

Effects of Switching to Mixed-Mode Design on Estimates from
NSOC IV 2021 (Round 11)

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Overview

NSOC IV began in Round 11 of NHATS (2021). Interviews are conducted annually in conjunction with NHATS and may be completed by web or telephone. In the first round of NSOC IV, a randomized experiment was embedded, in which eligible caregivers were randomly assigned to a mixed mode option (with a choice of responding either by web or by telephone) or to a telephone-only option. This experiment allowed assessment of the impact on estimates of changing from a telephone to a mixed-mode (web/telephone) design. This technical paper evaluates effects of switching to mixed mode design on NSOC survey items. Starting in 2022, all NSOC participants will be given a choice of web or telephone modes.

Design & Sample

About half of the 3,216 eligible caregivers were randomly assigned to a mixed mode design with responses allowed by web or telephone ($n=1,600$); the other half were randomly assigned to the telephone only mode ($n=1,616$; as fielded in NSOC I-NSOC III). All caregivers to an NHATS SP were assigned to the same design (e.g. all mixed mode or all phone only).

In NSOC IV Round 11, interviews were conducted with 1,642 caregivers to NHATS SPs who were living at the time of the NSOC interview, and 296 caregivers of deceased older adults. Among the 1,938 caregivers, 996 were assigned to the mixed mode design and 942 were assigned to the phone-only design. The technical paper examines differences in survey estimates between the two design groups among the 1,938 caregivers.

The final response rate for NSOC IV Round 11 was 60.3%. The response rate for those assigned to the mixed mode design was 62.3%, significantly higher than the 58.3% for those assigned to the phone-only design (p -value = 0.02).

Analysis

Variables

For the purpose of the analysis, we focused on variables with at least 50 respondents (at least 25 in each design group). We also excluded the following variables:

- ID variables (spid and opid) and survey design variables and weights
- Survey paradata variables including case breakoff status (c11breakoffst), breakoff question (c11breakoffqt), days between SP interview and caregiver interview (c11dintdays), question where mode was changed (c11dmodechg), month of NSOC interview (c11intmonth) and interview mode (c11dintmode).
- Flag variables such as the flag for NSOC questionnaire routing and whether SP was died.
- Variables collected in NHATS (e.g. caregiver gender and relationship to SP).
- Variables collected in only one mode (either web or phone; see Appendix Table 1).

These procedures yielded a sample of 267 variables.

Analysis for categorical variables

For categorical variables, we first conducted chi-square tests of the association between each variable and the design assignment group (op11dmixmode). To explore whether differences were meaningful in

practice, we also calculated effect sizes for each variable of interest (by design assignment group) using a Cramer's V statistic. With one degree of freedom, Cramer's V below 0.10 is considered negligible in size, 0.10-0.29 is considered small, 0.30-0.49 is considered medium, and greater than or equal to 0.50 is considered large. For categorical variables including binary, ordinal and nominal variables, missing cases were treated as separate response categories.

Analysis for continuous variables

For continuous variables, we first conducted t tests of the mean differences across the two design assignment groups (op11dmixmode). We also examined the magnitude of mean differences between the two design assignment groups using Cohen's D. A value below 0.20 is considered negligible in size, 0.20-0.49 is considered small, 0.50-0.79 is considered medium, and greater than or equal to 0.8 is considered large. For continuous variables, missing data were not included in the analysis.

Results

Table 1 shows differences between phone-only and mixed-mode design groups for questions in NSOC IV 2021 (Round 11). For about 86% of the categorical variables examined (199 out of 232), there are no statistically significant differences between the two design groups based on chi-square tests. Of the 33 categorical variables that are significantly different across the two groups, the effect sizes between the two groups are negligible or small.

We explored further two groups of variables with significant differences and small effect sizes. First, responses to the Hispanic and primary race/ethnicity questions differed across the design groups. Specifically, Hispanic appears to be lower among NSOC respondents assigned to the mixed mode design group (6.8%) than to the phone-only design group (14.7%). This finding is related in part to the uneven assignment of caregivers to the two design conditions by Hispanic ethnicity of the respondent (that is, 8.6% of NSOC eligible caregivers cared for an older adult who was Hispanic in the mixed mode design group and 12.4% did so in the phone only design group). In addition, caregivers to Hispanic older adults were less likely than those caring for older adults from other groups to participate if assigned to the mixed mode group. Note that the care recipient's race/ethnicity has been incorporated into non-response adjusted NSOC weights, which addresses some of the differential non-response. Overall estimates of percentage of caregivers who are Hispanic do not appear to be biased (10.6% in NSOC using caregiver's ethnicity vs. 10.5% in NHATS using the sample person's ethnicity).

Second, chi-square tests suggest that 6 of 7 items in a series measuring caregivers' eudemonic wellbeing (on an ordinal scale of 1 Agree strongly; 2 Agree somewhat; 3 Disagree somewhat; and 4 Disagree strongly) differed across design groups. For these items, we found that those answering by web were more likely than those answering by phone to pick middle (Agree somewhat, Disagree somewhat) rather than first or last (Agree strongly, Disagree strongly) categories. When reviewing the specifications for the phone interview mode, we found that interviewers were instructed to read all four answer categories only for the first item in the series (whereas in the web mode, respondents were shown all answers for all items). Starting in 2023 (Round 13), interviewers will be instructed to read the categories for the first, second, fourth and fifth items (and as needed for other items; see HE21 in the NSOC instrument). We also found that for a summary score (i.e., adding all seven items after recoding in the same direction), we found that despite a significant t-test for differences in means between the mixed-

mode group (23.7) and the phone-only group (24.3), the effect size was negligible in size (Cohen's D was -0.18).

