eligible sample units	Row percentage			
		Interview	Refusal	Noncontact	Other Nonresponse
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
2020q1	7,474	44.0	22.5	7.3	26.3
2020q2	7,409	26.1	12.1	2.7	59.1

Table 1.2 Diary Survey: prevalence of nonresponse reclassifications

Quarter	Number of eligible sample units	Number of nonresponse reclassifications		
		Total reclassifications	COVID 19 reclassifications	Other reclassifications
2017q3	4,916	283	0	283
2017q4	5,168	227	0	227
2018q1	5,032	227	0	227
2018q2	5,015	241	0	241
2018q3	5,014	247	0	247
2018q4	5,072	205	0	205
2019q1	4,926	232	0	232
2019q2	5,082	243	0	243
2019q3	5,020	229	0	229
2019q4	5,216	188	0	188
2020q1	7,474	855	562	293
2020q2	7,411	3,393	3,202	191

Interview Survey**Pre-COVID 19 trends (2017q4 – 2019q4)**

- Response rates declined 7.6 percentage points from 59.2 to 51.6 percent.
- Refusal rates rose 6.1 percentage points from 30.7 to 36.8 percent and accounted for the largest share of the decline in response rates.
- Other nonresponse rates rose from 4.4 to 5.5 percent and accounted for 1.1 percentage points of the decline in response rates.

COVID 19 impacts (2020q1 – 2020q2)

- In mid-March 2020, all in-person interviews were suspended, causing response rates to drop 5.7 percentage points from 2019q4 to 2020q2.
- Refusal and noncontact rates also declined in the first two quarters of 2020 but this was offset by large increases in other nonresponse rates.
- The other nonresponse rate rose 32.4 percentage points from 2019q4 to 2020q2 and nonresponse reclassifications increased by 2,944 cases through 2020q2.²
- These impacts were largest for Wave 1 interviews because interviewers were less likely to have a working telephone number for these cases.

² Many respondents could not be reached by telephone because interviewers did not have a working telephone number for the respondent. Interviewers were instructed to classify these cases as ineligible nonrespondents and BLS elected to reclassify the majority as eligible other nonrespondents. For more information on this nonresponse reclassification please see the DQP Reference Guide (Knappenberger, Lee, Pham, and Armstrong, 2021).

COVID 19 impacts (2020q3)

- Beginning in July 2020, interviewers were allowed to resume in-person interviews in certain locations as a result, other nonresponse rates decreased 10.5 percentage points while refusal rates increased 8.8 percentage points, and noncontact rates increased 3.2 percentage points.
- As in-person interviews began to resume, the number of reclassifications declined by 2,867 cases.

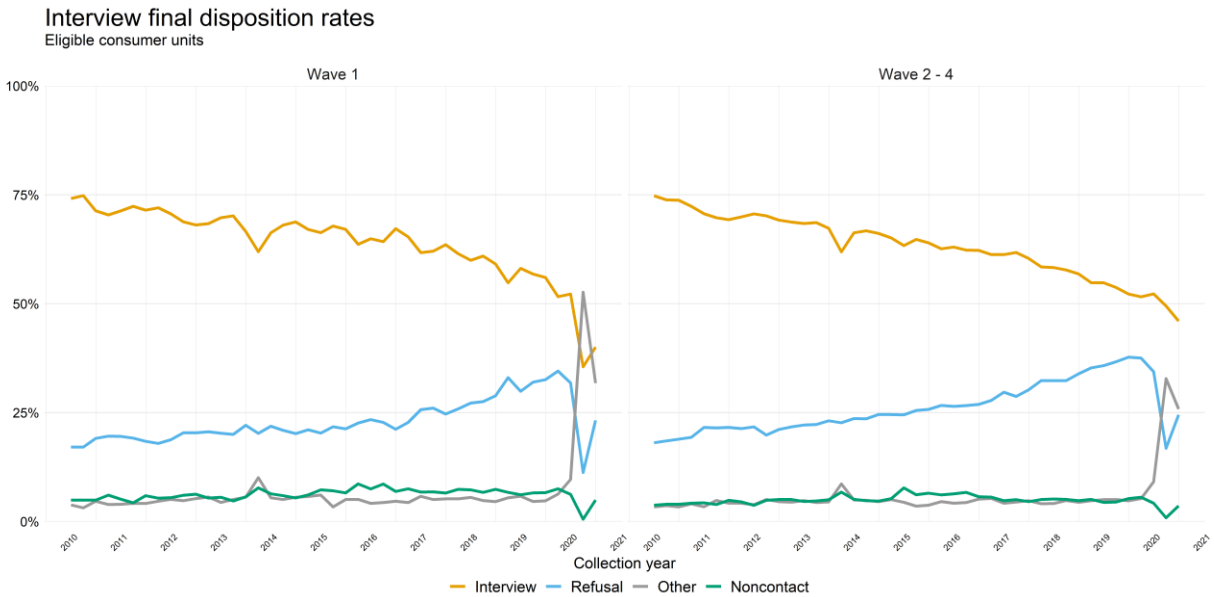


Table 1.3 Interview Survey: distribution of final dispositions for eligible sample units (unweighted)

Quarter	Number of eligible sample units	Row percentage			
		Interview	Refusal	Noncontact	Other nonresponse
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
2020q1	9,956	52.2	33.8	4.7	9.3
2020q2	10,581	45.9	15.4	0.8	37.9
2020q3	11,189	44.5	24.2	4.0	27.4

Table 1.4 Interview Survey: prevalence of nonresponse reclassifications

Quarter	Number of eligible sample units	Number of nonresponse reclassifications		
		Total reclassifications	COVID 19 reclassifications	Other reclassifications
2017q4	10,138	15	0	15
2018q1	10,077	1	0	1
2018q2	10,075	1	0	1
2018q3	10,053	8	0	8
2018q4	10,161	5	0	5
2019q1	10,108	8	0	8
2019q2	10,075	2	0	2
2019q3	10,037	9	0	9
2019q4	10,170	14	0	14
2020q1	9,956	197	186	11
2020q2	10,581	2,955	2,944	11
2020q3	11,190	88	74	14

2. Records Use (Interview Survey)

This metric measures the proportion of respondents who used records while answering the Interview 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.

Interview Survey

- 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.
- Since 2017, records use has been stable across interview waves.

