

Experimental Study of Cigarette Warnings: Study 2 Report

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Executive Summary of Methods and Results for *Experimental Study of Cigarette Warnings* (OMB# 0910-0866)

Background: Under Section 201 of the Family Smoking Prevention and Tobacco Control Act (TCA) (Pub. L. 111-31), FDA is required to issue a regulation requiring color graphics that depict the negative health consequences of cigarette smoking to accompany new textual warning statements required by the TCA. Pursuant to Section 202(b) of the TCA, the Secretary may adjust the text of the TCA warning statements, through a rulemaking, if doing so would “promote greater public understanding of the risks associated with the use of tobacco products.” As part of the new cigarette health warning development process, FDA developed revised textual warning statements that were tested in a previous study (OMB# 0910-0848) along with the warning statements provided in the TCA. Based on the results of that study, FDA selected 15 warning statements that were then paired with concordant photorealistic images that depicted the negative health consequences of cigarette smoking to form 16 cigarette health warnings to be tested in the present study. Those images were developed and tested through previous formative research.

Purpose of the Study: The main goal of this study was to assess which, if any, of the cigarette health warnings being tested promote greater understanding of the risks associated with cigarette smoking as compared to the Surgeon General’s warnings (i.e., the *status quo* currently on cigarette packages and in cigarette advertisements).

Participants Included: This study included 9,760 participants recruited through an existing online panel called Lightspeed. There were 2,301 adolescents (ages 13-17 years), including both current smokers and those who had never smoked but were at risk for starting smoking. There were 2,071 young adult (ages 18-24 years) current smokers and nonsmokers and 5,388 older adult (ages 25 years and older) current smokers and nonsmokers.

Design of the Study: Participants in all age groups were randomly assigned to a condition that determined which warning they viewed during the study. Participants in the control condition viewed 1 of the 4 current Surgeon General’s warnings; participants in each of the 16 treatment conditions viewed 1 of 16 new cigarette health warnings. The text of all warnings appears in Table 1. All participants viewed their assigned warning on both a mock cigarette pack and a mock cigarette magazine advertisement.

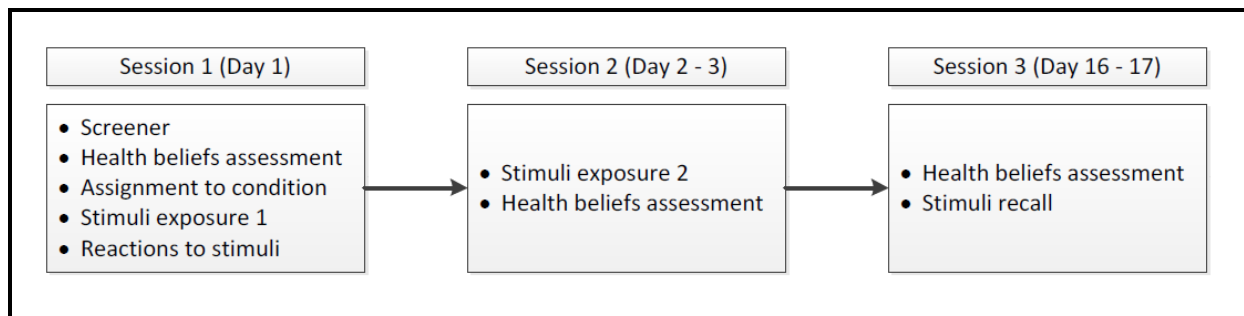
Table 1. Text of Surgeon General’s Warnings and Cigarette Health Warnings

| Condition Number | Exposure | Abbreviated Term for Warning |
|---|--|-------------------------------------|
| Surgeon General’s Warnings ^a | | |
| 0 (control) | Random selection of 1 of the following SG warnings: | |
| | 1) SURGEON GENERAL’S WARNING: Smoking Causes Lung Cancer, Heart Disease, Emphysema, and May Complicate Pregnancy. | SG Disease |
| | 2) SURGEON GENERAL’S WARNING: Quitting Smoking Now Greatly Reduces Serious Risks to Your Health. | SG Quitting |
| | 3) SURGEON GENERAL’S WARNING: Smoking by Pregnant Women May Result in Fetal Injury, Premature Birth, and Low Birth Weight. | SG Pregnancy |
| | 4) SURGEON GENERAL’S WARNING: Cigarette Smoke Contains Carbon Monoxide. | SG Carbon Monoxide |
| Cigarette Health Warnings ^b | | |
| 1 | WARNING: Cigarettes are addictive. | Addictive |
| 2 | WARNING: Tobacco smoke can harm your children. | Harm children |
| 3 | WARNING: Smoking can kill you. | Kill you |
| 4 | WARNING: Tobacco smoke causes fatal lung disease in nonsmokers. | Fatal lung disease in nonsmokers |
| 5 | WARNING: Quitting smoking now greatly reduces serious risks to your health. | Quit now |
| 6 | WARNING: Smoking causes head and neck cancer. | Head and neck cancer |
| 7 | WARNING: Smoking causes bladder cancer, which can lead to bloody urine. | Bladder cancer |
| 8 | WARNING: Smoking during pregnancy stunts fetal growth. | Stunt fetal growth |
| 9 | WARNING: Smoking can cause heart disease and strokes by clogging arteries. | Clogged arteries |
| 10 | WARNING: Smoking causes COPD, a lung disease that can be fatal. [Paired with COPD Image 1: diseased lungs] | COPD 1 |
| 11 | WARNING: Smoking causes COPD, a lung disease that can be fatal. [Paired with COPD Image 2: man with oxygen] | COPD 2 |
| 12 | WARNING: Smoking reduces blood flow, which can cause erectile dysfunction. | Erectile dysfunction |
| 13 | WARNING: Smoking reduces blood flow to the limbs, which can require amputation. | Amputation |
| 14 | WARNING: Smoking causes type 2 diabetes, which raises blood sugar. | Diabetes |
| 15 | WARNING: Smoking causes age-related macular degeneration, which can lead to blindness. | Macular degeneration |
| 16 | WARNING: Smoking causes cataracts, which can lead to blindness. | Cataracts |

^a Each of the Surgeon General’s (SG) warnings were presented as they currently appear on cigarette packs and advertisements: as text-only warnings on the side of packs and at the bottom of advertisements. ^b Each of the cigarette health warnings appeared as they are required by the TCA and described in the Notice of Proposed Rulemaking (NPRM), with the textual warning statement paired with a concordant photorealistic image on the top 50% of the front and rear panels of the mock cigarette pack and at the top 20% of the mock cigarette advertisement.

Study Procedure:

Figure 1. Study Sessions



The study had three sessions (Figure 1). In Session 1, participants completed a baseline assessment of health beliefs, then viewed their assigned warnings on both the mock cigarette pack and mock cigarette advertisement and then completed a set of questions assessing their reactions to the warnings. In Session 2, one to two days after Session 1, participants viewed the same warnings they saw during Session 1 and completed a second set of questions assessing health beliefs. In Session 3, approximately 14 days after Session 2, participants responded to a final set of questions assessing health beliefs and an item measuring recall of the warnings they viewed in the previous sessions. The interval between Session 2 and Session 3 was chosen to account for the trade-off between minimizing loss to follow-up and allowing for the examination of both immediate and delayed effects of exposure.

Questions were designed to measure several study outcomes, including:

- whether the warning was new information to participants ("*New information*");
- whether participants learned something from the warning ("*Self-reported learning*");
- whether the warning made participants think about the health risks of smoking ("*Thinking about risks*");
- whether the warning was perceived to be informative ("*Perceived Informativeness*");
- whether the warning was perceived to be understandable ("*Perceived Understandability*");
- whether the warning was perceived to be a fact or opinion ("*Perceived Factualness*");
- beliefs about the link between smoking and each of the health consequences presented in the warning ("*Health beliefs*");
- whether the warning was perceived to help participants understand the negative health effects of smoking ("*Perceived helpfulness understanding health effects*");
- whether the warning grabbed their attention ("*Attention*"); and

- whether the warning was recalled ("*Recall*").

Overview of Statistical Analyses: Analyses compared the responses from participants in each of the treatment conditions to responses from participants in the control condition (i.e., average of the 4 Surgeon General's warnings). These analyses examined whether, relative to viewing a Surgeon General's warning, viewing a cigarette health warning resulted in statistically significantly higher levels of the outcomes measured (e.g., *New information, Self-reported learning*). For the change in health beliefs over the sessions these analyses examined whether, relative to changes in level of agreement with the health belief statements between session for those participants in the control condition, the difference between sessions was larger for those participants in each of the treatment conditions (cigarette health warnings).

Summary of Results: In general, the vast majority of the new cigarette health warnings tested showed statistically significant effects across the outcomes measured, as compared to the current Surgeon General's warnings. Participants were significantly more likely, relative to the control condition (i.e., the Surgeon General's warnings), to report that for 13 of the 16 cigarette health warnings tested (except for Addictive, Kill you, and Quit now): the new cigarette health warnings provided *new information*, were higher on *self-reported learning*, and that the new cigarette health warnings were higher on *perceived informativeness*. Participants in nearly all cigarette health warning conditions (15 of 16) were significantly more likely, relative to the control condition, to rate the warnings as higher on *Perceived Understandability* (except for Quit now) and to report that the warnings were higher on *Perceived helpfulness understanding health effects* (except for Addictive). Similarly, participants in 14 of the 16 cigarette health warning conditions rated these warnings statistically significantly higher on *thinking about risks* (except for Addictive and Quit now), relative to the control condition. All warnings (new cigarette health warnings and current Surgeon General's warnings) were rated as factual by the vast majority of participants. However, half of the cigarette health warnings (8 of 16) were rated as lower on *Perceived Factualness* relative to the control condition, the other half of the half of the cigarette health warnings were rated similar on *Perceived Factualness* relative to the control condition. Participants in all 16 cigarette health warnings conditions were more likely, relative to participants in the control condition, to report that the warning they viewed would attract *attention*. Participants in all 16 cigarette health warnings conditions were more likely to be accurately *recall* which warning they had seen than were participants in the control condition. As for changes in *health beliefs*, between Session 1 and Session 2 (approximately 1-2 days apart), 11 cigarette health warnings resulted in greater net positive changes in participants' agreement with health belief items linking smoking to a specific health consequence, and between Session 1 and Session 3 (approximately 15-16 days apart), 7 cigarette health warnings resulted in greater net positive changes in agreement with *health beliefs*.

Overall, relative to the average of the Surgeon General's warnings, most of the new cigarette health warnings were reported to be new information; led to thinking about risks; resulted in greater self-reported learning, attracted attention, and were higher on perceived informativeness, perceived understandability, and perceived helpfulness understanding health effects and were recalled. Additionally, many of the new cigarette health warnings, relative to the average of the Surgeon General's warnings, also increased agreement with accurate health beliefs over time.

1. Background and Purpose

The Tobacco Control Act (TCA) (Pub. L. 111-31) amends the Federal Food, Drug, and Cosmetic Act (the FD&C Act) to grant U.S. Food and Drug Administration (FDA) authority to regulate the manufacture, marketing, and distribution of tobacco products to protect the public health and to reduce tobacco use by minors. Section 201 of the TCA amends section 4 of the Federal Cigarette Labeling and Advertising Act (FCLAA) (15 U.S.C. 1333) to mandate FDA to issue regulations that require color graphics depicting the negative health consequences of smoking to accompany the label statements specified in subsection (a)(1). FDA's Center for Tobacco Products requires data on how the public may respond to various cigarette health warnings (CHW) focusing on the negative health consequences of cigarette smoking in order to implement this requirement.

To this end, RTI International collaborated with FDA to conduct a series of studies using theory-driven approaches based upon communication and social science theories (McGuire, 2001; Noar et al., 2015; Wogalter et al, 1999). In Study 1 (*Experimental Study on Warning Statements for Cigarette Graphic Health Warning Cigarette Health Warnings*, OMB Control Number 0910-0848, approved by OMB on January 29, 2018), FDA compared 15 revised textual warning statements with the 9 TCA statements (i.e., the statements enumerated in section 202 of the TCA) to assess whether revised statements represented an improvement over TCA statements in terms of improving understanding of smoking-related health consequences. Study 1 informed the selection of 15 textual warning statements to be paired with graphics for testing as part of this study (Study 2: *Experimental Study of Cigarette Warnings*, OMB Control Number 0910-0866).

The purpose of this study was to assess whether new cigarette health warnings increased understanding of the negative health consequences of cigarette smoking to provide the scientific support necessary to inform future rulemaking consistent with section 201 of the TCA.

2. Study Design

2.1 Experimental Design

To inform the design of the current study, the U.S. Food and Drug Administration (FDA) reviewed the existing scientific literature on communication and social science theories, methods, design issues, and outcome measures used in other studies seeking to improve consumer knowledge and to correct misperceptions about the health risks of cigarette smoking. In addition, FDA consulted with experts who were Special Government Employees to inform areas of research to support implementation of Section 201 of the Family Smoking Prevention and Tobacco Control Act. Recommendations from these experts informed the revised textual warning statements examined in Study 1, as well as issues surrounding study design and methodological approaches. The results and design of Study 1 informed the present study of CHW.

CHW were developed through an iterative process that included multiple rounds of development and testing with various groups. This process included 16 qualitative focus groups with adolescent smokers, adolescents at risk for starting smoking, and adult smokers (OMB control number 0910-0674) and a large quantitative study (OMB control number 0910-0848, "Experimental Study on Warning Statements for Cigarette Graphic Health Warnings"). The process of developing and testing the images also included 53 in-depth individual interviews with adolescents and adults (OMB control number 0910-0796, "Qualitative Study of Perceptions and Knowledge of Visually Depicted Health Conditions") and 20 qualitative focus groups with adolescent smokers, adolescents at risk for starting smoking, and adult smokers (OMB control number 0910-0796, "Qualitative Study on Consumer Perceptions of Cigarettes Health Warning Images").

In this study, participants from six subgroups (adolescent smokers, adolescents susceptible to smoking, young adult smokers, young adult nonsmokers, older adult smokers, and older adult nonsmokers) were randomized to 1 of 16 treatment conditions viewing CHW or a control condition viewing Surgeon General's (SG) warnings in this online study. Specifically, within each of the six subgroups, the participants were assigned to the condition with the lowest count (i.e., fewest number of participants), and if more than one condition shared the lowest count, the participants were randomly assigned to one of those conditions. Participants remained in the same condition throughout the study. We also set recruitment and sampling parameters to minimize skewing in demographic characteristics that we anticipated could differ substantially in the sample as compared with population distributions. Specifically, we had quotas such that female participants would comprise no more than 60% of the total sample, and adults aged 65 and older would comprise no more than 25% of the total older adult (aged 25+) sample.

The experimental conditions, along with the abbreviated terms used in this report to describe the warnings, appear in Table 2. In the control condition (condition 0), participants saw a random selection of one of four SG warnings displayed on an image of a mock cigarette pack and mock cigarette advertisement (order of pack and advertisement was randomized). In the treatment conditions (conditions 1-16), participants saw a CHW (i.e., a warning statement combined with an image) displayed on an image of a mock cigarette pack and mock cigarette advertisement (order of pack and advertisement was randomized). Conditions 10 and 11 used the same statement (“Smoking causes COPD, a lung disease that can be fatal.”) but with different images (diseased lungs or man with oxygen); because the images differed, conditions 10 and 11 were treated as distinct warnings.

Each of the Surgeon General’s warnings were presented as they currently appear on cigarette packs and advertisements: as text-only warnings on the side of packs and at the bottom of advertisements. Each of the new cigarette health warnings appeared as they are required by the TCA and proposed in the Notice of Proposed Rulemaking (NPRM), with the textual warning statement paired with a concordant photorealistic image on the top 50% of the front and rear panels of the mock cigarette pack and at the top 20% of the mock cigarette advertisement. The use of a mock cigarette brand was to prevent beliefs related to specific brands from influencing the results. The mock advertisement was developed to reflect the tone and style of cigarette print advertisements. Exposure to the stimuli at both Sessions 1 and 2 were to better approximate real-world conditions in which people will see the warning often. Appendix A displays the stimuli for all conditions.

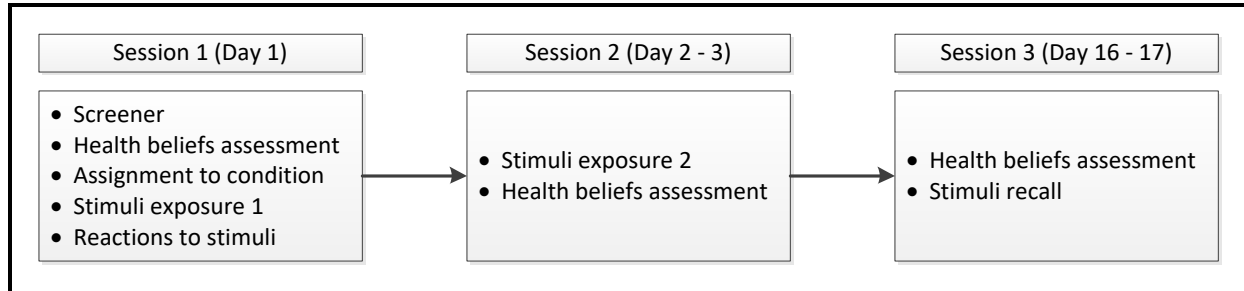
Table 2. Study Conditions

| Condition Number | Exposure | Abbreviated Term for Warning |
|---|--|-------------------------------------|
| Surgeon General’s Warnings ^a | | |
| 0 (control) | Random selection of 1 of the following SG warnings: | |
| | 1) SURGEON GENERAL’S WARNING: Smoking Causes Lung Cancer, Heart Disease, Emphysema, and May Complicate Pregnancy. | SG Disease |
| | 2) SURGEON GENERAL’S WARNING: Quitting Smoking Now Greatly Reduces Serious Risks to Your Health. | SG Quitting |
| | 3) SURGEON GENERAL’S WARNING: Smoking by Pregnant Women May Result in Fetal Injury, Premature Birth, and Low Birth Weight. | SG Pregnancy |
| | 4) SURGEON GENERAL’S WARNING: Cigarette Smoke Contains Carbon Monoxide. | SG Carbon Monoxide |
| Cigarette Health Warnings ^b | | |
| 1 | WARNING: Cigarettes are addictive. | Addictive |
| 2 | WARNING: Tobacco smoke can harm your children. | Harm children |
| 3 | WARNING: Smoking can kill you. | Kill you |
| 4 | WARNING: Tobacco smoke causes fatal lung disease in nonsmokers. | Fatal lung disease in nonsmokers |
| 5 | WARNING: Quitting smoking now greatly reduces serious risks to your health. | Quit now |
| 6 | WARNING: Smoking causes head and neck cancer. | Head and neck cancer |
| 7 | WARNING: Smoking causes bladder cancer, which can lead to bloody urine. | Bladder cancer |
| 8 | WARNING: Smoking during pregnancy stunts fetal growth. | Stunt fetal growth |
| 9 | WARNING: Smoking can cause heart disease and strokes by clogging arteries. | Clogged arteries |
| 10 | WARNING: Smoking causes COPD, a lung disease that can be fatal. [Paired with COPD Image 1: diseased lungs] | COPD 1 |
| 11 | WARNING: Smoking causes COPD, a lung disease that can be fatal. [Paired with COPD Image 2: man with oxygen] | COPD 2 |
| 12 | WARNING: Smoking reduces blood flow, which can cause erectile dysfunction. | Erectile dysfunction |
| 13 | WARNING: Smoking reduces blood flow to the limbs, which can require amputation. | Amputation |
| 14 | WARNING: Smoking causes type 2 diabetes, which raises blood sugar. | Diabetes |
| 15 | WARNING: Smoking causes age-related macular degeneration, which can lead to blindness. | Macular degeneration |
| 16 | WARNING: Smoking causes cataracts, which can lead to blindness. | Cataracts |

^a Each of the Surgeon General’s (SG) warnings were presented as they currently appear on cigarette packs and advertisements: as text-only warnings on the side of packs and at the bottom of advertisements. ^b Each of the cigarette health warnings appeared as they are required by the TCA and described in the Notice of Proposed Rulemaking (NPRM), with the textual warning statement paired with a concordant photorealistic image on the top 50% of the front and rear panels of the mock cigarette pack and at the top 20% of the mock cigarette advertisement

The study comprised three Sessions, outlined in Figure 2.

Figure 2. Study Protocol



In Session 1, which took approximately 12 minutes, participants first completed a screening questionnaire through an email invitation. After screening for inclusion (see Study Screener in Appendix B), participants who qualified for the study completed three consecutive components: (1) a baseline assessment of beliefs about the negative health consequences of cigarette smoking (i.e., “health beliefs”); (2) assignment to study condition and exposure to cigarette warning stimuli according to condition assignment; and (3) assessment of new information, self-reported learning, and other reactions to the stimuli (see Session 1 Survey Instrument in Appendix B). These three components are described below.

- *Component (1)*: First, participants were asked questions about beliefs related to the health consequences of cigarette smoking.
- *Component (2)*: Following the baseline assessment of health beliefs, participants were randomized to one of 16 treatment conditions or a control condition with variation in exposure to cigarette warnings. Participants in each treatment condition were exposed to one CHW, with each condition corresponding to a unique warning from a set of 16. Participants in the control condition were exposed to a random selection of one of four SG warnings. Each stimuli exposure included viewing of the warning in two formats: on a mock cigarette package depicted in a 3-dimensional, rotational model; and on a mock cigarette advertisement. We forced a 5-second minimum exposure for both pack and ad stimuli (median exposure time was 32 seconds for pack and 13 seconds for ad). The order of viewing the package and advertisement formats were randomized. In all analyses, stimuli exposure was considered the joint exposure to both stimuli formats; stimuli format was not considered a study factor.
- *Component (3)*: After viewing the warning stimuli in both package and advertisement formats, participants completed a brief set of measures to assess

(a) if the information presented in the warning was new; (b) self-reported learning from the warning; (c) understandability of the warning; (d) if the warning was perceived to be a fact or an opinion; (e) informativeness of the warning; (f) if the warning grabbed their attention; and (g) if the warning made them think about the health risks of smoking.

One to two days following completion of the baseline assessment (Session 1), Session 1 participants received an email invitation to complete a follow-up (Session 2). In this follow-up session (approximately 8 minutes in duration), participants were re-exposed to the warning stimuli they were shown in Session 1. This exposure followed the same protocol described in Component 2, above. Median exposure time was 30 seconds for pack and 11 seconds for ad stimuli. Following stimuli exposure, participants completed a set of immediate post-test measures assessing beliefs related to the negative health consequences of cigarette smoking (see Session 2 Survey Instrument in Appendix C).

Fourteen days after Session 2, at the delayed post-test (Session 3, approximately 5 minutes in duration), Session 2 participants received an email invitation to complete a questionnaire assessing measures of beliefs about the negative health consequences of cigarette smoking, as well as recall of the warning (see Session 3 Survey Instrument in Appendix D).

2.2 Sampling Frame and Sampling Methodology

Study participants were recruited from a national online panel of adults managed by Lightspeed. The Lightspeed panel is a non-probability convenience sample recruited via social media, online recruitment (e.g., via banner placements), and affiliate corporate networks. For the current study, Lightspeed recruited adult panelists and parents of potential youth respondents using information from panelists' user profiles related to study eligibility (i.e., age, smoking status, and whether or not the panelist had a child in the eligible age range). Recruitment focused on six subgroups (adolescent smokers, adolescents susceptible to smoking, young adult smokers, young adult nonsmokers, older adult smokers, and older adult nonsmokers) based on the criteria listed in Table 3. In order to get a broad and heterogenous sample, both adults and adolescents and smokers and non-smokers (including adolescents susceptible to smoking) were included. Because the goal of these warnings is to increase knowledge and understanding of the health consequences of tobacco and not to change behavior, all these groups are relevant to the purpose of the study. Respondents were not eligible if they or any members of their households had worked for a tobacco company, a tobacco-related public health/community organization, or FDA in the past 5 years.

Table 3. Age and Smoking-Related Criteria for Inclusion in Subgroup

| Subgroup | Age | Smoking-Related Criteria |
|------------------------------------|-----------|---|
| Adolescent smokers | 13–17 | Smoked a cigarette in past 30 days |
| Adolescents susceptible to smoking | 13–17 | Never tried cigarettes and responded anything <u>other</u> than “definitely not” to ≥ 1 of 4 questions assessing susceptibility. (Pierce et al., 1996) |
| Young adult smokers | 18–24 | Smoked 100 cigarettes in lifetime and now smoke “every day” or “some days” |
| Young adult nonsmokers | 18–24 | Now smoke “not at all” or have not smoked 100 cigarettes in lifetime ^a |
| Older adult smokers | ≥ 25 | Smoked 100 cigarettes in lifetime and now smoke “every day” or “some days” |
| Older adult nonsmokers | ≥ 25 | Now smoke “not at all” or have not smoked 100 cigarettes in lifetime ^a |

^a Adult nonsmokers may have smoked previously, but currently smoke “not at all” or have not smoked 100 cigarettes in lifetime

Potentially eligible Lightspeed panel members received an email inviting them to participate in Session 1 of the study using a laptop or desktop computer (the study was not available for panel members to complete on a mobile device, such as a phone or tablet). Adolescent children of adult panel participants were invited to complete the survey through an email invitation to their parents asking for consent to solicit their child’s opinions. The permission and consent/assent forms included information about the study sponsor (U.S. Food and Drug Administration’s Center for Tobacco Products) and noted that the study “asks people what they think about tobacco use.” Panel members and children of panelists who met the study eligibility criteria and chose to participate were randomly assigned to an experimental condition and completed the Session 1 questionnaire.

Session 1 participants were re-contacted to participate in Sessions 2 and 3. There was no sample replenishment between sessions. Participants received Lightspeed “LifePoints,” valued at approximately \$10.00, as compensation for their participation in Session 1. They received the same number of LifePoints as compensation for their participation in Sessions 2 and 3.

Lightspeed maintains a quality control program for their data. The components of that program, some details of which are proprietary, include the following:

- Honesty detector: an online, statistical approach to remove over-reporters by analyzing panelists’ responses to high and low probability statements as well as a benchmark question.
- Identity validation: matching personally identifying information to financial and social network databases to authenticate individuals before they are admitted to the panel.

- Internet Protocol (IP) address validation: checking IP addresses to confirm location and ensure they do not match a known list of fraudulent surveys.
- Unique survey responders: identifying and eliminating duplicate respondents using “digital fingerprinting” technology.
- Engagement assessment: ensuring that respondents are thoughtful and engaged by including speeding checks and survey satisfaction ratings.

Online panels of consumers are well suited for experimental designs because they allow data to be collected from very specific study populations in a short period of time and enable consumers to easily view multimedia materials. However, because respondents were recruited using non-probability, convenience sampling methods, results from this study are not necessarily representative of the populations from which the sample was drawn.

2.3 Instrument Development

FDA and RTI collaborated on instrument design which was informed by communication and social science theories (McGuire, 2001; Noar et al., 2015; Wogalter et al, 1999) Many survey items were adapted from the well-established literature and/or selected from validated instruments in communication and social science literature (Bann et al., 2012; Bansal-Travers et al., 2011; Byrne et al., 2015; Fathelrahman et al., 2010; Hammond et al., 2007; Herz-Roiphe, 2015; Magnan & Cameron, 2015; Pierce et al., 1996).

Session 1 survey content was the same for adolescents (aged 13–17) and adults (aged 18 and over) with a few exceptions in the screener portion of the instrument:

- Only adolescents responded to items about ever smoking, smoking in the past 30 days, and smoking susceptibility.
- Only adults responded to items about smoking 100 cigarettes in lifetime, current smoking (defined by every day, some days, or not at all), income, education, sexual orientation, and health literacy.

There were no differences in survey content by age or other variables in Sessions 2 or 3.

Adolescents and adults were eligible for the survey if they met the criteria for one of the groups in Table 3 and did not work or have household members who worked for a tobacco company, tobacco-related community organization, or FDA in the past 5 years.

The study protocol and materials were approved by the OMB (OMB Control Number 0910-0866), the Research Involving Human Subjects Committee (RIHSC) at FDA, and the Institutional Review Board at RTI International.

3. Data Collection Timeline and Final Disposition

3.1 Data Collection Timeline

Lightspeed sent invitations to panel members for Session 1 beginning on March 11, 2019. Data collection for Session 1 ended on April 13, 2019, when we hit the target sample size in each subgroup. Session 2 data collection ended on April 18, 2019, and Session 3 ended on May 2, 2019. We ended Sessions 2 and 3 on those dates to meet a court-mandated deadline for completing this research.

3.2 Disposition of Sample

Tables 4 through 9 provide information about the final disposition of the sample at each session by age group, condition, gender, age range, and smoking status. To check for balance in sociodemographic and tobacco use characteristics between treatment and control conditions, we conducted chi-square tests comparing proportions in treatment vs. control conditions and age, race/ethnicity, gender, educational attainment (adults only), and smoking status (susceptible vs. current smoker for adolescents, and current vs. nonsmoker for adults) within each age group (adolescent, young adult, older adult) and across each study session. Sociodemographic and tobacco use characteristics did not vary significantly ($p < 0.05$) by treatment vs. control in any of these analyses.

Table 4. Final Disposition of Sample at Session 1 by Age Group

| Disposition | Adolescents | Young Adults | Older Adults | Total |
|---|--------------------|---------------------|---------------------|--------------|
| Total sample (unique invites sent) | 195,943 | 206,079 | 334,578 | 736,600 |
| Total entering study | 5,181 | 3,363 | 11,246 | 19,790 |
| Screen outs | 2,601 | 537 | 552 | 3,690 |
| Quits (qualified but did not complete) | 75 | 59 | 245 | 379 |
| Over quotas | 203 | 696 | 5,052 | 5,951 |
| Completed survey | 2,302 | 2,071 | 5,397 | 9,770 |
| Removed from analytic sample ^a | 1 | 0 | 9 | 10 |
| Qualified completes | 2,301 | 2,071 | 5,388 | 9,760 |

^a 10 participants who completed the survey on a mobile phone or tablet were excluded from analysis.

Table 5. Completed Surveys by Age Group and Participant Characteristics at Session 1

| Participant Characteristic | Adolescents | Young Adults | Older Adults | Total |
|-------------------------------------|--------------------|---------------------|---------------------|--------------|
| Study Condition | | | | |
| 0 (CONTROL) | 492 | 439 | 1,149 | 2,080 |
| 1 | 113 | 102 | 267 | 482 |
| 2 | 113 | 102 | 263 | 478 |
| 3 | 114 | 102 | 263 | 479 |
| 4 | 113 | 102 | 265 | 480 |
| 5 | 113 | 102 | 266 | 481 |
| 6 | 113 | 102 | 267 | 482 |
| 7 | 113 | 102 | 265 | 480 |
| 8 | 113 | 102 | 265 | 480 |
| 9 | 113 | 102 | 265 | 480 |
| 10 | 113 | 102 | 266 | 481 |
| 11 | 113 | 102 | 263 | 478 |
| 12 | 113 | 102 | 264 | 479 |
| 13 | 113 | 102 | 265 | 480 |
| 14 | 113 | 102 | 265 | 480 |
| 15 | 113 | 102 | 265 | 480 |
| 16 | 113 | 102 | 265 | 480 |
| Gender | | | | |
| Male | 1,109 | 1,038 | 2,190 | 4,337 |
| Female | 1,192 | 1,033 | 3,198 | 5,423 |
| Age range | | | | |
| 13–17 | 2,301 | N/A | N/A | 2,301 |
| 18–24 | N/A | 2,071 | N/A | 2,071 |
| 25–34 | N/A | N/A | 1,385 | 1,385 |
| 35–44 | N/A | N/A | 492 | 492 |
| 45–54 | N/A | N/A | 785 | 785 |
| 55–64 | N/A | N/A | 1,520 | 1,520 |
| 65+ | N/A | N/A | 1,206 | 1,206 |
| Smoking status | | | | |
| Susceptible to smoking ^a | 1,891 | N/A | N/A | 1,891 |
| Nonsmoker ^b | N/A | 1,332 | 2,409 | 3,741 |
| Current smoker ^c | 410 | 739 | 2,979 | 4,128 |
| TOTAL | 2,301 | 2,071 | 5,388 | 9,760 |

^a Adolescent (aged 13–17) who never tried cigarettes and responded anything other than “definitely not” to ≥1 of 4 questions assessing susceptibility. ^bYoung adult (aged 18–24) or older adult (aged 25+) who currently smokes “not at all.” ^cAdolescent (aged 13–17) who smoked in past 30 days; young adult (aged 18–24) or older adult (aged 25+) who smoked 100 cigarettes in lifetime and now smokes “every day” or “some days.” N/A = Not applicable

Table 6. Final Disposition of Sample at Session 2 by Age Group

| Disposition | Adolescents | Young Adults | Older Adults | Total |
|--|--------------------|---------------------|---------------------|--------------|
| Total sample (unique invites sent to Session 1 participants) | 2,302 | 2,071 | 5,397 | 9,770 |
| Total entering study | 1,023 | 683 | 3,764 | 5,470 |
| Screen outs ^a | 31 | 30 | 137 | 198 |
| Quits (qualified but did not complete) | 41 | 35 | 272 | 348 |
| Over quotas | 0 | 0 | 0 | 0 |
| Completed survey | 951 | 618 | 3,355 | 4,924 |
| Removed from analytic sample ^b | — | — | — | 11 |
| Qualified completes | 949 | 617 | 3,346 | 4,913 |

^a The total number screened out includes 123 participants that were terminated due to an unspecified technical error in the online survey platform.

^b 4 participants (1 adolescent; 1 young adult; and 2 older adults) who completed the survey on a mobile phone or tablet were excluded from analysis. 1 older adult participant completed the survey twice; we retained the first completed record and excluded the duplicate record for this case. We also excluded from analysis 6 participants that did not have a respondent ID at Session 2, meaning that they could not be matched to a record from Session 1. We do not have sufficient data to determine the age of these 6 participants; thus, we only report the number removed from the total analytic sample, instead of the number removed from each age group.

Table 7. Completed Surveys by Age Group and Participant Characteristics at Session 2

| Participant Characteristic | Adolescents | Young Adults | Older Adults | Total |
|-----------------------------------|--------------------|---------------------|---------------------|--------------|
| Study Condition | | | | |
| 0 (CONTROL) | 208 | 140 | 716 | 1,064 |
| 1 | 53 | 22 | 154 | 229 |
| 2 | 40 | 26 | 173 | 239 |
| 3 | 45 | 32 | 171 | 248 |
| 4 | 46 | 32 | 161 | 239 |
| 5 | 41 | 35 | 168 | 244 |
| 6 | 55 | 27 | 168 | 250 |
| 7 | 56 | 30 | 160 | 246 |
| 8 | 46 | 32 | 163 | 241 |
| 9 | 39 | 27 | 163 | 229 |
| 10 | 48 | 28 | 167 | 243 |
| 11 | 48 | 31 | 159 | 238 |
| 12 | 47 | 36 | 153 | 236 |
| 13 | 34 | 37 | 170 | 241 |

(continued)

Table 7. Completed Surveys by Age Group and Participant Characteristics at Session 2 (continued)

| Participant Characteristic | Adolescents | Young Adults | Older Adults | Total |
|-------------------------------------|--------------------|---------------------|---------------------|--------------|
| 14 | 43 | 32 | 164 | 239 |
| 15 | 49 | 27 | 166 | 242 |
| 16 | 51 | 23 | 171 | 245 |
| Gender | | | | |
| Male | 473 | 356 | 1,469 | 2,298 |
| Female | 476 | 261 | 1,878 | 2,615 |
| Age range | | | | |
| 13–17 | 949 | N/A | N/A | 949 |
| 18–24 | N/A | 617 | N/A | 617 |
| 25–34 | N/A | N/A | 459 | 459 |
| 35–44 | N/A | N/A | 333 | 333 |
| 45–54 | N/A | N/A | 537 | 537 |
| 55–64 | N/A | N/A | 1,129 | 1,129 |
| 65+ | N/A | N/A | 889 | 889 |
| Smoking status | | | | |
| Susceptible to smoking ^a | 737 | N/A | N/A | 737 |
| Nonsmoker ^b | N/A | 448 | 1,638 | 2,086 |
| Current smoker ^c | 212 | 169 | 1,709 | 2,090 |
| TOTAL | 949 | 617 | 3,347 | 4,913 |

^a Adolescent (aged 13–17) who never tried cigarettes and responded anything other than “definitely not” to ≥1 of 4 questions assessing susceptibility. ^bYoung adult (aged 18–24) or older adult (aged 25+) who currently smokes “not at all.” ^cAdolescent (aged 13–17) who smoked in past 30 days; young adult (aged 18–24) or older adult (aged 25+) who smoked 100 cigarettes in lifetime and now smokes “every day” or “some days.” N/A = Not applicable

Table 8. Final Disposition of Sample at Session 3 by Age Group

| Disposition | Adolescents | Young Adults | Older Adults | Total |
|---|--------------------|---------------------|---------------------|--------------|
| Total sample (unique invites sent) ^a | 947 | 616 | 3,314 | 4,877 |
| Total entering study | 572 | 281 | 2,598 | 3,451 |
| Screen outs | 7 | 2 | 14 | 23 |
| Quits (qualified but did not complete) | 4 | 1 | 41 | 46 |
| Over quotas | 0 | 0 | 0 | 0 |
| Completed survey | 561 | 278 | 2,543 | 3,382 |
| Removed from analytic sample ^b | — | — | — | 22 |
| Qualified completes | 561 | 273 | 2,526 | 3,360 |

^a 47 participants completed the Session 3 survey prematurely (prior to the intended 14 days between Session 2 and Session 3) due to an error in the invitation process. We deleted the Session 3 data for these cases and did not re-invite them to participate in Session 3.

^b 2 participants (1 young adult; 1 older adult) who completed the survey on a mobile phone or tablet were excluded from analysis. 13 participants (all older adults) completed the survey twice; we retained the first completed record and excluded 13 duplicate records for these cases. We also excluded from analysis 7 participants that did not have a respondent ID at Session 3, meaning that they could not be matched to a record from Session 1. We do not have sufficient data to determine the age of these 7 participants; thus, we only report the number removed from the total analytic sample, instead of the number removed from each age group.

Table 9. Completed Surveys by Age Group and Participant Characteristics at Session 3

| Participant Characteristic | Adolescents | Young Adults | Older Adults | Total |
|-----------------------------------|--------------------|---------------------|---------------------|--------------|
| Study Condition | | | | |
| 0 (CONTROL) | 119 | 60 | 527 | 706 |
| 1 | 27 | 13 | 119 | 159 |
| 2 | 24 | 14 | 130 | 168 |
| 3 | 28 | 13 | 140 | 181 |
| 4 | 30 | 16 | 115 | 161 |
| 5 | 28 | 19 | 137 | 184 |
| 6 | 31 | 12 | 125 | 168 |
| 7 | 31 | 7 | 126 | 164 |
| 8 | 25 | 10 | 107 | 142 |
| 9 | 26 | 12 | 125 | 163 |
| 10 | 34 | 9 | 121 | 164 |
| 11 | 22 | 16 | 128 | 166 |
| 12 | 27 | 12 | 114 | 153 |

(continued)

Table 9. Completed Surveys by Age Group and Participant Characteristics at Session 3 (continued)

| Participant Characteristic | Adolescents | Young Adults | Older Adults | Total |
|-------------------------------------|-------------|--------------|--------------|-------|
| 13 | 21 | 14 | 136 | 171 |
| 14 | 32 | 18 | 119 | 169 |
| 15 | 25 | 15 | 128 | 168 |
| 16 | 31 | 13 | 129 | 173 |
| Gender | | | | |
| Male | 284 | 181 | 1136 | 1,601 |
| Female | 277 | 92 | 1390 | 1,759 |
| Age range | | | | |
| 13–17 | 561 | N/A | N/A | 561 |
| 18–24 | N/A | 273 | N/A | 273 |
| 25–34 | N/A | N/A | 287 | 287 |
| 35–44 | N/A | N/A | 269 | 269 |
| 45–54 | N/A | N/A | 426 | 426 |
| 55–64 | N/A | N/A | 901 | 901 |
| 65+ | N/A | N/A | 643 | 643 |
| Smoking status | | | | |
| Susceptible to smoking ^a | 425 | N/A | N/A | 425 |
| Nonsmoker ^b | N/A | 196 | 1,270 | 1,466 |
| Current smoker ^c | 136 | 77 | 1,256 | 1,469 |
| TOTAL | 561 | 273 | 2,526 | 3,360 |

^a Adolescent (aged 13–17) who never tried cigarettes and responded anything other than “definitely not” to ≥1 of 4 questions assessing susceptibility. ^bYoung adult (aged 18–24) or older adult (aged 25+) who currently smokes “not at all.” ^cAdolescent (aged 13–17) who smoked in past 30 days; young adult (aged 18–24) or older adult (aged 25+) who smoked 100 cigarettes in lifetime and now smokes “every day” or “some days.” N/A = Not applicable.

Due to a technical error with the online survey platform, the question assessing accuracy of warning recall did not function properly for 197 participants in Session 3. These cases were removed from the analysis of warning recall.

4. Analysis Plan

4.1 Measures and Coding

4.1.1 *Theory-based approaches to inform study variables*

Our selection of study variables was guided by communication and social science theories (McGuire, 2001; Noar et al., 2015; Wogalter et al, 1999) which show that warning message characteristics (e.g., use of pictorials, content of the textual warning statement) impacts consumer understanding of the warning. A large body of scientific evidence demonstrates that pictorial cigarette warnings promote greater public understanding about the health consequences of smoking as they: (1) increase the noticeability of the warning's message, resulting in increased consumer attention to, reading, and recall of the message; and (2) increase knowledge, learning, reactions to the message, information processing, and thinking about the negative health consequences of smoking. Because understanding is multifaceted and encompasses many processes such as the ones described, there is no "gold standard" measure or other conventions used to capture understanding. As such, our theory-driven selection of study items relies on a robust body of literature and/or validated instruments (Bann et al., 2012; Bansal-Travers et al., 2011; Byrne et al., 2015; Fathelrahman et al., 2010; Hammond et al., 2007; Herz-Roiphe, 2015; Magnan & Cameron, 2015; Pierce et al., 1996).

4.1.2 *Components of Understanding and Selected Study Outcomes*

Selection of survey items for understanding was guided by communication and social science theories (McGuire, 2001; Noar et al., 2015; Wogalter et al, 1999). Because understanding is multifaceted, we selected multiple components of understanding based upon the literature. We briefly describe these various components of understanding and the items that were chosen as study outcomes below:[Note: Items selected for each component of understanding are bulleted and their citations reflect the source of the original or adapted survey item.]

Initial Reactions: This component of understanding captures participants' initial and immediate reactions to warnings. Initial perceptions that the source of a message (i.e., the warning) is effective (e.g., perceptions that a warning provides new information and can contribute to learning) serves as a necessary precursor to message comprehension and learning (McGuire, 2001; Noar et al., 2015; Wogalter et al., 1999). As such, we believe this component to be a *necessary* component of understanding. We selected the following items to reflect this component of understanding:

- Whether the health effect in the warning was new information (Magnan & Cameron, 2014)
- Self-reported learning (Magnan & Cameron, 2014)

Message Reactions: This component of understanding captures participants' reactions to and judgement of a message (Noar et al., 2015). An individual's judgement of a message is linked to actual effectiveness of the message (e.g., perceiving a warning to be understandable is linked to increased likelihood that the warning is understood) (Dillar et al., 2007; Noar et al., 2018). We selected the following items to reflect this component of understanding:

- To what extent the warning was informative (Atkin & Beltramini, 2007)
- To what extent the warning was understandable (Cameron et al., 2015).
- Whether the warning was a fact or opinion (Herz-Roiphe, 2015)
- Perceived helpfulness of the warning (OMB, 2011)

Learning and Processing: This component of understanding captures participants' ability to process and think on the information in a message which leads to knowledge acquisition and learning (Wogalter et al. 1999, cite). Warnings that promote health beliefs and thinking about the health risks of smoking are more likely to lead to understanding about the negative health consequences of smoking compared to warnings that fail to promote these indicators. We selected the following items to reflect this component of understanding.

- Beliefs about smoking-related health risks (Byrne, Katz, & Niederdeppe, 2014; Mutti et al., 2013)
- Thinking about the health risks of smoking (Fathelrahman et al., 2010; Hammond et al., 2007)

Attention and Recall: This component of understanding captures participants' attention to the warning and ability to recognize or recall the warning (Noar et al., 2015; Wogalter et al., 1999). A warning that is noticed and attracts sufficient attention for information to be encoded and recalled increases the likelihood of understanding the warning compared to a warning that does not attraction (Davis et al., 2008; McGuire, 1980; Noar et al., 2018; Ophir et al., 2019). We selected the following items to reflect this component of understanding:

- Attention (Bansal-Travers et al., 2011; Borland et al., 2009)
- Recall of warning previously viewed (Brubaker & Mitby, 1990; Kees et al., 2010; Strasser et al. 2012)

Table 10 presents item wording, and details regarding the coding for all of the outcomes of understanding examined in the study. The table also includes an abbreviated term for each warning, which is used in tables and text in this report in lieu of writing the complete item. In the list below, the sources of the items are noted.

Table 10. Study Outcomes

| Session When Assessed | Item Number(s) | Item Wording and Response Options | Coding for Analysis | Abbreviated Term for Item |
|------------------------------|-----------------------|--|--|-------------------------------------|
| 1 | B1 | Before today, had you heard about the specific smoking-related health effect described in the warning? [Yes / No / I'm not sure] | Dichotomous [Yes (0) vs. No / I'm not sure (1)] | New information |
| 1 | B12 | To what extent did you learn something new from this warning that you did not know before? [7-pt scale from 1 (Not at all) to 7 (Very Much)] | Continuous | Self-reported learning ^a |
| 1 | B10 | How much does this warning make you think about the health risks of smoking? [Not at all / A little / Somewhat / A lot] | Dichotomous [Somewhat / A lot (1) vs. Not at all / A little (0)] | Thinking about risks |

(continued)

Table 10. Study Outcomes (continued)

| Session When Assessed | Item Number(s) | Item Wording and Response Options | Coding for Analysis | Abbreviated Term for Item |
|------------------------------|-----------------------|---|--|----------------------------------|
| 1 | B8_1 | This warning is [7-pt scale from 1 (Not at all informative) to 7 (Very informative)] | Continuous | Informative-ness |
| 1 | B8_2 | This warning is [7-pt scale from 1 (Hard to understand) to 7 (Easy to understand)] | Continuous | Understand-ability |
| 1 | B9 | Would you say that this warning is an opinion or a fact? [Opinion / Fact] | Dichotomous [Fact (1) / Opinion (0)] | Factualness |
| 1, 2, & 3 | A1_1 – A16_2 | Agreement with a health belief statement or statements related to a given warning. For example, agreement with the beliefs "Smoking causes head cancer" and "Smoking causes neck cancer" for the CHW Head and neck cancer [5-pt scale from 1 (Strongly disagree) to 5 (Strongly agree)] | Categorical (single health belief items) or continuous (scaled multiple health belief items) | Health beliefs |
| 3 | E1 | You recently took a survey in which you were shown a cigarette pack and | Dichotomous [Accurate (1) vs. | Recall |

| | |
|---|---|
| advertisement with a warning on it. Which label do you remember seeing? [Label 1 / Label 2 / Label 3 / Label 4 / None of these / I don't remember] | Inaccurate / None of these / I don't remember (0)] |
|---|---|

^aThe Statistical Analysis Plan refers to this item using the abbreviated term “knowledge gain.”

The items used to measure health beliefs had Likert-type response scales. Additional information about treatment of these items for analyses is described in Section 4.3.3.

The survey also included items assessing gender, age, race/ethnicity, education (assessed among adults only), income (among adults only), sexual orientation (among adults only), smoking status (current smoker or susceptible to smoking for adolescents and current smoker or nonsmoker for adults), health literacy (among adults only), and region.

4.2 Power Analyses

Prior to conducting the study, we conducted power calculations to confirm that the overall sample size (shown in Table 11) was sufficiently powered and to determine the optimal sample size and allocation of sample across study conditions. To control for Type 1 error taking into account multiple testing, power calculations were based on the false discovery rate (FDR; Benjamini & Hochberg, 1995). Assuming the tests are independent, the FDR is the expected proportion of significant results that are falsely declared as statistically significant. Controlling the FDR is controlling the expected proportion of falsely declared differences (i.e., false discoveries). Controlling the FDR is a more powerful method for dealing with multiple comparisons than other methods that control the family-wise error rate (Benjamini & Hochberg, 1995).

For the overall study sample size, we calculated power to detect a difference in the change in a health belief from Session 1 to Session 2 between treatment and control groups (i.e., difference in difference; Table 11 provides power estimates for Session 2 across various scenarios). We calculated power to detect a 0.3 difference on a 7-point scale (two-sided tests, assuming a standard deviation of 1) under different scenarios with variation in FDR, within-person correlation between Sessions 1 and 2, and sample allocation. Estimates of effect sizes used in the power analysis were derived from previously conducted studies with similar methodologies and included relevant outcomes as the present study, including FDA's previous study on warnings conducted in 2011 (Nonnemaker et al., 2015). We conservatively assumed 50% retention from Session 1 to Session 2. Power calculations were computed using 100 simulations for each sample allocation in SAS v9.4.

Across various assumptions of within-person correlation and FDR, we found generally higher levels of power using an optimized sample allocation with between 1,760 and 2,400 participants assigned to the control condition at Session 1 (880–1,200 participants at Session 2, assuming 50% retention). Based on this analysis showing that higher power is

achieved with an unbalanced allocation, we planned to allocate 2,080 to the control group and 480 to each treatment group at Session 1. Final allocations are shown in Table 11.