For the 35 continuous variables examined, only two variables – number of hours helped per day and height in inches – were significantly different between the two design groups. The effect sizes for both variables were negligible in size. Note that the derived variable on number of hours of work missed last month to help SP had a medium effect size, despite the non-significant t-test. This finding may be due to the small number of respondents answering this question (given skip patterns) and to the presence of outlier responses.

Recommendations

For the majority of the variables, there were no significant differences between the mixed mode and phone-only designs; for cases with significant differences, most effect sizes were negligible in size. For these variables, users can conduct analyses confidently with NSOC data collected from both methods. For variables with significant differences based on statistical tests and small effect sizes, users may further evaluate whether the small effect sizes are practically meaningful and, if so, may want to consider controlling for design assignment (mixed-mode vs. phone only) in their analysis.

References

Hu, Mengyao, Rui Jiao, & Vicki A. Freedman. 2022. National Study of Caregiving (NSOC) IV Weighting Guide. NHATS Technical Paper #33. Baltimore: Johns Hopkins Bloomberg School of Public Health. Available at www.nhats.org.

Table 1. Weighted differences between phone-only and mixed-mode design groups for questions in NSOC IV Round 11.

Questionnaire Item	Variable	Variable label	Sample size [#]	Categorical Variables			Continuous Variables		
				χ^2	Cramér's V	Effect size	<i>t</i>	Cohen's D	Effect size
CA1	cca11hwoftchs	C11 CA1 HOW OFT HELP WITH CHORES	1,938	5.64	0.05	negligible			
CA2	cca11hwoftshp	C11 CA2 HOW OFTEN SHOPPED FOR SP	1,938	7.62	0.06	negligible			
CA3	cca11hlpordmd	C11 CA3 EVER HELP ORDER MEDICINES	1,938	8.74	0.07	negligible			
CA4	cca11hlpbnkng	C11 CA4 HELP WTH BILLS OR BANKING	1,938	0.99	0.02	negligible			
CA5	cca11cmpgcray	C11 CA5A GO ONLINE SHOP FR GROC	1,647	6.49	0.06	negligible			
CA5	cca11cmpordrx	C11 CA5B GO ONLINE ORDER MEDS	777	0.57	0.03	negligible			
CA5	cca11cmpbnkng	C11 CA5C GO ONLINE BILLS BANKNG	1,093	2.60	0.05	negligible			
CA6	cca11hwoftpc	C11 CA6 HOW OFT HELP PERS CARE	1,938	11.74	0.08	negligible			
CA6B1	cca11hlpfeet	C11 CA6B1 HELP CARE FOR TEETH (PREVIOUSLY CA11F)	1,938	0.27	0.01	negligible			
CA6B2	cca11hlpfeet	C11 CA6B2 HELP CARE FOR FEET (PREVIOUSLY CA11G)	1,938	6.81	0.06	negligible			
CA7	cca11hwoftthom	C11 CA7 HOW OFT HLP GTNG ARD HOME	1,938	18.68	0.10	negligible			
CA9	cca11hwoftdrv	C11 CA9 HOW OFTEN DROVE SP	1,938	7.51	0.06	negligible			
CA10	cca11hwoftott	C11 CA10 OFTN WENT ON OTH TRANSPR	1,938	17.95*	0.10	negligible			
CA11a	cca11hlpmed	C11 CA11A KEEP TRACK OF MEDS	1,938	3.96	0.05	negligible			
CA11b	cca11hlpshot	C11 CA11B TAKE SHOTS OR INJECTNS	1,938	7.78*	0.06	negligible			
CA11c	cca11hlpmdtk	C11 CA11C MANAGE MEDICAL TASKS	1,938	5.52	0.05	negligible			
CA11d	cca11hlpskin	C11 CA11D HELP W SKIN CARE WOUNDS (PREVIOUSLY CA11H)	1,938	9.10	0.07	negligible			
CA11A1	cca11training	C11 CA11A1 MED PROVIDERS GIVE TRAINING	1,038	0.98	0.03	negligible			
CA11A2a	cca11hlpexrcs	C11 CA11A2A HELP WITH EXERCISES (PREVIOUSLY CA11D)	1,938	15.26*	0.09	negligible			
CA11A2b	cca11hlpdiet	C11 CA11A2B HELP WITH A SPECIAL DIET (PREV CA11E)	1,938	9.25	0.07	negligible			
DC1	cdc11hlpshed	C11 DC1 HELP ON REGULAR SCHEDULE	1,938	1.44	0.03	negligible			
DC2	cdc11hlpdyswk	C11 DC2 NUMB OF DAYS PER WK HELP	520				-0.46	0.06	negligible

