

# RANDS During COVID-19 Round 1 Probability Sample Technical Documentation

## Overview

The National Center for Health Statistics (NCHS) Division of Research and Methodology (DRM) contracted NORC at the University of Chicago (NORC) to collect timely information on COVID-19-related health outcomes from U.S. adults as a special iteration of the Research and Development Survey (RANDS). This special iteration of RANDS, referred to as RANDS during COVID-19, was conducted using both a probability-based panel and an opt-in commercial survey panel. RANDS during COVID-19 is a three-round survey, with a longitudinal design in Round 1 and Round 2 for the probability-based panel. This technical documentation describes the sampling methodology and weighting for the probability-based panelists in the first round of RANDS during COVID-19 (RANDS during COVID-19 Round 1 Probability Sample).

While RANDS has previously been collected for methodological research purposes, RANDS during COVID-19 was designed to collect and report timely information on COVID-19-related health measures. RANDS during COVID-19 was used to produce a set of experimental estimates for selected topics, including loss of work due to illness with COVID-19, telemedicine access and use, and health care access. The estimates are considered experimental as research is underway to improve the calibration method (see Sample Weighting below) and understand potential sources of measurement error. Experimental national and subnational estimates for the selected outcomes are published online (<https://www.cdc.gov/nchs/covid19/rands.htm>); remaining variables were collected for research purposes.

To evaluate the question-response pattern as in previous rounds of RANDS, RANDS during COVID-19 Round 1 included probe questions and two specific experiments:

- 1) Unspecified vs. Specified COVID-19 Tests: Comparing between the following two ways of inquiring about receiving diagnostic tests for COVID-19: (a) a standalone question not specifying the type of the COVID-19 test the respondent received, and (b) a series of two questions with the first one inquiring about having a test for determining whether one having been infected with the COVID-19 virus *at the time of the test*, followed by another question inquiring about having an antibody test for determining whether one had been infected with the COVID-19 virus *in the past*.
- 2) Close-Ended Multi-Punch Probes vs. Open-Ended Probes: Comparing responses between close-ended response options with the “select-all-that-apply” style versus an open-ended probe on the respondent’s interpretation of quarantine/isolation behavior.

NORC conducted RANDS during COVID-19 Round 1 from June 9, 2020 to July 6, 2020. Panelists from the probability sample responded to either online web surveys or telephone interviews. This documentation describes the sampling approach, data collection timeline, response rate, and sample weighting for the survey.

## Sampling

The target population for this study consisted of the general population of the United States aged 18 and older. The source of the sample for this study was NORC's AmeriSpeak® Panel (<http://amerispeak.norc.org/>). Funded and operated by NORC at the University of Chicago, AmeriSpeak® is a probability-based panel designed to be representative of the U.S. household population. Randomly selected U.S. households were sampled from the NORC National Sample Frame (<https://www.norc.org/Research/Projects/Pages/2010-national-sample-frame.aspx>) and then contacted by U.S. mail, telephone, and through face-to-face field interviews for recruitment to the Panel. As of early 2021, the AmeriSpeak® Panel included more than 40,000 U.S. households and provided sample coverage of 99% of the U.S. household population.

For the RANDES during COVID-19 Round 1 Probability Sample, NORC collaborated with NCHS' Division of Research and Methodology on a stratified sample design to obtain a random and representative sample of U.S. adults aged 18 and over from the AmeriSpeak® Panel. The target population was stratified by age (18-34, 35-49, 50-64, 65+), race/Hispanic ethnicity (Hispanic, Non-Hispanic Black, Non-Hispanic All Other), education (Associate's degree/some college or less, Bachelor's degree or above), sex (male, female) and annual household income (less than \$75,000, greater than or equal to \$75,000) for a total of 96 sampling strata. Then, NORC performed sampling independently within each stratum using simple random sampling. The sampling ratios varied by stratum to account for differential nonresponse for each stratum to ensure a representative sample of the target population. If more than one panelist were available in one household, random within-household sampling was carried out to ensure only one adult from the household was eligible for sampling. Moreover, in an effort to improve the cumulative response rate without introducing bias into the estimates, NORC excluded certain panelists from sampling, including panelists added to AmeriSpeak® Panel from other probability samples, panelists with a past-year history of low completion rate, and panelists recruited in 2019, due to the fact that NORC did not conduct nonresponse follow-ups that year.

