Health Information National Trends Survey

hints

Health Information National Trends Survey 5 (HINTS 5)

Web Pilot Results Report

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Table of Contents

Tables **Page**

Tables

Figures

Exhibits

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1 Pilot Study Design

When HINTS moved from a telephone to a paper survey in 2007, access to and use of the internet was not widespread enough to make web data collection a viable option. However, with increased internet access, increases in internet speed, and the proliferation of smart phones, web data collection with a national probability sample has become more feasible. Data collection via the web has the potential to significantly improve data quality and to decrease costs. The HINTS 5 Web Pilot was designed to explore whether it is possible to push enough HINTS respondents to the web to realize these advantages.

The web pilot was fielded in parallel with HINTS 5 Cycle 3 in early 2019. This timing allowed for the use of Cycle 3 (the traditional HINTS uni-mode paper design) as a comparison group for the mixed-mode design without disrupting normal HINTS data collection. In addition to testing a mixed-mode design, the pilot included the use of an additional 'bonus' promised incentive for responding over the web and the use of prompting interventions to intervene with web respondents who exhibit sub-optimal response behavior.

1.1 Research Questions

The primary research questions that the web pilot was designed to investigate are related to response rates, data quality, and cost-effectiveness.

Response rate research questions:

- What response rate can HINTS achieve using a mixed mode design (paper + web)?
- How do the response rates for a mixed-design compare to the existing single-mode HINTS data collection protocol?
- Will offering an additional promised incentive for web response push more respondents to complete the survey by web?
- Will web prompting interventions affect web completion and dropout rates?

Sample composition and data quality research questions:

- Will a mixed-mode design lead to a more representative sample?
- How will a mixed-mode design affect the topline HINTS estimates?
- How will a mixed-mode design affect undesirable respondent behavior?

- How does offering an additional promised incentive for web response impact data quality?
- Will web-prompting interventions for undesirable survey behaviors increase data quality among web respondents?
- Will there be any interaction effects of providing a promised incentive and prompt interventions on data quality?

Cost Effectiveness Questions:

- What is the cost-effectiveness of offering a web option?
- What is the cost-effectiveness of pushing more people to the web with an additional incentive?

1.2 Experimental Factors

The web pilot study design included three experimental factors, summarized in Table 1-1. They include:

1. Data collection mode: Each household was assigned to either the traditional paper-only group (Cycle 3) or groups that gave respondents the choice between paper and web completion.

2. Use of a bonus incentive for web response: Households that were offered the choice between web and paper were randomly assigned to either receive an additional $10 incentive to complete by web or they were not offered any additional incentive. The bonus incentive was provided in the form of an Amazon e-gift card code.

3. Use of prompt interventions: Each household that was offered the option of completing by web was randomly assigned to either receive prompting interventions on the web or not. These interventions were intended to prompt respondents who display undesirable behavior (speeding, straightlining) to reduce those behaviors. A description of the specific interventions that were used is included Chapter 2.5.

Table 1-1. Experimental design

Data Collection Group	Starting Sample Sizes		
	Prompts	No Prompts	Total
Standard Paper-only ("paper-only")			14,730
Option to complete by paper or web ("web option")	2,175	2,175	4,350
Option to complete by paper or web with an additional incentive for completing by web ("web bonus")	2,175	2,175	4,350

1.3 Data Collection Methodology

Sampling

The sampling for both Cycle 3 and the web pilot was conducted in the same manner as all HINTS data collections: a stratified, random sample was selected from a national list of mailing addresses. Households in high minority areas were oversampled. The sample sizes are shown in Table 1-1 above.

In the second stage of sampling, respondents were asked to select the appropriate adult in the household to complete the questionnaire based on the next-birthday method. More details about the sampling and stratification can be found in the *HINTS 5 Cycle 3 Methodology Report*.

Survey Instrument

The paper survey was similar in design to previous HINTS cycles. The survey booklet was 23 pages long and questions were presented in two columns on each page (with the exception of the respondent-selection page at the beginning of the survey which was presented in a single column). Appendix A provides the paper survey.

For the web instrument, the question about the respondent's age was placed at the front of the survey rather than at the end. The number of questions on each page for the web survey varied. Multiple questions were presented on a page when it was helpful for comprehension and skip patterns. Questions on similar topics were included on the same page (e.g., grids). Questions that determined a skip pattern were the last question (or only question) on a page. The number of questions per page was kept as low as possible to minimize the need for vertical scrolling. The web survey programming could detect what type of electronic device the respondent was using and optimized the survey presentation accordingly. The web survey also included range checks for respondent errors such as answering with letters when numbers were expected. Example screenshots of the web survey are shown in Appendix B.

The questions administered to the web option and web bonus groups were identical with the exception of the extra pages at the end of the survey related to delivering the electronic incentive for the web bonus group.

Data Collection

Data collection occurred between January and May of 2019, during which time four separate mailed contact attempts were made. All initial mailings included a $2 pre-incentive. The contact materials were slightly different for the paper-only and the mixed-mode groups as outlined in Table 1-2. For the two mixed-mode groups, the survey link and PIN were included in all contact attempts. For the web bonus group, an additional flyer drawing attention to the $10 web bonus incentive was included in all contact materials. Appendix C provides the initial cover letter for each group. The language in the cover letters varied by whether respondents were invited to complete the survey by web and, if so, whether they were being offered the bonus incentive to do so.

Table 1-2. Contact procedures by treatment group*

Group	1st Contact via First Class mail	2nd Contact via First Class mail	3rd Contact via Priority Mail	4th Contact via First Class mail
Paper-only (control)	• $2 prepaid incentive • Cover letter • Paper Questionnaire	Thank you/reminder postcard	• Cover letter • Paper Questionnaire	• Cover letter • Paper Questionnaire
Web option	• $2 prepaid incentive • Cover letter with login info • Paper Questionnaire	Thank you/reminder postcard with login info	• Cover letter with login info • Paper Questionnaire	• Cover letter with login info • Paper Questionnaire
Web bonus	• $2 prepaid incentive • Cover letter with login info and promising a $10 bonus for web completion • Additional flyer promoting web response • Paper Questionnaire	Thank you/reminder postcard with login info and promising $10 web bonus	• Cover letter with login info and promising $10 web bonus • Additional flyer promoting web response • Paper Questionnaire	• Cover letter with login info and promising $10 web bonus • Additional flyer promoting web response • Paper Questionnaire

*Respondents in all conditions could request a paper Spanish questionnaire. There was no Spanish web instrument.

Once a household was recorded as having completed a questionnaire, it was removed from additional mailings. Each paper questionnaire was scanned and both paper and web questionnaires were verified, cleaned, and edited. Cleaning and editing details can be found in the *HINTS 5 Cycle 3 Methodology Report.*

Weighting

Separate weights were created for each of the three groups (web bonus, web option and paper-only). These weights were created by adjusting for the initial probabilities of selection, non-response, and

coverage adjustments. For details on the weighting methods, see the *HINTS 5 Cycle 3 Methodology Report.*

Different weights are used for the various analyses described in this report. When evaluating response rates and sample composition, the base-weights, which account for the probability of selection, are used. These are used so the analysis can assess how well each group does before making adjustments for non-response and coverage. For comparisons of HINTS estimates (e.g., percent that look for health information) the final weights are used. These are calibrated to address nonresponse and coverage. For comparison of other data quality metrics (item nonresponse, speeding, straightlining, etc.), the analyses do not use any weights.

Results 2

Analyses addressed each of the research questions, including those related to response rates, sample composition, differences in HINTS outcomes, data quality, the effect of prompting and costs.

2.1 Response Rates

One of the issues associated with giving respondents a choice of mode is that it could lower the response rate relative to offering just one mode.[1] If pushing respondents to the web reduces the overall response rate, then it may not be an optimal design for HINTS.

Response rates[2] were first computed for the two web option and web bonus groups together. As shown in Table 2-1, offering respondents a choice of paper or web did not result in a drop in response rates overall. The response rates between the two groups was not significantly different ($x^2(1) = 0.22, p = 0.64$).

Table 2-1. Response rates for respondents with and without a choice of response mode

Assignment Group	Response Rate
Paper-only	30.2%
Paper or web choice	30.6%

There were small differences in response rates between the web bonus group and the web option group (Table 2-2) although none of these differences were statistically significant ($x^2(2) = 1.88, p = 0.39$). However, compared to the web option group, the web bonus group had a significantly higher response via the web (22.2% vs. 12.9%) ($x^2(1) = 110.80, p < 0.0001$). Approximately 60 percent of the web bonus respondents used the web compared to 25 percent of the web option group. These findings suggest that the bonus $10 incentive for web response was effective in pushing respondents to the web.

[1] Medway, R., and J. Fulton (2012), "When More Gets You Less: A Meta-Analysis of the Effect of Concurrent Web Options on Mail Survey Response Rates," Public Opinion Quarterly, 76, 733–746.; Millar, M. M., and D. A. Dillman (2011), "Improving Response to Web and Mixed-Mode Surveys," Public Opinion Quarterly, 75, 249–269.

[2] Response rates were calculated using the RR2 formula of the American Association of Public Opinion Research (AAPOR). Response rates were calculated using the base-weights which account for the probability of selection but do not correct for nonresponse or undercoverage.

Table 2-2. Response rates overall, by assignment group and by mode

Data collection group	Completion mode - response rates (%)		
	Paper	Web	Overall
Paper only	30.2	NA	30.2
Web option	22.2**	7.5**	29.6
Web bonus	12.9**	18.7**	31.5

** Significant difference in response rate (p <.001)

2.2 Sample Composition

Previous HINTS cycles have underrepresented certain groups, including younger, healthier, less educated, and non-white people. It is possible that offering a web survey option could reduce nonresponse bias if it attracts those who have historically responded to HINTS at a lower rate.

For the analysis below, the distributions are provided for both the base-weighted and final-calibrated estimates. The primary outcome discussed below uses the base-weighted estimates because these reflect the extent to which the different experimental treatments were completed by particular types of respondents. The final calibrated estimates are provided to show whether the experimental treatments affected the final distributions after the full weighting process is applied. However, in a number of cases, the distributions using the final calibrated weights are, by design, the same across the three experimental groups.[3]

Table 2-3 summarizes the demographic estimates produced for the three experimental groups (paper-only, web option and web bonus) along with the estimates from the American Community Survey (ACS) and the National Health Interview Survey (NHIS). Two of the seven types of demographics exhibited significant differences across groups: age and cancer status. The estimate of younger adults (age 18-34) was significantly higher in the web bonus group as compared to the paper-only (10.1% vs. 17.2%) ($t(5432) = 4.85, p < 0.0001$). The web option group does not differ from the paper-only group. This suggests that the additional $10 promised incentive for web response was most effective at getting younger adults to respond overall.

[3] For example, the weighting uses the percent of the population that has had cancer from the NHIS. The final calibrated estimate for this variable, therefore, will be the same for all three of the experimental groups.

The estimate of respondents who reported ever having cancer in the web bonus group was significantly lower than the paper-only group (14.3% vs 19.5%) ($t(5432) = 2.80, p = 0.005$) and lower but not significantly different from the web option group (14.3% vs. 16.7%) ($t(5432) = 1.13, p = 0.26$).

Table 2-3. Sample composition by assignment group and ACS

Demographic Characteristics	Paper-only		Web option		Web bonus		2017 ACS %
	Base weighted estimate %	Final calibrated estimate %	Base weighted estimate %	Final calibrated estimate %	Base weighted estimate %	Final calibrated estimate %	
Age**							
18-34	10.1**	23.3	10.7	21.5	17.2**	27.2	30.1
35-49	17.3	25.6	19.2	26.1	19.4	22.2	24.6
50 +	72.6	51.1	69.9	52.2	63.3	50.5	45.3
Median Age	59.8	49.4	59.3	50.1	55.7	49.1	37.8
Gender							
Male	43.6	48.7	41	48.7	42.7	48.7	48.7
Ethnicity							
Hispanic	8	16	6.7	16	9.1	16	16
Non-Hisp. Whites	77	63.5	79	63.5	77.7	63.5	63.5
Non-Hisp. Blacks	7	11.9	6.8	11.9	6.2	11.9	11.9
Non-Hisp. Asian	4.9	5.6	5	5.4	4.3	5.6	5.7
Non-Hisp. Others/Multiracial	3.1	3	2.5	3.1	2.7	3	2.8
Marital Status							
Married	56.3	52.2	57.8	52.2	54.4	52.2	52.2
Never married	12.8	30.4	11.6	30.4	16.1	30.4	30.4
Other	30.8	17.4	30.6	17.4	29.5	17.4	17.4
Education							
High school or less	22.7	31	20.3	27.7	18.4	30.2	39.8
Some college, no degree	27.2	39.6	30.1	42.9	28.5	40.4	30.8
College grad	50.2	29.4	49.6	29.4	53.1	29.4	29.4
Cancer**							
Yes, have had cancer	19.5**	9.4	16.7	9.4	14.3**	9.4	9.4
Health Insurance							
Yes, insured	95.6	91.7	96.8	91.7	95.5	91.7	91.7

Note: ** p < 0.01, *p<0.05. Significance tests are the results of tests comparing the base-weighted estimates between the data collection groups for HINTS. The age and education categories used in the table are different from the categories used for raking and therefore the final calibrated estimates are different from the ACS estimates.

Table 2-4 summarizes the respondent composition for the two mixed-mode groups broken down by whether the respondents selected to use the paper or web survey across the two mixed mode treatments. Five out of the seven demographic characteristics show large differences between people who opt to respond by paper vs. by web. Overall, respondents who completed the survey by web tended to be younger, male, unmarried, with higher educational attainment, and heathier as compared to those who completed the survey by paper.

When comparing these same distributions for the two web groups, there are no differences with respect to the composition by mode of response. That is, the same type of people (i.e., young, less cancer) are responding to the web for both the bonus and option groups. This suggests that while the $10 bonus attracted more people to the web, it did not attract demographically different types of people.

The above results indicate that the mixed-mode approach, coupled with the bonus incentive for web response, was successful at improving representation from groups that appear underrepresented among paper respondents. It is important to note, however, that even the web-bonus group still under-represents young people and those never experiencing cancer. The comparison of the base-weighted numbers for young people are still below national benchmarks (ACS) and higher than NHIS estimates of adults ever having cancer.

Table 2-4. Sample composition by completion mode and ACS

Key Demographic Characteristics	Complete by Paper		Complete by Web		2017 ACS %
	Base weighted estimate %	Final calibrated estimate %	Base weighted estimate %	Final calibrated estimate %	
Age**					
18-34	6.2	11.8	24.7	38.3	30.1
35-49	13.5	21	27.2	27.6	24.6
50 +	80.3	67.2	48.1	34.1	45.3
Median Age	62.3	55.7	48.1	41.7	37.8
Gender**					
Male	38.2	44	46.7	53.8	48.7
Ethnicity					
Hispanic	7.7	15	8.2	17.1	16
Non-Hisp. Whites	78.8	64.1	77.8	62.9	63.5
Non-Hisp. Blacks	7.6	14.2	5.1	9.4	11.9
Non-Hisp. Asian	3.3	4.1	6.4	7	5.7
Non-Hisp. Others/Multiracial	2.7	2.6	2.5	3.5	2.8
Marital Status*					
Married	53.8	53.2	56.1	48.3	52.2
Never married	9.6	23.4	19.6	38.1	30.4
Other	36.5	23.4	24.3	13.7	17.4
Education**					
High school or less	26	35.5	10.3	21.7	39.8
Some college, no degree	32.4	42.4	25.1	40.9	30.8
College grad	41.5	22.1	64.6	37.5	29.4
Cancer**					
Yes, have had cancer	19.5	12.8	10.1	5.7	9.4
Health Insurance					
Yes, insured	96.7	93.2	95.3	90	91.7

Note: ** $p < 0.01$, *$p<0.05$. Significance tests are the results of tests comparing the base-weighted estimated between the data collection modes for HINTS.

2.3 Comparisons of Select Key HINTS Estimates

While the response rates are very similar across the experimental groups, the above analysis suggests that the sample composition between groups are not the same. For example, as noted above, the web bonus group attracted more young people into the survey. Because age is related to some of the

key health and health information outcomes, this may change the national estimates relative to the paper survey. There may also be effects of mixing the two different modes (paper and web). If there are differences in how individuals answer the paper and web questionnaires, then this may also lead to differences between the paper and mixed mode groups. However, because the web and paper are both self-administered modes, it is not expected that this would have a large effect on measurement.

Table 2-5 compares eight estimates from HINTS for which external benchmarks[4] were available for comparison from the NHIS and the Medical Expenditure Panel Survey (MEPS). The final weights are used for these comparisons since these are used for analysis. None of the differences across HINTS data collection groups in Table 2-5 are statistically significant.

Table 2-5. Comparison of key HINTS estimates by data collection group and in comparison to external benchmarks (NHIS & MEPS)

Variable	Paper only	Web Option	Web Bonus	2017 NHIS
Access to Internet	83.9	82.9	84.7	77.8
Excellent, very good, or good health	83.7	84.3	82.5	89.9
Smoked 100+ cigarettes in life time	36.1	35.2	33.5	36.3
Never visited doctor in the past 12 months	16.6	14.4	16.7	16.3
Looked for health information on the Internet in the past 12 months	72	74.7	70	53.6
Used Internet to communicate with doctor in the past 12 months	42.1	41	45.6	14.6
Variable	**Paper only**	**Web Option**	**Web Bonus**	**2015 MEPS**
Health professionals always explain things in a way you understand	65.8	66.5	67.3	66.7
In past 12 months, health professionals always spend enough time with you	48.9	53.1	47.9	57.2

Thirty-six other measures from HINTS, which do not have alternative benchmarks, were compared across the experimental groups. All of the comparisons are shown in Appendix D with comparisons that are statistically significant shown in Table 2-6.

[4] For some estimates, the exact question wording is not the same across sources. The question wording across sources is outlined in Appendix E.

Table 2-6. Summary of significantly different HINTS estimates across data collection groups^

HINTS estimate category and topic	Paper only	Web Option	Web Bonus
Health communication			
Trust a doctor regarding health/medical topics a lot	67.3*	68.1	73.4*
Health and health services			
Feeling nervous, anxious, or on edge more than 'not at all'	40.8*	34.6*	39.4
Heard about Hepatitis C	83.4*	79.9	77.0*
Other topics			
Seen tobacco messages about dangers of smoking	42.0**	44.9	51.8**

Note: ** p < 0.01, *p<0.05. Significance tests are for comparing the final calibrated estimates of the paper-only group to either the web-option or web-bonus group.
^See Appendix D for full list of variables which were compared.