DC3	cdc11hlpdysmt	C11 DC3 NUMB DAYS HELPD LAST MNTH	1,373				-0.25	0.02	negligible
DC4	cdc11hlphrsdy	C11 DC4 NUMB HOURS HELPED PER DAY	1,840				2.68*	-0.15	negligible
DC5	cdc11hlphrmvf	C11 DC5 VERFY TOTAL HRS HELP MNTH	1,839	4.53	0.05	negligible			
DC6	cdc11hlphrlmt	C11 DC6 HOURS HELPED IN MONTH	107				-0.84	0.17	negligible
DC7	cdc11hlphrpc	C11 DC7 HRS PERS CARE GET ARND	1,326				1.15	-0.07	negligible
DC8	cdc11hlphrpce	C11 DC8 EST PERS CARE GET ARND	147	6.16	0.20	small			
DC9	cdc11hlpyrpls	C11 DC9 HELPED LONGER THAN A YEAR	1,938	0.38	0.01	negligible			
DC10	cdc11hlpmthst	C11 DC10 MONTH STARTED HELPING	218	14.39	0.26	small			
DC10B	cdc11hlpyearst	C11 DC10B YEAR STARTED HELPING	196				0.81	-0.13	negligible
DC11 Derived Variable	cdc11dhlpys	C11 D NUMBER OF YEARS HELPING	1,672				0.29	-0.02	negligible
LL1	cll11painhlp	C11 LL1 HELP SP MANAGE PAIN	293	2.01	0.08	negligible			
LL2	cll11brehlp	C11 LL2 HELP SP MANAGE BREATHING	293	0.81	0.05	negligible			
LL3	cll11sadhlp	C11 LL3 HELP SP MANAGE SADNESS ANXIETY	293	0.61	0.05	negligible			
LL4	cll11training	C11 LL4 MED PROVIDER GIVE TRAINING LML	252	2.32	0.10	negligible			
LL5	cll11talkmed	C11 LL5 TALK TO SP ABOUT MEDICAL CARE	293	3.90	0.12	small			
LL6	cll11makedecis	C11 LL6 MAKE MEDICAL DECISIONS FOR SP	293	16.68***	0.24	small			
LL7	cll11caredecis	C11 LL7 DEC ABOUT CARE WO INPUT	293	3.89	0.12	small			
LL8	cll11carenowan	C11 LL8 DEC ABOUT CARE NOT WANTED	293	5.69	0.14	small			
LL9	cll11respect	C11 LL9 TREATED WITH RESPECT	293	7.96	0.16	small			
LL10	cll11informed	C11 LL10 INFORMED ABOUT CONDITION	293	14.98	0.23	small			
HC1	chc11hlpspkdr	C11 HC1 HLP SPEAK TO MED PROVDR (PREVIOUSLY CA12B)	1,938	0.75	0.02	negligible			
HC2	chc11talkoft	C11 HC2 HOW OFTEN TALK WITH MED PROVIDERS	1,010	1.13	0.03	negligible			
HC3	chc11hlpdramt	C11 HC3 AMT HLP SPEAK TO MED PROVDR (PREVIOUSLY CA12E)	1,010	12.95	0.11	small			
HC4A	chc11regdoc	C11 HC4A DOC COMMUNICATE MOST WITH	1,010	7.35	0.09	negligible			
HC4BA	chc11listen	C11 HC4BA DOC LISTENS TO CG	1,010	0.60	0.02	negligible			
HC4BB	chc11understood	C11 HC4BB ASKS UNDERSTAND SP HLTH TREATMNT	1,010	15.74	0.12	small			
HC4BC	chc11hlpmanage	C11 HC4BC ASKS NEEDS HELP MANAGE SP HLTH	1,010	0.81	0.03	negligible			

HC5A	chc11hlpmdapt	C11 HC5A HELP MAKE MEDICAL APPTS (PREVIOUSLY CA12A)	1,938	1.43	0.03	negligible			
HC5D	chc11hvaccappt	C11 HC5D HELP COVID VACCINE APPOINTMENT	1,642	1.70	0.03	negligible			
HC5B	chc11online	C11 HC5B GO ONLINE MED ACCOUNTS	1,938	0.34	0.01	negligible			
HC5C	chc11coordnat	C11 HC5C COORDINATE SP MED CARE	1,938	3.01	0.04	negligible			
HC6A	chc11hlpinsrn	C11 HC6A HELP ADD HEALTH INS PLN (PREVIOUSLY CA12C)	1,938	2.27	0.03	negligible			
HC6B	chc11hlpothin	C11 HC6B HELP W OTHR HEALTH INS (PREVIOUSLY CA12D)	1,938	2.50	0.04	negligible			
HC7	chc11hosphlp	C11 HC7 HELP AFTER OVERNIGHT HOSPITALIZATION	1,938	6.43	0.06	negligible			
HC8	chc11hospset	C11 HC8 WHERE DID SP GO AFTER HOSPITAL	737	2.89	0.06	negligible			
HC9	chc11hosptrain	C11 HC9 TRAINING FOR POST HOSPITAL CARE	737	3.64	0.07	negligible			
AC1	cac11joylevel	C11 AC1 ENJOY BEING WITH SP	1,642	0.48	0.02	negligible			
AC2	cac11arguelv	C11 AC2 LEVEL SP ARGUES WITH YOU	1,642	14.38	0.09	negligible			
AC3	cac11spapprlv	C11 AC3 LEVEL SP APPRECIATES YOU	1,642	5.91	0.06	negligible			
AC4	cac11nerveslv	C11 AC4 LEVEL SP ON YOUR NERVES	1,642	24.77**	0.12	small			
AC5a	cac11moreconf	C11 AC5A HLP SP U MORE CNF ABLTY	1,938	12.19	0.08	negligible			
AC5b	cac11dealbetr	C11 AC5B HLP SP U DEAL W DIFF SIT	1,938	1.50	0.03	negligible			
AC5c	cac11closr2sp	C11 AC5C HLP SP U R CLOSER TO SP	1,938	7.37	0.06	negligible			
AC5d	cac11moresat	C11 AC5D HLP SP U STSFY SP CARED4	1,938	15.01	0.09	negligible			
AC6a	cac11diffinc	C11 AC6A FINANCIAL DIFF HELPING	1,938	0.18	0.01	negligible			
AC6b	cac11diffemo	C11 AC6B EMOTIONAL DIFF HELPING	1,938	3.02	0.04	negligible			
AC6c	cac11diffphy	C11 AC6C PHYSICAL DIFF HELPING	1,938	0.72	0.02	negligible			
AC7	cac11diffinlv	C11 AC7A LEVEL FINANCIALLY DIFF	227	6.19	0.17	small			
AC7	cac11diffemlv	C11 AC7B LEVEL EMOTIONALLY DIFF	818	9.29	0.11	small			
AC7	cac11diffphlv	C11 AC7C LEVEL PHYSICALLY DIFF	409	10.52	0.16	small			
AC7Aa	cac11medsdif	C11 AC7AA DIFFICULTY MANAGING MEDICAL TASKS (PREVIOUSLY AC7AI)	1,038	28.36**	0.17	small			
AC7Ab	cac11cooorddif	C11 AC7AB DIFFICULTY COORDINATE MED CARE (PREVIOUSLY AC7BB)	1,329	14.55	0.10	small			
AC7Af	cac11vaccinedif	C11 AC7AF DIFFICULTY MAKING COVID VACCINE APPT	584	7.44	0.11	small			

