

Source of the Data and Accuracy of the Estimates for the 2020 Household Pulse Survey

Interagency Federal Statistical Rapid Response Survey to Measure Household Experiences during the Coronavirus (COVID-19) Pandemic

SOURCE OF THE DATA

The 2020 Household Pulse Survey (HPS), an experimental data product, is an Interagency Federal Statistical Rapid Response Survey to Measure Household Experiences during the Coronavirus (COVID-19) Pandemic, conducted by the United States Census Bureau in partnership with five other agencies from the Federal Statistical System:

- Bureau of Labor Statistics (BLS)
- National Center for Health Statistics (NCHS)
- Department of Agriculture Economic Research Service (ERS)
- National Center for Education Statistics (NCES)
- Department of Housing and Urban Development (HUD)

These agencies collaborated on the design and content for the HPS, which was also reviewed and approved by the Office of Management and Budget (OMB). (OMB # 0607-1013; expires 07/31/2020.)

The HPS asks individuals about their experiences regarding employment status, spending patterns, food security, housing, physical and mental health, access to health care, and educational disruption. The ability to understand how individuals are experiencing this period is critical to governmental and non-governmental response in light of business curtailment and closures, stay-at-home and safer-at-home orders, school closures, changes in consumer patterns and the availability of consumer goods, and other abrupt and significant changes to American life.

The HPS is designed to produce estimates at three different geographical levels. The first level, the lowest geographical area, is for the 15 largest Metropolitan Statistical Areas (MSAs). The second level of geography is state-level estimates for each of the 50 states plus the District of Columbia, and the final level of geography is national-level estimates.

The U.S. Census Bureau conducted the 2020 HPS every week starting April 23, 2020. Due to limitations implementing the full contact strategy in the system collecting the data for the first week, the interviewing period was extended an additional week. The table below provides the data collection periods. This document will be updated after each weekly interviewing period until the end of the survey.

Table 1. Data Collection Period for the 2020 Household Pulse Survey

Week	Start Date	Finish Date
Week 1	April 23, 2020	May 5, 2020
Week 2	May 7, 2020	May12, 2020

Sample Design

The HPS utilizes the Census Bureau’s Master Address File (MAF) as the source of sampled housing units (HUs). The sample design was a systematic sample of all eligible HUs, with adjustments applied to the sampling intervals to select a large enough sample to create state level estimates¹ and estimates for the top 15 MSAs. Sixty-six independent sample areas were defined.

Sample sizes were determined such that a two percentage point detectable difference in weekly estimates for an estimate of 40 percent of the population would be detectable with a 90 percent confidence interval within each sample area. The overall sample sizes within the sampling areas were adjusted for an anticipated response rate of five percent. For those counties in one of the top MSAs, the sampling interval was adjusted to select the higher of the sampling rate for either the state or MSA.

The initial sample was divided into three panels with each panel receiving up to three interviews – see Table 2. As the survey moves through the weeks of the pandemic, one panel will be replaced with a new panel to ease the response burden of the selected HUs. In the first week of interviewing, three panels are in sample. In the second and third weeks of interviewing, four panels are in sample. Starting in the fourth week and beyond, three panels are in sample. The replacement sample size was adjusted each week to maintain the desired number of respondents based on previous response rates.

Table2. 2020 Household Pulse Survey Rotation Chart

Panel / Week	Panel V01A	Panel V01B	Panel V01C	Panel V02	Panel V03	Panel V04
Week 1	Initial Full Sample	Initial Full Sample	Initial Full Sample			
Week 2	Respondents from week 1 only	Respondents from week 1 only	Respondents from week 1 only	New Sample		
Week 3	Respondents from week 2 only	New Sample				
Week 4				Respondents from week 3 only	Respondents from week 3 only	...
Week 5					⋮	⋮

¹ Including the District of Columbia as a state.

To enable the use of a rapid deployment internet response system, we added email and mobile telephone numbers from the Census Bureau Contact Frame to the MAF. Since 2013, the Census Bureau has maintained contact frames to allow appended contact information onto sample units within household sample frames to aid in contacting respondents at those households. The primary motivation for creating this contact frame was to support research on potential contact strategies for the 2020 Census.

The Contact Frame information is maintained in two separate files – one containing phone numbers (both landline and cell phones) and the other containing email addresses. Information is obtained primarily from commercial sources, with additions from respondents to the American Community Survey and Census tests, as well as participants in food and other assistance programs from a few states, as well as from the Alaska Permanent Fund Division. Commercial sources were evaluated against respondent reported phone numbers to determine which sources would be acquired, after determining which vendors provided the best value for the government.

Commercial, survey, and administrative record data providers link phone numbers and email addresses to physical addresses before providing them for the Contact Frame. Addresses were matched to the MAF. For addresses matched with confidence, the contact information was added to the frame along with the unique identifier from the MAF. Approximately 140,000,000 housing units are represented in the MAF and we consider valid for sampling. The phone frame contains over a billion phone/address pairs, and the email frame contains over 686 million well-formed email/address pairs. The phone frame contains phone/address pairs for over 88 percent of addresses in the country, and over three quarters of those phone numbers were acquired in the past two years. The email frame contains email/address links for almost 80 percent of addresses in the country, and two-thirds of those emails were acquired in past two years. Unique phone numbers and email addresses were identified and assigned to only one HU. The HUs on MAF were then limited to these addresses on the Contact Frame as the final eligible HUs for the HPS. Table 3 shows the number of addresses with contact information.

Table 3. Number Addresses on the Master Address File with Contact Information

Total Addresses	144,136,000
Addresses with any contact information:	116,533,000
Addresses with cell phone	87,883,000
Addresses with email	107,075,000

Source: U.S. Census Bureau Master Address File Extracts and Contact Frame

Newly sampled households were contacted by email if an email was available, and by text if no email was available. Contact email addresses and phone numbers were rotated daily until all were exhausted and then the contact attempts returned to the initial email addresses and numbers. These contact methods were not fully implemented until the third sample panel was implemented. Once a complete interview was obtained from a household, that household remained in sample for two additional weekly interviewing periods. These modes were expected to yield response rates much lower than traditional

in-person or mail surveys usually conducted by the U.S. Census Bureau. The benefits to this collection plan were implementation efficiency, cost, and timeliness of responses.

Initially, interviews were planned for twelve weekly samples, with each sampled household expected to be interviewed three times.

The Census Bureau conducted the HPS online using Qualtrics as the data collection platform. Qualtrics is currently used at the Census Bureau for research and development surveys and provides the necessary agility to deploy the HPS quickly and securely. It operates in the Gov Cloud, is FedRAMP authorized at the moderate level, and has an Authority to Operate from the Census Bureau to collect personally identifiable and Title-protected data.

Approximately 1,867,000 housing units were selected from the sampling frame for the first week of interviewing. Approximately 75,000 respondents answered the online questionnaire. Table 4 shows the sample sizes and the number of responses by week.

Table 4. Sample Size and Number of Respondents at the National Level

Week	Sample Size	Number of Respondents
Week 1	1,867,000	74,500
Week 2	1,047,000	42,000

Source: U.S. Census Bureau, 2020 Household Pulse Survey

State level sample sizes and number of responses can be found in Appendix A.

Estimation Procedure

The final HPS weights are designed to produce weekly estimates for the total persons age 18 and older living within HUs. These weights were created by adjusting the household-level sampling base weights by various factors to account for nonresponse, adults per household, and coverage.

The sampling base weights for each incoming weekly sample in each of the 66 sample areas are calculated as the total eligible HUs in the sampling frame divided by the number of eligible HUs selected for first interviews each week. Therefore, the base weights for all sampled HUs sum to the total number of HUs for which contact information is known.

The final HPS person weights are created by applying the following adjustments to the sampling base weights:

1. Nonresponse adjustment – the weight of all sample units that did not respond to the HPS are evenly allocated to the units that did respond within the same sample week, sample area (MSA or balance of state) and state. After this step, the weights of all respondents sum to the total HUs with contact information in the sampling frame.
2. Occupied HU ratio adjustment – this adjustment corrects for undercoverage in the sampling frame by inflating the HU weights after the nonresponse adjustment to match independent controls for the number of occupied HUs within each state. Each sampled respondent was assigned to the state where they reported their current

address, which may be different from the selected state. For this adjustment, the independent controls are the 2018 American Community Survey (ACS) one-year, state-level estimates available at www.census.gov².

3. Person adjustment – this adjustment converts the HU weights into person weights by multiplying them by the number of persons age 18 and older that were reported to live within the household based on the subtracting the number of children in the household from the number of total persons in the household. This number was capped at 10 adults. If the number of total persons and number of children was not reported, then it is imputed.
4. Iterative Ranking Ratio to Population Estimates – this procedure controls the person weights to independent population controls by various demographics within each state. The ratio adjustment is done through an iterative raking procedure to simultaneously control the sample estimates to two sets of population controls -- Educational attainment estimates from the 2018 1-year ACS estimates (Table B115001)³ by age and sex, and the July 1, 2020 Hispanic origin/race by age and sex estimates from the Census Bureau’s Population Estimates Program (PEP). PEP provided July 1, 2020 household population estimates by single year of age (0-84, 85+), sex, race (31 groups), and Hispanic origin for states from the Vintage 2019 estimates series⁴. The ACS 2018 estimates were adjusted to match the 2020 pop controls within states by sex, and the five age categories in the ACS educational attainment estimates. Tables 5 and 6 show the demographic groups formed.

Before the raking procedure was applied, cells containing too few responses were collapsed to ensure all cells met the minimum response count requirement. The cells after collapsing remained the same throughout the raking. These collapsed cells were used in the calculation of replicate weights.