## **Summary of Field Work**

The RANDES during COVID-19 Round 1 survey was administered in English via either online web surveys or phone interviews. On May 21, 2020, NORC invited a small sample of AmeriSpeak® web-mode panelists for a pretest and collected 49 pretest interviews. Following the pre-test, the wording of a probe question (PROBE\_QUAR1) and corresponding response options was updated, and the contact information of Centers for Disease Control and Prevention (CDC) was added to the survey.

For the sampled web-mode panelists, NORC sent e-mail invitations along with text messages in two batches. The soft-launch invitation was sent to some panelists on June 9, 2020. Additional invitations for 90% of the sample selected were sent on June 12, 2020, while reminders were sent on the same day to panelists of the soft-launch sample. On June 16, 2020, NORC sent invitations to a "top-off" sample selected from the initial sample that were selected but not fielded in the first two batches in order to obtain the required number of survey completions. Reminders were sent to invited panelists who had not completed the surveys on June 14, June 18, June 26, June 27, June 29, and July 1. Additionally, an invitation/reminder letter was sent via United States Postal Service (USPS) to 3,166 low-completion rate panelists (defined as having survey

completion rates equal to or less than 50% in the last 6 months) on June 10, 2020. For the sampled phone-mode panelists, NORC dialed their numbers throughout the field period.

In total, out of 8,663 panelists sampled, 6,800 completed the interviews, resulting in an overall completion rate of 78.5%. The weighted cumulative response rate was 23.0%. An additional 258 respondents were removed from the dataset prior to post-stratification weighting. Among these 258 respondents, 141 started but did not complete the survey and 117 respondents either completed the survey in less than one third of the median duration and/or had high refusal/skipping rates (defined as refused/skipped more than 50% of eligible questions).

NCHS did not provide an incentive for participation in RANDS, although NORC offered a non-cash, point-based incentive for responding to surveys such as RANDS, which can be traded for gift cards or other non-cash prizes.

Table 1 reports the sample sizes and response rates by sampling strata.

**Table 1. RANDS during COVID-19 Round 1 Response Rates of the Probability Sample by Sampling Strata**

<b>Race/Ethnicity</b>	<b>Education Level</b>	<b>Age Group (Year)</b>	<b>Gender</b>	<b>Income Group</b>	<b>Total Sample per Stratum</b>	<b>Completes per Stratum</b>	<b>Response Rate</b>
Non-Hispanic All Other	Associate degree/some college or less	35-49	Female	<\$75,000	216	188	87.04%
Non-Hispanic All Other	Bachelor degree or more	35-49	Male	<\$75,000	66	63	95.45%
Non-Hispanic All Other	Bachelor degree or more	35-49	Female	<\$75,000	86	81	94.19%
Non-Hispanic All Other	Associate degree/some college or less	50-64	Male	<\$75,000	293	212	72.35%
Non-Hispanic All Other	Associate degree/some college or less	50-64	Female	<\$75,000	288	270	93.75%
Non-Hispanic All Other	Bachelor degree or more	50-64	Male	<\$75,000	60	58	96.67%

Non-Hispanic All Other	Bachelor degree or more	50-64	Female	<\$75,000	67	67	100.00%
Non-Hispanic All Other	Associate degree/some college or less	65+	Male	<\$75,000	302	263	87.09%
Non-Hispanic All Other	Associate degree/some college or less	65+	Female	<\$75,000	423	377	89.13%
Non-Hispanic All Other	Bachelor degree or more	65+	Male	<\$75,000	112	106	94.64%
Non-Hispanic All Other	Bachelor degree or more	65+	Female	<\$75,000	101	98	97.03%
Non-Hispanic Black	Associate degree/some college or less	35-49	Female	<\$75,000	99	73	73.74%
Non-Hispanic Black	Bachelor degree or more	35-49	Male	<\$75,000	13	13	100.00%
Non-Hispanic Black	Bachelor degree or more	35-49	Female	<\$75,000	25	24	96.00%
Non-Hispanic Black	Associate degree/some college or less	50-64	Male	<\$75,000	92	54	58.70%
Non-Hispanic Black	Associate degree/some college or less	50-64	Female	<\$75,000	94	82	87.23%
Non-Hispanic Black	Bachelor degree or more	50-64	Male	<\$75,000	11	10	90.91%
Non-Hispanic Black	Bachelor degree or more	50-64	Female	<\$75,000	22	21	95.45%
Non-Hispanic Black	Associate degree/some college or less	65+	Male	<\$75,000	65	39	60.00%