The differences shown in Appendix D across these comparisons are generally small, with most being less than 5 percentage points. Four of the 36 measures have statistically significant differences between the paper-only and one of the web option groups (p<.05 level). Three of these four are comparisons involving the paper-only and web bonus conditions. The paper-only survey estimates fewer adults have a lot of trust in the information on health and medical topics from their doctor (67.3% vs. 73.4%). The estimate for the percent of adults who have heard about Hepatitis C in the web bonus group was about six points lower than the estimate for the paper-only group $(t(50) = -2.16, p = 0.004)$. The estimate for the percent who have seen tobacco company messages about dangers of smoking is about 10 points higher in the web bonus group compared to the paper-only group $(42.0\% \text{ vs. } 51.8\%)$ $(t(50) = 3.89, p = 0.0003)$. The one significant difference between the web option and paper-only groups is for the question of how often the respondent feels nervous, anxious, or on edge. More of the paper respondents said 'not at all' than the web option group $((40.8\% \text{ vs. } 34.6\%)(t(50) = 2.34, p = 0.02)$.

With respect to the other comparisons that are not significantly different (Appendix D), many are between 1 to 5 percentage points. Among the larger, non-significant differences are that the paper-only group was more likely to be home owners (91.8% vs. 84.2%), watch TV more than 5 hours per day (55% vs. 49.3%) , and to use online medical records less often (36.8% vs. 42.3%).

Four of the 88 comparisons made (44 measures x 2 comparisons) are statistically significant at the p<.05 level. This is about what would be expected by chance (5%). Overall, therefore, there do not seem to be large differences between the groups.

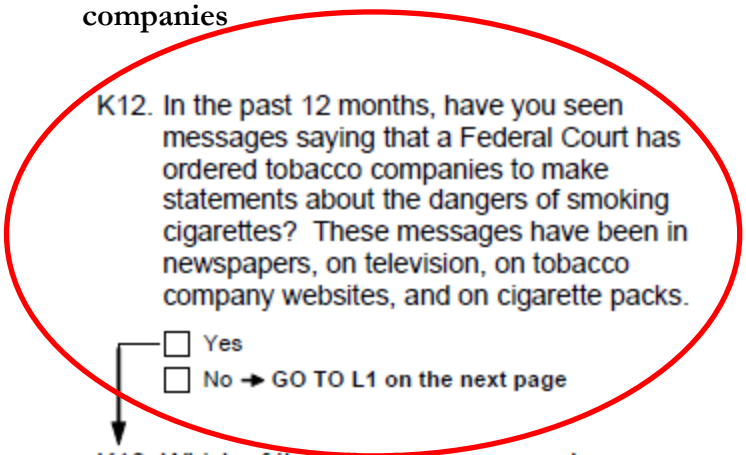
There are two reasons why the web bonus and paper-only groups may differ. One is because different types of respondents may have completed the survey. As shown in the prior section, when

compared to the paper-only group, the web bonus group has more young people, more educated people, and more people without a cancer diagnosis. Even after calibrating for these characteristics, there may still be differences in sample composition. The weighting does not control for all characteristics (e.g., health, income). To investigate this further, a series of logistic regressions were estimated that predicted each of the four estimates with significant differences using experimental group assignment, age, gender, race/ethnicity, marital status, education, home ownership (yes vs. no), household with children (yes vs. no), single-person household (yes vs. no), access to Internet (yes vs. no), and stratum (high minority vs. low minority stratum). After controlling for these factors, three of the four significant differences shown above in Table 2-6 remain significant. The one difference between the paper and web option for the item on feeling nervous, anxious or on edge becomes just marginally significant (p=.06).

A second reason there may be differences between the experimental treatments is that measurement may differ by mode. That is, the mode of presentation between the paper and web may lead to different responses. Exhibits 1 and 2 present the question on tobacco messages as they appear on the paper and the web. There is not a clear reason why the web respondents would be selecting 'yes' more often than the paper respondents. One difference between the two is that the paper survey makes it clear that a 'yes' answer leads to some follow-up questions. This is not the case for the web, which skips the respondent to another page without any forewarning. However, we do not know of any research literature which documents such effects across these two modes. It is also important to note that the other questions which show differences (trust in doctors and heard of Hepatitis C) do not exhibit the same difference in format between the two modes.

The design of the pilot does not allow analysis to cleanly separate out the effects of mode from the effects of which respondents selected to use either the paper or web modes. It may still be the case that the differences observed above are related to selection effects. For example, it could be the case that even after controlling for demographics, the respondents to the web bonus condition are more tech savvy or healthier or different on some other characteristic related to the outcomes shown in Table 2-6.

Exhibit 1. Paper questionnaire column with question about hearing messages from tobacco companies



K12. In the past 12 months, have you seen messages saying that a Federal Court has ordered tobacco companies to make statements about the dangers of smoking cigarettes? These messages have been in newspapers, on television, on tobacco company websites, and on cigarette packs.

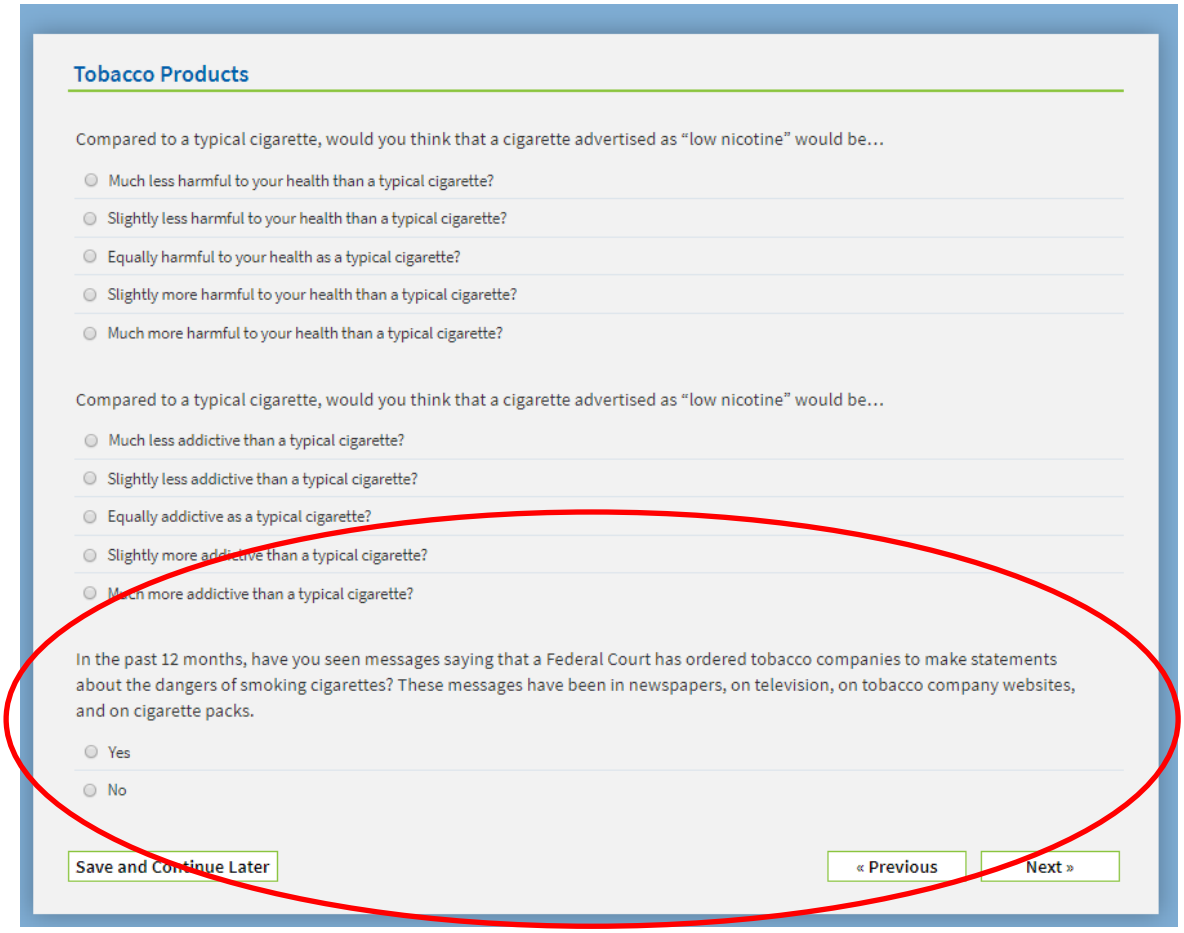
- ☐ Yes
- ☐ No → **GO TO L1 on the next page**

K13. Which of the following messages have you seen?

Mark all that apply.

- ☐ That a Federal Court has ordered tobacco companies to make statements about the health effects of smoking.
- ☐ That a Federal Court has ordered tobacco companies to make statements about the health effects of secondhand smoke.
- ☐ That a Federal Court has ordered tobacco companies to make statements about the addictiveness of smoking and nicotine.
- ☐ That a Federal Court has ordered tobacco companies to make statements about how cigarettes are designed to enhance the delivery of nicotine.
- ☐ That a Federal Court has ordered tobacco companies to make statements about low tar and light cigarettes being just as harmful as regular cigarettes.

Exhibit 2. Web page with question about hearing messages from tobacco companies



Respondents who selected the web versus the paper survey significantly differ across many of the 44 measures compared above. Web respondents were more likely to be tech savvy (Tables 2-7 and 2-8). This is illustrated by the fact that web respondents were more likely to have access to the internet, to look for health information on the internet, to use the internet to communicate with a doctor, to access the internet through a cellular network, to access on-line medical records, and to use a wearable health tracking device. There is also some indication that web respondents see doctors less frequently and have a lower opinion of doctors as a source of care. This is indicated by significant differences showing web respondents were also less likely to visit a doctor in the last 12 months, less likely to have smoked 100+ cigarettes in their lifetime, less likely to believe health professionals always spend enough time with them, and less willing to first go to a doctor regarding health or medical topics.

Table 2-7. Comparison of key HINTS estimates by completion mode compared to external benchmarks (NHIS & MEPS)

Variable	Completed by Paper N = 1,201	Completed by Web N = 865	2017 NHIS estimates
Access to Internet	73.9*	94.7*	77.8
Excellent, very good, or good health	83	83.8	89.9
Smoked 100+ cigarettes in life time	40**	28.2**	36.3
Never visited doctor in the past 12 months	12.2*	19.2*	16.3
Looked for health information on the Internet in the past 12 months	64.3*	81.2*	53.6
Used Internet to communicate with doctor in the past 12 months	34.3*	53.3*	14.6
Variable	**Completed by Paper**	**Completed by Web**	**2015 MEPS estimates**
Health professionals always explain things in a way you understand	67.2	66.7	66.7
In past 12 months, health professionals always spend enough time with you	56.7*	44.6*	57.2

Note: ** $p < 0.01$, * $p<0.05$. Significance tests are for comparing the final calibrated estimates of the respondents who returned a paper survey compared to those who returned a web survey.

Table 2-8. HINTS final calibrated estimates found to be significantly different between web and paper respondents in the mixed-mode data collection groups for measures without benchmarks

HINTS estimate category and topic	Completed by Mail	Completed by Web
Demographics		
Household with children	22**	33.3**
Communication		
Access Internet through a cellular network	64.8**	79.3**
Health communication		
Trust a doctor regarding health/medical topics a lot	67.4*	74.4*
Would go to doctor regarding health or medial topics first	50.4**	36.6**
Accessed OMR 1 or more time in last 12 months	33**	47.2**
Health and health services		
Heard of HPV	62.8**	76.7**
Ever had a PSA test	50.5**	29.5**
Ever had test for colon cancer	59.5**	32.9**
Health behaviors		
Used a wearable health tracking device in past 12 months	20.9**	38**
Other topics		
Seen tobacco messages about dangers of smoking	41.7**	55.7**

Note: **p <.01, *p < .05). Significance tests are for comparing the final calibrated estimates of the respondents who returned a paper survey compared to those who returned a web survey.

To explore if the selection of the mode can be explained by demographics, we fit logistic regression models predicting each of the measures with a significant difference with the mode selected, age, gender, race/ethnicity, marital status, education, home ownership (yes vs. no), household with children (yes vs. no), single-person household (yes vs. no), and stratum (high minority vs. low minority stratum). The mode coefficient is not significant for several of these models (Table 2-9). Web respondents still report being more likely to access the internet, use it to communicate with their doctor, to have heard of HPV, and to have seen messages on the health effects of smoking. They are also still less likely to think health professionals always spend enough time with them and to have had a test for colon cancer.

Table 2-9. Statistical significance of mode after demographic and socioeconomic factors have been controlled in a logistic regression predicting selected HINTS measures

HINTS estimates	Significant after Demographic controls?
Access to the internet	yes
Smoked 100+ cigarettes in life time	No
Never visited doctor in the past 12 months	No
Looked for health information on the internet in the past 12 months	No
Used Internet to communicate with doctor in the past 12 months	Yes
In the past 12 months, health professionals always spend enough time with you	Yes
Access Internet through a cellular network	Yes
Trust a doctor regarding health/medical topics a lot	No
Would go to doctor regarding health or medial topics first	No
Accessed OMR 1 or more time in last 12 months	No
Heard of HPV	Yes
Ever had a PSA test	No
Ever had test for colon cancer	Yes
Used a wearable health tracking device in past 12 months	No
Seen tobacco messages about dangers of smoking	Yes

In summary, for the 44 HINTS measures that were compared, four were found to be statistically different between the paper-only and one of the two web groups. Three of these are related to differences between the paper-only group and the web bonus group. The one difference for the web option group (feeling nervous, anxious, or on edge.) dropped to insignificance once controlling for demographic and other characteristics. The fact that more differences were observed for the web bonus group suggests that either the types of respondents that responded to the survey in this group were different or there were differences because of a variation in the mode of response. Further analysis is needed to assess which of these two explanations may be true, although the design of the pilot does not allow for cleanly distinguishing between these two effects. The summary section provides guidance on how users of the data can decide how to combine the data across the different modes.

2.4 Data Quality Measures

A key benefit of web data collection is the ability to improve data quality relative to paper. When filling out a paper survey, respondents have to navigate and answer the survey correctly on their own. When they fail to do so, this can result in missing data and added data processing and cleaning costs. Fewer respondent mistakes improves the utility of the data and power for analysis. Web surveys make responding easier by automatically navigating respondents through skip patterns. They

also include edit checks which prevent respondents from entering out-of-range or illogical values. In addition, web surveys can be programmed to intervene when respondents exhibit undesirable behavior such as straightlining or speeding. This pilot study experimented with the utility of these interventions.

Item Nonresponse

Item non-response refers to when a particular question that should be answered does not have a usable response. On the paper questionnaire, this can occur for at least three reasons:

1. The item is intentionally skipped;
2. The item is inadvertently skipped because of not following skip instructions; and
3. Filling in a response that is not usable (e.g., does not clearly check a box; writes in a response that is out of range or wrong format).

The web survey was programmed to minimize the second and third reasons for item nonresponse by using computerization.

Item nonresponse rate is defined as the percent of questions that a respondent was expected to answer but did not. For purposes of evaluation, this rate only includes questions that were asked of everyone. The overall item nonresponse rates shown in Table 2-10 were very close across the three groups and not significantly different after controlling for the demographic characteristics ($F^2_{5419} = 0.37, p = 0.69$).

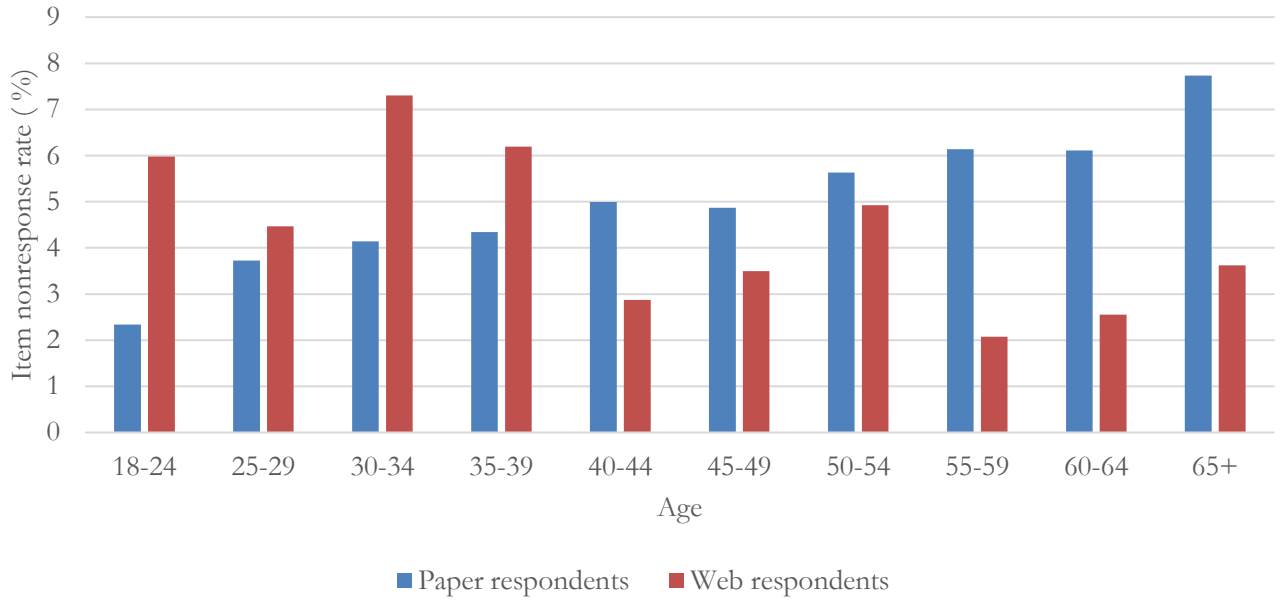
In the mixed-mode groups, the item nonresponse was higher for web respondents in the web option group than the web bonus group, whereas the item nonresponse was lower for paper respondents in the web option group than the web bonus group. One issue with comparing these rates is that respondents were self-selected into a particular mode. For example, younger people were more likely to respond by web than by paper. Differences in missing data may also reflect differences in age. To control for these differences, a generalized linear model (GLM) was fit that predicted item missing data using the mode of response, experimental group, and demographic characteristics. This regression found significant less missing data on the web for the bonus group. This was statistically significant after controlling for the demographic characteristics ($F^1_{2014} = 5.70, p = 0.02$).