Table 5: Educational Attainment Population Adjustment Cells within State

Age	No HS diploma, Male	No HS diploma, Female	HS diploma, Male	HS diploma, Female	Some college or Associate's degree, Male	Some college or Associate's degree, Female	Bachelor's degree or higher, Male	Bachelor's degree or higher, Female
18-24								
25-34								
35-44								
45-64								
65+								

² The one-year estimates are at this URL: _____

³ The 1-year state-level detailed table B15001 is located at this URL: _____

⁴ The Vintage 2019 estimates methodology statement is available at this URL: <https://www2.census.gov/programs-surveys/popest/technical-documentation/methodology/2010-2019/natstcopr-methv2.pdf>

The Modified Race Summary File methodology statement is available at this URL: <https://www2.census.gov/programs-surveys/popest/technical-documentation/methodology/modified-race-summary-file-method/mrsf2010.pdf>

Table 6: Race/Ethnicity Population Adjustment Cells within State

Age	Hispanic, Any Race, Male	Hispanic, Any Race, Female	Non-Hispanic, White-Alone, Male	Non-Hispanic, White-Alone, Female	Non-Hispanic, Black-Alone, Male	Non-Hispanic, Black-Alone, Female	Non-Hispanic, Other Races, Male	Non-Hispanic, Other Races, Female
18-24								
25-29								
30-34								
35-39								
40-44								
45-49								
50-54								
55-64								
65+								

The detailed tables released for this experimental Household Pulse Survey show frequency counts rather than percentages. Showing the frequency counts allows data users to see the count of cases for each topic and variable that are in each response category and in the ‘Did Not Report’ category. This ‘Did Not Report’ category is not a commonly used data category in U.S. Census Bureau tables. Most survey programs review these missing data, and statistically assign them to one of the other response categories based on numerous characteristics.

In these tables, the Census Bureau recommends choosing the numerators and denominators for percentages carefully, so that missing data is deliberately include or exclude in these counts. In the absence of external information, the percentage based on only the responding cases will most closely match a percentage that would result from statistical imputation. Only including the missing data in the denominator for percentages will lower the percentages that are calculated.

Microdata will be available by FTP in the future. Users may develop statistical imputations for the missing data, but should ensure that they continue to be deliberate and transparent with their handling of these data.

ACCURACY OF THE ESTIMATES

A sample survey estimate has two types of error: sampling and nonsampling. The accuracy of an estimate depends on both types of error. The nature of the sampling error is known given the survey design; the full extent of the nonsampling error is unknown.

Sampling Error

Since the HPS estimates come from a sample, they may differ from figures from an enumeration of the entire population using the same questionnaires, instructions, and enumeration methods. For a given estimator, the difference between an estimate based on a sample and the estimate that would result if the sample were to include the entire population is known as sampling error. Standard errors, as calculated by methods described below in “Standard Errors and Their Use,” are primarily measures of the

magnitude of sampling error. However, the estimation of standard errors may include some nonsampling error.

Nonsampling Error

For a given estimator, the difference between the estimate that would result if the sample were to include the entire population and the true population value being estimated is known as nonsampling error. There are several sources of nonsampling error that may occur during the development or execution of the survey. It can occur because of circumstances created by the respondent, the survey instrument, or the way the data are collected and processed. Some nonsampling errors, and examples of each, include:

- Measurement error: The respondent provides incorrect information, the respondent estimates the requested information, or an unclear survey question is misunderstood by the respondent.
- Coverage error: Some individuals who should have been included in the survey frame were missed.
- Nonresponse error: Responses are not collected from all those in the sample or the respondent is unwilling to provide information.
- Imputation error: Values are estimated imprecisely for missing data.

To minimize these errors, the Census Bureau applies quality control procedures during all stages of the production process including the design of the survey, the wording of questions, and the statistical review of reports.

Two types of nonsampling error that can be examined to a limited extent are nonresponse and undercoverage.

Nonresponse

The effect of nonresponse cannot be measured directly, but one indication of its potential effect is the nonresponse rate. Table 7 shows the unit response rates by week.

Table 7. National Level Weighted Response Rates by Week for the 2020 Household Pulse Survey

Week	Response Rate (Percent)
Week 1	3.8
Week 2	1.3

Source: U.S. Census Bureau, 2020 Household Pulse Survey

State level response rates can be found in Appendix A.

In accordance with Census Bureau and Office of Management and Budget Quality Standards, the Census Bureau will conduct a nonresponse bias analysis to assess nonresponse bias in the HPS.

Responses are made up of complete interviews and sufficient partial interviews. A sufficient partial interview is an incomplete interview in which the household or person answered enough of the questionnaire to be considered a complete interview. Some remaining questions may have been edited or imputed to fill in missing values. Insufficient partial interviews are considered to be nonrespondents.

Undercoverage

The concept of coverage with a survey sampling process is defined as the extent to which the total population that could be selected for sample “covers” the survey’s target population. Missed housing units and missed people within sample households create undercoverage in the HPS. A common measure of survey coverage is the coverage ratio, calculated as the estimated population before poststratification divided by the independent population control. Table 8 shows the household level coverage ratios.

Table 8. Household Level Coverage Ratios for the 2020 Household Pulse Survey

Week	Household Level Coverage Ratio
Week 1	0.96
Week 2	0.96

Source: U.S. Census Bureau, 2020 Household Pulse Survey

State household level coverage ratios can be found in Appendix A.

HPS person coverage varies with age, sex, Hispanic origin/race, and educational attainment. Generally, coverage is higher for females than for males and higher for non-Blacks than for Blacks. This differential coverage is a general problem for most household-based surveys. Table 9 shows the Coverage Ratios for the person demographics of age, sex, Hispanic origin/race, and educational attainment before the raking procedure is run.

Table 9. Person Level Coverage Ratios at the National Level for 2020 Household Pulse Survey Before Raking

Demographic Characteristic	Week 1	Week 2
Male	0.86	0.89
Female	1.21	1.16
Age 18-24	0.27	0.16
Age 25-29	0.63	0.51
Age 30-34	1.00	0.83
Age 35-39	1.35	1.25
Age 40-44	1.40	1.29
Age 45-49	1.36	1.30
Age 50-54	1.35	1.36
Age 55-64	1.21	1.29
Age 65+	1.01	1.13
Hispanic	0.69	0.58
Non-Hispanic white-only	1.20	1.24
Non-Hispanic black-only	0.76	0.61
Non-Hispanic other races	0.97	0.94
No high-school diploma	0.20	0.17
High-school diploma	0.52	0.44
Some college or associate's degree	1.15	1.04
Bachelor's degree or higher	1.74	1.87

Source: U.S. Census Bureau, 2020 Household Pulse Survey

The HPS weighting procedure tries to mitigate the bias from undercoverage within the raking procedure. But due to small sample sizes, some demographic cells needed collapsing to increase sample counts within the raking cells. Convergence to both sets of the population controls were not attained. Therefore, the final coverage ratios are not perfect for some demographic groups. Table 10 show these coverage ratios after the raking was complete.

Table 10. Person Level Coverage Ratios at the National Level for 2020 Household Pulse Survey After Raking

Demographic Characteristic	Week 1	Week 2
Male	1.00	1.00
Female	1.00	1.00
Age 18-24	0.57	0.36
Age 25-29	1.16	1.04
Age 30-34	1.21	1.30
Age 35-39	1.03	1.22
Age 40-44	1.08	1.19
Age 45-49	1.05	1.07
Age 50-54	1.06	1.09
Age 55-64	1.03	1.04
Age 65+	0.95	0.93
Hispanic	1.00	0.95
Non-Hispanic white-only	1.00	1.02
Non-Hispanic black-only	0.96	0.89
Non-Hispanic other races	1.04	1.06
No high-school diploma	0.60	0.53
High-school diploma	1.17	1.20
Some college or associate's degree	1.00	1.00
Bachelor's degree or higher	1.00	1.00

Source: U.S. Census Bureau, 2020 Household Pulse Survey

State person level coverage ratios can be found in Appendix A.

Biases may also be present when people who are missed by the survey differ from those interviewed in ways other than age, sex, Hispanic origin/race, educational attainment and state of residence. How this weighting procedure affects other variables in the survey is not precisely known. All of these considerations affect comparisons across different surveys or data sources.

Comparability of Data

Data obtained from the HPS and other sources are not entirely comparable. This is due to differences in data collection processes within this survey and others. These differences are examples of nonsampling variability not reflected in the standard errors. Therefore, caution should be used when comparing results from different sources.

A Nonsampling Error Warning

Since the full extent of the nonsampling error is unknown, one should be particularly careful when interpreting results based on small differences between estimates. The Census Bureau recommends that data users incorporate information about nonsampling errors into their analyses, as nonsampling error could impact the conclusions drawn from the results. Caution should also be used when interpreting results based on a relatively small number of cases.

Standard Errors and Their Use

A sample estimate and its standard error enable one to construct a confidence interval. A confidence interval is a range about a given estimate that has a specified probability of containing the average result of all possible samples. For example, if all possible samples were surveyed under essentially the same general conditions and using the same sample design, and if an estimate and its standard error were calculated from each sample, then approximately 90 percent of the intervals from 1.645 standard errors below the estimate to 1.645 standard errors above the estimate would include the average result of all possible samples.

A particular confidence interval may or may not contain the average estimate derived from all possible samples, but one can say with the specified confidence that the interval includes the average estimate calculated from all possible samples.

Standard errors may also be used to perform hypothesis testing, a procedure for distinguishing between population parameters using sample estimates. The most common type of hypothesis is that the population parameters are different. An example of this would be comparing the percentage of adults in households where someone had a loss in employment income since March 13, 2020 from week 1 to week 2.

Tests may be performed at various levels of significance. A significance level is the probability of concluding that the characteristics are different when, in fact, they are the same. For example, to conclude that two characteristics are different at the 0.10 level of significance, the absolute value of the estimated difference between characteristics must be greater than or equal to 1.645 times the standard error of the difference.

The Census Bureau uses 90-percent confidence intervals and 0.10 levels of significance to determine statistical validity. Consult standard statistical textbooks for alternative criteria.

Estimating Standard Errors

The Census Bureau uses replication methods to estimate the standard errors of HPS estimates. These methods primarily measure the magnitude of sampling error. However, they do measure some effects of nonsampling error as well. They do not measure systematic biases in the data associated with nonsampling error. Bias is the average over all possible samples of the differences between the sample estimates and the true value.