AC7Ac	cac11insurdif	C11 AC7AC DIFFICULTY HANDLE HEALTH INSURANCE (PREVIOUSLY AC7BC)	495	20.71*	0.20	small			
AC7Ad	cac11hospdif	C11 AC7AD DIFFICULTY TRANSITION POST HOSP CARE (PREVIOUSLY AB7BD)	737	3.97	0.07	negligible			
AC7Ae	cac11decsdif	C11 AC7AE DIFFICULTY MAKE MED DECISIONS (PREVIOUSLY A7AN)	130	9.97	0.28	small			
AC8	cac11fmlydisa	C11 AC8 LVL FMLY DISAGR OVER CARE	1,576	1.11	0.03	negligible			
AC8A	cac11careamt	C11 AC8A FAIR SHARE OF SP CARE	1,576	0.60	0.02	negligible			
AC9a	cac11exhaustd	C11 AC9A U ARE EXHAUSTED AT NIGHT	1,938	4.70	0.05	negligible			
AC9b	cac11toomuch	C11 AC9B CARE MORE THN CAN HANDLE	1,938	1.70	0.03	negligible			
AC9c	cac11notime	C11 AC9C U HAVE NO TIME FOR SELF	1,938	4.49	0.05	negligible			
AC9d	cac11uroutchg	C11 AC9D CARE ROUTINE THEN CHANGS	1,938	5.88	0.06	negligible			
SE1	cse11frfamtlk	C11 SE1 FRIENDS FAMILY TO TALK TO	1,938	0.33	0.01	negligible			
SE2	cse11frfamact	C11 SE2 FRIENDS FAMILY HLP W ACT	1,938	2.23	0.03	negligible			
SE3	cse11frfamhlp	C11 SE3 FRIENDS FAMILY HELP W SP	1,938	1.70	0.03	negligible			
SE4	cse11spptgrp	C11 SE4 GONE TO SUPPORT GROUP	1,938	2.20	0.03	negligible			
SE4a	cse11srv2hlp	C11 SE4A USED SERV TAKE TIME AWAY	1,938	0.13	0.01	negligible			
SE5	cse11training	C11 SE5 U RCVD TRAINING 2 HELP	1,938	10.18*	0.07	negligible			
SE6	cse11fndfnhlp	C11 SE6 U FOUND FINANCIL HLP 4 SP	1,938	0.22	0.01	negligible			
SE10	cse11hlpgtdev	C11 SE10 HLPD GET MOBILTY DEVICES	1,938	6.26	0.06	negligible			
SE11	cse11homsafer	C11 SE11 MADE SP HOME SAFER	1,938	12.51*	0.08	negligible			
SE12	cse11hlpdhlp	C11 SE12 HELPED FIND PAID HELPER	1,938	6.50	0.06	negligible			
VS1A	cvs11phone	C11 VS1A HOW OFT IN CONTACT WITH SP PHONE	1,166	7.09	0.08	negligible			
VS1B	cvs11email	C11 VS1B HOW OFT IN CONTACT WITH SP EMAIL TXT SOC MED	1,166	5.31	0.07	negligible			
VS1C	cvs11video	C11 VS1C HOW OFT IN CONTACT WITH SP VIDEO CALLS	1,166	26.84**	0.15	small			
VS1D	cvs11visit	C11 VS1D HOW OFT IN CONTACT WITH SP IN PERSON VISIT	1,166	1.47	0.04	negligible			
DI1	cdi11hwget2sp	C11 DI1 MODE OF TRANS TO VIST SP (PREVIOUSLY CA13)	1,167	18.30	0.13	small			