Table 2-10. Item nonresponse rates by data collection group and response mode

Assignment Group	Average Item Nonresponse Rate					
	Web Respondents		Paper Respondents		Overall	
	N	Percent	N	Percent	N	Percent
Web option	246	4.3	740	4.9	986	4.7
Web bonus	619	3.3	461	6.5	1,080	4.7
Paper only	NA	NA	3,372	4.6	3,372	4.6

There was also a significant two-way interaction between completion mode and age on item nonresponse rate ($F^{9}_{2014} = 2.79, p = 0.003$). Figure 2-1 presents the estimated item nonresponse rate by completion mode and age, adjusting for other effects in the model. For younger respondents (aged 18-34), the estimated item nonresponse rate was higher for web than for paper respondents. In contrast, for older respondents (aged 40+), the estimated item nonresponse rate was higher for paper than for web respondents.

Figure 2-1. Estimated item nonresponse rate by completion mode and age after controlling for other predictors.



This analysis did not find evidence that the paper-only mode had significantly more missing data than the two web groups when restricted to just those items that everyone was supposed to answer. Further analysis should examine whether items that are administered after skip patterns differ by the two groups.

When comparing paper and web survey response for the two experimental groups, differences were found between the modes. The web survey data produced a lower missing data rate than the paper survey even after controlling for demographic characteristics. Interestingly, this effect varied by age, with younger respondents having more missing data for web, while older respondents had more missing data for paper.

Straightlining

Straightlining is indicative of low respondent effort and 'satisficing' behavior (putting forth minimal effort). This is thought to be correlated with measurement error. Table 2-11 shows that the straightlining rates across groups were within two percentage points and not significantly different.

Table 2-11. Straightlining rates by data collection group

Assignment Group	Straightlining	
	Number	Percent
Paper only	3,361	26.1
Web Option	980	26.9
Web Bonus	1,079	25.2

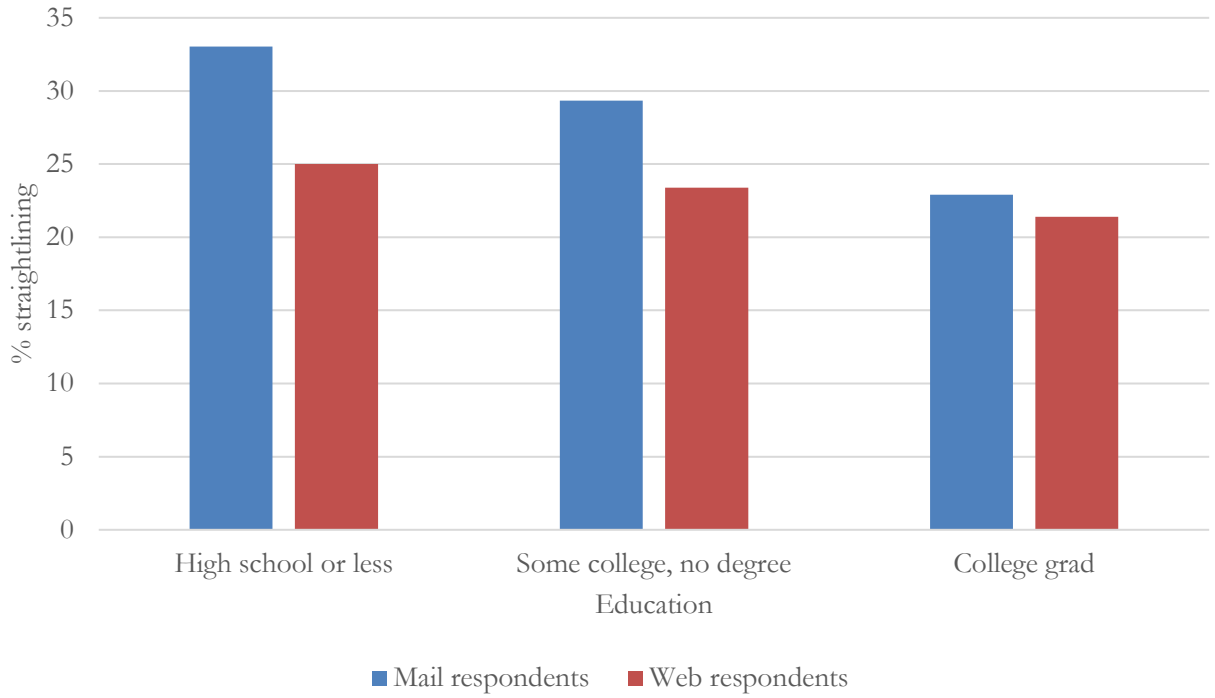
In the mixed-mode groups (Table 2-12), the straightlining rates were significantly lower for web respondents than paper respondent ($F^{1}_{2057} = 81.2, p < 0.0001$).

Table 2-12. Straightlining for mixed-mode groups by survey mode

Assignment Group	Straightlining			
	Web Respondents		Paper Respondents	
	Number	Percent	Number	Percent
Web Option	246	22.1	740	28.5
Web Bonus	619	21.3	461	30.5

There was a significant two-way interaction between completion mode and education on straightlining after controlling for data collection groups and other demographic characteristics ($F^{2}_{2007} = 3.94, p = 0.02$). Figure 2-2 presents the estimated percent of straightlining by completion mode and education, adjusting for other effects in the model. For college graduates, the estimated percent of straightlining was similar for web and paper respondents. However, for respondents with lower educational attainment, the estimated percent of straightlining was lower for web than for paper respondents.

Figure 2-2. Estimated percent of straightlining by completion mode and education after controlling for other predictors.



Similar to the results on missing data, straightlining did not differ across the assigned experimental groups. However, there were differences when comparing by response mode for the two web groups. The web survey respondents exhibited less straightlining than the paper survey. Straightlining behavior was more common for less educated respondents and this effect was consistent across modes.

Speeding

Speeding is when the respondent goes through the question so fast that it is unlikely that they have time to read the question and formulate an answer. One hypothesis is that speeding may occur more frequently for web bonus respondents if these individuals choose to quickly skip to the end in order to get their incentive. While the speeding rate was slightly higher in the web bonus group than the web option group, the difference was not statistically significant. Therefore, the bonus incentive did not appear to impact speeding substantially (Table 2-13).

Table 2-13. Speeding rates by web respondents

Assignment Group	Speeding	
	Number	Percent
Web Option	246	34.3
Web Bonus	619	35.1

Note: The percent of speeding is calculated as the proportion of the 19 grid-type questions in which the respondent sped (answered faster than expected given expected reading rates).

Completion Time

Completion time is a commonly used indicator of survey burden. It is ideal to minimize the length of a survey to the extent possible. By facilitating navigation, it can reduce the time it takes to respond to the web survey relative to paper. However, if the web instrument is not well designed, the opposite could be true. Similar to speeding, it is possible that the web bonus group's completion time is lowered because some respondents sped through quickly just to get their incentive.

While this cycle of the paper HINTS questionnaire did not include a question capturing response time, we know from previous rounds of HINTS that respondents report that the paper instrument takes on average 30 minutes to complete. On the web survey it was possible to calculate completion time directly.[5]

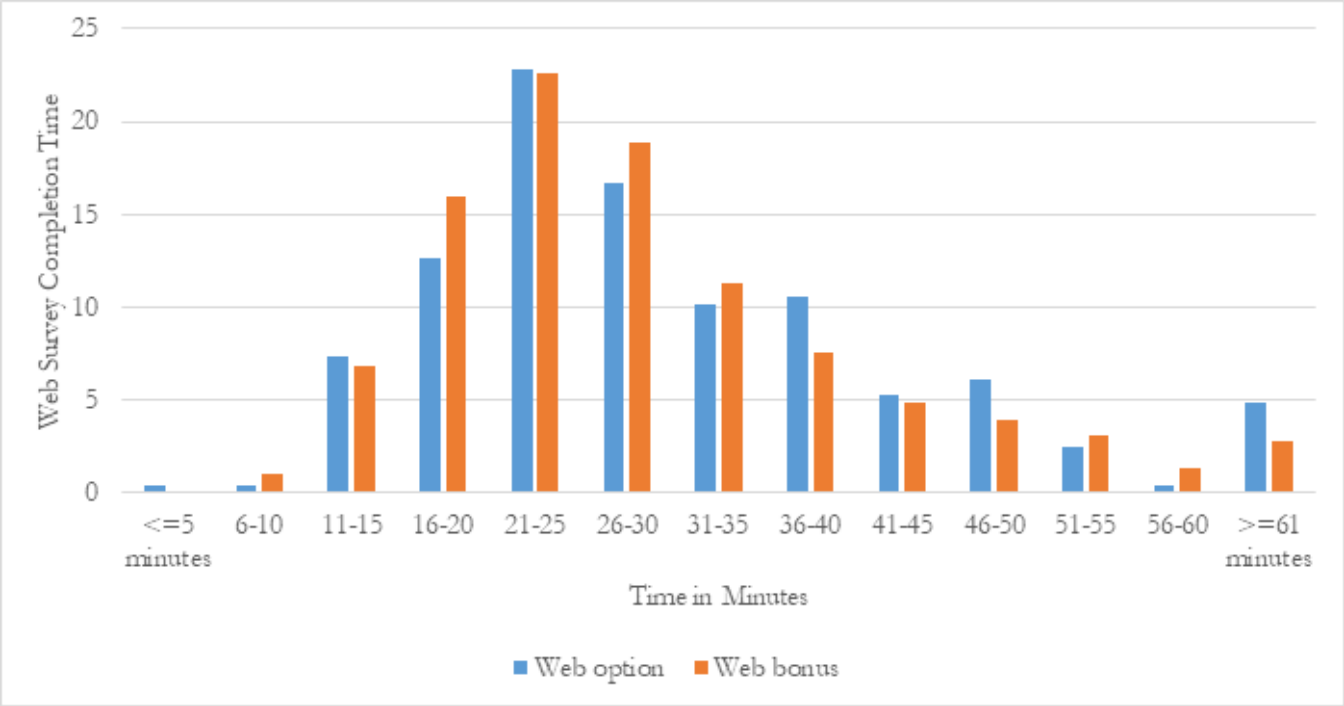
Table 2-14 presents the average completion time for the web respondents in the web option and web bonus groups and the distribution of web response times by group is presented in Figure 2-3. The mean web completion times for web option and web bonus groups were 29.5 minutes and 28.2 minutes, respectively. The difference of 1.3 minutes is marginally significant after controlling for the demographic characteristics ($F_{847}^{1} = 3.32, p = 0.07$). The time respondents spent on completing the survey was close between modes. These findings suggest that the web instrument takes no more time than the paper instrument to complete and perhaps even less time.

[5] Web survey completion time is calculated as the difference in minutes between the web survey login and submission of the completed survey. This could happen in one session or over multiple sessions (e.g. the respondent may break off and then log in again to complete the survey). We truncated completion time to eliminate the impact of extreme values on distribution. Completion time below the bottom 5% of the distribution is set to be 11.3 minutes (5% of the distribution), and completion time above the top 5% of the distribution is set to be 54.1 minutes (95% of the distribution).

Table 2-14. Completion time by data collection group

Completion Group	Minutes to complete
Paper-only	30 (estimate)
Web Option (web only)	29.5
Web Bonus (web only)	28.2

Figure 2-3. Web survey completion time distribution for web option and web bonus groups



2.5 Prompt Intervention

One potential advantage of the web is that it enables the researcher to intervene when respondents are exhibiting undesirable behavior. One way to intervene is by prompting respondents. However, it is possible that interventions elicit negative reactions from respondents and lead to increased dropout. The pilot experimented with two types of prompts for respondents opting to reply via web. We examined the effects of these prompt on web response rates and data quality measures.

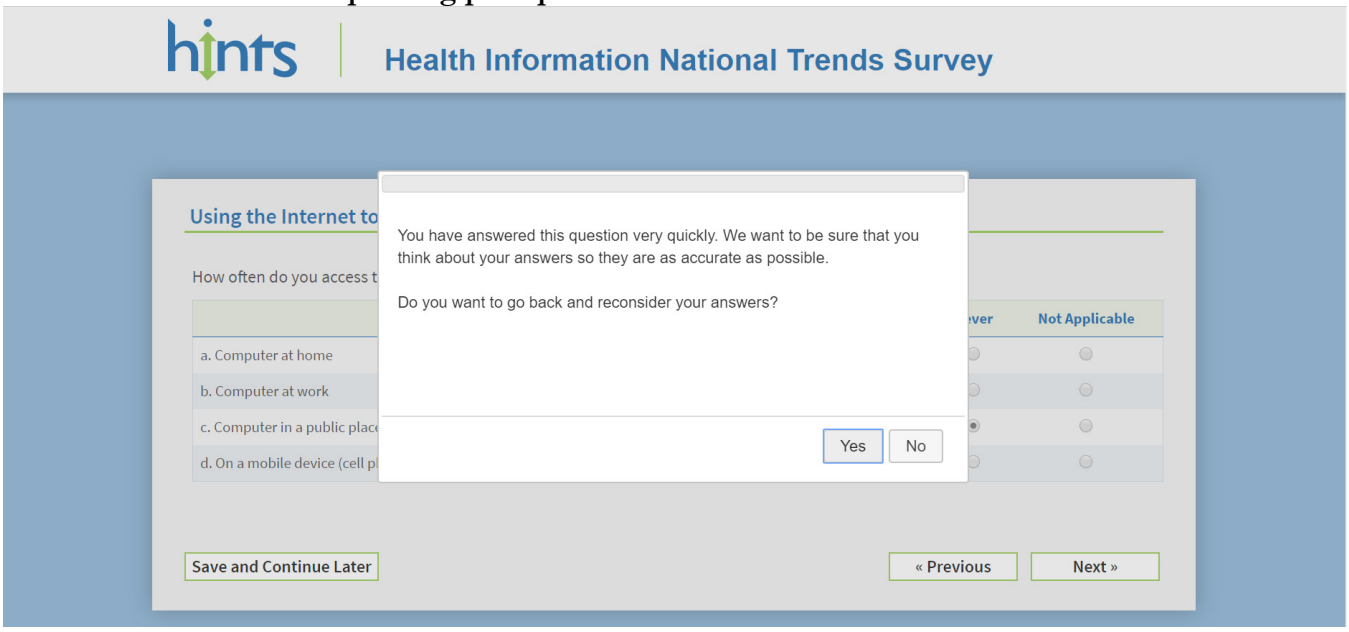
Prompting Design Details

Those respondents who were in the two mix-mode groups and chose to respond by web were assigned to either receive or not receive prompts. Among those in the prompt group, two types of prompts were used. One targeted speeding and the other targeting straightlining. Respondents were prompted the first time they exhibited each of these undesirable behaviors and were only prompted once for each type of behavior. Therefore, the maximum number of prompts that a respondent could receive was two.

Speeding intervention. To reduce speeding, a prompt was applied to nineteen grids throughout the web instrument (see Appendix F). Respondents were considered to be speeding on a given page if they answered the questions on that page in less time than a given threshold. The threshold was calculated based on the number of words in the grid multiplied by the respondent's expected reading speed. Consistent with Conrad et al. (2017)[6], we used two age-based reading speeds. Those age 18-34 were assigned a faster reading speed (300 milliseconds per word) than those age 35 and older (350 milliseconds per word). In order to implement two speeding thresholds in the web instrument, age was asked at the beginning of the survey instead of in its usual location in the last section on demographics. The language for the speeding prompt is shown in Exhibit 3.

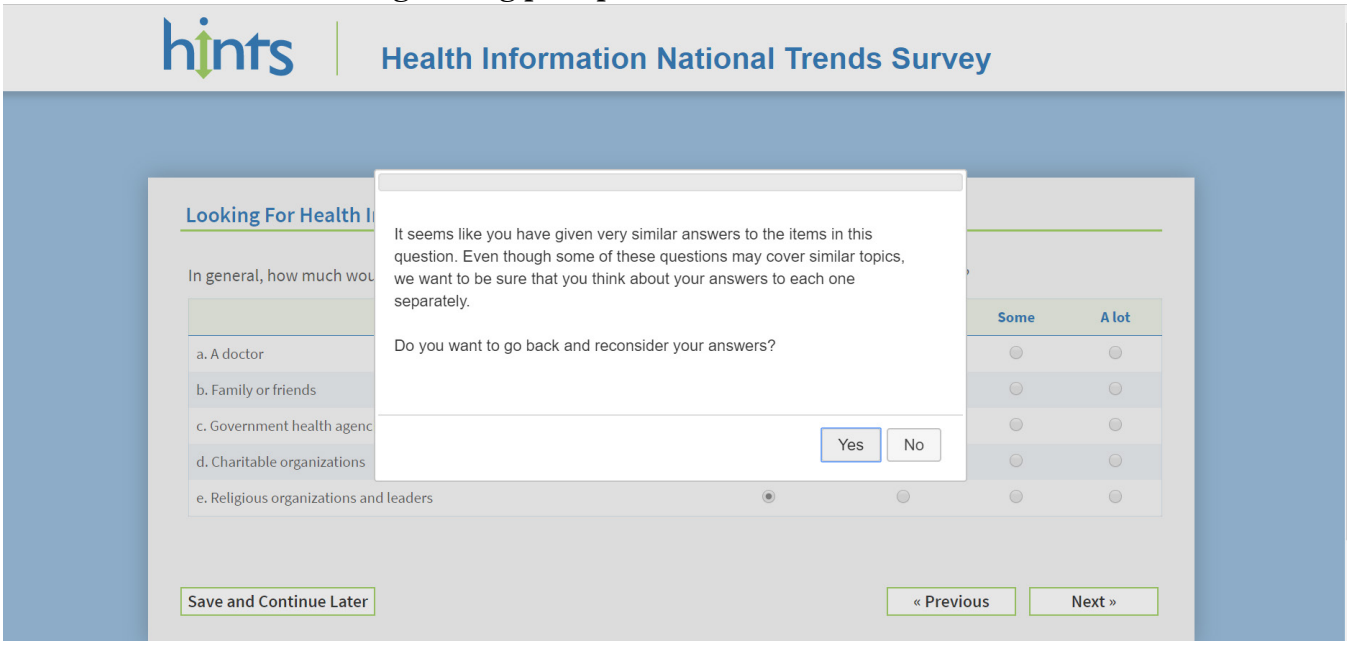
[6] Conrad, F., Tourangeau, R., Couper, M., & Zhang, C. (2017, April). Reducing speeding in web surveys by providing immediate feedback. Survey Research Methods, 11 (1), 45-61.

Exhibit 3. Screenshot of speeding prompt



Straightlining intervention. The straightlining intervention was applied to eight grids in the web instrument. These eight grids (see Appendix F) were selected based on an assessment that there was a low likelihood that a given respondent would choose the same response for all of the items within the grid. The intervention was triggered when a respondent selected the same response for all of the sub-items within a grid and then clicked 'Next'. The language for the straightlining prompt is shown in Exhibit 4.