Eighty replicate weights were created for the HPS. Using these replicate weights, the variance of an estimate can be calculated as follows:

$$Var(\hat{x}) = \frac{4}{80} \sum_{i=1}^{80} (x_i - \hat{x})^2$$

where x_i is the 80 replicate estimates and \hat{x} is the full estimate using the full weight.

TECHNICAL ASSISTANCE

If you require assistance or additional information, please contact the Demographic Statistical Methods Division via e-mail at dsmd.source.and.accuracy@census.gov.

Appendix A. State-level Quality Measures

Table A1. State-Level Sample Counts, Number of Respondents, Weighted Response Rate, and Occupied Housing Unit Coverage Ratio by Week

STATE/MEASURE	WEEK 1	WEEK 2
ALABAMA		
Sample Size	32,718	22,494
Number of Respondents	987	582
Weighted Response Rate	3.0%	1.0%
Occupied HU Coverage Ratio	0.99	0.94
ALASKA		
Sample Size	24,540	10,245
Number of Respondents	1,823	806
Weighted Response Rate	8.4%	2.7%
Occupied HU Coverage Ratio	0.94	0.97
ARIZONA		
Sample Size	43,110	23,199
Number of Respondents	1,922	1,046
Weighted Response Rate	4.2%	1.4%
Occupied HU Coverage Ratio	1.01	1.02
ARKANSAS		
Sample Size	32,718	22,619
Number of Respondents	890	567
Weighted Response Rate	3.0%	1.1%
Occupied HU Coverage Ratio	0.91	0.89
CALIFORNIA		
Sample Size	112,269	65,048
Number of Respondents	4,772	2,896
Weighted Response Rate	3.8%	1.3%
Occupied HU Coverage Ratio	0.91	0.93
COLORADO		
Sample Size	32,718	14,895
Number of Respondents	1,772	963
Weighted Response Rate	4.9%	1.8%
Occupied HU Coverage Ratio	1.05	1.08
CONNECTICUT		
Sample Size	32,718	19,590
Number of Respondents	1,049	662
Weighted Response Rate	3.5%	1.3%
Occupied HU Coverage Ratio	0.92	0.91

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Table A1. State-Level Sample Counts, Number of Respondents, Weighted Response Rate, and Occupied Housing Unit Coverage Ratio by Week

STATE/MEASURE	WEEK 1	WEEK 2
DELAWARE		
Sample Size	32,720	15,896
Number of Respondents	1,265	695
Weighted Response Rate	4.5%	1.7%
Occupied HU Coverage Ratio	1.05	1.04
DISTRICT OF COLUMBIA		
Sample Size	24,540	10,151
Number of Respondents	1,163	586
Weighted Response Rate	5.6%	2.0%
Occupied HU Coverage Ratio	1.09	1.09
FLORIDA		
Sample Size	56,676	36,697
Number of Respondents	2,651	1,654
Weighted Response Rate	3.7%	1.3%
Occupied HU Coverage Ratio	1.08	1.10
GEORGIA		
Sample Size	46,870	27,319
Number of Respondents	1,778	999
Weighted Response Rate	3.6%	1.2%
Occupied HU Coverage Ratio	0.95	0.95
HAWAII		
Sample Size	32,718	21,591
Number of Respondents	857	605
Weighted Response Rate	3.2%	1.3%
Occupied HU Coverage Ratio	0.72	0.70
IDAHO		
Sample Size	32,718	14,600
Number of Respondents	1,496	702
Weighted Response Rate	5.0%	1.7%
Occupied HU Coverage Ratio	1.02	1.08
ILLINOIS		
Sample Size	40,979	24,074
Number of Respondents	1,564	988
Weighted Response Rate	3.6%	1.3%
Occupied HU Coverage Ratio	0.90	0.91

Appendix A. State-level Quality Measures

Table A1. State-Level Sample Counts, Number of Respondents, Weighted Response Rate, and Occupied Housing Unit Coverage Ratio by Week

STATE/MEASURE	WEEK 1	WEEK 2
INDIANA		
Sample Size	32,718	18,810
Number of Respondents	1,165	727
Weighted Response Rate	3.7%	1.3%
Occupied HU Coverage Ratio	0.94	0.93
IOWA		
Sample Size	32,718	18,678
Number of Respondents	1,147	634
Weighted Response Rate	3.7%	1.3%
Occupied HU Coverage Ratio	0.97	0.96
KANSAS		
Sample Size	32,718	19,226
Number of Respondents	1,045	630
Weighted Response Rate	3.6%	1.3%
Occupied HU Coverage Ratio	0.95	0.96
KENTUCKY		
Sample Size	32,718	18,758
Number of Respondents	1,145	613
Weighted Response Rate	3.7%	1.2%
Occupied HU Coverage Ratio	0.92	0.89
LOUISIANA		
Sample Size	32,718	22,766
Number of Respondents	875	510
Weighted Response Rate	2.9%	0.9%
Occupied HU Coverage Ratio	0.93	0.85
MAINE		
Sample Size	32,718	17,678
Number of Respondents	1,146	608
Weighted Response Rate	4.0%	1.4%
Occupied HU Coverage Ratio	0.85	0.82
MARYLAND		
Sample Size	33,162	15,521
Number of Respondents	1,647	841
Weighted Response Rate	4.8%	1.7%
Occupied HU Coverage Ratio	1.06	1.01

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Table A1. State-Level Sample Counts, Number of Respondents, Weighted Response Rate, and Occupied Housing Unit Coverage Ratio by Week

STATE/MEASURE	WEEK 1	WEEK 2
MASSACHUSETTS		
Sample Size	41,841	21,061
Number of Respondents	1,879	1,122
Weighted Response Rate	4.3%	1.7%
Occupied HU Coverage Ratio	0.98	0.99
MICHIGAN		
Sample Size	50,976	29,383
Number of Respondents	1,966	1,140
Weighted Response Rate	3.9%	1.4%
Occupied HU Coverage Ratio	0.99	0.97
MINNESOTA		
Sample Size	32,718	16,989
Number of Respondents	1,471	844
Weighted Response Rate	4.2%	1.5%
Occupied HU Coverage Ratio	1.01	1.04
MISSISSIPPI		
Sample Size	32,718	22,767
Number of Respondents	841	531
Weighted Response Rate	2.9%	1.0%
Occupied HU Coverage Ratio	0.91	0.89
MISSOURI		
Sample Size	32,718	19,589
Number of Respondents	1,156	659
Weighted Response Rate	3.6%	1.1%
Occupied HU Coverage Ratio	0.94	0.94
MONTANA		
Sample Size	32,718	16,825
Number of Respondents	1,200	623
Weighted Response Rate	4.2%	1.5%
Occupied HU Coverage Ratio	0.90	0.89
NEBRASKA		
Sample Size	32,718	17,418
Number of Respondents	1,136	609
Weighted Response Rate	4.1%	1.4%
Occupied HU Coverage Ratio	0.88	0.88

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Table A1. State-Level Sample Counts, Number of Respondents, Weighted Response Rate, and Occupied Housing Unit Coverage Ratio by Week

STATE/MEASURE	WEEK 1	WEEK 2
NEVADA		
Sample Size	32,718	19,016
Number of Respondents	1,164	679
Weighted Response Rate	3.7%	1.3%
Occupied HU Coverage Ratio	1.02	0.96
NEW HAMPSHIRE		
Sample Size	32,718	15,657
Number of Respondents	1,373	744
Weighted Response Rate	4.6%	1.7%
Occupied HU Coverage Ratio	0.99	1.07
NEW JERSEY		
Sample Size	34,741	19,749
Number of Respondents	1,369	777
Weighted Response Rate	3.7%	1.3%
Occupied HU Coverage Ratio	0.93	0.93
NEW MEXICO		
Sample Size	32,718	16,163
Number of Respondents	1,272	719
Weighted Response Rate	4.5%	1.6%
Occupied HU Coverage Ratio	0.88	0.93
NEW YORK		
Sample Size	33,746	18,725
Number of Respondents	1,698	1,052
Weighted Response Rate	3.9%	1.5%
Occupied HU Coverage Ratio	0.85	0.85
NORTH CAROLINA		
Sample Size	32,718	18,879
Number of Respondents	1,409	810
Weighted Response Rate	3.7%	1.2%
Occupied HU Coverage Ratio	0.97	0.98
NORTH DAKOTA		
Sample Size	24,540	13,728
Number of Respondents	782	360
Weighted Response Rate	3.8%	1.2%
Occupied HU Coverage Ratio	0.79	0.76

Appendix A. State-level Quality Measures

Table A1. State-Level Sample Counts, Number of Respondents, Weighted Response Rate, and Occupied Housing Unit Coverage Ratio by Week

STATE/MEASURE	WEEK 1	WEEK 2
OHIO		
Sample Size	32,718	19,486
Number of Respondents	1,299	710
Weighted Response Rate	3.6%	1.1%
Occupied HU Coverage Ratio	0.97	0.94
OKLAHOMA		
Sample Size	32,718	21,388
Number of Respondents	987	562
Weighted Response Rate	3.2%	1.1%
Occupied HU Coverage Ratio	0.90	0.87
OREGON		
Sample Size	32,718	14,954
Number of Respondents	1,642	896
Weighted Response Rate	4.9%	1.8%
Occupied HU Coverage Ratio	1.06	1.13
PENNSYLVANIA		
Sample Size	44,614	24,837
Number of Respondents	1,837	1,053
Weighted Response Rate	3.8%	1.3%
Occupied HU Coverage Ratio	0.92	0.92
RHODE ISLAND		
Sample Size	32,718	20,222
Number of Respondents	904	523
Weighted Response Rate	3.4%	1.1%
Occupied HU Coverage Ratio	0.94	1.03
SOUTH CAROLINA		
Sample Size	32,718	18,906
Number of Respondents	1,231	642
Weighted Response Rate	3.7%	1.2%
Occupied HU Coverage Ratio	1.04	0.98
SOUTH DAKOTA		
Sample Size	24,540	16,091
Number of Respondents	652	370
Weighted Response Rate	3.2%	1.0%
Occupied HU Coverage Ratio	0.85	0.81