Table 11. Study Power by Sample Allocation at Session 2

| Sample Allocation at Session 2 | | Within-person Correlation | Adjusted Power by FDR Value | | | | | Unadjusted Power |
|--------------------------------|-----------|---------------------------|-----------------------------|------|------|------|------|------------------|
| Control | Treatment | | 0.05 | 0.1 | 0.15 | 0.2 | 0.25 | |
| 287 | 287 | 0 | 0.60 | 0.71 | 0.83 | 0.89 | 0.91 | 0.68 |
| 880 | 250 | 0 | 0.80 | 0.89 | 0.94 | 0.95 | 0.97 | 0.85 |
| 1,200 | 230 | 0 | 0.77 | 0.87 | 0.90 | 0.94 | 0.95 | 0.81 |
| 1,520 | 210 | 0 | 0.88 | 0.92 | 0.94 | 0.96 | 0.98 | 0.88 |
| 1,840 | 190 | 0 | 0.72 | 0.84 | 0.88 | 0.92 | 0.93 | 0.78 |
| 287 | 287 | 0.2 | 0.64 | 0.77 | 0.83 | 0.89 | 0.90 | 0.73 |
| 880 | 250 | 0.2 | 0.95 | 0.95 | 0.97 | 0.99 | 0.99 | 0.96 |
| 1,200 | 230 | 0.2 | 0.89 | 0.94 | 0.95 | 0.98 | 1.00 | 0.91 |
| 1,520 | 210 | 0.2 | 0.87 | 0.92 | 0.94 | 0.96 | 0.98 | 0.89 |
| 1,840 | 190 | 0.2 | 0.85 | 0.88 | 0.94 | 0.94 | 0.99 | 0.87 |
| 287 | 287 | 0.4 | 0.85 | 0.91 | 0.96 | 0.98 | 0.99 | 0.89 |
| 880 | 250 | 0.4 | 0.97 | 0.98 | 0.99 | 0.99 | 1.00 | 0.98 |
| 1,200 | 230 | 0.4 | 0.97 | 1.00 | 1.00 | 1.00 | 1.00 | 0.97 |
| 1,520 | 210 | 0.4 | 0.95 | 0.97 | 0.97 | 0.97 | 0.98 | 0.95 |

(continued)

Table 11. Study Power by Sample Allocation at Session 2 (continued)

| Sample Allocation at Session 2 | | Within-person Correlation | Adjusted Power by FDR Value | | | | | Unadjusted Power |
|--------------------------------|-----------|---------------------------|-----------------------------|------|------|------|------|------------------|
| Control | Treatment | | 0.05 | 0.1 | 0.15 | 0.2 | 0.25 | |
| 1,840 | 190 | 0.4 | 0.91 | 0.94 | 0.97 | 0.97 | 0.97 | 0.91 |
| 287 | 287 | 0.6 | 0.97 | 0.98 | 0.98 | 1.00 | 1.00 | 0.98 |
| 880 | 250 | 0.6 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 1,200 | 230 | 0.6 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 1,520 | 210 | 0.6 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 1,840 | 190 | 0.6 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 287 | 287 | 0.8 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 880 | 250 | 0.8 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 1,200 | 230 | 0.8 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 1,520 | 210 | 0.8 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 1,840 | 190 | 0.8 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |

Note: FDR = False Discovery Rate

4.3 Analyses

In the sections that follow, we provide general information about our analytic approach. We then describe our approach for three phases of analysis. In Phase 1, we examined how reactions to warnings varied between the treatment conditions (CHW) and control condition (average of the 4 SG warnings). In Phase 2, we conducted a longitudinal analysis to examine the extent to which changes in health beliefs varied between those exposed to CHW versus those exposed to SG warnings. Finally, in Phase 3 we assessed variation in recall of warnings between those exposed to CHW versus SG warnings.

4.3.1 **General Approach to All Analyses, Including Adjustment for Multiple Comparisons and Indications of Statistical Significance in Results**

In all analyses, we used the Benjamini-Hochberg procedure to account for multiple comparisons. The Benjamini-Hochberg procedure involves ranking all the p-values from a family of tests from smallest to largest. The smallest p-value has a rank of $i=1$, the next smallest has $i=2$, etc. The next step is comparing each individual p-value to its Benjamini-Hochberg critical value, $(i/m)Q$, where i is the rank, m is the total number of tests, and Q is the FDR you choose. The largest p-value that has $P < (i/m)Q$ is statistically significant, and all of the p-values smaller than it are also statistically significant, even the ones that are not less than their Benjamini-Hochberg critical value. In other words, once a p-value in the list satisfies $P \geq (i/m)Q$, then no other p-values of that value or larger are considered statistically significant (and all less than that value are statistically significant).

There are no conventions or standards for selecting the FDR to use in a study. However, for an FDR of 0.05, the smallest p-value needs to be less than what would be the conservative Bonferroni correction ($0.05/m$), i.e., when $i=1$, then the Benjamini-Hochberg critical value is $(1/m)*0.05$. At an FDR of 0.05, the Benjamini-Hochberg critical value becomes slightly less conservative than a Bonferroni cut-off if p-values are less than this cut-off. However, if no p-values are less than $0.05/m$, then no results are statistically significant. Thus, an FDR of 0.05 is conservative, like a Bonferroni correction. In our original power calculations, we calculated power for several different values of the FDR (see Table 11). In the Final Results Report and Supplemental Analyses Report, rather than use multiple FDRs, we indicate statistical significance using an FDR of 0.05 (most conservative) and using no adjustment for multiple comparisons (least conservative).

All regressions were estimated in Stata version 14.1 and using Stata's robust standard errors. Each model included indicator variables for age group (i.e., adolescents aged 13–17; young adults aged 18–24; and older adults aged 25+) and smoking status (i.e., current smoker versus nonsmoker) as covariates, to account for potential associations between age, smoking status, and outcomes of interest. In the young adult and older adult samples, nonsmokers are those who currently smoke "not at all"; in the adolescent sample, nonsmokers are those adolescents susceptible to smoking. Additionally, we conducted

parallel analyses, stratified by age group and by smoking status, to examine potential effects within each age and smoking status group. These findings will be included in the Supplemental Analyses Report. Of note, this study was not powered to detect within-group differences, so results from the stratified analyses should be interpreted with caution (i.e., a non-statistically significant finding within an age group or smoking status group may reflect lack of statistical power).

In all analyses, we examined the data for issues of item nonresponse and differential item nonresponse. The “recall” variable was missing for 197 cases due to technical errors in the survey platform (see page 3-6). Missingness in the other outcome variables ranged from 0% (new information, self-reported learning, perceived informativeness, and perceived understandability) to 2.2% (perceived factualness). Individuals who were missing an outcome variable were not included in the analysis for that outcome. There was no missingness in predictor variables (age group, smoking status, or experimental condition). In all analyses described below, the term “significant” refers to statistical significance, which we provide both adjusted for multiple comparisons and unadjusted for multiple comparisons in the Final Results Report and Supplemental Analyses Report.

4.3.2 Phase 1 Hypotheses and Analyses: Reactions to Warnings

For the Phase 1 analysis, we conducted comparisons of means and proportions for key measures related to perceptions of the warnings. All Phase 1 data were collected at Session 1. Participants in the control condition were exposed to a random selection of one of four SG warnings; thus, each analysis compared reaction measure means or proportions for a particular treatment condition to the means or proportions of the control group as averaged across the four SG warnings (i.e., we compared treatment scores with a single control group score, rather than conducting separate analyses for each SG warning within the control condition). Table 12 describes the hypothesis and analysis approach for each Phase 1 dependent variable. Each analysis in this Phase was repeated for each treatment-control comparison, for a total of 16 analyses per dependent variable.

Table 12. Hypotheses and Analyses for Phase 1 Outcomes

| Outcome | Hypothesis | Analysis |
|-----------------|--|---------------------|
| New information | <p>H₀: proportion (%) responding that the warning provides new information (had not heard of the information contained in the warning prior to the stimulus exposure) for those in the treatment condition = proportion (%) responding that warning provides new information for those in the control condition.</p> <p>H_a: proportion (%) responding that warning provides new information for those in the treatment condition ≠ proportion (%) responding that warning provides new information for those in the control condition.</p> | Logistic regression |

| | | |
|------------------------|---|---------------------|
| Self-reported learning | <p>H₀: the mean response for self-reported learning for those in the treatment condition = the mean response for self-reported learning for those in the control condition.</p> <p>H_a: the mean response for self-reported learning for those in the treatment condition ≠ the mean response self-reported learning for those in the control condition.</p> | Linear regression |
| Thinking about risks | <p>H₀: proportion (%) responding that the warning made them think about the health risks of smoking somewhat or a lot for those in the treatment condition = proportion (%) responding that warning made them think about the health risks of smoking somewhat or a lot for those in the control condition.</p> <p>H_a: proportion (%) responding that the warning made them think about the health risks of smoking somewhat or a lot for those in the treatment condition ≠ proportion (%) responding that warning made them think about the health risks of smoking somewhat or a lot for those in the control condition.</p> | Logistic regression |
| Informativeness | <p>H₀: the mean response for perceived informativeness for those in the treatment group = the mean response for perceived informativeness for those in the control group.</p> <p>H_a: the mean response for perceived informativeness for those in the treatment group ≠ the mean response for perceived informativeness for those in the control group.</p> | Linear regression |
| Understandability | <p>H₀: the mean response for perceived understandability for those in the treatment group = the mean response for perceived understandability for those in the control group.</p> <p>H_a: the mean response for perceived understandability for those in the treatment group ≠ the mean response for perceived understandability for those in the control group.</p> | Linear regression |

(continued)

Table 12. Hypotheses and Analyses for Phase 1 Outcomes (continued)

| Outcome | Hypothesis | Analysis |
|----------------|---|---------------------|
| Factualness | <p>H₀: proportion (%) responding that the warning is a fact for those in the treatment condition = proportion (%) responding that warning is a fact for those in the control condition.</p> <p>H_a: proportion (%) responding that the warning is a fact for those in the treatment condition ≠ proportion (%) responding that warning is a fact for those in the control condition.</p> | Logistic regression |

To test the hypotheses, for each outcome, we estimated a regression model of the following general form:

$$\text{Outcome} = f(\text{Condition, Age, Smoking Status})$$

where Outcome was a measure of reaction to the warning, Condition was a dichotomous indicator for a treatment versus control condition, Age was a categorical variable for age group (i.e., adolescents aged 13–17; young adults aged 18–24; and older adults aged 25+), and Smoking Status was an indicator for current smoker versus nonsmoker. For adolescents, nonsmokers were adolescents susceptible to smoking. For young adults and older adults, nonsmokers were adults who currently smoke “not at all.” These models included covariates for age and smoking status to account for potential associations between age, smoking status, and outcomes of interest.

The coefficient from the Condition variable indicates whether the outcome was significantly higher among those exposed to a CHW than those exposed to an SG warning. This general model was repeated for each of 16 treatment versus control group comparisons. A total of 96 statistical tests were conducted in Phase 1. As described above, we controlled for FDR using the Benjamini-Hochberg procedure (assuming a two-tailed test and FDR of 0.05).

4.3.3 Phase 2 Hypotheses and Analyses: Condition-level Comparisons of Change in Health Beliefs

Model 1: Change in Health Beliefs from Session 1 to Session 2

For the Phase 2 analysis, we conducted treatment versus control comparisons of change in beliefs about the negative health consequences of smoking contained in the warnings. Note that participants in the control condition were exposed to a random selection of one of four SG warnings; thus, each analysis compared the change in health belief scores between a particular treatment condition and the control group as averaged across the four SG warnings (i.e., we compared treatment scores with a control group score representing the mean of the SG warnings, rather than conducting separate analyses for each SG warning within the control condition).

The survey included an item or series of items in which respondents were asked to rate their level of agreement with a statement about a negative health consequence described in a CHW (i.e., a health belief). The number of items associated with a particular warning ranged from 1 to 4. These items were assessed once during Session 1 before stimuli exposure and then again following second stimuli exposure in Session 2.

All health belief items used Likert response scales (5-level “Strongly disagree” to “Strongly agree” response options). Conceptually, the response categories for a Likert response scale represent an underlying belief continuum. For warnings with a single health belief statement (Addictive, Harm children, Kill you, Fatal lung disease in nonsmokers, Quit now, and Stunt fetal growth), we used ordinal logistic regressions in our analyses. For warnings with multiple corresponding health belief items, we assessed whether to scale the items, using the following pre-specified protocol:

- 1) Run a test of internal consistency reliability using Cronbach’s alpha (Cronbach, 1951) on all of the items in a domain. If the test indicates “modest” reliability of $\alpha \geq 0.70$ (Nunnally & Bernstein, 1994), scale the items.
- 2) If $\alpha < 0.70$, but all item-total correlations (i.e., the correlation between the item score and the overall scale score) are ≥ 0.4 , scale the items. Item-total correlations of between 0.30–0.40 and greater have been suggested as sufficiently discriminating (Nunnally & Bernstein, 1994; Traub, 1994; Leong & Austin, eds., 2006).
- 3) If criteria 1 and 2 are not met, determine whether the scale alpha would increase to ≥ 0.70 if any items were deleted from the scale (i.e., using Stata’s “alpha” command with “item” option specified). If the alpha value threshold would be met by dropping an item or items:
 - a. Drop those items to form a scale with $\alpha \geq 0.70$
 - b. Also run analyses of each item individually
- 4) Otherwise, run analyses of each item individually.

To determine whether to scale health belief items, the above protocol was applied to the health belief items assessed at Session 1. For scale consistency across the different time points, items that were scaled in Session 1 were also scaled in Sessions 2 and 3. Items that were not scaled in Session 1 remained unscaled in Session 2 and Session 3.

At Session 1, all health beliefs with multiple items met the first criteria with $\alpha \geq 0.70$ and were scaled. Table 13 shows the internal consistency scores for each set of health belief items.

Table 13. Internal Consistency of Scaled Responses to Phase 1 Health Belief Items

| Treatment condition | Scaled Health Belief items [All 5-level “Strongly disagree” to “Strongly agree” response options] | Cronbach’s Alpha |
|-----------------------------------|--|-------------------------|
| Head and neck cancer | <ul style="list-style-type: none"> ▪ Smoking causes head cancer ▪ Smoking causes neck cancer | 0.842 |
| Bladder cancer | <ul style="list-style-type: none"> ▪ Smoking causes bladder cancer, which can lead to bloody urine ▪ Smoking causes bladder cancer | 0.939 |
| Clogged arteries | <ul style="list-style-type: none"> ▪ Smoking causes heart disease ▪ Smoking causes strokes ▪ Smoking clogs arteries ▪ Smoking clogs arteries, which causes heart disease ▪ Smoking clogs arteries, which causes strokes | 0.926 |
| COPD 1 (image of diseased lungs) | <ul style="list-style-type: none"> ▪ Smoking causes COPD, a lung disease that can be fatal ▪ Smoking causes COPD ▪ Smoking causes a lung disease that can be fatal | 0.849 |
| COPD 2 (image of man with oxygen) | <ul style="list-style-type: none"> ▪ Smoking causes COPD, a lung disease that can be fatal ▪ Smoking causes COPD ▪ Smoking causes a lung disease that can be fatal | 0.849 |
| Erectile dysfunction | <ul style="list-style-type: none"> ▪ Smoking reduces blood flow, which can cause erectile dysfunction ▪ Smoking reduces blood flow ▪ Smoking can cause erectile dysfunction | 0.871 |
| Amputation | <ul style="list-style-type: none"> ▪ Smoking reduces blood flow to the limbs, which can require amputation ▪ Smoking reduces blood flow to the limbs ▪ Smoking can lead to amputation | 0.893 |
| Diabetes | <ul style="list-style-type: none"> ▪ Smoking causes type 2 diabetes, which raises blood sugar. ▪ Smoking can cause type 2 Diabetes | 0.936 |
| Macular degeneration | <ul style="list-style-type: none"> ▪ Smoking causes age-related macular degeneration, which can lead to blindness ▪ Smoking causes age-related macular degeneration ▪ Smoking can lead to blindness | 0.895 |
| Cataracts | <ul style="list-style-type: none"> ▪ Smoking causes cataracts, which can lead to blindness ▪ Smoking causes cataracts | 0.935 |

To determine the CHW's immediate impact on a given health belief, we examined the extent to which pre-post differences in that health belief varied between those exposed to CHW (treatment) and SG warnings (control). The general form of this analysis approach is as follows:

$$(\text{Health Belief}^{T_{S2}} - \text{Health Belief}^{T_{S1}}) - (\text{Health Belief}^{C_{S2}} - \text{Health Belief}^{C_{S1}})$$

where Health Belief represents the average value (for continuous variables) or probability of being in a higher response category (for ordinality-treated variables), among those in a Treatment (*T*) or Control (*C*) group, at Session 2 (*S2*) or Session 1 (*S1*).

For each treatment versus control comparison, we tested hypotheses of the following general form:

- H_0 : Average pre-post difference in health belief score for those in the treatment condition = average pre-post difference in health belief score in the control condition
- H_a : Average pre-post difference in health belief score for those in the treatment condition \neq average pre-post difference in health belief score in the control condition

To test the hypotheses for Phase 2 analyses, for each outcome we estimated a regression model of the following general form:

$$\text{Health Belief} = f(\text{Condition, Session, Condition*Session, Age, Smoking Status})$$

where Health Belief is a measure of agreement with a statement (or set of statements) about the health effects of cigarette smoking, Condition is a dichotomous indicator for a treatment versus control condition, Session is a dichotomous indicator for Session 2 versus Session 1, Condition*Session is the interaction between study condition and study session, Age is a categorical variable for age group (i.e., adolescents aged 13–17; young adults aged 18–24; and older adults aged 25+), and Smoking Status is an indicator for current smoker versus nonsmoker (in the young adult and older adult samples, nonsmokers are those who currently smoke “not at all”; in the adolescent sample, nonsmokers are those adolescents susceptible to smoking). These models included covariates for age and smoking status to account for potential associations between age, smoking status, and outcomes of interest. The key variable of interest in these models was the interaction term, Condition*Session. The coefficient on Condition*Session indicates whether the pre-post change in health belief was greater among respondents exposed to a CHW than those exposed to an SG warning. This general model was repeated for each of 16 treatment versus control group comparisons.

For warnings with multiple corresponding health belief items, we averaged those items to create a continuous scale and tested these hypotheses using linear regression. For warnings with single ordinal Likert-type health belief items, we tested hypotheses of the form that being in the treatment group (being exposed to CHW) is associated with a greater pre-post

change in level of the ordinal dependent variable than being in the control group (being exposed to an SG warning). Thus, for these items we used ordinal logistic regression. All regressions, both ordinal logistic and linear, were estimated in Stata version 14.1 using Stata’s robust standard errors.

In the cases where the dependent variable was continuous and a linear regression model was estimated, the interaction term (Session*Condition) represents the difference in difference of the means or treatment effect. However, in a non-linear model, such as when the dependent variable was ordered and we estimated an ordinal regression model, the coefficient of the interaction term is not a direct measure of the treatment effect due to the non-linear model. As noted in Puhani (2012), in a non-linear model with a strictly monotonic transformation function of a linear index, the sign of the coefficient of the interaction term is equal to the sign of the treatment effect. Testing the significance of the interaction term in the non-linear model is best done via bootstrapping (Puhani, 2012).

A total of 16 statistical tests were conducted in Phase 2 (not including supplemental age-stratified and smoking status-stratified analyses described in the Supplemental Analyses Report). To account for the possibility of falsely detecting a significant result (i.e., Type 1 error) arising from multiple statistical tests, we controlled for the FDR using the Benjamini-Hochberg procedure (assuming a two-tailed test and FDR of 0.05).

As with all multi-session studies, we expected some level of overall attrition between Session 1 and Sessions 2 and 3. Although unlikely given the nature of the experimental procedure, there was a potential that the rate of attrition could vary between treatment and control groups, resulting in biased estimates of the effect of the GHWs. To assess potential problems resulting from differential attrition, we calculated and reported rates of overall attrition (i.e., the proportion of Session 1 participants randomly assigned to a treatment or control group for whom Session 2/Session 3 data were not available) and differential attrition (i.e., the difference in attrition rates between treatment and control groups). We reported overall and differential rates of attrition for each of 16 treatment groups, assessed at Session 2 and Session 3. We had no *a priori* threshold for determining an acceptable level of attrition bias. Nevertheless, to contextualize findings, we compared attrition rates with guidelines for randomized controlled trials established by the Department of Education’s What Works Clearinghouse (IES, 2013; IES, 2014; Deke et al., 2015).

Model 2: Change in Health Beliefs at Session 3

To determine the CHW’s sustained impact on targeted health beliefs, we conducted parallel analyses to the Model 1 analyses described above but with a Session indicator variable that indicated Session 3 versus Session 1 (as opposed to Session 2 versus Session 1). The general form of this analysis approach was as follows:

$$(\text{Health Belief}^{T_{S3}} - \text{Health Belief}^{T_{S1}}) - (\text{Health Belief}^{C_{S3}} - \text{Health Belief}^{C_{S1}})$$

where Health Belief represented the average value (for continuous variables) or probability of being in a higher response category (for ordinally-treated variables), among those in a Treatment (*T*) or Control (*C*) group, at Session 3 (*S3*) or Session 1 (*S1*).

The specific functional form of these models, hypothesis tests, and interpretation of coefficients was identical to those described for Model 1, with the exception that with Model 2 we were examining differences in Session 3 versus Session 1 health belief values.

4.3.4 Phase 3 Hypotheses and Analyses: Warning Label Recall

For the Phase 3 analysis, we conducted comparisons of the proportion of respondents accurately recalling (at Session 3) the warning that they were exposed to at Sessions 1 and 2. We assessed recall with the following item, which showed thumbnail images of four labels:

E1. You recently took a survey in which you were shown a cigarette pack and advertisement with a warning on it. Which label do you remember seeing?

1. [LABEL 1]
2. [LABEL 2]
3. [LABEL 3]
4. [LABEL 4]
5. None of these
6. I don't remember

For respondents in the control condition, LABELS 1–4 included the SG label that they were exposed to earlier and the 3 other SG labels in a random order. For respondents in each treatment condition, LABELS 1–4 included the CHW that they were exposed to earlier, along with three randomly selected additional CHW in a random order. Thus, each respondent was shown one warning that they were exposed to earlier in the study and three warnings (of the same type—CHW or SG) that they had not been exposed to. We constructed an indicator variable such that 1 = accurate recall of the warning to which the respondent was exposed and 0 = inaccurate or lack of recall (i.e., false recall of any of the 3 warnings not shown earlier in the study or a response of “None of these” or “I don’t remember”).

For the Phase 3 analysis, we tested hypotheses of the following general form:

- H_0 : proportion (%) of those in the treatment condition accurately recalling the warning = proportion (%) of those in the control condition accurately recalling the warning
- H_a : proportion (%) of those in the treatment condition accurately recalling the warning \neq proportion (%) of those in the control condition accurately recalling the warning

Since the recall measure is dichotomous, we tested this hypothesis using logistic regression of the following form:

$$\text{Recall} = f(\text{Condition, Age, Smoking Status})$$

where Recall was a measure of accurate recall of the warning, Condition was a dichotomous indicator for a treatment versus control condition, Age was a categorical variable for age group (i.e., adolescents aged 13–17; young adults aged 18–24; and older adults aged 25+), and Smoking Status was an indicator for current smoker versus nonsmoker (in the older adult and young adult samples, nonsmokers are those who currently smoke “not at all”; in the adolescent sample, nonsmokers are those adolescents susceptible to smoking). These models included covariates for age and smoking status to account for potential associations between age, smoking status, and outcomes of interest. The coefficient from the Condition variable indicates whether accurate warning recall was significantly greater among those exposed to a CHW than those exposed to an SG warning. This general model was repeated for each of 16 treatment versus control group comparisons. All regressions were estimated in Stata version 14.1 using Stata’s robust standard errors.

A total of 16 statistical tests were conducted in Phase 3 (not including supplemental age-stratified and smoking status-stratified analyses described in the Supplemental Analyses Report). To account for the possibility of falsely detecting a significant result (i.e., Type 1 error) arising from multiple statistical tests, we controlled for the FDR using the Benjamini-Hochberg procedure (assuming a two-tailed test and FDR of 0.05; Benjamini & Hochberg, 1995).

5. Results

5.1 Participant Characteristics

Participant characteristics from each session appear in Table 14. In the total analytic sample at Session 1 ($n = 9,760$), the mean age was 36.2 years, just over half of participants were female (55.6%), and most were non-Hispanic White (74.8%). Among adults, 35.8% had some college education and 34.4% had a college degree or more. Just over half of adults had incomes of less than \$50,000 annually (18.8% selected \$0–\$19,999 and 33.1% selected \$20,000–\$49,999), and 71.4% of adults correctly answered the health literacy item. Per the study design, among adolescents, 17.8% were current smokers and 82.2% were nonsmokers susceptible to smoking. Among adults, 49.8% were current smokers and 50.2% were nonsmokers.

In the Session 2 analytic sample ($n = 4,913$), the mean age was 43.0 years, 53.2% were female, and 78.2% were non-Hispanic White. Among adults, 35.1% had some college education and 35.9% had a college degree or more. Just over half of adults had incomes of less than \$50,000 annually (17.3% selected \$0–\$19,999 and 34.2% selected \$20,000–\$49,999), and 72.6% of adults correctly answered the health literacy item. Among adolescents, 22.3% were current smokers and 77.7% were nonsmokers susceptible to smoking. Among adults, 47.4% were current smokers and 52.6% were nonsmokers.

In the Session 3 analytic sample ($n = 3,360$), the mean age was 45.9 years, 52.4% were female, and 79.3% were non-Hispanic White. Among adults, 34.1% had some college education and 37.2% had a college degree or more. Just over half of adults had incomes of less than \$50,000 annually (15.8% selected \$0–\$19,999 and 34.7% selected \$20,000–\$49,999), and 73.8% of adults correctly answered the health literacy item. Among adolescents, 24.2% were current smokers and 75.8% were nonsmokers susceptible to smoking. Among adults, 47.6% were current smokers and 52.4% were nonsmokers.

Table 14. Participant Characteristics by Session (combining adolescent adult samples unless otherwise noted)

| | Session 1 (n = 9,760) | Session 2 (n = 4,913) | Session 3 (n = 3,360) |
|----------------|----------------------------------|----------------------------------|----------------------------------|
| Gender | | | |
| Male | 4,337 (44.4%) | 2,298 (46.8%) | 1,601 (47.6%) |
| Female | 5,423 (55.6%) | 2,615 (53.2%) | 1,759 (52.4%) |
| Age: Mean (SD) | 36.2 (20.5) | 43.0 (21.2) | 45.9 (20.4) |

(continued)

Table 14. Participant Characteristics by Session (combining adolescent adult samples unless otherwise noted) (continued)

| | Session 1 (n = 9,760) | Session 2 (n = 4,913) | Session 3 (n = 3,360) |
|---|----------------------------------|----------------------------------|----------------------------------|
| Race/ethnicity | | | |
| White, non-Hispanic | 7,301 (74.8%) | 3,842 (78.2%) | 2,666 (79.3%) |
| Black, non-Hispanic | 870 (8.9%) | 404 (8.2%) | 265 (7.9%) |
| Other or multiracial, non-Hispanic | 511 (5.2%) | 217 (4.4%) | 139 (4.1%) |
| Hispanic | 1,078 (11.0%) | 450 (9.2%) | 290 (8.6%) |
| Education^a | | | |
| Less than HS | 201 (2.7%) | 91 (2.3%) | 66 (2.4%) |
| HS or GED | 2,015 (27.0%) | 1,060 (26.7%) | 737 (26.3%) |
| Some college | 2,674 (35.8%) | 1,391 (35.1%) | 954 (34.1%) |
| College or more | 2,569 (34.4%) | 1,422 (35.9%) | 1,042 (37.2%) |
| Annual household income^a | | | |
| \$0–\$19,999 | 1,406 (18.8%) | 687 (17.3%) | 443 (15.8%) |
| \$20,000–\$49,999 | 2,467 (33.1%) | 1,354 (34.2%) | 970 (34.7%) |
| \$50,000–\$74,999 | 1,538 (20.6%) | 808 (20.4%) | 576 (20.6%) |
| \$75,000 or more | 2,048 (27.5%) | 1,115 (28.1%) | 810 (28.9%) |
| Region | | | |
| Northeast | 2,018 (20.7%) | 1,012 (20.6%) | 696 (20.7%) |
| Midwest | 2,351 (24.1%) | 1,255 (25.5%) | 872 (26.0%) |
| South | 3,444 (35.3%) | 1,675 (34.1%) | 1,137 (33.8%) |
| West | 1,947 (19.9%) | 971 (19.8%) | 655 (19.5%) |
| Sexual orientation^a | | | |
| Heterosexual | 6,635 (89.0%) | 3,630 (91.6%) | 2,583 (92.3%) |
| LGB or other ^b | 824 (11.0%) | 334 (8.4%) | 216 (7.7%) |
| Health literacy^{a,c} (correct response) | | | |
| | 5,325 (71.4%) | 2,876 (72.6%) | 2,065 (73.8%) |
| Smoking status | | | |
| Adolescent susceptible to smoking ^d | 1,891 (19.4%) | 737 (15.0%) | 425 (12.6%) |
| Adolescent current smoker ^e | 410 (4.2%) | 212 (4.3%) | 136 (4.0%) |
| Adult nonsmoker ^f | 3,741 (38.3%) | 2,086 (42.5%) | 1,466 (43.6%) |
| Adult current smoker ^g | 3,718 (38.1%) | 1,878 (38.2%) | 1,333 (39.7%) |

^aItem only asked of young adult and older adult respondents (aged ≥ 18). ^b"LGB or other" includes identifying as homosexual, gay, or lesbian; bisexual; or something else. ^cParticipant correctly answers the question "If a person is at high risk for heart disease, which of the following levels of low density lipoprotein (LDL) cholesterol is best?" after reading facts about cholesterol. ^dHas not smoked in past 30 days and responds anything other than "definitely not" to at least one of four items assessing susceptibility. ^eSmoked in the past 30 days. ^fCurrently smokes "not at all." ^gSmoked 100 cigarettes in lifetime and now smokes every day or some days.

GED = general education diploma. HS = high school. LGB = lesbian, gay, or bisexual. SD = standard deviation.

The overall rate of attrition between Sessions 1 and 2 was 49.7%, specifically, 48.8% for the control condition and 48.1–52.5% for treatment conditions (Table 15). The overall rate of attrition between Sessions 1 and 3 was 65.6%, specifically 66.1% for the control condition and 61.7–70.4% for treatment conditions.

Table 15 Attrition Rates by Condition

| Condition Number | Attrition from Sessions 1 to 2 | Attrition from Sessions 1 to 3 |
|------------------|--------------------------------|--------------------------------|
| Overall | 49.7% | 65.6% |
| 0 (control) | 48.8% | 66.1% |
| 1 | 52.5% | 67.0% |
| 2 | 50.0% | 64.9% |
| 3 | 48.2% | 62.2% |
| 4 | 50.2% | 66.5% |
| 5 | 49.3% | 61.7% |
| 6 | 48.1% | 65.1% |
| 7 | 48.8% | 65.8% |
| 8 | 49.8% | 70.4% |
| 9 | 52.3% | 66.0% |
| 10 | 49.5% | 65.9% |
| 11 | 50.2% | 65.3% |
| 12 | 50.7% | 68.1% |
| 13 | 49.8% | 64.4% |
| 14 | 50.2% | 64.8% |
| 15 | 49.6% | 65.0% |
| 16 | 49.0% | 64.0% |

We had no *a priori* threshold for determining an acceptable level of attrition bias. We place attrition findings in context by describing guidance from the Department of Education’s What Works Clearinghouse (WWC) (Institute of Education Sciences [IES], 2013; IES, 2014; Deke et al., 2015). As noted by the WWC, an overall attrition rate of approximately 50% can be considered acceptable if differential attrition remains less than 3.5–4% (IES, 2014). At Session 2, where overall attrition was just under 50%, there was only 1 condition in which differential attrition exceeded 3.5%. Specifically, there was a difference of 3.7% between Condition 1 versus control. The WWC does not provide guidance about attrition for a second follow-up. In the second follow-up of this study (Session 3), the overall attrition rate from Session 1 was 65.6%, and differential attrition ranged from 0.1% (Condition 9 versus control) to 4.4% (Condition 5 versus control).

5.2 Phase 1 Results

5.2.1 New Information

As shown in Table 16, 27.9% of participants in the control condition described the warning as new information; between 22.8% (Addictive) and 88.7% (Cataracts) participants in treatment conditions described the warning they viewed as new information. Participants were significantly more likely to describe a warning as providing new information relative to the control in 13 conditions: Harm children, Fatal lung disease in nonsmokers, Head and neck cancer, Bladder cancer, Stunt fetal growth, Clogged arteries, COPD 1, COPD 2, Erectile dysfunction, Amputation, Diabetes, Macular degeneration, and Cataracts. One warning (Addictive) was less likely to be considered new information than the control condition. These comparisons were statistically significant before and after controlling for multiple comparisons.

Table 16. Logistic Regressions of New Information, Thinking about Risks, and Perceived Factualness Comparing CHW with SG Warnings

| Condition | Warning | New Information | | Thinking About Risks | | Perceived Factualness | |
|-------------|----------------------------------|-----------------|---|----------------------|--------------------------------------|-----------------------|--------------------------------------|
| | | % | OR (95% CI) | % | OR (95% CI) | % | OR (95% CI) |
| 0 (Control) | Average of the 4 SG warnings | 27.9 % | REF | 69.6 % | REF | 86.1 % | REF |
| 1 | Addictive | 22.8 % | 0.61 (0.47, 0.78) ^{a, b} | 70.0 % | 1.11 (0.89, 1.39) | 86.4 % | 1.07 (0.78, 1.45) |
| 2 | Harm children | 40.7 % | 1.37 (1.11, 1.69) ^{a, b} | 83.3 % | 2.38 (1.82, 3.10) ^{a, b} | 83.1 % | 0.94 (0.70, 1.27) |
| 3 | Kill you | 34.2 % | 1.04 (0.83, 1.29) | 73.9 % | 1.70 (1.34, 2.17) ^{a, b} | 85.5 % | 0.99 (0.73, 1.34) |
| 4 | Fatal lung disease in nonsmokers | 41.9 % | 1.55 (1.26, 1.91) ^{a, b} | 77.3 % | 1.94 (1.52, 2.49) ^{a, b} | 77.5 % | 0.70 (0.53, 0.92) ^{a, b} |
| 5 | Quit now | 27.8 % | 0.95 (0.76, 1.19) | 69.5 % | 1.18 (0.94, 1.47) | 87.9 % | 1.01 (0.75, 1.37) |
| 6 | Head and neck cancer | 80.9 % | 8.09 (6.44, 10.16) ^{a, b} | 84.5 % | 2.70 (2.05, 3.55) ^{a, b} | 71.6 % | 0.53 (0.41, 0.68) ^{a, b} |
| 7 | Bladder cancer | 87.2 % | 14.63 (11.19, 19.14) ^{a, b} | 80.0 % | 2.14 (1.66, 2.77) ^{a, b} | 66.0 % | 0.43 (0.33, 0.55) ^{a, b} |
| 8 | Stunt fetal growth | 40.0 % | 1.73 (1.40, 2.12) ^{a, b} | 78.9 % | 2.00 (1.55, 2.57) ^{a, b} | 83.9 % | 0.93 (0.69, 1.25) |
| 9 | Clogged arteries | 52.1 % | 2.64 (2.15, 3.23) ^{a, b} | 80.2 % | 2.05 (1.59, 2.63) ^{a, b} | 85.2 % | 1.14 (0.83, 1.57) |
| 10 | COPD 1 ^c | 33.1 % | 1.48 (1.20, 1.83) ^{a, b} | 80.5 % | 2.25 (1.73, 2.91) ^{a, b} | 85.4 % | 1.23 (0.89, 1.70) |

(continued)

Table 16. Logistic Regressions of New Information, Thinking about Risks, and Perceived Factualness Comparing CHW with SG Warnings (continued)

| Condition | Warning | New Information | | Thinking About Risks | | Perceived Factualness | |
|-----------|----------------------|-----------------|---|----------------------|--------------------------------------|-----------------------|--------------------------------------|
| | | % | OR (95% CI) | % | OR (95% CI) | % | OR (95% CI) |
| 11 | COPD 2 ^d | 35.7 % | 1.48 (1.20, 1.83) ^{a, b} | 79.2 % | 2.13 (1.64, 2.75) ^{a, b} | 83.8 % | 1.26 (0.91, 1.73) |
| 12 | Erectile dysfunction | 78.8 % | 7.65 (6.10, 9.60) ^{a, b} | 77.2 % | 1.56 (1.23, 1.98) ^{a, b} | 72.4 % | 0.53 (0.41, 0.69) ^{a, b} |
| 13 | Amputation | 74.7 % | 7.26 (5.79, 9.11) ^{a, b} | 87.5 % | 3.52 (2.60, 4.75) ^{a, b} | 76.7 % | 0.66 (0.50, 0.86) ^{a, b} |
| 14 | Diabetes | 87.2 % | 10.64 (8.34, 13.58) ^{a, b} | 76.6 % | 2.11 (1.63, 2.72) ^{a, b} | 64.0 % | 0.44 (0.34, 0.56) ^{a, b} |
| 15 | Macular degeneration | 82.6 % | 11.81 (9.17, 15.21) ^{a, b} | 81.4 % | 2.64 (2.01, 3.46) ^{a, b} | 73.7 % | 0.59 (0.45, 0.77) ^{a, b} |
| 16 | Cataracts | 88.7 % | 14.45 (11.08, 18.86) ^{a, b} | 75.6 % | 1.71 (1.34, 2.17) ^{a, b} | 65.5 % | 0.38 (0.30, 0.49) ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses.

^b Significant after adjustment for multiple comparisons.

^c Image of diseased lungs.

^d Image of man with oxygen.

5.2.2 Thinking about Risks

As shown in Table 16, 69.6% of control condition participants and a range of 69.5% (Quit now) to 87.5% (Amputation) treatment condition participants thought about the health risks of smoking in response to the warning. CHW were significantly more likely to cause participants to think about the health risks of smoking in 14 conditions relative to the control condition: Harm children, Kill you, Fatal lung disease in nonsmokers, Head and neck cancer, Bladder cancer, Stunt fetal growth, Clogged arteries, COPD 1, COPD 2, Erectile dysfunction, Amputation, Diabetes, Macular degeneration, and Cataracts. These comparisons were significant before and after adjustment.

5.2.3 Perceived Factualness

As shown in Table 16, the majority of participants considered the label they viewed to be factual. Specifically, 86.1% of control condition participants and a range of 64.0% (Diabetes) to 87.9% (Quit now) of treatment condition participants believed the label they saw was factual. Participants were less likely to consider the CHW as factual than the control in 8 conditions: Fatal lung disease in nonsmokers, Head and neck cancer, Bladder cancer, Erectile dysfunction, Amputation, Diabetes, Macular degeneration, and Cataracts. These comparisons were significant before and after adjustment for multiple comparisons.

5.2.4 Self-Reported Learning

The mean rating of self-reported learning in the control condition was 3.02 on the 1-7 scale (Table 17). Among the treatment condition participants, mean ratings of self-reported learning varied from 2.66 (Addictive) to 5.70 (Macular degeneration). Participants' self-reports of learning were significantly higher, both before and after adjustment for multiple comparisons, for 13 warnings compared with the control condition: Harm children, Fatal lung disease in nonsmokers, Head and neck cancer, Bladder cancer, Stunt fetal growth, Clogged arteries, COPD 1, COPD 2, Erectile dysfunction, Amputation, Diabetes, Macular degeneration, and Cataracts. Self-reported learning was lower for Addictive, Kill you, and Quit now than for control condition before and after adjustment for multiple comparisons.

Table 17. Linear Regressions of Self-Reported Learning, Perceived Informativeness, and Perceived Understandability Comparing CHW with SG Warnings

| Condition | Description | Self-Reported Learning | | Perceived Informativeness | | Perceived Understandability | |
|-------------|----------------------------------|------------------------|--------------------------------------|---------------------------|--------------------------------------|-----------------------------|-----------------------------------|
| | | Mean (SD) | Coeff. (95% CI) | Mean (SD) | Coeff. (95% CI) | Mean (SD) | Coeff. (95% CI) |
| 0 (Control) | Average of the 4 SG warnings | 3.02 (2.09) | REF | 4.94 (1.65) | REF | 5.83 (1.54) | REF |
| 1 | Addictive | 2.66 (2.02) | -0.44 (-0.64, -0.24) ^{a, b} | 4.90 (1.65) | -0.05 (-0.22, 0.11) | 6.06 (1.34) | 0.39 (0.25, 0.53) ^{a, b} |
| 2 | Harm children | 3.51 (2.13) | 0.31 (0.10, 0.52) ^{a, b} | 5.36 (1.52) | 0.54 (0.38, 0.69) ^{a, b} | 6.24 (1.19) | 0.52 (0.38, 0.66) ^{a, b} |
| 3 | Kill you | 2.83 (2.13) | -0.30 (-0.51, -0.10) ^{a, b} | 4.95 (1.75) | 0.17 (0.00, 0.34) | 5.92 (1.57) | 0.42 (0.27, 0.57) ^{a, b} |
| 4 | Fatal lung disease in nonsmokers | 3.72 (2.13) | 0.64 (0.43, 0.84) ^{a, b} | 5.43 (1.54) | 0.69 (0.54, 0.84) ^{a, b} | 5.98 (1.47) | 0.41 (0.27, 0.56) ^{a, b} |
| 5 | Quit now | 2.75 (1.97) | -0.44 (-0.63, -0.25) ^{a, b} | 4.61 (1.59) | -0.33 (-0.49, -0.17) ^{a, b} | 5.82 (1.43) | 0.12 (-0.04, 0.27) |
| 6 | Head and neck cancer | 5.20 (1.72) | 1.96 (1.78, 2.13) ^{a, b} | 5.68 (1.40) | 0.78 (0.63, 0.92) ^{a, b} | 6.14 (1.27) | 0.44 (0.30, 0.58) ^{a, b} |
| 7 | Bladder cancer | 5.52 (1.73) | 2.37 (2.19, 2.54) ^{a, b} | 5.81 (1.41) | 0.95 (0.81, 1.09) ^{a, b} | 6.13 (1.38) | 0.46 (0.32, 0.60) ^{a, b} |
| 8 | Stunt fetal growth | 3.65 (2.04) | 0.74 (0.54, 0.94) ^{a, b} | 5.59 (1.38) | 0.91 (0.77, 1.05) ^{a, b} | 6.15 (1.33) | 0.58 (0.45, 0.71) ^{a, b} |
| 9 | Clogged arteries | 4.13 (2.13) | 1.20 (1.00, 1.40) ^{a, b} | 5.65 (1.41) | 0.88 (0.74, 1.03) ^{a, b} | 6.15 (1.29) | 0.55 (0.41, 0.68) ^{a, b} |
| 10 | COPD 1 ^c | 3.53 (2.05) | 0.70 (0.50, 0.90) ^{a, b} | 5.55 (1.37) | 0.76 (0.62, 0.90) ^{a, b} | 6.14 (1.27) | 0.47 (0.34, 0.61) ^{a, b} |
| 11 | COPD 2 ^d | 3.57 (2.14) | 0.78 (0.58, 0.99) ^{a, b} | 5.52 (1.39) | 0.77 (0.63, 0.92) ^{a, b} | 6.24 (1.17) | 0.53 (0.40, 0.67) ^{a, b} |
| 12 | Erectile dysfunction | 5.42 (1.68) | 2.21 (2.04, 2.39) ^{a, b} | 5.77 (1.35) | 0.95 (0.81, 1.09) ^{a, b} | 6.18 (1.19) | 0.47 (0.33, 0.61) ^{a, b} |

(continued)

Table 17. Linear Regressions of Self-Reported Learning, Perceived Informativeness, and Perceived Understandability Comparing CHW with SG Warnings (continued)

| Condition | Description | Self-Reported Learning | | Perceived Informativeness | | Perceived Understandability | |
|-----------|----------------------|------------------------|--------------------------------------|---------------------------|--------------------------------------|-----------------------------|--------------------------------------|
| | | Mean (SD) | Coeff. (95% CI) | Mean (SD) | Coeff. (95% CI) | Mean (SD) | Coeff. (95% CI) |
| 13 | Amputation | 5.41 (1.79) | 2.28 (2.11, 2.46) ^{a, b} | 5.95 (1.25) | 1.13 (0.99, 1.26) ^{a, b} | 6.25 (1.39) | 0.60 (0.46, 0.74) ^{a, b} |
| 14 | Diabetes | 5.62 (1.62) | 2.43 (2.26, 2.60) ^{a, b} | 5.68 (1.40) | 0.90 (0.76, 1.04) ^{a, b} | 6.21 (1.22) | 0.54 (0.40, 0.67) ^{a, b} |
| 15 | Macular degeneration | 5.70 (1.66) | 2.58 (2.41, 2.74) ^{a, b} | 5.86 (1.37) | 1.12 (0.99, 1.26) ^{a, b} | 6.12 (1.40) | 0.44 (0.29, 0.58) ^{a, b} |
| 16 | Cataracts | 5.56 (1.74) | 2.37 (2.20, 2.54) ^{a, b} | 5.67 (1.35) | 0.86 (0.72, 1.00) ^{a, b} | 6.17 (1.30) | 0.47 (0.33, 0.61) ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses.

^b Significant after adjustment for multiple comparisons.

^c Image of diseased lungs.

^d Image of man with oxygen.

5.2.5 Perceived Informativeness

The mean rating of informativeness in the control condition was 4.94 on the 1-7 scale; mean ratings in the treatment conditions varied from 4.61 (Quit now) to 5.95 (Amputation; Table 17). Participants perceived the CHW as more informative than the control condition (both before and after adjustment) in 13 conditions: Harm children, Fatal lung disease in nonsmokers, Head and neck cancer, Bladder cancer, Stunt fetal growth, Clogged arteries, COPD 1, COPD 2, Erectile dysfunction, Amputation, Diabetes, Macular degeneration, and Cataracts. One warning (Quit now) was perceived as less informative than the control condition before and after adjustment for multiple comparisons.

5.2.6 Perceived Understandability

The mean rating of understandability for all warnings was greater than 5.8 on a 1-7 scale, suggesting moderate to high levels of understandability in all conditions. As shown in Table 17, mean rating of understandability was 5.83 in the control condition and between 5.82 (Quit now) and 6.25 (Amputation) in the treatment conditions. Participants rated the warnings in 15 conditions as more understandable than did participants in the control condition before and after adjustment. These conditions were Addictive, Harm children, Kill you, Fatal lung disease in nonsmokers, Head and neck cancer, Bladder cancer, Stunt fetal growth, Clogged arteries, COPD 1, COPD 2, Erectile dysfunction, Amputation, Diabetes, Macular degeneration, and Cataracts.

5.3 Phase 2 Results: Changes in Health Beliefs

Phase 2 analyses included condition-level comparisons for key measures assessing beliefs about the negative health consequences of smoking contained in the warnings. Specifically, the survey included an item or series of items in which respondents were asked to rate their level of agreement with a statement about a negative health consequence described in the CHW (i.e., a health belief). The number of items associated with a particular warning ranged from 1 to 4. These health belief items were asked at the beginning of Session 1 (before viewing the stimuli), the end of Session 2 (after viewing the stimuli in Session 2), and the beginning of Session 3 (before the assessment of recall).

The health belief items have Likert response scales. Conceptually, the response categories for a Likert response scale represent an underlying belief continuum. For warnings with multiple corresponding items, we assessed whether the items could be appropriately scaled for use in linear regressions.

As part of our assessment of items' scalability, we ran a test of internal consistency reliability using Cronbach's alpha for all of the warnings with multiple corresponding items (Cronbach, 1951). If this test indicated modest reliability (alpha greater than or equal to 0.70), we scaled the items (Nunnally & Bernstein, 1994).

There were 10 warnings with health belief items that were potentially scalable (i.e., had multiple items). All 10 sets of health belief items had an alpha of greater than 0.70 and were thus scaled.

Six warnings (Addictive, Harm children, Kill you, Fatal lung disease in nonsmokers, Quit now, and Stunt fetal growth) could not be scaled because there was only one associated health belief per warning.

For both linear and ordinal regressions, we used a difference in difference (DID) approach to detect whether changes in agreement with health beliefs between sessions for a treatment condition (a CHW) differed from changes in health beliefs between sessions for the control condition. We examined the DID health belief scores between Session 1 and Session 2, as well as between Session 1 and Session 3.

The DID score in linear analyses represents the net change in agreement with health beliefs related to the CHW among treatment group participants after accounting for changes in health beliefs in the control condition. For example (see Table 18), the mean rating of agreement for health beliefs about head and neck cancer among participants in the Head and Neck cancer condition was 3.40 at Session 1 and 3.97 at Session 2, an increase of 0.57 between sessions. Mean health belief scores about head and neck cancer among control condition participants were 3.35 at Session 1 and 3.42 at Session 2, an increase of 0.07. Thus, the total DID for that health belief between Sessions 1 and 2 is 0.50 (the difference between 0.57 and 0.07).

In the ordinal analyses (Tables 20 and 22), there is a DID score for each level of the outcome variable (strongly disagree, disagree, etc.), and an interaction term for the ordinal model. Significant positive interaction terms, such as 0.50 for Fatal lung disease in nonsmokers in Table 20, indicate there was a greater pre-post change in agreement with health beliefs for participants in the treatment condition than in the control condition in a direction that “favors” the CHW (i.e., toward greater agreement with the health belief in treatment over control). Significant negative interaction terms, such as -1.03 for Addictive in Table 20, indicate lower agreement with the health belief in treatment over control.

Because of attrition, the sample sizes for Sessions 2 and 3 differ; thus, we present results first for differences between Session 2 and 1 and then differences between Session 3 and Session 1.

5.3.1 Differences in Health Beliefs Between Session 2 and Session 1

As seen in Table 19, DID health belief scores were positive and significant before and after adjustment for 9 of the 10 warnings with scores on a linear scale: Head and neck cancer, Bladder cancer, Clogged arteries, COPD 1, Erectile dysfunction, Amputation, Diabetes, Macular degeneration, and Cataracts. That is, there was a net positive increase in agreement with health beliefs for those CHW after accounting for changes in health beliefs in the control condition.