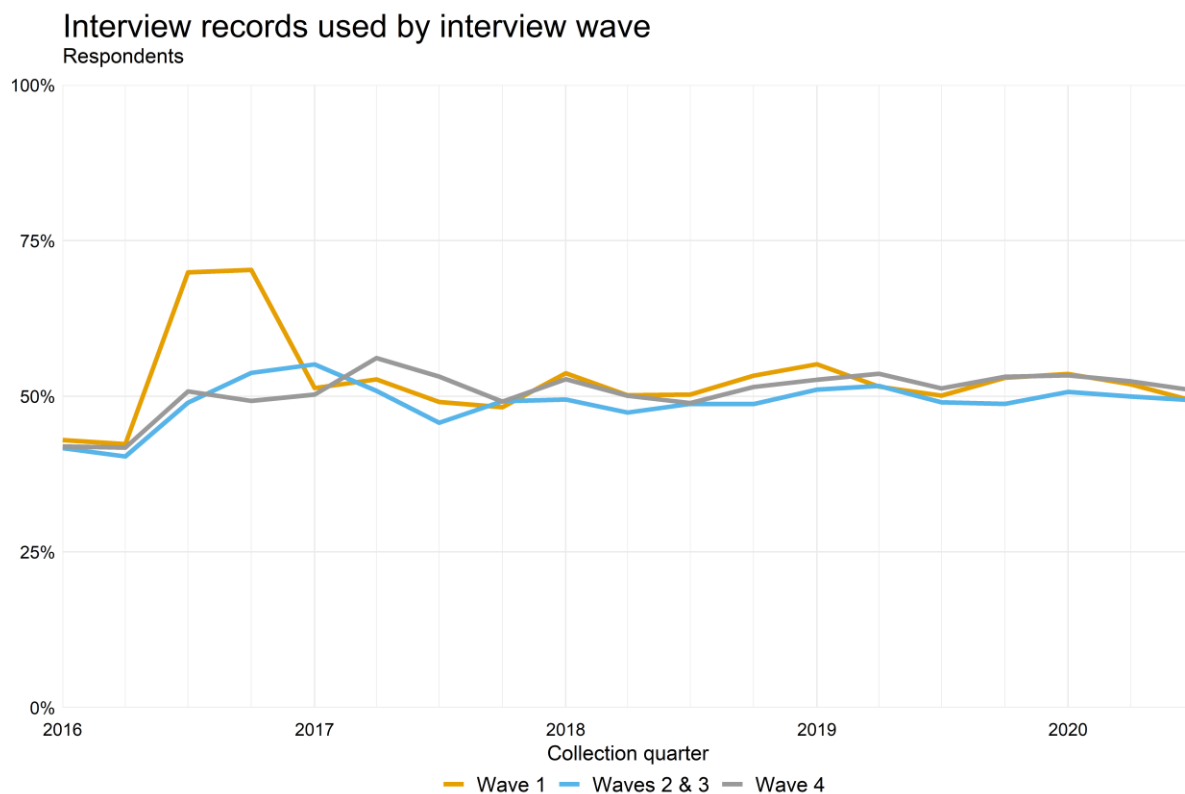


Table 2.1 Interview Survey: prevalence of records use among respondents

Quarter	Wave	Number of respondents	Row percentage		
			Used	Did not use	Missing response
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
2020q1	Wave 1	1,239	53.6	45.2	1.2
2020q1	Waves 2 & 3	2,601	50.7	48.9	0.4
2020q1	Wave 4	1,362	53.4	46.2	0.4
2020q2	Wave 1	965	51.9	47.3	0.8
2020q2	Waves 2 & 3	2,559	50	49.7	0.3
2020q2	Wave 4	1,334	52.4	47.1	0.5
2020q3	Wave 1	1,143	49.3	49.3	1.4
2020q3	Waves 2 & 3	2,444	49.4	50.3	0.3
2020q3	Wave 4	1,393	51	48.7	0.4

3. Information Book use (Diary and Interview Surveys)

The Information Book is a recall aide the interviewer provides for respondents. 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 Interview 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 it is available on the BLS website), 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.

Diary Survey

- The prevalence of Information Book use among Diary Survey respondents declined 39.5 percentage points from 43.6 percent in 2017q3 to 4.1 percent in 2020q2.
- In mid-March 2020, CE suspended all in-person interviews and Information Book use declined by 29 percentage points from 2020q1 to 2020q2.

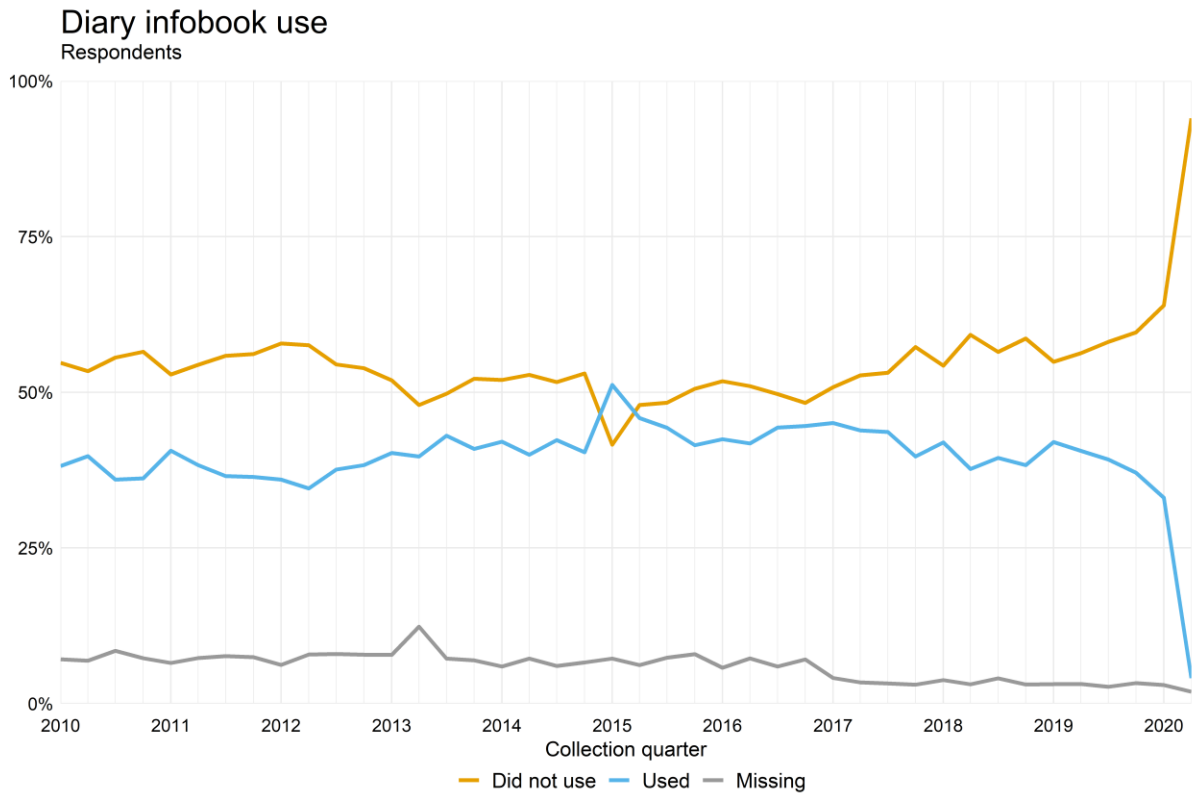


Table 3.1 Diary Survey: prevalence of Information Book use among respondents

Quarter	Number of respondents	Row percentage		
		Used	Did not use	Missing response
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
2020q1	3,285	33.1	64.0	3.0
2020q2	1,936	4.1	94.0	1.9

Interview Survey**Pre-COVID 19 trends (2017q4 – 2019q4)**

- Information Book use in Wave 1 declined 3.4 percentage points from 50.1 percent in 2017q4 to 46.7 percent in 2019q4.
- The rate of Wave 1 respondents who did not have access to the Information Book increased by 3.1 percentage points from 32.8 percent in 2017q4 to 35.9 percent in 2019q4.
- In subsequent waves, the rate of Information Book use was at least 10 percentage points lower than in Wave 1, and about half of respondents did not have access to the Information Booklet.