DI2	cdi11tm2spunt	C11 DI2 UNIT TIME GET 2 SP HOME (PREVIOUSLY CA14)	1,144	0.47	0.02	negligible			
DI2A	cdi11tm2spmin	C11 DI2A MINUTES GET 2 SP HOME (PREVIOUSLY CA14A)	993				1.80	-0.18	negligible
DI2B	cdi11tm2sphrs	C11 DI2B HOURS GET 2 SP HOME (PREVIOUSLY CA14B)	133				-1.35	0.25	small
PP1	cpp11vstfrfam	C11 PP1 VISIT FAMILY OR FRIENDS	1,619	1.29	0.03	negligible			
PP2	cpp11hlpkptvs	C11 PP2 KEPT FRM VISITING	1,606	8.27*	0.07	negligible			
PP3	cpp11impvst	C11 PP3 IMPORTNCE OF VISITING	1,606	3.01	0.04	negligible			
PP4	cpp11gorelgs	C11 PP4 ATTEND RELIGIOUS SERVICES	1,619	0.27	0.01	negligible			
PP5	cpp11hlpkptrl	C11 PP5 KEPT FRM RELIG SERV	1,605	11.90*	0.09	negligible			
PP6	cpp11imprel	C11 PP6 IMPORTNCE OF RELIG SERV	1,605	6.83	0.07	negligible			
PP7	cpp11prtgroup	C11 PP7 PARTICIPATE GROUP ACTIV	1,619	1.65	0.03	negligible			
PP8	cpp11hlpkptgr	C11 PP8 KEPT FRM GROUP ACTIV	1,607	11.52*	0.08	negligible			
PP9	cpp11impgroup	C11 PP9 IMPORTNCE OF GROUP ACTIV	1,607	7.15	0.07	negligible			
PP10	cpp11go4fun	C11 PP10 GO OUT FOR ENJOYMENT	1,619	6.02	0.06	negligible			
PP11	cpp11hlpkptgo	C11 PP11 KEPT FRM GOING OUT	1,605	4.67	0.05	negligible			
PP12	cpp11impgo	C11 PP12 IMPORTNCE OF GOING OUT	1,605	5.78	0.06	negligible			
PP13	cpp11wrk4pay	C11 PP13 WORK FR PAY IN LAST MNTH	1,619	7.37	0.07	negligible			
PP14	cpp11hlpkptwk	C11 PP14 KEPT FRM WORKING	1,607	7.44	0.07	negligible			
PP15	cpp11volun	C11 PP15 VOLUNTEER IN LAST MONTH	1,619	1.52	0.03	negligible			
PP16	cpp11hlpkptvo	C11 PP16 KEPT FRM VOLUNTEER	1,606	13.79**	0.09	negligible			
PP17	cpp11careotr	C11 PP17 PROVIDE CARE ANYONE ELSE	1,619	10.34	0.08	negligible			
PP18	cpp11hlpkptca	C11 PP18 KEPT FRM PROVIDING CARE	1,619	5.84	0.06	negligible			
HE1	che11health	C11 HE1 GENERAL HEALTH	1,938	21.71*	0.11	small			
HE2	che11hrtattck	C11 HE2A HAD HEART ATTACK	1,938	1.72	0.03	negligible			
HE2	che11othheart	C11 HE2B HAD HEART DISEASE	1,938	3.05	0.04	negligible			
HE2	che11highbld	C11 HE2C HAD HIGH BLOOD PRESS	1,938	2.02	0.03	negligible			
HE2	che11arthrits	C11 HE2D HAD ARTHRITIS	1,938	3.65	0.04	negligible			
HE2	che11osteoprs	C11 HE2E HAD OSTEOPOROSIS	1,938	0.20	0.01	negligible			
HE2	che11diabetes	C11 HE2F HAD DIABETES	1,938	4.31	0.05	negligible			

HE2	che11lungdis	C11 HE2G HAD LUNG DISEASE	1,938	1.17	0.02	negligible			
HE2	che11cancer	C11 HE2H HAD CANCER	1,938	3.72	0.04	negligible			
HE2	che11seeing	C11 HE2I HAD SERIOUS DIFF SEEING	1,938	0.22	0.01	negligible			
HE2	che11hearing	C11 HE2J HAD SERIOUS DIFF HEARING	1,938	4.04	0.05	negligible			
HE3	che11cnrcrskin	C11 HE3 CANCER TYPE SKIN CANCER	253	2.86	0.11	small			
HE3	che11cnrcrbst	C11 HE3 CANCER TYPE BREAST CANCER	253	0.73	0.05	negligible			
HE3	che11cnrcrpros	C11 HE3 CANCER TYPE PROSTATE CNCR	253	0.91	0.06	negligible			
HE3	che11cnrcroth	C11 HE3 CANCER TYPE OTHER TYPE	253	1.91	0.09	negligible			
HE4	che11pain	C11 HE4 PAIN IN LAST MONTH	1,938	1.73	0.03	negligible			
HE5	che11painlmt	C11 HE5 PAIN OFT LIMITED	1,060	5.61	0.07	negligible			
HE6	che11brethprb	C11 HE6 BREATHING PROBLEMS	1,938	2.92	0.04	negligible			
HE7	che11brethlmt	C11 HE7 BREATHING OFT LIMITED	262	2.47	0.10	negligible			
HE8	che11armstr	C11 HE8 LIMITED STRENGTH IN ARMS	1,938	2.99	0.04	negligible			
HE9	che11armlmt	C11 HE9 ARM STRENGTH OFT LIMITED	475	4.35	0.10	negligible			
HE10	che11legstr	C11 HE10 LIMITED STRENGTH IN LEGS	1,938	0.54	0.02	negligible			
HE11	che11leglmt	C11 HE11 LEG STRENGTH OFT LIMITED	592	5.88	0.10	negligible			
HE12	che11lowenrgy	C11 HE12 LOW ENERGY IN LAST MONTH	1,938	14.72*	0.09	negligible			
HE13	che11enrgylmt	C11 HE13 ENERGY OFT LIMITED	759	2.32	0.06	negligible			
HE14	che11sleeptrb	C11 HE14 TROUBL FALLNG BACK ASLEP	1,938	19.99*	0.10	small			
HE15	che11sleepint	C11 HE15 INTERRUPTED SLEEP	1,938	9.23	0.07	negligible			
HE16	che11weight	C11 HE16 WEIGHT IN POUNDS	1,855				1.37	-0.08	negligible
HE17a	che11heightft	C11 HE17A HEIGHT IN FEET	1,892				0.68	-0.04	negligible
HE17b	che11heightin	C11 HE17B HEIGHT INCHES	1,891				-2.03*	0.12	negligible
HE18	che11lost10lb	C11 HE18 IN YR LOST 10 POUNDS	1,938	2.23	0.03	negligible			
HE18a	che11try2lose	C11 HE18A TRYING TO LOSE WEIGHT	587	6.53	0.11	small			
HE19	che11moodcher	C11 HE19A CG FELT CHEERFUL	1,938	7.91	0.06	negligible			
HE19	che11moodpcfl	C11 HE19B CG FELT CALM PEACEFUL	1,938	1.71	0.03	negligible			
HE19	che11moodfull	C11 HE19C CG FELT FULL OF LIFE	1,938	11.60	0.08	negligible			
HE19	che11moodbord	C11 HE19D CG FELT BORED	1,938	3.59	0.04	negligible			
HE19	che11moodlone	C11 HE19E CG FELT LONELY	1,938	23.90*	0.11	small			