Table 19. Linear Regression of Difference in Difference Mean Health Belief Scores between Session 2 and Session 1

| Condition | Mean (SD) Health Belief Score | | DID (95% CI) |
|----------------------|-------------------------------|----------------|--------------------------------------|
| | Session 1 | Session 2 | |
| Head and neck cancer | 3.40 (3.04) | 3.97 (2.94) | 0.50 (0.37, 0.63) ^{a, b} |
| Control | 3.35 (1.48) | 3.42 (1.46) | |
| Bladder cancer | 3.27 (3.14) | 3.96 (2.98) | 0.60 (0.47, 0.74) ^{a, b} |
| Control | 3.25 (1.47) | 3.34 (1.50) | |
| Clogged arteries | 4.00 (2.67) | 4.20 (2.52) | 0.18 (0.07, 0.29) ^{a, b} |
| Control | 3.94 (1.32) | 3.96 (1.29) | |
| COPD 1 ^c | 4.35 (2.27) | 4.49 (2.17) | 0.12 (0.04, 0.21) ^{a, b} |
| Control | 4.36 (1.08) | 4.38 (1.09) | |

(continued)

Table 19. Linear Regression of Difference in Difference Mean Health Belief Scores between Session 2 and Session 1 (continued)

| Condition | Mean (SD) Health Belief Score | | DID (95% CI) |
|----------------------|-------------------------------|----------------|--------------------------------------|
| | Session 1 | Session 2 | |
| COPD 2 ^d | 4.44 (2.36) | 4.47 (2.52) | 0.01 (-0.09, 0.11) |
| Control | 4.37 (1.08) | 4.38 (1.08) | |
| Erectile dysfunction | 3.67 (2.74) | 4.16 (2.76) | 0.41 (0.28, 0.53) ^{a, b} |
| Control | 3.59 (1.31) | 3.67 (1.30) | |
| Amputation | 3.55 (2.96) | 4.20 (2.54) | 0.56 (0.43, 0.69) ^{a, b} |
| Control | 3.52 (1.46) | 3.61 (1.43) | |
| Diabetes | 2.97 (3.12) | 3.89 (3.22) | 0.74 (0.59, 0.89) ^{a, b} |
| Control | 2.90 (1.52) | 3.07 (1.51) | |
| Macular degeneration | 3.32 (2.61) | 4.01 (2.89) | 0.58 (0.46, 0.70) ^{a, b} |
| Control | 3.21 (1.39) | 3.32 (1.43) | |
| Cataracts | 3.14 (3.01) | 3.92 (3.06) | 0.66 (0.52, 0.80) ^{a, b} |
| Control | 3.09 (1.45) | 3.22 (1.45) | |

^a Significant at $p < .05$ in unadjusted analyses.

^b Significant after adjustment for multiple comparisons.

^c Image of diseased lungs. ^dImage of man with oxygen.

Note: Control = average of the 4 Surgeon General warnings for the relevant health belief. Regressions control for age group and smoking status. DID = difference in difference. CHW = cigarette health warning. SD = standard deviation. DID scores represent: (Session 2 mean for CHW - Session 1 mean for CHW) - (Session 2 mean for Control - Session 1 mean for Control).

As seen in Table 20, DID health beliefs were significantly different before and after adjustment for 3 of the 6 CHW compared with the control condition using ordinal regression: Addictive, Fatal lung disease in nonsmokers, and Stunt fetal growth. That is, the CHW was associated with a greater pre-post change in level of the ordinal dependent variable than the control group (an average of the 4 SG warnings). For the Addictive warning, this difference was in the negative direction (i.e., toward lower levels of agreement with the health belief in the CHW condition compared with the control condition). For the Fatal lung disease in smokers and Stunt fetal growth warnings, the differences were in the positive direction (i.e., toward higher levels of agreement with the health belief in the CHW condition compared with the control condition).

Table 20. Ordinal Regression of Difference in Difference Health Belief Scores between Session 2 and Session 1

| Warning | Ordinal Response Options for Corresponding Health Belief Item | Condition | Proportion Selecting Response | | DID (95% CI) | Interaction Term (95% CI) | |
|---------------|---|-----------|-------------------------------|-----------|----------------|---------------------------|---|
| | | | Session 1 | Session 2 | | | |
| Addictive | 1 "Strongly disagree" | CHW | 0.01 | 0.01 | 0.01 | | |
| | | Control | 0.02 | 0.01 | (0.00, 0.01) | | |
| | 2 "Disagree" | CHW | 0.00 | 0.01 | 0.00 | | |
| | | Control | 0.01 | 0.01 | (0.00, 0.01) | | |
| | 3 "Neither agree nor disagree" | CHW | 0.02 | 0.03 | 0.02 | | -1.03 ^{a, b} (-1.64, -0.41) |
| | | Control | 0.04 | 0.03 | (0.01, 0.03) | | |
| | 4 "Agree" | CHW | 0.13 | 0.19 | 0.06 | | |
| | | Control | 0.19 | 0.19 | (0.03, 0.10) | | |
| | 5 "Strongly agree" | CHW | 0.84 | 0.76 | -0.09 | | |
| | | Control | 0.75 | 0.76 | (-0.15, -0.04) | | |
| Harm children | 1 "Strongly disagree" | CHW | 0.01 | 0.01 | 0.00 | | |
| | | Control | 0.01 | 0.01 | (0.00, 0.00) | | |
| | 2 "Disagree" | CHW | 0.02 | 0.02 | 0.00 | | |
| | | Control | 0.02 | 0.02 | (-0.01, 0.00) | | |
| | 3 "Neither agree nor disagree" | CHW | 0.07 | 0.06 | -0.01 | | 0.32 (-0.15, 0.79) |
| | | Control | 0.07 | 0.08 | (-0.03, 0.00) | | |
| | 4 "Agree" | CHW | 0.31 | 0.29 | -0.02 | | |
| | | Control | 0.31 | 0.32 | (-0.05, 0.01) | | |
| | 5 "Strongly agree" | CHW | 0.60 | 0.62 | 0.04 | | |
| | | Control | 0.59 | 0.58 | (-0.02, 0.09) | | |

(continued)

Table 20. Ordinal Regression of Difference in Difference Health Belief Scores between Session 2 and Session 1 (continued)

| Warning | Ordinal Response Options for Corresponding Health Belief Item | Condition | Proportion Selecting Response | | DID (95% CI) | Interaction Term (95% CI) |
|----------------------------------|---|-----------|-------------------------------|-----------|----------------|---------------------------|
| | | | Session 1 | Session 2 | | |
| Kill you | 1 "Strongly disagree" | CHW | 0.01 | 0.01 | 0.00 | 0.09 (-0.42, 0.61) |
| | | Control | 0.01 | 0.01 | (0.00, 0.00) | |
| | 2 "Disagree" | CHW | 0.01 | 0.01 | 0.00 | |
| | | Control | 0.01 | 0.01 | (0.00, 0.00) | |
| | 3 "Neither agree nor disagree" | CHW | 0.07 | 0.06 | 0.00 | |
| | | Control | 0.07 | 0.07 | (-0.02, 0.01) | |
| | 4 "Agree" | CHW | 0.29 | 0.28 | -0.01 | |
| | | Control | 0.30 | 0.29 | (-0.04, 0.03) | |
| | 5 "Strongly agree" | CHW | 0.62 | 0.64 | 0.01 | |
| | | Control | 0.61 | 0.62 | (-0.05, 0.07) | |
| Fatal lung disease in nonsmokers | 1 "Strongly disagree" | CHW | 0.03 | 0.02 | -0.01 | 0.50 a, b (0.08, 0.92) |
| | | Control | 0.03 | 0.02 | (-0.02, 0.00) | |
| | 2 "Disagree" | CHW | 0.09 | 0.06 | -0.02 | |
| | | Control | 0.09 | 0.08 | (-0.04, 0.00) | |
| | 3 "Neither agree nor disagree" | CHW | 0.24 | 0.19 | -0.03 | |
| | | Control | 0.23 | 0.22 | (-0.06, -0.01) | |
| | 4 "Agree" | CHW | 0.37 | 0.38 | 0.00 | |
| | | Control | 0.38 | 0.38 | (-0.01, 0.01) | |
| | 5 "Strongly agree" | CHW | 0.26 | 0.35 | 0.06 | |
| | | Control | 0.28 | 0.30 | (0.01, 0.11) | |
| Quit now | 1 "Strongly disagree" | CHW | 0.02 | 0.01 | 0.00 | 0.29 (-0.13, 0.72) |
| | | Control | 0.02 | 0.02 | (-0.01, 0.00) | |
| | 2 "Disagree" | CHW | 0.02 | 0.02 | 0.00 | |
| | | Control | 0.02 | 0.02 | (-0.01, 0.00) | |
| | 3 "Neither agree nor disagree" | CHW | 0.08 | 0.06 | -0.01 | |
| | | Control | 0.08 | 0.07 | (-0.03, 0.01) | |
| | 4 "Agree" | CHW | 0.38 | 0.34 | -0.02 | |
| | | Control | 0.37 | 0.35 | (-0.06, 0.01) | |
| | 5 "Strongly agree" | CHW | 0.49 | 0.57 | 0.04 | |
| | | Control | 0.50 | 0.55 | (-0.02, 0.11) | |

(continued)

Table 20. Ordinal Regression of Difference in Difference Health Belief Scores between Session 2 and Session 1 (continued)

| Warning | Ordinal Response Options for Corresponding Health Belief Item | Condition | Proportion Selecting Response | | DID (95% CI) | Interaction Term (95% CI) |
|--------------------|---|-----------|-------------------------------|-----------|----------------|---------------------------|
| | | | Session 1 | Session 2 | | |
| Stunt fetal growth | 1 "Strongly disagree" | CHW | 0.01 | 0.01 | -0.01 | 1.02 a, b (0.54, 1.49) |
| | | Control | 0.01 | 0.01 | (-0.01, 0.00) | |
| | 2 "Disagree" | CHW | 0.02 | 0.01 | -0.01 | |
| | | Control | 0.02 | 0.02 | (-0.02, -0.01) | |
| | 3 "Neither agree nor disagree" | CHW | 0.15 | 0.10 | -0.06 | |
| | | Control | 0.15 | 0.16 | (-0.08, -0.03) | |
| | 4 "Agree" | CHW | 0.37 | 0.32 | -0.05 | |
| | | Control | 0.37 | 0.37 | (-0.08, -0.03) | |
| | 5 "Strongly agree" | CHW | 0.44 | 0.56 | 0.13 | |
| | | Control | 0.44 | 0.43 | (0.07, 0.19) | |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

Note: Control = average of the 4 Surgeon General warnings for the relevant health belief. Regressions control for age group and smoking status. DID = difference in difference. CHW = cigarette health warning. DID scores represent: (Session 2 proportion for CHW - Session 1 proportion for CHW) - (Session 2 proportion for Control - Session 1 proportion for Control).

5.3.2 Differences in Health Beliefs Between Session 3 and Session 1

As seen in Table 21, DID health belief scores were positive and significant before and after adjustment for 6 of the 10 warnings with scores on a linear scale: Head and neck cancer, Bladder cancer, Amputation, Diabetes, Macular degeneration, and Cataracts. There was a net positive increase in agreement with health beliefs for those CHW after accounting for changes in health beliefs in the control condition.

Table 21. Linear Regression of Difference in Difference Mean Health Belief Scores between Session 3 and Session 1

| Condition | Mean (SD) Health Belief Score | | DID (95% CI) |
|----------------------|-------------------------------|----------------|--------------------------------------|
| | Session 1 | Session 3 | |
| Head and neck cancer | 3.22 (2.96) | 3.64 (2.85) | 0.25 (0.11, 0.40) ^{a, b} |
| Control | 3.36 (1.50) | 3.52 (1.45) | |

(continued)

Table 21. Linear Regression of Difference in Difference Mean Health Belief Scores between Session 3 and Session 1 (continued)

| Condition | Mean (SD) Health Belief Score | | DID (95% CI) |
|----------------------|-------------------------------|----------------|--------------------------------------|
| | Session 1 | Session 3 | |
| Bladder cancer | 3.25 (3.04) | 3.66 (2.87) | 0.36 (0.19, 0.52) ^{a, b} |
| Control | 3.26 (1.42) | 3.31 (1.49) | |
| Clogged arteries | 3.94 (2.44) | 3.99 (2.42) | -0.01 (-0.13, 0.12) |
| Control | 3.95 (1.29) | 4.01 (1.31) | |
| COPD 1 ^c | 4.35 (2.33) | 4.34 (2.26) | -0.08 (-0.19, 0.04) |
| Control | 4.38 (1.05) | 4.45 (1.05) | |
| COPD 2 ^d | 4.46 (2.18) | 4.43 (2.03) | -0.10 (-0.20, 0.00) |
| Control | 4.39 (1.05) | 4.46 (1.05) | |
| Erectile dysfunction | 3.65 (2.81) | 3.87 (2.48) | 0.10 (-0.05, 0.24) |
| Control | 3.61 (1.31) | 3.74 (1.35) | |
| Amputation | 3.46 (2.80) | 3.97 (2.56) | 0.37 (0.23, 0.51) ^{a, b} |
| Control | 3.55 (1.44) | 3.69 (1.46) | |
| Diabetes | 2.90 (2.86) | 3.35 (3.04) | 0.25 (0.08, 0.42) ^{a, b} |
| Control | 2.89 (1.50) | 3.09 (1.53) | |
| Macular degeneration | 3.22 (2.54) | 3.60 (2.75) | 0.26 (0.13, 0.40) ^{a, b} |
| Control | 3.22 (1.40) | 3.35 (1.42) | |
| Cataracts | 3.02 (2.69) | 3.55 (2.62) | 0.33 (0.18, 0.49) ^{a, b} |
| Control | 3.08 (1.44) | 3.27 (1.51) | |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons. ^c Image of diseased lungs. ^d Image of man with oxygen.

Note: Control = average of the 4 Surgeon General warnings for the relevant health belief. Regressions control for age group and smoking status. DID = difference in difference. CHW = cigarette health warning. SD = standard deviation. DID scores represent: (Session 3 mean for CHW - Session 1 mean for CHW) - (Session 3 mean for Control - Session 1 mean for Control).

As seen in the ordinal regression results in Table 22, DID health beliefs were significantly different before and after adjustment for multiple comparisons for 1 treatment condition (Fatal lung disease in nonsmokers) compared with the control condition. This difference was in the positive direction (i.e., toward higher levels of agreement with the health belief in the CHW condition compared with the control condition).

Table 22. Ordinal Regression of Difference in Difference Health Belief Scores between Session 3 and Session 1

| Warning | Ordinal Response Options for Corresponding Health Belief Item | Condition | Proportion Selecting Response | | DID (95% CI) | Interaction term (95% CI) | |
|--------------------|---|-----------|-------------------------------|---------------|---------------|---------------------------|------------------------|
| | | | Session 1 | Session 3 | | | |
| Addictive | 1 "Strongly disagree" | CHW | 0.02 | 0.02 | 0.01 | | |
| | | Control | 0.02 | 0.02 | (0.00, 0.02) | | |
| | 2 "Disagree" | CHW | 0.01 | 0.01 | 0.00 | | |
| | | Control | 0.01 | 0.01 | (0.00, 0.01) | | |
| | 3 "Neither agree nor disagree" | CHW | 0.03 | 0.03 | 0.01 | | -0.39 (-1.08, 0.30) |
| | | Control | 0.03 | 0.03 | (-0.01, 0.02) | | |
| 4 "Agree" | CHW | 0.15 | 0.16 | 0.03 | | | |
| | Control | 0.17 | 0.16 | (-0.02, 0.07) | | | |
| 5 "Strongly agree" | CHW | 0.80 | 0.78 | -0.04 | | | |
| | Control | 0.77 | 0.78 | (-0.11, 0.03) | | | |
| Harm children | 1 "Strongly disagree" | CHW | 0.01 | 0.01 | 0.00 | | |
| | | Control | 0.01 | 0.01 | (0.00, 0.01) | | |
| | 2 "Disagree" | CHW | 0.02 | 0.02 | 0.00 | | |
| | | Control | 0.02 | 0.02 | (0.00, 0.01) | | |
| | 3 "Neither agree nor disagree" | CHW | 0.08 | 0.08 | 0.01 | | -0.21 (-0.79, 0.37) |
| | | Control | 0.08 | 0.07 | (-0.01, 0.03) | | |
| 4 "Agree" | CHW | 0.32 | 0.32 | 0.01 | | | |
| | Control | 0.32 | 0.31 | (-0.02, 0.05) | | | |
| 5 "Strongly agree" | CHW | 0.58 | 0.57 | -0.02 | | | |
| | Control | 0.58 | 0.59 | (-0.09, 0.04) | | | |
| Kill you | 1 "Strongly disagree" | CHW | 0.01 | 0.01 | 0.00 | | |
| | | Control | 0.01 | 0.01 | (0.00, 0.00) | | |
| | 2 "Disagree" | CHW | 0.01 | 0.01 | 0.00 | | |
| | | Control | 0.01 | 0.01 | (0.00, 0.01) | | |
| | 3 "Neither agree nor disagree" | CHW | 0.07 | 0.06 | 0.01 | | -0.26 (-0.82, 0.30) |
| | | Control | 0.07 | 0.06 | (-0.01, 0.03) | | |
| 4 "Agree" | CHW | 0.29 | 0.27 | 0.02 | | | |
| | Control | 0.29 | 0.26 | (-0.02, 0.05) | | | |
| 5 "Strongly agree" | CHW | 0.62 | 0.65 | -0.03 | | | |
| | Control | 0.62 | 0.67 | (-0.09, 0.03) | | | |

(continued)

Table 22. Ordinal Regression of Difference in Difference Health Belief Scores between Session 3 and Session 1 (continued)

| Warning | Ordinal Response Options for Corresponding Health Belief Item | Condition | Proportion Selecting Response | | DID (95% CI) | Interaction term (95% CI) |
|----------------------------------|---|-----------|-------------------------------|-----------|----------------|-------------------------------------|
| | | | Session 1 | Session 3 | | |
| Fatal lung disease in nonsmokers | 1 "Strongly disagree" | CHW | 0.03 | 0.02 | -0.01 | 0.59 ^{a,b} (0.10, 1.08) |
| | | Control | 0.02 | 0.02 | (-0.02, 0.00) | |
| | 2 "Disagree" | CHW | 0.10 | 0.06 | -0.02 | |
| | | Control | 0.08 | 0.07 | (-0.05, 0.00) | |
| | 3 "Neither agree nor disagree" | CHW | 0.25 | 0.19 | -0.04 | |
| | | Control | 0.23 | 0.21 | (-0.07, -0.01) | |
| | 4 "Agree" | CHW | 0.38 | 0.39 | 0.00 | |
| | | Control | 0.39 | 0.39 | (-0.01, 0.02) | |
| | 5 "Strongly agree" | CHW | 0.24 | 0.34 | 0.07 | |
| | | Control | 0.28 | 0.31 | (0.01, 0.12) | |
| Quit now | 1 "Strongly disagree" | CHW | 0.02 | 0.01 | 0.00 | -0.06 (-0.54, 0.42) |
| | | Control | 0.02 | 0.01 | (-0.01, 0.01) | |
| | 2 "Disagree" | CHW | 0.02 | 0.01 | 0.00 | |
| | | Control | 0.02 | 0.01 | (-0.01, 0.01) | |
| | 3 "Neither agree nor disagree" | CHW | 0.08 | 0.06 | 0.00 | |
| | | Control | 0.08 | 0.06 | (-0.02, 0.02) | |
| | 4 "Agree" | CHW | 0.39 | 0.34 | 0.01 | |
| | | Control | 0.39 | 0.34 | (-0.04, 0.05) | |
| | 5 "Strongly agree" | CHW | 0.49 | 0.57 | -0.01 | |
| | | Control | 0.49 | 0.58 | (-0.08, 0.06) | |
| Stunt fetal growth | 1 "Strongly disagree" | CHW | 0.01 | 0.01 | 0.00 | -0.02 (-0.58, 0.54) |
| | | Control | 0.01 | 0.01 | (0.00, 0.00) | |
| | 2 "Disagree" | CHW | 0.03 | 0.03 | 0.00 | |
| | | Control | 0.03 | 0.03 | (-0.01, 0.01) | |
| | 3 "Neither agree nor disagree" | CHW | 0.14 | 0.13 | 0.00 | |
| | | Control | 0.15 | 0.13 | (-0.03, 0.03) | |
| | 4 "Agree" | CHW | 0.36 | 0.36 | 0.00 | |
| | | Control | 0.36 | 0.36 | (-0.02, 0.03) | |
| | 5 "Strongly agree" | CHW | 0.45 | 0.47 | 0.00 | |
| | | Control | 0.45 | 0.47 | (-0.07, 0.07) | |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

Note: Control = average of the 4 Surgeon General warnings for the relevant health belief. Regressions control for age group and smoking status. DID = difference in difference. CHW = cigarette health warning. DID scores represent: (Session 3 proportion for CHW - Session 1 proportion for CHW) - (Session 3 proportion for Control - Session 1 proportion for Control).

5.4 Phase 3 Results: Recall of Warnings

Approximately one-quarter of control group participants (25.7%) accurately recalled the SG warning, and a range of 49.4% (Clogged arteries) to 73.8% (Amputation) treatment group participants accurately recalled the CHW. Participants in all 16 treatment conditions were more likely to accurately recall which CHW they had seen (out of 4 possible CHW) than participants in the control condition were to accurately recall which SG warning they had seen (out of 4 possible SG warnings).

Table 23. Logistic Regressions of Warning Label Recall Comparing CHW with SG Warnings

| Condition | Description | % Recall | OR (95% CI) |
|-------------|----------------------------------|----------|---------------------------------------|
| 0 (Control) | Average of 4 SG warnings | 25.7% | REF |
| 1 | Addictive | 64.9% | 5.63 (3.85, 8.22) ^{a, b} |
| 2 | Harm children | 61.6% | 7.64 (5.17, 11.31) ^{a, b} |
| 3 | Kill you | 63.7% | 9.42 (6.33, 14.02) ^{a, b} |
| 4 | Fatal lung disease in nonsmokers | 66.7% | 5.20 (3.55, 7.61) ^{a, b} |
| 5 | Quit now | 62.8% | 5.15 (3.60, 7.37) ^{a, b} |
| 6 | Head and neck cancer | 58.1% | 4.89 (3.38, 7.06) ^{a, b} |
| 7 | Bladder cancer | 57.8% | 5.39 (3.70, 7.86) ^{a, b} |
| 8 | Stunt fetal growth | 66.7% | 6.13 (4.08, 9.20) ^{a, b} |
| 9 | Clogged arteries | 49.4% | 2.99 (2.07, 4.32) ^{a, b} |
| 10 | COPD 1 ^c | 58.1% | 4.14 (2.86, 5.99) ^{a, b} |
| 11 | COPD 2 ^d | 57.8% | 4.23 (2.92, 6.12) ^{a, b} |
| 12 | Erectile dysfunction | 61.4% | 4.69 (3.20, 6.88) ^{a, b} |
| 13 | Amputation | 73.8% | 8.73 (5.88, 12.98) ^{a, b} |
| 14 | Diabetes | 62.3% | 4.90 (3.39, 7.08) ^{a, b} |
| 15 | Macular degeneration | 60.8% | 4.87 (3.37, 7.05) ^{a, b} |
| 16 | Cataracts | 53.0% | 3.44 (2.41, 4.91) ^{a, b} |

^a Significant at p<.05 in unadjusted analyses.

^b Significant after adjustment for multiple comparisons.

^c Image of diseased lungs.

^d Image of man with oxygen.

Note: Due to a technical error with the online survey platform, the question assessing accuracy of warning recall did not function properly for 197 Session 3 participants. These cases were removed from the analysis of recall. Thus, the analytic sample size in this table is 3,163 (197 less than the overall Session 3 sample size of 3,360).

6. Summary and Limitations

The primary purpose of this study was to test if CHW increased public understanding of the negative health consequences of cigarette smoking relative to existing SG warnings. Below we describe key findings. A summary of findings across outcomes appears in Table 24.

6.1 Summary of Findings

We compared the 16 CHW (two of which shared a text statement but varied in image) with the control (the mean of the 4 SG warnings) on several outcomes: new information, thinking about risks, self-reported learning, perceived factualness, perceived informativeness, perceived understandability, changes in health beliefs, and recall.

Phase 1 results are reactions to warnings after viewing them displayed on mock cigarette packs and advertisements in Session 1. After adjustment for multiple comparisons, respondents were more likely to state they learned new information for 13 of the CHW conditions relative to the control and less likely to state they learned new information for 1 CHW condition relative to the control. Self-reported learning was higher in 13 CHW conditions and lower in 3 CHW conditions relative to the control condition. Out of 16 CHW conditions, 14 were more likely to make participants think about the health risks of smoking than the control, and 8 CHW conditions were less likely to be seen as factual than the control. Perceived informativeness was higher for 13 CHW conditions and lower for 1 CHW condition relative to the control condition. Perceived understandability was higher for 15 CHW conditions.

Phase 2 results represent changes in health beliefs for CHW relative to changes in beliefs for the control condition. Between Session 1 and Session 2, 11 CHW resulted in greater net positive changes in agreement with health beliefs. One CHW resulted in greater net negative changes in agreement health beliefs. From Session 1 to Session 3, 7 CHW resulted in greater net positive changes in agreement with health beliefs.

Phase 3 results are recall of warnings at Session 3. At a median of 17 days after initial exposure, participants in all 16 treatment conditions were more likely to correctly recall which CHW they had seen than participants in the control condition were to recall which SG warning they had seen.

Overall, relative to the average of the SG warnings, many of the CHW were considered to be new information; lead to thinking about risks; result in greater self-reported learning, perceived informativeness, and perceived understandability; and increase agreement with accurate health beliefs over time. The vast majority (nearly three-quarters or more) of participants believed the warning they viewed was a fact, although half of the CHW were seen as less likely to be factual than SG warnings. Participants who viewed SG warnings

were likely viewing something they had seen in real life, particularly so if they were cigarette smokers. In contrast, participants who viewed CHW were inherently viewing something novel. That novelty may produce skepticism. It is possible, though not necessarily the case, that skepticism of the warnings would decline with repeated exposure or if the warnings were viewed in a “real world,” rather than hypothetical, context.

Some of the CHW did not perform as well as others for some measures. In particular, the warnings for Addictive, Kill you, and Quit now were often not significantly different from the control condition or were less likely to result in a given outcome (e.g., they produced lower levels of self-reported learning compared with the controls or did not lead to a net positive improvement in accurate health beliefs between sessions). Participants may have muted responses to these warnings because they viewed the content as obvious; it is widely known that smoking is addictive and can kill you and that quitting has positive health effects, even if individuals do not fully understand the extent of these smoking risks and cessation benefits (e.g., Arnett, 2000; Cummings et al., 2004; Mantler, 2013; Murphy-Hoefer et al., 2004; Weinstein, 1998; Weinstein et al., 2004a; Weinstein et al., 2004b).

6.2 Limitations

Some limitations of this study are common to many online studies. For example, the stimuli being tested (in this case, mock cigarette packs and advertisements) were not displayed in a naturalistic fashion but rather on a computer screen. We minimized the lack of realism by showing mock cigarette packs that were the same size as real cigarette packs and enabling participants to rotate the 3-D image of the pack with the warning on it. Two sessions of exposure to stimuli may not be enough to generate changes in some outcomes.

There are also additional, study-specific limitations. Although the universe of respondents included six subgroups (adolescents susceptible to smoking, adolescent current smokers, young adult current smokers, young adult nonsmokers, older adult current smokers, and older adult nonsmokers), we did not have power to look for within-group differences.

In addition, the survey used a convenience sample rather than a probability sample, and the results are not nationally representative. Generating a representative sample of the size necessary for this study would have been cost prohibitive. In addition, an experimental design does not require a nationally representative sample of these subgroups to demonstrate an effect. The panel choice is driven by the large and diverse membership to allow for targeting of adequate numbers of those in the specified tobacco use status groups and to obtain a reasonable degree of demographic diversity in each of the targeted subgroups and the overall sample. Despite efforts to have the study population reflect the demographic makeup of the larger population, the nature of convenience samples still limits the generalizability of the results from this study. These limitations in generalizability do not affect the internal validity, and thus the conclusions, of the study.

Table 24. Summary of Results for each CHW Compared with Average of SG Warnings Among All Participants

| | | Session 1 (n = 9,760) | | | | | | Session 2 (n = 4,913) | Session 3 (n=3,360) | |
|----|---|-----------------------|---------------------------|----------------------------|----------------------------|-------------------------------|---------------------------------|--|--|--------------------------|
| | | New information (OR) | Thinking about risks (OR) | Perceived factualness (OR) | Self-reported learning (B) | Perceived informativeness (B) | Perceived understandability (B) | Health beliefs Session 2 vs. Session 1 (DID or interaction term) | Health beliefs Session 3 vs. Session 1 (DID or interaction term) | Recall ^f (OR) |
| 1 | Addictive ^c | 0.61 ^{a, b} | 1.11 | 1.07 | -0.44 ^{a, b} | -0.05 | 0.39 ^{a, b} | -1.03 ^{a, b} | -0.39 | 5.63 ^{a, b} |
| 2 | Harm children ^c | 1.37 ^{a, b} | 2.38 ^{a, b} | 0.94 | 0.31 ^{a, b} | 0.54 ^{a, b} | 0.52 ^{a, b} | 0.32 | -0.21 | 7.64 ^{a, b} |
| 3 | Kill you ^c | 1.04 | 1.70 ^{a, b} | 0.99 | -0.30 ^{a, b} | 0.17 | 0.42 ^{a, b} | 0.09 | -0.26 | 9.42 ^{a, b} |
| 4 | Fatal lung disease in nonsmokers ^c | 1.55 ^{a, b} | 1.94 ^{a, b} | 0.70 ^{a, b} | 0.64 ^{a, b} | 0.69 ^{a, b} | 0.41 ^{a, b} | 0.50 ^{a, b} | 0.59 ^{a, b} | 5.20 ^{a, b} |
| 5 | Quit now ^c | 0.95 | 1.18 | 1.01 | -0.44 ^{a, b} | -0.33 ^{a, b} | 0.12 | 0.29 | -0.06 | 5.15 ^{a, b} |
| 6 | Head and neck cancer | 8.09 ^{a, b} | 2.70 ^{a, b} | 0.53 ^{a, b} | 1.96 ^{a, b} | 0.78 ^{a, b} | 0.44 ^{a, b} | 0.50 ^{a, b} | 0.25 ^{a, b} | 4.89 ^{a, b} |
| 7 | Bladder cancer | 14.63 ^{a, b} | 2.14 ^{a, b} | 0.43 ^{a, b} | 2.37 ^{a, b} | 0.95 ^{a, b} | 0.46 ^{a, b} | 0.60 ^{a, b} | 0.36 ^{a, b} | 5.39 ^{a, b} |
| 8 | Stunt fetal growth ^c | 1.73 ^{a, b} | 2.00 ^{a, b} | 0.93 | 0.74 ^{a, b} | 0.91 ^{a, b} | 0.58 ^{a, b} | 1.02 ^{a, b} | -0.02 | 6.13 ^{a, b} |
| 9 | Clogged arteries | 2.64 ^{a, b} | 2.05 ^{a, b} | 1.14 | 1.20 ^{a, b} | 0.88 ^{a, b} | 0.55 ^{a, b} | 0.18 ^{a, b} | -0.01 | 2.99 ^{a, b} |
| 10 | COPD 1 ^d | 1.48 ^{a, b} | 2.25 ^{a, b} | 1.23 | 0.70 ^{a, b} | 0.76 ^{a, b} | 0.47 ^{a, b} | 0.12 ^{a, b} | -0.08 | 4.14 ^{a, b} |
| 11 | COPD 2 ^e | 1.48 ^{a, b} | 2.13 ^{a, b} | 1.26 | 0.78 ^{a, b} | 0.77 ^{a, b} | 0.53 ^{a, b} | 0.01 | -0.10 | 4.23 ^{a, b} |
| 12 | Erectile dysfunction | 7.65 ^{a, b} | 1.56 ^{a, b} | 0.53 ^{a, b} | 2.21 ^{a, b} | 0.95 ^{a, b} | 0.47 ^{a, b} | 0.41 ^{a, b} | 0.10 | 4.69 ^{a, b} |
| 13 | Amputation | 7.26 ^{a, b} | 3.52 ^{a, b} | 0.66 ^{a, b} | 2.28 ^{a, b} | 1.13 ^{a, b} | 0.60 ^{a, b} | 0.56 ^{a, b} | 0.37 ^{a, b} | 8.73 ^{a, b} |

(continued)

Table 24. Summary of Results for each CHW Compared with Average of SG Warnings Among All Participants (continued)

| | | Session 1 (n = 9,760) | | | | | | Session 2 (n = 4,913) | Session 3 (n=3,360) | |
|----|----------------------|-----------------------|---------------------------|----------------------------|----------------------------|-------------------------------|---------------------------------|--|--|--------------------------|
| | | New information (OR) | Thinking about risks (OR) | Perceived factualness (OR) | Self-reported learning (B) | Perceived informativeness (B) | Perceived understandability (B) | Health beliefs Session 2 vs. Session 1 (DID or interaction term) | Health beliefs Session 3 vs. Session 1 (DID or interaction term) | Recall ^f (OR) |
| 14 | Diabetes | 10.64 ^{a, b} | 2.11 ^{a, b} | 0.44 ^{a, b} | 2.43 ^{a, b} | 0.90 ^{a, b} | 0.54 ^{a, b} | 0.74 ^{a, b} | 0.25 ^{a, b} | 4.90 ^{a, b} |
| 15 | Macular degeneration | 11.81 ^{a, b} | 2.64 ^{a, b} | 0.59 ^{a, b} | 2.58 ^{a, b} | 1.12 ^{a, b} | 0.44 ^{a, b} | 0.58 ^{a, b} | 0.26 ^{a, b} | 4.87 ^{a, b} |
| 16 | Cataracts | 14.45 ^{a, b} | 1.71 ^{a, b} | 0.38 ^{a, b} | 2.37 ^{a, b} | 0.86 ^{a, b} | 0.47 ^{a, b} | 0.66 ^{a, b} | 0.33 ^{a, b} | 3.44 ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons. ^c Relevant health belief items are not scaled so the reported result is the interaction term from the ordinal regression rather than the DID. ^d Image of diseased lungs. ^e Image of man with oxygen. ^f Sample size for recall analyses is 3,163; 197 cases missing due to technical error with the survey platform for the item assessing recall.

Note: All results control for age group and smoking status. OR = odds ratio. B = regression coefficient. DID = difference in difference score. DID scores for linear analyses represent: (follow-up session proportion for CHW – Session 1 proportion for CHW) – (follow-up session proportion for Control – Session 1 proportion for Control) where follow-up is either Session 2 or Session 3. Significant interaction terms from ordinal regression models for non-scaled health beliefs (i.e., the CHW with a superscript “c”) indicate that there was a greater pre-post change in agreement with health beliefs for treatment versus control, either in the direction of greater agreement with health beliefs in the treatment condition (positive coefficients) or greater agreement with health beliefs in the control condition (negative coefficients).

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Appendix A: Study Stimuli

Example of 3-dimensional Rotational Pack



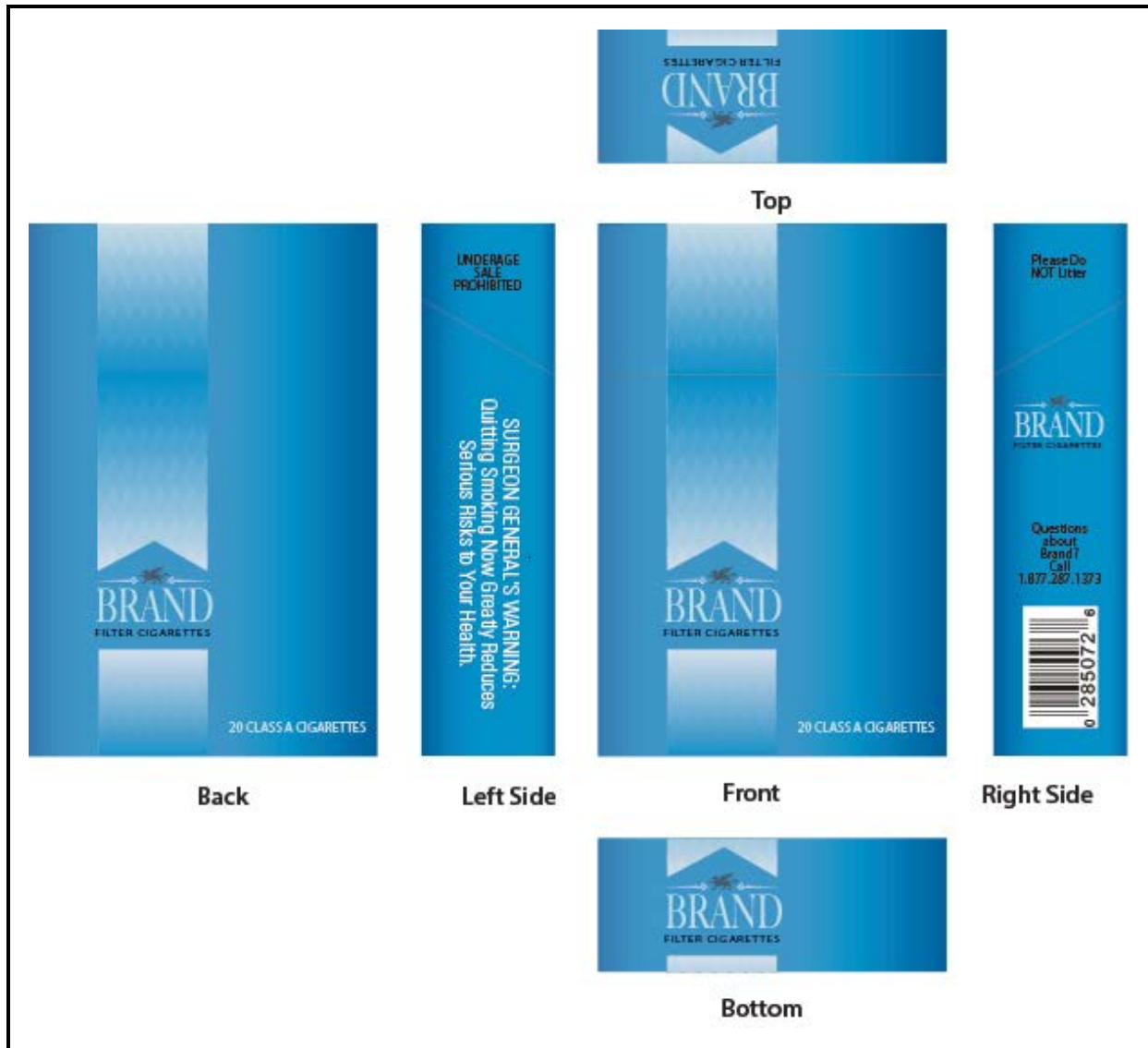
Control Stimuli – Surgeon General’s Warning #1 on Pack



Control Stimuli — Surgeon General's Warning #1 on Advertisement



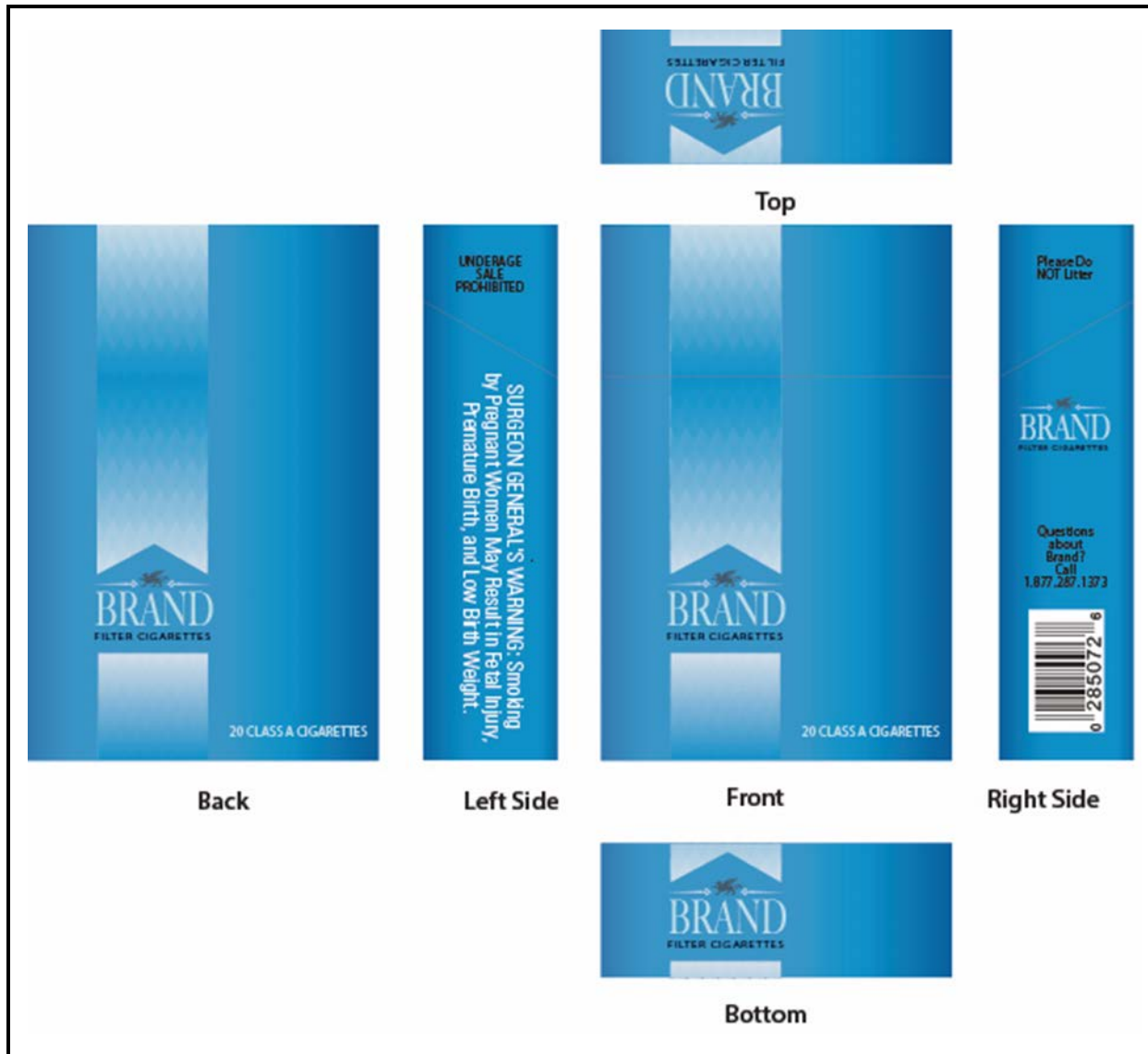
Control Stimuli – Surgeon General’s Warning #2 on Pack



Control Stimuli — Surgeon General’s Warning #2 on Advertisement



Control Stimuli – Surgeon General’s Warning #3 on Pack



Control Stimuli — Surgeon General's Warning #3 on Advertisement



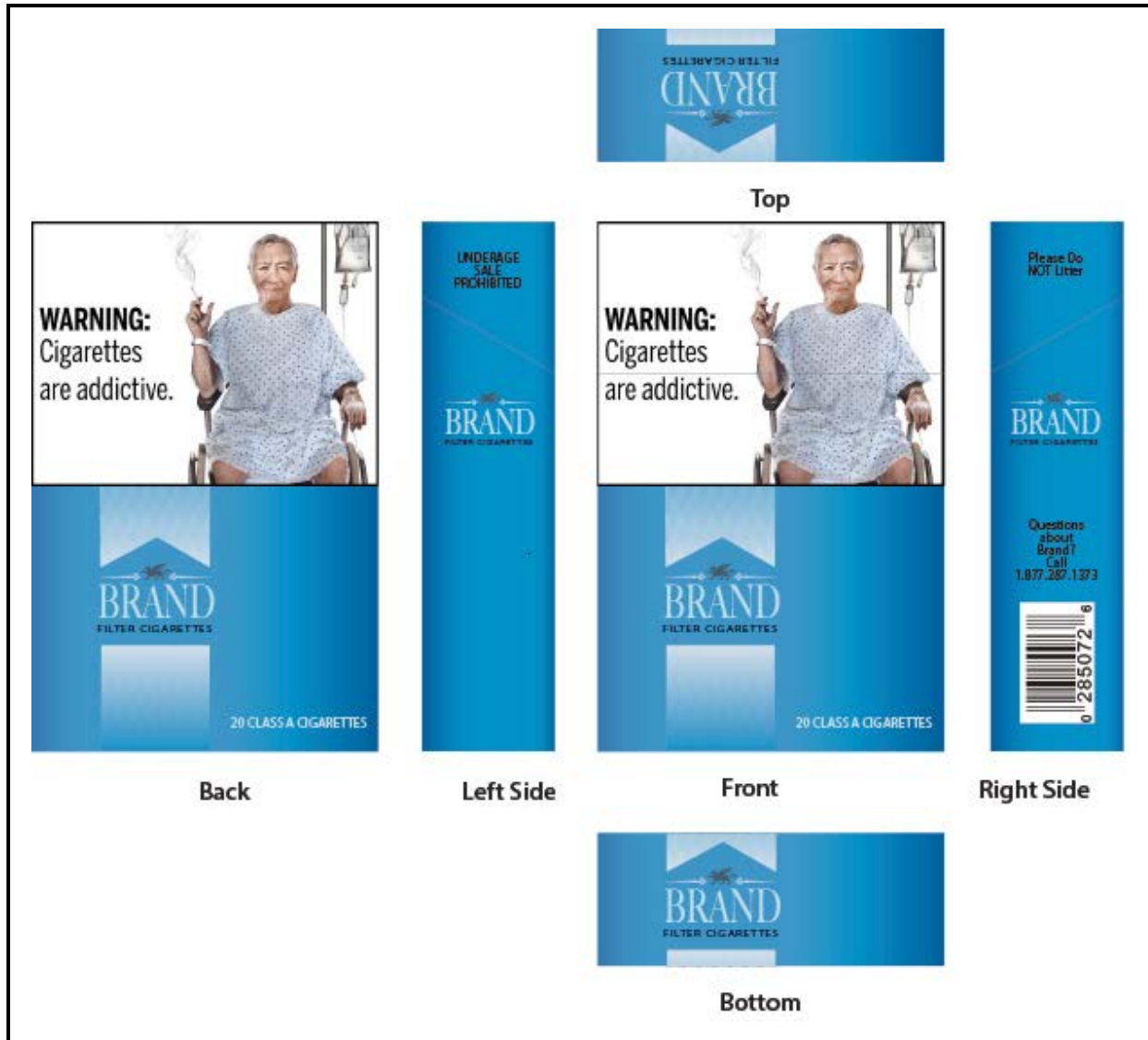
Control Stimuli – Surgeon General’s Warning #4 on Pack



Control Stimuli — Surgeon General’s Warning #4 on Advertisement



Treatment Stimuli – Cigarette Health Warning (CHW) #1 (Addictive) on Pack



Treatment Stimuli — CHW #1 (Addictive) on Advertisement

WARNING: Cigarettes are addictive.

BRAND
FILTER CIGARETTES

flavor for
the soul.

Treatment Stimuli — CHW #2 (Harm children) on Pack



Treatment Stimuli — CHW #2 (Harm children) on Advertisement

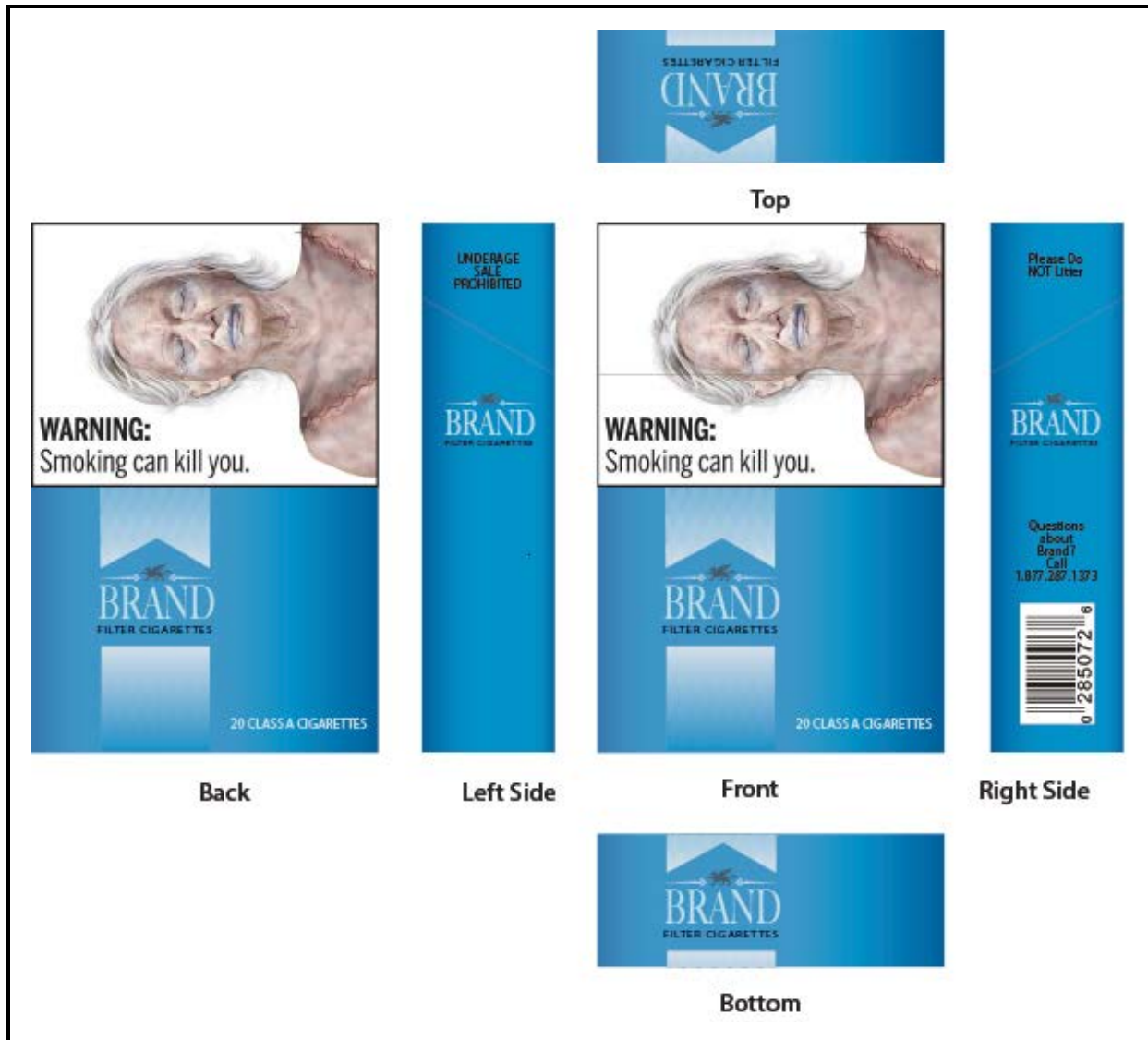
WARNING: Tobacco smoke can harm your children.