COVID 19 impacts (2020q1 – 2020q2)

- In mid-March 2020, CE temporarily discontinued the use of physical copies of the Information Book and referred respondents to the online version. As a result, Information Book use rate declined 44.1 percentage points for Wave 1 respondents from 2019q4 to 2020q2.
- Declines in Information Book use were similar for subsequent waves and about 95 percent of all respondents in 2020q2 did not have access to the Information Book.

COVID 19 impacts (2020q3)

- Beginning in July 2020, disposable copies of the Information Books were provided to respondents and Information Book use rose to an average of 5.3 percent for all waves in 2020q3.

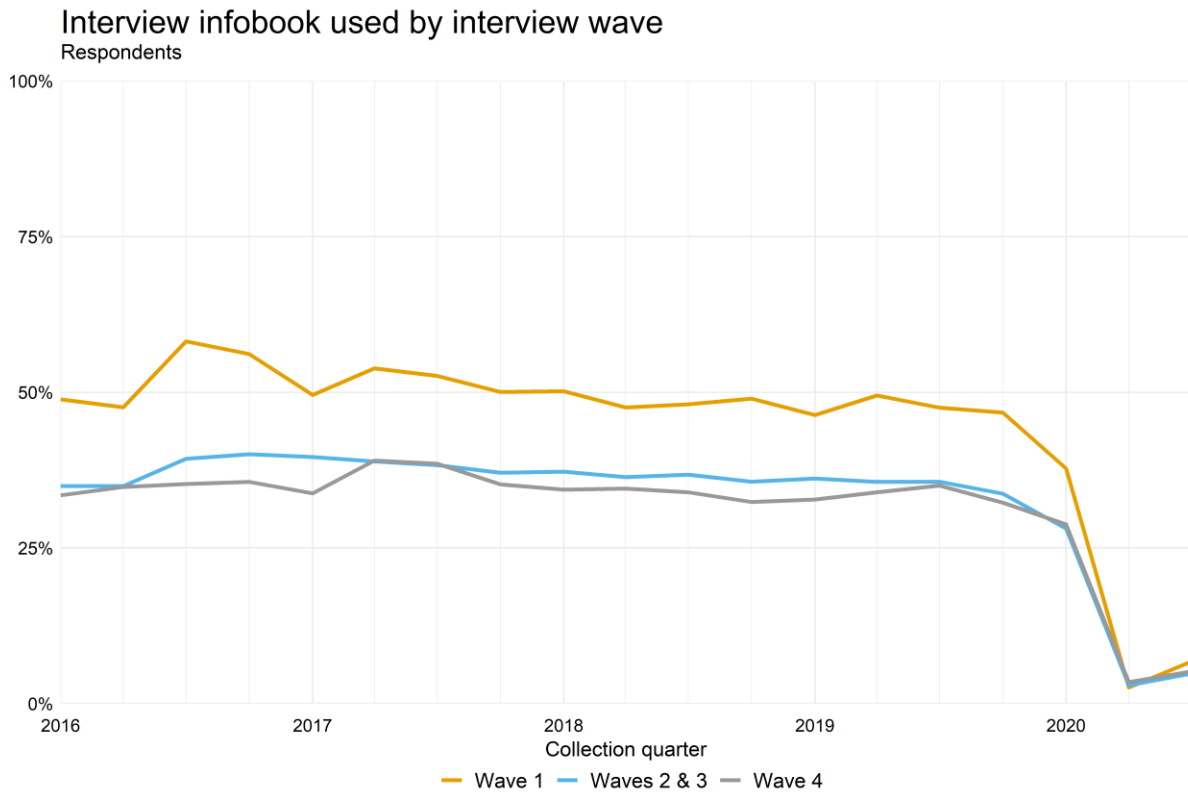


Table 3.2 Prevalence of Infobook use among Interview Survey respondents

Quarter	Wave	Number of respondents	Row percentage			
			Used	Did not use	No Infobook available	Missing response
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
2020q1	Wave 1	1,239	37.8	15.7	45.4	1.2
2020q1	Wave 2&3	2,601	28.1	13.9	57.6	0.4
2020q1	Wave 4	1,362	28.8	13.7	57.0	0.4
2020q2	Wave 1	965	2.6	1.8	94.8	0.8
2020q2	Wave 2&3	2,559	2.9	1.8	95.0	0.3
2020q2	Wave 4	1,334	3.4	0.8	95.2	0.5
2020q3	Wave 1	1,143	6.7	2.4	89.5	1.4
2020q3	Wave 2&3	2,444	4.8	2.7	92.2	0.3
2020q3	Wave 4	1,393	5.2	2.1	92.4	0.4

4. Expenditure edit rates (Diary and Interview Surveys)

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 Interview Survey are broken down into three categories: Imputation, allocation, and manual edits:

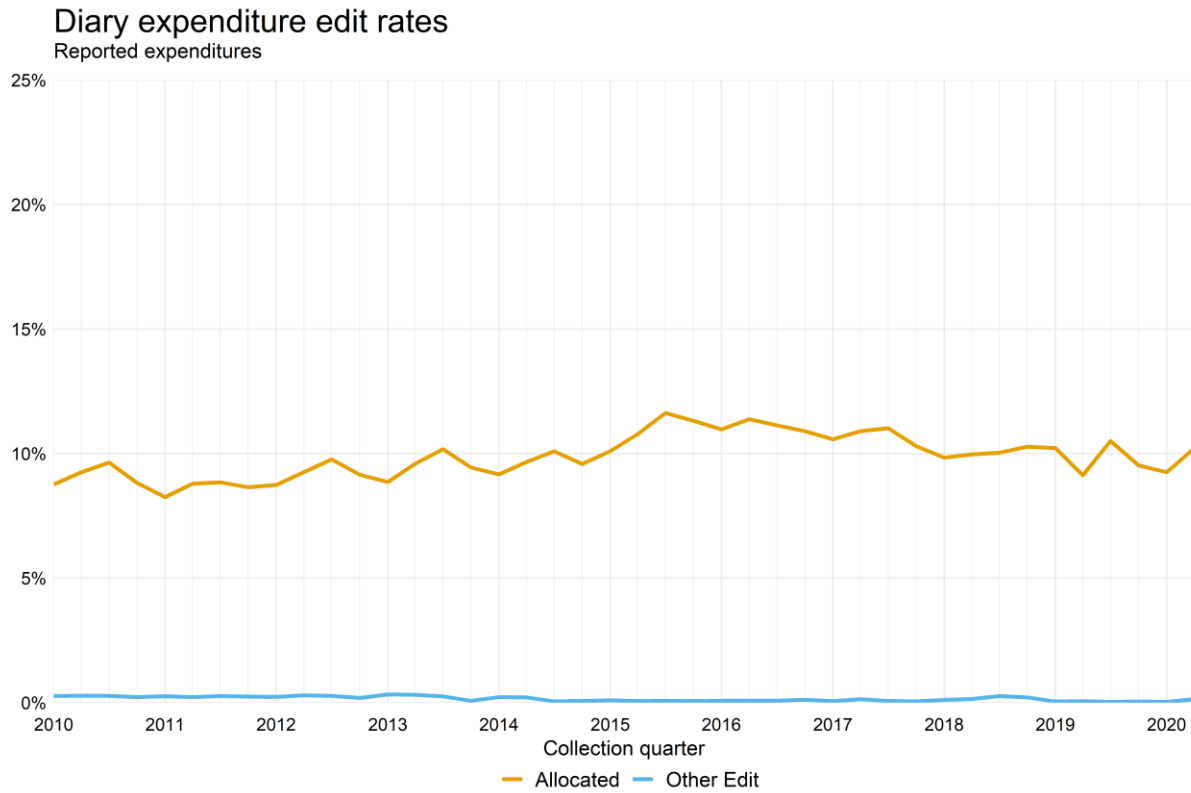
- *Imputation* replaces missing or invalid responses with a valid value.
- *Allocation* edits are applied when respondents provide insufficient detail to meet tabulation requirements. For example, if a respondent provides a non-itemized total expenditure report for the category of fuels and utilities, 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 Diary Survey are only broken down into two categories. Almost all edits in the Diary survey are allocations. The “other edits” category encompasses all other expenditure edits including imputation and manual edits, though table 4.1 below shows that these are rare.