Exhibit 4. Screenshot of straightlining prompt



The majority of web respondents were prompted for each type of prompting intervention (Table 2-15). In the web option group, 87.4% of the web respondents assigned to the prompt condition were prompted for straightlining and 78.2% were prompted for speeding. The differences between the two web groups on being prompted were not statistically significant.

Table 2-15. Rate at which prompting interventions were invoked in the web option and web bonus groups

Type of Prompt	Web option	Web bonus
Invoked straight-lining prompt (%)	87.4	91.1
Invoked speeding prompt (%)	78.2	77.9

Prompting Interventions and Web Response Rate

It is possible that the prompting interventions could suppress web response rates if respondents react negatively to them. The overall unweighted web response rate was about 2 percentage points lower when there were prompt interventions (10.2%) as compared to when there were no prompts (11.8%) (see Table 2-16). This difference was significant ($x^2(1) = 5.18, p = 0.02$).

Table 2-16. Web response rates by data collection group and prompting intervention condition

Group Assignment		Web Response Rate (unweighted)	Overall Response Rate (unweighted)
Prompt interventions if needed	Web option	6.1	24.8
	Web bonus	14.3	26.6
	Total	10.2*	25.7
No prompt interventions	Web option	6.4	25.2
	Web bonus	17.1	28.1
	Total	11.8*	26.7

Note: Significant difference between the prompting and no prompting conditions (*p < 0.05).

The intervention does seem to have a different effect for the two different web groups. For the web bonus, the difference was approximately three percentage points and significant ($x^2(3) = 5.85, p = 0.02$), while it was only 0.3 percentage points for the web option (not significant). However, the two-way interaction between assignment group and prompt interventions on web response rate was

not statistically significant ($x^2(3) = 0.85, p = 0.36$). The difference found for the web bonus group was not large enough to be manifested in a significant interaction.

In terms of the effect on the overall response rate once including the paper surveys, there are nominal differences across the groups that mirror those for respondents that selected to use the web. The web bonus condition without the prompts has the highest response rates (28.1%), while the web bonus with the prompts is about 1.5 points lower (26.6%). However these differences are not statistically significant.

The difference in web response rates between the prompt and no-prompt groups for the web bonus group may be explained by the types of respondents who selected to use the web. To assess this, we fit a logistic regression predicting web response status using group (web option vs. web bonus), prompt interventions (yes vs. no), demographic characteristics, and two-way interactions between prompt interventions and each demographic characteristic. The impact of prompt interventions becomes insignificant after controlling for other predictors. There were also no significant two-way interactions between prompt interventions and demographic characteristics on web response rates. This suggests that other predictors (data collection group and demographic characteristics) in the model explain the differences observed in the two-way cross tabulation.

A second possible effect of a prompt is the respondent dropping out of the survey. To assess this, dropout rates were examined by prompt condition. Among all the respondents who ever logged into the web survey, only 18 dropped out of the survey and became nonrespondents. These respondents dropped out early on, either in the within-household selection section or Section A of the survey. Therefore, the effect of the prompt intervention on the dropout rate was negligible.

Data Quality Measures

A number of data quality measures were examined and compared between the prompt conditions and option vs. bonus web groups (Table 2-17). Of note:

- The web completion time was significantly slower by about 2 minutes for respondents assigned to prompt interventions as compared to those with no prompts ($F^1_{862} = 8.12, p = 0.005$). The effect was consistent across the web option and the web bonus groups.
- The item nonresponse rate was lower for prompts as compared to no prompts for the web option group but not the web bonus group.

- The percent straightlining was significantly lower for the prompting intervention groups as compared to no prompts ($F^1_{862} = 10.48, p = 0.001$).

- The effects of prompts on speeding were statistically significant ($F^1_{862} = 39.76, p < 0.0001$). The percent of speeding was about 14 points lower for prompts as compared to no prompts in the web option group, a

Table 2-17. The effects of prompt interventions on data quality measures

Data quality measures	Prompt interventions		No prompt interventions	
	Web option	Web bonus	Web option	Web bonus
Completion time (minutes) **	31.0	29.2	28.2	27.3
Item nonresponse rate (%)	3.6	3.3	5	3.3
Straightlining (%)**	19.8	19.5	24.3	22.7
Speeding (%)**	27.1	29.6	41.1	39.7
n	119	281	127	338

Note: Significant difference between the prompting and no prompting conditions (** p < 0.01, *p < 0.05).

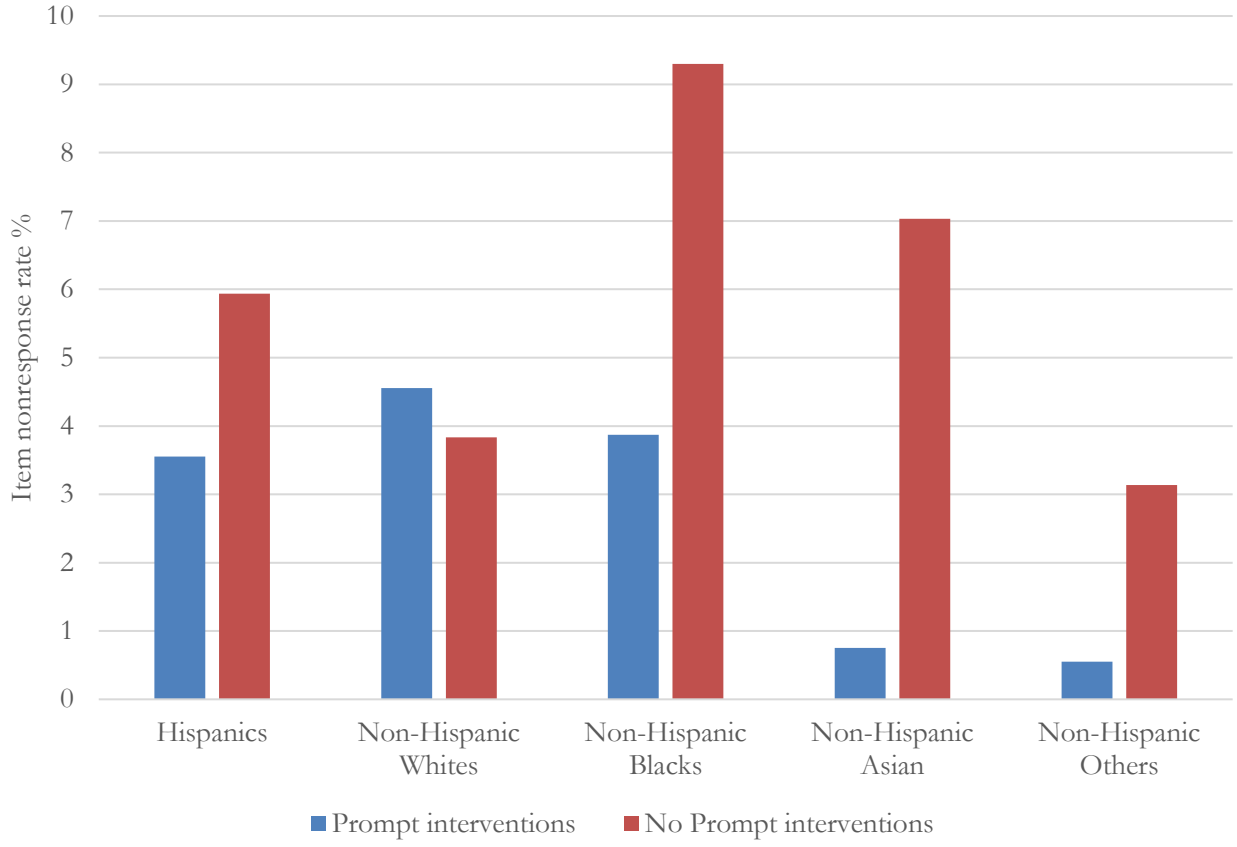
Overall, we saw improved data quality in the prompt condition as compared to the no prompt condition. Respondents spent more time answering the web survey, had lower percent of straightlining, and had lower percent of speeding.

Prompt Interventions and Demographic Characteristics

We also investigated whether the impact of prompt interventions on the data quality measures vary by demographic characteristics to see if some respondents were more affected by the prompts than others. We fit generalized linear models predicting each data quality measure using group (web option vs. web bonus), prompt interventions (yes vs. no), demographic characteristics, two-way interactions between modes and each demographic characteristic, and two-way interactions between prompt interventions and each demographic characteristic. The effects of prompts were significant in all models after controlling for other predictors. Just one model found a significant two-way interaction between prompt interventions and a demographic characteristic (race/ethnicity). This was the model predicting item nonresponse rate ($F^4_{813} = 2.66, p = 0.03$). Figure 2-4 illustrates the estimated item nonresponse by prompt interventions and race/ethnicity, adjusting for other effects in the model. For non-Hispanic Whites, the item nonresponse rate from the prompt condition was higher than the estimate from the no prompt condition. However, for other race/ethnicity groups, the item nonresponse rate for the prompt condition was much lower than the estimate from the no

prompt condition. None of the two-way interactions between prompt interventions and demographic characteristics had significant effects on straightlining or speeding after controlling for other predictors in the model. These findings suggest that the prompting interventions worked consistently across demographic subgroups in minimizing data quality issues.

Figure 2-4. Item nonresponse rate for web respondents in mixed mode conditions by race/ethnicity and by whether respondent was part of the prompting intervention



In summary, the use of prompt interventions slightly reduced the web response rate as compared to the no prompt condition. However, the prompting interventions made substantial improvements on data quality. Respondents assigned to the prompt condition spent more time on the survey, exhibited less straightlining, and less speeding. The effects of prompt interventions on data quality do not vary dramatically across respondent demographic characteristics.

2.6 Cost Effectiveness

Cost analyses help determine whether any of the experimental treatments can provide enhanced data collection efficiency by reducing the number of mailings and lowering data processing costs. This analysis considers the three main components of costs for the survey:

1. Mailing costs – This includes the postage for the outgoing mailings (including Priority Mail) as well as the postage-paid return envelopes for completed surveys.

2. Incentives – This includes the $2 pre-incentive sent to all sampled households as well as the $10 Amazon gift card that was used for the web bonus condition.

3. Data collection – This includes instrument programming, labor for handling the mailing materials, printing, and data processing costs.

All costs are presented as ratios relative to the paper survey that is currently being used for HINTS. The costs are computed with several variations. One is with and without mailing costs. HINTS is unique in that NCI pays for postage completely separately from other HINTS costs and therefore it is not usually considered part of the HINTS budget. Because of this separation, HINTS was not able to capitalize on this specific cost savings that would normally be expected from a mixed-mode design. However, it is instructive to look at costs with postage to show effectiveness for a survey that does have to pay postage. The second variation in this analysis is the assumption about programming costs. "Current" costs are what was incurred for the pilot, while "future" costs reduce the web programming by 50%. The distinction recognizes that the pilot absorbed startup costs related to programming the basic infrastructure of the survey, such as the website design, the prompting interventions, and collection of paradata. Future surveys will use this infrastructure and modify it based on revisions to the questionnaire. All other things equal, we would expect lower programming costs for future, similar, HINTS cycles. Finally, the above costs were calculated based on costs per sampled household as well as costs per completed survey.

As seen in Table 2-18, the costs for the two mixed-mode conditions are higher than the costs for the paper-only condition. For costs per sampled households, the ratio of the web bonus design to the paper-only survey ranged from 1.66 to 1.77, depending on whether mailing costs are included. Much of the difference is for the programming of the survey. The ratios range from 1.24 to 1.33 when programming is reduced to account for future efforts. We believe that if the web survey is done on a routine basis, it is likely the programming costs will go down further, as long as significant changes to the web program/site are not made. Interestingly, even though the web bonus includes an additional $10 for completed surveys, the costs are comparable to the web option. This is because

the bonus condition results in more web surveys, which reduces the processing of the paper surveys. The web bonus group's ratio is actually lower than the web option group (1.66 vs. 1.57 for current; 1.33 vs. 1.24 for future) when mailing costs are included. The further reduction is because fewer surveys have to be mailed out in the follow-up contacts because the response rate is somewhat higher.

The cost per complete metric accounts for the overall response rate. For HINTS, the sample size needed to achieve a target number (e.g., 3,500) is a function of the response rate. These ratios are lower than when using the costs per sampled household. For current costs, the ratios of the web bonus to the paper survey range from 1.45 to 1.74. For future data collections, these ratios are 1.14 with mailing costs and 1.22 without mailing costs. When looking at cost per completed survey, the bonus group is lower than the option group regardless of whether it is the current or future calculation.

Table 2-18. Cost effectiveness across modes

Cost Ratio	Paper-only	Web Option	Web Bonus
Cost per sampled household			
Current cost (with mailing costs)	1	1.66	1.57
Current cost (no mailing costs)	1	1.72	1.77
Estimated costs for future data collection (with mailing costs)	1	1.33	1.24
Estimated costs for future data collection (no mailing costs)	1	1.28	1.33
Cost per complete			
Current cost (with mailing costs)	1	1.68	1.45
Current cost (no mailing costs)	1	1.74	1.63
Estimated costs for future data collection (with mailing costs)	1	1.34	1.14
Estimated costs for future data collection (no mailing costs)	1	1.29	1.22

Conclusions and Discussion 3

We carried out the pilot study to assess whether the use of a mixed-mode approach for HINTS could push enough people to the web to improve data quality and decrease costs while maintaining, or perhaps improving, response rates.

Impact on Response Rates

The differences in response rates between the data collection groups were not statistically different. The web option group had the lowest response rate (29.6%), the paper group had the middle response rate (30.2%) and the web bonus had the highest (31.5%). The use of a bonus incentive for web response significantly improved the web response rates as compared to the web option group which offered no additional incentive. These findings indicate that while offering a web option for HINTS respondents will not hurt response rates, an option without an incentive has many fewer people select the web as a response mode relative to the bonus condition.

Impact on Sample Composition

The web bonus group generally improved coverage for young people. The percentage of persons 18-34 was significantly higher than both the paper and the web option group. This seems to have resulted in healthier (less cancer), more tech savvy, unmarried, and higher educated respondents as compared to the paper-only (standard HINTS) procedure.

There is a clear advantage of the bonus incentive procedure. Nonresponse on HINTS using the paper survey is higher among healthier, younger individuals. By increasing the response by these individuals, the procedure should reduce bias associated with the current survey. It should be pointed out, however, that while the bonus procedure improves coverage of these groups, the overall profile relative to key benchmarks (e.g., ACS) still results in under-representing these groups.

HINTS Estimates

Among forty-four Cycle 3 estimates examined, there were four significant differences between the paper-only group and one of the mixed-mode group's estimates. Some of the differences were relatively small (e.g., <5%), but a few others were larger. One of these four differences was explained once controlling for the demographic and socioeconomic characteristics of the respondents. Three of the differences remained. It is unclear why differences remained after controlling for individual characteristics. It may be by chance – given that 88 comparisons were made and 4 were statistically significant, this is expected by chance. If not by chance, then these are either due to differences in the types of respondents who responded by the web or an effect of mode of communication. The analysis did control for some demographics, but differences due to sample composition could still be the reason for the differences in the estimates. Analysis of who selected to use the web found a number of differences in use of the internet and other health related measures. For example, those responding by web may be more tech savvy or less likely to have health problems. A second possible explanation is the mode of communication. Responding to particular questions on the web may lead to different answers than when responding by paper. Generally, research does not find big differences between the web and paper mode, as they are both self-administered. Further analysis is needed to assess this more thoroughly.

Impact on Data Quality

We did not find significant differences in the amount of item-missing data for the paper-only condition and the two web groups. This analysis is limited to items that everyone received. More analysis is needed to assess missing data for items that are for questions that result in a skip pattern.

The other measure of data quality common to the paper and web groups was straightlining. The analysis did not find a significant difference between the three experimental groups on this measure.

Impact of Prompting Intervention on Web Response Quality

The use of prompt interventions made substantial improvement on data quality among web respondents. Web respondents assigned to the prompt condition spent more time on the survey, had lower percent of straight-lining, and lower percent of speeding. We saw a consistent impact of prompt interventions on data quality across the different demographic groups with the possible exception of the impact of race/ethnicity on item nonresponse. The prompt intervention condition exhibited a slightly reduced web response rate as compared to the no prompt condition. However,

this effect was insignificant after controlling for other factors (group and demographic characteristics).

Cost Effectiveness

Several different variations on the costs were provided. One was whether it included the cost of postage or not. This was done to provide data on the costs included in the HINTS budget (no postage) and the costs for surveys that normally included these. A second variation was to provide costs for the current pilot versus future costs. The future costs reduced the programming costs by about 50% in recognition that the infrastructure for the web survey has been built for the pilot and there would be incremental costs associated with changing the questionnaire for future cycles.

The data were also displayed by the cost per completed survey versus costs per sampled household. We believe the cost per complete is the best gauge because it directly accounts for the response rates across the three different conditions.

The cost per complete survey is lowest for the paper-only condition. For the costs without the postage, the ratio with the web bonus is 1.63 (current) and 1.22 (future). Going forward, therefore, this translates to an increase of 22% in the data collection and processing costs if the web bonus were used.

The costs for the web option, without postage, are somewhat higher (1.74 vs. 1.29). This web option is more expensive relative to the web bonus because fewer people go to the web. Furthermore, the $10 incentive pays for itself in not only getting more people to the web, but also increasing the response rate.

Discussion

Table 3-1 provides a brief synopsis of the outcomes associated with the web pilot experimental factors.

Table 3-1. Outcomes associated with experimental factors

Experimental factor	Increase response rates?	Increase web response?	Improve representativeness?	Improve data quality?	Increase costs?
Offer a mixed mode design (paper and web)			X		X
Offer a bonus incentive for web response		X	X	X	X
Using prompting interventions on web survey				X	

The findings from the web pilot suggest that offering the web response option with a bonus incentive led to a more diverse group of survey participants than offering exclusively a paper option. It also led to significantly more web respondents relative to offering no bonus incentive. The use of prompt interventions improved the data quality for the web survey as compared to the no prompts condition. These benefits of improved representation and higher data quality came with an approximately 22 percent higher cost for future data collection and processing relative to the current paper survey. The latter uses the costs associated with a future survey, after discounting for lower programming costs.

Comparing estimates between the paper and web bonus surveys found relatively small differences (i.e. <5%). Some of these differences could be explained by the higher number of younger people drawn into the survey. There were some remaining differences that could not be explained by controlling for demographics or other characteristics. Some of this may be a further effect of drawing in respondents who are more tech savvy and healthier beyond the simple control for age. Another possibility is that there may be some effects of the mode of response. Further analysis can provide more insight into these differences.