Appendix A. State-level Quality Measures

Table A1. State-Level Sample Counts, Number of Respondents, Weighted Response Rate, and Occupied Housing Unit Coverage Ratio by Week

STATE/MEASURE	WEEK 1	WEEK 2
TENNESSEE		
Sample Size	32,718	20,368
Number of Respondents	1,202	731
Weighted Response Rate	3.4%	1.3%
Occupied HU Coverage Ratio	1.04	0.99
TEXAS		
Sample Size	81,393	48,986
Number of Respondents	3,469	1,998
Weighted Response Rate	3.6%	1.2%
Occupied HU Coverage Ratio	0.96	0.96
UTAH		
Sample Size	32,718	13,136
Number of Respondents	1,883	933
Weighted Response Rate	5.8%	2.1%
Occupied HU Coverage Ratio	1.05	1.01
VERMONT		
Sample Size	24,540	11,311
Number of Respondents	1,057	567
Weighted Response Rate	4.8%	1.9%
Occupied HU Coverage Ratio	0.84	0.98
VIRGINIA		
Sample Size	37,185	17,463
Number of Respondents	1,901	1,025
Weighted Response Rate	4.6%	1.6%
Occupied HU Coverage Ratio	1.03	1.05
WASHINGTON		
Sample Size	48,063	21,960
Number of Respondents	2,540	1,334
Weighted Response Rate	4.9%	1.7%
Occupied HU Coverage Ratio	1.01	1.04
WEST VIRGINIA		
Sample Size	32,717	19,923
Number of Respondents	940	565
Weighted Response Rate	3.5%	1.2%
Occupied HU Coverage Ratio	0.73	0.74

Appendix A. State-level Quality Measures

Table A1. State-Level Sample Counts, Number of Respondents, Weighted Response Rate, and Occupied Housing Unit Coverage Ratio by Week

STATE/MEASURE	WEEK 1	WEEK 2
WISCONSIN		
Sample Size	32,720	18,743
Number of Respondents	1,228	682
Weighted Response Rate	3.7%	1.3%
Occupied HU Coverage Ratio	0.96	0.93
WYOMING		
Sample Size	24,540	13,363
Number of Respondents	766	422
Weighted Response Rate	4.0%	1.4%
Occupied HU Coverage Ratio	0.83	0.69

Source: U.S. Census Bureau, 2020 Household Pulse Survey

Appendix A. State-level Quality Measures

Table A2. Person Level Coverage Ratios at the State Level for 2020 Household Pulse Survey Before and After Raking

State	Week	Before / After Raking	Male	Female	Age 18-24	Age 25-29	Age 30-34	Age 35-39	Age 40-44	Age 45-49	Age 50-54	Age 55-64	Age 65+	Hispanic	NH white-only	NH black-only	NH other races	No HS diploma	HS diploma	Some college	Bachelors +
ALABAMA	1	Before	0.80	1.33	0.24	0.82	1.42	1.73	1.42	1.48	1.30	1.18	0.83	0.87	1.18	0.83	1.19	0.27	0.52	1.33	1.95
ALABAMA	1	After	1.00	1.00	0.53	1.24	1.44	0.98	1.01	1.17	0.94	1.08	0.87	1.10	1.02	0.93	1.04	0.56	1.19	1.00	1.00
ALABAMA	2	Before	0.79	1.22	0.11	0.63	1.19	1.60	1.46	1.72	1.47	0.94	0.83	0.87	1.22	0.45	1.34	0.38	0.58	1.03	1.94
ALABAMA	2	After	1.00	1.00	0.15	0.78	1.47	1.35	1.59	1.24	1.38	0.88	0.86	1.47	1.00	0.83	1.81	0.49	1.22	1.00	1.00
ALASKA	1	Before	0.92	1.13	0.41	0.76	1.42	1.36	0.99	1.01	1.94	0.85	0.92	1.07	1.22	0.50	0.57	0.16	0.34	1.03	1.97
ALASKA	1	After	1.00	1.00	0.76	1.10	1.15	0.98	1.04	1.04	0.98	0.94	1.05	1.00	1.00	0.74	1.03	0.56	1.11	1.00	1.00
ALASKA	2	Before	0.79	1.17	0.25	0.42	1.67	1.29	1.29	1.19	1.12	0.78	1.07	1.27	1.17	0.19	0.52	0.13	0.30	0.84	2.12
ALASKA	2	After	1.00	1.00	0.51	0.78	1.57	1.02	1.19	1.31	0.82	0.96	0.99	1.00	1.01	0.31	1.07	0.47	1.13	1.00	1.00
ARIZONA	1	Before	0.86	1.13	0.28	0.59	0.84	1.11	1.38	1.28	1.25	1.16	1.11	0.60	1.25	0.91	0.68	0.21	0.44	1.23	1.58
ARIZONA	1	After	1.00	1.00	0.60	1.12	1.17	1.05	1.00	1.27	1.12	0.98	0.96	1.00	1.00	0.99	1.00	0.85	1.08	1.00	1.00
ARIZONA	2	Before	0.84	1.09	0.08	0.42	0.77	0.89	1.43	1.05	1.14	1.18	1.31	0.45	1.29	0.53	0.69	0.12	0.41	1.13	1.66
ARIZONA	2	After	1.00	1.00	0.27	0.89	1.26	0.95	0.99	1.79	1.12	0.97	1.04	1.00	1.00	1.02	0.99	0.51	1.25	1.00	1.00
ARKANSAS	1	Before	0.77	1.39	0.31	0.61	1.22	1.54	1.77	1.57	1.42	1.08	0.94	0.60	1.20	0.72	1.28	0.22	0.54	1.41	2.03
ARKANSAS	1	After	1.00	1.00	0.53	0.83	1.44	1.42	1.06	1.19	1.04	0.97	0.90	0.51	1.05	0.72	1.86	0.42	1.22	1.00	1.00
ARKANSAS	2	Before	0.90	1.29	0.22	0.56	1.10	1.38	2.04	1.72	1.36	1.09	1.02	0.55	1.24	0.66	0.96	0.35	0.48	1.14	2.49
ARKANSAS	2	After	1.00	1.00	0.30	0.80	1.36	1.28	1.73	1.19	0.73	0.97	0.98	0.46	1.13	0.63	0.78	0.75	1.09	1.00	1.00
CALIFORNIA	1	Before	0.87	1.09	0.26	0.60	0.85	1.15	1.25	1.14	1.30	1.20	1.10	0.66	1.34	0.77	0.94	0.19	0.47	1.06	1.66
CALIFORNIA	1	After	1.00	1.00	0.76	1.22	1.02	0.97	1.01	1.01	1.05	1.03	0.97	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
CALIFORNIA	2	Before	0.84	1.05	0.12	0.48	0.59	1.08	1.04	1.23	1.27	1.29	1.20	0.52	1.42	0.57	0.92	0.11	0.37	0.84	1.85
CALIFORNIA	2	After	1.00	1.00	0.40	1.34	1.22	1.01	1.09	0.94	1.08	1.13	0.90	1.00	1.00	1.00	1.00	0.72	1.20	1.00	1.00
COLORADO	1	Before	0.78	1.21	0.23	0.56	0.87	1.29	1.31	1.16	1.42	1.15	1.07	0.52	1.15	0.82	0.89	0.11	0.39	0.93	1.59
COLORADO	1	After	1.00	1.00	0.57	1.16	1.11	0.96	1.04	0.94	1.11	1.06	1.03	1.00	1.00	1.10	0.94	0.36	1.25	1.00	1.00
COLORADO	2	Before	0.86	1.10	0.14	0.22	0.82	1.24	1.21	1.22	1.39	1.24	1.25	0.50	1.15	0.55	0.85	0.15	0.39	0.87	1.59
COLORADO	2	After	1.00	1.00	0.32	0.40	1.60	1.04	1.26	1.16	0.94	1.21	1.03	1.00	1.00	0.84	1.10	0.46	1.21	1.00	1.00
CONNECTICUT	1	Before	0.93	1.28	0.28	0.76	1.24	1.64	1.63	1.31	1.31	1.30	0.94	0.72	1.26	0.91	0.80	0.21	0.60	1.19	1.66
CONNECTICUT	1	After	1.00	1.00	0.47	1.01	1.42	1.15	1.05	1.09	1.21	0.95	0.94	0.88	1.04	1.05	0.78	0.40	1.20	1.00	1.00
CONNECTICUT	2	Before	0.98	1.19	0.14	0.56	0.93	1.29	1.38	1.73	1.17	1.29	1.18	0.70	1.22	0.79	1.10	0.26	0.41	1.15	1.75
CONNECTICUT	2	After	1.00	1.00	0.16	0.63	0.86	1.70	1.72	1.43	1.20	0.89	0.94	0.93	1.01	1.03	1.01	0.69	1.10	1.00	1.00
DELAWARE	1	Before	0.79	1.32	0.51	0.44	1.07	1.22	1.34	1.54	1.48	1.10	1.07	0.74	1.19	0.85	0.92	0.10	0.55	1.37	1.73
DELAWARE	1	After	1.00	1.00	0.89	0.52	1.13	1.16	1.17	1.09	0.91	1.13	0.97	1.00	1.00	1.00	1.00	0.27	1.23	1.00	1.00

Appendix A. State-level Quality Measures

Table A2. Person Level Coverage Ratios at the State Level for 2020 Household Pulse Survey Before and After Raking