Imputation in CE data results from expenditure amount nonresponse. Allocation is a consequence of responses lacking the required details for items asked by the survey. Lower edit rates are preferred in general since that lowers the risk of processing error. 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, Pham, and Armstrong, 2021).

Diary Survey

- In the beginning of January 2020, an increase in CE’s sample size saw the number of reported expenditures rise by over 22,000 expenditures. However, as response rates dropped in 2020q2, so did the number of expenditures.³
- The total rate of unedited expenditure amounts increased 0.7 percentage points from 88.9 percent in 2017q3 to 89.6 percent in 2020q2.
- Decreasing edit rates were driven by an 0.8 percentage point decline in allocation rates from 2017q3 to 2020q2.



³ This increase in sample size was made possible by increased funding to accommodate collection of outlet information needed for calculating the Consumer Price Index

Table 4.1 Diary Survey: reported expenditure records

Quarter	Number of expenditures	Row percentage		
		Allocated	Other edit	Unedited
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
2020q1	102,693	9.2	0.0	90.7
2020q2	41,257	10.2	0.1	89.6

Interview Survey

- The total rate of unedited expenditure amounts increased 0.6 percentage points from 83 percent in 2017q4 to 83.6 percent in 2020q3.
- This was primarily driven by allocation rates declining 0.8 percentage points from 12.4 percent in 2017q4 to 11.6 percent in 2020q3.⁴
- Declines in allocation rates were partially offset by increases in the manual edit rate from 0.1 percent in 2017q4 to 0.3 percent in 2020q3.
- Imputation rates remained close to 4.3 percent, and the rate of expenditures that were both imputed and allocated was steady at 0.2 from 2017q4 through 2020q3.

⁴ The 2017q2 collection quarter saw a large increase in allocation rates accompanied by an almost equal decrease in imputation rates. Both were the result of a change in how BLS processes cable, internet, and telephone utility expenditures. These had previously been imputed, but are now allocated to preserve more of the data provided by respondents.

Interview expenditure edit rates

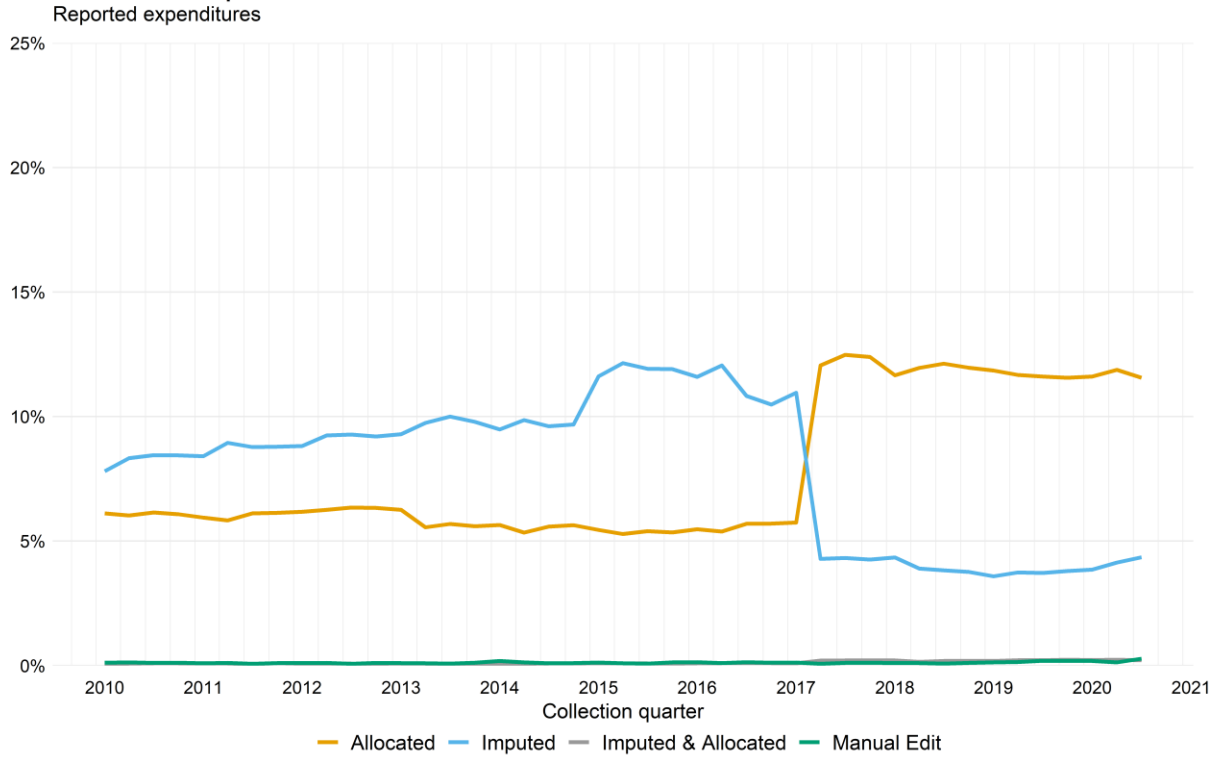


Table 4.2 Interview Survey: reported expenditure records

Quarter	Number of expenditures	Row percentage				
		Allocated	Imputed	Imputed & allocated	Maual Edit	Unedited
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
2020q1	246,488	11.6	3.9	0.2	0.2	84.1
2020q2	217,785	11.9	4.1	0.2	0.1	83.6
2020q3	224,639	11.6	4.3	0.2	0.3	83.6

5. Income imputation rates (Diary and Interview Surveys)

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 Interview and Diary Surveys:

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.

After imputation, income from each component source is summed to compute total income before taxes. In the text that follows, income before taxes is defined as "unimputed" if no source of total income required imputation for one of the three reasons identified above. Again, this applies to both the Diary and Interview Surveys.

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, Pham, and Armstrong, 2021) and the [Users Guide to Income Imputation in the CE](#) (Paulin, Reyes-Morales, and Fisher, 2018).