With respect to analyzing these data for HINTS data users, the relatively small differences observed across a wide range of measures should enable analysts to combine the data into a single data-set. Prior to doing this, however, we recommend analysis by the three experimental groups to assess whether the particular outcomes differ in a meaningful way. This can be done by combining the datasets, creating weights using the methods when comparing across HINTS cycles. If there are

meaningful differences, then the experimental groups should be controlled in analytic models. At this point we do not recommend placing further controls for the mode of the survey, since this is highly correlated with other variables that are natural correlates to most of the HINTS outcomes (e.g., age, sex, health).

Limitations and Future Research

One of the limitations of this study is that the power for comparing survey outcomes and measures of data quality could not detect relatively small effects (e.g., <5%). The analyses discussed above, therefore, provide results that detect large effects. Having said this, however, there were very few observed differences between outcomes and measures of data quality that were large.

A second limitation is that the design cannot directly assess differences in HINTS outcomes because of mode. Sampled members in the two mixed-mode groups could choose to either respond by mail or by web. They were not randomly assigned. Of course, this is a limitation for virtually all mixed modes surveys outside of the experimental laboratory. Mixed mode studies are common and the best practice is to combine across modes which are compatible. Web and paper surveys are two such modes. Nonetheless, further research is needed to assess whether any of the differences across modes observed in this study may be due to different survey formats or contexts.

The immediate next steps should be to assess the item missing data for items that were subject to a skip pattern. This would more thoroughly assess the effects of computerization on the skip patterns.

This pilot tests two different types of designs. Both concurrently offered a web or paper mode. A third design that was considered when designing this study was a sequential one which offers the web at the first mailing and then paper at follow-up mailings. This has been used on other mixed mode surveys of this type with some success (e.g., response rates, percent using the web). This is a design that should be considered if a web option is adopted for the ongoing HINTS. It may result in a higher response rate and/or more individuals going to the web.

Appendix A

Paper Questionnaire

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Health Information

National Trends Survey

hints

DEPARTMENT OF HEALTH & HUMAN SERVICES · USA

NIH

H5–C3

START HERE:

Instructions

- ▶ Please use a black or blue pen to complete this form.
- ▶ Mark ☒ to indicate your answer.
- ▶ If you want to change your answer, mark ▩ on the wrong answer.

1. Is there more than one person age 18 or older living in this household?

☐ Yes
☐ No → **GO TO A1 on the next page**

2. Including yourself, how many people age 18 or older live in this household?

3. **The adult with the next birthday should complete this questionnaire.** This way, across all households, HINTS will include responses from adults of all ages.

4. Please write the first name, nickname, or initials of the adult with the next birthday. This is the person who should complete the questionnaire.

Si prefiere recibir la encuesta en español, por favor llame 1-888-738-6812

36491

A: Looking For Health Information

A1. Have you ever looked for information about health or medical topics from any source?

- ☐ Yes
- ☐ No → **GO TO A5 in the next column**

A2. The most recent time you looked for information about health or medical topics, where did you go first?

Mark only one.

- ☐ Books
- ☐ Brochures, pamphlets, etc.
- ☐ Cancer organization
- ☐ Family
- ☐ Friend/Co-worker
- ☐ Doctor or health care provider
- ☐ Internet
- ☐ Library
- ☐ Magazines
- ☐ Newspapers
- ☐ Telephone information number
- ☐ Complementary, alternative, or unconventional practitioner

A3. The most recent time you looked for information about health or medical topics, who was it for?

- ☐ Myself
- ☐ Someone else
- ☐ Both myself and someone else

A4. Based on the results of your most recent search for information about health or medical topics, how much do you agree or disagree with each of the following statements?

	Strongly agree	Somewhat agree	Somewhat disagree	Strongly disagree
a. It took a lot of effort to get the information you needed.....	☐	☐	☐	☐
b. You felt frustrated during your search for the information.....	☐	☐	☐	☐

A5. Overall, how confident are you that you could get advice or information about health or medical topics if you needed it?

- ☐ Completely confident
- ☐ Very confident
- ☐ Somewhat confident
- ☐ A little confident
- ☐ Not confident at all

A6. In general, how much would you trust information about health or medical topics from each of the following?

	Not at all	A little	Some	A lot
a. A doctor.....	☐	☐	☐	☐
b. Family or friends.....	☐	☐	☐	☐
c. Government health agencies...	☐	☐	☐	☐
d. Charitable organizations.....	☐	☐	☐	☐
e. Religious organizations and leaders.....	☐	☐	☐	☐

36491

A7. Imagine that you had a strong need to get information about health or medical topics. Where would you go first?

Mark only one.

- ☐ Books
- ☐ Brochures, pamphlets, etc.
- ☐ Cancer organization
- ☐ Family
- ☐ Friend/Co-worker
- ☐ Doctor or health care provider
- ☐ Internet
- ☐ Library
- ☐ Magazines
- ☐ Newspapers
- ☐ Telephone information number
- ☐ Complementary, alternative, or unconventional practitioner
- ☐ Other – Specify → ☐

A8. Have you ever looked for information about cancer from any source?

- ☐ Yes
- ☐ No

B: Using the Internet to Find Information

B1. Do you ever go on-line to access the Internet or World Wide Web, or to send and receive e-mail?

- ☐ Yes
- ☐ No → **GO TO B5 on the next page**

B2. When you use the Internet, do you access it through...

		Yes	No
a.	A regular dial-up telephone line.....	☐	☐
b.	Broadband such as DSL, cable, or FiOS.....	☐	☐
c.	A cellular network (i.e., phone, 3G/4G).....	☐	☐
d.	A wireless network (Wi-Fi).....	☐	☐

B3. In the past 12 months, have you used the Internet to look for information about cancer for yourself?

- ☐ Yes
- ☐ No

B4. How often do you access the Internet through each of the following?

		Daily	Sometimes	Never	Not Applicable
a.	Computer at home.....	☐	☐	☐	☐
b.	Computer at work.....	☐	☐	☐	☐
c.	Computer in a public place (library, community center, other).....	☐	☐	☐	☐
d.	On a mobile device (cell phone/smart phone/tablet).....	☐	☐	☐	☐

36491

B5. In the past 12 months, have you used a computer, smartphone, or other electronic means to do any of the following?

	Yes	No
a. Looked for health or medical information for yourself	☐	☐
b. Bought medicine or vitamins online	☐	☐
c. Used e-mail or the Internet to communicate with a doctor or a doctor's office	☐	☐
d. Tracked health care charges and costs	☐	☐
e. Looked up medical test results	☐	☐
f. Made appointments with a health care provider	☐	☐
g. Looked for information about the **harms** of electronic or e-cigarettes (also known as vapes, vape-pens, tanks, mods, or pod-mods)	☐	☐

B6. Please indicate if you have each of the following.

Mark <u>all that apply</u>.

- ☐ Tablet computer (for example, an iPad, Samsung Galaxy, Motorola Xoom, or Kindle Fire)
- ☐ Smartphone (for example, an iPhone, Android, Blackberry, or Windows phone)
- ☐ Basic cell phone only
- ☐ I do not have any of the above

GO TO B9 in the next column

B7. On your <u>tablet or smartphone</u>, do you have any "apps" related to health and wellness?

- ☐ Yes
- ☐ No
- ☐ Don't know

B8. Has your tablet or smartphone…

	Yes	No
a. Helped you track progress on a health-related goal such as quitting smoking, losing weight, or increasing physical activity?	☐	☐
b. Helped you make a decision about how to treat an illness or condition?	☐	☐
c. Helped you in discussions with your health care provider?	☐	☐

B9. In the past 12 months, have you used an electronic wearable device to monitor or track your health or activity? For example, a Fitbit, Apple Watch, or Garmin Vivofit.

- ☐ Yes
- ☐ No → **GO TO B12 below**

B10. In the past month, how often did you use a wearable device to track your health?

- ☐ Every day
- ☐ Almost every day
- ☐ 1-2 times per week
- ☐ Less than once per week
- ☐ I did not use a wearable device in the past month

B11. Would you be willing to share health data from your wearable device with...

	Yes	No
a. your health care provider?	☐	☐
b. your family or friends?	☐	☐

B12. In the last 12 months, have you used an <u>electronic medical device</u> to monitor or track your health? For example a glucometer or digital blood pressure device.

- ☐ Yes
- ☐ No

36491

B13. Have you shared health information from either an electronic monitoring device or smartphone with a health professional within the last 12 months?

- ☐ Yes
- ☐ No
- ☐ Not Applicable

B14. Sometimes people use the Internet to connect with other people online through social networks like Facebook or Twitter. This is often called "social media".

In the past 12 months, have you used the Internet for any of the following reasons?

	Yes	No
a. To visit a social networking site, such as Facebook or LinkedIn	☐	☐
b. To share health information on social networking sites, such as Facebook or Twitter	☐	☐
c. To write in an online diary or blog (i.e., Web log)	☐	☐
d. To participate in an online forum or support group for people with a similar health or medical issue	☐	☐
e. To watch a health-related video on YouTube	☐	☐

B15. Have you sent a text message to or received a text message from a doctor or other health care professional within the last 12 months?

- ☐ Yes
- ☐ No
- ☐ Don't know

C: Your Health Care

C1. Not including psychiatrists and other mental health professionals, is there a particular doctor, nurse, or other health professional that you see most often?

- ☐ Yes
- ☐ No

C2. In the past 12 months, not counting times you went to an emergency room, how many times did you go to a doctor, nurse, or other health professional to get care for yourself?

- ☐ None → **GO TO C4 on the next page**
- ☐ 1 time
- ☐ 2 times
- ☐ 3 times
- ☐ 4 times
- ☐ 5-9 times
- ☐ 10 or more times

C3. Overall, how would you rate the quality of health care you received in the past 12 months?

- ☐ Excellent
- ☐ Very good
- ☐ Good
- ☐ Fair
- ☐ Poor

36491

C4. Urgent care, walk-in or retail clinics are healthcare providers that allow people to come in without an appointment. They do not include visits to the emergency room.

How many times in the past 12 months have you visited an urgent care, walk-in or retail clinic to get care for yourself?

- ☐ I have not visited an urgent care, walk-in or retail clinic in the past 12 months ➔ **SEE INSTRUCTIONS IN THE BOX BELOW**
- ☐ 1 time
- ☐ 2-4 times
- ☐ 5-9 times
- ☐ 10 or more times

C5. Overall, how would you rate the quality of health care you received from urgent care, walk-in or retail clinics in the past 12 months?

- ☐ Excellent
- ☐ Very good
- ☐ Good
- ☐ Fair
- ☐ Poor

If you have not seen any health care professionals in the last 12 months then go to C7 in the next column.

Otherwise, go to C6 in the next column.

C6. The following questions are about your communication with all doctors, nurses, or other health professionals you saw during the past 12 months.

How often did they do each of the following?	Always	Usually	Sometimes	Never
a. Give you the chance to ask all the health-related questions you had	☐	☐	☐	☐
b. Give the attention you needed to your feelings and emotions	☐	☐	☐	☐
c. Involve you in decisions about your health care as much as you wanted	☐	☐	☐	☐
d. Make sure you understood the things you needed to do to take care of your health	☐	☐	☐	☐
e. Explain things in a way you could understand	☐	☐	☐	☐
f. Spend enough time with you	☐	☐	☐	☐
g. Help you deal with feelings of uncertainty about your health or health care	☐	☐	☐	☐

C7. Are you currently covered by any of the following types of health insurance or health coverage plans?

	Yes	No
a. Insurance through a current or former employer or union	☐	☐
b. Insurance purchased directly from an insurance company	☐	☐
c. Medicare, for people 65 and older, or people with certain disabilities	☐	☐
d. Medicaid, Medical Assistance, or any kind of government-assistance plan for those with low incomes or a disability	☐	☐
e. TRICARE or other military health care	☐	☐
f. VA (including those who have ever used or enrolled for VA health care)	☐	☐
g. Indian Health Service	☐	☐
h. Any other type of health insurance or health coverage plan (Specify)	☐	☐

36491

D: Medical Records

Next, we are going to ask you some questions about your medical records. Medical records are defined as medical history, such as laboratory test results, clinical notes, and current list of medications.

D1. Do any of your doctors or other health care providers maintain your medical records in a computerized system?

- ☐ Yes
- ☐ No
- ☐ Don't Know

D2. Have you ever been offered online access to your medical records by your…

	Yes	No	Don't know
a. health care provider?	☐	☐	☐
b. health insurer?	☐	☐	☐

D3. How many times did you access your online medical record in the last 12 months?

- ☐ 0
- ☐ 1 to 2 times
- ☐ 3 to 5 times
- ☐ 6 to 9 times
- ☐ 10 or more times

GO TO D5 on the next page

D4. Why have you not accessed your medical record online? Is it because…

	Yes	No
a. You prefer to speak to your health care provider directly?	☐	☐
b. You do not have a way to access the website?	☐	☐
c. You did not have a need to use your online medical record?	☐	☐
d. You were concerned about the privacy or security of the website that had your medical records?	☐	☐
e. You don't have an online medical record?	☐	☐
f. You found it difficult to login (for example, you had trouble remembering your password)?	☐	☐
g. You are not comfortable or experienced with computers?	☐	☐
h. You have more than one online medical record?	☐	☐

If you have not accessed any medical records in the last 12 months, go to Section E.

Otherwise, go to D5 on the next page.

36491

D5. In the past 12 months, have you used your online medical record to...

	Yes	No
a. Request refill of medications?	☐	☐
b. Look up test results?	☐	☐
c. Request correction of inaccurate information?	☐	☐
d. Securely message health care provider and staff (for example, e-mail)?	☐	☐
e. Download your health information to your computer or mobile device, such as a cell phone or tablet?	☐	☐
f. Add health information to share with your health care provider, such as health concerns, symptoms, and side effects?	☐	☐
g. Help you make a decision about how to treat an illness or condition?	☐	☐

D6. Did you use a smartphone health app to access your online medical record?

- ☐ Yes
- ☐ No
- ☐ Don't Know

D7. Do any of your online medical records include clinical notes (health provider's notes that describe a visit)?

- ☐ Yes
- ☐ No
- ☐ Don't Know

D8. Have you electronically sent your medical information to…?

	Yes	No
a. Another health care provider?	☐	☐
b. A family member or another person involved with your care?	☐	☐
c. A service or app that can help manage and store your health information?	☐	☐

D9. How easy or difficult was it to understand the health information in your online medical record?

- ☐ Very easy
- ☐ Somewhat easy
- ☐ Somewhat difficult
- ☐ Very difficult

D10. In general, how useful is your online medical record for monitoring your health?

- ☐ Very useful
- ☐ Somewhat useful
- ☐ Not very useful
- ☐ Not at all useful
- ☐ I do not use my online medical records to monitor my health

36491

E: Caregiving

E1. Are you currently caring for or making health care decisions for someone with a **medical, behavioral, disability, or other condition?**

Mark all that apply.

- ☐ Yes, a child/children
- ☐ Yes, a spouse/partner
- ☐ Yes, a parent/parents
- ☐ Yes, another family member
- ☐ Yes, a friend or other non-relative
- ☐ No → **GO TO Section F on the next page**

E2. Do you provide any of this care professionally as part of a job (for example, as a nurse or professional home health aide)?

- ☐ Yes
- ☐ No

E3. Think about the individual for whom you are currently providing the most care. About how many hours per week do you spend in an average week providing care?

☐☐☐ Hours spent providing care per week

E4. Please think about the individual for whom you are currently providing the most care.

Please check all conditions for which you have provided care for this person.

Mark all that apply.

- ☐ **Cancer**
- ☐ **Alzheimer's, confusion, dementia, forgetfulness**
- ☐ **Orthopedic/Musculoskeletal Issues** (examples: back problems, broken bones, arthritis, mobility problems, can't get around, feeble, unsteady, falling)
- ☐ **Mental health/behavioral/substance abuse issues** (examples: mental illness, emotional problems, depression, anxiety, substance/drug/alcohol abuse)
- ☐ **Chronic conditions** (examples: high blood pressure/hypertension, diabetes, heart disease, heart attack, lung disease, emphysema, Chronic Obstructive Pulmonary Disease (COPD), Parkinson's)
- ☐ **Neurological/developmental Issues** (examples: brain damage or injury, developmental or intellectual disorder, mental retardation, Down syndrome, stroke)
- ☐ **Acute conditions**
- ☐ **Aging/aging related health issues not listed in the other categories above**
- ☐ **Other – Specify** → ☐
- ☐ **Not sure/don't know**

E5. Think about the individual for whom you are currently providing the most care. How many times did you access your care recipient's online medical record in the last 12 months?

- ☐ None
- ☐ 1 to 2 times
- ☐ 3 to 5 times
- ☐ 6 to 9 times
- ☐ 10 or more times

36491

F: Your Overall Health

F1. In general, would you say your health is...

- ☐ Excellent,
- ☐ Very good,
- ☐ Good,
- ☐ Fair, or
- ☐ Poor?

F2. Overall, how confident are you about your ability to take good care of your health?

- ☐ Completely confident
- ☐ Very confident
- ☐ Somewhat confident
- ☐ A little confident
- ☐ Not confident at all

F3. Some people avoid visiting their doctor even when they suspect they should. Would you say this is true for you, or not true for you?

- ☐ True
- ☐ Not true

F4. Are you deaf or do you have serious difficulty hearing?

- ☐ Yes
- ☐ No

F5. Do you have friends or family members that you talk to about your health?

- ☐ Yes
- ☐ No

F6. Has a doctor or other health professional ever told you that you had any of the following medical conditions:

	Yes	No
a. Diabetes or high blood sugar?	☐	☐
b. High blood pressure or hypertension?	☐	☐
c. A heart condition such as heart attack, angina, or congestive heart failure?	☐	☐
d. Chronic lung disease, asthma, emphysema, or chronic bronchitis?	☐	☐
e. Depression or anxiety disorder?	☐	☐

F7. About how tall are you without shoes?

☐ Feet ***and*** ☐☐ Inches

F8. About how much do you weigh, in pounds, without shoes?

☐☐☐ Pounds

F9. Right now, do you feel you are...

- ☐ Overweight,
- ☐ Slightly overweight,
- ☐ Underweight,
- ☐ Slightly underweight, or
- ☐ Just about the right weight for you?

F10. At any time in the past year, have you intentionally tried to…

- ☐ Lose weight,
- ☐ Maintain your weight,
- ☐ Gain weight, or
- ☐ You haven't really paid attention to your weight?