Non-Hispanic Black	Associate degree/some college or less	65+	Female	<\$75,000	91	67	73.63%
Non-Hispanic Black	Bachelor degree or more	65+	Male	<\$75,000	7	6	85.71%
Non-Hispanic Black	Bachelor degree or more	65+	Female	<\$75,000	16	13	81.25%
Non-Hispanic All Other	Associate degree/some college or less	18-34	Male	<\$75,000	209	136	65.07%
Non-Hispanic All Other	Associate degree/some college or less	18-34	Male	≥\$75,000	72	47	65.28%
Non-Hispanic All Other	Associate degree/some college or less	18-34	Female	<\$75,000	313	224	71.57%
Non-Hispanic All Other	Associate degree/some college or less	18-34	Female	≥\$75,000	91	61	67.03%
Non-Hispanic All Other	Bachelor degree or more	18-34	Male	<\$75,000	130	99	76.15%
Non-Hispanic All Other	Bachelor degree or more	18-34	Male	≥\$75,000	103	81	78.64%
Non-Hispanic All Other	Bachelor degree or more	18-34	Female	<\$75,000	166	134	80.72%
Non-Hispanic All Other	Bachelor degree or more	18-34	Female	≥\$75,000	158	131	82.91%
Non-Hispanic All Other	Associate degree/some college or less	35-49	Male	<\$75,000	188	132	70.21%
Non-Hispanic All Other	Associate degree/some college or less	35-49	Male	≥\$75,000	124	97	78.23%

Non-Hispanic All Other	Associate degree/some college or less	35-49	Female	≥\$75,000	145	109	75.17%
Non-Hispanic All Other	Bachelor degree or more	35-49	Male	≥\$75,000	277	228	82.31%
Non-Hispanic All Other	Bachelor degree or more	35-49	Female	≥\$75,000	330	251	76.06%
Non-Hispanic All Other	Associate degree/some college or less	50-64	Male	≥\$75,000	173	142	82.08%
Non-Hispanic All Other	Associate degree/some college or less	50-64	Female	≥\$75,000	216	186	86.11%
Non-Hispanic All Other	Bachelor degree or more	50-64	Male	≥\$75,000	284	244	85.92%
Non-Hispanic All Other	Bachelor degree or more	50-64	Female	≥\$75,000	339	277	81.71%
Non-Hispanic All Other	Associate degree/some college or less	65+	Male	≥\$75,000	120	98	81.67%
Non-Hispanic All Other	Associate degree/some college or less	65+	Female	≥\$75,000	141	116	82.27%
Non-Hispanic All Other	Bachelor degree or more	65+	Male	≥\$75,000	362	309	85.36%
Non-Hispanic All Other	Bachelor degree or more	65+	Female	≥\$75,000	211	159	75.36%
Non-Hispanic Black	Associate degree/some college or less	18-34	Male	<\$75,000	67	36	53.73%
Non-Hispanic Black	Associate degree/some college or less	18-34	Male	≥\$75,000	11	5	45.45%

Non-Hispanic Black	Associate degree/some college or less	18-34	Female	<\$75,000	130	87	66.92%
Non-Hispanic Black	Associate degree/some college or less	18-34	Female	≥\$75,000	20	11	55.00%
Non-Hispanic Black	Bachelor degree or more	18-34	Male	<\$75,000	12	9	75.00%
Non-Hispanic Black	Bachelor degree or more	18-34	Male	≥\$75,000	5	2	40.00%
Non-Hispanic Black	Bachelor degree or more	18-34	Female	<\$75,000	40	28	70.00%
Non-Hispanic Black	Bachelor degree or more	18-34	Female	≥\$75,000	17	13	76.47%
Non-Hispanic Black	Associate degree/some college or less	35-49	Male	<\$75,000	66	39	59.09%
Non-Hispanic Black	Associate degree/some college or less	35-49	Male	≥\$75,000	17	9	52.94%
Non-Hispanic Black	Associate degree/some college or less	35-49	Female	≥\$75,000	18	9	50.00%
Non-Hispanic Black	Bachelor degree or more	35-49	Male	≥\$75,000	18	14	77.78%
Non-Hispanic Black	Bachelor degree or more	35-49	Female	≥\$75,000	42	28	66.67%
Non-Hispanic Black	Associate degree/some college or less	50-64	Male	≥\$75,000	19	11	57.89%
Non-Hispanic Black	Associate degree/some college or less	50-64	Female	≥\$75,000	29	20	68.97%