HE19	che11moodupst	C11 HE19F CG FELT UPSET	1,938	7.80	0.06	negligible			
HE20	che11fltlin	C11 HE20A CG FELT LITTLE INTERST	1,938	2.24	0.03	negligible			
HE20	che11fltdown	C11 HE20B CG FELT DOWN DEPRESSED	1,938	1.15	0.02	negligible			
HE20	che11fltnervs	C11 HE20C CG FELT NERVOUS ANXIOUS	1,938	21.62*	0.11	small			
HE20	che11flt worry	C11 HE20D CG FELT UNABLE2STP WRRY	1,938	9.32	0.07	negligible			
HE21	che11lifemng	C11 HE21A LIFE HAS MEANING PURPOS	1,938	10.74	0.07	negligible			
HE21	che11feelconf	C11 HE21B CG FEELS CONFIDENT	1,938	24.27**	0.11	small			
HE21	che11gaveup	C11 HE21C CG GAVEUP IMPROVNG LIFE	1,938	21.14*	0.10	small			
HE21	che11lifegood	C11 HE21D CG LIKES LIVING SITUATN	1,938	28.92*	0.12	small			
HE21	che11lifelone	C11 HE21E CG FEELS LONELY	1,938	25.29**	0.11	small			
HE21	che11easychng	C11 HE21F CG ADJUSTS CHANG EASILY	1,938	47.53***	0.16	small			
HE21	che11rcvrqick	C11 HE21G CG RECOVERS QUICKLY	1,938	35.72**	0.14	small			
CV1	ccv11covid	C11 CV1 EVER HAD COVID-19	1,938	10.98	0.08	negligible			
CV2	ccv11effects	C11 CV2 STILL HAVING HEALTH EFFECTS FROM COVID-19	326	0.09	0.02	negligible			
CV3	ccv11quarantine	C11 CV3 HAD TO QUARANTINE COVID-19 EXPOSURE	1,938	2.08	0.03	negligible			
CV4	ccv11limitsp	C11 CV4 HAD TO LIMIT IN PERSON TIME WITH SP COVID-19	1,938	1.10	0.02	negligible			
CV5	ccv11nohelp	C11 CV5 SP WENT WIHTOUT HELP COVID-19	1,938	1.92	0.03	negligible			
CV6	ccv11vaccine	C11 CV6 VACCINATED FOR COVID-19	1,938	6.18	0.06	negligible			
CV7A	ccv11vaccinemth	C11 CV7A MONTH VACCINATED FOR COVID-19	1,585	9.92	0.08	negligible			
CV7B	ccv11vaccineyr	C11 CV7B YEAR VACCINATED FOR COVID-19	1,585	7.41	0.07	negligible			
CV8	ccv11vaccinetry	C11 CV8 TRIED TO GET COVID-19 VACCINE	291	0.40	0.04	negligible			
HD1	chd11martstat	C11 HD1 MARITAL STATUS	1,632	4.72	0.05	negligible			
HD1 Derived Variable	chd11dmartstat	C11 D HD1 MARITAL STATUS	1,938	3.86	0.04	negligible			
HD2	chd11marendmt	C11 HD2 MONTH MARRIAGE ENDED	346	22.59	0.26	small			
HD2a	chd11marendyr	C11 HD2A YEAR MARRIAGE ENDED	313				-1.38	0.18	negligible
HD3	chd11chldlvng	C11 HD3 HAVE CHILDREN LIVING	1,938	2.11	0.03	negligible			
HD4	chd11numchild	C11 HD4 NUMBER OF CHILDREN	1,561				-0.84	0.06	negligible