BRAND
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flavor for
the soul.

A pack of BRAND cigarettes is visible on a surface in the bottom right corner of the advertisement.

Treatment Stimuli – CHW #3 (Kill you) on Pack



Treatment Stimuli — CHW #3 (Kill you) on Advertisement

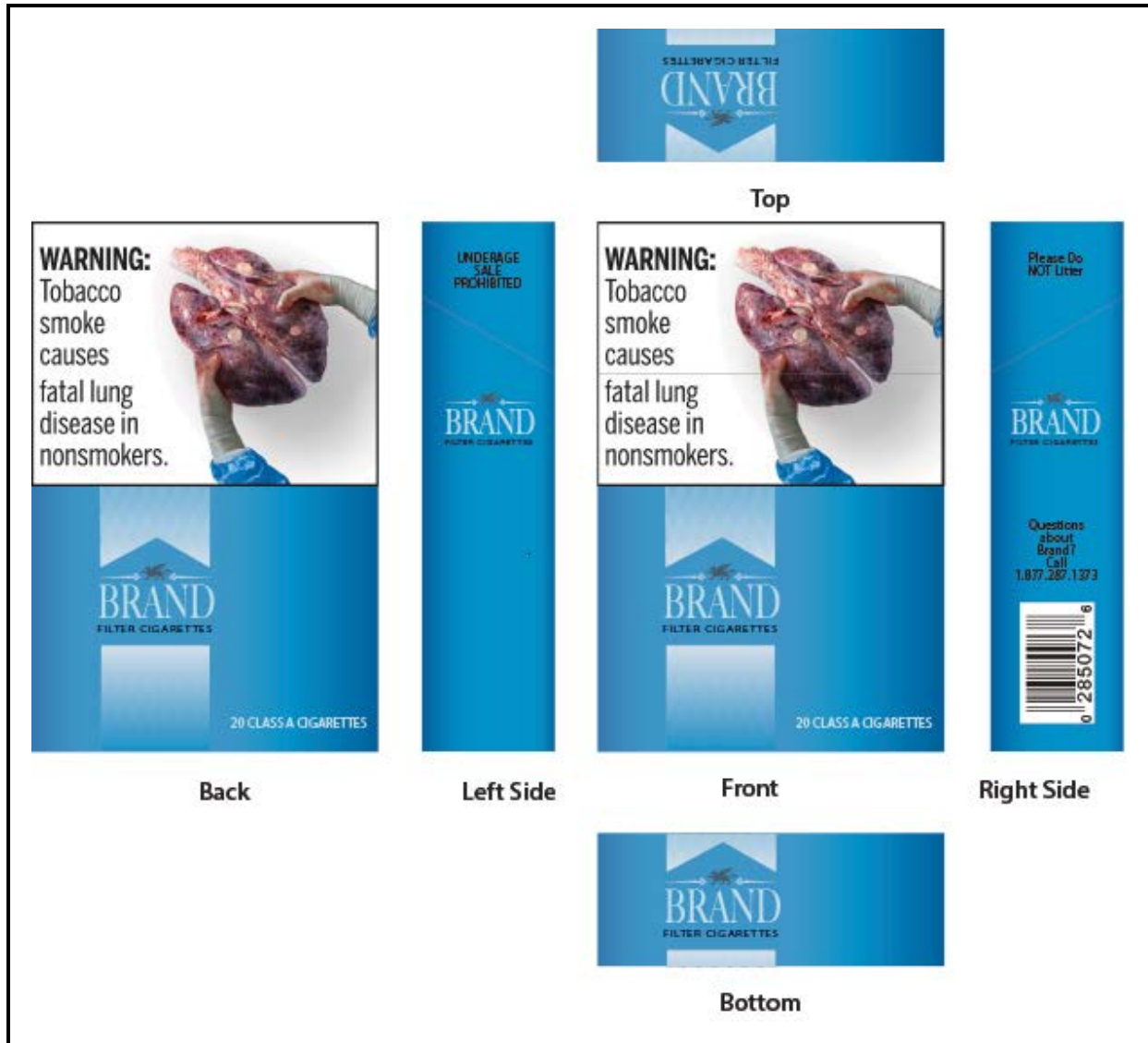
WARNING: Smoking can kill you.

BRAND
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flavor for
the soul.

A pack of BRAND Filter Cigarettes is visible in the bottom right corner of the advertisement.

Treatment Stimuli – CHW #4 (Fatal lung disease in nonsmokers) on Pack



Treatment Stimuli — CHW #4 (Fatal lung disease in nonsmokers) on Advertisement

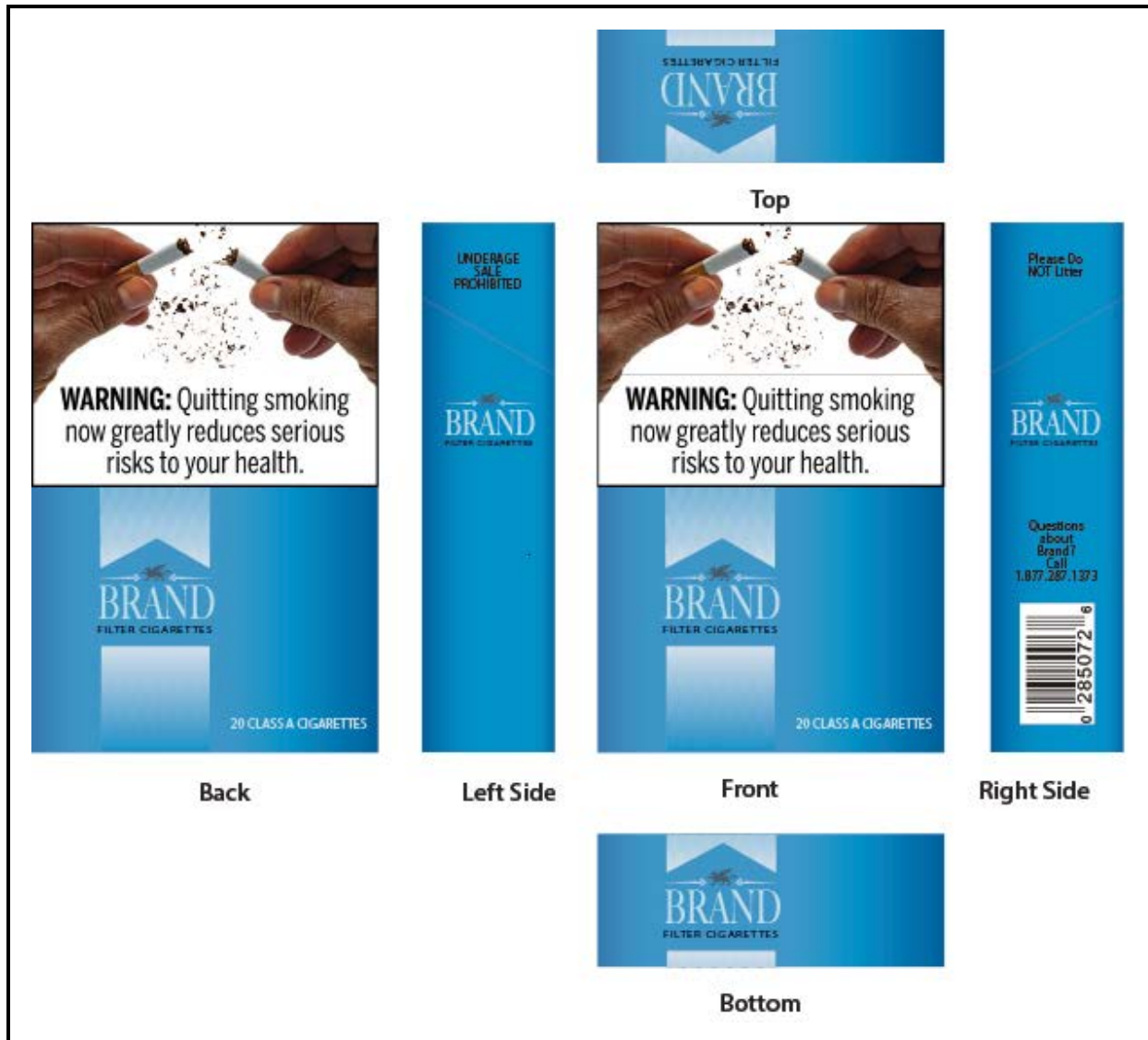
WARNING: Tobacco smoke causes fatal lung disease in nonsmokers.

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the soul.

The advertisement is a composite image. The top section features a white background with a black border. On the left, a warning message is written in bold black text. On the right, a pair of hands in blue surgical gloves holds a pair of human lungs, which are covered in numerous small, dark, circular spots representing cancerous nodules. The bottom section of the advertisement is a dark, moody photograph of a man wearing a dark hat and a dark jacket over a white t-shirt. He is playing an acoustic guitar. The lighting is dramatic, with strong highlights on the guitar's neck and the man's hands. In the bottom right corner, a pack of BRAND Filter Cigarettes is visible on a surface.

Treatment Stimuli – CHW #5 (Quit now) on Pack



Treatment Stimuli — CHW #5 (Quit now) on Advertisement

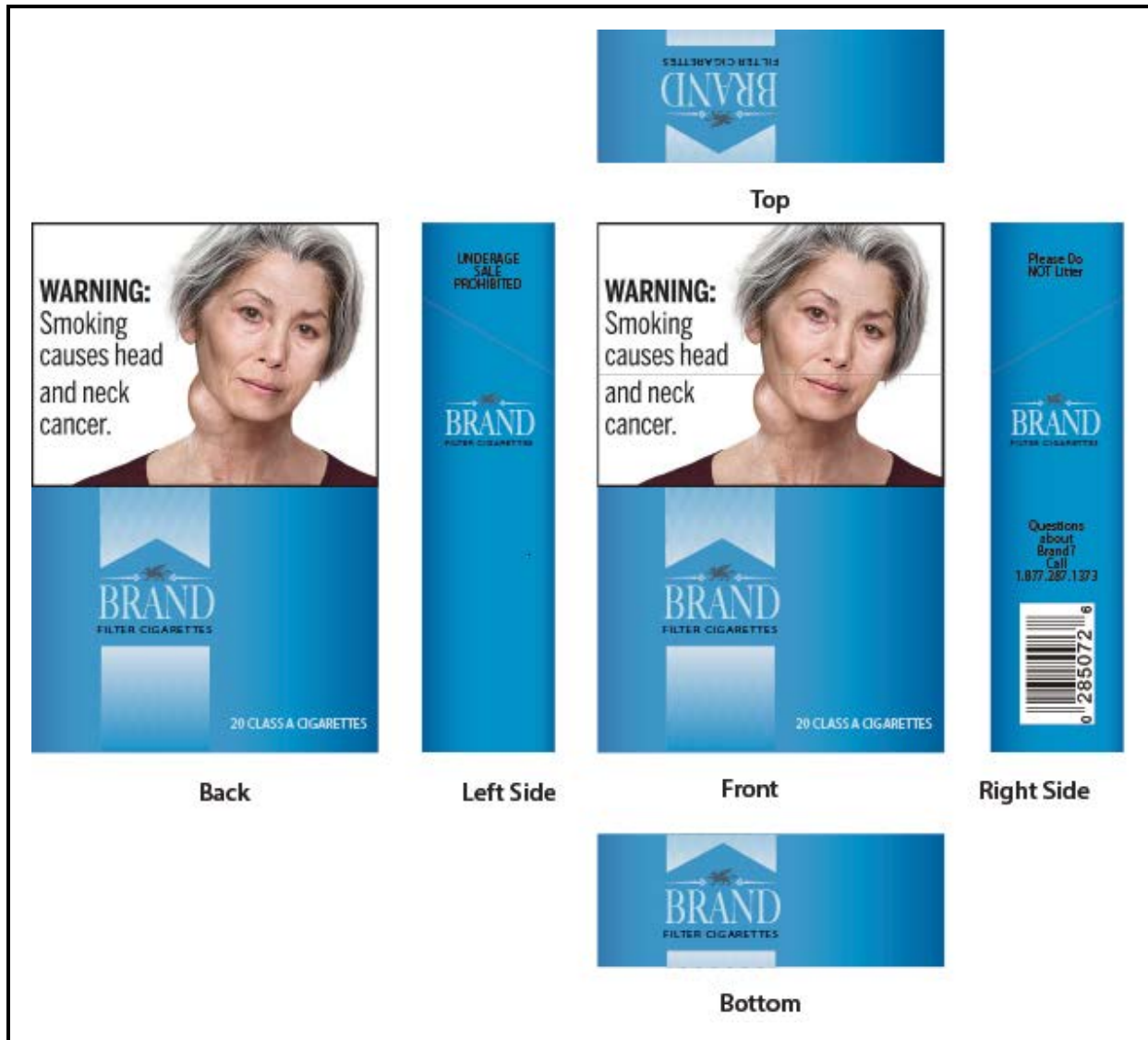
WARNING: Quitting smoking now greatly reduces serious risks to your health.

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the soul.

A pack of BRAND cigarettes is visible on a surface in the bottom right corner of the advertisement.

Treatment Stimuli – CHW #6 (Head and neck cancer) on Pack



Treatment Stimuli — CHW #6 (Head and neck cancer) on Advertisement

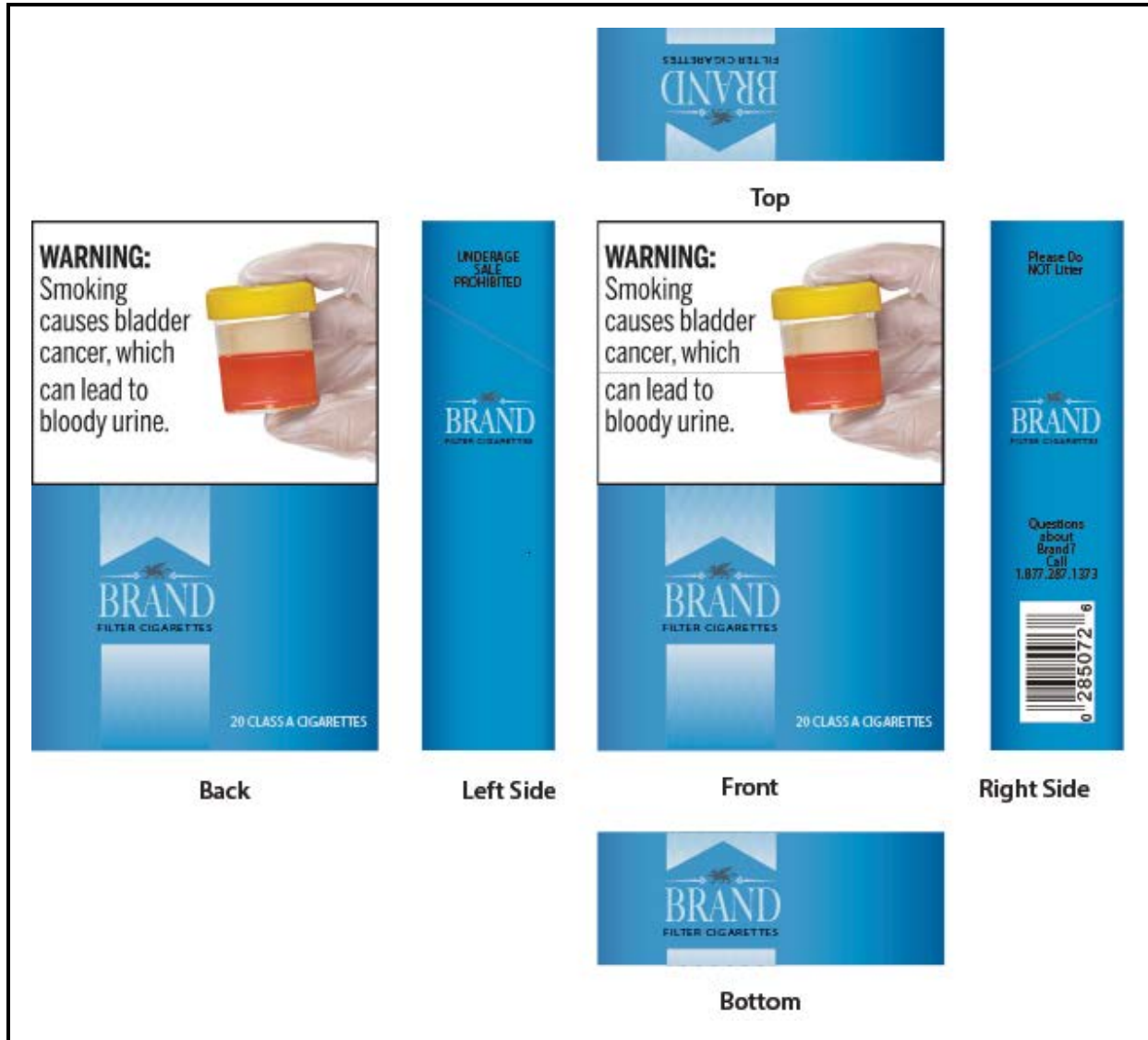
WARNING: Smoking causes head and neck cancer.

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The advertisement is a composite image. The top portion shows a woman with a large, prominent neck lump, with a warning text overlay. The bottom portion shows a man in a dark suit and hat playing an acoustic guitar in a dimly lit setting. A pack of BRAND Filter Cigarettes is visible on a surface in the bottom right corner.

Treatment Stimuli – CHW #7 (Bladder cancer) on Pack



Treatment Stimuli — CHW #7 (Bladder cancer) on Advertisement

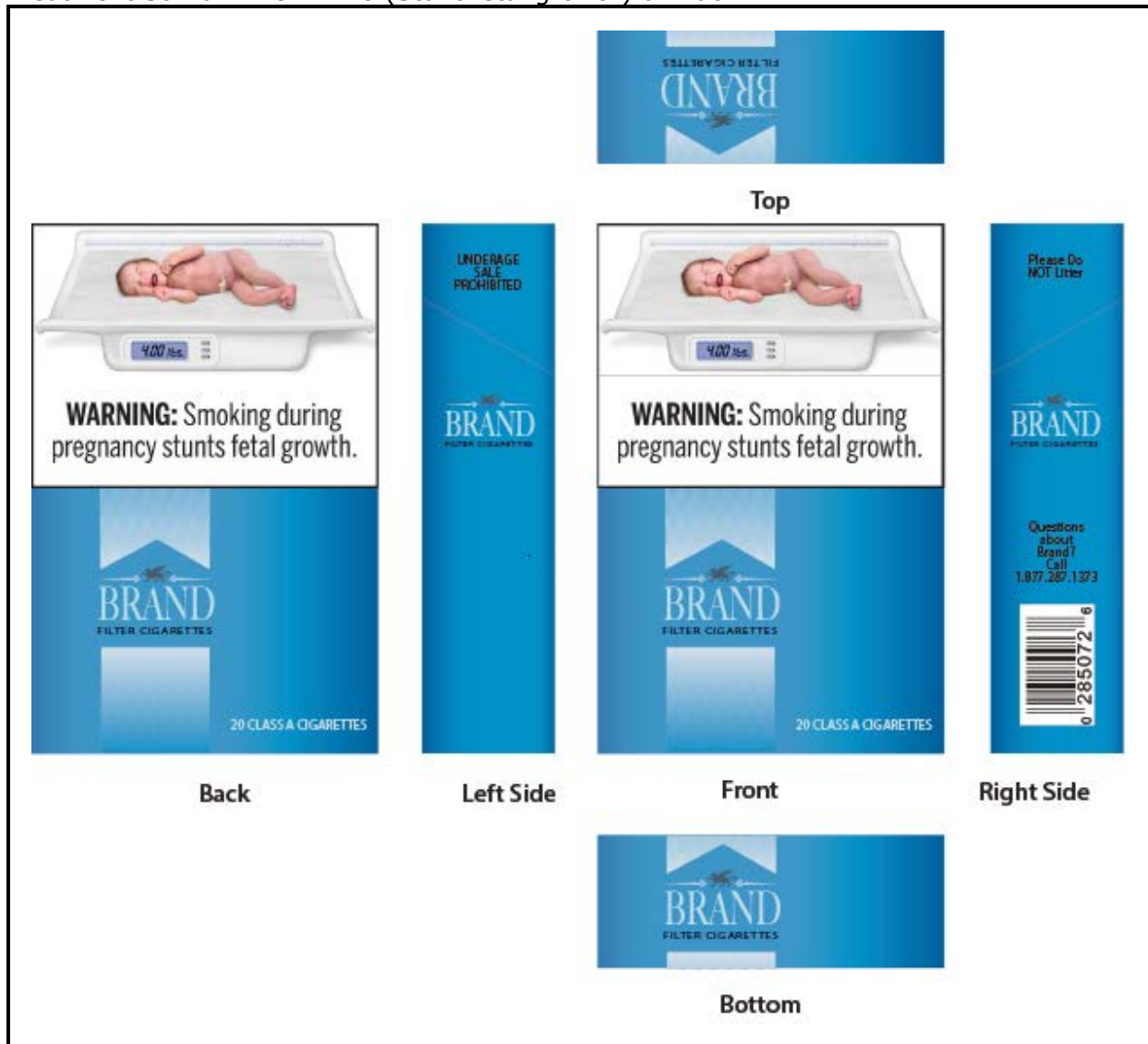
WARNING: Smoking causes bladder cancer, which can lead to bloody urine.

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The advertisement is a composite image. The top portion is a white rectangular area containing a warning text on the left and a photograph of a hand in a white glove holding a small, clear plastic container with a yellow lid. The container is filled with a red liquid at the bottom and a white substance on top. The bottom portion of the advertisement is a dark, moody photograph of a man wearing a dark hat and a dark jacket over a white t-shirt, playing an acoustic guitar. The scene is lit with a strong blue light. In the bottom right corner of the photograph, a pack of BRAND cigarettes is visible on a surface.

Treatment Stimuli — CHW #8 (Stunt fetal growth) on Pack



Treatment Stimuli — CHW #8 (Stunt fetal growth) on Advertisement

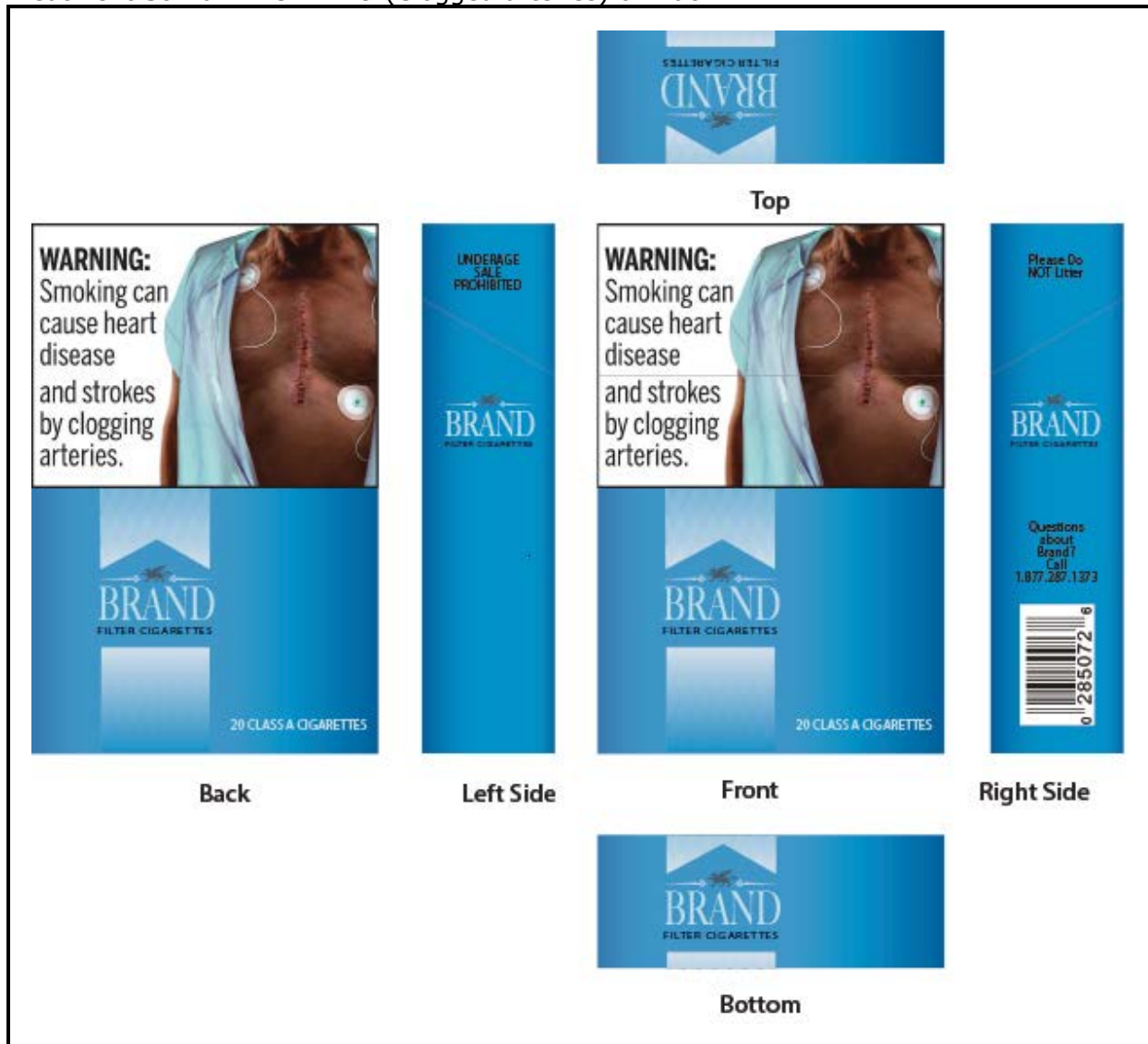
WARNING: Smoking during pregnancy stunts fetal growth.



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Treatment Stimuli — CHW #9 (Clogged arteries) on Pack



Treatment Stimuli — CHW #9 (Clogged arteries) on Advertisement

WARNING: Smoking can cause heart disease and strokes by clogging arteries.

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The advertisement is a composite image. The top section features a white background with a black warning text on the left and a photograph of a person's bare chest with a vertical surgical scar and two circular medical electrodes on the right. The bottom section is a dark, moody photograph of a man in a suit and hat playing an acoustic guitar. The text 'BRAND FILTER CIGARETTES' and 'flavor for the soul.' is overlaid on the right side of the guitar player. A pack of cigarettes is visible on a surface in the bottom right corner.

Treatment Stimuli – CHW #10 (COPD 1: Diseased lungs) on Pack



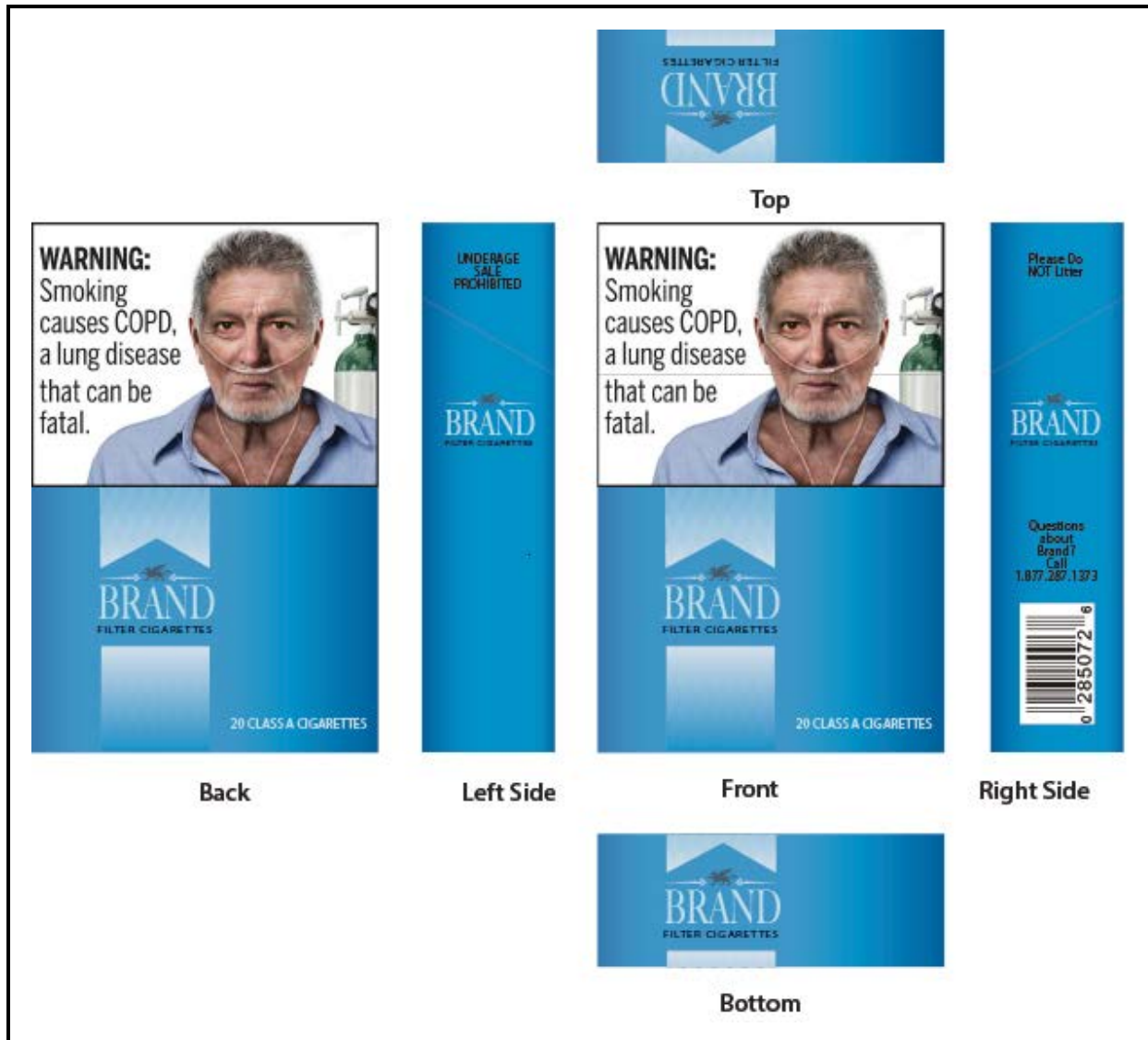
Treatment Stimuli — CHW #10 (COPD 1: Diseased lungs) on Advertisement

WARNING: Smoking causes COPD, a lung disease that can be fatal.

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Treatment Stimuli – CHW #11 (COPD 2: Man with oxygen) on Pack



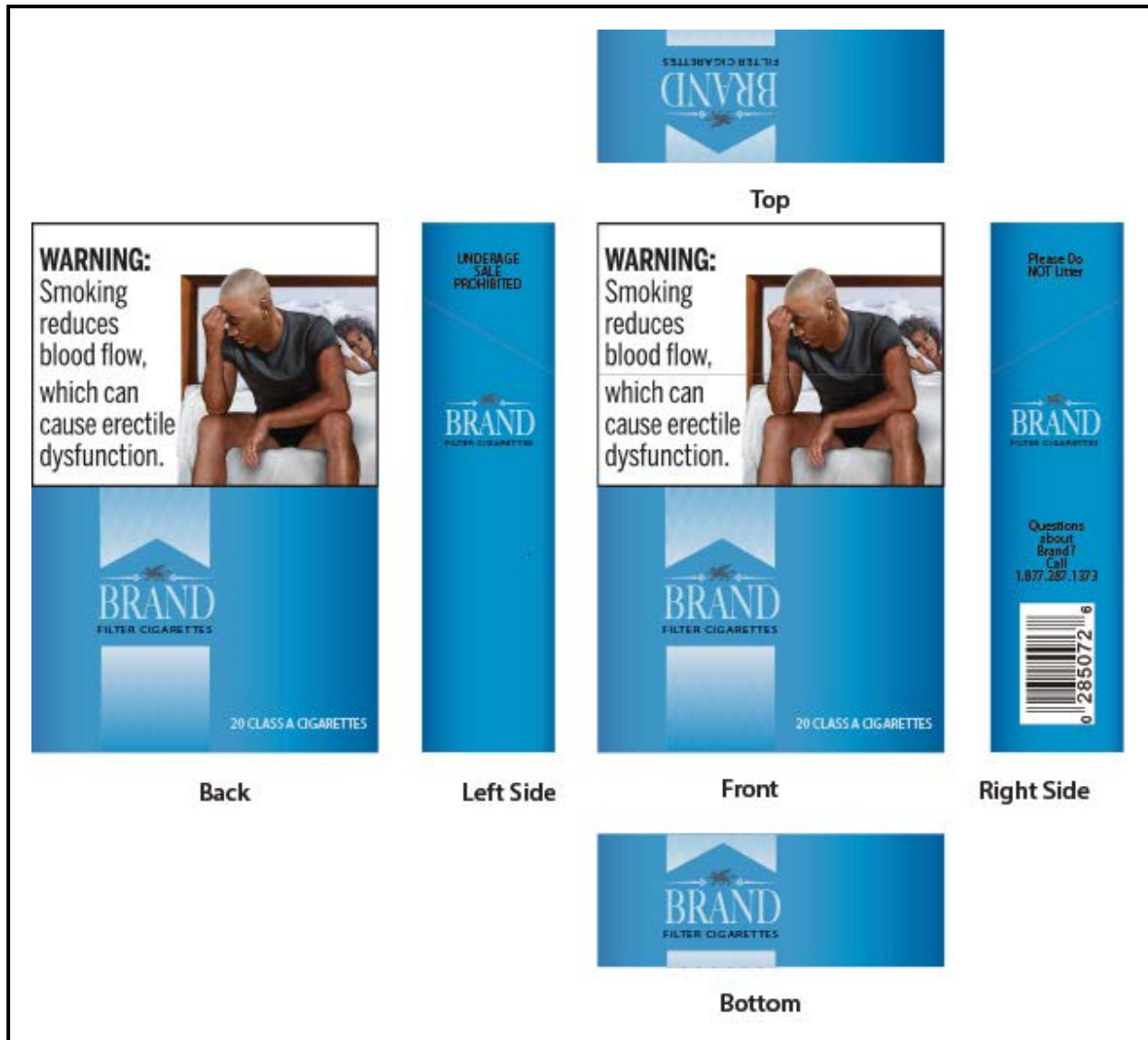
Treatment Stimuli — CHW #11 (COPD 2: Man with oxygen) on Advertisement

WARNING: Smoking causes COPD, a lung disease that can be fatal.

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Treatment Stimuli – CHW #12 (Erectile dysfunction) on Pack



Treatment Stimuli — CHW #12 (Erectile dysfunction) on Advertisement

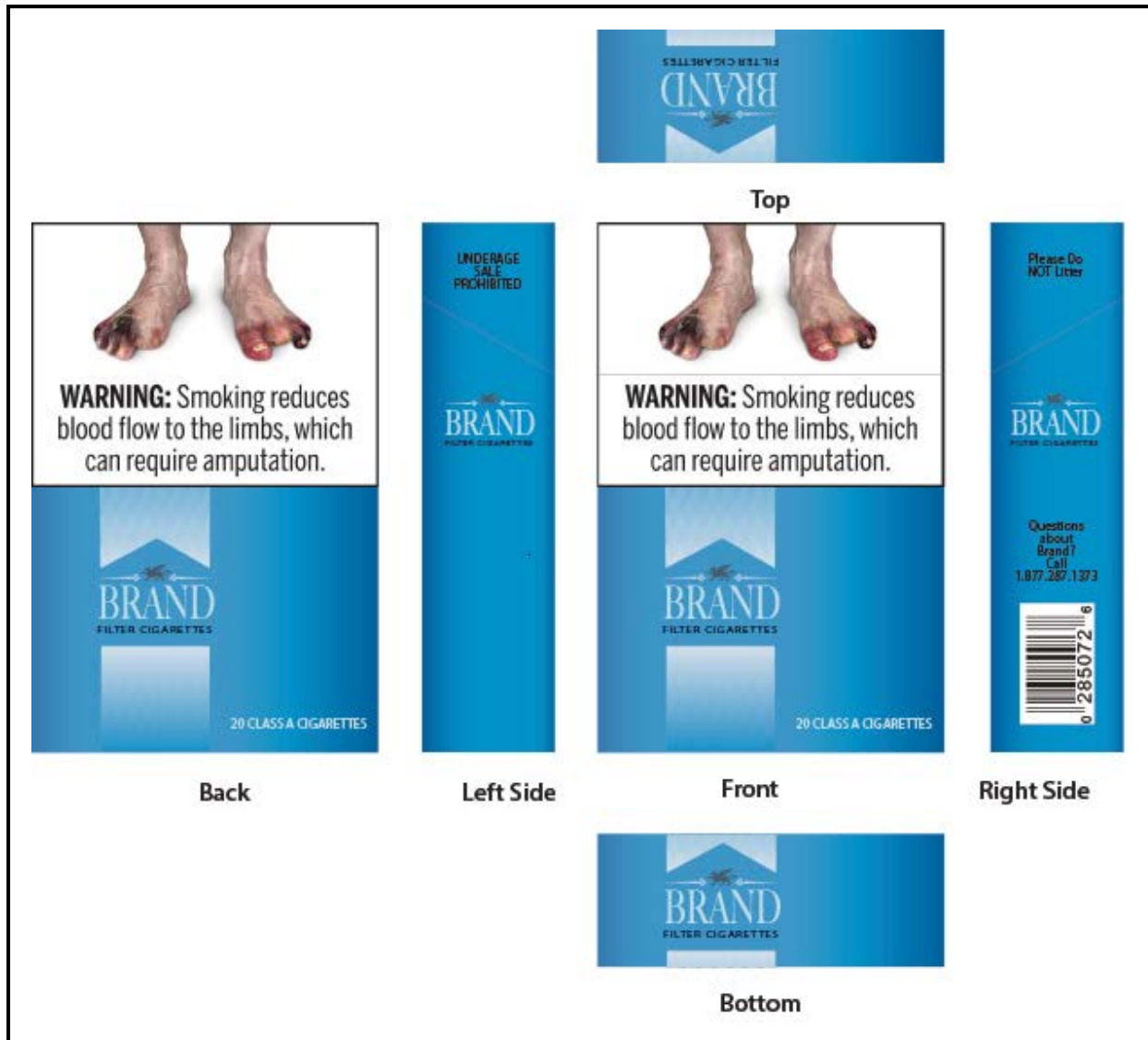
WARNING: Smoking reduces blood flow, which can cause erectile dysfunction.

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The advertisement is a composite image. The top right shows a man sitting on the edge of a bed, looking distressed, with a woman sleeping in the background. The bottom half shows a man in a dark suit and hat playing an acoustic guitar in a dimly lit setting. A pack of Brand Filter Cigarettes is visible in the bottom right corner.

Treatment Stimuli – CHW #13 (Amputation) on Pack



Treatment Stimuli — CHW #13 (Amputation) on Advertisement

WARNING: Smoking reduces blood flow to the limbs, which can require amputation.



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Treatment Stimuli – CHW #14 (Diabetes) on Pack



Treatment Stimuli — CHW #14 (Diabetes) on Advertisement

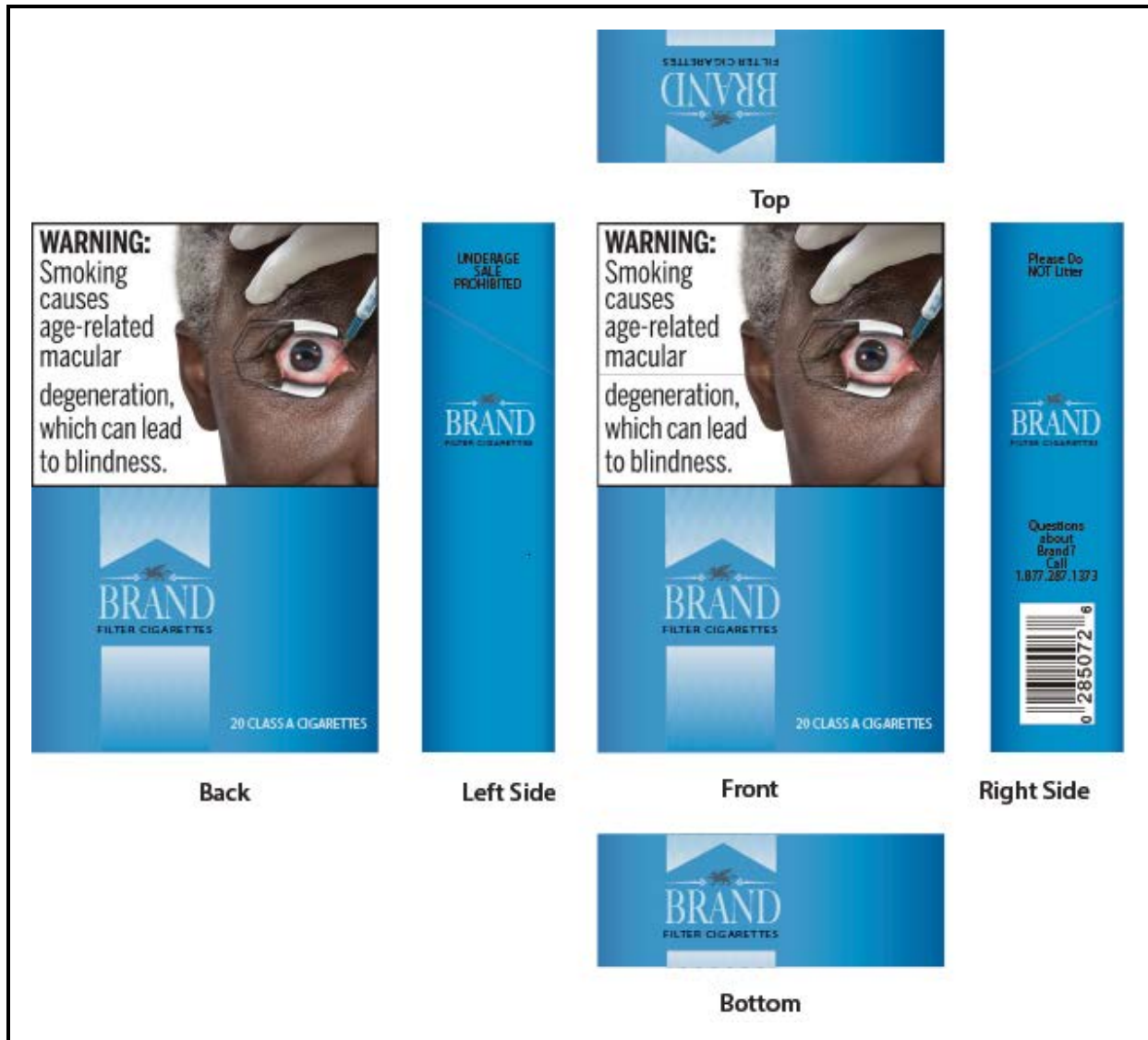
WARNING: Smoking causes type 2 diabetes, which raises blood sugar.

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Treatment Stimuli – CHW #15 (Macular degeneration) on Pack



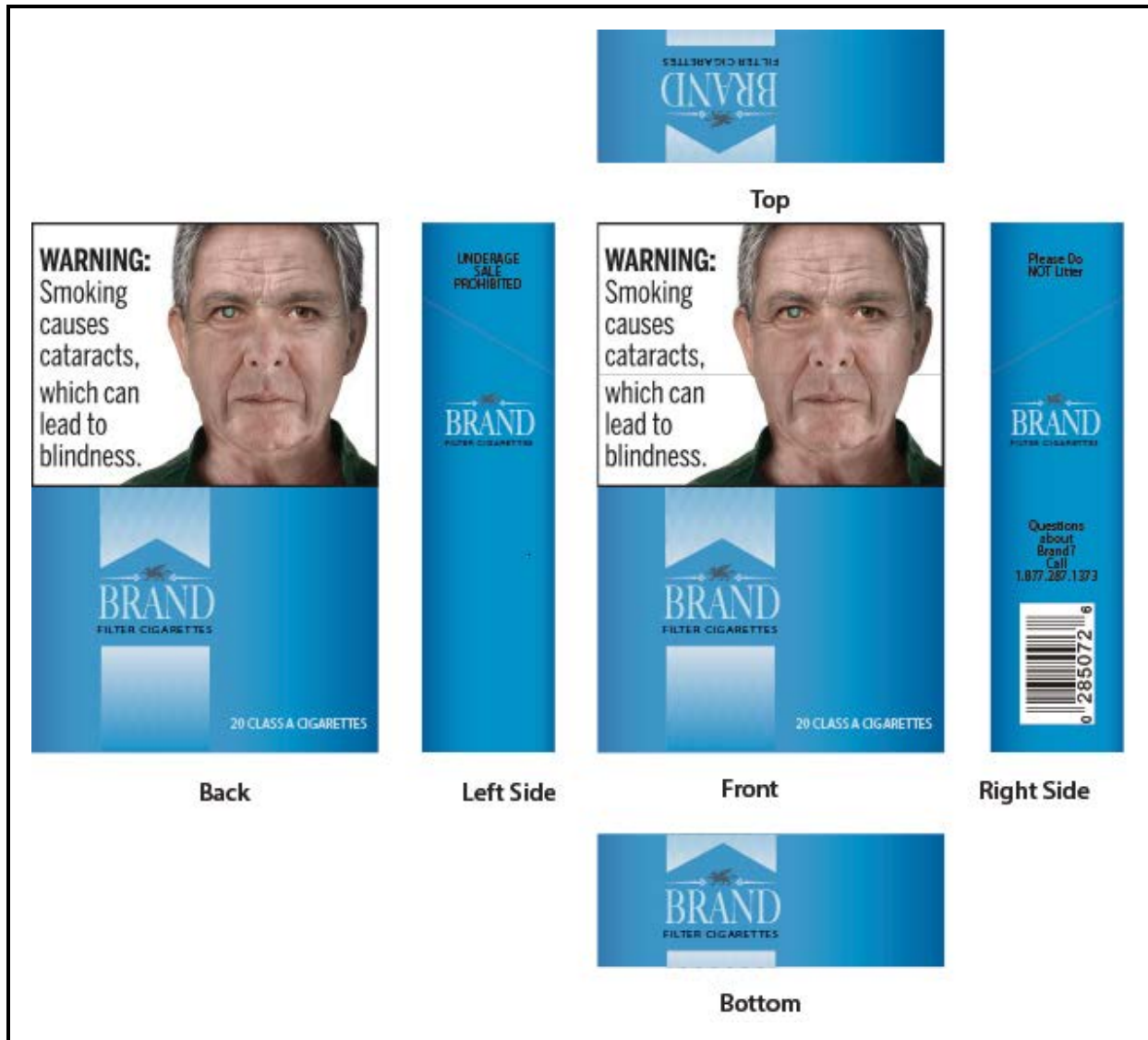
Treatment Stimuli — CHW #15 (Macular degeneration) on Advertisement

WARNING: Smoking causes age-related macular degeneration, which can lead to blindness.

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the soul.

Treatment Stimuli – CHW #16 (Cataracts) on Pack



Treatment Stimuli — CHW #16 (Cataracts) on Advertisement

WARNING: Smoking causes cataracts, which can lead to blindness.

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A pack of BRAND Filter Cigarettes is visible on a surface in the bottom right corner of the advertisement.

Appendix B: Screener and Session 1 Survey Instrument

STUDY SCREENER

[DISPLAY INTRO_TEXT, SA1, AND PRA_STAT ON SINGLE PAGE]

[DISPLAY TEXT "OMB #0910-0866 Expires 03/31/2022" IN THE OPENING PAGE OF THE SCREENER, PREFERABLY IN SMALLER GREY FONT IN THE UPPER OR LOWER CORNER (E.G., AS A HEADER OR FOOTER).]

INTRO_TEXT. Thank you for your interest in this survey. To get started, we first need to ask you a few questions to see if you are eligible to take the survey.

[INCLUDE THE STATEMENT BELOW IN SMALLER FONT AT THE BOTTOM OF THE FIRST PAGE—SAME PAGE AS INTRO_TEXT AND SA1]

PRA_STAT. Paperwork Reduction Act Statement: The public reporting burden for this information collection has been estimated to average 2 minutes per response to complete this screener survey (the time estimated to read and complete). Send comments regarding this burden estimate or any other aspects of this information collection, including suggestions for reducing burden, to PRASupport@fda.hhs.gov.

SECTION SA: AGE SCREENER

SA1. How old are you?