36491

F11. Over the past 2 weeks, how often have you been bothered by any of the following problems?

	Nearly every day	More than half the days	Several days	Not at all
a. Little interest or pleasure in doing things	☐	☐	☐	☐
b. Feeling down, depressed, or hopeless	☐	☐	☐	☐
c. Feeling nervous, anxious, or on edge	☐	☐	☐	☐
d. Not being able to stop or control worrying	☐	☐	☐	☐

F12. To what extent do you agree or disagree with the following statements?

	Strongly agree	Somewhat agree	Somewhat disagree	Strongly disagree
a. I control my emotions by changing the way I am thinking about the situation I'm in	☐	☐	☐	☐
b. I consider how things might be in the future, and try to influence those things with my day to day behavior	☐	☐	☐	☐

G: Health and Nutrition

G1. About how many cups of fruit (including 100% pure fruit juice) do you eat or drink each day?

- ☐ None
- ☐ ½ cup or less
- ☐ ½ cup to 1 cup
- ☐ 1 to 2 cups
- ☐ 2 to 3 cups
- ☐ 3 to 4 cups
- ☐ 4 or more cups

1 cup of fruit could be:
- 1 small apple
- 1 large banana
- 1 large orange
- 8 large strawberries
- 1 medium pear
- 2 large plums
- 32 seedless grapes
- 1 cup (8 oz.) fruit juice
- ½ cup dried fruit
- 1 inch-thick wedge of watermelon

G2. About how many cups of vegetables (including 100% pure vegetable juice) do you eat or drink each day?

- ☐ None
- ☐ ½ cup or less
- ☐ ½ cup to 1 cup
- ☐ 1 to 2 cups
- ☐ 2 to 3 cups
- ☐ 3 to 4 cups
- ☐ 4 or more cups

1 cup of vegetables could be:
- 3 broccoli spears
- 1 cup cooked leafy greens
- 2 cups lettuce or raw greens
- 12 baby carrots
- 1 medium potato
- 1 large sweet potato
- 1 large ear of corn
- 1 large raw tomato
- 2 large celery sticks
- 1 cup of cooked beans

G3. About how many calories do you think a man/woman of your age and physical activity needs to consume a day to maintain your current weight?

☐☐☐☐ Calories

☐ Don't know

G4. Think about the last time you ordered food in a fast food or sit down restaurant, did you notice calorie information listed next to the food on the menu or menu board?

- ☐ Yes
- ☐ No → **GO TO G7 in the next column**

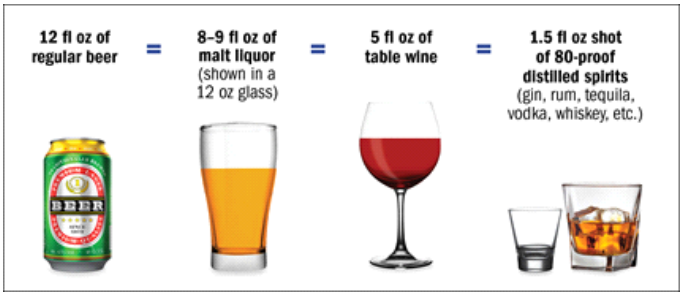
G5. Thinking about the last time you noticed calorie information on the menu or menu board, how easy or difficult to understand was the calorie information?

- ☐ Very easy
- ☐ Somewhat easy
- ☐ Somewhat difficult
- ☐ Very difficult

G6. Thinking about the last time you noticed calorie information on the menu or menu board, how did the calorie information change what you were thinking of ordering?

	Yes	No
a. I ordered something with fewer calories.....	☐	☐
b. I ordered something with more calories.....	☐	☐
c. I ordered fewer items.....	☐	☐
d. I ordered smaller sizes.....	☐	☐
e. I ordered more items.....	☐	☐
f. I ordered larger sizes.....	☐	☐

G7. These are examples of one drink of alcohol:



During the past 30 days, how many days per week did you have at least one drink of any alcoholic beverage?

☐ Days per week

→ **(IF 0 THEN GO TO G9 BELOW)**

G8. During the past 30 days, on the days when you drank, about how many drinks did you drink on average?

☐☐ Average drinks per day

G9. Which of the following health conditions do you think can result from drinking too much alcohol?

	Yes	No	Don't know
a. Cancer.....	☐	☐	☐
b. Heart Disease.....	☐	☐	☐
c. Diabetes.....	☐	☐	☐
d. Liver disease.....	☐	☐	☐

G10. In the past 12 months, how much have you heard about the negative health consequences of drinking alcohol from a doctor or other health care professional?

- ☐ A lot
- ☐ Some
- ☐ A little
- ☐ Nothing
- ☐ I have not seen a doctor or health professional in the past 12 months

36491

H: Physical Activity and Exercise

H1. In a typical week, how many days do you do any physical activity or exercise of at least moderate intensity, such as brisk walking, bicycling at a regular pace, and swimming at a regular pace (do not include weightlifting)?

- ☐ None → **GO TO H3 below**
- ☐ 1 day per week
- ☐ 2 days per week
- ☐ 3 days per week
- ☐ 4 days per week
- ☐ 5 days per week
- ☐ 6 days per week
- ☐ 7 days per week

H2. On the days that you do any physical activity or exercise of at least moderate intensity, how long do you typically do these activities?

☐☐☐ **Minutes per day**

H3. In a typical week, outside of your job or work around the house, how many days do you do leisure-time physical activities specifically designed to strengthen your muscles such as lifting weights or circuit training (do not include cardio exercise such as walking, biking, or swimming)?

- ☐ None
- ☐ 1 day per week
- ☐ 2 days per week
- ☐ 3 days per week
- ☐ 4 days per week
- ☐ 5 days per week
- ☐ 6 days per week
- ☐ 7 days per week

H4. During the past 7 days, how much time did you spend sitting on a typical day at home or at work? This may include time spent sitting at a desk, visiting friends, reading, driving or riding in a car, or sitting or lying down to watch television.

☐☐ **Hours per day**

H5. To what extent do you enjoy exercising?

- ☐ Not at all
- ☐ A little
- ☐ Some
- ☐ A lot

H6. People start or continue exercising regularly for lots of reasons. How much do each of the following reflect why you would start or continue exercising regularly?

	Not at all	A little	Some	A lot
a. Pressure from others	☐	☐	☐	☐
b. Concern over the way you look	☐	☐	☐	☐
c. Feeling guilty when you skip exercising	☐	☐	☐	☐
d. Getting enjoyment from exercise	☐	☐	☐	☐

36491

H7. The Federal Government publishes the Physical Activity Guidelines for Americans, which provide recommendations for how much physical activity to get to be healthy. In the past 6 months, have you heard about government recommendations for physical activity from any of the following sources?

	Yes	No
a. Health professional or doctor	☐	☐
b. Social media or Internet	☐	☐
c. Television	☐	☐
d. Magazine	☐	☐

H8. Think about the last time you heard a new government recommendation about physical activity or exercise. Which of the following best describe what you did in response to the new recommendation?

Mark all that apply.

- ☐ I increased the amount of physical activity/exercise that I do
- ☐ I decreased the amount of physical activity/exercise that I do
- ☐ I changed the type of physical activity that I do
- ☐ I looked for more information about the recommendation
- ☐ I did not change what I do
- ☐ I have not heard any government recommendations about physical activity or exercise

H9. As far as you know, does physical activity…

	Yes	No	Don't know
a. Help with sleep?	☐	☐	☐
b. Reduce anxiety and depression?	☐	☐	☐
c. Reduce pain?	☐	☐	☐

H10. During the past 7 days, how many hours of sleep did you get on average per night?

☐☐ **Hours of sleep per night**

H11. In the past 7 days, how would you rate your sleep quality overall?

- ☐ Very good
- ☐ Fairly good
- ☐ Fairly bad
- ☐ Very bad

H12. Someone might describe themselves as a "morning-person" or "night-person." Which do you consider yourself to be?

- ☐ I'm definitely a morning-person
- ☐ I'm more of a morning-person than a night-person
- ☐ I'm neither a morning-person nor a night-person
- ☐ I'm more of a night-person than a morning-person
- ☐ I'm definitely a night-person

36491

J: Sun & UV Exposure

J1. On warm sunny days, how often do you spend time in the sun in order to get a tan?

- ☐ Often
- ☐ Sometimes
- ☐ Rarely
- ☐ Never
- ☐ Don't go out on sunny days

J2. To what extent do you enjoy spending time in the sun?

- ☐ Not at all
- ☐ A little
- ☐ Some
- ☐ A lot

J3. During the past 12 months, how many times have you had a sunburn (even a small part of your skin turns red or hurts for 12 hours or more) from too much sun exposure?

☐☐☐ **Sunburns in past 12 months**

→ **(IF 0 THEN GO TO SECTION K ON THE NEXT PAGE)**

J4. On the most recent time you were sunburned, what were you doing when you were sunburned?

Mark <u>all that apply</u>.

- ☐ Working at your job
- ☐ Working outside at your own home or a family/friend's home
- ☐ Sunbathing
- ☐ Swimming
- ☐ Exercise (running, hiking, sports) (do not include swimming)
- ☐ Watching a sporting event
- ☐ Attending an outdoor event or venue (a concert, the zoo, a fair, etc.)
- ☐ Day-to-day activities
- ☐ Other
- ☐ Don't know

J5. The most recent time you got sunburned, were you doing any of the following things to protect yourself from the sun?

Mark <u>all that apply</u>.

- ☐ Wearing sunscreen with SPF of at least 15
- ☐ Wearing protective clothing such as long pants or a shirt with sleeves that cover your shoulders
- ☐ Staying in the shade or under an umbrella
- ☐ None of the above
- ☐ I don't know/I don't remember

J6. Were you drinking alcohol at any of the times when you were sunburned?

- ☐ Yes
- ☐ No

36491

K: Tobacco Products

K1. Have you smoked at least 100 cigarettes in your entire life?

- ☐ Yes
- ☐ No → **GO TO K5 below**

K2. How often do you now smoke cigarettes?

- ☐ Every day
- ☐ Some days
- ☐ Not at all → **GO TO K5 below**

K3. At any time in the past year, have you stopped smoking for one day or longer because you were trying to quit?

- ☐ Yes
- ☐ No

K4. Are you seriously considering quitting smoking in the next six months?

- ☐ Yes
- ☐ No

K5. New types of cigarettes are now available called electronic cigarettes or e-cigarettes (also known as vapes, vape-pens, tanks, mods or pod-mods). These products deliver nicotine through a vapor. Compared to smoking cigarettes, would you say that electronic cigarettes are…

- ☐ Much less harmful,
- ☐ Less harmful,
- ☐ Just as harmful,
- ☐ More harmful,
- ☐ Much more harmful, or
- ☐ I don't know

K6. Have you ever used an e-cigarette, even one or two times?

- ☐ Yes
- ☐ No → **GO TO K9 on the next page**

K7. Do you now use an e-cigarette every day, some days, or not at all?

- ☐ Every day
- ☐ Some days
- ☐ Not at all

K8. During the past 30 days, on how many days did you use e-cigarettes?

- ☐ 0 days
- ☐ 1 or 2 days
- ☐ 3 to 5 days
- ☐ 6 to 9 days
- ☐ 10 to 19 days
- ☐ 20 to 29 days
- ☐ All 30 days

K9. How much do you agree or disagree with the following statements?

	Strongly agree	Agree	Disagree	Strongly disagree	Don't know
a. Nicotine is the main substance in tobacco that makes people want to smoke.....	☐	☐	☐	☐	☐
b. The nicotine in cigarettes is the substance that causes most of the cancer caused by smoking.....	☐	☐	☐	☐	☐
c. Addiction to nicotine is something that I am concerned about.....	☐	☐	☐	☐	☐

K10. Compared to a typical cigarette, would you think that a cigarette advertised as "low nicotine" would be…

- ☐ Much less harmful to your health than a typical cigarette?
- ☐ Slightly less harmful to your health than a typical cigarette?
- ☐ Equally harmful to your health as a typical cigarette?
- ☐ Slightly more harmful to your health than a typical cigarette?
- ☐ Much more harmful to your health than a typical cigarette?

K11. Compared to a typical cigarette, would you think that a cigarette advertised as "low nicotine" would be…

- ☐ Much less addictive than a typical cigarette?
- ☐ Slightly less addictive than a typical cigarette?
- ☐ Equally addictive as a typical cigarette?
- ☐ Slightly more addictive than a typical cigarette?
- ☐ Much more addictive than a typical cigarette?

K12. In the past 12 months, have you seen messages saying that a Federal Court has ordered tobacco companies to make statements about the dangers of smoking cigarettes? These messages have been in newspapers, on television, on tobacco company websites, and on cigarette packs.

- ☐ Yes
- ☐ No → **GO TO L1 on the next page**

K13. Which of the following messages have you seen?

Mark all that apply.

- ☐ That a Federal Court has ordered tobacco companies to make statements about the health effects of smoking.
- ☐ That a Federal Court has ordered tobacco companies to make statements about the health effects of secondhand smoke.
- ☐ That a Federal Court has ordered tobacco companies to make statements about the addictiveness of smoking and nicotine.
- ☐ That a Federal Court has ordered tobacco companies to make statements about how cigarettes are designed to enhance the delivery of nicotine.
- ☐ That a Federal Court has ordered tobacco companies to make statements about low tar and light cigarettes being just as harmful as regular cigarettes.

L: Cancer Screening and Awareness

L1. Are you male or female?

- ☐ Male
- ☐ Female → **GO TO L3 below**

L2. A PSA test is used to check for prostate cancer. Have you ever had a PSA test?

- ☐ Yes
- ☐ No

Males GO TO L5 in the next column

L3. How long ago did you have your most recent Pap test to check for cervical cancer?

- ☐ A year ago or less
- ☐ More than 1, up to 2 years ago
- ☐ More than 2, up to 3 years ago
- ☐ More than 3, up to 5 years ago
- ☐ More than 5 years ago
- ☐ I have never had a Pap test

L4. When did you have your most recent mammogram to check for breast cancer, if ever?

- ☐ A year ago or less
- ☐ More than 1, up to 2 years ago
- ☐ More than 2, up to 3 years ago
- ☐ More than 3, up to 5 years ago
- ☐ More than 5 years ago
- ☐ I have never had a mammogram

L5. There are a few different tests to check for colon cancer. These tests include:

A **colonoscopy** – For this test, a tube is inserted into your rectum and you are given medication that may make you feel sleepy. After the procedure, you need someone to drive you home.

A **sigmoidoscopy** – For this test, you are awake when the tube is inserted into your rectum. After the test you can drive yourself home.

A **stool blood test** – For this test, you collect a stool sample at home, and then provide it to a doctor or lab for testing

Have you ever had one of these tests to check for colon cancer?

- ☐ Yes
- ☐ No

L6. Have you ever heard of the Hepatitis C virus (also known as Hep C or **HCV**)?

- ☐ Yes
- ☐ No

L7. Have you ever heard of **HPV**? HPV stands for Human Papillomavirus. It is not HCV, HIV, HSV, or herpes.

- ☐ Yes
- ☐ No → **GO TO L9 below**

L8. Do you think **HPV** can cause…

	Yes	No	Not sure
a. Cervical Cancer?	☐	☐	☐
b. Penile Cancer?	☐	☐	☐
c. Anal Cancer?	☐	☐	☐
d. Oral Cancer?	☐	☐	☐

L9. A vaccine to prevent **HPV** infection is available and is called the HPV shot, cervical cancer vaccine, GARDASIL®.

Before today, have you ever heard of the cervical cancer vaccine or HPV shot?

- ☐ Yes
- ☐ No

36491

M: Your Cancer History

M1. Have you ever been diagnosed as having cancer?

- ☐ Yes
- ☐ No → **GO TO N1 in the next column**

M2. What type of cancer did you have?

Mark <u>all that apply</u>.

- ☐ Bladder cancer
- ☐ Bone cancer
- ☐ Breast cancer
- ☐ Cervical cancer (cancer of the cervix)
- ☐ Colon cancer
- ☐ Endometrial cancer (cancer of the uterus)
- ☐ Head and neck cancer
- ☐ Leukemia/Blood cancer
- ☐ Liver cancer
- ☐ Lung cancer
- ☐ Lymphoma (Hodgkin's)
- ☐ Lymphoma (Non-Hodgkin's)
- ☐ Melanoma
- ☐ Oral cancer
- ☐ Ovarian cancer
- ☐ Pancreatic cancer
- ☐ Pharyngeal (throat) cancer
- ☐ Prostate cancer
- ☐ Rectal cancer
- ☐ Renal (kidney) cancer
- ☐ Skin cancer, non-melanoma
- ☐ Stomach cancer
- ☐ Other – Specify → ☐

M3. At what age were you first told that you had cancer?

☐☐☐ Age

GO TO N3 in the next column

N: Beliefs About Cancer

Think about cancer in general when answering the questions in this section.

N1. How likely are you to get cancer in your lifetime?

- ☐ Very unlikely
- ☐ Unlikely
- ☐ Neither unlikely nor likely
- ☐ Likely
- ☐ Very likely

N2. How worried are you about getting cancer?

- ☐ Not at all
- ☐ Slightly
- ☐ Somewhat
- ☐ Moderately
- ☐ Extremely

N3. Have any of your family members ever had cancer?

- ☐ Yes
- ☐ No
- ☐ Not sure

36491

N4. How much do you agree or disagree with each of the following statements?

	Strongly agree	Somewhat agree	Somewhat disagree	Strongly disagree
a. It seems like everything causes cancer	☐	☐	☐	☐
b. There's not much you can do to lower your chances of getting cancer	☐	☐	☐	☐
c. There are so many different recommendations about preventing cancer, it's hard to know which ones to follow	☐	☐	☐	☐

N5. Do you think the following could be a sign of cancer?

	Yes	No	Don't know
a. Unexplained bleeding	☐	☐	☐
b. A change in bowel or bladder habits	☐	☐	☐
c. Unexplained weight loss	☐	☐	☐

N6. How much do you think that each of the following can influence whether or not a person will develop cancer?

	A lot	A little	Not at all	Don't know
a. Being overweight or obese	☐	☐	☐	☐
b. Eating enough fiber	☐	☐	☐	☐
c. Eating too much processed meat	☐	☐	☐	☐
d. Eating fruits and vegetables	☐	☐	☐	☐

O: You and Your Household

O1. What is your age?

☐☐☐ Years old

O2. What is your marital status?

Mark only one.

- ☐ Married
- ☐ Living as married or living with a romantic partner
- ☐ Divorced
- ☐ Widowed
- ☐ Separated
- ☐ Single, never been married

O3. What is the highest grade or level of schooling you completed?