State	Week	Before / After Raking	Male	Female	Age 18-24	Age 25-29	Age 30-34	Age 35-39	Age 40-44	Age 45-49	Age 50-54	Age 55-64	Age 65+	Hispanic	NH white-only	NH black-only	NH other races	No HS diploma	HS diploma	Some college	Bachelors +
DELAWARE	2	Before	0.83	1.23	0.09	0.26	0.83	1.06	1.07	1.48	1.63	1.15	1.28	0.54	1.20	0.73	0.95	0.11	0.47	1.21	1.86
DELAWARE	2	After	1.00	1.00	0.23	0.43	1.35	2.00	0.85	0.98	1.10	1.10	0.98	0.87	1.03	0.84	1.43	0.37	1.20	1.00	1.00
DISTRICT OF COLUMBIA	1	Before	0.85	1.11	0.14	0.38	0.84	2.01	1.39	1.22	1.39	1.01	0.90	0.80	1.34	0.65	1.32	0.18	0.38	0.91	1.31
DISTRICT OF COLUMBIA	1	After	1.00	1.00	0.39	0.73	1.59	1.15	0.87	0.97	1.13	1.03	0.91	0.68	1.08	1.00	1.05	0.43	1.25	1.00	1.00
DISTRICT OF COLUMBIA	2	Before	0.94	0.94	0.14	0.35	1.11	1.30	1.20	1.24	0.92	1.18	1.04	0.38	1.53	0.56	0.66	0.16	0.20	0.84	1.31
DISTRICT OF COLUMBIA	2	After	1.00	1.00	0.52	0.87	1.57	0.94	1.12	0.93	0.71	1.04	0.93	0.28	1.14	1.10	0.66	0.68	1.14	0.83	1.05
FLORIDA	1	Before	0.84	1.08	0.28	0.55	0.76	1.07	1.22	1.36	1.17	1.19	0.97	0.75	1.13	0.62	1.18	0.13	0.51	1.11	1.62
FLORIDA	1	After	1.00	1.00	0.63	1.10	1.25	0.92	1.16	1.08	0.97	1.00	0.99	1.00	1.00	1.00	1.00	0.31	1.28	1.00	1.00
FLORIDA	2	Before	0.83	1.03	0.16	0.38	0.63	0.88	1.06	1.03	1.37	1.18	1.13	0.68	1.14	0.53	1.15	0.10	0.35	1.14	1.66
FLORIDA	2	After	1.00	1.00	0.40	0.73	1.49	1.27	1.31	1.07	1.08	0.96	0.96	1.00	1.00	1.00	1.00	0.31	1.28	1.00	1.00
GEORGIA	1	Before	0.87	1.16	0.22	0.52	0.95	1.24	1.51	1.42	1.59	1.06	1.00	0.62	1.20	0.78	1.19	0.20	0.46	1.12	1.82
GEORGIA	1	After	1.00	1.00	0.60	0.98	1.30	1.05	1.11	0.96	1.18	1.00	0.96	1.00	1.00	1.00	1.00	0.53	1.21	1.00	1.00
GEORGIA	2	Before	0.88	1.14	0.23	0.62	0.78	1.05	1.46	1.14	1.57	1.16	1.14	0.60	1.27	0.62	1.38	0.15	0.45	1.02	1.93
GEORGIA	2	After	1.00	1.00	0.70	1.31	1.04	0.97	1.24	0.82	1.42	0.90	0.90	0.56	1.06	1.01	1.03	0.61	1.18	1.00	1.00
HAWAII	1	Before	0.77	1.19	0.20	0.35	0.75	1.26	1.49	1.30	1.05	1.31	1.00	0.89	1.72	0.26	0.77	0.10	0.49	0.96	1.68
HAWAII	1	After	1.00	1.00	0.39	0.46	1.24	1.46	1.24	1.23	1.06	1.01	1.00	0.94	1.06	0.34	1.00	0.21	1.23	1.00	1.00
HAWAII	2	Before	0.84	1.08	0.11	0.33	0.65	1.03	1.19	1.24	1.54	1.36	1.01	0.85	1.33	0.91	0.85	0.22	0.44	0.86	1.74
HAWAII	2	After	1.00	1.00	0.14	0.49	0.81	1.65	1.61	1.01	1.28	1.09	1.00	0.84	1.05	0.79	1.01	0.56	1.13	1.00	1.00
IDAHO	1	Before	0.76	1.24	0.31	0.76	1.02	0.93	1.41	1.58	1.50	1.06	0.93	0.47	1.07	0.46	1.09	0.28	0.51	1.23	1.53
IDAHO	1	After	1.00	1.00	0.57	1.31	1.07	1.04	1.10	1.07	0.99	1.01	0.99	1.00	1.00	0.55	1.07	0.84	1.05	1.00	1.00
IDAHO	2	Before	0.79	1.21	0.13	0.53	1.33	0.81	1.11	1.42	1.66	1.18	1.05	0.47	1.06	0.47	1.30	0.25	0.45	0.97	1.96
IDAHO	2	After	1.00	1.00	0.14	0.94	1.64	1.46	1.05	1.20	0.94	0.99	0.98	0.63	1.03	0.73	1.48	0.54	1.16	1.00	1.00
ILLINOIS	1	Before	0.86	1.25	0.26	0.69	1.04	1.49	1.37	1.40	1.34	1.19	1.02	0.58	1.30	0.61	0.98	0.24	0.46	1.02	1.87
ILLINOIS	1	After	1.00	1.00	0.42	1.17	1.34	0.97	1.10	1.17	1.15	1.05	0.89	1.00	1.00	0.87	1.23	0.56	1.18	1.00	1.00
ILLINOIS	2	Before	0.97	1.07	0.19	0.42	0.82	1.48	1.49	1.14	1.17	1.32	1.08	0.47	1.29	0.49	0.93	0.32	0.38	0.83	1.94
ILLINOIS	2	After	1.00	1.00	0.45	0.88	1.39	1.17	1.08	0.96	1.07	1.23	0.86	0.86	1.08	0.76	1.06	0.73	1.11	1.00	1.00
INDIANA	1	Before	0.86	1.29	0.26	0.59	1.03	1.75	1.59	1.31	1.25	1.23	1.04	0.55	1.15	0.94	0.91	0.17	0.54	1.27	2.01
INDIANA	1	After	1.00	1.00	0.61	1.14	1.16	1.06	1.16	0.85	1.03	1.07	0.99	0.78	1.02	0.97	1.10	0.44	1.20	1.00	1.00

Appendix A. State-level Quality Measures

Table A2. Person Level Coverage Ratios at the State Level for 2020 Household Pulse Survey Before and After Raking

State	Week	Before / After Raking	Male	Female	Age 18-24	Age 25-29	Age 30-34	Age 35-39	Age 40-44	Age 45-49	Age 50-54	Age 55-64	Age 65+	Hispanic	NH white-only	NH black-only	NH other races	No HS diploma	HS diploma	Some college	Bachelors +
INDIANA	2	Before	0.86	1.29	0.13	0.39	0.96	1.53	1.22	1.67	1.35	1.48	1.06	0.48	1.19	0.60	0.82	0.24	0.50	1.28	2.00
INDIANA	2	After	1.00	1.00	0.25	0.97	1.55	1.50	0.97	1.25	0.89	0.98	0.97	0.52	1.06	0.77	1.09	0.56	1.15	1.00	1.00
IOWA	1	Before	0.84	1.36	0.36	0.76	1.27	1.52	1.61	1.33	1.28	1.20	1.00	0.72	1.14	0.54	1.17	0.26	0.63	1.18	1.79
IOWA	1	After	1.00	1.00	0.55	1.06	1.33	1.02	1.03	0.94	1.09	1.01	1.04	0.87	1.00	0.86	1.21	0.42	1.15	1.00	1.00
IOWA	2	Before	0.93	1.24	0.27	0.55	1.43	1.69	1.04	1.29	1.48	1.32	0.98	0.59	1.14	0.59	1.06	0.15	0.53	1.13	1.94
IOWA	2	After	1.00	1.00	0.67	0.68	1.45	1.29	0.98	1.07	0.99	0.97	1.02	0.77	1.02	0.73	0.99	0.34	1.18	1.00	1.00
KANSAS	1	Before	0.87	1.36	0.17	0.77	1.25	1.52	1.69	1.57	1.56	1.16	1.03	0.70	1.22	0.75	0.86	0.25	0.54	1.12	1.86
KANSAS	1	After	1.00	1.00	0.35	1.37	1.26	0.96	1.14	1.21	1.07	1.00	0.98	0.97	1.02	1.01	0.84	0.47	1.19	1.00	1.00
KANSAS	2	Before	0.86	1.33	0.15	0.70	0.99	1.40	1.68	1.91	1.02	1.11	1.24	0.87	1.19	0.66	0.75	0.21	0.39	1.16	1.89
KANSAS	2	After	1.00	1.00	0.25	1.33	1.08	1.30	1.44	1.14	0.90	0.98	0.96	0.63	1.06	0.71	1.07	0.77	1.08	1.00	1.00
KENTUCKY	1	Before	0.73	1.45	0.25	0.76	1.13	1.51	1.50	1.36	1.82	1.23	0.87	1.23	1.10	0.97	1.27	0.26	0.63	1.27	2.02
KENTUCKY	1	After	1.00	1.00	0.39	1.33	1.26	1.13	0.97	1.11	1.03	1.00	0.98	1.46	0.99	0.82	1.36	0.52	1.19	1.00	1.00
KENTUCKY	2	Before	0.73	1.37	0.13	0.42	0.90	1.60	1.17	1.30	1.60	1.27	1.15	1.06	1.11	0.66	0.74	0.20	0.60	1.27	1.95
KENTUCKY	2	After	1.00	1.00	0.20	0.72	1.57	1.99	0.77	1.03	1.11	0.98	0.97	1.08	1.01	0.86	1.11	0.47	1.21	1.00	1.00
LOUISIANA	1	Before	0.77	1.32	0.44	0.69	1.17	1.80	1.47	1.57	1.15	1.03	0.83	1.38	1.17	0.79	1.00	0.30	0.59	1.40	1.82
LOUISIANA	1	After	1.00	1.00	0.53	0.96	1.49	1.11	1.06	1.08	0.80	1.10	0.94	1.08	1.01	0.90	1.57	0.56	1.18	1.00	1.00
LOUISIANA	2	Before	0.78	1.29	0.15	0.61	1.19	1.44	2.02	0.97	1.07	1.06	1.11	1.47	1.19	0.70	0.98	0.29	0.57	1.18	2.09
LOUISIANA	2	After	1.00	1.00	0.19	1.02	1.28	1.20	2.09	0.91	1.02	0.98	0.83	1.06	1.01	0.96	1.10	0.71	1.12	1.00	1.00
MAINE	1	Before	0.84	1.34	0.22	0.80	1.30	1.40	1.42	1.17	1.24	1.18	1.11	2.59	1.09	0.32	1.20	0.16	0.46	1.27	1.83
MAINE	1	After	1.00	1.00	0.42	1.42	1.21	1.01	1.02	1.07	0.94	1.00	0.99	1.32	1.01	0.17	0.92	0.41	1.13	1.00	1.00
MAINE	2	Before	0.97	1.15	0.29	0.55	0.60	1.47	1.05	1.33	1.27	1.03	1.36	0.80	1.08	0.89	0.72	0.04	0.33	1.13	2.03
MAINE	2	After	1.00	1.00	0.45	0.95	1.22	1.39	1.04	0.98	1.02	1.00	1.00	0.85	1.00	1.13	0.90	0.11	1.20	1.00	1.00
MARYLAND	1	Before	0.97	1.15	0.20	0.68	0.91	1.32	1.35	1.24	1.37	1.36	1.03	0.68	1.24	0.86	1.09	0.29	0.49	1.04	1.65
MARYLAND	1	After	1.00	1.00	0.37	1.32	1.26	1.01	1.15	1.02	0.89	1.08	0.96	1.00	1.00	1.00	1.00	0.76	1.09	1.00	1.00
MARYLAND	2	Before	0.95	1.09	0.09	0.60	0.65	1.37	1.39	1.18	1.46	1.23	1.10	0.67	1.27	0.65	1.22	0.12	0.37	0.91	1.77
MARYLAND	2	After	1.00	1.00	0.19	1.20	0.78	1.20	1.89	0.74	1.07	1.19	0.87	0.61	1.09	1.02	0.83	0.36	1.25	1.00	1.00
MASSACHUSETTS	1	Before	0.93	1.23	0.26	0.52	1.00	1.32	1.29	1.28	1.46	1.38	1.13	0.70	1.19	0.80	0.94	0.18	0.48	1.14	1.60
MASSACHUSETTS	1	After	1.00	1.00	0.55	1.04	1.23	1.02	1.04	1.05	1.08	1.06	0.97	1.00	1.00	0.88	1.10	0.56	1.17	1.00	1.00
MASSACHUSETTS	2	Before	1.00	1.15	0.07	0.58	0.78	1.43	0.96	1.25	1.65	1.33	1.29	0.71	1.21	0.65	0.79	0.12	0.38	1.07	1.69
MASSACHUSETTS	2	After	1.00	1.00	0.15	1.44	1.08	1.33	1.17	0.93	1.07	1.02	0.96	0.84	1.03	0.84	1.06	0.68	1.13	1.00	1.00