_____ [NUMERIC TEXT FIELD, WHOLE NUMBERS ONLY]

[IF SAMPLE SOURCE = PARENT/YOUTH & SA1 < 13 OR ≥ 18, TERMINATE]

[IF SAMPLE SOURCE = ADULT & SA1 < 18, TERMINATE]

[IF SAMPLE SOURCE = PARENT/YOUTH & SA1 ≥ 13 AND ≤ 17, GO TO YOUTH SCREENER (SB1)]

[IF SAMPLE SOURCE = ADULT & SA1 ≥ 18, GO TO ADULT SCREENER (SC1)]

SECTION SB: YOUTH SCREENER

SB1. Have you ever tried cigarette smoking, even one or two puffs?

- | | |
|--------|-------------|
| 1. Yes | [GO TO SB2] |
| 2. No | [GO TO SB3] |

SB2. In the past 30 days, have you smoked a cigarette?

- | | |
|--------|-------------|
| 1. Yes | [GO TO SB7] |
| 2. No | [TERMINATE] |

SB3. Have you ever been curious about smoking a cigarette?

1. Definitely yes
2. Probably yes
3. Probably not
4. Definitely not

SB4. Do you think that in the future you might experiment with cigarettes?

1. Definitely yes
2. Probably yes
3. Probably not
4. Definitely not

SB5. At any time during the next year, do you think you will smoke a cigarette?

1. Definitely yes
2. Probably yes
3. Probably not
4. Definitely not

SB6. If one of your best friends offered you a cigarette, would you smoke it?

1. Definitely yes
2. Probably yes
3. Probably not
4. Definitely not

[IF SB3 = 4 AND SB4 = 4 AND SB5 = 4 AND SB6 = 4, TERMINATE]

SB7. In the past 5 years, have you or any member of your household worked for any of the following?

| Yes [1] | No [2] | I don't know [3] |
|------------|--------|------------------------|
|------------|--------|------------------------|

SB7_1. A tobacco or cigarette company

SB7_2. A public health or community organization involved in communicating the dangers of smoking or the benefits of quitting

SB7_3. The U.S. Food and Drug Administration (FDA)

[IF SB7_1 = 1 OR SB7_2 = 1 OR SB7_3 = 1, TERMINATE]

[IF (SB7_1 = 2 OR 3) AND (SB7_2 = 2 OR 3) AND (SB7_3 = 2 OR 3) AND SB2 = 1, ASSIGN TO YOUTH SMOKER GROUP]

[IF (SB7_1 = 2 OR 3) AND (SB7_2 = 2 OR 3) AND (SB7_3 = 2 OR 3) AND [(SB3 = 1, 2, OR 3) OR (SB4 = 1, 2, OR 3) OR (SB5 = 1, 2, OR 3) OR (SB6 = 1, 2, OR 3)], ASSIGN TO YOUTH SUSCEPTIBLE GROUP]

SECTION SC: ADULT SCREENER

SC1. Have you smoked at least 100 cigarettes in your entire life?

- 1. Yes
- 2. No

SC2. Do you now smoke cigarettes every day, some days, or not at all?

- 1. Every day
- 2. Some days
- 3. Not at all

SC3. In the past 5 years, have you or any member of your household worked for any of the following?

Yes [1] No [2]

SC3_1. A tobacco or cigarette company

SC3_2. A public health or community organization involved in communicating the dangers of smoking or the benefits of quitting

SC3_3. The U.S. Food and Drug Administration (FDA)

[IF SC3_1 = 1 OR SC3_2 = 1 OR SC3_3 = 1, TERMINATE]

[IF SA1 ≥ 18 AND ≤ 24, AND (SC1 = 1 AND SC2=1 OR 2) ASSIGN TO YOUNG ADULT SMOKER GROUP]

[IF SA1 ≥ 18 AND ≤ 24, AND (SC1 = 2 OR SC2=3) ASSIGN TO YOUNG ADULT NONSMOKER GROUP]

[IF SA1 ≥ 25, AND (SC1 = 1 AND SC2=1 OR 2) ASSIGN TO ADULT SMOKER GROUP]

[IF SA1 ≥ 25, AND (SC1 = 2 OR SC2=3) ASSIGN TO ADULT NONSMOKER GROUP]

SECTION SD: DEMOGRAPHICS

SD1. What is your sex?

- 1. Male
- 2. Female

[ASK IF SA1 ≥ 18]

SD2. What is the highest level of school you have completed or the highest degree you have received?

1. Never attended school or only attended kindergarten
2. Grades 1 through 8
3. Grades 9 through 11
4. High school graduate or GED
5. Post high school training other than college (vocational or technical training)
6. Some college or 2-year degree
7. College degree (4-year degree)
8. Postgraduate degree

SD3. Are you Hispanic, Latino/a, or of Spanish origin?

1. Yes
2. No

SD4. What is your race? (One or more categories may be selected)

1. White
2. Black or African American
3. American Indian or Alaska Native
4. Asian Indian
5. Chinese
6. Filipino
7. Japanese
8. Korean
9. Vietnamese
10. Other Asian
11. Native Hawaiian
12. Guamanian or Chamorro
13. Samoan
14. Other Pacific Islander

[GO TO SESSION 1 SURVEY INSTRUMENT]

[TERMINATE SCRIPT: You do not qualify for this survey. Thank you for your time.]

[SCRIPT IF QUESTION IS SKIPPED: It looks like you missed a question on this page. To participate in the survey, we need to know your answer to this question. Please select a response.]

END

Thank you for your time.

Paperwork Reduction Act Statement: The public reporting burden for this information collection has been estimated to average 2 minutes per response to complete this survey (the time estimated to read and complete). Send comments regarding this burden estimate or any other aspects of this information collection, including suggestions for reducing burden, to PRASStaff@fda.hhs.gov.

SESSION 1 SURVEY INSTRUMENT

[DISPLAY THE STATEMENT BELOW ON A SINGLE PAGE]

[DISPLAY TEXT "OMB #0910-0866 Expires 03/31/2022" IN THE SAME PAGE]

Paperwork Reduction Act Statement: The public reporting burden for this information collection has been estimated to average 12 minutes per response to complete this survey (the time estimated to read and complete). Send comments regarding this burden estimate or any other aspects of this information collection, including suggestions for reducing burden, to PRStaff@fda.hhs.gov.

SECTION A: HEALTH BELIEFS

First, we would like to ask you some questions about your beliefs about smoking-related health effects.

Please tell us how much you agree or disagree with the following statement:

[RANDOMIZE ORDER OF ITEM "BLOCKS" ACCORDING TO ITEM PREFIXES WITH NUMBERS (I.E. RANDOMIZE A1_, A2_, A3_ SERIES, ETC.). ALSO RANDOMIZE ORDER OF QUESTIONS WITHIN BLOCKS. DISPLAY AS SCROLLING LIST. ALSO, RANDOMLY SELECT ACONT1_1, ACONT2_1, OR ACONT3_1 AND DISPLAY AFTER 4TH BLOCK. RANDOMLY SELECT AND DISPLAY ONE OF THE REMAINING TWO "ACONT_" ITEMS AFTER 8TH BLOCK. DISPLAY THE FINAL "ACONT_" ITEM AFTER 12TH BLOCK.]

[DO NOT DISPLAY: WARNING: Cigarettes are addictive]

A1_1. Cigarettes are addictive

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Tobacco smoke can harm your children]

A2_1. Tobacco smoke can harm your children

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking can kill you]

A3_1. Smoking can kill you

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking causes fatal lung disease in nonsmokers]

A4_1. Smoking causes fatal lung disease in nonsmokers

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Quitting smoking now greatly reduces serious risks to your health]

A5_1. Quitting smoking now greatly reduces serious risks to your health

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking causes head and neck cancer]

A6_1. Smoking causes head cancer

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A6_2. Smoking causes neck cancer

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: Smoking causes bladder cancer, which can lead to bloody urine]

A7_1. Smoking causes bladder cancer, which can lead to bloody urine

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A7_2. Smoking causes bladder cancer

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking during pregnancy stunts fetal growth]

A8_1. Smoking during pregnancy stunts fetal growth

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking can cause heart disease and strokes by clogging arteries]

A9_1. Smoking causes heart disease

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A9_2. Smoking causes strokes

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A9_3. Smoking clogs arteries

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A9_4. Smoking clogs arteries, which causes heart disease

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A9_5. Smoking clogs arteries, which causes strokes

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking causes COPD, a lung disease that can be fatal]

A10_1. Smoking causes COPD, a lung disease that can be fatal

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A10_2. Smoking causes COPD

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A10_3. Smoking causes lung disease that can be fatal

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking reduces blood flow, which can cause erectile dysfunction]

A12_1. Smoking reduces blood flow, which can cause erectile dysfunction

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A12_2. Smoking reduces blood flow

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A12_3. Smoking can cause erectile dysfunction

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking reduces blood flow to the limbs, which can require amputation]

A13_1. Smoking reduces blood flow to the limbs, which can require amputation

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A13_2. Smoking reduces blood flow to the limbs

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A13_3. Smoking can lead to amputation

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking causes type 2 diabetes, which raises blood sugar]

A14_1. Smoking causes type 2 diabetes, which raises blood sugar

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A14_2. Smoking causes type 2 diabetes

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking causes age-related macular degeneration, which can lead to blindness]

A15_1. Smoking causes age-related macular degeneration, which can lead to blindness

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A15_2. Smoking causes age-related macular degeneration

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A15_3. Smoking can lead to blindness

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking causes cataracts, which can lead to blindness]

A16_1. Smoking causes cataracts, which can lead to blindness

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A16_2. Smoking causes cataracts

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: CONTROL STATEMENT – NO ASSOCIATED WARNING LABEL]

ACONT1_1. Smoking causes migraines

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: CONTROL STATEMENT – NO ASSOCIATED WARNING LABEL]

ACONT2_1. Secondhand smoke causes sleep disorders like insomnia in children

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: CONTROL STATEMENT – NO ASSOCIATED WARNING LABEL]

ACONT3_1. Smoking during pregnancy causes hearing loss in babies

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

SECTION B: STIMULI EXPOSURE + STIMULI-SPECIFIC ASSESSMENT

PROTOCOL

WITHIN EACH STUDY GROUP (ADULT SMOKER, ADULT NONSMOKER, YOUNG ADULT SMOKER, YOUNG ADULT NONSMOKER, YOUTH SMOKER, YOUTH SUSCEPTIBLE), RANDOMLY ASSIGN PARTICIPANTS INTO A CONTROL CONDITION (0) OR ONE OF 16 TREATMENT CONDITIONS USING LEAST FILL QUOTAS TO ACHIEVE THE APPROXIMATE DISTRIBUTIONS IN TABLE 1. GENERATE VARIABLE FOR STUDY CONDITION ASSIGNED.

TABLE 1. STUDY CONDITION ALLOCATION

| Condition | Adult (25+) Current Smoker | Adult (25+) Non-smoker | Young Adult (18-24) Current Smoker | Young Adult (18-24) Non-smoker | Youth (13-17) Current Smoker | Youth (13-17) Susceptible to Smoking | TOTAL |
|-------------|----------------------------|------------------------|------------------------------------|--------------------------------|------------------------------|--------------------------------------|-------|
| 0 (Control) | 512 | 512 | 274 | 290 | 54 | 438 | 2,080 |
| 1 | 118 | 118 | 66 | 65 | 11 | 102 | 480 |
| 2 | 118 | 118 | 66 | 65 | 11 | 102 | 480 |
| 3 | 118 | 118 | 66 | 65 | 11 | 102 | 480 |
| 4 | 118 | 118 | 66 | 65 | 11 | 102 | 480 |
| 5 | 118 | 118 | 66 | 65 | 11 | 102 | 480 |
| 6 | 118 | 118 | 66 | 65 | 11 | 102 | 480 |
| 7 | 118 | 118 | 66 | 65 | 11 | 102 | 480 |
| 8 | 118 | 118 | 66 | 65 | 11 | 102 | 480 |
| 9 | 118 | 118 | 66 | 65 | 11 | 102 | 480 |
| 10 | 118 | 118 | 66 | 65 | 11 | 102 | 480 |
| 11 | 118 | 118 | 66 | 65 | 11 | 102 | 480 |
| 12 | 118 | 118 | 66 | 65 | 11 | 102 | 480 |
| 13 | 118 | 118 | 66 | 65 | 11 | 102 | 480 |
| 14 | 118 | 118 | 66 | 65 | 11 | 102 | 480 |

| Condition | Adult (25+) Current Smoker | Adult (25+) Non-smoker | Young Adult (18-24) Current Smoker | Young Adult (18-24) Non-smoker | Youth (13-17) Current Smoker | Youth (13-17) Susceptible to Smoking | TOTAL |
|--------------|----------------------------|------------------------|------------------------------------|--------------------------------|------------------------------|--------------------------------------|--------------|
| 15 | 118 | 118 | 66 | 65 | 11 | 102 | 480 |
| 16 | 118 | 118 | 66 | 65 | 11 | 102 | 480 |
| TOTAL | 2,400 | 2,400 | 1,330 | 1,330 | 230 | 2,070 | 9,760 |

EACH RESPONDENT WILL BE EXPOSED TO CIGARETTE WARNING STUMULI ACCORDING TO THEIR STUDY CONDITION, AS SHOWN IN TABLE 2. EACH RESPONDENT WILL SEE THEIR ASSIGNED STIMULI IN 2 SEPARATE FORMATS (PACK AND AD) SEQUENTIALLY, IN RANDOM ORDER. GENERATE VARIABLE TO INDICATE WHICH OF THE 4 SG STIMULI (0_1, 0_2, 0_3, 0_4) RESPONDENTS IN THE CONTROL CONDITION WERE ASSIGNED.

TABLE 2. STIUMUL EXPOSURE BY STUDY CONDITION

| Condition | Exposure |
|-------------|--|
| 0 (Control) | <p>Random selection (using least fill quotas to ensure approximately even distribution) of 1 of the following SG statements:</p> <p>0_1: SURGEON GENERAL’S WARNING: Smoking Causes Lung Cancer, Heart Disease, Emphysema, and May Complicate Pregnancy.</p> <p>0_2: SURGEON GENERAL’S WARNING: Quitting Smoking Now Greatly Reduces Serious Risks to Your Health.</p> <p>0_3: SURGEON GENERAL’S WARNING: Smoking by Pregnant Women May Result in Fetal Injury, Premature Birth, and Low Birth Weight.</p> <p>0_4: SURGEON GENERAL’S WARNING: Cigarette Smoke Contains Carbon Monoxide.</p> |
| 1 | WARNING: Cigarettes are addictive. [GHW] |
| 2 | WARNING: Tobacco smoke can harm your children. [GHW] |
| 3 | WARNING: Smoking can kill you. [GHW] |
| 4 | WARNING: Tobacco smoke causes fatal lung disease in nonsmokers. [GHW] |
| 5 | WARNING: Quitting smoking now greatly reduces serious risks to your health. [GHW] |
| 6 | WARNING: Smoking causes head and neck cancer. [GHW] |
| 7 | WARNING: Smoking causes bladder cancer, which can lead to bloody urine. [GHW] |
| 8 | WARNING: Smoking during pregnancy stunts fetal growth. [GHW] |
| 9 | WARNING: Smoking can cause heart disease and strokes by clogging arteries. [GHW] |
| 10 | WARNING: Smoking causes COPD, a lung disease that can be fatal. [GHW – IMAGE 1] |
| 11 | WARNING: Smoking causes COPD, a lung disease that can be fatal. [GHW – IMAGE 2] |
| 12 | WARNING: Smoking reduces blood flow, which can cause erectile dysfunction. [GHW] |
| 13 | WARNING: Smoking reduces blood flow to the limbs, which can require amputation. [GHW] |

| Condition | Exposure |
|-----------|--|
| 14 | WARNING: Smoking causes type 2 diabetes, which raises blood sugar. [GHW] |
| 15 | WARNING: Smoking causes age-related macular degeneration, which can lead to blindness. [GHW] |
| 16 | WARNING: Smoking causes cataracts, which can lead to blindness. [GHW] |

[DISPLAY THIS STATEMENT ONLY ON A SINGLE PAGE]

INTRO_TEXT_1. Next, we are going to ask you to view images of a cigarette pack and cigarette advertisement. Please view each image carefully and answer the questions that follow to the best of your ability.

[NEXT PAGE]

[RANDOMIZE ORDER OF PACK AND AD STIMULI. SHOW SINGLE STIMULI (PACK OR AD) AND CORRESPONDING INTRO TEXT ON A SINGLE SCREEN. FORCE MINIMUM OF 5 SECOND EXPOSURE. THEN, SHOW REMAINING STIMULI AND CORRESPONDING INTRO TEXT ON A FOLLOWING SCREEN. FORCE 5 SECOND EXPOSURE. RECORD LENGTH OF TIME ON EACH EXPOSURE PAGE]

PACK_INTRO. Please take a moment to look at the cigarette pack below. Note that you can scroll to zoom in and drag to rotate the image.

This 3D image may take up to 30 seconds to load...please be patient.

[SHOW PACK STIMULI]

AD_INTRO. Please take a moment to look at the cigarette advertisement below. Note that you can scroll to zoom in.

[SHOW AD STIMULI]

[KEEP AD STIMULI VISIBLE ON SCREEN FOR EACH QUESTION IN SECTION B. AUTOMATICALLY ADVANCE AFTER PARTICIPANT SELECTS A RESPONSE IN SECTION B.]

B1_INTRO. Now we are going to ask you some questions about the warning you just saw.

B1. Before today, had you heard about the specific smoking-related health effect described in the warning?

1. Yes
2. No
3. I'm not sure

B2_INTRO. Please tell us how much you agree or disagree with the following statements.

B2. This warning grabbed my attention.

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

B3. This warning helps me understand the negative health effects of smoking

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

B4. I would notice this health warning if I saw it.

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

B6. I would read or look closely at this health warning if I saw it on cigarette packages or ads

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

B8. This warning is...

| | | | | | | | |
|----------------------------------|-----|-----|-----|-----|-----|------------------------|--------------------------|
| B8_1. Not at all informative [1] | [2] | [3] | [4] | [5] | [6] | Very informative [7] | Prefer not to answer [9] |
| B8_2. Hard to understand | [2] | [3] | [4] | [5] | [6] | Easy to understand [7] | Prefer not to answer [9] |

B9_INTRO. Next, we would like to know whether you think this warning is an opinion or a fact.

Opinions are judgments or feelings that cannot be proven true or false. Facts are statements that can be proven true or false.

B9. Would you say that this warning is an opinion or a fact?

1. Opinion
2. Fact
9. Prefer not to answer

B10. How much does this warning make you think about the health risks of smoking?

1. Not at all
2. A little
3. Somewhat
4. A lot
9. Prefer not to answer

B12. To what extent did you learn something new from this warning that you did not know before?

| | | | | | | | |
|-------------------|-----|-----|-----|-----|-----|------------------|-----------------------------------|
| Not at all [1] | [2] | [3] | [4] | [5] | [6] | Very much [7] | Prefer not to answer [9] |
|-------------------|-----|-----|-----|-----|-----|------------------|-----------------------------------|

SECTION C: DEMOGRAPHICS

C1_INTRO. Now we are going to ask you a few questions that are not about cigarettes or smoking.

[ASK IF SA1 ≥ 18]

C1. 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?

1. \$0 to \$9,999
2. \$10,000 to \$14,999
3. \$15,000 to \$19,999
4. \$20,000 to \$34,999
5. \$35,000 to \$49,999
6. \$50,000 to \$74,999
7. \$75,000 to \$99,999
8. \$100,000 or more

C2. How many adults (age 18 or older) and children (aged 17 or younger), including yourself, live in your household?

C2_1. Adults (age 18 or older): _____ [DROP-DOWN MENU, RANGE 1-20]

C2_2. Children (age 17 or younger): _____ [DROP-DOWN MENU, RANGE 0-20]

(FORCE RESPONSE OF 1-20 FOR YOUTH RESPONDENTS)]

C3. Please indicate your state of residence.

[INSERT DROP DOWN MENU WITH STATES]

[ASK IF SA1 ≥ 18]

C4. Do you think of yourself as...

1. Heterosexual or straight
2. Homosexual, or gay or lesbian
3. Bisexual
4. Something else (Other)

| | |
|--|--|
| <p>Cholesterol: What Your Level Means</p> <p>What is cholesterol?</p> <p>Cholesterol is a waxy substance the body uses to protect nerves, make cell tissues and produce certain hormones.</p> <p>Are there different types of cholesterol?</p> <p>Yes. Cholesterol travels through the blood in different types of packages, called lipoproteins.</p> <p>Low-density lipoproteins (LDL) deliver cholesterol to the body. High-density lipoproteins (HDL) remove cholesterol from the bloodstream.</p> | <p>Total cholesterol level</p> <ul style="list-style-type: none"> • Less than 200 is best. • 200 to 239 is borderline high. • 240 or more means a person is at increased risk for heart disease. <p>LDL cholesterol levels</p> <ul style="list-style-type: none"> • Below 100 is ideal for people who have a higher risk of heart disease. • 100 to 129 is near optimal. • 130 to 159 is borderline high. • 160 or more means a person is at a higher risk for heart disease. <p>HDL cholesterol levels</p> <ul style="list-style-type: none"> • Less than 40 means a person is at higher risk for heart disease. • 60 or higher greatly reduces a person's risk of heart disease. |
|--|--|

[ASK IF SA1 ≥ 18]

C5. Please answer the following question based on the information in the text above.

If a person is at high risk for heart disease, which of the following levels of low density lipoprotein (LDL) cholesterol is best?

1. 102
2. 86
3. 129
4. 155
5. Not sure

ENDSCREEN: You've reached the end of the survey. Thank you for your participation. As a reminder, you will be invited to participate in two more surveys as part of this study. As a thanks for your participation, [IF AGE >= 18: "you"; IF AGE < 18 "your parent"] will get 1,000 Lifepoints for each survey that you take. Please keep an eye out for an invitation to the next survey in the next day or two.

[DISPLAY THE STATEMENT BELOW ON THE END SCREEN IN SMALLER FONT]

Paperwork Reduction Act Statement: The public reporting burden for this information collection has been estimated to average 12 minutes per response to complete this survey (the time estimated to read and complete). Send comments regarding this burden estimate or any other aspects of this information collection, including suggestions for reducing burden, to PRStaff@fda.hhs.gov.

Appendix C: Session 2 Survey Instrument

[DISPLAY THE STATEMENT BELOW ON A SINGLE PAGE]

[DISPLAY TEXT "OMB #0910-0866 Expires 03/31/2022" IN THE SAME PAGE]

Paperwork Reduction Act Statement: The public reporting burden for this information collection has been estimated to average 8 minutes per response to complete this survey (the time estimated to read and complete). Send comments regarding this burden estimate or any other aspects of this information collection, including suggestions for reducing burden, to PRAStaff@fda.hhs.gov.

[DISPLAY THIS STATEMENT ONLY ON A SINGLE PAGE]

INTRO_TEXT_1. We are going to ask you to view images of a cigarette pack and cigarette advertisement. Please view each image carefully and answer the questions that follow to the best of your ability.

[NEXT PAGE]

[RANDOMIZE ORDER OF PACK AND AD STIMULI. SHOW SINGLE STIMULI (PACK OR AD) AND CORRESPONDING INTRO TEXT ON A SINGLE SCREEN. FORCE 5 SECOND EXPOSURE. THEN, SHOW REMAINING STIMULI AND CORRESPONDING INTRO TEXT ON A FOLLOWING SCREEN. FORCE 5 SECOND EXPOSURE. RECORD LENGTH OF TIME ON EACH EXPOSURE PAGE]

PACK_INTRO. Please take a moment to look at the cigarette pack below. Note that you can scroll to zoom in and drag to rotate the image.

This 3D image may take up to 30 seconds to load...please be patient.

[SHOW PACK STIMULI]

AD_INTRO. Please take a moment to look at the cigarette advertisement below. Note that you can scroll to zoom in.

[SHOW AD STIMULI]

SECTION A: HEALTH BELIEFS

Next, we would like to ask you some questions about your beliefs about smoking-related health effects.

Please tell us how much you agree or disagree with the following statement:

[RANDOMIZE ORDER OF ITEM "BLOCKS" ACCORDING TO ITEM PREFIXES WITH NUMBERS (I.E. RANDOMIZE A1_, A2_, A3_ SERIES, ETC.). ALSO RANDOMIZE ORDER OF QUESTIONS WITHIN BLOCKS. DISPLAY AS SCROLLING LIST. ALSO, RANDOMLY SELECT ACONT1_1, ACONT2_1, OR ACONT3_1 AND DISPLAY AFTER 4TH BLOCK. RANDOMLY SELECT AND DISPLAY ONE OF THE REMAINING TWO "ACONT_" ITEMS

AFTER 8TH BLOCK. DISPLAY THE FINAL "ACONT_" ITEM AFTER 12TH BLOCK. ORDER OF ITEMS AND ITEM BLOCKS MAY BE DIFFERENT THAN ORDER FROM SESSION 1.]

[DO NOT DISPLAY: WARNING: Cigarettes are addictive]

A1_1. Cigarettes are addictive

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Tobacco smoke can harm your children]

A2_1. Tobacco smoke can harm your children

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking can kill you]

A3_1. Smoking can kill you

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking causes fatal lung disease in nonsmokers]

A4_1. Smoking causes fatal lung disease in nonsmokers

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Quitting smoking now greatly reduces serious risks to your health]

A5_1. Quitting smoking now greatly reduces serious risks to your health

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking causes head and neck cancer]

A6_1. Smoking causes head cancer

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A6_2. Smoking causes neck cancer

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: Smoking causes bladder cancer, which can lead to bloody urine]

A7_1. Smoking causes bladder cancer, which can lead to bloody urine

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A7_2. Smoking causes bladder cancer

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking during pregnancy stunts fetal growth]

A8_1. Smoking during pregnancy stunts fetal growth

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking can cause heart disease and strokes by clogging arteries]

A9_1. Smoking causes heart disease

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A9_2. Smoking causes strokes

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A9_3. Smoking clogs arteries

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A9_4. Smoking clogs arteries, which causes heart disease

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A9_5. Smoking clogs arteries, which causes strokes

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking causes COPD, a lung disease that can be fatal]

A10_1. Smoking causes COPD, a lung disease that can be fatal

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A10_2. Smoking causes COPD

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A10_3. Smoking causes lung disease that can be fatal

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking reduces blood flow, which can cause erectile dysfunction]

A12_1. Smoking reduces blood flow, which can cause erectile dysfunction

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A12_2. Smoking reduces blood flow

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A12_3. Smoking can cause erectile dysfunction

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking reduces blood flow to the limbs, which can require amputation]

A13_1. Smoking reduces blood flow to the limbs, which can require amputation

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A13_2. Smoking reduces blood flow to the limbs

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A13_3. Smoking can lead to amputation

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking causes type 2 diabetes, which raises blood sugar]

A14_1. Smoking causes type 2 diabetes, which raises blood sugar

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A14_2. Smoking causes type 2 diabetes

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking causes age-related macular degeneration, which can lead to blindness]

A15_1. Smoking causes age-related macular degeneration, which can lead to blindness

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A15_2. Smoking causes age-related macular degeneration

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A15_3. Smoking can lead to blindness

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking causes cataracts, which can lead to blindness]

A16_1. Smoking causes cataracts, which can lead to blindness

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A16_2. Smoking causes cataracts

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: CONTROL STATEMENT – NO ASSOCIATED WARNING LABEL]

ACONT1_1. Smoking causes migraines

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: CONTROL STATEMENT – NO ASSOCIATED WARNING LABEL]

ACONT2_1. Secondhand smoke causes sleep disorders like insomnia in children

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: CONTROL STATEMENT – NO ASSOCIATED WARNING LABEL]

ACONT3_1. Smoking during pregnancy causes hearing loss in babies

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

ENDSCREEN: You've reached the end of the survey. Thank you for your participation. As a reminder, you will be invited to participate in one more survey as part of this study. As a thanks for your participation, [IF AGE >= 18: "you"; IF AGE < 18 "your parent"] will get

1,000 Lifepoints for each survey that you take. Please keep an eye out for an invitation to the next survey in the next two weeks.

[DISPLAY THE STATEMENT BELOW ON THE END SCREEN IN SMALLER FONT]

Paperwork Reduction Act Statement: The public reporting burden for this information collection has been estimated to average 8 minutes per response to complete this survey (the time estimated to read and complete). Send comments regarding this burden estimate or any other aspects of this information collection, including suggestions for reducing burden, to PRStaff@fda.hhs.gov.

Appendix D: Session 3 Survey Instrument

SECTION A: HEALTH BELIEFS

[DISPLAY THE STATEMENT BELOW ON A SINGLE PAGE]

[DISPLAY TEXT "OMB #0910-0866 Expires 03/31/2022" IN THE SAME PAGE]

Paperwork Reduction Act Statement: The public reporting burden for this information collection has been estimated to average 5 minutes per response to complete this survey (the time estimated to read and complete). Send comments regarding this burden estimate or any other aspects of this information collection, including suggestions for reducing burden, to PRASStaff@fda.hhs.gov.

[DISPLAY THIS STATEMENT ONLY ON A SINGLE PAGE]

First, we would like to ask you some questions about your beliefs about smoking-related health effects.

Please tell us how much you agree or disagree with the following statements.

[RANDOMIZE ORDER OF ITEM "BLOCKS" ACCORDING TO ITEM PREFIXES WITH NUMBERS (I.E. RANDOMIZE A1_, A2_, A3_ SERIES, ETC.). ALSO RANDOMIZE ORDER OF QUESTIONS WITHIN BLOCKS. DISPLAY AS SCROLLING LIST.

ALSO, RANDOMLY SELECT ACONT1_1, ACONT2_1, OR ACONT3_1 AND DISPLAY AFTER 4TH BLOCK. RANDOMLY SELECT AND DISPLAY ONE OF THE REMAINING TWO "ACONT_" ITEMS AFTER 8TH BLOCK. DISPLAY THE FINAL "ACONT_" ITEM AFTER 12TH BLOCK. ORDER OF ITEMS AND ITEM BLOCKS MAY BE DIFFERENT THAN SESSION 1 AND SESSION 2.]

[DO NOT DISPLAY: WARNING: Cigarettes are addictive]

A1_1. Cigarettes are addictive

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Tobacco smoke can harm your children]

A2_1. Tobacco smoke can harm your children

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking can kill you]

A3_1. Smoking can kill you

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking causes fatal lung disease in nonsmokers]

A4_1. Smoking causes fatal lung disease in nonsmokers

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Quitting smoking now greatly reduces serious risks to your health]

A5_1. Quitting smoking now greatly reduces serious risks to your health

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking causes head and neck cancer]

A6_1. Smoking causes head cancer

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A6_2. Smoking causes neck cancer

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: Smoking causes bladder cancer, which can lead to bloody urine]

A7_1. Smoking causes bladder cancer, which can lead to bloody urine

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A7_2. Smoking causes bladder cancer

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking during pregnancy stunts fetal growth]

A8_1. Smoking during pregnancy stunts fetal growth

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking can cause heart disease and strokes by clogging arteries]

A9_1. Smoking causes heart disease

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A9_2. Smoking causes strokes

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A9_3. Smoking clogs arteries

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A9_4. Smoking clogs arteries, which causes heart disease

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A9_5. Smoking clogs arteries, which causes strokes

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking causes COPD, a lung disease that can be fatal]

A10_1. Smoking causes COPD, a lung disease that can be fatal

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A10_2. Smoking causes COPD

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A10_3. Smoking causes lung disease that can be fatal

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking reduces blood flow, which can cause erectile dysfunction]

A12_1. Smoking reduces blood flow, which can cause erectile dysfunction

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A12_2. Smoking reduces blood flow

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A12_3. Smoking can cause erectile dysfunction

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking reduces blood flow to the limbs, which can require amputation]

A13_1. Smoking reduces blood flow to the limbs, which can require amputation

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A13_2. Smoking reduces blood flow to the limbs

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A13_3. Smoking can lead to amputation

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking causes type 2 diabetes, which raises blood sugar]

A14_1. Smoking causes type 2 diabetes, which raises blood sugar

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A14_2. Smoking causes type 2 diabetes

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking causes age-related macular degeneration, which can lead to blindness]

A15_1. Smoking causes age-related macular degeneration, which can lead to blindness

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A15_2. Smoking causes age-related macular degeneration

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A15_3. Smoking can lead to blindness

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: WARNING: Smoking causes cataracts, which can lead to blindness]

A16_1. Smoking causes cataracts, which can lead to blindness

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

A16_2. Smoking causes cataracts

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: CONTROL STATEMENT – NO ASSOCIATED WARNING LABEL]

ACONT1_1. Smoking causes migraines

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: CONTROL STATEMENT – NO ASSOCIATED WARNING LABEL]

ACONT2_1. Secondhand smoke causes sleep disorders like insomnia in children

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

[DO NOT DISPLAY: CONTROL STATEMENT – NO ASSOCIATED WARNING LABEL]

ACONT3_1. Smoking during pregnancy causes hearing loss in babies

1. Strongly disagree
2. Disagree
3. Neither agree nor disagree
4. Agree
5. Strongly agree
9. Prefer not to answer

SECTION E: RECALL

E1. You recently took a survey in which you were shown a cigarette pack and advertisement with a warning on it. Which label do you remember seeing?

[POPULATE WITH 4 THUMBNAIL STIMULI ACCORDING TO THE FOLLOWING PROTOCOL:

- IF CONTROL GROUP (0): SHOW ALL 4 CONTROL STIMULI
- IF TREATMENT GROUP (1-16): SHOW 1 STIMULI CORRESPONDING TO ASSIGNED STUDY CONDITION + 3 RANDOMLY SELECTED REMAINING TREATMENT STIMULI (USING LEAST FILL)

RANDOMIZE ORDER OF STIMULI 1-4, FIX OPTIONS 5 AND 6 IN LAST POSITIONS. RECORD STIMULI ASSESSED.]

1. LABEL 1
2. LABEL 2
3. LABEL 3
4. LABEL 4
5. None of these
6. I don't remember

ENDSCREEN: You've reached the end of the survey. Thank you for your participation.

[DISPLAY THE STATEMENT BELOW ON THE END SCREEN]

Paperwork Reduction Act Statement: The public reporting burden for this information collection has been estimated to average 5 minutes per response to complete this survey (the time estimated to read and complete). Send comments regarding this burden estimate or any other aspects of this information collection, including suggestions for reducing burden, to PRASStaff@fda.hhs.gov.

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Table E-1. Youth: Logistic Regressions of New Information, Thinking about Risks, and Perceived Factualness Comparing CHW with SG Warnings

| Condition | Warning | New Information | | Thinking About Risks | | Perceived Factualness | |
|-------------|----------------------------------|-----------------|-------------------------------------|----------------------|------------------------------------|-----------------------|------------------------------------|
| | | % | OR (95% CI) | % | OR (95% CI) | % | OR (95% CI) |
| 0 (Control) | Average of the 4 SG warnings | 30.7 % | REF | 71.2 % | REF | 90.6 % | REF |
| 1 | Addictive | 17.7 % | 0.49 (0.29, 0.82) ^{a, b} | 77.9 % | 1.43 (0.87, 2.32) | 92.0 % | 1.18 (0.55, 2.51) |
| 2 | Harm children | 35.4 % | 1.24 (0.80, 1.90) | 92.0 % | 4.71 (2.33, 9.52) ^{a, b} | 90.1 % | 0.93 (0.46, 1.87) |
| 3 | Kill you | 30.7 % | 1.00 (0.64, 1.56) | 86.8 % | 2.68 (1.51, 4.77) ^{a, b} | 84.7 % | 0.56 (0.31, 1.03) |
| 4 | Fatal lung disease in nonsmokers | 41.6 % | 1.61 (1.06, 2.45) ^{a, b} | 89.3 % | 3.39 (1.81, 6.36) ^{a, b} | 88.2 % | 0.77 (0.39, 1.49) |
| 5 | Quit now | 30.1 % | 0.97 (0.62, 1.52) | 78.6 % | 1.49 (0.91, 2.44) | 89.1 % | 0.84 (0.42, 1.67) |
| 6 | Head and neck cancer | 80.5 % | 9.35 (5.65, 15.47) ^{a, b} | 90.3 % | 3.77 (1.96, 7.25) ^{a, b} | 85.6 % | 0.60 (0.32, 1.11) |
| 7 | Bladder cancer | 88.5 % | 17.38 (9.46, 31.96) ^{a, b} | 83.2 % | 2.01 (1.18, 3.41) ^{a, b} | 82.3 % | 0.47 (0.26, 0.84) ^{a, b} |
| 8 | Stunt fetal growth | 44.2 % | 1.79 (1.18, 2.72) ^{a, b} | 85.8 % | 2.46 (1.39, 4.34) ^{a, b} | 87.4 % | 0.71 (0.37, 1.36) |
| 9 | Clogged arteries | 54.0 % | 2.65 (1.75, 4.02) ^{a, b} | 88.5 % | 3.15 (1.74, 5.70) ^{a, b} | 92.0 % | 1.19 (0.56, 2.53) |
| 10 | COPD 1 ^c | 45.1 % | 1.86 (1.22, 2.82) ^{a, b} | 88.4 % | 3.10 (1.68, 5.71) ^{a, b} | 94.5 % | 1.80 (0.74, 4.38) |
| 11 | COPD 2 ^d | 39.8 % | 1.49 (0.98, 2.28) | 89.4 % | 3.42 (1.82, 6.43) ^{a, b} | 98.2 % | 5.76 (1.38, 24.11) ^{a, b} |
| 12 | Erectile dysfunction | 77.0 % | 7.56 (4.69, 12.20) ^{a, b} | 74.1 % | 1.16 (0.73, 1.85) | 79.3 % | 0.37 (0.21, 0.66) ^{a, b} |
| 13 | Amputation | 76.1 % | 7.19 (4.48, 11.55) ^{a, b} | 93.8 % | 6.16 (2.80, 13.58) ^{a, b} | 87.4 % | 0.70 (0.37, 1.34) |
| 14 | Diabetes | 78.8 % | 8.37 (5.13, 13.67) ^{a, b} | 90.2 % | 3.73 (1.94, 7.19) ^{a, b} | 87.7 % | 0.71 (0.37, 1.39) |
| 15 | Macular degeneration | 83.2 % | 11.19 (6.60, 18.98) ^{a, b} | 92.0 % | 4.65 (2.30, 9.39) ^{a, b} | 88.2 % | 0.76 (0.39, 1.48) |
| 16 | Cataracts | 85.8 % | 13.73 (7.84, 24.05) ^{a, b} | 84.1 % | 2.15 (1.26, 3.66) ^{a, b} | 78.6 % | 0.37 (0.21, 0.64) ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

^c Image of diseased lungs. ^d Image of man with oxygen.

Note: Regressions control for smoking status.

Table E-2. Young Adults: Logistic Regressions of New Information, Thinking about Risks, and Perceived Factualness Comparing CHW with SG Warnings

| Condition | Warning | New Information | | Thinking About Risks | | Perceived Factualness | |
|-------------|----------------------------------|-----------------|--|----------------------|--------------------------------------|-----------------------|--------------------------------------|
| | | % | OR (95% CI) | % | OR (95% CI) | % | OR (95% CI) |
| 0 (Control) | Average of the 4 SG warnings | 26.4 % | REF | 69.2 % | REF | 86.9 % | REF |
| 1 | Addictive | 11.8 % | 0.37 (0.20, 0.70) ^{a, b} | 70.6 % | 1.08 (0.67, 1.72) | 87.9 % | 1.11 (0.57, 2.17) |
| 2 | Harm children | 19.6 % | 0.68 (0.40, 1.15) | 79.2 % | 1.71 (1.02, 2.88) ^a | 92.1 % | 1.78 (0.81, 3.91) |
| 3 | Kill you | 13.7 % | 0.44 (0.24, 0.81) ^{a, b} | 86.3 % | 2.82 (1.55, 5.12) ^{a, b} | 94.1 % | 2.47 (1.03, 5.92) ^a |
| 4 | Fatal lung disease in nonsmokers | 23.5 % | 0.86 (0.52, 1.42) | 84.3 % | 2.41 (1.37, 4.26) ^{a, b} | 91.0 % | 1.55 (0.74, 3.27) |
| 5 | Quit now | 22.5 % | 0.81 (0.49, 1.35) | 76.5 % | 1.45 (0.88, 2.40) | 84.2 % | 0.81 (0.44, 1.49) |
| 6 | Head and neck cancer | 56.9 % | 3.67 (2.35, 5.73) ^{a, b} | 85.1 % | 2.59 (1.45, 4.61) ^{a, b} | 89.1 % | 1.26 (0.63, 2.51) |
| 7 | Bladder cancer | 75.5 % | 8.56 (5.20, 14.11) ^{a, b} | 91.1 % | 4.57 (2.24, 9.33) ^{a, b} | 90.7 % | 1.51 (0.73, 3.15) |
| 8 | Stunt fetal growth | 37.3 % | 1.65 (1.04, 2.59) ^{a, b} | 86.3 % | 2.81 (1.54, 5.12) ^{a, b} | 92.1 % | 1.78 (0.81, 3.89) |
| 9 | Clogged arteries | 44.1 % | 2.19 (1.40, 3.41) ^{a, b} | 81.4 % | 1.96 (1.14, 3.35) ^{a, b} | 94.1 % | 2.42 (1.00, 5.85) |
| 10 | COPD 1 ^c | 37.3 % | 1.65 (1.05, 2.60) ^{a, b} | 87.1 % | 3.03 (1.64, 5.61) ^{a, b} | 93.9 % | 2.42 (1.01, 5.77) ^a |
| 11 | COPD 2 ^d | 36.3 % | 1.58 (1.00, 2.50) ^a | 85.3 % | 2.61 (1.46, 4.66) ^{a, b} | 95.0 % | 2.95 (1.15, 7.58) ^{a, b} |
| 12 | Erectile dysfunction | 61.8 % | 4.49 (2.85, 7.06) ^{a, b} | 85.3 % | 2.61 (1.46, 4.66) ^{a, b} | 94.8 % | 2.86 (1.11, 7.35) ^{a, b} |
| 13 | Amputation | 69.6 % | 6.37 (3.97, 10.21) ^{a, b} | 87.1 % | 3.04 (1.64, 5.62) ^{a, b} | 89.9 % | 1.36 (0.66, 2.80) |
| 14 | Diabetes | 64.7 % | 5.11 (3.23, 8.08) ^{a, b} | 91.0 % | 4.56 (2.26, 9.20) ^{a, b} | 92.0 % | 1.77 (0.81, 3.85) |
| 15 | Macular degeneration | 79.4 % | 10.73 (6.34, 18.14) ^{a, b} | 90.2 % | 4.14 (2.10, 8.15) ^{a, b} | 89.2 % | 1.27 (0.64, 2.53) |
| 16 | Cataracts | 73.5 % | 7.73 (4.74, 12.60) ^{a, b} | 85.3 % | 2.60 (1.45, 4.66) ^{a, b} | 86.6 % | 0.98 (0.51, 1.89) |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.
^c Image of diseased lungs. ^d Image of man with oxygen.

Note: Regressions control for smoking status.

Table E-3. Older Adults: Logistic Regressions of New Information, Thinking about Risks, and Perceived Factualness Comparing CHW with SG Warnings

| Condition | Warning | New Information | | Thinking About Risks | | Perceived Factualness | |
|-------------|----------------------------------|-----------------|---|----------------------|--------------------------------------|-----------------------|--------------------------------------|
| | | % | OR (95% CI) | % | OR (95% CI) | % | OR (95% CI) |
| 0 (Control) | Average of the 4 SG warnings | 27.9 % | REF | 69.6 % | REF | 86.1 % | REF |
| 1 | Addictive | 22.8 % | 0.76 (0.56, 1.05) | 70.0 % | 1.02 (0.76, 1.37) | 86.4 % | 1.02 (0.69, 1.51) |
| 2 | Harm children | 40.7 % | 1.78 (1.34, 2.35) ^{a, b} | 83.3 % | 2.20 (1.55, 3.14) ^{a, b} | 83.1 % | 0.79 (0.55, 1.14) |
| 3 | Kill you | 34.2 % | 1.35 (1.01, 1.79) ^a | 73.9 % | 1.24 (0.92, 1.69) | 85.5 % | 0.95 (0.65, 1.41) |
| 4 | Fatal lung disease in nonsmokers | 41.9 % | 1.86 (1.41, 2.46) ^{a, b} | 77.3 % | 1.51 (1.10, 2.06) ^{a, b} | 77.5 % | 0.55 (0.39, 0.77) ^{a, b} |
| 5 | Quit now | 27.8 % | 0.99 (0.74, 1.34) | 69.5 % | 1.00 (0.74, 1.34) | 87.9 % | 1.18 (0.78, 1.77) |
| 6 | Head and neck cancer | 80.9 % | 11.25 (8.05, 15.70) ^{a, b} | 84.5 % | 2.44 (1.71, 3.48) ^{a, b} | 71.6 % | 0.40 (0.29, 0.55) ^{a, b} |
| 7 | Bladder cancer | 87.2 % | 18.05 (12.27, 26.56) ^{a, b} | 80.0 % | 1.77 (1.27, 2.46) ^{a, b} | 66.0 % | 0.31 (0.23, 0.42) ^{a, b} |
| 8 | Stunt fetal growth | 40.0 % | 1.73 (1.31, 2.29) ^{a, b} | 78.9 % | 1.65 (1.20, 2.28) ^{a, b} | 83.9 % | 0.84 (0.57, 1.22) |
| 9 | Clogged arteries | 52.1 % | 2.84 (2.15, 3.74) ^{a, b} | 80.2 % | 1.79 (1.29, 2.49) ^{a, b} | 85.2 % | 0.93 (0.63, 1.36) |
| 10 | COPD 1 ^c | 33.1 % | 1.28 (0.96, 1.71) | 80.5 % | 1.82 (1.31, 2.54) ^{a, b} | 85.4 % | 0.95 (0.64, 1.39) |
| 11 | COPD 2 ^d | 35.7 % | 1.44 (1.08, 1.92) ^{a, b} | 79.2 % | 1.69 (1.22, 2.34) ^{a, b} | 83.8 % | 0.83 (0.57, 1.21) |
| 12 | Erectile dysfunction | 78.8 % | 9.93 (7.19, 13.72) ^{a, b} | 77.2 % | 1.50 (1.09, 2.05) ^{a, b} | 72.4 % | 0.42 (0.30, 0.58) ^{a, b} |
| 13 | Amputation | 74.7 % | 7.75 (5.69, 10.57) ^{a, b} | 87.5 % | 3.12 (2.12, 4.61) ^{a, b} | 76.7 % | 0.52 (0.37, 0.73) ^{a, b} |
| 14 | Diabetes | 87.2 % | 18.16 (12.36, 26.68) ^{a, b} | 76.6 % | 1.44 (1.05, 1.98) ^{a, b} | 64.0 % | 0.28 (0.21, 0.38) ^{a, b} |
| 15 | Macular degeneration | 82.6 % | 12.70 (8.99, 17.94) ^{a, b} | 81.4 % | 1.94 (1.39, 2.73) ^{a, b} | 73.7 % | 0.45 (0.32, 0.62) ^{a, b} |
| 16 | Cataracts | 88.7 % | 20.89 (13.93, 31.30) ^{a, b} | 75.6 % | 1.36 (1.00, 1.86) | 65.5 % | 0.30 (0.22, 0.41) ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

^c Image of diseased lungs. ^d Image of man with oxygen.

Note: Regressions control for smoking status.

Table E-4. Current Smokers: Logistic Regressions of New Information, Thinking about Risks, and Perceived Factualness Comparing CHW with SG Warnings

| Condition | Warning | New Information | | Thinking About Risks | | Perceived Factualness | |
|-------------|----------------------------------|-----------------|---|----------------------|--------------------------------------|-----------------------|--------------------------------------|
| | | % | OR (95% CI) | % | OR (95% CI) | % | OR (95% CI) |
| 0 (Control) | Average of the 4 SG warnings | 25.0 % | REF | 63.9 % | REF | 82.6 % | REF |
| 1 | Addictive | 21.0 % | 0.80 (0.55, 1.15) | 65.4 % | 1.07 (0.78, 1.47) | 82.1 % | 0.97 (0.65, 1.44) |
| 2 | Harm children | 37.1 % | 1.77 (1.28, 2.45) ^{a, b} | 79.7 % | 2.22 (1.53, 3.22) ^{a, b} | 79.5 % | 0.81 (0.55, 1.20) |
| 3 | Kill you | 25.7 % | 1.04 (0.73, 1.48) | 68.5 % | 1.23 (0.88, 1.70) | 81.9 % | 0.95 (0.64, 1.42) |
| 4 | Fatal lung disease in nonsmokers | 41.7 % | 2.15 (1.56, 2.95) ^{a, b} | 70.1 % | 1.32 (0.95, 1.84) | 74.2 % | 0.61 (0.42, 0.87) ^{a, b} |
| 5 | Quit now | 21.1 % | 0.80 (0.55, 1.16) | 71.1 % | 1.39 (1.00, 1.94) | 84.3 % | 1.13 (0.75, 1.72) |
| 6 | Head and neck cancer | 72.1 % | 7.76 (5.52, 10.92) ^{a, b} | 78.4 % | 2.06 (1.43, 2.95) ^{a, b} | 67.0 % | 0.43 (0.30, 0.60) ^{a, b} |
| 7 | Bladder cancer | 83.7 % | 15.47 (10.33, 23.19) ^{a, b} | 76.2 % | 1.81 (1.28, 2.58) ^{a, b} | 64.0 % | 0.37 (0.27, 0.52) ^{a, b} |
| 8 | Stunt fetal growth | 40.7 % | 2.05 (1.49, 2.83) ^{a, b} | 75.5 % | 1.74 (1.23, 2.46) ^{a, b} | 83.1 % | 1.03 (0.68, 1.56) |
| 9 | Clogged arteries | 50.5 % | 3.06 (2.23, 4.19) ^{a, b} | 71.3 % | 1.40 (1.00, 1.96) ^a | 85.8 % | 1.27 (0.82, 1.97) |
| 10 | COPD 1 ^c | 30.9 % | 1.34 (0.96, 1.87) | 76.4 % | 1.83 (1.28, 2.60) ^{a, b} | 85.1 % | 1.20 (0.78, 1.84) |
| 11 | COPD 2 ^d | 33.2 % | 1.48 (1.07, 2.07) ^{a, b} | 74.1 % | 1.62 (1.15, 2.28) ^{a, b} | 81.5 % | 0.93 (0.62, 1.38) |
| 12 | Erectile dysfunction | 70.4 % | 7.15 (5.09, 10.04) ^{a, b} | 70.4 % | 1.35 (0.97, 1.88) | 68.8 % | 0.46 (0.33, 0.65) ^{a, b} |
| 13 | Amputation | 76.0 % | 9.53 (6.67, 13.61) ^{a, b} | 84.2 % | 3.02 (2.02, 4.52) ^{a, b} | 74.6 % | 0.62 (0.43, 0.89) ^{a, b} |
| 14 | Diabetes | 78.9 % | 11.29 (7.82, 16.31) ^{a, b} | 74.4 % | 1.64 (1.16, 2.32) ^{a, b} | 64.0 % | 0.37 (0.26, 0.52) ^{a, b} |
| 15 | Macular degeneration | 78.9 % | 11.25 (7.76, 16.31) ^{a, b} | 77.7 % | 1.97 (1.38, 2.82) ^{a, b} | 73.3 % | 0.58 (0.40, 0.83) ^{a, b} |
| 16 | Cataracts | 82.4 % | 14.00 (9.46, 20.71) ^{a, b} | 69.3 % | 1.27 (0.92, 1.77) | 60.4 % | 0.32 (0.23, 0.45) ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.
^c Image of diseased lungs. ^d Image of man with oxygen.