Non-Hispanic Black	Bachelor degree or more	50-64	Male	≥\$75,000	31	25	80.65%
Non-Hispanic Black	Bachelor degree or more	50-64	Female	≥\$75,000	27	19	70.37%
Non-Hispanic Black	Associate degree/some college or less	65+	Male	≥\$75,000	14	9	64.29%
Non-Hispanic Black	Associate degree/some college or less	65+	Female	≥\$75,000	15	8	53.33%
Non-Hispanic Black	Bachelor degree or more	65+	Male	≥\$75,000	20	17	85.00%
Non-Hispanic Black	Bachelor degree or more	65+	Female	≥\$75,000	13	12	92.31%
Hispanic	Associate degree/some college or less	18-34	Male	<\$75,000	152	91	59.87%
Hispanic	Associate degree/some college or less	18-34	Male	≥\$75,000	28	18	64.29%
Hispanic	Associate degree/some college or less	18-34	Female	<\$75,000	207	138	66.67%
Hispanic	Associate degree/some college or less	18-34	Female	≥\$75,000	39	27	69.23%
Hispanic	Bachelor degree or more	18-34	Male	<\$75,000	33	25	75.76%
Hispanic	Bachelor degree or more	18-34	Male	≥\$75,000	16	10	62.50%
Hispanic	Bachelor degree or more	18-34	Female	<\$75,000	46	37	80.43%



Hispanic	Bachelor degree or more	18-34	Female	≥\$75,000	22	20	90.91%
Hispanic	Associate degree/some college or less	35-49	Male	<\$75,000	57	37	64.91%
Hispanic	Associate degree/some college or less	35-49	Male	≥\$75,000	22	14	63.64%
Hispanic	Associate degree/some college or less	35-49	Female	<\$75,000	134	90	67.16%
Hispanic	Associate degree/some college or less	35-49	Female	≥\$75,000	32	23	71.88%
Hispanic	Bachelor degree or more	35-49	Male	<\$75,000	26	22	84.62%
Hispanic	Bachelor degree or more	35-49	Male	≥\$75,000	26	21	80.77%
Hispanic	Bachelor degree or more	35-49	Female	<\$75,000	36	29	80.56%
Hispanic	Bachelor degree or more	35-49	Female	≥\$75,000	42	30	71.43%
Hispanic	Associate degree/some college or less	50-64	Male	<\$75,000	35	26	74.29%
Hispanic	Associate degree/some college or less	50-64	Male	≥\$75,000	24	17	70.83%
Hispanic	Associate degree/some college or less	50-64	Female	<\$75,000	82	62	75.61%
Hispanic	Associate degree/some	50-64	Female	≥\$75,000	30	27	90.00%

	college or less						
Hispanic	Bachelor degree or more	50-64	Male	<\$75,000	14	14	100.00%
Hispanic	Bachelor degree or more	50-64	Male	≥\$75,000	19	13	68.42%
Hispanic	Bachelor degree or more	50-64	Female	<\$75,000	19	18	94.74%
Hispanic	Bachelor degree or more	50-64	Female	≥\$75,000	31	25	80.65%
Hispanic	Associate degree/some college or less	65+	Male	<\$75,000	31	19	61.29%
Hispanic	Associate degree/some college or less	65+	Male	≥\$75,000	9	7	77.78%
Hispanic	Associate degree/some college or less	65+	Female	<\$75,000	56	34	60.71%
Hispanic	Associate degree/some college or less	65+	Female	≥\$75,000	10	6	60.00%
Hispanic	Bachelor degree or more	65+	Male	<\$75,000	14	11	78.57%
Hispanic	Bachelor degree or more	65+	Male	≥\$75,000	16	11	68.75%
Hispanic	Bachelor degree or more	65+	Female	<\$75,000	13	12	92.31%
Hispanic	Bachelor degree or more	65+	Female	≥\$75,000	10	9	90.00%