Appendix A. State-level Quality Measures

Table A2. Person Level Coverage Ratios at the State Level for 2020 Household Pulse Survey Before and After Raking

State	Week	Before / After Raking	Male	Female	Age 18-24	Age 25-29	Age 30-34	Age 35-39	Age 40-44	Age 45-49	Age 50-54	Age 55-64	Age 65+	Hispanic	NH white-only	NH black-only	NH other races	No HS diploma	HS diploma	Some college	Bachelors +
MICHIGAN	1	Before	0.88	1.32	0.33	0.66	1.09	1.43	1.66	1.47	1.35	1.24	1.05	0.88	1.17	0.73	1.19	0.23	0.53	1.15	1.94
MICHIGAN	1	After	1.00	1.00	0.63	1.23	1.18	1.05	1.06	1.05	1.03	1.02	0.94	0.98	1.00	0.99	1.00	0.49	1.16	1.00	1.00
MICHIGAN	2	Before	0.97	1.25	0.24	0.43	0.88	1.11	1.44	1.41	1.46	1.43	1.31	0.89	1.22	0.56	1.10	0.29	0.42	1.05	2.21
MICHIGAN	2	After	1.00	1.00	0.55	1.21	1.24	1.22	1.22	1.05	1.05	0.94	0.92	0.80	1.01	0.79	1.56	0.78	1.07	1.00	1.00
MINNESOTA	1	Before	0.84	1.31	0.29	0.61	1.08	1.41	1.19	1.29	1.36	1.21	1.18	0.57	1.17	0.62	0.76	0.18	0.47	1.12	1.66
MINNESOTA	1	After	1.00	1.00	0.66	1.18	1.10	0.99	1.17	1.05	0.98	0.98	1.00	0.48	1.03	0.92	1.02	0.56	1.13	1.00	1.00
MINNESOTA	2	Before	0.86	1.25	0.15	0.43	0.77	1.17	1.13	1.32	1.27	1.50	1.26	0.84	1.15	0.42	0.72	0.19	0.35	0.91	1.89
MINNESOTA	2	After	1.00	1.00	0.45	0.67	1.16	1.65	1.08	1.12	0.90	1.01	1.02	1.62	0.99	0.70	0.91	0.77	1.07	1.00	1.00
MISSISSIPPI	1	Before	0.70	1.37	0.22	0.60	1.18	1.61	1.88	1.56	1.26	1.23	0.73	0.94	1.18	0.82	1.52	0.24	0.60	1.26	1.93
MISSISSIPPI	1	After	1.00	1.00	0.29	0.98	1.38	1.34	1.31	1.10	1.11	1.16	0.79	0.79	1.01	0.97	1.39	0.53	1.23	1.00	1.00
MISSISSIPPI	2	Before	0.64	1.49	0.21	0.62	1.14	1.48	1.76	1.45	1.12	1.30	1.01	0.73	1.15	0.95	2.01	0.47	0.67	1.15	1.99
MISSISSIPPI	2	After	1.00	1.00	0.32	0.84	1.48	1.61	0.92	1.11	1.13	1.10	0.87	0.53	1.02	0.95	1.83	0.66	1.17	1.00	1.00
MISSOURI	1	Before	0.85	1.36	0.27	0.61	1.16	1.70	1.68	1.67	1.36	1.15	0.97	1.18	1.13	0.92	1.21	0.21	0.63	1.24	1.83
MISSOURI	1	After	1.00	1.00	0.52	1.08	1.26	1.07	1.03	1.39	0.94	0.99	0.96	1.73	0.97	0.90	1.13	0.31	1.22	1.00	1.00
MISSOURI	2	Before	0.86	1.32	0.34	0.54	0.92	1.58	1.71	1.27	1.12	1.26	1.16	1.23	1.17	0.60	0.95	0.25	0.50	1.23	1.91
MISSOURI	2	After	1.00	1.00	0.56	1.02	0.94	1.31	1.31	1.06	1.23	0.93	0.95	1.93	1.00	0.70	0.96	0.68	1.10	1.00	1.00
MONTANA	1	Before	0.83	1.29	0.31	0.38	1.18	1.21	1.54	1.40	1.18	1.48	0.96	0.78	1.12	0.87	0.62	0.14	0.55	0.96	1.90
MONTANA	1	After	1.00	1.00	0.75	0.81	1.35	1.11	1.05	1.01	0.99	0.99	1.00	1.09	1.01	1.83	0.84	0.34	1.16	1.00	1.00
MONTANA	2	Before	0.96	1.20	0.15	0.34	0.98	1.13	1.94	1.29	1.21	1.35	1.20	0.57	1.15	0.61	0.59	0.15	0.37	0.89	2.22
MONTANA	2	After	1.00	1.00	0.46	0.54	2.09	0.77	1.32	0.88	1.21	0.99	0.99	0.81	1.04	1.09	0.61	0.38	1.15	1.00	1.00
NEBRASKA	1	Before	0.90	1.39	0.35	0.85	1.30	1.62	1.51	1.63	1.58	1.06	1.06	0.47	1.25	0.91	1.03	0.15	0.51	1.23	1.90
NEBRASKA	1	After	1.00	1.00	0.55	1.59	0.95	1.05	0.99	1.01	1.01	1.02	0.97	0.56	1.06	0.84	0.93	0.41	1.20	1.00	1.00
NEBRASKA	2	Before	0.81	1.34	0.17	0.48	1.23	1.32	1.30	1.38	1.29	1.16	1.33	0.32	1.19	0.92	0.95	0.14	0.48	1.19	1.75
NEBRASKA	2	After	1.00	1.00	0.27	1.22	1.41	1.34	0.97	1.04	1.00	1.02	0.97	0.58	1.03	1.17	1.20	0.41	1.20	1.00	1.00
NEVADA	1	Before	0.90	1.26	0.49	0.67	0.86	1.15	1.36	1.51	1.23	1.09	1.27	0.71	1.33	0.79	1.04	0.25	0.58	1.35	1.79
NEVADA	1	After	1.00	1.00	0.98	0.94	1.11	0.86	0.95	1.41	0.99	1.03	0.89	1.00	1.00	0.79	1.14	0.51	1.23	1.00	1.00
NEVADA	2	Before	0.89	1.12	0.15	0.55	0.69	1.03	1.32	1.55	1.16	1.11	1.28	0.43	1.35	0.74	0.97	0.15	0.40	1.18	2.00
NEVADA	2	After	1.00	1.00	0.43	0.84	0.99	0.89	1.63	1.42	1.04	1.10	0.89	0.72	1.13	0.72	1.22	0.46	1.25	1.00	1.00
NEW HAMPSHIRE	1	Before	0.80	1.40	0.31	0.55	0.97	1.30	1.35	1.20	1.45	1.26	1.24	1.03	1.12	0.20	1.18	0.20	0.50	1.26	1.65
NEW HAMPSHIRE	1	After	1.00	1.00	0.69	1.09	1.12	0.97	0.94	0.96	1.09	1.05	1.01	1.40	0.99	0.17	1.13	0.60	1.10	1.00	1.00

Appendix A. State-level Quality Measures

Table A2. Person Level Coverage Ratios at the State Level for 2020 Household Pulse Survey Before and After Raking