HD5	chd11numchu18	C11 HD5 NUMBER CHILDREN UNDER 18	1,555					-1.63	0.13	negligible
HD6	chd11numinhh	C11 HD6 NUMBR OF PEOPLE LIVE IN HH EXCLUDING CG	1,890					0.55	-0.04	negligible
HD6 Derived Variable	chd11dnuminhh	C11 D HD6 NUMBR OF PEOPLE LIVE IN HH INCLUDING CG	1,890					0.55	-0.04	negligible
HD7	chd11educ	C11 HD7 HIGHEST DEGREE OR GRADE	1,890					-1.36	0.09	negligible
HD8	chd11educsprt	C11 HD8 SPOUS PARTR HIGH DEGREE	1,148					-0.48	0.04	negligible
HD9A	chd11cgbrthmt	C11 HD9 CG BIRTHDATE MONTH	1,938	21.95	0.11	small				
HD9C	chd11cgbrthyr	C11 HD9 CG BIRTHDATE YEAR	1,864					-0.62	0.04	negligible
HD9 Derived Variable	chd11dage	C11 D HD9 CG AGE	1,850					0.55	-0.04	negligible
HD10A	chd11spbrthmt	C11 HD10 SPOUS PARTR DOB MONTH	1,192	25.74	0.15	small				
HD10C	chd11spbrthyr	C11 HD10 SPOUS PARTR DOB YEAR	1,135					-0.28	0.03	negligible
HD10 Derived Variable	chd11dspouage	C11 D HD10 SPOUS PARTR AGE	1,116					0.14	-0.01	negligible
RL1	crl11yourrace1	C11 RL1 RACE OF CG WHITE	1,938	10.32	0.07	negligible				
RL1	crl11yourrace2	C11 RL1 RACE OF CG AFRICN AMERICN	1,938	10.11	0.07	negligible				
RL1	crl11yourrace3	C11 RL1 RACE OF CG AM INDIAN ALASKA NATIVE	1,938	12.57	0.08	negligible				
RL1	crl11yourrace4	C11 RL1 RACE OF CG ASIAN	1,938	23.54**	0.11	small				
RL1	crl11yourrace5	C11 RL1 RACE OF CG NATIVE HAWAIIAN PAC ISLANDR	1,938	20.48**	0.10	small				
RL3	crl11hisplatno	C11 RL3 CG HISPANIC OR LATINO	1,938	34.80***	0.13	small				
RL Derived Variable	crl11dcgracehisp	C11 D CG RACE AND HISPANIC ETHNICITY	1,938	41.25***	0.15	small				
EL1	cel11wrk4pay	C11 EL1 WORK FOR PAY LML	296	11.82	0.20	small				
EL2	cel11unpdwrk	C11 EL2 UNPAID WRK FAM BUS LML	296	5.51	0.14	small				
EL3	cel11miswork	C11 EL3 ABSENT FROM JOB LML	121	2.24	0.14	small				
EL4	cel11flexhrs	C11 EL4 HAVE FLEXIBLE HOURS LML	125	3.20	0.16	small				
EL5	cel11wrksched	C11 EL5 WORK SCHEDULE LML	125	3.23	0.16	small				
EL6	cel11mswkhelp	C11 EL6 MISS WORK HELPING LML	123	0.77	0.08	negligible				
EL7	cel11mswkhlph	C11 EL7 NUM HRS MISS WORK HELP LML	72					-1.44	0.46	small

EL8	cel11mswkpd	C11 EL8 PAID FOR MISSED WORK LML	84	4.62	0.23	small			
EC1	cec11wrk4pay	C11 EC1 WORK FOR PAY LAST WEEK	1,642	27.49**	0.13	small			
EC2	cec11ownbusns	C11 EC2 OWN FARM BUSINESS	1,642	3.69	0.05	negligible			
EC3	cec11unpdwrk	C11 EC3 UNPAID WRK FAM BUS LST WK	90	0.95	0.10	small			
EC4	cec11misswork	C11 EC4 ABSENT FROM JOB LAST WEEK	600	4.20	0.08	negligible			
EC5	cec11look4wrk	C11 EC5 LOOKING FOR JOB LAID OFF	511	14.88	0.17	small			
EC6	cec11wrkmulti	C11 EC6 HAVE MORE THAN ONE JOB	659	0.31	0.02	negligible			
EC7	cec11hrsweek	C11 EC7 HRS PER WEEK AT MAIN JOB	650				1.95	-0.18	negligible
EC8	cec11hrslstwk	C11 EC8 NUMB HRS WORKED LAST WEEK	605				-0.02	0.00	negligible
EC10	cec11hrswork	C11 EC10 HOURS WORKED AT ALL JOBS	110				0.66	-0.24	small
EC11	cec11flexhrs	C11 EC11 HAVE FLEXIBLE HOURS	659	4.85	0.09	negligible			
EC12	cec11wrksched	C11 EC12 WORK SCHEDULE	659	2.94	0.07	negligible			
EC13	cec11msswrkmt	C11 EC13 EVER ABSENT FROM WORK	621	3.20	0.07	negligible			
EC14	cec11mswkvctn	C11 EC14A MISS WORK VACATION	266	6.94	0.16	small			
EC14	cec11mswksick	C11 EC14B MISS WORK SICK	266	8.76	0.18	small			
EC14	cec11mswkhelph	C11 EC14C MISS WORK HELPING	259	3.80	0.12	small			
EC14	cec11mswkwfmy	C11 EC14D MISS WORK FAM SCK	266	10.47	0.20	small			
EC14	cec11mswkwpers	C11 EC14E MISS WORK PERSONAL	266	5.04	0.14	small			
EC Derived Variable	cec11dmswkunit	C11 D HRS MISS WORK HELP UNIT	90	1.29	0.12	small			
EC Derived Variable	cec11dmswkhelph	C11 D NUM HRS MISS WORK HELP	83				0.92	-0.50	medium
EC16A	cec11mswkpd	C11 EC16A PAID FOR MISSED WORK	91	7.81	0.29	small			
EC17	cec11hlpafwk1	C11 EC17 HELPING AFFECTS WORK	645	2.79	0.07	negligible			
EC18	cec11hlpafwk2	C11 EC18 HOW MUCH HELP AFECTD WRK	1,938				-0.19	0.01	negligible
EC19	cec11busntype	C11 EC19 TYPE OF BUSINESS	809	51.37	0.25	small			
EC20	cec11occuptn	C11 EC20 OCCUPATION	809	40.81	0.22	small			
EC Derived Variable	cec11dworktype	C11 D TYPE WORK DURNG LIFETIME	1,938	28.24**	0.12	small			
EC Derived Variable	cec11doccpdscr	C11 D LIFETIME OCCUP DESCRIPT	1,918	69.40*	0.19	small			