- ☐ Less than 8 years
- ☐ 8 through 11 years
- ☐ 12 years or completed high school
- ☐ Post high school training other than college (vocational or technical)
- ☐ Some college
- ☐ College graduate
- ☐ Postgraduate

O4. How well do you speak English?

- ☐ Very well
- ☐ Well
- ☐ Not well
- ☐ Not at all

36491

O5. Are you of Hispanic, Latino/a, or Spanish origin? One or more categories may be selected.

Mark all that apply.

- ☐ No, not of Hispanic, Latino/a, or Spanish origin
- ☐ Yes, Mexican, Mexican American, Chicano/a
- ☐ Yes, Puerto Rican
- ☐ Yes, Cuban
- ☐ Yes, another Hispanic, Latino/a, or Spanish origin

O6. What is your race? One or more categories may be selected.

Mark all that apply.

- ☐ White
- ☐ Black or African American
- ☐ American Indian or Alaska Native
- ☐ Asian Indian
- ☐ Chinese
- ☐ Filipino
- ☐ Japanese
- ☐ Korean
- ☐ Vietnamese
- ☐ Other Asian
- ☐ Native Hawaiian
- ☐ Guamanian or Chamorro
- ☐ Samoan
- ☐ Other Pacific Islander

O7. Do you think of yourself as…

- ☐ Heterosexual, or straight
- ☐ Homosexual, or gay or lesbian
- ☐ Bisexual
- ☐ Something else – Specify →

O8. Including yourself, how many people live in your household?

☐☐ Number of people

O9. Starting with yourself, please mark the sex, and write in the age and month of birth for each adult 18 years of age or older living at this address.

	Sex	Age	Month Born (01-12)
SELF	☐ Male ☐ Female	☐☐☐	☐☐
Adult 2	☐ Male ☐ Female	☐☐☐	☐☐
Adult 3	☐ Male ☐ Female	☐☐☐	☐☐
Adult 4	☐ Male ☐ Female	☐☐☐	☐☐
Adult 5	☐ Male ☐ Female	☐☐☐	☐☐

O10. How many children under the age of 18 live in your household?

☐☐ Number of children under 18

O11. Do you currently rent or own your home?

- ☐ Own
- ☐ Rent
- ☐ Occupied without paying monetary rent

36491

O12. Thinking about members of your family living in this household, what is your combined annual income, meaning the total pre-tax income from all sources earned in the past year?

- ☐ $0 to $9,999
- ☐ $10,000 to $14,999
- ☐ $15,000 to $19,999
- ☐ $20,000 to $34,999
- ☐ $35,000 to $49,999
- ☐ $50,000 to $74,999
- ☐ $75,000 to $99,999
- ☐ $100,000 to $199,999
- ☐ $200,000 or more

O13. Which one of these comes closest to your own feelings about your household's income?

- ☐ Living comfortably on present income
- ☐ Getting by on present income
- ☐ Finding it difficult on present income
- ☐ Finding it very difficult on present income

Thank you!

Please return this questionnaire in the postage-paid envelope within 2 weeks.

If you have lost the envelope, mail the completed questionnaire to:

HINTS Study, TC 1046F
Westat
1600 Research Boulevard
Rockville, MD 20850

36491

Appendix B

Web Survey Screen Shots

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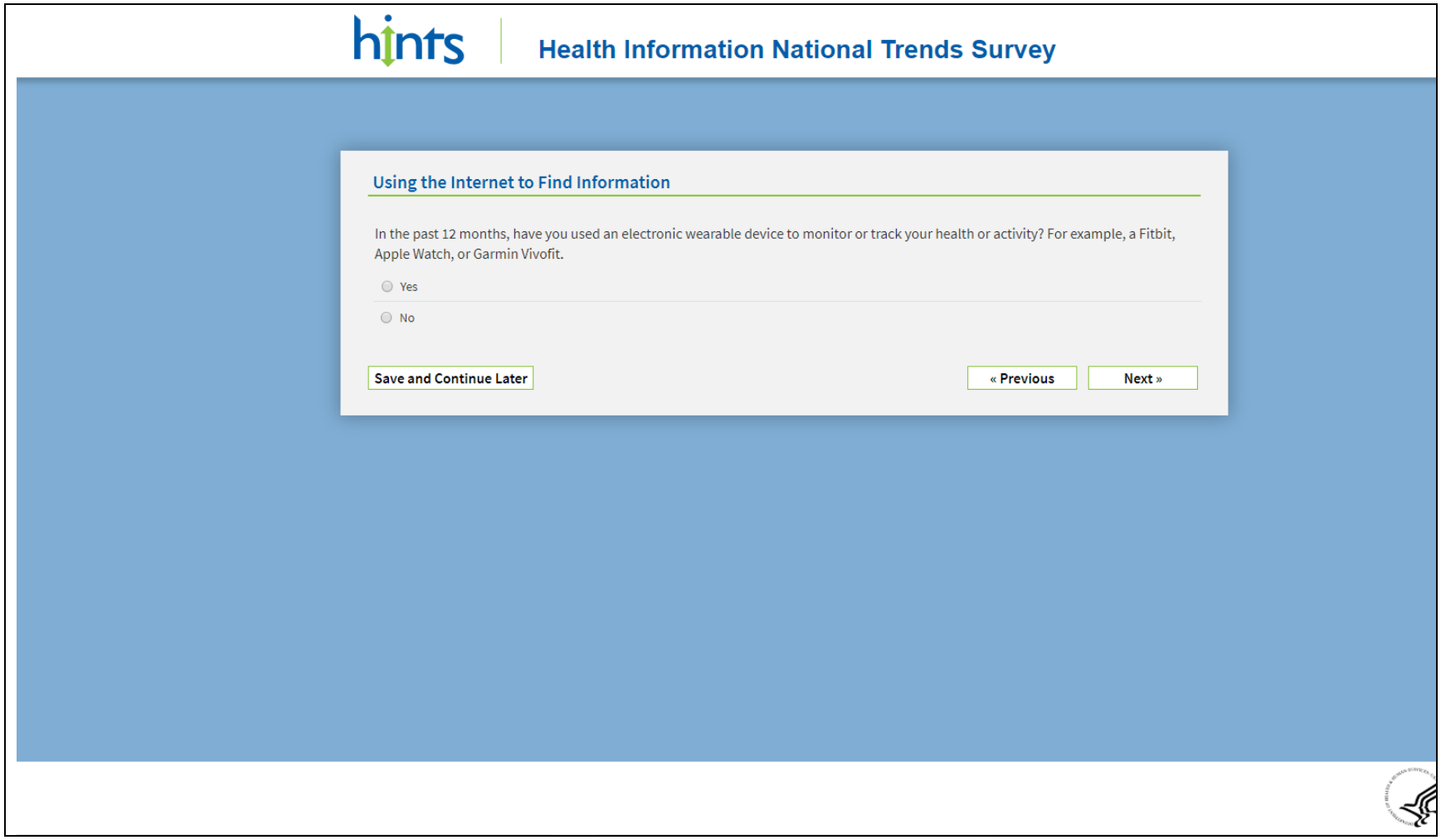
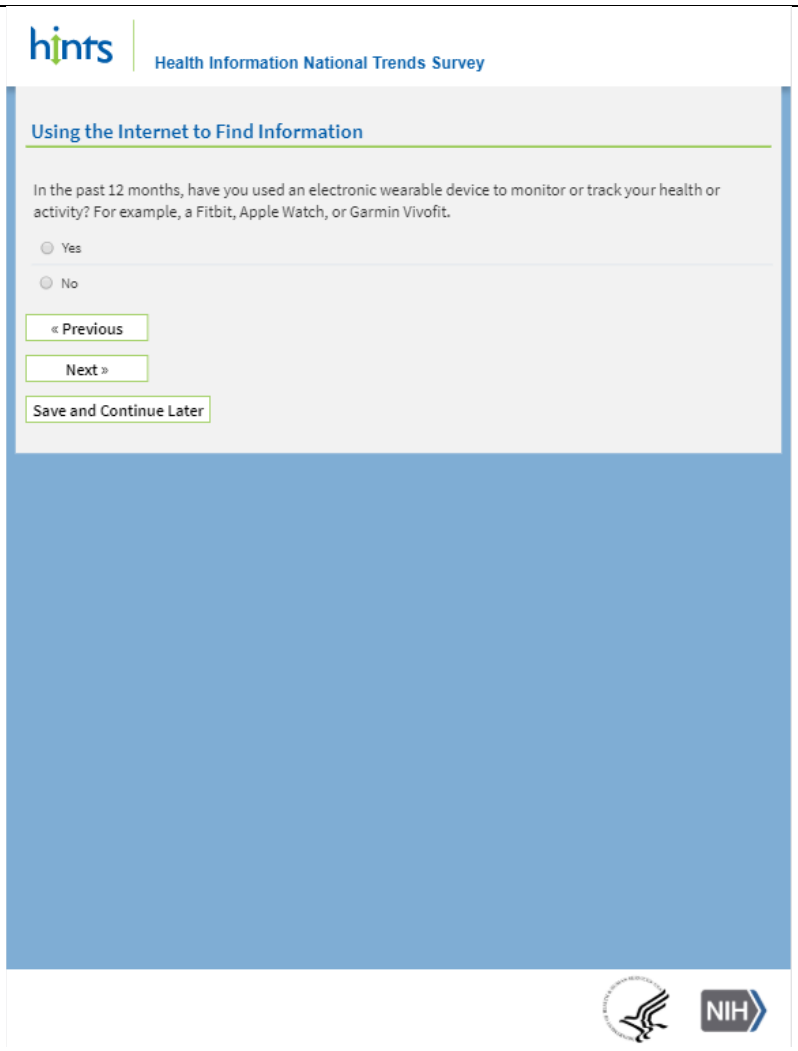
Appendix B
Web Survey Screen Shots

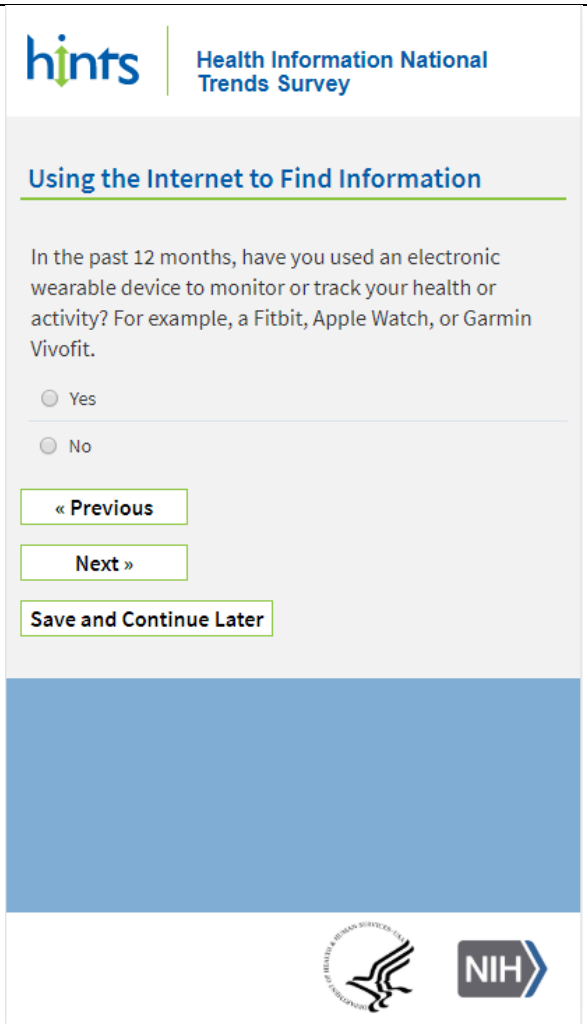
DESKTOP



TABLET


hints
Health Information National Trends Survey
Using the Internet to Find Information
In the past 12 months, have you used an electronic wearable device to monitor or track your health or activity? For example, a Fitbit, Apple Watch, or Garmin Vivofit.
Yes
No
« Previous
Next »
Save and Continue Later
NIH

SMARTPHONE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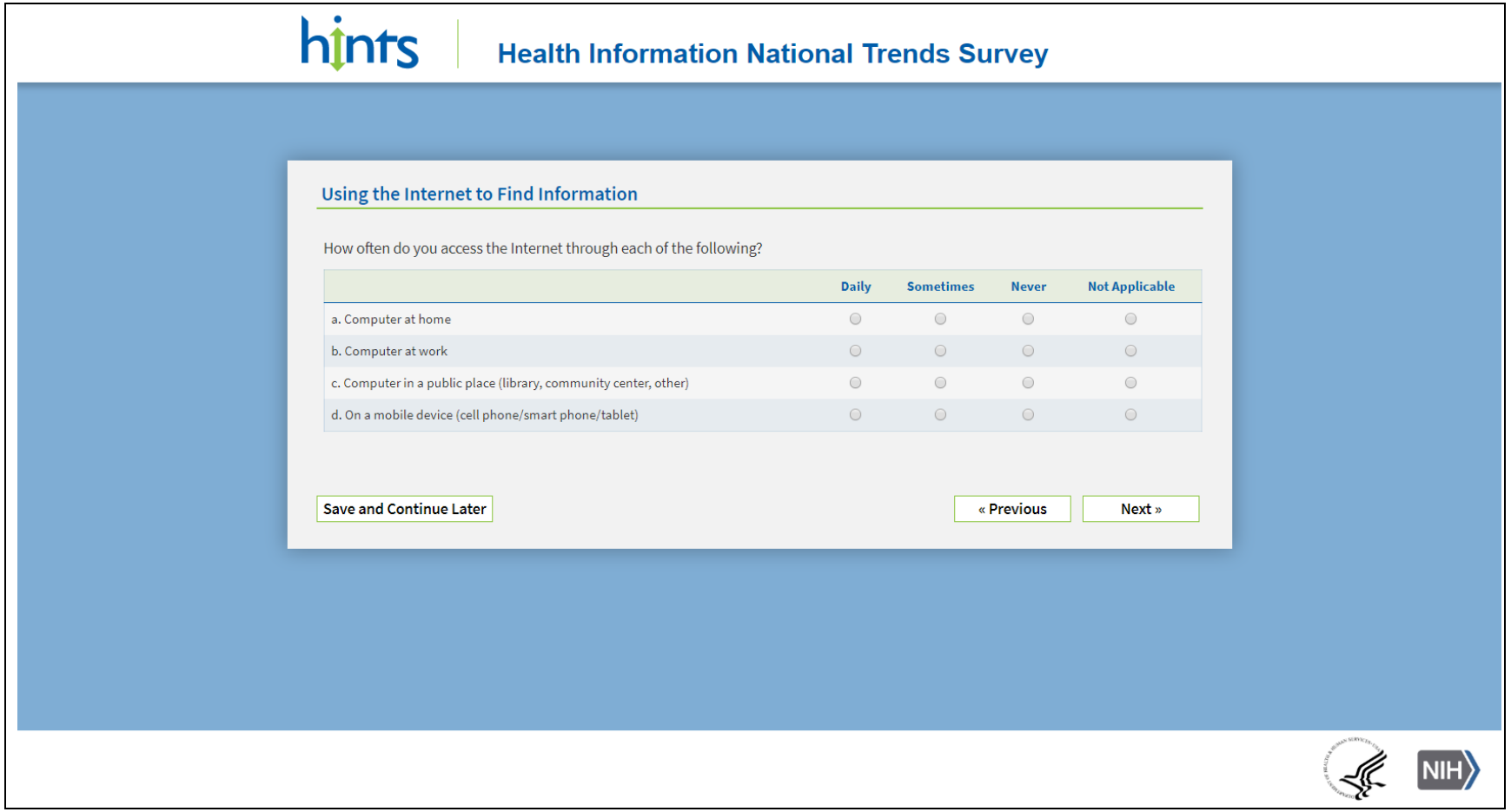
Save and Continue Later
NIH

DESKTOP


hints
Health Information National Trends Survey
Using the Internet to Find Information
How often do you access the Internet through each of the following?
Daily
Sometimes
Never
Not Applicable
a. Computer at home
b. Computer at work
c. Computer in a public place (library, community center, other)
d. On a mobile device (cell phone/smart phone/tablet)
Save and Continue Later
« Previous
Next »
NIH

TABLET


hints
Health Information National Trends Survey
Using the Internet to Find Information
How often do you access the Internet through each of the following?
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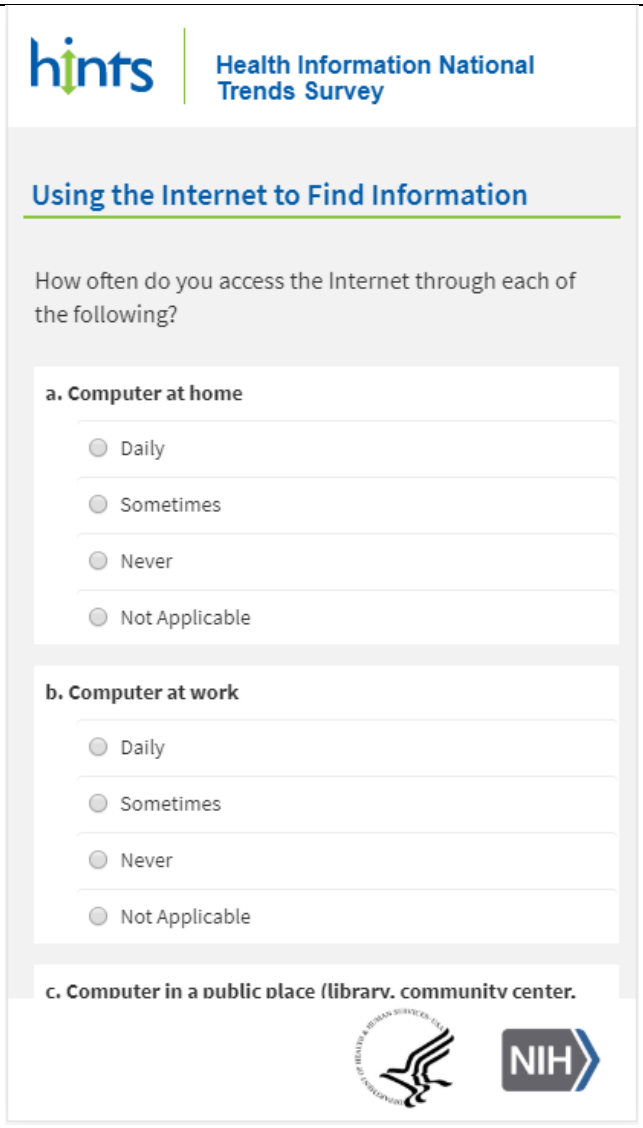
c. Computer in a public place (library, community center, other)
d. On a mobile device (cell phone/smart phone/tablet)
« Previous
Next »
Save and Continue Later
NIH

SMARTPHONE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Daily
Sometimes
Never
Not Applicable
c. Computer in a public place (library, community center,
NIH

Appendix C

First Mailing Cover Letters

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Appendix C
First Mailing Cover Letters

Paper-only Group

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Public Health Service

National Institutes of Health
Bethesda, Maryland 20892

Dear {City} Resident:

We are writing to invite you to take part in an important national survey sponsored by the U.S. Department of Health and Human Services - the Health Information National Trends Survey (HINTS). The goal of HINTS is to learn about how people find and use health and medical information. By completing this survey, you will help us learn what health information you need and how to make that information available to you, your family, and your community.