Note: Regressions control for age.

Table E-5. Nonsmokers: Logistic Regressions of New Information, Thinking about Risks, and Perceived Factualness Comparing CHW with SG Warnings

| Condition | Warning | New Information | | Thinking About Risks | | Perceived Factualness | |
|-------------|----------------------------------|-----------------|---|----------------------|--------------------------------------|-----------------------|--------------------------------------|
| | | % | OR (95% CI) | % | OR (95% CI) | % | OR (95% CI) |
| 0 (Control) | Average of the 4 SG warnings | 30.6 % | REF | 74.2 % | REF | 90.8 % | REF |
| 1 | Addictive | 18.1 % | 0.50 (0.36, 0.69) ^{a, b} | 76.9 % | 1.15 (0.85, 1.57) | 92.3 % | 1.22 (0.75, 1.99) |
| 2 | Harm children | 33.3 % | 1.13 (0.86, 1.50) | 88.0 % | 2.55 (1.73, 3.75) ^{a, b} | 91.9 % | 1.15 (0.71, 1.86) |
| 3 | Kill you | 31.4 % | 1.04 (0.78, 1.37) | 87.7 % | 2.48 (1.69, 3.65) ^{a, b} | 91.1 % | 1.04 (0.65, 1.65) |
| 4 | Fatal lung disease in nonsmokers | 35.1 % | 1.23 (0.93, 1.62) | 90.1 % | 3.18 (2.09, 4.84) ^{a, b} | 89.3 % | 0.84 (0.55, 1.30) |
| 5 | Quit now | 31.8 % | 1.05 (0.80, 1.40) | 74.6 % | 1.02 (0.75, 1.38) | 89.7 % | 0.88 (0.57, 1.36) |
| 6 | Head and neck cancer | 78.4 % | 8.39 (6.16, 11.43) ^{a, b} | 91.6 % | 3.81 (2.44, 5.96) ^{a, b} | 87.2 % | 0.69 (0.46, 1.03) |
| 7 | Bladder cancer | 85.9 % | 14.08 (9.84, 20.15) ^{a, b} | 88.1 % | 2.57 (1.74, 3.79) ^{a, b} | 83.1 % | 0.50 (0.34, 0.72) ^{a, b} |
| 8 | Stunt fetal growth | 40.2 % | 1.53 (1.16, 2.00) ^{a, b} | 87.0 % | 2.32 (1.59, 3.37) ^{a, b} | 89.0 % | 0.82 (0.53, 1.26) |
| 9 | Clogged arteries | 51.1 % | 2.38 (1.82, 3.10) ^{a, b} | 90.5 % | 3.34 (2.18, 5.10) ^{a, b} | 90.9 % | 1.01 (0.64, 1.59) |
| 10 | COPD 1 ^c | 41.2 % | 1.59 (1.21, 2.08) ^{a, b} | 89.1 % | 2.85 (1.91, 4.26) ^{a, b} | 92.6 % | 1.26 (0.77, 2.07) |
| 11 | COPD 2 ^d | 39.5 % | 1.48 (1.13, 1.94) ^{a, b} | 89.4 % | 2.94 (1.96, 4.42) ^{a, b} | 95.6 % | 2.19 (1.19, 4.03) ^{a, b} |
| 12 | Erectile dysfunction | 77.9 % | 8.15 (6.00, 11.09) ^{a, b} | 83.9 % | 1.82 (1.28, 2.57) ^{a, b} | 86.3 % | 0.64 (0.43, 0.95) ^{a, b} |
| 13 | Amputation | 72.5 % | 6.01 (4.49, 8.05) ^{a, b} | 92.4 % | 4.21 (2.64, 6.70) ^{a, b} | 87.4 % | 0.70 (0.47, 1.06) |
| 14 | Diabetes | 81.5 % | 10.19 (7.36, 14.11) ^{a, b} | 89.1 % | 2.82 (1.89, 4.23) ^{a, b} | 83.9 % | 0.53 (0.36, 0.77) ^{a, b} |
| 15 | Macular degeneration | 84.4 % | 12.44 (8.79, 17.62) ^{a, b} | 91.7 % | 3.82 (2.44, 5.99) ^{a, b} | 85.7 % | 0.61 (0.41, 0.90) ^{a, b} |
| 16 | Cataracts | 86.6 % | 14.91 (10.34, 21.49) ^{a, b} | 87.3 % | 2.38 (1.63, 3.48) ^{a, b} | 82.4 % | 0.47 (0.33, 0.69) ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

^c Image of diseased lungs. ^d Image of man with oxygen.

Note: Regressions control for age.

Table E-6. Youth: Linear Regressions of Self-Reported Learning, Perceived Informativeness, and Perceived Understandability Comparing CHW with SG Warnings

| Condition | Description | Self-Reported Learning | | Perceived Informativeness | | Perceived Understandability | |
|-------------|----------------------------------|------------------------|--------------------------------------|---------------------------|-----------------------------------|-----------------------------|-----------------------------------|
| | | Mean (SD) | Coeff. (95% CI) | Mean (SD) | Coeff. (95% CI) | Mean (SD) | Coeff. (95% CI) |
| 0 (Control) | Average of the 4 SG warnings | 3.51 (2.02) | REF | 4.61 (1.74) | REF | 5.38 (1.69) | REF |
| 1 | Addictive | 2.73 (1.89) | -0.77 (-1.14, -0.39) ^{a, b} | 4.46 (1.71) | -0.15 (-0.49, 0.19) | 6.00 (1.37) | 0.62 (0.33, 0.92) ^{a, b} |
| 2 | Harm children | 3.65 (2.10) | 0.14 (-0.27, 0.56) | 5.35 (1.44) | 0.74 (0.43, 1.04) ^{a, b} | 5.94 (1.63) | 0.56 (0.22, 0.90) ^{a, b} |
| 3 | Kill you | 3.07 (2.05) | -0.43 (-0.84, -0.02) ^a | 4.97 (1.60) | 0.36 (0.03, 0.70) ^{a, b} | 6.11 (1.37) | 0.73 (0.43, 1.02) ^{a, b} |
| 4 | Fatal lung disease in nonsmokers | 4.20 (2.01) | 0.70 (0.29, 1.11) ^{a, b} | 5.51 (1.33) | 0.90 (0.61, 1.19) ^{a, b} | 6.12 (1.30) | 0.75 (0.46, 1.03) ^{a, b} |
| 5 | Quit now | 2.93 (1.98) | -0.57 (-0.96, -0.18) ^{a, b} | 4.32 (1.65) | -0.29 (-0.63, 0.05) | 5.58 (1.63) | 0.21 (-0.13, 0.54) |
| 6 | Head and neck cancer | 5.45 (1.69) | 1.95 (1.59, 2.31) ^{a, b} | 5.45 (1.38) | 0.84 (0.55, 1.14) ^{a, b} | 6.03 (1.48) | 0.65 (0.34, 0.96) ^{a, b} |
| 7 | Bladder cancer | 5.70 (1.65) | 2.19 (1.84, 2.55) ^{a, b} | 5.51 (1.36) | 0.90 (0.61, 1.20) ^{a, b} | 6.02 (1.34) | 0.64 (0.35, 0.93) ^{a, b} |
| 8 | Stunt fetal growth | 4.35 (1.95) | 0.84 (0.44, 1.24) ^{a, b} | 5.73 (1.25) | 1.12 (0.85, 1.40) ^{a, b} | 6.34 (1.03) | 0.96 (0.72, 1.20) ^{a, b} |
| 9 | Clogged arteries | 4.71 (1.84) | 1.20 (0.82, 1.59) ^{a, b} | 5.57 (1.33) | 0.96 (0.67, 1.25) ^{a, b} | 6.20 (1.22) | 0.83 (0.55, 1.10) ^{a, b} |
| 10 | COPD 1 ^c | 4.39 (1.87) | 0.89 (0.50, 1.27) ^{a, b} | 5.38 (1.33) | 0.77 (0.48, 1.06) ^{a, b} | 6.14 (1.26) | 0.76 (0.48, 1.04) ^{a, b} |
| 11 | COPD 2 ^d | 4.33 (1.92) | 0.82 (0.43, 1.22) ^{a, b} | 5.54 (1.36) | 0.93 (0.64, 1.22) ^{a, b} | 6.00 (1.46) | 0.62 (0.31, 0.93) ^{a, b} |
| 12 | Erectile dysfunction | 5.44 (1.53) | 1.94 (1.60, 2.28) ^{a, b} | 5.49 (1.36) | 0.88 (0.58, 1.17) ^{a, b} | 5.77 (1.67) | 0.39 (0.05, 0.74) ^{a, b} |
| 13 | Amputation | 5.74 (1.37) | 2.24 (1.93, 2.55) ^{a, b} | 5.94 (1.12) | 1.33 (1.07, 1.59) ^{a, b} | 6.19 (1.37) | 0.81 (0.51, 1.10) ^{a, b} |
| 14 | Diabetes | 5.61 (1.69) | 2.11 (1.75, 2.46) ^{a, b} | 5.63 (1.29) | 1.02 (0.74, 1.30) ^{a, b} | 6.16 (1.20) | 0.78 (0.51, 1.05) ^{a, b} |
| 15 | Macular degeneration | 5.96 (1.28) | 2.45 (2.15, 2.75) ^{a, b} | 5.80 (1.08) | 1.19 (0.93, 1.44) ^{a, b} | 5.91 (1.32) | 0.53 (0.25, 0.82) ^{a, b} |
| 16 | Cataracts | 5.81 (1.42) | 2.31 (1.99, 2.63) ^{a, b} | 5.53 (1.38) | 0.92 (0.62, 1.22) ^{a, b} | 6.08 (1.46) | 0.70 (0.39, 1.01) ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

^c Image of diseased lungs. ^d Image of man with oxygen.

Note: Regressions control for smoking status.

Table E-7. Young Adults: Linear Regressions of Self-Reported Learning, Perceived Informativeness, and Perceived Understandability Comparing CHW with SG Warnings

| Condition | Description | Self-Reported Learning | | Perceived Informativeness | | Perceived Understandability | |
|-------------|----------------------------------|------------------------|--------------------------------------|---------------------------|--------------------------------------|-----------------------------|-----------------------------------|
| | | Mean (SD) | Coeff. (95% CI) | Mean (SD) | Coeff. (95% CI) | Mean (SD) | Coeff. (95% CI) |
| 0 (Control) | Average of the 4 SG warnings | 3.12 (1.93) | REF | 4.33 (1.70) | REF | 5.38 (1.69) | REF |
| 1 | Addictive | 2.85 (2.05) | -0.28 (-0.72, 0.16) | 4.36 (1.62) | 0.02 (-0.34, 0.38) | 5.95 (1.53) | 0.56 (0.23, 0.90) ^{a, b} |
| 2 | Harm children | 3.17 (1.93) | 0.03 (-0.38, 0.44) | 4.95 (1.44) | 0.61 (0.28, 0.93) ^{a, b} | 6.14 (1.31) | 0.75 (0.45, 1.05) ^{a, b} |
| 3 | Kill you | 2.68 (2.01) | -0.46 (-0.89, -0.03) ^a | 4.67 (1.73) | 0.32 (-0.05, 0.70) | 6.28 (1.16) | 0.90 (0.62, 1.17) ^{a, b} |
| 4 | Fatal lung disease in nonsmokers | 3.53 (2.09) | 0.39 (-0.05, 0.84) | 5.27 (1.46) | 0.93 (0.60, 1.26) ^{a, b} | 6.11 (1.43) | 0.72 (0.40, 1.04) ^{a, b} |
| 5 | Quit now | 2.40 (1.77) | -0.73 (-1.12, -0.34) ^{a, b} | 3.96 (1.65) | -0.39 (-0.74, -0.04) ^{a, b} | 5.74 (1.69) | 0.34 (-0.02, 0.71) |
| 6 | Head and neck cancer | 4.51 (1.71) | 1.37 (1.00, 1.75) ^{a, b} | 5.14 (1.48) | 0.79 (0.46, 1.12) ^{a, b} | 5.92 (1.49) | 0.53 (0.20, 0.86) ^{a, b} |
| 7 | Bladder cancer | 5.32 (1.43) | 2.19 (1.86, 2.52) ^{a, b} | 5.52 (1.16) | 1.17 (0.90, 1.45) ^{a, b} | 6.06 (1.26) | 0.67 (0.38, 0.96) ^{a, b} |
| 8 | Stunt fetal growth | 4.02 (1.98) | 0.88 (0.46, 1.31) ^{a, b} | 5.70 (1.26) | 1.35 (1.06, 1.65) ^{a, b} | 6.23 (1.25) | 0.84 (0.55, 1.13) ^{a, b} |
| 9 | Clogged arteries | 4.55 (2.07) | 1.41 (0.97, 1.84) ^{a, b} | 5.60 (1.36) | 1.25 (0.94, 1.56) ^{a, b} | 6.23 (1.33) | 0.84 (0.53, 1.14) ^{a, b} |
| 10 | COPD 1 ^c | 4.13 (1.94) | 0.99 (0.57, 1.42) ^{a, b} | 5.49 (1.25) | 1.14 (0.85, 1.43) ^{a, b} | 5.97 (1.34) | 0.58 (0.28, 0.89) ^{a, b} |
| 11 | COPD 2 ^d | 4.46 (1.99) | 1.32 (0.90, 1.75) ^{a, b} | 5.42 (1.29) | 1.08 (0.78, 1.38) ^{a, b} | 6.16 (1.33) | 0.77 (0.47, 1.07) ^{a, b} |
| 12 | Erectile dysfunction | 5.16 (1.61) | 2.02 (1.66, 2.38) ^{a, b} | 5.69 (1.23) | 1.34 (1.05, 1.63) ^{a, b} | 6.27 (1.22) | 0.89 (0.60, 1.17) ^{a, b} |
| 13 | Amputation | 5.19 (1.90) | 2.05 (1.64, 2.47) ^{a, b} | 5.54 (1.53) | 1.19 (0.85, 1.53) ^{a, b} | 6.21 (1.30) | 0.82 (0.52, 1.12) ^{a, b} |
| 14 | Diabetes | 5.46 (1.45) | 2.33 (1.99, 2.66) ^{a, b} | 5.52 (1.24) | 1.18 (0.88, 1.47) ^{a, b} | 6.05 (1.47) | 0.66 (0.34, 0.99) ^{a, b} |
| 15 | Macular degeneration | 5.57 (1.48) | 2.43 (2.09, 2.78) ^{a, b} | 5.91 (1.24) | 1.57 (1.28, 1.86) ^{a, b} | 6.09 (1.34) | 0.70 (0.40, 1.01) ^{a, b} |
| 16 | Cataracts | 5.11 (1.65) | 1.97 (1.60, 2.35) ^{a, b} | 5.45 (1.18) | 1.10 (0.82, 1.38) ^{a, b} | 5.94 (1.36) | 0.55 (0.25, 0.86) ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

^c Image of diseased lungs. ^d Image of man with oxygen.

Note: Regressions control for smoking status.

Table E-8. Older Adults: Linear Regressions of Self-Reported Learning, Perceived Informativeness, and Perceived Understandability Comparing CHW with SG Warnings

| Condition | Description | Self-Reported Learning | | Perceived Informativeness | | Perceived Understandability | |
|-------------|----------------------------------|------------------------|--------------------------------------|---------------------------|--------------------------------------|-----------------------------|-----------------------------------|
| | | Mean (SD) | Coeff. (95% CI) | Mean (SD) | Coeff. (95% CI) | Mean (SD) | Coeff. (95% CI) |
| 0 (Control) | Average of the 4 SG warnings | 3.02 (2.09) | REF | 4.94 (1.65) | REF | 5.83 (1.54) | REF |
| 1 | Addictive | 2.66 (2.02) | -0.36 (-0.63, -0.09) ^{a, b} | 4.90 (1.65) | -0.04 (-0.26, 0.18) | 6.06 (1.34) | 0.23 (0.04, 0.41) ^{a, b} |
| 2 | Harm children | 3.51 (2.13) | 0.49 (0.20, 0.77) ^{a, b} | 5.36 (1.52) | 0.42 (0.21, 0.63) ^{a, b} | 6.24 (1.19) | 0.41 (0.24, 0.58) ^{a, b} |
| 3 | Kill you | 2.83 (2.13) | -0.19 (-0.48, 0.09) | 4.95 (1.75) | 0.02 (-0.21, 0.25) | 5.92 (1.57) | 0.10 (-0.11, 0.31) |
| 4 | Fatal lung disease in nonsmokers | 3.72 (2.13) | 0.70 (0.42, 0.99) ^{a, b} | 5.43 (1.54) | 0.50 (0.29, 0.71) ^{a, b} | 5.98 (1.47) | 0.15 (-0.05, 0.35) |
| 5 | Quit now | 2.75 (1.97) | -0.27 (-0.54, 0.00) ^a | 4.61 (1.59) | -0.33 (-0.54, -0.11) ^{a, b} | 5.82 (1.43) | -0.01 (-0.20, 0.18) |
| 6 | Head and neck cancer | 5.20 (1.72) | 2.18 (1.94, 2.42) ^{a, b} | 5.68 (1.40) | 0.74 (0.55, 0.93) ^{a, b} | 6.14 (1.27) | 0.31 (0.14, 0.49) ^{a, b} |
| 7 | Bladder cancer | 5.52 (1.73) | 2.50 (2.26, 2.74) ^{a, b} | 5.81 (1.41) | 0.87 (0.68, 1.07) ^{a, b} | 6.13 (1.38) | 0.30 (0.11, 0.49) ^{a, b} |
| 8 | Stunt fetal growth | 3.65 (2.04) | 0.63 (0.36, 0.90) ^{a, b} | 5.59 (1.38) | 0.65 (0.46, 0.84) ^{a, b} | 6.15 (1.33) | 0.32 (0.14, 0.51) ^{a, b} |
| 9 | Clogged arteries | 4.13 (2.13) | 1.11 (0.83, 1.40) ^{a, b} | 5.65 (1.41) | 0.71 (0.52, 0.90) ^{a, b} | 6.15 (1.29) | 0.32 (0.14, 0.50) ^{a, b} |
| 10 | COPD 1 ^c | 3.53 (2.05) | 0.51 (0.23, 0.78) ^{a, b} | 5.55 (1.37) | 0.61 (0.42, 0.80) ^{a, b} | 6.14 (1.27) | 0.31 (0.13, 0.48) ^{a, b} |
| 11 | COPD 2 ^d | 3.57 (2.14) | 0.55 (0.27, 0.84) ^{a, b} | 5.52 (1.39) | 0.58 (0.39, 0.78) ^{a, b} | 6.24 (1.17) | 0.41 (0.24, 0.57) ^{a, b} |
| 12 | Erectile dysfunction | 5.42 (1.68) | 2.40 (2.17, 2.64) ^{a, b} | 5.77 (1.35) | 0.83 (0.64, 1.02) ^{a, b} | 6.18 (1.19) | 0.35 (0.18, 0.52) ^{a, b} |
| 13 | Amputation | 5.41 (1.79) | 2.39 (2.14, 2.64) ^{a, b} | 5.95 (1.25) | 1.01 (0.84, 1.19) ^{a, b} | 6.25 (1.39) | 0.42 (0.23, 0.61) ^{a, b} |
| 14 | Diabetes | 5.62 (1.62) | 2.60 (2.37, 2.83) ^{a, b} | 5.68 (1.40) | 0.74 (0.55, 0.93) ^{a, b} | 6.21 (1.22) | 0.38 (0.21, 0.55) ^{a, b} |
| 15 | Macular degeneration | 5.70 (1.66) | 2.68 (2.45, 2.92) ^{a, b} | 5.86 (1.37) | 0.92 (0.73, 1.11) ^{a, b} | 6.12 (1.40) | 0.29 (0.10, 0.48) ^{a, b} |
| 16 | Cataracts | 5.56 (1.74) | 2.54 (2.30, 2.78) ^{a, b} | 5.67 (1.35) | 0.73 (0.54, 0.92) ^{a, b} | 6.17 (1.30) | 0.34 (0.16, 0.52) ^{a, b} |

^a Significant at p<.05 in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

^c Image of diseased lungs. ^d Image of man with oxygen.

Note: Regressions control for smoking status.

Table E-9. Current Smokers: Linear Regressions of Self-Reported Learning, Perceived Informativeness, and Perceived Understandability Comparing CHW with SG Warnings

| Condition | Description | Self-Reported Learning | | Perceived Informativeness | | Perceived Understandability | |
|-------------|----------------------------------|------------------------|-----------------------------------|---------------------------|-----------------------------------|-----------------------------|-----------------------------------|
| | | Mean (SD) | Coeff. (95% CI) | Mean (SD) | Coeff. (95% CI) | Mean (SD) | Coeff. (95% CI) |
| 0 (Control) | Average of the 4 SG warnings | 3.16 (2.13) | REF | 4.84 (1.70) | REF | 5.84 (1.53) | REF |
| 1 | Addictive | 2.94 (2.18) | -0.22 (-0.54, 0.10) | 4.79 (1.66) | -0.04 (-0.29, 0.21) | 6.13 (1.33) | 0.30 (0.09, 0.50) ^{a, b} |
| 2 | Harm children | 3.79 (2.13) | 0.62 (0.30, 0.95) ^{a, b} | 5.21 (1.53) | 0.37 (0.14, 0.61) ^{a, b} | 6.19 (1.25) | 0.36 (0.16, 0.56) ^{a, b} |
| 3 | Kill you | 2.98 (2.15) | -0.19 (-0.51, 0.14) | 4.77 (1.76) | -0.07 (-0.33, 0.20) | 5.99 (1.50) | 0.15 (-0.08, 0.38) |
| 4 | Fatal lung disease in nonsmokers | 3.85 (2.14) | 0.69 (0.36, 1.01) ^{a, b} | 5.26 (1.56) | 0.43 (0.19, 0.67) ^{a, b} | 6.07 (1.31) | 0.23 (0.02, 0.44) ^{a, b} |
| 5 | Quit now | 2.95 (2.13) | -0.21 (-0.53, 0.11) | 4.67 (1.72) | -0.16 (-0.42, 0.10) | 6.03 (1.33) | 0.19 (-0.02, 0.40) |
| 6 | Head and neck cancer | 5.09 (1.80) | 1.93 (1.65, 2.22) ^{a, b} | 5.45 (1.60) | 0.62 (0.37, 0.86) ^{a, b} | 6.03 (1.33) | 0.20 (-0.01, 0.41) |
| 7 | Bladder cancer | 5.32 (1.82) | 2.15 (1.86, 2.44) ^{a, b} | 5.62 (1.47) | 0.78 (0.55, 1.02) ^{a, b} | 6.01 (1.46) | 0.18 (-0.05, 0.41) |
| 8 | Stunt fetal growth | 3.76 (2.05) | 0.60 (0.29, 0.91) ^{a, b} | 5.61 (1.40) | 0.77 (0.55, 0.99) ^{a, b} | 6.17 (1.35) | 0.33 (0.12, 0.54) ^{a, b} |
| 9 | Clogged arteries | 4.28 (2.04) | 1.12 (0.81, 1.42) ^{a, b} | 5.52 (1.40) | 0.68 (0.46, 0.91) ^{a, b} | 6.15 (1.23) | 0.32 (0.12, 0.51) ^{a, b} |
| 10 | COPD 1 ^c | 3.73 (2.10) | 0.56 (0.25, 0.88) ^{a, b} | 5.51 (1.35) | 0.67 (0.46, 0.89) ^{a, b} | 6.11 (1.34) | 0.28 (0.07, 0.49) ^{a, b} |
| 11 | COPD 2 ^d | 3.89 (2.19) | 0.72 (0.39, 1.05) ^{a, b} | 5.45 (1.43) | 0.62 (0.39, 0.84) ^{a, b} | 6.16 (1.27) | 0.32 (0.12, 0.52) ^{a, b} |
| 12 | Erectile dysfunction | 5.20 (1.75) | 2.03 (1.75, 2.32) ^{a, b} | 5.61 (1.40) | 0.77 (0.55, 1.00) ^{a, b} | 6.10 (1.27) | 0.26 (0.06, 0.47) ^{a, b} |
| 13 | Amputation | 5.31 (1.82) | 2.15 (1.86, 2.43) ^{a, b} | 5.72 (1.40) | 0.88 (0.66, 1.10) ^{a, b} | 6.22 (1.39) | 0.38 (0.17, 0.60) ^{a, b} |
| 14 | Diabetes | 5.54 (1.58) | 2.38 (2.12, 2.64) ^{a, b} | 5.53 (1.42) | 0.69 (0.47, 0.92) ^{a, b} | 6.06 (1.39) | 0.23 (0.01, 0.44) ^a |
| 15 | Macular degeneration | 5.59 (1.59) | 2.43 (2.17, 2.69) ^{a, b} | 5.68 (1.46) | 0.85 (0.62, 1.08) ^{a, b} | 5.93 (1.53) | 0.10 (-0.14, 0.33) |
| 16 | Cataracts | 5.34 (1.81) | 2.18 (1.89, 2.47) ^{a, b} | 5.48 (1.43) | 0.64 (0.42, 0.87) ^{a, b} | 6.01 (1.36) | 0.18 (-0.03, 0.39) |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

^c Image of diseased lungs. ^d Image of man with oxygen.

Note: Regressions control for age.

Table E-10. Nonsmokers: Linear Regressions of Self-Reported Learning, Perceived Informativeness, and Perceived Understandability Comparing CHW with SG Warnings

| Condition | Description | Self-Reported Learning | | Perceived Informativeness | | Perceived Understandability | |
|-------------|----------------------------------|------------------------|--------------------------------------|---------------------------|--------------------------------------|-----------------------------|-----------------------------------|
| | | Mean (SD) | Coeff. (95% CI) | Mean (SD) | Coeff. (95% CI) | Mean (SD) | Coeff. (95% CI) |
| 0 (Control) | Average of the 4 SG warnings | 3.15 (1.99) | REF | 4.66 (1.70) | REF | 5.48 (1.67) | REF |
| 1 | Addictive | 2.55 (1.84) | -0.60 (-0.85, -0.35) ^{a, b} | 4.60 (1.68) | -0.06 (-0.28, 0.16) | 5.94 (1.42) | 0.46 (0.27, 0.65) ^{a, b} |
| 2 | Harm children | 3.23 (2.02) | 0.08 (-0.18, 0.34) | 5.31 (1.46) | 0.65 (0.46, 0.85) ^{a, b} | 6.11 (1.39) | 0.64 (0.45, 0.82) ^{a, b} |
| 3 | Kill you | 2.76 (2.04) | -0.39 (-0.66, -0.13) ^{a, b} | 4.99 (1.67) | 0.33 (0.12, 0.55) ^{a, b} | 6.09 (1.41) | 0.61 (0.42, 0.80) ^{a, b} |
| 4 | Fatal lung disease in nonsmokers | 3.75 (2.08) | 0.60 (0.33, 0.87) ^{a, b} | 5.53 (1.41) | 0.87 (0.68, 1.06) ^{a, b} | 6.02 (1.50) | 0.54 (0.34, 0.75) ^{a, b} |
| 5 | Quit now | 2.55 (1.76) | -0.60 (-0.84, -0.37) ^{a, b} | 4.21 (1.54) | -0.46 (-0.66, -0.25) ^{a, b} | 5.54 (1.65) | 0.06 (-0.16, 0.28) |
| 6 | Head and neck cancer | 5.13 (1.70) | 1.97 (1.75, 2.20) ^{a, b} | 5.55 (1.29) | 0.89 (0.72, 1.07) ^{a, b} | 6.09 (1.40) | 0.61 (0.43, 0.80) ^{a, b} |
| 7 | Bladder cancer | 5.67 (1.50) | 2.52 (2.31, 2.73) ^{a, b} | 5.72 (1.26) | 1.06 (0.89, 1.24) ^{a, b} | 6.14 (1.24) | 0.66 (0.49, 0.84) ^{a, b} |
| 8 | Stunt fetal growth | 3.99 (2.00) | 0.84 (0.58, 1.10) ^{a, b} | 5.67 (1.27) | 1.01 (0.83, 1.20) ^{a, b} | 6.24 (1.17) | 0.77 (0.60, 0.93) ^{a, b} |
| 9 | Clogged arteries | 4.41 (2.08) | 1.26 (0.99, 1.53) ^{a, b} | 5.69 (1.36) | 1.03 (0.84, 1.22) ^{a, b} | 6.20 (1.32) | 0.72 (0.54, 0.91) ^{a, b} |
| 10 | COPD 1 ^c | 3.95 (1.96) | 0.80 (0.55, 1.06) ^{a, b} | 5.48 (1.32) | 0.82 (0.64, 1.01) ^{a, b} | 6.09 (1.24) | 0.62 (0.44, 0.79) ^{a, b} |
| 11 | COPD 2 ^d | 3.98 (2.03) | 0.83 (0.56, 1.09) ^{a, b} | 5.54 (1.31) | 0.88 (0.70, 1.07) ^{a, b} | 6.17 (1.29) | 0.69 (0.51, 0.87) ^{a, b} |
| 12 | Erectile dysfunction | 5.50 (1.53) | 2.34 (2.13, 2.55) ^{a, b} | 5.74 (1.27) | 1.08 (0.90, 1.25) ^{a, b} | 6.11 (1.39) | 0.63 (0.44, 0.82) ^{a, b} |
| 13 | Amputation | 5.54 (1.66) | 2.38 (2.16, 2.61) ^{a, b} | 5.96 (1.20) | 1.30 (1.14, 1.47) ^{a, b} | 6.23 (1.35) | 0.75 (0.57, 0.94) ^{a, b} |
| 14 | Diabetes | 5.61 (1.61) | 2.46 (2.24, 2.68) ^{a, b} | 5.71 (1.28) | 1.05 (0.87, 1.23) ^{a, b} | 6.24 (1.17) | 0.76 (0.59, 0.93) ^{a, b} |
| 15 | Macular degeneration | 5.84 (1.51) | 2.68 (2.47, 2.89) ^{a, b} | 5.99 (1.11) | 1.33 (1.16, 1.49) ^{a, b} | 6.16 (1.24) | 0.69 (0.51, 0.86) ^{a, b} |
| 16 | Cataracts | 5.66 (1.54) | 2.51 (2.29, 2.72) ^{a, b} | 5.67 (1.23) | 1.01 (0.84, 1.18) ^{a, b} | 6.16 (1.35) | 0.69 (0.50, 0.87) ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons. ^c Image of diseased lungs. ^d Image of man with oxygen.

Note: Regressions control for age.

Table E-11. Youth: Linear Regression of Difference in Difference Mean Health Belief Scores between Session 2 and Session 1

| Condition | Mean (SD) Health Belief Score | | DID (95% CI) |
|----------------------|-------------------------------|-------------|------------------------------|
| | Session 1 | Session 2 | |
| Head and neck cancer | 3.39 (3.31) | 4.09 (2.21) | 0.71 |
| Control | 3.38 (1.45) | 3.38 (1.39) | (0.41, 1.01) ^{a, b} |
| Bladder cancer | 3.47 (3.14) | 4.25 (2.33) | 0.65 |
| Control | 3.15 (1.55) | 3.28 (1.48) | (0.38, 0.92) ^{a, b} |
| Clogged arteries | 3.89 (3.16) | 4.25 (3.09) | 0.37 |
| Control | 4.01 (1.25) | 3.99 (1.20) | (0.02, 0.73) ^a |
| COPD 1 ^c | 4.34 (2.10) | 4.67 (1.71) | 0.27 |
| Control | 4.37 (0.98) | 4.44 (0.96) | (0.05, 0.48) ^{a, b} |
| COPD 2 ^d | 4.42 (2.26) | 4.48 (2.52) | -0.01 |
| Control | 4.37 (0.98) | 4.44 (0.96) | (-0.20, 0.19) |
| Erectile dysfunction | 3.45 (2.45) | 4.19 (2.72) | 0.65 |
| Control | 3.50 (1.37) | 3.59 (1.19) | (0.34, 0.95) ^{a, b} |
| Amputation | 3.43 (3.77) | 4.25 (2.81) | 0.70 |
| Control | 3.41 (1.45) | 3.53 (1.41) | (0.36, 1.05) ^{a, b} |
| Diabetes | 2.84 (2.89) | 3.92 (2.99) | 0.97 |
| Control | 2.90 (1.55) | 3.01 (1.42) | (0.62, 1.32) ^{a, b} |
| Macular degeneration | 3.17 (2.54) | 4.05 (2.62) | 0.77 |
| Control | 3.17 (1.44) | 3.28 (1.43) | (0.52, 1.01) ^{a, b} |
| Cataracts | 3.11 (2.72) | 4.01 (2.69) | 0.89 |
| Control | 3.17 (1.49) | 3.18 (1.43) | (0.60, 1.19) ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.
^c Image of diseased lungs. ^d Image of man with oxygen.

Note: Control = average of the 4 Surgeon General warnings for the relevant health belief. Regressions control for smoking status. DID = difference in difference. CHW = cigarette health warning. SD = standard deviation. DID scores represent: (Session 2 mean for CHW - Session 1 mean for CHW) - (Session 2 mean for Control - Session 1 mean for Control).

Table E-12. Young Adults: Linear Regression of Difference in Difference Mean Health Belief Scores between Session 2 and Session 1

| Condition | Mean (SD) Health Belief Score | | DID (95% CI) |
|----------------------|-------------------------------|-------------|------------------------------|
| | Session 1 | Session 2 | |
| Head and neck cancer | 3.76 (3.52) | 4.24 (3.24) | 0.30 |
| Control | 3.56 (1.55) | 3.74 (1.39) | (-0.17, 0.77) |
| Bladder cancer | 3.12 (2.79) | 3.81 (3.20) | 0.52 |
| Control | 3.45 (1.57) | 3.62 (1.55) | (0.08, 0.95) ^a |
| Clogged arteries | 4.19 (2.40) | 4.26 (2.45) | -0.05 |
| Control | 3.99 (1.40) | 4.10 (1.32) | (-0.32, 0.23) |
| COPD 1 ^c | 4.31 (2.50) | 4.43 (2.56) | 0.13 |
| Control | 4.40 (1.04) | 4.38 (1.09) | (-0.11, 0.37) |
| COPD 2 ^d | 4.62 (1.67) | 4.58 (2.74) | -0.03 |
| Control | 4.40 (1.04) | 4.39 (1.09) | (-0.37, 0.31) |
| Erectile dysfunction | 4.18 (2.32) | 4.24 (2.85) | -0.06 |
| Control | 3.80 (1.31) | 3.92 (1.33) | (-0.39, 0.28) |
| Amputation | 3.58 (3.21) | 4.30 (2.48) | 0.58 |
| Control | 3.70 (1.60) | 3.85 (1.54) | (0.19, 0.97) ^{a, b} |
| Diabetes | 3.44 (2.73) | 4.26 (2.53) | 0.45 |
| Control | 3.11 (1.76) | 3.48 (1.72) | (0.10, 0.81) ^a |
| Macular degeneration | 3.59 (3.11) | 4.33 (2.34) | 0.60 |
| Control | 3.54 (1.41) | 3.68 (1.41) | (0.26, 0.94) ^{a, b} |
| Cataracts | 3.72 (2.66) | 4.28 (2.76) | 0.42 |
| Control | 3.50 (1.64) | 3.65 (1.48) | (0.03, 0.81) ^a |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.
^c Image of diseased lungs. ^d Image of man with oxygen.

Note: Control = average of the 4 Surgeon General warnings for the relevant health belief. Regressions control for smoking status. DID = difference in difference. CHW = cigarette health warning. SD = standard deviation. DID scores represent: (Session 2 mean for CHW - Session 1 mean for CHW) - (Session 2 mean for Control - Session 1 mean for Control).

Table E-13. Older Adults: Linear Regression of Difference in Difference Mean Health Belief Scores between Session 2 and Session 1

| Condition | Mean (SD) Health Belief Score | | DID (95% CI) |
|----------------------|-------------------------------|-------------|------------------------------|
| | Session 1 | Session 2 | |
| Head and neck cancer | 3.34 (2.84) | 3.88 (3.10) | 0.47 |
| Control | 3.30 (1.47) | 3.36 (1.49) | (0.32, 0.61) ^{a, b} |
| Bladder cancer | 3.23 (3.15) | 3.89 (3.07) | 0.60 |
| Control | 3.24 (1.43) | 3.30 (1.50) | (0.43, 0.77) ^{a, b} |
| Clogged arteries | 4.00 (2.57) | 4.18 (2.40) | 0.17 |
| Control | 3.91 (1.33) | 3.92 (1.32) | (0.06, 0.29) ^{a, b} |
| COPD 1 ^c | 4.35 (2.28) | 4.44 (2.21) | 0.08 |
| Control | 4.36 (1.12) | 4.37 (1.12) | (-0.02, 0.18) |
| COPD 2 ^d | 4.42 (2.49) | 4.45 (2.47) | 0.02 |
| Control | 4.36 (1.11) | 4.37 (1.12) | (-0.10, 0.14) |
| Erectile dysfunction | 3.63 (2.87) | 4.13 (2.71) | 0.44 |
| Control | 3.57 (1.29) | 3.64 (1.33) | (0.30, 0.59) ^{a, b} |
| Amputation | 3.58 (2.71) | 4.18 (2.49) | 0.52 |
| Control | 3.51 (1.44) | 3.59 (1.42) | (0.38, 0.67) ^{a, b} |
| Diabetes | 2.92 (3.24) | 3.82 (3.38) | 0.73 |
| Control | 2.85 (1.46) | 3.01 (1.50) | (0.55, 0.91) ^{a, b} |
| Macular degeneration | 3.31 (2.54) | 3.94 (3.04) | 0.53 |
| Control | 3.16 (1.38) | 3.26 (1.44) | (0.38, 0.67) ^{a, b} |
| Cataracts | 3.04 (3.08) | 3.82 (3.16) | 0.62 |
| Control | 2.99 (1.40) | 3.15 (1.45) | (0.45, 0.80) ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

^c Image of diseased lungs. ^d Image of man with oxygen.

Note: Control = average of the 4 Surgeon General warnings for the relevant health belief. Regressions control for smoking status. DID = difference in difference. CHW = cigarette health warning. SD = standard deviation. DID scores represent: (Session 2 mean for CHW - Session 1 mean for CHW) - (Session 2 mean for Control - Session 1 mean for Control).

Table E-14. Current Smokers: Linear Regression of Difference in Difference Mean Health Belief Scores between Session 2 and Session 1

| Condition | Mean (SD) Health Belief Score | | DID (95% CI) |
|----------------------|-------------------------------|-------------|------------------------------|
| | Session 1 | Session 2 | |
| Head and neck cancer | 3.26 (3.13) | 3.74 (3.37) | 0.36 |
| Control | 3.09 (1.51) | 3.22 (1.56) | (0.16, 0.55) ^{a, b} |
| Bladder cancer | 2.94 (3.36) | 3.75 (3.18) | 0.72 |
| Control | 3.09 (1.48) | 3.19 (1.52) | (0.48, 0.95) ^{a, b} |
| Clogged arteries | 3.81 (2.64) | 4.05 (2.63) | 0.24 |
| Control | 3.79 (1.40) | 3.79 (1.41) | (0.10, 0.39) ^{a, b} |
| COPD 1 ^c | 4.16 (2.53) | 4.29 (2.56) | 0.07 |
| Control | 4.19 (1.19) | 4.25 (1.21) | (-0.08, 0.22) |
| COPD 2 ^d | 4.30 (2.83) | 4.35 (2.69) | -0.01 |
| Control | 4.19 (1.18) | 4.25 (1.20) | (-0.15, 0.13) |
| Erectile dysfunction | 3.61 (2.86) | 4.04 (2.65) | 0.36 |
| Control | 3.50 (1.37) | 3.57 (1.41) | (0.16, 0.55) ^{a, b} |
| Amputation | 3.40 (2.89) | 4.01 (2.78) | 0.55 |
| Control | 3.42 (1.50) | 3.49 (1.54) | (0.34, 0.77) ^{a, b} |
| Diabetes | 2.94 (3.45) | 3.78 (3.78) | 0.65 |
| Control | 2.71 (1.57) | 2.89 (1.54) | (0.43, 0.88) ^{a, b} |
| Macular degeneration | 3.20 (2.57) | 3.83 (3.15) | 0.55 |
| Control | 3.05 (1.50) | 3.14 (1.52) | (0.36, 0.73) ^{a, b} |
| Cataracts | 2.87 (3.19) | 3.65 (3.48) | 0.62 |
| Control | 2.90 (1.48) | 3.05 (1.52) | (0.40, 0.84) ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons. ^c Image of diseased lungs. ^d Image of man with oxygen.

Note: Control = average of the 4 Surgeon General warnings for the relevant health belief. Regressions control for age group. DID = difference in difference. CHW = cigarette health warning. SD = standard deviation. DID scores represent: (Session 2 mean for CHW - Session 1 mean for CHW) - (Session 2 mean for Control - Session 1 mean for Control).

Table E-15. Nonsmokers: Linear Regression of Difference in Difference Mean Health Belief Scores between Session 2 and Session 1

| Condition | Mean (SD) Health Belief Score | | DID (95% CI) |
|----------------------|-------------------------------|-------------|------------------------------|
| | Session 1 | Session 2 | |
| Head and neck cancer | 3.51 (2.95) | 4.13 (2.66) | 0.59 |
| Control | 3.53 (1.45) | 3.56 (1.38) | (0.42, 0.76) ^{a, b} |
| Bladder cancer | 3.51 (2.95) | 4.11 (2.85) | 0.52 |
| Control | 3.37 (1.46) | 3.45 (1.49) | (0.36, 0.68) ^{a, b} |
| Clogged arteries | 4.16 (2.69) | 4.32 (2.42) | 0.13 |
| Control | 4.05 (1.26) | 4.09 (1.21) | (-0.03, 0.28) |
| COPD 1 ^c | 4.49 (2.06) | 4.63 (1.85) | 0.16 |
| Control | 4.50 (1.00) | 4.48 (0.99) | (0.06, 0.27) ^{a, b} |
| COPD 2 ^d | 4.55 (2.01) | 4.56 (2.39) | 0.03 |
| Control | 4.50 (1.00) | 4.48 (0.99) | (-0.11, 0.16) |
| Erectile dysfunction | 3.71 (2.63) | 4.24 (2.82) | 0.45 |
| Control | 3.66 (1.26) | 3.74 (1.22) | (0.28, 0.61) ^{a, b} |
| Amputation | 3.67 (3.02) | 4.35 (2.34) | 0.56 |
| Control | 3.59 (1.43) | 3.71(1.35) | (0.40, 0.72) ^{a, b} |
| Diabetes | 3.00 (2.84) | 3.98 (2.77) | 0.80 |
| Control | 3.03 (1.48) | 3.21 (1.49) | (0.61, 0.99) ^{a, b} |
| Macular degeneration | 3.41 (2.64) | 4.14 (2.71) | 0.61 |
| Control | 3.33 (1.30) | 3.45 (1.36) | (0.45, 0.76) ^{a, b} |
| Cataracts | 3.33 (2.82) | 4.12 (2.66) | 0.69 |
| Control | 3.23 (1.42) | 3.34 (1.39) | (0.50, 0.87) ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

^c Image of diseased lungs. ^d Image of man with oxygen.

Note: Control = average of the 4 Surgeon General warnings for the relevant health belief. Regressions control for age group. DID = difference in difference. CHW = cigarette health warning. SD = standard deviation. DID scores represent: (Session 2 mean for CHW - Session 1 mean for CHW) - (Session 2 mean for Control - Session 1 mean for Control).

Table E-16. Youth: Ordinal Regression of Difference in Difference Health Belief Scores between Session 2 and Session 1

| Warning | Ordinal Response Options for Corresponding Health Belief Item | Condition | Proportion Selecting Response | | DID (95% CI) | Interaction Term (95% CI) | |
|--------------------|---|-----------|-------------------------------|----------------|---------------|---------------------------|---|
| | | | Session 1 | Session 2 | | | |
| Addictive | 1 "Strongly disagree" | CHW | 0.00 | 0.01 | 0.01 | | |
| | | Control | 0.01 | 0.01 | (0.00, 0.02) | | |
| | 2 "Disagree" | CHW | 0.01 | 0.02 | 0.02 | | |
| | | Control | 0.02 | 0.01 | (0.00, 0.03) | | |
| | 3 "Neither agree nor disagree" | CHW | 0.01 | 0.03 | 0.03 | | -1.78 (-3.09, -0.46) ^{a, b} |
| | | Control | 0.03 | 0.03 | (0.00, 0.05) | | |
| 4 "Agree" | CHW | 0.13 | 0.22 | 0.13 | | | |
| | Control | 0.23 | 0.19 | (0.04, 0.22) | | | |
| 5 "Strongly agree" | CHW | 0.85 | 0.71 | -0.18 | | | |
| | Control | 0.71 | 0.76 | (-0.31, -0.06) | | | |
| Harm children | 1 "Strongly disagree" | CHW | 0.01 | 0.00 | 0.00 | | |
| | | Control | 0.01 | 0.01 | (-0.01, 0.01) | | |
| | 2 "Disagree" | CHW | 0.02 | 0.01 | -0.01 | | |
| | | Control | 0.02 | 0.02 | (-0.03, 0.01) | | |
| | 3 "Neither agree nor disagree" | CHW | 0.07 | 0.03 | -0.03 | | 1.02 (-0.19, 2.23) |
| | | Control | 0.07 | 0.06 | (-0.08, 0.01) | | |
| | 4 "Agree" | CHW | 0.31 | 0.21 | -0.09 | | |
| | | Control | 0.30 | 0.29 | (-0.19, 0.01) | | |
| | 5 "Strongly agree" | CHW | 0.58 | 0.74 | 0.14 | | |
| | | Control | 0.61 | 0.63 | (-0.03, 0.31) | | |

(continued)

Table E-16. Youth: Ordinal Regression of Difference in Difference Health Belief Scores between Session 2 and Session 1 (continued)

| Warning | Ordinal Response Options for Corresponding Health Belief Item | Condition | Proportion Selecting Response | | DID (95% CI) | Interaction Term (95% CI) |
|----------------------------------|---|-----------|-------------------------------|---------------|----------------|------------------------------|
| | | | Session 1 | Session 2 | | |
| Kill you | 1 "Strongly disagree" | CHW | 0.00 | 0.00 | 0.00 | |
| | | Control | 0.01 | 0.01 | (0.00, 0.01) | |
| | 2 "Disagree" | CHW | 0.01 | 0.01 | 0.00 | |
| | | Control | 0.02 | 0.01 | (-0.01, 0.01) | |
| | 3 "Neither agree nor disagree" | CHW | 0.03 | 0.02 | 0.01 | -0.05 |
| | | Control | 0.06 | 0.04 | (-0.02, 0.03) | (-1.44, 1.33) |
| 4 "Agree" | CHW | 0.22 | 0.18 | 0.01 | | |
| | Control | 0.29 | 0.24 | (-0.09, 0.10) | | |
| 5 "Strongly agree" | CHW | 0.73 | 0.78 | -0.02 | | |
| | Control | 0.63 | 0.69 | (-0.15, 0.12) | | |
| Fatal lung disease in nonsmokers | 1 "Strongly disagree" | CHW | 0.03 | 0.01 | -0.02 | |
| | | Control | 0.02 | 0.02 | (-0.05, 0.00) | |
| | 2 "Disagree" | CHW | 0.13 | 0.05 | -0.07 | |
| | | Control | 0.10 | 0.09 | (-0.13, -0.02) | |
| | 3 "Neither agree nor disagree" | CHW | 0.23 | 0.14 | -0.09 | 1.51 |
| | | Control | 0.20 | 0.20 | (-0.15, -0.03) | (0.52, 2.50) ^{a, b} |
| 4 "Agree" | CHW | 0.39 | 0.38 | -0.01 | | |
| | Control | 0.40 | 0.40 | (-0.06, 0.04) | | |
| 5 "Strongly agree" | CHW | 0.22 | 0.43 | 0.20 | | |
| | Control | 0.28 | 0.29 | (0.07, 0.32) | | |
| Quit now | 1 "Strongly disagree" | CHW | 0.03 | 0.01 | -0.01 | |
| | | Control | 0.02 | 0.02 | (-0.04, 0.01) | |
| | 2 "Disagree" | CHW | 0.04 | 0.02 | -0.02 | |
| | | Control | 0.03 | 0.03 | (-0.04, 0.01) | |
| | 3 "Neither agree nor disagree" | CHW | 0.08 | 0.04 | -0.03 | 0.88 |
| | | Control | 0.07 | 0.06 | (-0.07, 0.01) | (-0.11, 1.87) |
| 4 "Agree" | CHW | 0.44 | 0.33 | -0.09 | | |
| | Control | 0.42 | 0.39 | (-0.18, 0.01) | | |
| 5 "Strongly agree" | CHW | 0.41 | 0.60 | 0.15 | | |
| | Control | 0.46 | 0.51 | (-0.02, 0.31) | | |

(continued)

Table E-16. Youth: Ordinal Regression of Difference in Difference Health Belief Scores between Session 2 and Session 1 (continued)

| Warning | Ordinal Response Options for Corresponding Health Belief Item | Condition | Proportion Selecting Response | | DID (95% CI) | Interaction Term (95% CI) |
|--------------------|---|-----------|-------------------------------|-----------|----------------|------------------------------|
| | | | Session 1 | Session 2 | | |
| Stunt fetal growth | 1 "Strongly disagree" | CHW | 0.00 | 0.00 | 0.00 | |
| | | Control | 0.00 | 0.00 | (-0.01, 0.00) | |
| | 2 "Disagree" | CHW | 0.02 | 0.01 | -0.02 | |
| | | Control | 0.02 | 0.03 | (-0.03, 0.00) | |
| | 3 "Neither agree nor disagree" | CHW | 0.10 | 0.06 | -0.06 | 1.22 |
| | | Control | 0.12 | 0.13 | (-0.12, -0.01) | (0.19, 2.24) ^{a, b} |
| | 4 "Agree" | CHW | 0.35 | 0.27 | -0.10 | |
| | | Control | 0.37 | 0.39 | (-0.19, -0.01) | |
| | 5 "Strongly agree" | CHW | 0.53 | 0.66 | 0.18 | |
| | | Control | 0.49 | 0.45 | (0.03, 0.33) | |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

Note: Control = average of the 4 Surgeon General warnings for the relevant health belief. Regressions control for smoking status. DID = difference in difference. CHW = cigarette health warning. DID scores represent: (Session 2 proportion for CHW - Session 1 proportion for CHW) - (Session 2 proportion for Control - Session 1 proportion for Control).