Diary Survey

- The rate of unimputed total income before taxes remained stable at 55.5 percent from 2017q3 to 2020q2.
- Model-based imputation rates declined 2.3 percentage points from 18.8 percent in 2017q3 to 16.5 percent in 2020q2.
- These declines in the rate of model-based imputation were partially offset by the 1.6 percentage point rise in bracket response imputation rates from 19.2 percent in 2017q3 to of 20.8 percent in 2020q2.
- These declines were even further offset by the 1.4 percentage point rise in respondents requiring both model-based and bracket response imputation from 4.8 percent in 2017q3 to 6.2 percent in 2020q2.

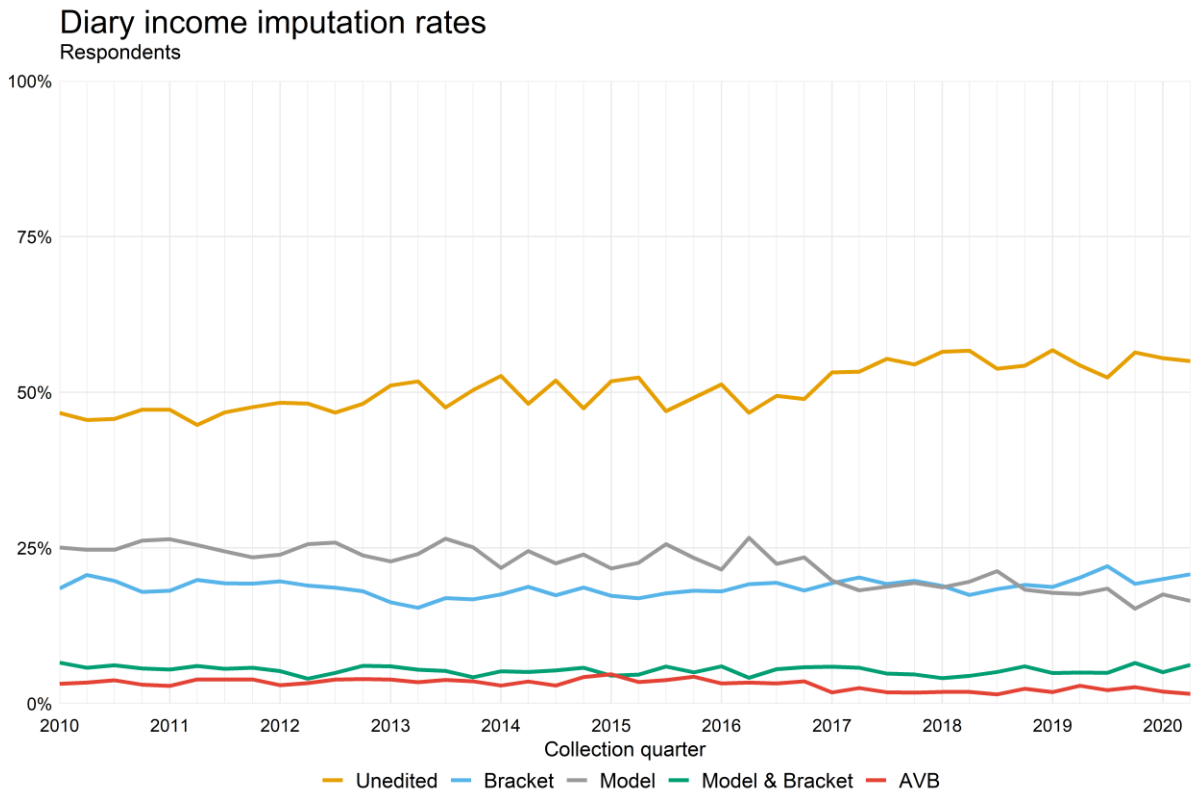


Table 5.1 Diary Survey: income imputation rates for total amount of family income before taxes

Quarter	Number of respondents	Row percentage				
		Valid blanks converted (AVB)	Bracket imputation	Model imputation	Model & bracket imputation	Unedited
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
2020q1	3,285	1.9	20.0	17.5	5.1	55.5
2020q2	1,936	1.5	20.8	16.5	6.2	55.5

Interview Survey

- The rate of unimputed total income before taxes declined 0.8 percentage points from 57.4 in 2017q3 to 56.6 percent in 2020q2.
- Model-based imputation rates rose 0.6 percentage points from 17.6 percent in 2017q3 to 18.2 percent in 2020q2 and accounted for the largest share of the decline in unimputed income.
- The proportion of respondents requiring both model-based and bracket response imputation rose a further 0.5 percentage points from 4.6 percent in 2017q3 to 5.1 percent in 2020q2.
- Rising imputation rates were partially offset by a 0.6 percentage point decline in the rate of respondents undergoing all valid blank conversion from 1.7 percent in 2017q3 to 1.1 percent in 2020q2.

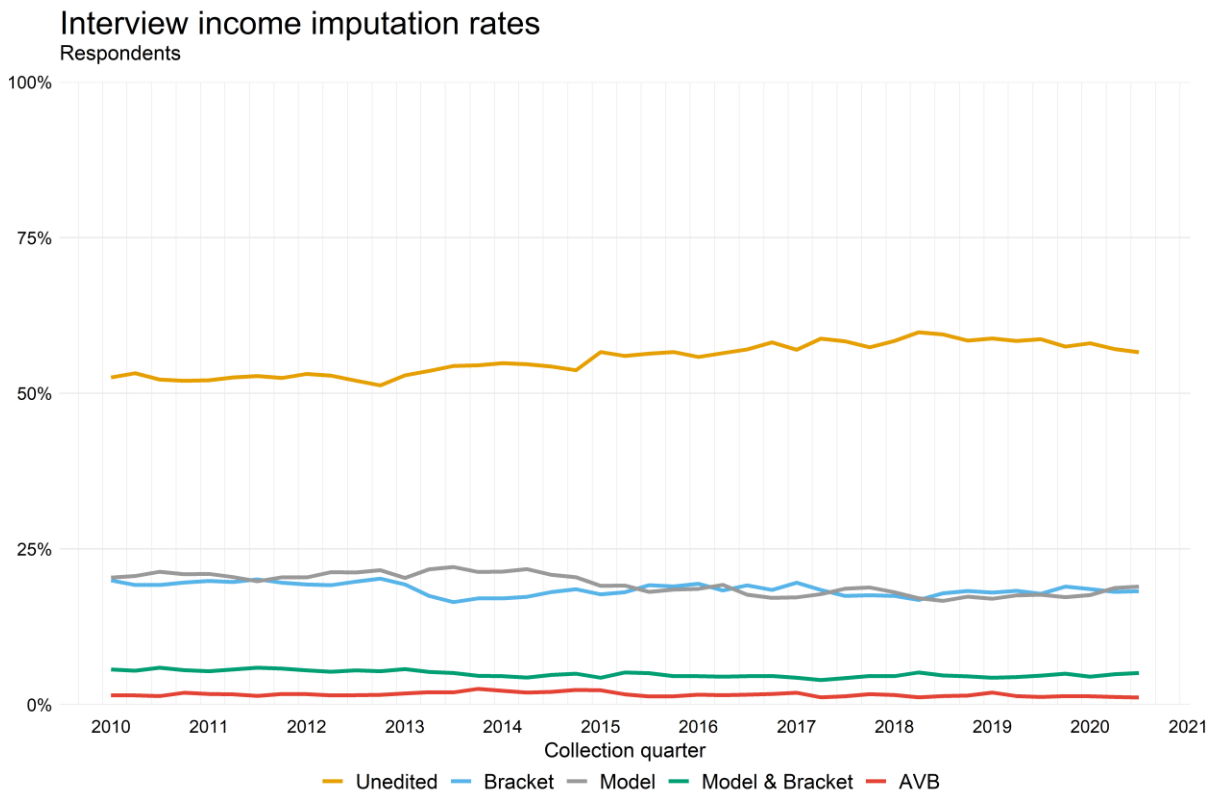


Table 5.2 Interview Survey: income imputation rates for total amount of family income before taxes