HI1	chi11medicare	C11 HI1 MEDICARE COVERAGE	1,938	0.36	0.01	negligible			
HI2	chi11medigap	C11 HI2 MEDIGAP COVERAGE	961	4.44	0.07	negligible			
HI3	chi11medicaid	C11 HI3 MEDICAID COVERAGE	1,938	3.04	0.04	negligible			
HI4	chi11privinsr	C11 HI4 PRIVATE INSURANCE COVERAGE	1,938	2.93	0.04	negligible			
HI5	chi11tricare	C11 HI5 TRICARE OR CHAMPVA	1,938	4.49	0.05	negligible			
HI6	chi11uninsurd	C11 HI6 NO INSURANCE VERIFICATION	147	8.96	0.25	small			
HI8	chi11ownhome	C11 HI8 OWN YOUR HOME	1,938	6.13	0.06	negligible			
HI9A	chi11chckacct	C11 HI9A CG HAS CHECKING ACCT	1,938	13.05	0.08	negligible			
HI9B	chi11svgsacct	C11 HI9B CG HAS SAVINGS ACCOUNT	1,938	15.74	0.09	negligible			
HI9C	chi11certdpst	C11 HI9C CG HAS CERT OF DEPOSIT	1,938	13.24*	0.08	negligible			
HI9D	chi11retrplan	C11 HI9D CG HAS RETIREMENT PLAN	1,938	3.80	0.04	negligible			
HI9E	chi11mutlfnds	C11 HI9E CG HAS STOCKS MUT FUNDS	1,938	2.61	0.04	negligible			
HI10	chi11income	C11 HI10 INCOME LAST YEAR	1,387				1.53	-0.09	negligible
HI10	chi11incimf	C11 F IMPUTED INCOME LAST YEAR FLG	1,938	6.40	0.06	negligible			
HI10	chi11incim1	C11 HI10 IMPUTED INCOME LAST YEAR INC1	1,938				1.13	-0.06	negligible
HI10	chi11incim2	C11 HI10 IMPUTED INCOME LAST YEAR INC2	1,938				1.77	-0.09	negligible
HI10	chi11incim3	C11 HI10 IMPUTED INCOME LAST YEAR INC3	1,938				1.91	-0.10	negligible
HI10	chi11incim4	C11 HI10 IMPUTED INCOME LAST YEAR INC4	1,938				1.21	-0.06	negligible
HI10	chi11incim5	C11 HI10 IMPUTED INCOME LAST YEAR INC5	1,938				1.62	-0.08	negligible
HI11	ch11incomeest	C11 HI11 ESTIMATED TOTAL INCOME	551	15.43	0.17	small			
HI14	chi11paymeds	C11 HI14A CG PAY FOR MEDS	1,938	0.43	0.01	negligible			
HI14	chi11payinsur	C11 HI14B CG PAY FOR HEALTH INS	1,938	0.99	0.02	negligible			
HI14	chi11paymbdvc	C11 HI14C CG PAY FOR MOBILITY DEV	1,938	0.42	0.01	negligible			
HI14	chi11paysfty	C11 HI14D CG PAY FOR SAFETY EQUIP	1,938	0.30	0.01	negligible			
HI14	chi11payasdvc	C11 HI14E CG PAY FOR ASSIST DEVIC	1,938	1.10	0.02	negligible			
HI14	chi11payhmhlp	C11 HI14F CG PAY FOR IN HOME HELP	1,938	1.22	0.03	negligible			
HI Derived Variable	chi11dpaycat	C11 D PAY CATEGORY TO HELP	342	3.79	0.11	small			
HI18	chi11gifttosp	C11 HI18 FINANCIAL GIFT TO SP	1,336	2.61	0.04	negligible			

HI Derived Variable	chi11dgiftospcat	C11 D FINANCIAL GIFT TO SP CATEGORY	1,938	5.37	0.05	negligible			
HI22	chi11fromsp	C11 HI22 FINANCIAL GIFT FROM SP	1,336	1.12	0.03	negligible			
HI Derived Variable	chi11dfromspcat	C11 D FINANCIAL GIFT FROM SP CATEGORY	833	4.85	0.08	negligible			

Sample size in the chi-square of t test. For chi-square tests, missing cases are included as a separate category, with ineligible cases removed from the tests. For t test, missing cases are also excluded.

* p < 0.05; ** p < 0.01; *** p < 0.001.

Appendix Table 1. NSOC IV 2011 (Round 11) Variables Collected separately for Web and Phone Modes

Phone-interviews only	Web only
cdc11hlpunit cdc11hlpys cdc11hlpyst	cdc11hlpysweb
cec11mswkunit cec11mswkhlp cec11mswkhlpd	cec11mswkhlpweb
cec11worktype	Variable not on file
chi11pay1000 chi11pay2000 chi11pay500	chi11paycat
chi11gift500 chi11gift1000 chi11gift100	chi11giftospcat
chi11frsp500 chi11frsp1000 chi11frsp100	chi11fromspcat