In order to make sure we get responses from a random sample of people, **we ask the adult in your household with the next birthday to complete the survey in the next two weeks.**

Your participation is voluntary and your responses will not be linked to your name. We have enclosed $2 as a token of our appreciation for your participation.

You can find out more about HINTS at hints.cancer.gov. Westat, a research firm, is conducting the survey. If you have any questions about HINTS, please call Westat toll-free at 1-888-738-6805.

Thank you in advance for your participation.

Sincerely,

Kelly D. Blake, ScD
Director, HINTS
National Institutes of Health
U.S. Dept. of Health and Human Services

Si prefiere recibir la encuesta en español, por favor llame al 1-888-738-6812.

The Health Information National Trends Survey is authorized under 42 USC, Section 285A.

Health Information National Trends Survey hints

Web Option Group

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Public Health Service

National Institutes of Health
Bethesda, Maryland 20892

Dear {City} Resident:

We are writing to invite you to take part in an important national survey sponsored by the U.S. Department of Health and Human Services - the Health Information National Trends Survey (HINTS). The goal of HINTS is to learn about how people find and use health and medical information. By completing this survey, you will help us learn what health information you need and how to make that information available to you, your family, and your community.

In order to make sure we get responses from a random sample of people, **we ask the adult in your household with the next birthday to complete the survey in the next two weeks.** To complete the survey online, please visit:

Survey Website: www.hints-survey.org
Your Access Code: {**1A0784B8**}

You may also fill out and return the paper survey that is included in this mailing. You do not need to do both the online and paper versions of the survey.

Your participation is voluntary and your responses will not be linked to your name. We have enclosed $2 as a token of our appreciation for your participation.

The study is sponsored by the U.S. Department of Health and Human Services. Westat, a research firm, is conducting the survey. If you have any questions about HINTS, please call Westat toll-free at 1-888-738-6805. Thank you in advance for your participation.

Sincerely,

Kelly D. Blake, ScD
Director, HINTS
National Institutes of Health
U.S. Dept. of Health and Human Services

Si prefiere recibir la encuesta en español, por favor llame al 1-888-738-6812.

The Health Information National Trends Survey is authorized under 42 USC, Section 285A.

Health Information National Trends Survey hints

Web Bonus Group

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Public Health Service

National Institutes of Health
Bethesda, Maryland 20892

Dear {City} Resident:

We are writing to invite you to take part in an important national survey sponsored by the U.S. Department of Health and Human Services - the Health Information National Trends Survey (HINTS). The goal of HINTS is to learn about how people find and use health and medical information. By completing this survey, you will help us learn what health information you need and how to make that information available to you, your family, and your community.

In order to make sure we get responses from a random sample of people, **we ask the adult in your household with the next birthday to complete the survey in the next two weeks.** To complete the survey online, please visit:

Survey Website: www.hints-survey.org
Your Access Code: {**1A0784B8**}

If you complete the survey online, you will receive an additional $10 Amazon e-gift card. You may also fill out and return the paper survey that is included in this mailing. You do not need to do both the online and paper versions of the survey.

Your participation is voluntary and your responses will not be linked to your name. We have enclosed $2 as a token of our appreciation for your participation.

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Sincerely,

Kelly D. Blake, ScD
Director, HINTS
National Institutes of Health
U.S. Dept. of Health and Human Services

Si prefiere recibir la encuesta en español, por favor llame al 1-888-738-6812.

The Health Information National Trends Survey is authorized under 42 USC, Section 285A.

Health Information National Trends Survey hints

Appendix D

Comparison of HINTS Estimates by Group and Mode

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Appendix D
Comparison of HINTS Estimates by Group and Mode

HINTS estimates by data collection group overall

Selected HINTS estimates	Mail Only (%)		Web Option (%)		Web Bonus (%)	
	Base - weighted estimate	**Final calibrated estimate**	Base-weighted estimate	**Final calibrated estimate**	Base-weighted estimate	**Final calibrated estimate**
Demographics						
Income $100k or more	26.4	**23.5**	27.8	**26.7**	25.8	**22.2**
Own home	93.3	**91.8**	91.4	**84.2**	91.9	**88.7**
Household with children	20.4	**29.4**	20.2	**25.9**	22.5	**28.9**
Single-person household	27.9	**17.1**	24.6	**16.2**	23.5	**13.8**
Communication						
Access Internet through a cellular network	61.3	**70.2**	62	**71.2**	65.9	**73.9**
Watch TV more than 5 hours per day	56.6	**55**	55.3	**49.3**	54.9	**52.7**
Health communication						
Looked for information about health or medical topics from any source in past 12 months	82.2	**78.8**	82.3	**77**	81.7	**75.1**
Very or completely confident could get advice or information on health or medical topics	64.1	**61.5**	63.8	**62.4**	63.1	**59.4**
Trust a doctor regarding health/medical topics a lot	71.9	**67.3***	72.2	**68.1**	74.6	**73.4***
Would go to doctor regarding health or medial topics first	48.3	**43.7**	46.9	**42**	44.3	**45.2**
Ever sought cancer information for self	59	**54.8**	58.9	**53**	56.8	**50**
Heard of HPV	70.1	**69.1**	70.3	**68**	72.6	**70.8**
Heard about Hepatitis C	87.1	**83.4***	84.7	**79.9**	81.7	**77.0***
Medical records						
Have doctors who maintain medical information in a computerized record system	81.6	**77.7**	83.4	**77.8**	84.4	**78.5**
Accessed OMR 1 or more time in last 12 months	41.1	**36.8**	42.2	**37.2**	48.3	**42.3**
Health and health services						
Very confident or completely confident take care of own health	72.2	**70.8**	76.3	**69.8**	73.4	**70.3**
Feeling nervous, anxious, or on edge more than 'not at all'	35	**40.8***	33.9	**34.6***	37.6	**39.4**
Have a doctor that they see most often	72.7	**62.9**	73.4	**61.9**	71.1	**64.2**
Quality of care good, fair, or poor	23	**28**	24.6	**28.7**	24.3	**26.9**
Health behaviors						
Eat 2 or more cups of fruit per day	15.9	**16**	18	**17.5**	14.4	**12.9**
Eat 2 or more cups of vegetables per day	24.7	**23.4**	26.3	**24.5**	23.1	**20.7**
Ever used an E-cigarette	12.3	**18.8**	12.5	**19.1**	14.9	**20.1**
Ever had a PSA test	59.6	**39.2**	58.7	**42.4**	54.5	**36.1**
Ever had test for colon cancer	64.7	**45.7**	63.3	**49.1**	58.1	**44.7**
BMI#	27.7	**28.1**	27.5	**27.8**	27.2	**27.6**
Mean minutes/day of moderate exercise#	39.8	**43.1**	40.9	**47.3**	40.1	**42.1**
Used a wearable health tracking device in past 12 months	25.6	**25.1**	25.4	**28.7**	29.5	**29.3**

Selected HINTS estimates	Mail Only (%)		Web Option (%)		Web Bonus (%)	
	Base - weighted estimate	**Final calibrated estimate**	Base-weighted estimate	**Final calibrated estimate**	Base-weighted estimate	**Final calibrated estimate**
Used an electronic medical device to monitor health	28	**25**	26.1	**23.7**	27.8	**25.5**
Beliefs about cancer						
Likely or very likely to get cancer in lifetime	30.7	**30.3**	29.8	**25.7**	31.9	**27.8**
Moderately or extremely worried about getting cancer	17	**19.5**	15.4	**13.5**	16.5	**15.2**
Agree it seems like everything causes cancer	66.8	**71.4**	69	**71.2**	70.5	**71.4**
Agree there's not much you can do to lower your chances of getting cancer	27.6	**30.2**	27.6	**30.1**	26	**33.7**
Agree there are so many different recommendations about preventing cancer, it's hard to know which ones to follow	73.8	**75.2**	72.8	**73.7**	71.8	**76.4**
Cancer history						
Have family members who have had cancer	72.6	**69**	72	**63**	73	**67**
Other topics						
Caregiver for someone with a health condition	14.8	**15.2**	16.1	**16.8**	17.4	**16.3**
Seen tobacco messages about dangers of smoking	43.4	**42.0****	45	**44.9**	52	**51.8****

Note: ** p < 0.01, *p<0.05. Significance tests are for comparing the final calibrated estimates of the paper-only group to either the web-option or web-bonus group.
#: estimate is a not a proportion

HINTS estimates for web pilot groups combined by completion mode

Selected HINTS estimates	Complete by Mail (%)		Complete by Web (%)	
	Base-weighted estimate	**Final calibrated estimate**	**Base-weighted estimate**	**Final calibrated estimate**
Demographics				
Income $100k or more	21.6	**21.8**	33.6	**27.3**
Own home	91.1	**89.6**	92.4	**82.9**
Household with children	15.4	**22****	29.5	**33.3****
Single-person household	27.9	**17.4**	19	**12.3**
Communication				
Access Internet through a cellular network	53.3	**64.8****	75	**79.3****
Watch TV more than 5 hours per day	52	**50**	59.2	**52.2**
Health communication				
Looked for information about health or medical topics from any source in past 12 months	79.3	**77.1**	85.6	**74.9**
Very or completely confident could get advice or information on health or medical topics	59.1	**57**	69.3	**65.2**
Trust a doctor regarding health/medical topics a lot	70.2	**67.4***	77.6	**74.4***
Would go to doctor regarding health or medial topics first	55.2	**50.4****	33.3	**36.6****
Ever sought cancer information for self	53.5	**49.8**	63.5	**53.3**
Heard of HPV	65.2	**62.8****	79.9	**76.7****

Selected HINTS estimates	Complete by Mail (%)		Complete by Web (%)	
	Base-weighted estimate	Final calibrated estimate	Base-weighted estimate	Final calibrated estimate
Heard about Hepatitis C	85.5	**83**	80	**73.4**
Medical records				
Have doctors who maintain medical information in a computerized record system	82.3	**80.1**	86.1	**76**
Accessed OMR 1 or more time in last 12 months	35.1	**33****	59.1	**47.2****
Health and health services				
Very confident or completely confident take care of own health	73.9	**69.4**	76	**70.9**
Feeling nervous, anxious, or on edge	33	**36.1**	39.6	**38**
Have a doctor that they see most often	74.6	**65.8**	68.9	**60.1**
Quality of care good, fair, or poor	25.9	**28.9**	22.5	**26.6**
Health behaviors				
Eat 2 or more cups of fruit per day	16.4	**14.5**	15.8	**16**
Eat 2 or more cups of vegetables per day	23.8	**23.3**	25.8	**21.8**
Ever used an E-cigarette	10.6	**16.5**	18	**23**
Ever had a PSA test	64.8	**50.5****	47.6	**29.5****
Ever had test for colon cancer	70.8	**59.5****	46.9	**32.9****
BMI#	27.2	**27.8**	27.6	**27.7**
Mean minutes/day of moderate exercise#	40.4	**46**	40.7	**43.3**
Used a wearable health tracking device in past 12 months	18.6	**20.9****	39.4	**38****
Used an electronic medical device to monitor health	27.8	**26.3**	25.9	**22.7**
Beliefs about cancer				
Likely or very likely to get cancer in lifetime	28	**25.3**	34.3	**28.2**
Moderately or extremely worried about getting cancer	14.7	**13.8**	17.4	**14.9**
Agree it seems like everything causes cancer	68.5	**70.6**	71.6	**72.1**
Agree there's not much you can do to lower your chances of getting cancer	29.5	**32.3**	23.1	**31.5**
Agree there are so many different recommendations about preventing cancer, it's hard to know which ones to follow	73.2	**75.5**	71	**74.5**
Cancer history				
Have family members who have had cancer	72.4	**67.5**	72.6	**62.2**
Other topics				
Caregiver for someone with a health condition	15	**17.1**	19.1	**15.9**
Seen tobacco messages about dangers of smoking	41.9	**41.7****	57.6	**55.7****

Note: ** $p < 0.01$, *$p<0.05$. Significance tests are for comparing the final calibrated estimates of the respondents who returned a paper survey compared to those who returned a web survey.
#: estimate is a not a proportion

Appendix E

Comparison of HINTS Question Wording to NHIS

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Appendix E
Comparison of HINTS Question Wording to NHIS

Comparisons with NHIS	HINTS		NHIS	
	Variable	Text	Variable	Text
Access to Internet	UseInternet	Do you ever go on-line to access the Internet or World Wide Web, or to send and receive e-mails?	AWEBUSE (NHIS sample adult file)	The next questions are about your Internet and email use. Do you use the Internet?
Excellent, very good, or good health	GeneralHealth	In general, would you say your health is...	PHSTAT (NHIS person file)	Would you say [fill: your/ALIAS's] health in general is excellent, very good, good, fair, or poor?
Smoked 100+ cigarettes in life time	Smoke100	Have you smoked at least 100 cigarettes in your entire life?	SMKEV (NHIS sample adult file)	Have you smoked at least 100 cigarettes in your ENTIRE LIFE?
Ever had cancer	EverHadCancer_I	History of cancer with imputed values	CANEV (NHIS sample adult file)	Have you EVER been told by a doctor or other health professional that you had...Cancer or a malignancy of any kind?
Health insurance coverage	HealthInsurance_I	Health Care Coverage (C7a-h) with Imputed Values	NOTCOV (NHIS person file)	Derived variable from NHIS person file – The uninsured are persons who did not report having health insurance at the time of the interview under private health insurance, Medicare, Medicaid, State Children's Health Insurance Program (SCHIP), a State-sponsored health plan, other government programs, or military health plan (includes TRICARE, VA, and CHAMP-VA). This definition of uninsured matches that used in Health United States.

Comparisons with NHIS	HINTS		NHIS	
	Variable	Text	Variable	Text
Never visited doctor in the past 12 months	FreqGoProvider	In the past 12 months, not counting times you went to an emergency room, how many times did you go to a doctor, nurse, or other health professional to get care for yourself?	AHCNOYR2 (NHIS sample adult file)	Derived variable on NHIS sample adult file for total number of office visits in the past 12 months
Looked for health information on the Internet in the past 12 months	Electronic_SelfHealthInfo	In the past 12 months have you used a computer, smart phone, or other electronic means to look for health or medical information for yourself?	HIT1A (NHIS sample adult file)	DURING THE PAST 12 MONTHS, have you ever used computers for any of the following…Look up health information on the Internet.
Used Internet to communicate with doctor in the past 12 months	Electronic_TalkDoctor	In the past 12 months have you used a computer, smart phone, or other electronic means to use e-mail or the internet to communicate with a doctor or a doctor's office?	HIT4A (NHIS sample adult file)	DURING THE PAST 12 MONTHS, have you ever used computers for any of the following…Communicate with a health care provider by email.

Comparisons with MEPS	HINTS		MEPS	
	Variable	Text	Variable	Text
Health professionals always explain things in a way you understand	ExplainedClearly	How often did they explain things in a way you could understand?		Agency for Healthcare Research and Quality. Table 4.3: Among adults age 18 and over who reported going to a doctor's office or clinic in the last 12 months, percent distribution of how often their health providers explained things clearly, United States, 2014. Medical Expenditure Panel Survey Household Component Data. Generated interactively. (October 8, 2019)
In past 12 months, health professionals always spend enough time with you	SpentEnoughTime	How often did they spend enough time with you?		Agency for Healthcare Research and Quality. Table 4.7: Among adults age 18 and over who reported going to a doctor's office or clinic in the last 12 months, percent distribution of how often their health providers spent enough time with them, United States, 2014. Medical Expenditure Panel Survey Household Component Data. Generated interactively. (October 8, 2019)

Appendix F

Grids with Prompting

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Appendix F
Grids with Prompting

Summary of grid items that were included in the prompting experiments

Grids where speeding intervention was applied

Grid	Text
A6	In general, how much would you trust information about health or medical topics from each of the following?
B4	How often do you access the internet through the computer at home?
B5	In the past 12 months have you used a computer, smart phone, or other electronic means to do any of the following?
B8	Has your tablet or smartphone…
B14	Sometimes people use the Internet to connect with other people online through social networks like Facebook or Twitter. This is often called "social media". In the past 12 months, have you used the Internet for any of the following reasons?
C6	The following questions are about your communication with all doctors, nurses, or other health professionals you saw during the past 12 months. How often did they do each of the following?
D4	Why have you not accessed your medical record online? Is it because...
D5	In the past 12 months have you used your online medical record to…
D8	Have you electronically sent your medical information to…
F11	Over the past 2 weeks, how often have you been bothered by any of the following problems?
G9	Which of the following health conditions do you think can result from drinking too much alcohol?
H6	People start or continue exercising regularly for lots of reasons. How much do each of the following reflect why you would start or continue exercising regularly?
H7	The Federal government publishes the Physical Activity Guidelines for Americans, which provide recommendations for how much physical activity to get to be healthy. In the past 6 months, have you heard about government recommendations for physical activity from any of the following sources?
H9	As far as you know, does physical activity…
K9	How much do you agree or disagree with the following statements?
L8	Do you think HPV can cause…
N4	How much do you agree or disagree with each of the following statements?
N5	Do you think the following could be a sign of cancer?
N6	How much do you think that each of the following can influence whether or not a person will develop cancer?

Grids where straightlining intervention was applied

Grid	Text
A6	In general, how much would you trust information about health or medical topics from each of the following?
B4	How often do you access the internet through the computer at home?
C6	The following questions are about your communication with all doctors, nurses, or other health professionals you saw during the past 12 months. How often did they do each of the following?
F11	Over the past 2 weeks, how often have you been bothered by any of the following problems?
H6	People start or continue exercising regularly for lots of reasons. How much do each of the following reflect why you would start or continue exercising regularly?
K9	How much do you agree or disagree with the following statements?
N4	How much do you agree or disagree with each of the following statements?
N6	How much do you think that each of the following can influence whether or not a person will develop cancer?