Quarter	Number of respondents	Row percentage				
		Valid blanks converted (AVB)	Bracket imputation	Model imputation	Model & bracket	Unedited
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
2020q1	5,202	1.3	18.6	17.6	4.5	58.1
2020q2	4,858	1.2	18.1	18.7	4.9	57.1
2020q3	4,980	1.1	18.2	19.0	5.1	56.6

6. Respondent burden (Interview Survey)

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 Interview Survey introduced a response burden question with response options describing five different levels of burden at the end of the Wave 4 interview. The respondent burden metric is based on this question and maps the five burden categories to three metric values: not burdensome, some burden, and very burdensome. Please see the [Reference Guide](#) (Knappenberger, Lee, Pham, and Armstrong, 2021) for more details on the question wording and the burden categories.

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 Interview Survey at any point prior to completing the final survey wave. It is also possible that the respondent answering this question did not participate in prior interview waves. For example, the respondent who participated in the first three survey waves might move out of the sampled address prior to the final interview. If someone else moves into the sampled address in time for the final wave, then they would be asked these questions.

Interview Survey

- The rate of respondents who report perceiving no burden declined 3.1 percentage points from 33.6 percent in 2017q4 to 30.5 percent in 2020q3.
- Rising rates of respondents who felt that the survey was very burdensome accounted for 1.8 percentage points of this change, rising from 11.0 percent in 2017q4 to 12.8 percent in 2020q3.
- Respondents perceiving some burden also increased 1.4 percentage points from 52.7 percent in 2017q4 to 54.1 percent in 2020q3.

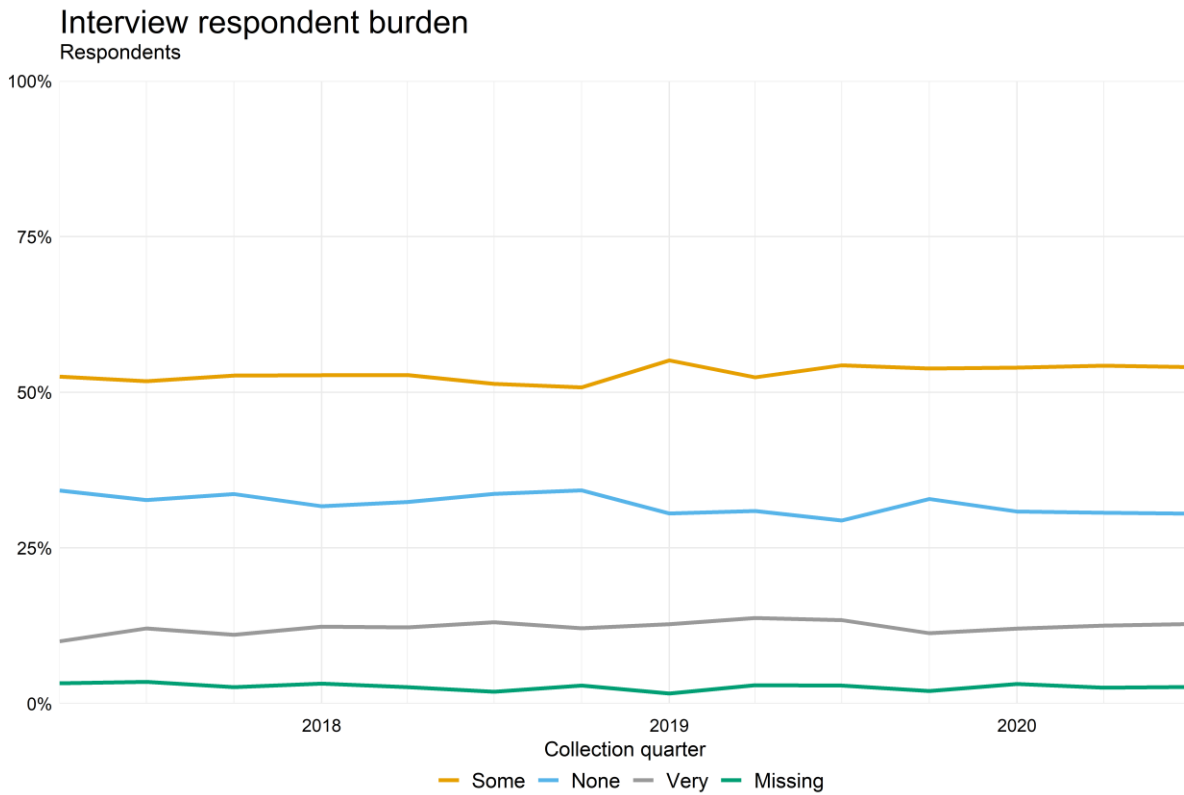


Table 6.1 Interview Survey: respondents’ perceived burden in the final survey wave

Quarter	Number of respondents	Row percentage			
		Not burdensome	Some burden	Very burdensome	Missing response
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
2020q1	1,362	30.8	54.0	12.0	3.2
2020q2	1,334	30.7	54.3	12.5	2.5
2020q3	1,393	30.5	54.1	12.8	2.7

7. Survey mode (Interview Survey)

This metric measures the prevalence of the mode of data collection. The Interview Survey was designed to be an in-person interview. However, the interviewer can also collect data for the Interview Survey 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 experience with the survey. Additionally, BLS has agreements with the Census Bureau that no more than 24 percent of first interviews or 48 percent of subsequent interviews will be collected over the phone. This agreement is still in effect, but the COVID-19 pandemic has made collecting in-person interviews unsafe for respondents and interviewers. BLS expects to return to the agreed upon rates as it becomes safer for in-person interviews to resume.

Interview Survey

Pre-COVID 19 trends (2017q4 – 2019q4)

- The rate of Wave 1 respondents whose interviews were conducted in-person declined 1.1 percentage points from 75.3 percent in 2017q4 to 74.2 percent in 2019q4.
- In all but two quarters (2019q1 and 2019q4) the rate of Wave 1 telephone interviews remained below the 24 percent threshold.
- The rate of subsequent interviews conducted in-person declined 2.8 percentage points from an average of 59.7 percent in 2017q4 to an average of 56.9 percent in 2019q4.
- In every quarter the rate of Wave 2 through 4 telephone interviews remained below the 48 percent threshold.

COVID 19 impacts (2020q1 – 2020q3)

- In mid-March 2020, the Census Bureau suspended all in-person interviews and by April close to 98 percent of all interviews were conducted over the phone regardless of wave.
- Beginning in July 2020, interviewers were allowed to resume in-person interviews in some locations and the rate of telephone interviews declined to 90 percent across all waves.