Table E-17. Young Adults: Ordinal Regression of Difference in Difference Health Belief Scores between Session 2 and Session 1

| Warning | Ordinal Response Options for Corresponding Health Belief Item | Condition | Proportion Selecting Response | | DID (95% CI) | Interaction Term (95% CI) | |
|---------------|---|-----------|-------------------------------|-----------|----------------|---------------------------|--------------------------------------|
| | | | Session 1 | Session 2 | | | |
| Addictive | 1 "Strongly disagree" | CHW | 0.00 | 0.02 | 0.01 | | |
| | | Control | 0.01 | 0.01 | (-0.01, 0.04) | | |
| | 2 "Disagree" | CHW | 0.00 | 0.02 | 0.02 | | |
| | | Control | 0.01 | 0.01 | (-0.01, 0.05) | | |
| | 3 "Neither agree nor disagree" | CHW | 0.01 | 0.05 | 0.05 | | -2.56 (-4.92, -0.20) ^a |
| | | Control | 0.03 | 0.03 | (0.00, 0.10) | | |
| | 4 "Agree" | CHW | 0.08 | 0.27 | 0.20 | | |
| | | Control | 0.19 | 0.18 | (0.05, 0.36) | | |
| | 5 "Strongly agree" | CHW | 0.91 | 0.64 | -0.29 | | |
| | | Control | 0.77 | 0.78 | (-0.52, -0.05) | | |
| Harm children | 1 "Strongly disagree" | CHW | — | — | — | | |
| | | Control | — | — | — | | |
| | 2 "Disagree" | CHW | 0.00 | 0.00 | 0.00 | | |
| | | Control | 0.01 | 0.01 | (-0.01, 0.00) | | |
| | 3 "Neither agree nor disagree" | CHW | 0.03 | 0.03 | -0.01 | | 0.14 (-1.25, 1.54) |
| | | Control | 0.05 | 0.05 | (-0.04, 0.03) | | |
| | 4 "Agree" | CHW | 0.16 | 0.16 | -0.01 | | |
| | | Control | 0.23 | 0.25 | (-0.13, 0.10) | | |
| | 5 "Strongly agree" | CHW | 0.81 | 0.81 | 0.02 | | |
| | | Control | 0.71 | 0.69 | (-0.14, 0.18) | | |

(continued)

Table E-17. Young Adults: Ordinal Regression of Difference in Difference Health Belief Scores between Session 2 and Session 1 (continued)

| Warning | Ordinal Response Options for Corresponding Health Belief Item | Condition | Proportion Selecting Response | | DID (95% CI) | Interaction Term (95% CI) | |
|----------------------------------|---|-----------|-------------------------------|-----------------------|------------------------|---------------------------|------------------------|
| | | | Session 1 | Session 2 | | | |
| Kill you | 1 "Strongly disagree" | CHW | 0.02 | 0.01 | -0.01 (-0.03, 0.01) | | |
| | | Control | 0.02 | 0.02 | | | |
| | 2 "Disagree" | CHW | 0.01 | 0.01 | 0.00 (-0.01, 0.01) | | |
| | | Control | 0.01 | 0.01 | | | |
| | 3 "Neither agree nor disagree" | CHW | 0.03 | 0.02 | -0.01 (-0.05, 0.02) | | 0.71 (-1.02, 2.43) |
| | | Control | 0.03 | 0.03 | | | |
| | 4 "Agree" | CHW | 0.28 | 0.23 | -0.07 (-0.24, 0.10) | | |
| | | Control | 0.24 | 0.26 | | | |
| 5 "Strongly agree" | CHW | 0.65 | 0.73 | 0.10 (-0.13, 0.33) | | | |
| | Control | 0.71 | 0.68 | | | | |
| Fatal lung disease in nonsmokers | 1 "Strongly disagree" | CHW | 0.03 | 0.03 | 0.01 (-0.02, 0.04) | | |
| | | Control | 0.03 | 0.03 | | | |
| | 2 "Disagree" | CHW | 0.08 | 0.09 | 0.02 (-0.03, 0.07) | | |
| | | Control | 0.08 | 0.07 | | | |
| | 3 "Neither agree nor disagree" | CHW | 0.18 | 0.19 | 0.03 (-0.04, 0.10) | | -0.44 (-1.44, 0.55) |
| | | Control | 0.19 | 0.17 | | | |
| | 4 "Agree" | CHW | 0.36 | 0.36 | 0.01 (-0.01, 0.02) | | |
| | | Control | 0.36 | 0.36 | | | |
| | 5 "Strongly agree" | CHW | 0.35 | 0.32 | -0.07 (-0.22, 0.08) | | |
| | | Control | 0.33 | 0.37 | | | |
| Quit now | 1 "Strongly disagree" | CHW | 0.04 | 0.02 | -0.01 (-0.04, 0.01) | | |
| | | Control | 0.03 | 0.02 | | | |
| | 2 "Disagree" | CHW | 0.03 | 0.01 | -0.01 (-0.03, 0.01) | | |
| | | Control | 0.03 | 0.02 | | | |
| | 3 "Neither agree nor disagree" | CHW | 0.08 | 0.04 | -0.02 (-0.06, 0.02) | | 0.58 (-0.44, 1.59) |
| | | Control | 0.07 | 0.05 | | | |
| | 4 "Agree" | CHW | 0.32 | 0.23 | -0.05 (-0.14, 0.04) | | |
| | | Control | 0.29 | 0.25 | | | |
| | 5 "Strongly agree" | CHW | 0.52 | 0.70 | 0.09 (-0.06, 0.25) | | |
| | | Control | 0.58 | 0.66 | | | |

(continued)

Table E-17. Young Adults: Ordinal Regression of Difference in Difference Health Belief Scores between Session 2 and Session 1 (continued)

| Warning | Ordinal Response Options for Corresponding Health Belief Item | Condition | Proportion Selecting Response | | DID (95% CI) | Interaction Term (95% CI) |
|--------------------|---|-----------|-------------------------------|-----------|---------------|---------------------------|
| | | | Session 1 | Session 2 | | |
| Stunt fetal growth | 1 "Strongly disagree" | CHW | 0.01 | 0.00 | 0.00 | |
| | | Control | 0.01 | 0.01 | (-0.01, 0.01) | |
| | 2 "Disagree" | CHW | 0.02 | 0.01 | -0.01 | |
| | | Control | 0.02 | 0.02 | (-0.03, 0.01) | |
| | 3 "Neither agree nor disagree" | CHW | 0.08 | 0.04 | -0.03 | 1.07 |
| | | Control | 0.09 | 0.08 | (-0.09, 0.03) | (-0.45, 2.60) |
| | 4 "Agree" | CHW | 0.31 | 0.21 | -0.09 | |
| | | Control | 0.33 | 0.32 | (-0.20, 0.03) | |
| | 5 "Strongly agree" | CHW | 0.58 | 0.74 | 0.13 | |
| | | Control | 0.54 | 0.57 | (-0.06, 0.32) | |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

Note: Control = average of the 4 Surgeon General warnings for the relevant health belief. Regressions control for smoking status. DID = difference in difference. CHW = cigarette health warning. DID scores represent: (Session 2 proportion for CHW - Session 1 proportion for CHW) - (Session 2 proportion for Control - Session 1 proportion for Control). — = no young adults endorsed this response.

Table E-18. Older Adults: Ordinal Regression of Difference in Difference Health Belief Scores between Session 2 and Session 1

| Warning | Ordinal Response Options for Corresponding Health Belief Item | | Proportion Selecting Response | | DID (95% CI) | Interaction Term (95% CI) |
|---------------|---|---------|-------------------------------|-----------|---------------|---------------------------|
| | | | Session 1 | Session 2 | | |
| Addictive | 1 "Strongly disagree" | CHW | 0.01 | 0.01 | 0.00 | |
| | | Control | 0.02 | 0.02 | (0.00, 0.01) | |
| | 2 "Disagree" | CHW | 0.00 | 0.01 | 0.00 | |
| | | Control | 0.01 | 0.01 | (0.00, 0.00) | |
| | 3 "Neither agree nor disagree" | CHW | 0.02 | 0.03 | 0.01 | -0.49 (-1.22, 0.25) |
| | | Control | 0.04 | 0.04 | (0.00, 0.02) | |
| | 4 "Agree" | CHW | 0.14 | 0.16 | 0.03 | |
| | | Control | 0.19 | 0.19 | (-0.01, 0.07) | |
| | 5 "Strongly agree" | CHW | 0.83 | 0.79 | -0.04 | |
| | | Control | 0.75 | 0.75 | (-0.10, 0.02) | |
| Harm children | 1 "Strongly disagree" | CHW | 0.01 | 0.01 | 0.00 | |
| | | Control | 0.01 | 0.01 | (0.00, 0.00) | |
| | 2 "Disagree" | CHW | 0.02 | 0.02 | 0.00 | |
| | | Control | 0.02 | 0.02 | (-0.01, 0.00) | |
| | 3 "Neither agree nor disagree" | CHW | 0.08 | 0.08 | -0.01 | 0.19 (-0.37, 0.75) |
| | | Control | 0.08 | 0.09 | (-0.02, 0.01) | |
| | 4 "Agree" | CHW | 0.33 | 0.33 | -0.01 | |
| | | Control | 0.33 | 0.34 | (-0.04, 0.02) | |
| | 5 "Strongly agree" | CHW | 0.56 | 0.57 | 0.02 | |
| | | Control | 0.56 | 0.54 | (-0.04, 0.08) | |
| Kill you | 1 "Strongly disagree" | CHW | 0.01 | 0.01 | 0.00 | |
| | | Control | 0.01 | 0.01 | (0.00, 0.00) | |
| | 2 "Disagree" | CHW | 0.01 | 0.01 | 0.00 | |
| | | Control | 0.01 | 0.01 | (-0.01, 0.01) | |
| | 3 "Neither agree nor disagree" | CHW | 0.08 | 0.08 | 0.00 | 0.02 (-0.57, 0.62) |
| | | Control | 0.08 | 0.08 | (-0.02, 0.02) | |
| | 4 "Agree" | CHW | 0.31 | 0.31 | 0.00 | |
| | | Control | 0.31 | 0.31 | (-0.04, 0.04) | |
| | 5 "Strongly agree" | CHW | 0.59 | 0.59 | 0.00 | |
| | | Control | 0.59 | 0.59 | (-0.07, 0.07) | |

(continued)

Table E-18. Older Adults: Ordinal Regression of Difference in Difference Health Belief Scores between Session 2 and Session 1

| Warning | Ordinal Response Options for Corresponding Health Belief Item | Condition | Proportion Selecting Response | | DID (95% CI) | Interaction Term (95% CI) |
|----------------------------------|---|-----------|-------------------------------|-----------|----------------|-----------------------------|
| | | | Session 1 | Session 2 | | |
| Fatal lung disease in nonsmokers | 1 "Strongly disagree" | CHW | 0.03 | 0.02 | -0.01 | |
| | | Control | 0.03 | 0.03 | (-0.02, 0.00) | |
| | 2 "Disagree" | CHW | 0.09 | 0.06 | -0.02 | |
| | | Control | 0.09 | 0.08 | (-0.03, 0.00) | |
| | 3 "Neither agree nor disagree" | CHW | 0.25 | 0.21 | -0.02 | 0.43 |
| | | Control | 0.25 | 0.23 | (-0.05, 0.00) | (-0.09, 0.94) |
| | 4 "Agree" | CHW | 0.37 | 0.38 | 0.00 | |
| | | Control | 0.37 | 0.38 | (-0.01, 0.01) | |
| | 5 "Strongly agree" | CHW | 0.25 | 0.33 | 0.05 | |
| | | Control | 0.26 | 0.29 | (-0.01, 0.10) | |
| Quit now | 1 "Strongly disagree" | CHW | 0.02 | 0.01 | 0.00 | |
| | | Control | 0.02 | 0.02 | (-0.01, 0.01) | |
| | 2 "Disagree" | CHW | 0.02 | 0.02 | 0.00 | |
| | | Control | 0.02 | 0.02 | (-0.01, 0.01) | |
| | 3 "Neither agree nor disagree" | CHW | 0.08 | 0.07 | 0.00 | 0.06 |
| | | Control | 0.08 | 0.07 | (-0.02, 0.02) | (-0.47, 0.60) |
| | 4 "Agree" | CHW | 0.38 | 0.36 | -0.01 | |
| | | Control | 0.38 | 0.36 | (-0.05, 0.04) | |
| | 5 "Strongly agree" | CHW | 0.50 | 0.54 | 0.01 | |
| | | Control | 0.50 | 0.53 | (-0.07, 0.09) | |
| Stunt fetal growth | 1 "Strongly disagree" | CHW | 0.02 | 0.01 | -0.01 | |
| | | Control | 0.02 | 0.02 | (-0.02, 0.00) | |
| | 2 "Disagree" | CHW | 0.03 | 0.02 | -0.01 | |
| | | Control | 0.02 | 0.03 | (-0.02, 0.00) | |
| | 3 "Neither agree nor disagree" | CHW | 0.18 | 0.13 | -0.06 | 0.96 |
| | | Control | 0.17 | 0.18 | (-0.09, -0.02) | (0.38, 1.54) ^{a,b} |
| | 4 "Agree" | CHW | 0.38 | 0.35 | -0.04 | |
| | | Control | 0.38 | 0.38 | (-0.06, -0.01) | |
| | 5 "Strongly agree" | CHW | 0.39 | 0.50 | 0.12 | |
| | | Control | 0.41 | 0.40 | (0.05, 0.18) | |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

Note: Control = average of the 4 Surgeon General warnings for the relevant health belief. Regressions control for smoking status. DID = difference in difference. CHW = cigarette health warning. DID scores represent: (Session 2 proportion for CHW - Session 1 proportion for CHW) - (Session 2 proportion for Control - Session 1 proportion for Control).

Table E-19. Current Smokers: Ordinal Regression of Difference in Difference Health Belief Scores between Session 2 and Session 1

| Warning | Ordinal Response Options for Corresponding Health Belief Item | Condition | Proportion Selecting Response | | DID (95% CI) | Interaction Term (95% CI) | |
|--------------------|---|-----------|-------------------------------|----------------|---------------|---------------------------|--|
| | | | Session 1 | Session 2 | | | |
| Addictive | 1 "Strongly disagree" | CHW | 0.01 | 0.03 | 0.01 | | |
| | | Control | 0.02 | 0.02 | (0.00, 0.03) | | |
| | 2 "Disagree" | CHW | 0.01 | 0.01 | 0.01 | | |
| | | Control | 0.01 | 0.01 | (0.00, 0.01) | | |
| | 3 "Neither agree nor disagree" | CHW | 0.04 | 0.06 | 0.02 | | -0.94 (-1.72, -0.15) ^{a,b} |
| | | Control | 0.05 | 0.05 | (0.00, 0.04) | | |
| | 4 "Agree" | CHW | 0.19 | 0.25 | 0.05 | | |
| | | Control | 0.21 | 0.22 | (0.01, 0.10) | | |
| 5 "Strongly agree" | CHW | 0.76 | 0.65 | -0.09 | | | |
| | Control | 0.71 | 0.70 | (-0.17, -0.01) | | | |
| Harm children | 1 "Strongly disagree" | CHW | 0.01 | 0.01 | 0.00 | | |
| | | Control | 0.01 | 0.01 | (-0.01, 0.00) | | |
| | 2 "Disagree" | CHW | 0.03 | 0.02 | -0.01 | | |
| | | Control | 0.03 | 0.03 | (-0.02, 0.00) | | |
| | 3 "Neither agree nor disagree" | CHW | 0.10 | 0.09 | -0.02 | | 0.41 (-0.28, 1.09) |
| | | Control | 0.12 | 0.12 | (-0.04, 0.01) | | |
| | 4 "Agree" | CHW | 0.37 | 0.36 | -0.02 | | |
| | | Control | 0.39 | 0.39 | (-0.05, 0.01) | | |
| 5 "Strongly agree" | CHW | 0.49 | 0.53 | 0.05 | | | |
| | Control | 0.45 | 0.44 | (-0.03, 0.12) | | | |
| Kill you | 1 "Strongly disagree" | CHW | 0.02 | 0.02 | 0.00 | | |
| | | Control | 0.02 | 0.02 | (-0.01, 0.01) | | |
| | 2 "Disagree" | CHW | 0.02 | 0.02 | 0.00 | | |
| | | Control | 0.02 | 0.02 | (-0.01, 0.01) | | |
| | 3 "Neither agree nor disagree" | CHW | 0.11 | 0.11 | 0.01 | | -0.15 (-0.79, 0.50) |
| | | Control | 0.11 | 0.10 | (-0.02, 0.04) | | |
| | 4 "Agree" | CHW | 0.37 | 0.37 | 0.01 | | |
| | | Control | 0.37 | 0.36 | (-0.02, 0.04) | | |
| 5 "Strongly agree" | CHW | 0.48 | 0.48 | -0.02 | | | |
| | Control | 0.48 | 0.50 | (-0.09, 0.06) | | | |

(continued)

Table E-19. Current Smokers: Ordinal Regression of Difference in Difference Health Belief Scores between Session 2 and Session 1 (continued)

| Warning | Ordinal Response Options for Corresponding Health Belief Item | Condition | Proportion Selecting Response | | DID (95% CI) | Interaction Term (95% CI) |
|----------------------------------|---|-----------|-------------------------------|-----------|----------------|-----------------------------|
| | | | Session 1 | Session 2 | | |
| Fatal lung disease in nonsmokers | 1 "Strongly disagree" | CHW | 0.05 | 0.03 | -0.01 | |
| | | Control | 0.04 | 0.04 | (-0.03, 0.01) | |
| | 2 "Disagree" | CHW | 0.13 | 0.10 | -0.02 | |
| | | Control | 0.12 | 0.10 | (-0.05, 0.01) | |
| | 3 "Neither agree nor disagree" | CHW | 0.31 | 0.27 | -0.02 | 0.36 |
| | | Control | 0.29 | 0.27 | (-0.05, 0.02) | (-0.26, 0.98) |
| | 4 "Agree" | CHW | 0.34 | 0.37 | 0.02 | |
| | | Control | 0.36 | 0.37 | (-0.01, 0.05) | |
| | 5 "Strongly agree" | CHW | 0.16 | 0.22 | 0.03 | |
| | | Control | 0.19 | 0.22 | (-0.03, 0.09) | |
| Quit now | 1 "Strongly disagree" | CHW | 0.02 | 0.01 | 0.00 | |
| | | Control | 0.02 | 0.02 | (-0.01, 0.01) | |
| | 2 "Disagree" | CHW | 0.02 | 0.01 | 0.00 | |
| | | Control | 0.03 | 0.02 | (-0.01, 0.01) | |
| | 3 "Neither agree nor disagree" | CHW | 0.09 | 0.06 | -0.01 | 0.30 |
| | | Control | 0.11 | 0.09 | (-0.04, 0.02) | (-0.34, 0.94) |
| | 4 "Agree" | CHW | 0.40 | 0.34 | -0.03 | |
| | | Control | 0.42 | 0.39 | (-0.08, 0.02) | |
| | 5 "Strongly agree" | CHW | 0.48 | 0.58 | 0.04 | |
| | | Control | 0.43 | 0.49 | (-0.05, 0.13) | |
| Stunt fetal growth | 1 "Strongly disagree" | CHW | 0.03 | 0.01 | -0.02 | |
| | | Control | 0.03 | 0.03 | (-0.03, -0.01) | |
| | 2 "Disagree" | CHW | 0.05 | 0.02 | -0.02 | |
| | | Control | 0.04 | 0.04 | (-0.04, -0.01) | |
| | 3 "Neither agree nor disagree" | CHW | 0.20 | 0.13 | -0.07 | 1.33 |
| | | Control | 0.18 | 0.19 | (-0.11, -0.03) | (0.60, 2.06) ^{a,b} |
| | 4 "Agree" | CHW | 0.40 | 0.37 | -0.03 | |
| | | Control | 0.40 | 0.40 | (-0.06, -0.01) | |
| | 5 "Strongly agree" | CHW | 0.32 | 0.46 | 0.15 | |
| | | Control | 0.36 | 0.35 | (0.07, 0.22) | |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

Note: Control = average of the 4 Surgeon General warnings for the relevant health belief. Regressions control for age group. DID = difference in difference. CHW = cigarette health warning. DID scores represent: (Session 2 proportion for CHW - Session 1 proportion for CHW) - (Session 2 proportion for Control - Session 1 proportion for Control).

Table E-20. Nonsmokers: Ordinal Regression of Difference in Difference Health Belief Scores between Session 2 and Session 1

| Warning | Ordinal Response Options for Corresponding Health Belief Item | Condition | Proportion Selecting Response | | DID (95% CI) | Interaction Term (95% CI) |
|---------------|---|-----------|-------------------------------|-----------|----------------|--|
| | | | Session 1 | Session 2 | | |
| Addictive | 1 "Strongly disagree" | CHW | 0.00 | 0.01 | 0.01 | -1.17 (-2.19, -0.16) ^{a,b} |
| | | Control | 0.01 | 0.01 | (0.00, 0.01) | |
| | 2 "Disagree" | CHW | 0.00 | 0.00 | 0.00 | |
| | | Control | 0.01 | 0.01 | (0.00, 0.01) | |
| | 3 "Neither agree nor disagree" | CHW | 0.01 | 0.02 | 0.01 | |
| | | Control | 0.02 | 0.02 | (0.00, 0.02) | |
| | 4 "Agree" | CHW | 0.08 | 0.14 | 0.07 | |
| | | Control | 0.18 | 0.16 | (0.01, 0.13) | |
| | 5 "Strongly agree" | CHW | 0.90 | 0.84 | -0.10 | |
| | | Control | 0.77 | 0.80 | (-0.17, -0.02) | |
| Harm children | 1 "Strongly disagree" | CHW | 0.01 | 0.00 | 0.00 | 0.25 (-0.39, 0.90) |
| | | Control | 0.00 | 0.01 | (0.00, 0.00) | |
| | 2 "Disagree" | CHW | 0.01 | 0.01 | 0.00 | |
| | | Control | 0.01 | 0.01 | (-0.01, 0.00) | |
| | 3 "Neither agree nor disagree" | CHW | 0.05 | 0.04 | -0.01 | |
| | | Control | 0.04 | 0.05 | (-0.02, 0.01) | |
| | 4 "Agree" | CHW | 0.26 | 0.25 | -0.02 | |
| | | Control | 0.25 | 0.26 | (-0.07, 0.03) | |
| | 5 "Strongly agree" | CHW | 0.68 | 0.70 | 0.03 | |
| | | Control | 0.69 | 0.68 | (-0.05, 0.11) | |
| Kill you | 1 "Strongly disagree" | CHW | 0.00 | 0.00 | 0.00 | 0.37 (-0.50, 1.24) |
| | | Control | 0.00 | 0.00 | (0.00, 0.00) | |
| | 2 "Disagree" | CHW | 0.01 | 0.00 | 0.00 | |
| | | Control | 0.01 | 0.01 | (-0.01, 0.00) | |
| | 3 "Neither agree nor disagree" | CHW | 0.03 | 0.02 | -0.01 | |
| | | Control | 0.03 | 0.04 | (-0.02, 0.01) | |
| | 4 "Agree" | CHW | 0.22 | 0.19 | -0.03 | |
| | | Control | 0.24 | 0.24 | (-0.11, 0.04) | |
| | 5 "Strongly agree" | CHW | 0.74 | 0.78 | 0.04 | |
| | | Control | 0.72 | 0.72 | (-0.06, 0.14) | |

(continued)

Table E-20. Nonsmokers: Ordinal Regression of Difference in Difference Health Belief Scores between Session 2 and Session 1 (continued)

| Warning | Ordinal Response Options for Corresponding Health Belief Item | Condition | Proportion Selecting Response | | DID (95% CI) | Interaction Term (95% CI) |
|----------------------------------|---|-----------|-------------------------------|-----------|----------------|--------------------------------------|
| | | | Session 1 | Session 2 | | |
| Fatal lung disease in nonsmokers | 1 "Strongly disagree" | CHW | 0.02 | 0.01 | -0.01 | 0.61 (0.05, 1.18) ^a |
| | | Control | 0.02 | 0.01 | (-0.01, 0.00) | |
| | 2 "Disagree" | CHW | 0.07 | 0.04 | -0.02 | |
| | | Control | 0.07 | 0.06 | (-0.04, 0.00) | |
| | 3 "Neither agree nor disagree" | CHW | 0.19 | 0.13 | -0.04 | |
| | | Control | 0.19 | 0.17 | (-0.07, 0.00) | |
| | 4 "Agree" | CHW | 0.39 | 0.37 | -0.02 | |
| | | Control | 0.39 | 0.39 | (-0.04, 0.00) | |
| | 5 "Strongly agree" | CHW | 0.34 | 0.45 | 0.08 | |
| | | Control | 0.34 | 0.37 | (0.01, 0.16) | |
| Quit now | 1 "Strongly disagree" | CHW | 0.03 | 0.02 | -0.01 | 0.30 (-0.27, 0.87) |
| | | Control | 0.02 | 0.02 | (-0.02, 0.00) | |
| | 2 "Disagree" | CHW | 0.03 | 0.02 | -0.01 | |
| | | Control | 0.02 | 0.02 | (-0.02, 0.00) | |
| | 3 "Neither agree nor disagree" | CHW | 0.07 | 0.06 | -0.01 | |
| | | Control | 0.06 | 0.05 | (-0.03, 0.01) | |
| | 4 "Agree" | CHW | 0.38 | 0.34 | -0.02 | |
| | | Control | 0.34 | 0.33 | (-0.08, 0.03) | |
| | 5 "Strongly agree" | CHW | 0.49 | 0.57 | 0.05 | |
| | | Control | 0.56 | 0.59 | (-0.04, 0.14) | |
| Stunt fetal growth | 1 "Strongly disagree" | CHW | 0.00 | 0.00 | 0.00 | 0.75 (0.12, 1.39) ^{a, b} |
| | | Control | 0.00 | 0.00 | (0.00, 0.00) | |
| | 2 "Disagree" | CHW | 0.01 | 0.00 | 0.00 | |
| | | Control | 0.01 | 0.01 | (-0.01, 0.00) | |
| | 3 "Neither agree nor disagree" | CHW | 0.11 | 0.07 | -0.04 | |
| | | Control | 0.12 | 0.13 | (-0.08, -0.01) | |
| | 4 "Agree" | CHW | 0.34 | 0.28 | -0.06 | |
| | | Control | 0.36 | 0.36 | (-0.11, -0.01) | |
| | 5 "Strongly agree" | CHW | 0.54 | 0.64 | 0.11 | |
| | | Control | 0.51 | 0.49 | (0.02, 0.20) | |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

Note: Control = average of the 4 Surgeon General warnings for the relevant health belief. Regressions control for age group. DID = difference in difference. CHW = cigarette health warning. DID scores represent: (Session 2 proportion for CHW - Session 1 proportion for CHW) - (Session 2 proportion for Control - Session 1 proportion for Control).

Table E-21. Youth: Linear Regression of Difference in Difference Mean Health Belief Scores between Session 3 and Session 1

| Condition | Mean (SD) Health Belief Score | | DID (95% CI) |
|----------------------|-------------------------------|-------------|---------------------------|
| | Session 1 | Session 3 | |
| Head and neck cancer | 3.12 (3.43) | 3.51 (2.40) | 0.16 |
| Control | 3.34 (1.49) | 3.58 (1.31) | (-0.23, 0.55) |
| Bladder cancer | 3.13 (3.17) | 3.73 (2.23) | 0.44 |
| Control | 3.16 (1.54) | 3.32 (1.60) | (0.04, 0.85) ^a |
| Clogged arteries | 3.74 (2.60) | 3.99 (1.82) | 0.19 |
| Control | 3.96 (1.27) | 4.02 (1.28) | (-0.16, 0.53) |
| COPD 1 ^c | 4.30 (1.88) | 4.41 (1.63) | 0.00 |
| Control | 4.36 (0.97) | 4.47 (1.09) | (-0.25, 0.25) |
| COPD 2 ^d | 4.36 (2.46) | 4.43 (1.85) | -0.04 |
| Control | 4.35 (0.94) | 4.46 (1.05) | (-0.36, 0.28) |
| Erectile dysfunction | 3.49 (2.71) | 3.67 (1.91) | -0.03 |
| Control | 3.48 (1.42) | 3.69 (1.38) | (-0.39, 0.34) |
| Amputation | 3.24 (3.40) | 3.79 (2.06) | 0.36 |
| Control | 3.39 (1.46) | 3.59 (1.43) | (-0.04, 0.75) |
| Diabetes | 2.87 (2.45) | 3.27 (2.50) | 0.13 |
| Control | 2.92 (1.56) | 3.19 (1.63) | (-0.26, 0.51) |
| Macular degeneration | 2.99 (2.32) | 3.49 (2.33) | 0.34 |
| Control | 3.20 (1.41) | 3.37 (1.44) | (0.04, 0.63) ^a |
| Cataracts | 3.04 (2.35) | 3.68 (2.12) | 0.50 |
| Control | 3.15 (1.44) | 3.29 (1.53) | (0.12, 0.89) ^a |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.
^c Image of diseased lungs. ^d Image of man with oxygen.

Note: Control = average of the 4 Surgeon General warnings for the relevant health belief. Regressions control for smoking status. DID = difference in difference. CHW = cigarette health warning. SD = standard deviation. DID scores represent: (Session 3 mean for CHW - Session 1 mean for CHW) - (Session 3 mean for Control - Session 1 mean for Control).

Table E-22. Young Adults: Linear Regression of Difference in Difference Mean Health Belief Scores between Session 3 and Session 1

| Condition | Mean (SD) Health Belief Score | | DID (95% CI) |
|----------------------|-------------------------------|-------------|---------------|
| | Session 1 | Session 3 | |
| Head and neck cancer | 3.43 (3.96) | 3.96 (2.29) | 0.30 |
| Control | 3.78 (1.37) | 4.02 (1.67) | (-0.44, 1.04) |
| Bladder cancer | 3.50 (2.26) | 4.03 (2.28) | 0.33 |
| Control | 3.47 (1.22) | 3.67 (1.51) | (-0.23, 0.88) |
| Clogged arteries | 3.93 (2.64) | 4.40 (1.57) | 0.34 |
| Control | 4.09 (1.18) | 4.22 (1.40) | (-0.05, 0.73) |
| COPD 1 ^c | 4.38 (2.91) | 4.19 (2.10) | -0.18 |
| Control | 4.47 (0.91) | 4.46 (1.28) | (-0.72, 0.37) |
| COPD 2 ^d | 4.78 (0.97) | 4.55 (1.19) | -0.20 |
| Control | 4.50 (0.93) | 4.47 (1.33) | (-0.51, 0.10) |
| Erectile dysfunction | 4.18 (2.26) | 3.88 (2.36) | -0.42 |
| Control | 3.89 (1.23) | 4.01 (1.55) | (-0.98, 0.14) |
| Amputation | 3.61 (2.97) | 4.02 (2.29) | 0.25 |
| Control | 3.84 (1.42) | 4.01 (1.49) | (-0.40, 0.89) |
| Diabetes | 3.37 (2.21) | 3.95 (1.85) | 0.06 |
| Control | 3.08 (1.65) | 3.60 (1.79) | (-0.46, 0.58) |
| Macular degeneration | 3.69 (2.88) | 4.19 (1.79) | 0.29 |
| Control | 3.56 (1.14) | 3.76 (1.69) | (-0.17, 0.76) |
| Cataracts | 3.40 (2.05) | 3.92 (1.98) | 0.19 |
| Control | 3.45 (1.47) | 3.79 (1.66) | (-0.32, 0.70) |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.
^c Image of diseased lungs. ^d Image of man with oxygen.

Note: Control = average of the 4 Surgeon General warnings for the relevant health belief. Regressions control for smoking status. DID = difference in difference. CHW = cigarette health warning. SD = standard deviation. DID scores represent: (Session 3 mean for CHW - Session 1 mean for CHW) - (Session 3 mean for Control - Session 1 mean for Control).

Table E-23. Older Adults: Linear Regression of Difference in Difference Mean Health Belief Scores between Session 3 and Session 1

| Condition | Mean (SD) Health Belief Score | | DID (95% CI) |
|----------------------|-------------------------------|-------------|------------------------------|
| | Session 1 | Session 3 | |
| Head and neck cancer | 3.24 (2.74) | 3.67 (3.04) | 0.28 |
| Control | 3.31 (1.51) | 3.46 (1.44) | (0.12, 0.44) ^{a, b} |
| Bladder cancer | 3.23 (3.15) | 3.58 (3.19) | 0.33 |
| Control | 3.24 (1.43) | 3.28 (1.47) | (0.14, 0.52) ^{a, b} |
| Clogged arteries | 3.96 (2.45) | 3.93 (2.77) | -0.09 |
| Control | 3.94 (1.31) | 3.99 (1.30) | (-0.23, 0.05) |
| COPD 1 ^c | 4.36 (2.44) | 4.34 (2.53) | -0.09 |
| Control | 4.38 (1.08) | 4.45 (1.02) | (-0.23, 0.04) |
| COPD 2 ^d | 4.44 (2.29) | 4.41 (2.25) | -0.10 |
| Control | 4.38 (1.09) | 4.45 (1.02) | (-0.22, 0.02) |
| Erectile dysfunction | 3.66 (2.84) | 3.97 (2.53) | 0.20 |
| Control | 3.61 (1.28) | 3.72 (1.32) | (0.03, 0.36) ^{a, b} |
| Amputation | 3.51 (2.68) | 4.03 (2.74) | 0.39 |
| Control | 3.54 (1.45) | 3.67 (1.46) | (0.24, 0.55) ^{a, b} |
| Diabetes | 2.85 (3.06) | 3.29 (3.45) | 0.28 |
| Control | 2.86 (1.46) | 3.02 (1.49) | (0.07, 0.49) ^{a, b} |
| Macular degeneration | 3.21 (2.54) | 3.56 (3.06) | 0.24 |
| Control | 3.19 (1.42) | 3.30 (1.39) | (0.08, 0.40) ^{a, b} |
| Cataracts | 2.96 (2.82) | 3.46 (2.87) | 0.31 |
| Control | 3.02 (1.43) | 3.21 (1.48) | (0.13, 0.49) ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.
^c Image of diseased lungs. ^d Image of man with oxygen.

Note: Control = average of the 4 Surgeon General warnings for the relevant health belief. Regressions control for smoking status. DID = difference in difference. CHW = cigarette health warning. SD = standard deviation. DID scores represent: (Session 3 mean for CHW - Session 1 mean for CHW) - (Session 3 mean for Control - Session 1 mean for Control).

Table E-24. Current Smokers: Linear Regression of Difference in Difference Mean Health Belief Scores between Session 3 and Session 1

| Condition | Mean (SD) Health Belief Score | | DID (95% CI) |
|----------------------|-------------------------------|-------------|------------------------------|
| | Session 1 | Session 3 | |
| Head and neck cancer | 3.21 (3.20) | 3.69 (3.22) | 0.26 |
| Control | 3.13 (1.51) | 3.35 (1.41) | (0.07, 0.46) ^{a, b} |
| Bladder cancer | 3.02 (3.33) | 3.56 (3.21) | 0.49 |
| Control | 3.11 (1.44) | 3.15 (1.47) | (0.22, 0.76) ^{a, b} |
| Clogged arteries | 3.76 (2.49) | 3.81 (2.84) | -0.04 |
| Control | 3.81 (1.34) | 3.89 (1.36) | (-0.22, 0.15) |
| COPD 1 ^c | 4.16 (2.69) | 4.12 (3.00) | -0.15 |
| Control | 4.21 (1.14) | 4.33 (1.14) | (-0.36, 0.05) |
| COPD 2 ^d | 4.34 (2.51) | 4.36 (2.05) | -0.11 |
| Control | 4.21 (1.14) | 4.33 (1.13) | (-0.28, 0.07) |
| Erectile dysfunction | 3.69 (2.71) | 3.96 (2.20) | 0.16 |
| Control | 3.54 (1.34) | 3.65 (1.34) | (-0.06, 0.37) |
| Amputation | 3.37 (2.76) | 3.92 (2.77) | 0.42 |
| Control | 3.46 (1.46) | 3.59 (1.47) | (0.21, 0.63) ^{a, b} |
| Diabetes | 2.86 (3.30) | 3.27 (3.72) | 0.24 |
| Control | 2.76 (1.55) | 2.93 (1.51) | (-0.03, 0.51) |
| Macular degeneration | 3.21 (2.73) | 3.53 (3.07) | 0.19 |
| Control | 3.08 (1.50) | 3.21 (1.38) | (-0.04, 0.42) |
| Cataracts | 2.80 (2.65) | 3.29 (2.84) | 0.28 |
| Control | 2.93 (1.50) | 3.14 (1.48) | (0.05, 0.51) ^a |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.
^c Image of diseased lungs. ^d Image of man with oxygen.

Note: Control = average of the 4 Surgeon General warnings for the relevant health belief. Regressions control for age group. DID = difference in difference. CHW = cigarette health warning. SD = standard deviation. DID scores represent: (Session 3 mean for CHW - Session 1 mean for CHW) - (Session 3 mean for Control - Session 1 mean for Control).

Table E-25. Nonsmokers: Linear Regression of Difference in Difference Mean Health Belief Scores between Session 3 and Session 1

| Condition | Mean (SD) Health Belief Score | | DID (95% CI) |
|----------------------|-------------------------------|-------------|------------------------------|
| | Session 1 | Session 3 | |
| Head and neck cancer | 3.29 (2.76) | 3.68 (2.52) | 0.27 |
| Control | 3.54 (1.48) | 3.66 (1.47) | (0.07, 0.47) ^{a, b} |
| Bladder cancer | 3.43 (2.77) | 3.76 (2.66) | 0.26 |
| Control | 3.37 (1.40) | 3.45 (1.51) | (0.06, 0.47) ^{a, b} |
| Clogged arteries | 4.09 (2.41) | 4.14 (2.17) | 0.01 |
| Control | 4.07 (1.25) | 4.11 (1.27) | (-0.16, 0.18) |
| COPD 1 ^c | 4.50 (2.07) | 4.51 (1.83) | -0.02 |
| Control | 4.53 (0.97) | 4.55 (0.96) | (-0.15, 0.12) |
| COPD 2 ^d | 4.57 (1.94) | 4.51 (1.98) | -0.08 |
| Control | 4.53 (0.97) | 4.55 (0.97) | (-0.21, 0.05) |
| Erectile dysfunction | 3.62 (2.83) | 3.83 (2.52) | 0.06 |
| Control | 3.67 (1.29) | 3.82 (1.36) | (-0.13, 0.26) |
| Amputation | 3.55 (2.79) | 4.02 (2.41) | 0.33 |
| Control | 3.62 (1.43) | 3.77 (1.45) | (0.13, 0.52) ^{a, b} |
| Diabetes | 2.95 (2.55) | 3.43 (2.65) | 0.24 |
| Control | 2.99 (1.46) | 3.22 (1.57) | (0.02, 0.47) ^a |
| Macular degeneration | 3.26 (2.37) | 3.68 (2.53) | 0.31 |
| Control | 3.34 (1.32) | 3.45 (1.46) | (0.14, 0.48) ^{a, b} |
| Cataracts | 3.18 (2.63) | 3.73 (2.42) | 0.37 |
| Control | 3.20 (1.38) | 3.38 (1.53) | (0.16, 0.58) ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.
^c Image of diseased lungs. ^d Image of man with oxygen.

Note: Control = average of the 4 Surgeon General warnings for the relevant health belief. Regressions control for age group. DID = difference in difference. CHW = cigarette health warning. SD = standard deviation. DID scores represent: (Session 3 mean for CHW - Session 1 mean for CHW) - (Session 3 mean for Control - Session 1 mean for Control).

Table E-26. Youth: Ordinal Regression of Difference in Difference Health Belief Scores between Session 3 and Session 1

| Warning | Ordinal Response Options for Health Belief Item | Condition | Proportion Selecting Response | | DID (95% CI) | Interaction Term (95% CI) |
|----------------------------------|---|-----------|-------------------------------|-----------|----------------|---------------------------|
| | | | Session 1 | Session 3 | | |
| Addictive | 1 "Strongly disagree" | CHW | 0.01 | 0.01 | 0.01 | |
| | | Control | 0.02 | 0.02 | (-0.01, 0.03) | |
| | 2 "Disagree" | CHW | 0.01 | 0.02 | 0.01 | |
| | | Control | 0.03 | 0.02 | (-0.01, 0.03) | |
| | 3 "Neither agree nor disagree" | CHW | 0.01 | 0.02 | 0.01 | -1.00 |
| | | Control | 0.03 | 0.02 | (-0.01, 0.03) | (-2.78, 0.77) |
| | 4 "Agree" | CHW | 0.13 | 0.17 | 0.07 | |
| | | Control | 0.21 | 0.18 | (-0.05, 0.20) | |
| | 5 "Strongly agree" | CHW | 0.84 | 0.77 | -0.11 | |
| | | Control | 0.72 | 0.76 | (-0.29, 0.07) | |
| Harm children | 1 "Strongly disagree" | CHW | 0.01 | 0.01 | 0.01 | |
| | | Control | 0.02 | 0.01 | (-0.01, 0.02) | |
| | 2 "Disagree" | CHW | 0.02 | 0.02 | 0.01 | |
| | | Control | 0.04 | 0.02 | (-0.02, 0.04) | |
| | 3 "Neither agree nor disagree" | CHW | 0.06 | 0.05 | 0.02 | -0.44 |
| | | Control | 0.08 | 0.05 | (-0.04, 0.07) | (-2.25, 1.36) |
| | 4 "Agree" | CHW | 0.28 | 0.25 | 0.03 | |
| | | Control | 0.33 | 0.27 | (-0.12, 0.18) | |
| | 5 "Strongly agree" | CHW | 0.63 | 0.68 | -0.07 | |
| | | Control | 0.54 | 0.66 | (-0.32, 0.19) | |
| Kill you | 1 "Strongly disagree" | CHW | 0.01 | 0.01 | 0.01 | |
| | | Control | 0.01 | 0.01 | (-0.01, 0.02) | |
| | 2 "Disagree" | CHW | 0.01 | 0.01 | 0.01 | |
| | | Control | 0.02 | 0.01 | (-0.01, 0.03) | |
| | 3 "Neither agree nor disagree" | CHW | 0.02 | 0.02 | 0.02 | -0.94 |
| | | Control | 0.05 | 0.03 | (-0.01, 0.05) | (-2.63, 0.75) |
| | 4 "Agree" | CHW | 0.23 | 0.23 | 0.08 | |
| | | Control | 0.33 | 0.25 | (-0.06, 0.21) | |
| | 5 "Strongly agree" | CHW | 0.73 | 0.73 | -0.11 | |
| | | Control | 0.59 | 0.70 | (-0.30, 0.07) | |
| Fatal lung disease in nonsmokers | 1 "Strongly disagree" | CHW | 0.03 | 0.00 | -0.02 | |
| | | Control | 0.02 | 0.02 | (-0.04, 0.01) | |
| | 2 "Disagree" | CHW | 0.14 | 0.04 | -0.08 | |
| | | Control | 0.11 | 0.09 | (-0.16, -0.01) | |
| | 3 "Neither agree nor disagree" | CHW | 0.20 | 0.09 | -0.10 | 1.60 |
| | | Control | 0.18 | 0.16 | (-0.16, -0.03) | (0.46, 2.75) ^a |
| | 4 "Agree" | CHW | 0.40 | 0.35 | -0.06 | |
| | | Control | 0.41 | 0.41 | (-0.14, 0.03) | |
| | 5 "Strongly agree" | CHW | | 0.52 | 0.26 | |
| | | Control | 0.29 | 0.32 | (0.09, 0.42) | |

(continued)

Table E-26. Youth: Ordinal Regression of Difference in Difference Health Belief Scores between Session 3 and Session 1 (continued)

| Warning | Ordinal Response Options for Corresponding Health Belief Item | Condition | Proportion Selecting Response | | DID (95% CI) | Interaction Term (95% CI) |
|--------------------|---|-----------|-------------------------------|-----------|---------------|---------------------------|
| | | | Session 1 | Session 3 | | |
| Quit now | 1 "Strongly disagree" | CHW | 0.03 | 0.01 | 0.00 | 0.18 (-0.98, 1.34) |
| | | Control | 0.03 | 0.01 | (-0.02, 0.02) | |
| | 2 "Disagree" | CHW | 0.02 | 0.01 | 0.00 | |
| | | Control | 0.02 | 0.01 | (-0.02, 0.01) | |
| | 3 "Neither agree nor disagree" | CHW | 0.09 | 0.04 | 0.00 | |
| | | Control | 0.10 | 0.05 | (-0.06, 0.05) | |
| | 4 "Agree" | CHW | 0.45 | 0.35 | -0.03 | |
| | | Control | 0.46 | 0.38 | (-0.13, 0.08) | |
| | 5 "Strongly agree" | CHW | 0.41 | 0.59 | 0.03 | |
| | | Control | 0.39 | 0.54 | (-0.16, 0.22) | |
| Stunt fetal growth | 1 "Strongly disagree" | CHW | 0.01 | 0.01 | 0.00 | -0.44 (-1.58, 0.70) |
| | | Control | 0.01 | 0.01 | (-0.01, 0.02) | |
| | 2 "Disagree" | CHW | 0.02 | 0.03 | 0.01 | |
| | | Control | 0.03 | 0.03 | (-0.01, 0.03) | |
| | 3 "Neither agree nor disagree" | CHW | 0.08 | 0.12 | 0.02 | |
| | | Control | 0.11 | 0.12 | (-0.04, 0.09) | |
| | 4 "Agree" | CHW | 0.34 | 0.38 | 0.04 | |
| | | Control | 0.37 | 0.38 | (-0.05, 0.12) | |
| | 5 "Strongly agree" | CHW | 0.56 | 0.46 | -0.07 | |
| | | Control | 0.49 | 0.46 | (-0.25, 0.11) | |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

Note: Control = average of the 4 Surgeon General warnings for the relevant health belief. Regressions control for smoking status. DID = difference in difference. CHW = cigarette health warning. DID scores represent: (Session 3 proportion for CHW - Session 1 proportion for CHW) - (Session 3 proportion for Control - Session 1 proportion for Control).