State	Week	Before / After Raking	Male	Female	Age 18-24	Age 25-29	Age 30-34	Age 35-39	Age 40-44	Age 45-49	Age 50-54	Age 55-64	Age 65+	Hispanic	NH white-only	NH black-only	NH other races	No HS diploma	HS diploma	Some college	Bachelors +
NEW HAMPSHIRE	2	Before	0.86	1.35	0.13	0.37	1.00	1.01	1.36	1.13	1.65	1.53	1.16	0.43	1.12	0.53	1.65	0.31	0.45	1.11	1.80
NEW HAMPSHIRE	2	After	1.00	1.00	0.40	0.85	1.72	1.13	0.78	1.20	1.00	1.00	1.00	0.58	1.01	0.45	1.24	0.68	1.08	1.00	1.00
NEW JERSEY	1	Before	0.91	1.25	0.24	0.72	1.04	1.31	1.35	1.15	1.44	1.43	0.99	0.73	1.30	0.68	1.08	0.21	0.59	1.27	1.54
NEW JERSEY	1	After	1.00	1.00	0.41	1.01	1.52	1.05	1.08	1.01	1.27	1.08	0.85	1.00	1.00	0.84	1.18	0.48	1.19	1.00	1.00
NEW JERSEY	2	Before	0.90	1.19	0.12	0.42	0.99	1.30	1.39	0.91	1.28	1.45	1.16	0.61	1.39	0.57	0.66	0.20	0.47	1.20	1.58
NEW JERSEY	2	After	1.00	1.00	0.21	0.64	1.62	1.05	1.47	0.93	1.61	0.96	0.88	1.00	1.00	0.86	1.15	0.71	1.11	1.00	1.00
NEW MEXICO	1	Before	0.84	1.20	0.18	0.57	0.64	1.27	1.48	1.53	1.32	1.20	1.14	0.69	1.51	0.75	0.72	0.13	0.49	1.14	1.97
NEW MEXICO	1	After	1.00	1.00	0.44	1.30	1.13	1.03	1.10	0.95	1.24	1.18	0.88	1.00	1.00	0.97	1.01	0.34	1.37	1.00	1.00
NEW MEXICO	2	Before	0.90	1.11	0.09	0.51	0.64	1.33	1.38	1.15	1.43	1.22	1.21	0.52	1.75	0.57	0.48	0.11	0.41	1.06	2.10
NEW MEXICO	2	After	1.00	1.00	0.24	0.85	0.86	1.50	1.38	0.75	1.45	1.33	0.87	1.00	1.09	1.31	0.65	0.38	1.35	1.00	1.00
NEW YORK	1	Before	0.94	1.17	0.19	0.66	1.10	1.39	1.52	1.27	1.36	1.32	0.93	0.75	1.29	0.66	0.90	0.22	0.47	1.15	1.73
NEW YORK	1	After	1.00	1.00	0.32	1.35	1.12	1.22	1.20	0.86	1.20	0.95	0.96	1.00	1.00	1.00	1.00	0.60	1.19	1.00	1.00
NEW YORK	2	Before	0.93	1.17	0.18	0.71	0.91	1.30	1.23	1.25	1.31	1.52	0.98	0.59	1.36	0.64	0.80	0.10	0.44	1.09	1.83
NEW YORK	2	After	1.00	1.00	0.18	1.08	1.47	1.31	0.97	1.12	1.01	1.16	0.87	0.88	1.06	0.81	1.12	0.40	1.29	1.00	1.00
NORTH CAROLINA	1	Before	0.72	1.35	0.29	0.56	1.20	1.53	1.42	1.23	1.47	1.19	0.93	0.88	1.14	0.89	0.95	0.16	0.45	1.17	1.81
NORTH CAROLINA	1	After	1.00	1.00	0.53	0.90	1.40	1.13	1.24	0.86	1.25	1.05	0.90	1.00	1.00	1.00	1.00	0.41	1.27	1.00	1.00
NORTH CAROLINA	2	Before	0.74	1.34	0.24	0.50	1.07	1.33	1.42	1.46	1.47	1.15	1.05	0.68	1.21	0.69	1.09	0.14	0.36	0.99	2.10
NORTH CAROLINA	2	After	1.00	1.00	0.40	0.76	1.67	1.12	0.98	1.05	1.35	1.03	0.91	1.13	1.00	0.81	1.56	0.62	1.17	1.00	1.00
NORTH DAKOTA	1	Before	0.94	1.42	0.39	0.36	1.07	1.38	1.77	2.20	1.69	1.37	1.14	1.04	1.24	0.11	0.94	0.34	0.65	1.09	2.04
NORTH DAKOTA	1	After	1.00	1.00	0.88	0.69	1.46	1.02	0.97	1.21	0.92	1.00	0.98	0.96	1.04	0.14	0.96	0.81	1.06	1.00	1.00
NORTH DAKOTA	2	Before	0.95	1.34	0.48	0.36	0.78	1.15	1.29	2.07	1.83	1.27	1.41	0.95	1.18	0.53	1.06	0.47	0.62	1.16	1.79
NORTH DAKOTA	2	After	1.00	1.00	0.61	0.46	1.02	1.15	1.17	2.16	0.97	0.99	1.00	1.19	1.02	0.73	0.79	0.65	1.10	1.00	1.00
OHIO	1	Before	0.89	1.29	0.35	0.67	0.96	1.43	1.68	1.59	1.46	1.37	0.86	0.81	1.17	0.77	0.94	0.37	0.57	1.32	1.76
OHIO	1	After	1.00	1.00	0.59	1.29	1.12	0.98	1.11	1.04	1.00	0.98	1.00	1.14	1.01	0.88	0.97	0.59	1.12	1.00	1.00
OHIO	2	Before	1.02	1.23	0.18	0.53	0.83	1.44	1.47	1.43	1.78	1.62	0.98	0.71	1.21	0.62	1.35	0.21	0.64	1.04	2.17
OHIO	2	After	1.00	1.00	0.33	0.96	1.13	1.48	1.23	1.07	1.13	0.94	1.00	0.90	1.01	0.72	1.67	0.34	1.20	1.00	1.00
OKLAHOMA	1	Before	0.79	1.29	0.27	0.67	1.10	1.50	1.63	1.19	1.60	1.25	0.81	0.71	1.12	0.68	1.11	0.24	0.55	1.19	1.94
OKLAHOMA	1	After	1.00	1.00	0.52	1.18	1.27	1.02	1.07	0.93	1.34	0.99	0.95	1.07	0.99	0.83	1.08	0.51	1.19	1.00	1.00
OKLAHOMA	2	Before	0.91	1.21	0.19	0.59	0.93	1.27	1.39	1.22	1.99	1.29	1.03	0.55	1.13	1.01	1.10	0.23	0.56	1.16	2.04
OKLAHOMA	2	After	1.00	1.00	0.29	0.71	1.22	1.42	1.36	0.86	1.16	1.11	1.03	0.69	1.04	1.07	0.96	0.58	1.16	1.00	1.00

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Table A2. Person Level Coverage Ratios at the State Level for 2020 Household Pulse Survey Before and After Raking