Interview survey mode

Respondents

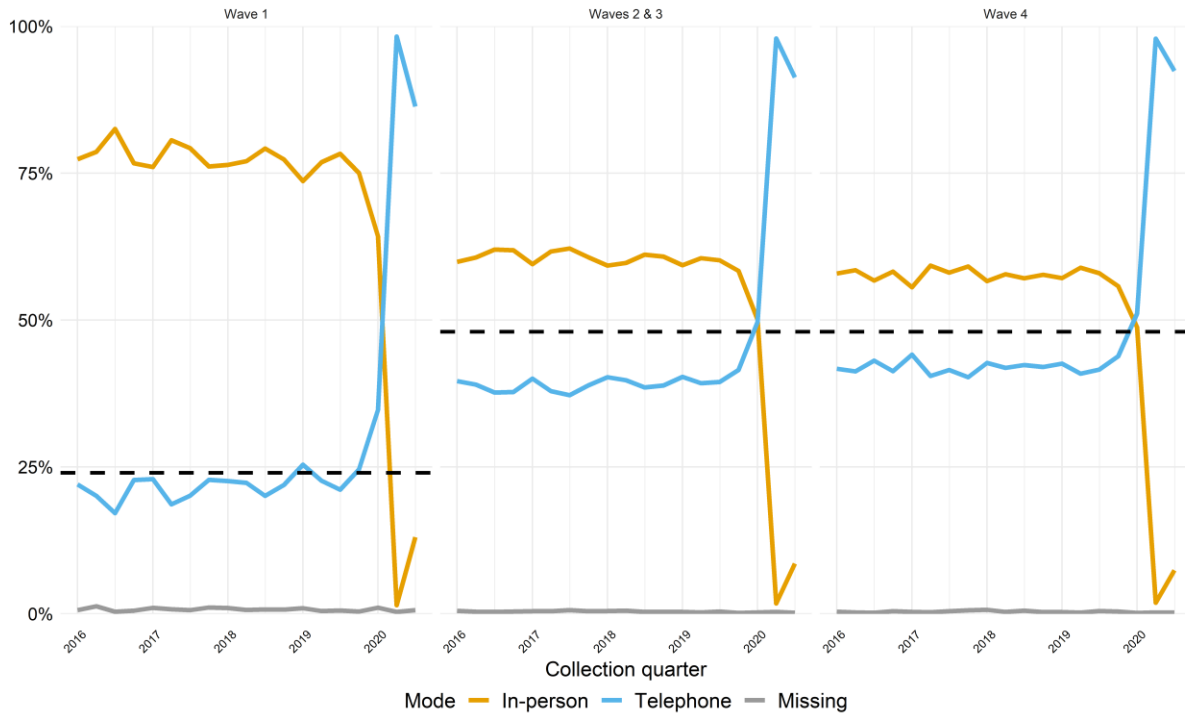


Table 7.1 Interview Survey: survey mode

Quarter	Wave	Number of respondents	Row percentage		
			In-person	Telephone	Missing
2017q4	Wave 1	1,592	75.3	22.8	1.1
2017q4	Waves 2 & 3	2,935	60.2	38.9	0.4
2017q4	Wave 4	1,477	58.8	40.3	0.6
2018q1	Wave 1	1,501	75.0	22.6	1.0
2018q1	Waves 2 & 3	2,951	58.8	40.3	0.5
2018q1	Wave 4	1,464	56.1	42.7	0.7
2018q2	Wave 1	1,529	76.3	22.3	0.7
2018q2	Waves 2 & 3	2,884	59.4	39.8	0.5
2018q2	Wave 4	1,486	57.2	41.9	0.3
2018q3	Wave 1	1,494	77.6	20.1	0.7
2018q3	Waves 2 & 3	2,815	60.8	38.5	0.3
2018q3	Wave 4	1,464	56.8	42.3	0.5
2018q4	Wave 1	1,399	76.1	21.9	0.7
2018q4	Waves 2 & 3	2,782	60.1	38.9	0.4
2018q4	Wave 4	1,390	57.3	42.0	0.3
2019q1	Wave 1	1,465	71.9	25.4	1.0
2019q1	Waves 2 & 3	2,730	59.0	40.3	0.3
2019q1	Wave 4	1,428	56.7	42.6	0.3
2019q2	Wave 1	1,443	75.6	22.7	0.5
2019q2	Waves 2 & 3	2,653	60.0	39.2	0.2
2019q2	Wave 4	1,397	58.3	40.9	0.2
2019q3	Wave 1	1,401	77.3	21.1	0.6
2019q3	Waves 2 & 3	2,651	59.7	39.5	0.4
2019q3	Wave 4	1,285	57.7	41.6	0.5
2019q4	Wave 1	1,318	74.2	24.6	0.4
2019q4	Waves 2 & 3	2,637	57.9	41.5	0.2
2019q4	Wave 4	1,293	55.0	43.9	0.4
2020q1	Wave 1	1,239	64.2	34.7	1.0
2020q1	Wave 4	1,362	48.8	51.1	0.1
2020q1	Waves 2 & 3	2,601	50.1	49.7	0.2
2020q2	Wave 1	965	1.5	98.2	0.3
2020q2	Wave 4	1,334	1.9	97.9	0.2
2020q2	Waves 2 & 3	2,559	1.8	97.9	0.3
2020q3	Wave 1	1,143	13.0	86.4	0.6
2020q3	Wave 4	1,393	7.4	92.4	0.2
2020q3	Waves 2 & 3	2,444	8.6	91.3	0.2

8. Survey Response Time (Diary and Interview Surveys)

For both Interview and Diary Surveys, survey response time is the amount of time needed to complete an interview. For the Interview Survey, the survey response time metric is the median length of time to complete the interview. For the Diary Survey, the survey response time metric 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. Tracking the median survey response time can be useful for assessing the effect of changes in the survey design.

Diary Survey

- The time to complete the personal interview component for income and demographics in the Diary Survey remained just over one-half hour from 32.0 minutes in 2017q3 to 34.9 minutes in 2020q2.