## Sample Weighting

The final RANDS during COVID-19 Round 1 Probability Sample was weighted to account for the sample design and was further weighted to U.S. population counts to account for differential nonresponse and under-coverage of some groups on the sample frame. Sample weights and survey design information must be used in the analysis of these data in order to produce results with meaningful population representativeness.

Derivation of statistical weights first started with panel base sampling weights. Since the AmeriSpeak® Panel is a probability panel, the panel base sampling weights were computed as the inverse probability of selection from the NORC National Sample Frame or other address-based sample frames for the supplemental panel samples. NORC adjusted the panel sampling weights for nonresponse and under-coverage. The sample design and recruitment protocol for the AmeriSpeak® Panel involved subsampling initial non-respondent housing units for an in-person follow up. The subsample of housing units that were selected for nonresponse follow-up (NRFU) had their panel base sampling weights inflated by the inverse of the subsampling rate. The base sampling weights were further adjusted to account for unknown eligibility and nonresponse among eligible housing units. The household-level nonresponse-adjusted weights were then post-stratified to external counts of the number of households per census division obtained from the U.S. Census Bureau Current Population Survey (CPS). Final household weights were assigned to each eligible adult in the recruited household, with weight adjustment carried out at the person-level to account for non-responding adults within the household. Furthermore, the person-level panel weights were adjusted by raking to external population totals associated with age, sex, education, race/Hispanic ethnicity, housing tenure, household telephone status, and Census Division using information obtained from the CPS and the National Health Interview Survey (NHIS) on wireless substitution to obtain the final panel weights.

The RANDS during COVID-19 Round 1 survey-specific base sampling weights were derived using a combination of the final panel weights (described above) and the probability of selection into RANDS associated with the sampled panel member. The overall survey sampling weights were calculated as the panel weights multiplied by the inverse probability of selection of an AmeriSpeak® Panel member to RANDS during COVID-19 Round 1 Probability Sample, where the probability of selection of a panelist within a stratum (defined by race/ethnicity, age, sex, education, and household income) was  $n_h/N_h$ , the ratio of the number of panelists sampled ( $n_h$ ) and the total number of panelists available ( $N_h$ ) in that stratum ( $h$ ).

Since not all sampled panel members responded to the survey interview, an adjustment is needed to account for non-respondents. This adjustment decreases potential nonresponse bias associated with probability-sampled panel members who did not complete the RANDS during COVID-19 Round 1 survey. The nonresponse-adjusted survey weights for the study were calculated by raking the overall survey sampling weights to general population totals associated with the following socio-demographic characteristics: age, sex, education, race/Hispanic ethnicity and Census Division. Any extreme weight was trimmed based on a criterion of minimizing the mean squared error associated with key survey estimates and then weights were re-raked to the same population totals. Once weighting adjustment achieved the goal of matching the CPS population post-stratum totals, the weights provided by NORC (WEIGHT\_AmSp) were

proportionally adjusted to sum to the total number of respondents in the RANDS during COVID-19 Round 1 Probability Sample (n=6,800).

The NORC-provided weights were further calibrated by NCHS to produce experimental estimates for selected COVID-19-related outcomes through raking using information from the 2018 National Health Interview Survey (NHIS). In order to correct for potential biases due to differences in demographic distribution and health statuses of probability-sampled respondents to RANDS during COVID-19 Round 1 and the 2018 NHIS, the weights were adjusted by raking to the percentage estimates of demographic and health variables from the 2018 NHIS (i.e. age, sex, education, race/Hispanic ethnicity, Census region, family income, marital status, diagnosed asthma, diagnosed hypertension, diagnosed diabetes, and diagnosed high cholesterol). The final calibrated weights (WEIGHT\_CALIBRATED) were proportionally adjusted to sum to the total number of respondents in the RANDS during COVID-19 Round 1 Probability Sample (n=6,800).

### **Suggested Citation**

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