State	Week	Before / After Raking	Male	Female	Age 18-24	Age 25-29	Age 30-34	Age 35-39	Age 40-44	Age 45-49	Age 50-54	Age 55-64	Age 65+	Hispanic	NH white-only	NH black-only	NH other races	No HS diploma	HS diploma	Some college	Bachelors +
OREGON	1	Before	0.93	1.17	0.27	0.54	0.81	1.13	1.46	1.34	1.32	1.18	1.22	0.52	1.17	0.61	0.74	0.14	0.53	1.06	1.70
OREGON	1	After	1.00	1.00	0.56	1.12	1.25	1.00	1.18	1.02	0.96	1.00	0.99	1.00	1.00	0.87	1.03	0.32	1.29	1.00	1.00
OREGON	2	Before	0.85	1.10	0.20	0.37	0.75	1.10	1.11	1.32	1.41	1.15	1.18	0.52	1.10	0.15	0.67	0.09	0.42	0.90	1.76
OREGON	2	After	1.00	1.00	0.59	0.86	1.42	1.18	1.11	1.02	0.85	1.06	0.96	1.14	1.00	0.46	0.94	0.27	1.31	1.00	1.00
PENNSYLVANIA	1	Before	0.90	1.29	0.35	0.72	1.20	1.38	1.45	1.26	1.61	1.21	0.99	0.83	1.18	0.76	0.97	0.27	0.54	1.19	1.92
PENNSYLVANIA	1	After	1.00	1.00	0.57	0.99	1.34	1.03	0.99	1.17	1.10	1.01	0.95	1.00	1.00	1.00	1.00	0.82	1.05	1.00	1.00
PENNSYLVANIA	2	Before	0.97	1.18	0.16	0.55	0.92	1.32	1.37	1.30	1.39	1.33	1.16	0.55	1.17	0.73	1.14	0.26	0.55	1.04	1.98
PENNSYLVANIA	2	After	1.00	1.00	0.32	0.90	1.63	1.17	1.09	1.03	1.12	0.94	0.99	0.73	1.02	0.93	1.14	0.50	1.13	1.00	1.00
RHODE ISLAND	1	Before	0.79	1.25	0.36	0.36	1.35	1.13	1.74	1.11	1.63	1.09	0.91	0.62	1.13	0.60	1.20	0.22	0.56	1.11	1.65
RHODE ISLAND	1	After	1.00	1.00	0.67	0.38	1.58	1.21	1.31	0.97	1.07	1.03	0.95	0.74	1.05	0.74	1.24	0.53	1.17	1.00	1.00
RHODE ISLAND	2	Before	0.62	1.35	0.11	0.21	1.31	1.32	1.27	0.80	2.00	0.93	1.12	0.47	1.09	0.66	1.49	0.16	0.39	0.94	1.87
RHODE ISLAND	2	After	1.00	1.00	0.29	0.67	1.27	2.08	1.03	0.88	1.15	0.97	0.95	0.67	1.06	0.76	1.28	0.59	1.15	1.00	1.00
SOUTH CAROLINA	1	Before	0.91	1.14	0.30	0.79	1.00	1.44	1.39	1.60	1.04	0.99	1.04	0.93	1.18	0.67	1.05	0.27	0.48	1.13	1.88
SOUTH CAROLINA	1	After	1.00	1.00	0.58	1.39	1.14	1.00	1.05	1.11	1.05	1.02	0.91	1.00	1.01	0.96	1.03	0.64	1.14	1.00	1.00
SOUTH CAROLINA	2	Before	0.92	1.05	0.20	0.56	0.68	1.08	1.44	1.46	1.20	0.99	1.18	0.68	1.17	0.57	1.01	0.21	0.35	1.03	2.02
SOUTH CAROLINA	2	After	1.00	1.00	0.46	0.84	0.85	1.42	1.55	1.34	1.08	0.99	0.90	0.50	1.04	1.02	0.83	0.51	1.19	1.00	1.00
SOUTH DAKOTA	1	Before	0.85	1.34	0.22	0.68	0.85	1.29	1.60	1.55	1.11	1.33	1.18	0.56	1.18	0.99	0.59	0.18	0.55	1.14	1.95
SOUTH DAKOTA	1	After	1.00	1.00	0.41	0.87	1.08	1.44	1.28	1.06	0.95	1.02	1.02	1.10	0.98	1.89	0.95	0.48	1.14	1.00	1.00
SOUTH DAKOTA	2	Before	0.82	1.27	0.07	0.51	0.79	1.27	1.77	1.69	1.20	1.11	1.15	0.39	1.18	0.06	0.30	0.29	0.59	1.00	1.83
SOUTH DAKOTA	2	After	1.00	1.00	0.16	0.98	1.45	1.61	0.79	1.35	0.88	1.00	1.00	0.30	1.14	0.28	0.20	0.70	1.08	1.00	1.00
TENNESSEE	1	Before	0.90	1.23	0.25	0.63	1.13	1.52	1.58	1.44	1.41	1.13	0.98	0.92	1.16	0.72	0.98	0.25	0.59	1.26	1.87
TENNESSEE	1	After	1.00	1.00	0.49	1.02	1.37	0.98	1.26	1.11	1.10	1.04	0.89	1.02	1.00	0.97	1.23	0.48	1.20	1.00	1.00
TENNESSEE	2	Before	0.85	1.17	0.13	0.57	0.81	1.25	1.35	1.39	1.37	1.17	1.09	0.74	1.14	0.55	0.82	0.18	0.57	1.21	1.74
TENNESSEE	2	After	1.00	1.00	0.33	1.74	0.80	1.38	1.10	0.90	1.16	0.94	0.93	1.88	1.01	0.70	0.97	0.43	1.21	1.00	1.00
TEXAS	1	Before	0.86	1.12	0.24	0.63	0.94	1.18	1.30	1.55	1.13	1.22	0.93	0.66	1.29	0.85	1.14	0.15	0.55	1.17	1.68
TEXAS	1	After	1.00	1.00	0.63	1.36	1.10	0.97	1.03	1.05	0.94	1.15	0.88	1.00	1.00	1.00	1.00	0.68	1.19	1.00	1.00
TEXAS	2	Before	0.91	1.06	0.16	0.58	0.78	1.19	1.22	1.57	1.03	1.35	1.03	0.59	1.39	0.66	1.07	0.11	0.42	1.09	1.90
TEXAS	2	After	1.00	1.00	0.40	1.52	1.32	0.91	1.02	1.24	0.84	1.11	0.85	1.00	1.00	1.00	1.00	0.40	1.37	1.00	1.00
UTAH	1	Before	0.88	1.16	0.24	0.60	0.97	1.27	1.24	1.53	1.54	1.24	1.09	0.49	1.13	0.47	0.83	0.14	0.47	1.00	1.69
UTAH	1	After	1.00	1.00	0.66	1.24	1.21	1.04	1.00	1.12	1.10	0.95	0.95	1.00	1.00	0.74	1.05	0.37	1.21	1.00	1.00

Appendix A. State-level Quality Measures

Table A2. Person Level Coverage Ratios at the State Level for 2020 Household Pulse Survey Before and After Raking

State	Week	Before / After Raking	Male	Female	Age 18-24	Age 25-29	Age 30-34	Age 35-39	Age 40-44	Age 45-49	Age 50-54	Age 55-64	Age 65+	Hispanic	NH white-only	NH black-only	NH other races	No HS diploma	HS diploma	Some college	Bachelors +
UTAH	2	Before	0.88	1.15	0.30	0.66	1.17	1.06	1.18	1.23	1.40	1.21	1.28	0.37	1.14	0.79	0.84	0.09	0.35	1.06	1.73
UTAH	2	After	1.00	1.00	0.71	1.33	1.10	0.98	0.99	0.93	1.09	1.05	0.96	0.55	1.08	0.82	0.97	0.24	1.26	1.00	1.00
VERMONT	1	Before	0.86	1.34	0.21	0.29	1.03	1.04	1.22	1.21	1.86	1.44	1.18	1.18	1.09	0.00	1.78	0.16	0.67	1.07	1.66
VERMONT	1	After	1.00	1.00	0.48	0.83	1.81	1.00	1.17	0.82	1.06	1.00	0.99	1.14	0.99	0.00	1.23	0.43	1.13	1.00	1.00
VERMONT	2	Before	1.07	1.15	0.09	0.08	1.09	0.87	1.32	0.72	1.73	1.50	1.43	1.75	1.14	0.00	0.33	0.08	0.24	1.24	1.89
VERMONT	2	After	1.00	1.00	0.25	0.30	1.53	1.06	2.14	0.79	1.18	1.00	1.00	1.66	0.98	0.00	1.55	0.69	1.07	1.00	1.00
VIRGINIA	1	Before	0.90	1.17	0.17	0.60	0.76	1.61	1.46	1.14	1.34	1.23	1.06	0.68	1.21	0.70	0.91	0.10	0.48	1.04	1.68
VIRGINIA	1	After	1.00	1.00	0.38	1.20	1.17	1.22	1.13	0.99	1.04	1.13	0.89	1.00	1.00	1.00	1.00	0.24	1.31	1.00	1.00
VIRGINIA	2	Before	0.89	1.19	0.10	0.44	0.70	1.66	1.34	1.06	1.59	1.10	1.25	0.73	1.25	0.57	0.87	0.08	0.45	0.95	1.78
VIRGINIA	2	After	1.00	1.00	0.31	0.64	1.09	1.67	1.24	1.17	1.39	0.94	0.91	0.79	1.06	0.93	0.92	0.22	1.32	1.00	1.00
WASHINGTON	1	Before	0.85	1.23	0.28	0.51	0.89	1.27	1.04	1.45	1.62	1.22	1.14	0.75	1.15	0.67	0.86	0.15	0.49	1.06	1.63
WASHINGTON	1	After	1.00	1.00	0.67	1.20	1.10	1.05	1.00	1.02	1.00	0.98	1.00	1.00	1.00	0.91	1.02	0.40	1.23	1.00	1.00
WASHINGTON	2	Before	0.97	1.12	0.13	0.42	0.77	1.26	1.20	1.22	1.69	1.35	1.22	0.54	1.20	0.42	0.86	0.20	0.40	0.91	1.83
WASHINGTON	2	After	1.00	1.00	0.31	1.03	1.36	1.07	1.18	1.06	0.93	1.13	0.95	1.00	1.00	0.61	1.10	0.53	1.18	1.00	1.00
WEST VIRGINIA	1	Before	0.84	1.31	0.26	0.54	1.27	1.83	1.25	1.22	1.55	1.18	0.97	1.72	1.04	1.19	2.37	0.20	0.61	1.39	2.12
WEST VIRGINIA	1	After	1.00	1.00	0.73	1.01	1.34	1.09	0.97	1.00	1.01	1.00	0.99	2.53	0.97	0.88	1.37	0.34	1.21	1.00	1.00
WEST VIRGINIA	2	Before	0.72	1.48	0.46	0.64	1.18	1.43	1.08	1.34	2.14	1.20	0.94	2.21	1.09	0.58	1.67	0.22	0.57	1.55	2.09
WEST VIRGINIA	2	After	1.00	1.00	0.46	0.95	1.27	1.30	1.19	0.88	1.12	1.00	1.00	1.97	1.00	0.41	1.12	0.33	1.21	1.00	1.00
WISCONSIN	1	Before	0.86	1.25	0.32	0.68	1.21	1.52	1.22	1.53	1.03	1.10	1.10	0.51	1.13	0.67	1.00	0.16	0.47	1.21	1.79
WISCONSIN	1	After	1.00	1.00	0.59	1.27	1.37	0.96	0.97	1.09	0.97	0.99	0.98	0.80	1.01	0.88	1.18	0.37	1.16	1.00	1.00
WISCONSIN	2	Before	0.93	1.24	0.15	0.44	1.19	1.70	1.31	1.46	1.31	1.23	1.14	0.48	1.19	0.49	0.77	0.20	0.41	1.12	2.07
WISCONSIN	2	After	1.00	1.00	0.31	0.76	1.18	1.67	1.27	0.92	1.04	1.04	1.00	0.80	1.03	0.50	1.22	0.70	1.08	1.00	1.00
WYOMING	1	Before	0.76	1.49	0.27	0.44	0.88	1.25	2.46	1.60	1.09	1.31	1.05	0.56	1.21	0.48	0.76	0.32	0.53	1.00	2.26
WYOMING	1	After	1.00	1.00	0.46	0.77	1.57	1.29	1.02	1.33	0.72	0.98	1.00	0.85	1.02	0.63	0.93	0.68	1.08	1.00	1.00
WYOMING	2	Before	0.85	1.31	0.10	0.50	0.79	0.95	1.71	1.48	1.68	1.17	1.31	0.53	1.18	0.35	0.50	0.08	0.54	1.20	1.85
WYOMING	2	After	1.00	1.00	0.18	0.78	1.65	1.57	1.20	0.81	0.97	1.00	1.00	0.65	1.06	0.27	0.63	0.21	1.21	1.00	1.00

Source: U.S. Census Bureau, 2020 Household Pulse Survey