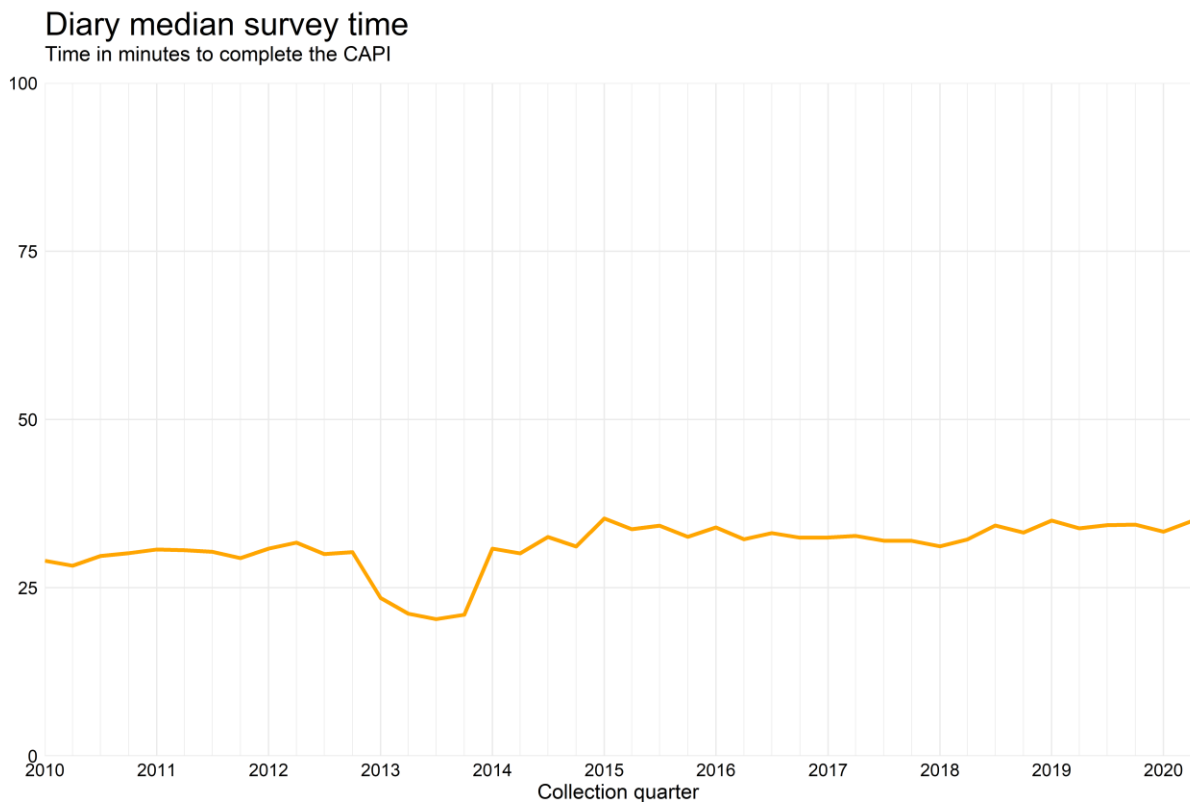


Table 8.1 Diary Survey: median length of time to complete the interview components (income and demographics)

Quarter	Number of respondents	Minutes
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
2020q1	3,281	33.3
2020q2	1,936	34.9

Interview Survey

- Median time to complete Wave 1 interviews rose 6.3 minutes from 70.5 minutes in 2017q4 to 76.8 minutes in 2020q3.
- Median time to complete Waves 2 and 3 interviews rose 6.7 minutes from 50.0 minutes in 2017q4 to 56.7 minutes in 2020q3.
- Wave 4 interviews similarly took 5.8 minutes longer, rising from 56.4 minutes in 2017q4 to 62.2 minutes in 2020q3.
- These increases in survey response time can in part be explained by the addition of a new extended recall section in 2019q2.

Interview median survey time by interview wave

Time in minutes

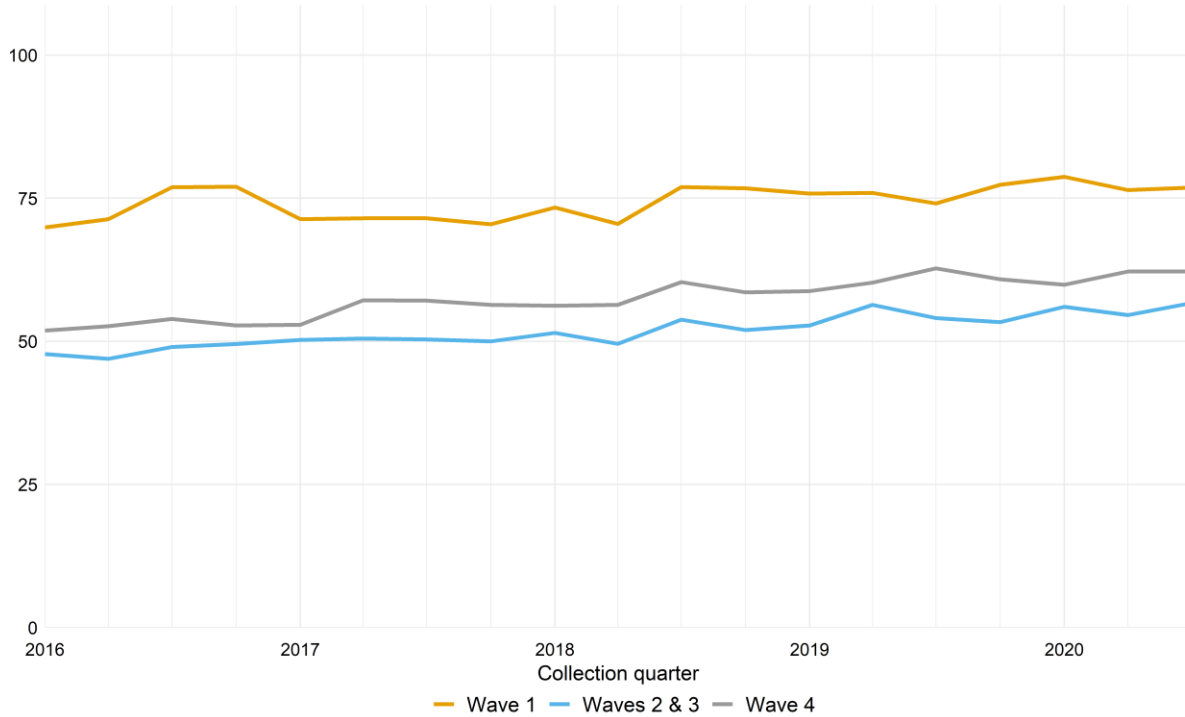


Table 8.2 Interview Survey: median length of time to complete survey

Quarter	Number of respondents	Minutes		
		Wave 1	Waves 2 & 3	Wave 4
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
2020q1	5,199	78.8	56.0	59.9
2020q2	4,855	76.4	54.6	62.2
2020q3	4,980	76.8	56.7	62.2

Conclusion

BLS is committed to producing data that are consistently of high statistical quality. As part of that commitment, BLS publishes the DQP and its accompanying [Reference Guide](#) (Knappenberger, Lee, Pham, and Armstrong, 2021) to assist data users as they evaluate CE data quality as they judge whether CE data fit their needs. DQP metrics therefore cover both the Interview and Diary Surveys, multiple dimensions of data quality, and several stages of the survey lifecycle. Additionally, BLS uses 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 the final quarters of 2017 to the first quarters of 2020, records use rates remained stable for the Interview Survey and expenditure edit rates declined for both the Interview and diary Surveys. On the other hand, some trends warrant concern. Over the same time period, response rates continued to decline, Information Book use declined, and perceived respondent burden increased for the Interview Survey. The COVID 19 pandemic in particular led to severe declines in response rates, Information Book use, and almost every interview was conducted over the phone rather than in-person. A few metrics either showed little change over the this time period, or had trends with an uncertain impact on data quality. Income imputation rates for the Diary Survey remained stable while rates for the Interview Survey went up after a period of decline. Survey time for the Diary Survey remained stable around just over half-an-hour. Survey time did increase for the Interview Survey, and BLS believes that this is related to the addition of new survey questions requested by our customers to improve CE's fitness for their use.

BLS will continue to monitor these trends, and the next issue of the CE Data Quality Profile will be released in September 2021 with BLS's annual release of CE data and will report on the remainder of the 2020 data.

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