Table E-27. Young Adults: Ordinal Regression of Difference in Difference Health Belief Scores between Session 3 and Session 1

| Warning | Ordinal Response Options for Corresponding Health Belief Item | Condition | Proportion Selecting Response | | DID (95% CI) | Interaction Term (95% CI) |
|--------------------|---|-----------|-------------------------------|---------------|---------------|---------------------------|
| | | | Session 1 | Session 3 | | |
| Addictive | 1 "Strongly disagree" | CHW | — | — | — | |
| | | Control | — | — | — | |
| | 2 "Disagree" | CHW | — | — | — | |
| | | Control | — | — | — | |
| | 3 "Neither agree nor disagree" | CHW | 0.05 | 0.08 | 0.03 | -0.96 |
| | | Control | 0.05 | 0.05 | (-0.05, 0.12) | (-3.72, 1.79) |
| 4 "Agree" | CHW | 0.13 | 0.17 | 0.04 | | |
| | Control | 0.13 | 0.13 | (-0.08, 0.17) | | |
| 5 "Strongly agree" | CHW | 0.82 | 0.75 | -0.08 | | |
| | Control | 0.83 | 0.83 | (-0.29, 0.13) | | |
| Harm children | 1 "Strongly disagree" | CHW | — | — | — | |
| | | Control | — | — | — | |
| | 2 "Disagree" | CHW | 0.01 | 0.02 | 0.01 | |
| | | Control | 0.01 | 0.01 | (-0.02, 0.04) | |
| | 3 "Neither agree nor disagree" | CHW | 0.03 | 0.07 | 0.04 | -1.23 |
| | | Control | 0.04 | 0.03 | (-0.02, 0.09) | (-2.80, 0.34) |
| 4 "Agree" | CHW | 0.16 | 0.25 | 0.09 | | |
| | Control | 0.17 | 0.16 | (-0.03, 0.22) | | |
| 5 "Strongly agree" | CHW | 0.80 | 0.67 | -0.14 | | |
| | Control | 0.79 | 0.80 | (-0.33, 0.05) | | |
| Kill you | 1 "Strongly disagree" | CHW | 0.00 | 0.01 | 0.01 | |
| | | Control | 0.02 | 0.02 | (-0.02, 0.04) | |
| | 2 "Disagree" | CHW | — | — | — | |
| | | Control | — | — | — | |
| | 3 "Neither agree nor disagree" | CHW | 0.01 | 0.01 | 0.01 | -2.84 |
| | | Control | 0.02 | 0.02 | (-0.01, 0.03) | (-17.83, 12.16) |
| 4 "Agree" | CHW | 0.10 | 0.17 | 0.08 | | |
| | Control | 0.20 | 0.20 | (-0.09, 0.25) | | |
| 5 "Strongly agree" | CHW | 0.89 | 0.80 | -0.10 | | |
| | Control | 0.77 | 0.77 | (-0.27, 0.08) | | |

(continued)

Table E-27. Young Adults: Ordinal Regression of Difference in Difference Health Belief Scores between Session 3 and Session 1 (continued)

| Warning | Ordinal Response Options for Corresponding Health Belief Item | Condition | Proportion Selecting Response | | DID (95% CI) | Interaction Term (95% CI) |
|----------------------------------|---|-----------|-------------------------------|-----------|---------------|---------------------------|
| | | | Session 1 | Session 3 | | |
| Fatal lung disease in nonsmokers | 1 "Strongly disagree" | CHW | 0.01 | 0.01 | 0.01 | |
| | | Control | 0.01 | 0.01 | (-0.01, 0.02) | |
| | 2 "Disagree" | CHW | 0.03 | 0.03 | 0.02 | |
| | | Control | 0.04 | 0.02 | (-0.02, 0.06) | |
| | 3 "Neither agree nor disagree" | CHW | 0.17 | 0.17 | 0.06 | -1.05 |
| | | Control | 0.20 | 0.14 | (-0.04, 0.16) | (-2.76, 0.66) |
| | 4 "Agree" | CHW | 0.42 | 0.42 | 0.03 | |
| | | Control | 0.43 | 0.40 | (-0.03, 0.09) | |
| | 5 "Strongly agree" | CHW | 0.37 | 0.36 | -0.12 | |
| | | Control | 0.32 | 0.43 | (-0.31, 0.07) | |
| Quit now | 1 "Strongly disagree" | CHW | 0.05 | 0.02 | -0.02 | |
| | | Control | 0.02 | 0.01 | (-0.07, 0.02) | |
| | 2 "Disagree" | CHW | 0.04 | 0.02 | -0.01 | |
| | | Control | 0.02 | 0.01 | (-0.04, 0.01) | |
| | 3 "Neither agree nor disagree" | CHW | 0.11 | 0.07 | -0.03 | 0.61 |
| | | Control | 0.06 | 0.04 | (-0.09, 0.03) | (-0.96, 2.17) |
| | 4 "Agree" | CHW | 0.35 | 0.28 | -0.03 | |
| | | Control | 0.25 | 0.22 | (-0.14, 0.08) | |
| | 5 "Strongly agree" | CHW | 0.45 | 0.61 | 0.10 | |
| | | Control | 0.66 | 0.71 | (-0.12, 0.31) | |
| Stunt fetal growth | 1 "Strongly disagree" | CHW | — | — | — | |
| | | Control | — | — | | |
| | 2 "Disagree" | CHW | 0.01 | 0.01 | 0.00 | |
| | | Control | 0.00 | 0.01 | (-0.02, 0.02) | |
| | 3 "Neither agree nor disagree" | CHW | 0.12 | 0.12 | -0.02 | 0.38 |
| | | Control | 0.07 | 0.09 | (-0.19, 0.15) | (-2.36, 3.13) |
| | 4 "Agree" | CHW | 0.40 | 0.39 | -0.03 | |
| | | Control | 0.33 | 0.36 | (-0.22, 0.15) | |
| | 5 "Strongly agree" | CHW | 0.48 | 0.48 | 0.05 | |
| | | Control | 0.59 | 0.54 | (-0.33, 0.43) | |

^a Significant at p<.05 in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

Note: Control = average of the 4 Surgeon General warnings for the relevant health belief. Regressions control for smoking status. DID = difference in difference. CHW = cigarette health warning. DID scores represent: (Session 3 proportion for CHW – Session 1 proportion for CHW) – (Session 3 proportion for Control – Session 1 proportion for Control). — = no young adults endorsed this response.

Table E-28. Older Adults: Ordinal Regression of Difference in Difference Health Belief Scores between Session 3 and Session 1

| Warning | Ordinal Response Options for Corresponding Health Belief Item | Condition | Proportion Selecting Response | | DID (95% CI) | Interaction Term (95% CI) |
|---------------|---|-----------|-------------------------------|-----------|---------------|---------------------------|
| | | | Session 1 | Session 3 | | |
| Addictive | 1 "Strongly disagree" | CHW | 0.02 | 0.02 | 0.00 | |
| | | Control | 0.02 | 0.02 | (-0.01, 0.02) | |
| | 2 "Disagree" | CHW | 0.00 | 0.01 | 0.00 | |
| | | Control | 0.01 | 0.01 | (0.00, 0.00) | |
| | 3 "Neither agree nor disagree" | CHW | 0.03 | 0.03 | 0.00 | -0.18 |
| | | Control | 0.03 | 0.03 | (-0.01, 0.02) | (-0.96, 0.61) |
| | 4 "Agree" | CHW | 0.15 | 0.16 | 0.01 | |
| | | Control | 0.17 | 0.16 | (-0.04, 0.06) | |
| | 5 "Strongly agree" | CHW | 0.79 | 0.78 | -0.02 | |
| | | Control | 0.77 | 0.78 | (-0.10, 0.06) | |
| Harm children | 1 "Strongly disagree" | CHW | 0.01 | 0.01 | 0.00 | |
| | | Control | 0.01 | 0.01 | (0.00, 0.01) | |
| | 2 "Disagree" | CHW | 0.02 | 0.02 | 0.00 | |
| | | Control | 0.02 | 0.02 | (-0.01, 0.01) | |
| | 3 "Neither agree nor disagree" | CHW | 0.09 | 0.09 | 0.00 | -0.04 |
| | | Control | 0.08 | 0.08 | (-0.02, 0.03) | (-0.70, 0.62) |
| | 4 "Agree" | CHW | 0.34 | 0.35 | 0.00 | |
| | | Control | 0.33 | 0.34 | (-0.04, 0.04) | |
| | 5 "Strongly agree" | CHW | 0.54 | 0.53 | 0.00 | |
| | | Control | 0.56 | 0.56 | (-0.08, 0.07) | |
| Kill you | 1 "Strongly disagree" | CHW | 0.01 | 0.01 | 0.00 | |
| | | Control | 0.01 | 0.01 | (0.00, 0.00) | |
| | 2 "Disagree" | CHW | 0.01 | 0.01 | 0.00 | |
| | | Control | 0.01 | 0.01 | (0.00, 0.00) | |
| | 3 "Neither agree nor disagree" | CHW | 0.10 | 0.08 | 0.00 | -0.09 |
| | | Control | 0.08 | 0.07 | (-0.02, 0.03) | (-0.70, 0.53) |
| | 4 "Agree" | CHW | 0.31 | 0.29 | 0.01 | |
| | | Control | 0.29 | 0.27 | (-0.03, 0.04) | |
| | 5 "Strongly agree" | CHW | 0.57 | 0.61 | -0.01 | |
| | | Control | 0.61 | 0.65 | (-0.08, 0.06) | |

(continued)

Table E-28. Older Adults: Ordinal Regression of Difference in Difference Health Belief Scores between Session 3 and Session 1 (contined)

| Warning | Ordinal Response Options for Corresponding Health Belief Item | Condition | Proportion Selecting Response | | DID (95% CI) | Interaction Term (95% CI) |
|----------------------------------|---|-----------|-------------------------------|-----------|---------------|---------------------------|
| | | | Session 1 | Session 3 | | |
| Fatal lung disease in nonsmokers | 1 "Strongly disagree" | CHW | 0.03 | 0.02 | -0.01 | |
| | | Control | 0.02 | 0.02 | (-0.02, 0.00) | |
| | 2 "Disagree" | CHW | 0.10 | 0.07 | -0.02 | |
| | | Control | 0.08 | 0.07 | (-0.04, 0.01) | |
| | 3 "Neither agree nor disagree" | CHW | 0.27 | 0.23 | -0.03 | 0.45 |
| | | Control | 0.24 | 0.23 | (-0.06, 0.01) | (-0.12, 1.01) |
| | 4 "Agree" | CHW | 0.37 | 0.38 | 0.01 | |
| | | Control | 0.38 | 0.38 | (-0.01, 0.02) | |
| | 5 "Strongly agree" | CHW | 0.22 | 0.29 | 0.04 | |
| | | Control | 0.27 | 0.29 | (-0.01, 0.10) | |
| Quit now | 1 "Strongly disagree" | CHW | 0.02 | 0.01 | 0.00 | |
| | | Control | 0.02 | 0.01 | (0.00, 0.01) | |
| | 2 "Disagree" | CHW | 0.02 | 0.02 | 0.00 | |
| | | Control | 0.02 | 0.01 | (0.00, 0.01) | |
| | 3 "Neither agree nor disagree" | CHW | 0.08 | 0.06 | 0.01 | -0.23 |
| | | Control | 0.08 | 0.06 | (-0.01, 0.03) | (-0.80, 0.33) |
| | 4 "Agree" | CHW | 0.38 | 0.35 | 0.02 | |
| | | Control | 0.39 | 0.34 | (-0.03, 0.07) | |
| | 5 "Strongly agree" | CHW | 0.51 | 0.56 | -0.03 | |
| | | Control | 0.49 | 0.57 | (-0.12, 0.05) | |
| Stunt fetal growth | 1 "Strongly disagree" | CHW | 0.01 | 0.01 | 0.00 | |
| | | Control | 0.01 | 0.01 | (-0.01, 0.00) | |
| | 2 "Disagree" | CHW | 0.03 | 0.02 | 0.00 | |
| | | Control | 0.03 | 0.03 | (-0.01, 0.01) | |
| | 3 "Neither agree nor disagree" | CHW | 0.15 | 0.13 | -0.01 | 0.15 |
| | | Control | 0.16 | 0.15 | (-0.04, 0.03) | (-0.52, 0.82) |
| | 4 "Agree" | CHW | 0.36 | 0.34 | -0.01 | |
| | | Control | 0.36 | 0.35 | (-0.04, 0.02) | |
| | 5 "Strongly agree" | CHW | 0.44 | 0.50 | 0.02 | |
| | | Control | 0.43 | 0.46 | (-0.06, 0.10) | |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

Note: Control = average of the 4 Surgeon General warnings for the relevant health belief. Regressions control for smoking status. DID = difference in difference. CHW = cigarette health warning. DID scores represent: (Session 3 proportion for CHW - Session 1 proportion for CHW) - (Session 3 proportion for Control - Session 1 proportion for Control).

Table E-29. Current Smokers: Ordinal Regression of Difference in Difference Health Belief Scores between Session 3 and Session 1

| Warning | Ordinal Response Options for Corresponding Health Belief Item | Condition | Proportion Selecting Response | | DID (95% CI) | Interaction Term (95% CI) |
|---------------|---|-----------|-------------------------------|-----------|---------------|---------------------------|
| | | | Session 1 | Session 3 | | |
| Addictive | 1 "Strongly disagree" | CHW | 0.02 | 0.03 | 0.01 | |
| | | Control | 0.02 | 0.02 | (0.00, 0.03) | |
| | 2 "Disagree" | CHW | 0.01 | 0.01 | 0.00 | |
| | | Control | 0.01 | 0.01 | (0.00, 0.01) | |
| | 3 "Neither agree nor disagree" | CHW | 0.04 | 0.05 | 0.02 | -0.65 |
| | | Control | 0.04 | 0.04 | (0.00, 0.04) | (-1.49, 0.20) |
| | 4 "Agree" | CHW | 0.20 | 0.23 | 0.04 | |
| | | Control | 0.21 | 0.20 | (-0.01, 0.10) | |
| | 5 "Strongly agree" | CHW | 0.73 | 0.67 | -0.07 | |
| | | Control | 0.72 | 0.73 | (-0.17, 0.02) | |
| Harm children | 1 "Strongly disagree" | CHW | 0.01 | 0.01 | 0.00 | |
| | | Control | 0.01 | 0.01 | (0.00, 0.01) | |
| | 2 "Disagree" | CHW | 0.02 | 0.02 | 0.01 | |
| | | Control | 0.03 | 0.03 | (0.00, 0.02) | |
| | 3 "Neither agree nor disagree" | CHW | 0.09 | 0.11 | 0.02 | -0.51 |
| | | Control | 0.11 | 0.11 | (-0.01, 0.06) | (-1.33, 0.32) |
| | 4 "Agree" | CHW | 0.38 | 0.40 | 0.03 | |
| | | Control | 0.41 | 0.40 | (-0.02, 0.07) | |
| | 5 "Strongly agree" | CHW | 0.50 | 0.46 | -0.06 | |
| | | Control | 0.44 | 0.45 | (-0.16, 0.04) | |
| Kill you | 1 "Strongly disagree" | CHW | 0.02 | 0.02 | 0.01 | |
| | | Control | 0.02 | 0.01 | (0.00, 0.02) | |
| | 2 "Disagree" | CHW | 0.02 | 0.02 | 0.00 | |
| | | Control | 0.02 | 0.01 | (0.00, 0.01) | |
| | 3 "Neither agree nor disagree" | CHW | 0.13 | 0.13 | 0.03 | -0.61 |
| | | Control | 0.12 | 0.09 | (-0.01, 0.06) | (-1.30, 0.08) |
| | 4 "Agree" | CHW | 0.39 | 0.39 | 0.03 | |
| | | Control | 0.38 | 0.35 | (0.00, 0.07) | |
| | 5 "Strongly agree" | CHW | 0.44 | 0.44 | -0.07 | |
| | | Control | 0.47 | 0.54 | (-0.16, 0.01) | |

(continued)

Table E-29. Current Smokers: Ordinal Regression of Difference in Difference Health Belief Scores between Session 3 and Session 1 (continued)

| Warning | Ordinal Response Options for Corresponding Health Belief Item | Condition | Proportion Selecting Response | | DID (95% CI) | Interaction Term (95% CI) |
|----------------------------------|---|-----------|-------------------------------|-----------|---------------|---------------------------|
| | | | Session 1 | Session 3 | | |
| Fatal lung disease in nonsmokers | 1 "Strongly disagree" | CHW | 0.04 | 0.03 | -0.01 | |
| | | Control | 0.04 | 0.03 | (-0.02, 0.01) | |
| | 2 "Disagree" | CHW | 0.12 | 0.09 | -0.01 | |
| | | Control | 0.11 | 0.09 | (-0.05, 0.02) | |
| | 3 "Neither agree nor disagree" | CHW | 0.29 | 0.26 | -0.01 | 0.22 |
| | | Control | 0.28 | 0.26 | (-0.05, 0.03) | (-0.49, 0.93) |
| | 4 "Agree" | CHW | 0.37 | 0.39 | 0.01 | |
| | | Control | 0.38 | 0.39 | (-0.02, 0.04) | |
| | 5 "Strongly agree" | CHW | 0.17 | 0.23 | 0.02 | |
| | | Control | 0.19 | 0.23 | (-0.04, 0.08) | |
| Quit now | 1 "Strongly disagree" | CHW | 0.01 | 0.01 | 0.00 | |
| | | Control | 0.02 | 0.01 | (-0.01, 0.01) | |
| | 2 "Disagree" | CHW | 0.02 | 0.01 | 0.00 | |
| | | Control | 0.02 | 0.02 | (-0.01, 0.01) | |
| | 3 "Neither agree nor disagree" | CHW | 0.08 | 0.06 | 0.01 | -0.10 |
| | | Control | 0.10 | 0.07 | (-0.02, 0.04) | (-0.78, 0.59) |
| | 4 "Agree" | CHW | 0.40 | 0.36 | 0.00 | |
| | | Control | 0.43 | 0.39 | (-0.06, 0.06) | |
| | 5 "Strongly agree" | CHW | 0.49 | 0.56 | -0.02 | |
| | | Control | 0.43 | 0.51 | (-0.12, 0.09) | |
| Stunt fetal growth | 1 "Strongly disagree" | CHW | 0.02 | 0.01 | 0.00 | |
| | | Control | 0.02 | 0.02 | (-0.01, 0.01) | |
| | 2 "Disagree" | CHW | 0.04 | 0.03 | 0.00 | |
| | | Control | 0.04 | 0.04 | (-0.02, 0.01) | |
| | 3 "Neither agree nor disagree" | CHW | 0.18 | 0.15 | -0.01 | 0.22 |
| | | Control | 0.19 | 0.17 | (-0.06, 0.04) | (-0.64, 1.08) |
| | 4 "Agree" | CHW | 0.39 | 0.38 | -0.01 | |
| | | Control | 0.39 | 0.39 | (-0.03, 0.02) | |
| | 5 "Strongly agree" | CHW | 0.37 | 0.43 | 0.02 | |
| | | Control | 0.35 | 0.39 | (-0.07, 0.12) | |

^a Significant at p<.05 in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

Note: Control = average of the 4 Surgeon General warnings for the relevant health belief. Regressions control for age group. DID = difference in difference. CHW = cigarette health warning. DID scores represent: (Session 3 proportion for CHW – Session 1 proportion for CHW) – (Session 3 proportion for Control – Session 1 proportion for Control).

Table E-30. Nonsmokers: Ordinal Regression of Difference in Difference Health Belief Scores between Session 3 and Session 1

| Warning | Ordinal Response Options for Corresponding Health Belief Item | Condition | Proportion Selecting Response | | DID (95% CI) | Interaction Term (95% CI) |
|----------------------------------|---|-----------|-------------------------------|-----------|----------------|-----------------------------|
| | | | Session 1 | Session 3 | | |
| Addictive | 1 "Strongly disagree" | CHW | 0.01 | 0.02 | 0.00 | |
| | | Control | 0.02 | 0.02 | (-0.01, 0.02) | |
| | 2 "Disagree" | CHW | 0.00 | 0.00 | 0.00 | |
| | | Control | 0.01 | 0.00 | (0.00, 0.00) | |
| | 3 "Neither agree nor disagree" | CHW | 0.01 | 0.02 | 0.00 | -0.18 |
| | | Control | 0.02 | 0.02 | (-0.01, 0.02) | (-1.38, 1.01) |
| | 4 "Agree" | CHW | 0.11 | 0.11 | 0.01 | |
| | | Control | 0.14 | 0.13 | (-0.06, 0.08) | |
| | 5 "Strongly agree" | CHW | 0.86 | 0.85 | -0.02 | |
| | | Control | 0.81 | 0.82 | (-0.12, 0.09) | |
| Harm children | 1 "Strongly disagree" | CHW | 0.01 | 0.01 | 0.00 | |
| | | Control | 0.01 | 0.01 | (-0.01, 0.00) | |
| | 2 "Disagree" | CHW | 0.02 | 0.01 | 0.00 | |
| | | Control | 0.01 | 0.01 | (-0.01, 0.01) | |
| | 3 "Neither agree nor disagree" | CHW | 0.06 | 0.06 | 0.00 | 0.08 |
| | | Control | 0.05 | 0.05 | (-0.03, 0.02) | (-0.73, 0.89) |
| | 4 "Agree" | CHW | 0.27 | 0.26 | -0.01 | |
| | | Control | 0.24 | 0.24 | (-0.06, 0.05) | |
| | 5 "Strongly agree" | CHW | 0.64 | 0.66 | 0.01 | |
| | | Control | 0.69 | 0.70 | (-0.08, 0.10) | |
| Kill you | 1 "Strongly disagree" | CHW | 0.00 | 0.00 | 0.00 | |
| | | Control | 0.00 | 0.00 | (0.00, 0.00) | |
| | 2 "Disagree" | CHW | 0.01 | 0.00 | 0.00 | |
| | | Control | 0.01 | 0.01 | (0.00, 0.00) | |
| | 3 "Neither agree nor disagree" | CHW | 0.03 | 0.02 | 0.00 | 0.18 |
| | | Control | 0.03 | 0.03 | (-0.02, 0.02) | (-0.78, 1.14) |
| | 4 "Agree" | CHW | 0.21 | 0.17 | -0.01 | |
| | | Control | 0.22 | 0.19 | (-0.08, 0.06) | |
| | 5 "Strongly agree" | CHW | 0.75 | 0.81 | 0.02 | |
| | | Control | 0.74 | 0.78 | (-0.08, 0.11) | |
| Fatal lung disease in nonsmokers | 1 "Strongly disagree" | CHW | 0.02 | 0.01 | -0.01 | |
| | | Control | 0.01 | 0.01 | (-0.02, 0.00) | |
| | 2 "Disagree" | CHW | 0.07 | 0.04 | -0.03 | |
| | | Control | 0.06 | 0.06 | (-0.06, 0.00) | |
| | 3 "Neither agree nor disagree" | CHW | 0.21 | 0.14 | -0.06 | 0.87 |
| | | Control | 0.18 | 0.17 | (-0.10, -0.01) | (0.20, 1.53) ^{a,b} |
| | 4 "Agree" | CHW | 0.40 | 0.37 | -0.02 | |
| | | Control | 0.39 | 0.39 | (-0.05, 0.00) | |
| | 5 "Strongly agree" | CHW | 0.31 | 0.44 | 0.12 | |
| | | Control | 0.35 | 0.37 | (0.03, 0.21) | |

(continued)

Table E-30. Nonsmokers: Ordinal Regression of Difference in Difference Health Belief Scores between Session 3 and Session 1 (continued)

| Warning | Ordinal Response Options for Corresponding Health Belief Item | Condition | Proportion Selecting Response | | DID (95% CI) | Interaction Term (95% CI) |
|--------------------|---|-----------|-------------------------------|-----------|---------------|---------------------------|
| | | | Session 1 | Session 3 | | |
| Quit now | 1 "Strongly disagree" | CHW | 0.02 | 0.01 | 0.00 | |
| | | Control | 0.02 | 0.01 | (-0.01, 0.01) | |
| | 2 "Disagree" | CHW | 0.02 | 0.01 | 0.00 | |
| | | Control | 0.02 | 0.01 | (-0.01, 0.01) | |
| | 3 "Neither agree nor disagree" | CHW | 0.08 | 0.05 | 0.00 | 0.00 |
| | | Control | 0.07 | 0.04 | (-0.03, 0.02) | (-0.66, 0.67) |
| | 4 "Agree" | CHW | 0.38 | 0.32 | 0.00 | |
| | | Control | 0.36 | 0.30 | (-0.05, 0.06) | |
| | 5 "Strongly agree" | CHW | 0.49 | 0.59 | 0.00 | |
| | | Control | 0.54 | 0.64 | (-0.10, 0.10) | |
| Stunt fetal growth | 1 "Strongly disagree" | CHW | 0.01 | 0.01 | 0.00 | |
| | | Control | 0.01 | 0.01 | (0.00, 0.01) | |
| | 2 "Disagree" | CHW | 0.01 | 0.02 | 0.00 | |
| | | Control | 0.02 | 0.02 | (-0.01, 0.01) | |
| | 3 "Neither agree nor disagree" | CHW | 0.10 | 0.11 | 0.01 | -0.20 |
| | | Control | 0.11 | 0.10 | (-0.03, 0.05) | (-0.95, 0.54) |
| | 4 "Agree" | CHW | 0.33 | 0.34 | 0.01 | |
| | | Control | 0.34 | 0.33 | (-0.04, 0.07) | |
| | 5 "Strongly agree" | CHW | 0.55 | 0.53 | -0.03 | |
| | | Control | 0.53 | 0.54 | (-0.14, 0.08) | |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

Note: Control = average of the 4 Surgeon General warnings for the relevant health belief. Regressions control for age group. DID = difference in difference. CHW = cigarette health warning. DID scores represent: (Session 3 proportion for CHW - Session 1 proportion for CHW) - (Session 3 proportion for Control - Session 1 proportion for Control).

Table E-31. Youth: Logistic Regressions of Warning Label Recall Comparing CHW with SG Warnings

| Condition | Description | % Recall | OR (95% CI) |
|-------------|----------------------------------|----------|--|
| 0 (Control) | Average of 4 SG warnings | 36.6% | REF |
| 1 | Addictive | 76.0% | 5.26 (1.91, 14.49) ^{a, b} |
| 2 | Harm children | 68.4% | 3.79 (1.34, 10.73) ^{a, b} |
| 3 | Kill you | 78.3% | 6.19 (2.06, 18.65) ^{a, b} |
| 4 | Fatal lung disease in nonsmokers | 69.6% | 4.11 (1.64, 10.29) ^{a, b} |
| 5 | Quit now | 86.4% | 11.23 (3.03, 41.64) ^{a, b} |
| 6 | Head and neck cancer | 74.1% | 4.59 (1.74, 12.11) ^{a, b} |
| 7 | Bladder cancer | 69.2% | 3.81 (1.50, 9.70) ^{a, b} |
| 8 | Stunt fetal growth | 85.0% | 9.61 (2.77, 33.32) ^{a, b} |
| 9 | Clogged arteries | 57.1% | 2.47 (0.93, 6.59) |
| 10 | COPD 1 ^c | 72.4% | 4.30 (1.70, 10.89) ^{a, b} |
| 11 | COPD 2 ^d | 70.6% | 4.27 (1.36, 13.34) ^{a, b} |
| 12 | Erectile dysfunction | 72.0% | 4.49 (1.67, 12.04) ^{a, b} |
| 13 | Amputation | 83.3% | 8.53 (2.28, 31.95) ^{a, b} |
| 14 | Diabetes | 80.8% | 8.04 (2.77, 23.37) ^{a, b} |
| 15 | Macular degeneration | 89.5% | 14.52 (3.20, 65.90) ^{a, b} |
| 16 | Cataracts | 73.1% | 4.86 (1.88, 12.51) ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

^c Image of diseased lungs. ^d Image of man with oxygen.

Note: Due to a technical error with the online survey platform, the question assessing accuracy of warning recall did not function properly for some Session 3 participants. These cases were removed from the analysis of recall. Thus, the analytic sample size in this table is 467. Regressions control for smoking status.

Table E-32. Young Adults: Logistic Regressions of Warning Label Recall Comparing CHW with SG Warnings

| Condition | Description | % Recall | OR (95% CI) |
|-------------|----------------------------------|----------|--------------------------------------|
| 0 (Control) | Average of 4 SG warnings | 40.0% | REF |
| 1 | Addictive | 100.0% | — ^e |
| 2 | Harm children | 92.3% | 17.10 (2.05, 142.64) ^a |
| 3 | Kill you | 88.9% | 12.65 (1.47, 109.06) ^a |
| 4 | Fatal lung disease in nonsmokers | 92.3% | 18.01 (2.09, 155.14) ^a |
| 5 | Quit now | 75.0% | 4.63 (1.33, 16.04) ^a |
| 6 | Head and neck cancer | 90.9% | 16.04 (1.89, 136.25) ^a |
| 7 | Bladder cancer | 66.7% | 3.38 (0.53, 21.47) |
| 8 | Stunt fetal growth | 75.0% | 4.50 (0.84, 24.10) |
| 9 | Clogged arteries | 66.7% | 3.07 (0.64, 14.67) |
| 10 | COPD 1 ^c | 62.5% | 2.49 (0.53, 11.80) |
| 11 | COPD 2 ^d | 83.3% | 8.12 (1.60, 41.16) ^a |
| 12 | Erectile dysfunction | 63.6% | 2.67 (0.68, 10.53) |
| 13 | Amputation | 85.7% | 9.00 (1.84, 43.97) ^a |
| 14 | Diabetes | 87.5% | 10.44 (2.14, 50.95) ^a |
| 15 | Macular degeneration | 90.9% | 16.04 (1.89, 136.25) ^a |
| 16 | Cataracts | 80.0% | 6.00 (1.19, 30.37) ^a |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

^c Image of diseased lungs. ^d Image of man with oxygen. ^e There is no odds ratio because 100% of young adults recalled the Addictive warning.

Note: Due to a technical error with the online survey platform, the question assessing accuracy of warning recall did not function properly for some Session 3 participants. These cases were removed from the analysis of recall. Thus, the analytic sample size in this table is 227. Regressions control for smoking status.

Table E-33. Older Adults: Logistic Regressions of Warning Label Recall Comparing CHW with SG Warnings

| Condition | Description | % Recall | OR (95% CI) |
|-------------|----------------------------------|----------|---------------------------------------|
| 0 (Control) | Average of 4 SG warnings | 22.1% | REF |
| 1 | Addictive | 59.5% | 5.18 (3.38, 7.93) ^{a, b} |
| 2 | Harm children | 69.5% | 8.22 (5.34, 12.63) ^{a, b} |
| 3 | Kill you | 73.7% | 9.91 (6.42, 15.31) ^{a, b} |
| 4 | Fatal lung disease in nonsmokers | 58.9% | 5.09 (3.31, 7.83) ^{a, b} |
| 5 | Quit now | 57.5% | 4.77 (3.19, 7.13) ^{a, b} |
| 6 | Head and neck cancer | 56.2% | 4.61 (3.04, 7.00) ^{a, b} |
| 7 | Bladder cancer | 62.4% | 5.94 (3.92, 9.02) ^{a, b} |
| 8 | Stunt fetal growth | 62.5% | 5.85 (3.74, 9.15) ^{a, b} |
| 9 | Clogged arteries | 46.8% | 3.17 (2.11, 4.78) ^{a, b} |
| 10 | COPD 1 ^c | 54.2% | 4.22 (2.77, 6.41) ^{a, b} |
| 11 | COPD 2 ^d | 53.6% | 4.08 (2.71, 6.14) ^{a, b} |
| 12 | Erectile dysfunction | 58.7% | 5.01 (3.24, 7.73) ^{a, b} |
| 13 | Amputation | 71.2% | 8.78 (5.70, 13.51) ^{a, b} |
| 14 | Diabetes | 54.7% | 4.38 (2.87, 6.67) ^{a, b} |
| 15 | Macular degeneration | 53.7% | 4.12 (2.73, 6.22) ^{a, b} |
| 16 | Cataracts | 46.9% | 3.17 (2.11, 4.77) ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

^c Image of diseased lungs. ^d Image of man with oxygen.

Note: Due to a technical error with the online survey platform, the question assessing accuracy of warning recall did not function properly for some Session 3 participants. These cases were removed from the analysis of recall. Thus, the analytic sample size in this table is 2,469. Regressions control for smoking status.

Table E-34. Current Smokers: Logistic Regressions of Warning Label Recall Comparing CHW with SG Warnings

| Condition | Description | % Recall | OR (95% CI) |
|-------------|----------------------------------|----------|--|
| 0 (Control) | Average of 4 SG warnings | 24.7% | REF |
| 1 | Addictive | 60.6% | 4.72 (2.75, 8.10) ^{a, b} |
| 2 | Harm children | 76.7% | 10.01 (5.50, 18.22) ^{a, b} |
| 3 | Kill you | 75.9% | 10.20 (5.73, 18.14) ^{a, b} |
| 4 | Fatal lung disease in nonsmokers | 59.7% | 4.55 (2.62, 7.91) ^{a, b} |
| 5 | Quit now | 63.0% | 5.31 (3.16, 8.91) ^{a, b} |
| 6 | Head and neck cancer | 63.9% | 5.65 (3.15, 10.14) ^{a, b} |
| 7 | Bladder cancer | 69.6% | 7.40 (4.15, 13.19) ^{a, b} |
| 8 | Stunt fetal growth | 67.2% | 6.25 (3.50, 11.16) ^{a, b} |
| 9 | Clogged arteries | 58.0% | 4.36 (2.51, 7.57) ^{a, b} |
| 10 | COPD 1 ^c | 59.7% | 4.60 (2.63, 8.05) ^{a, b} |
| 11 | COPD 2 ^d | 52.2% | 3.48 (2.03, 5.96) ^{a, b} |
| 12 | Erectile dysfunction | 64.3% | 5.60 (3.20, 9.79) ^{a, b} |
| 13 | Amputation | 71.6% | 7.79 (4.38, 13.86) ^{a, b} |
| 14 | Diabetes | 63.1% | 5.19 (2.92, 9.20) ^{a, b} |
| 15 | Macular degeneration | 57.1% | 4.26 (2.43, 7.48) ^{a, b} |
| 16 | Cataracts | 53.5% | 3.49 (2.04, 5.97) ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

^c Image of diseased lungs. ^d Image of man with oxygen.

Note: Due to a technical error with the online survey platform, the question assessing accuracy of warning recall did not function properly for some Session 3 participants. These cases were removed from the analysis of recall. Thus, the analytic sample size in this table is 1,432. Regressions control for age group.

Table E-35. Nonsmokers: Logistic Regressions of Warning Label Recall Comparing CHW with SG Warnings

| Condition | Description | % Recall | OR (95% CI) |
|-------------|----------------------------------|----------|---------------------------------------|
| 0 (Control) | Average of 4 SG warnings | 26.5% | REF |
| 1 | Addictive | 68.8% | 6.55 (3.81, 11.25) ^{a, b} |
| 2 | Harm children | 66.7% | 6.29 (3.73, 10.61) ^{a, b} |
| 3 | Kill you | 74.4% | 8.80 (5.06, 15.33) ^{a, b} |
| 4 | Fatal lung disease in nonsmokers | 66.7% | 6.03 (3.58, 10.15) ^{a, b} |
| 5 | Quit now | 62.6% | 5.05 (3.07, 8.31) ^{a, b} |
| 6 | Head and neck cancer | 60.2% | 4.40 (2.72, 7.10) ^{a, b} |
| 7 | Bladder cancer | 59.1% | 4.25 (2.57, 7.02) ^{a, b} |
| 8 | Stunt fetal growth | 66.2% | 5.93 (3.38, 10.41) ^{a, b} |
| 9 | Clogged arteries | 42.4% | 2.24 (1.35, 3.70) ^{a, b} |
| 10 | COPD 1 ^c | 56.8% | 3.75 (2.28, 6.17) ^{a, b} |
| 11 | COPD 2 ^d | 62.4% | 5.12 (3.05, 8.57) ^{a, b} |
| 12 | Erectile dysfunction | 58.7% | 3.99 (2.34, 6.80) ^{a, b} |
| 13 | Amputation | 75.6% | 9.77 (5.65, 16.90) ^{a, b} |
| 14 | Diabetes | 61.7% | 4.93 (3.05, 7.97) ^{a, b} |
| 15 | Macular degeneration | 63.3% | 5.48 (3.34, 9.00) ^{a, b} |
| 16 | Cataracts | 52.7% | 3.50 (2.17, 5.64) ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

^c Image of diseased lungs. ^d Image of man with oxygen.

Note: Due to a technical error with the online survey platform, the question assessing accuracy of warning recall did not function properly for some Session 3 participants. These cases were removed from the analysis of recall. Thus, the analytic sample size in this table is 1,731. Regressions control for age group.

Table E-36. Youth: Summary of Results for each CHW Compared with Average of SG Warnings

| | | Session 1 (n = 2,301) | | | | | Session 2 (n = 949) | Session 3 (n=561) | | |
|----|----------------------------------|-----------------------|---------------------------|----------------------------|----------------------------|-------------------------------|----------------------------------|--|--|--------------------------|
| | | New information (OR) | Thinking about risks (OR) | Perceived factualness (OR) | Self-reported learning (B) | Perceived informativeness (B) | Perceived understand-ability (B) | Health beliefs Session 2 vs. Session 1 (DID or interaction term) | Health beliefs Session 3 vs. Session 1 (DID or interaction term) | Recall ^f (OR) |
| 1 | Addictive | 0.49 ^{a, b} | 1.43 | 1.18 | -0.77 ^{a, b} | -0.15 | 0.62 ^{a, b} | -1.78 ^{a, b, c} | -1.00 | 5.26 ^{a, b} |
| 2 | Harm children | 1.24 | 4.71 ^{a, b} | 0.93 | 0.14 | 0.74 ^{a, b} | 0.56 ^{a, b} | 1.02 ^c | -0.44 | 3.79 ^{a, b} |
| 3 | Kill you | 1.00 | 2.68 ^{a, b} | 0.56 | -0.43 ^a | 0.36 ^{a, b} | 0.73 ^{a, b} | -0.05 ^c | -0.94 | 6.19 ^{a, b} |
| 4 | Fatal lung disease in nonsmokers | 1.61 ^{a, b} | 3.39 ^{a, b} | 0.77 | 0.70 ^{a, b} | 0.90 ^{a, b} | 0.75 ^{a, b} | 1.51 ^{a, b, c} | 1.60 ^a | 4.11 ^{a, b} |
| 5 | Quit now | 0.97 | 1.49 | 0.84 | -0.57 ^{a, b} | -0.29 | 0.21 | 0.88 ^c | 0.18 | 11.23 ^{a, b} |
| 6 | Head and neck cancer | 9.35 ^{a, b} | 3.77 ^{a, b} | 0.60 | 1.95 ^{a, b} | 0.84 ^{a, b} | 0.65 ^{a, b} | 0.71 ^{a, b} | 0.16 | 4.59 ^{a, b} |
| 7 | Bladder cancer | 17.38 ^{a, b} | 2.01 ^{a, b} | 0.47 ^{a, b} | 2.19 ^{a, b} | 0.90 ^{a, b} | 0.64 ^{a, b} | 0.65 ^{a, b} | 0.44 ^a | 3.81 ^{a, b} |
| 8 | Stunt fetal growth | 1.79 ^{a, b} | 2.46 ^{a, b} | 0.71 | 0.84 ^{a, b} | 1.12 ^{a, b} | 0.96 ^{a, b} | 1.22 ^{a, b, c} | -0.44 | 9.61 ^{a, b} |
| 9 | Clogged arteries | 2.65 ^{a, b} | 3.15 ^{a, b} | 1.19 | 1.20 ^{a, b} | 0.96 ^{a, b} | 0.83 ^{a, b} | 0.37 ^a | 0.19 | 2.47 |
| 10 | COPD 1 ^d | 1.86 ^{a, b} | 3.10 ^{a, b} | 1.80 | 0.89 ^{a, b} | 0.77 ^{a, b} | 0.76 ^{a, b} | 0.27 ^{a, b} | 0.00 | 4.30 ^{a, b} |
| 11 | COPD 2 ^e | 1.49 | 3.42 ^{a, b} | 5.76 ^{a, b} | 0.82 ^{a, b} | 0.93 ^{a, b} | 0.62 ^{a, b} | -0.01 | -0.04 | 4.27 ^{a, b} |
| 12 | Erectile dysfunction | 7.56 ^{a, b} | 1.16 | 0.37 ^{a, b} | 1.94 ^{a, b} | 0.88 ^{a, b} | 0.39 ^{a, b} | 0.65 ^{a, b} | -0.03 | 4.49 ^{a, b} |
| 13 | Amputation | 7.19 ^{a, b} | 6.16 ^{a, b} | 0.70 | 2.24 ^{a, b} | 1.33 ^{a, b} | 0.81 ^{a, b} | 0.70 ^{a, b} | 0.36 | 8.53 ^{a, b} |
| 14 | Diabetes | 8.37 ^{a, b} | 3.73 ^{a, b} | 0.71 | 2.11 ^{a, b} | 1.02 ^{a, b} | 0.78 ^{a, b} | 0.97 ^{a, b} | 0.13 | 8.04 ^{a, b} |
| 15 | Macular degeneration | 11.19 ^{a, b} | 4.65 ^{a, b} | 0.76 | 2.45 ^{a, b} | 1.19 ^{a, b} | 0.53 ^{a, b} | 0.77 ^{a, b} | 0.34 ^a | 14.52 ^{a, b} |
| 16 | Cataracts | 13.73 ^{a, b} | 2.15 ^{a, b} | 0.37 ^{a, b} | 2.31 ^{a, b} | 0.92 ^{a, b} | 0.70 ^{a, b} | 0.89 ^{a, b} | 0.50 ^a | 4.86 ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons. ^c Relevant health belief items are not scaled so the reported result is the interaction term from the ordinal regression rather than the DID. ^d Image of diseased lungs. ^e Image of man with oxygen. ^f Due to a technical error with the online survey platform, the question assessing accuracy of warning recall did not function properly for some Session 3 participants. These cases were removed from the analysis of recall. Thus, the analytic sample size in this table is 467.

Note: All results control for smoking status. OR = odds ratio. B = regression coefficient. DID = difference in difference score. DID scores represent: (follow-up session proportion for CHW – Session 1 proportion for CHW) – (follow-up session proportion for Control – Session 1 proportion for Control) where follow-up is either Session 2 or Session 3.

Table E-37. Young Adults: Summary of Results for each CHW Compared with Average of SG Warnings

| | Session 1 (n = 2,071) | | | | | | Session 2 (n = 617) | Session 3 (n=273) | |
|------------------------------------|----------------------------|------------------------------------|------------------------------------|--------------------------------------|--|---|--|--|-----------------------------|
| | New information (OR) | Thinking about risks (OR) | Perceived factual- ness (OR) | Self- reported learning (B) | Perceived infor- mativeness (B) | Perceived understan- d-ability (B) | Health beliefs Session 2 vs. Session 1 (DID or interaction term) | Health beliefs Session 3 vs. Session 1 (DID or interaction term) | Recall ^f (OR) |
| 1 Addictive | 0.37 ^{a, b} | 1.08 | 1.11 | -0.28 | 0.02 | 0.56 ^{a, b} | -2.56 ^{a, c} | -0.96 | — ^g |
| 2 Harm children | 0.68 | 1.71 ^a | 1.78 | 0.03 | 0.61 ^{a, b} | 0.75 ^{a, b} | 0.14 ^c | -1.23 | 17.10 ^{a, b} |
| 3 Kill you | 0.44 ^{a, b} | 2.82 ^{a, b} | 2.47 ^a | -0.46 ^a | 0.32 | 0.90 ^{a, b} | 0.71 ^c | -2.84 | 12.65 ^{a, b} |
| 4 Fatal lung disease in nonsmokers | 0.86 | 2.41 ^{a, b} | 1.55 | 0.39 | 0.93 ^{a, b} | 0.72 ^{a, b} | -0.44 ^c | -1.05 | 18.01 ^{a, b} |
| 5 Quit now | 0.81 | 1.45 | 0.81 | -0.73 ^{a, b} | -0.39 ^{a, b} | 0.34 | 0.58 ^c | 0.61 | 4.63 ^{a, b} |
| 6 Head and neck cancer | 3.67 ^{a, b} | 2.59 ^{a, b} | 1.26 | 1.37 ^{a, b} | 0.79 ^{a, b} | 0.53 ^{a, b} | 0.30 | 0.30 | 16.04 ^{a, b} |
| 7 Bladder cancer | 8.56 ^{a, b} | 4.57 ^{a, b} | 1.51 | 2.19 ^{a, b} | 1.17 ^{a, b} | 0.67 ^{a, b} | 0.52 ^a | 0.33 | 3.38 |
| 8 Stunt fetal growth | 1.65 ^{a, b} | 2.81 ^{a, b} | 1.78 | 0.88 ^{a, b} | 1.35 ^{a, b} | 0.84 ^{a, b} | 1.07 ^c | 0.38 | 4.50 |
| 9 Clogged arteries | 2.19 ^{a, b} | 1.96 ^{a, b} | 2.42 | 1.41 ^{a, b} | 1.25 ^{a, b} | 0.84 ^{a, b} | -0.05 | 0.34 | 3.07 |
| 10 COPD 1 ^d | 1.65 ^{a, b} | 3.03 ^{a, b} | 2.42 ^a | 0.99 ^{a, b} | 1.14 ^{a, b} | 0.58 ^{a, b} | 0.13 | -0.18 | 2.49 |
| 11 COPD 2 ^e | 1.58 ^a | 2.61 ^{a, b} | 2.95 ^{a, b} | 1.32 ^{a, b} | 1.08 ^{a, b} | 0.77 ^{a, b} | -0.03 | -0.20 | 8.12 ^{a, b} |
| 12 Erectile dysfunction | 4.49 ^{a, b} | 2.61 ^{a, b} | 2.86 ^{a, b} | 2.02 ^{a, b} | 1.34 ^{a, b} | 0.89 ^{a, b} | -0.06 | -0.42 | 2.67 |
| 13 Amputation | 6.37 ^{a, b} | 3.04 ^{a, b} | 1.36 | 2.05 ^{a, b} | 1.19 ^{a, b} | 0.82 ^{a, b} | 0.58 ^{a, b} | 0.25 | 9.00 ^{a, b} |
| 14 Diabetes | 5.11 ^{a, b} | 4.56 ^{a, b} | 1.77 | 2.33 ^{a, b} | 1.18 ^{a, b} | 0.66 ^{a, b} | 0.45 ^a | 0.06 | 10.44 ^{a, b} |
| 15 Macular degeneration | 10.73 ^{a, b} | 4.14 ^{a, b} | 1.27 | 2.43 ^{a, b} | 1.57 ^{a, b} | 0.70 ^{a, b} | 0.60 ^{a, b} | 0.29 | 16.04 ^{a, b} |
| 16 Cataracts | 7.73 ^{a, b} | 2.60 ^{a, b} | 0.98 | 1.97 ^{a, b} | 1.10 ^{a, b} | 0.55 ^{a, b} | 0.42 ^a | 0.19 | 6.00 ^{a, b} |

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^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons. ^c Relevant health belief items are not scaled so the reported result is the interaction term from the ordinal regression rather than the DID. ^d Image of diseased lungs. ^e Image of man with oxygen. ^f Due to a technical error with the online survey platform, the question assessing accuracy of warning recall did not function properly for some Session 3 participants. These cases were removed from the analysis of recall. Thus, the analytic sample size in this table is 227. ^g There is no odds ratio because 100% of young adults recalled the Addictive warning.

Note: All results control for smoking status. OR = odds ratio. B = regression coefficient. DID = difference in difference score. DID scores represent: (follow-up session proportion for CHW – Session 1 proportion for CHW) – (follow-up session proportion for Control – Session 1 proportion for Control) where follow-up is either Session 2 or Session 3.

Table E-38. Older Adults: Summary of Results for each CHW Compared with Average of SG Warnings

| | | Session 1 (n = 5,388) | | | | | Session 2 (n = 3,347) | Session 3 (n=2,526) | | |
|----|----------------------------------|-----------------------|---------------------------|----------------------------|----------------------------|-------------------------------|---------------------------------|--|--|--------------------------|
| | | New information (OR) | Thinking about risks (OR) | Perceived factualness (OR) | Self-reported learning (B) | Perceived informativeness (B) | Perceived understandability (B) | Health beliefs Session 2 vs. Session 1 (DID or interaction term) | Health beliefs Session 3 vs. Session 1 (DID or interaction term) | Recall ^f (OR) |
| 1 | Addictive | 0.76 | 1.02 | 1.02 | -0.36 ^{a, b} | -0.04 | 0.23 ^{a, b} | -0.49 ^c | -0.18 | 5.18 ^{a, b} |
| 2 | Harm children | 1.78 ^{a, b} | 2.20 ^{a, b} | 0.79 | 0.49 ^{a, b} | 0.42 ^{a, b} | 0.41 ^{a, b} | 0.19 ^c | -0.04 | 8.22 ^{a, b} |
| 3 | Kill you | 1.35 ^a | 1.24 | 0.95 | -0.19 | 0.02 | 0.10 | 0.02 ^c | -0.09 | 9.91 ^{a, b} |
| 4 | Fatal lung disease in nonsmokers | 1.86 ^{a, b} | 1.51 ^{a, b} | 0.55 ^{a, b} | 0.70 ^{a, b} | 0.50 ^{a, b} | 0.15 | 0.43 ^c | 0.45 | 5.09 ^{a, b} |
| 5 | Quit now | 0.99 | 1.00 | 1.18 | -0.27 ^a | -0.33 ^{a, b} | -0.01 | 0.06 ^c | -0.23 | 4.77 ^{a, b} |
| 6 | Head and neck cancer | 11.25 ^{a, b} | 2.44 ^{a, b} | 0.40 ^{a, b} | 2.18 ^{a, b} | 0.74 ^{a, b} | 0.31 ^{a, b} | 0.47 ^{a, b} | 0.28 ^{a, b} | 4.61 ^{a, b} |
| 7 | Bladder cancer | 18.05 ^{a, b} | 1.77 ^{a, b} | 0.31 ^{a, b} | 2.50 ^{a, b} | 0.87 ^{a, b} | 0.30 ^{a, b} | 0.60 ^{a, b} | 0.33 ^{a, b} | 5.94 ^{a, b} |
| 8 | Stunt fetal growth | 1.73 ^{a, b} | 1.65 ^{a, b} | 0.84 | 0.63 ^{a, b} | 0.65 ^{a, b} | 0.32 ^{a, b} | 0.96 ^{a, b, c} | 0.15 | 5.85 ^{a, b} |
| 9 | Clogged arteries | 2.84 ^{a, b} | 1.79 ^{a, b} | 0.93 | 1.11 ^{a, b} | 0.71 ^{a, b} | 0.32 ^{a, b} | 0.17 ^{a, b} | -0.09 | 3.17 ^{a, b} |
| 10 | COPD 1 ^d | 1.28 | 1.82 ^{a, b} | 0.95 | 0.51 ^{a, b} | 0.61 ^{a, b} | 0.31 ^{a, b} | 0.08 | -0.09 | 4.22 ^{a, b} |
| 11 | COPD 2 ^e | 1.44 ^{a, b} | 1.69 ^{a, b} | 0.83 | 0.55 ^{a, b} | 0.58 ^{a, b} | 0.41 ^{a, b} | 0.02 | -0.10 | 4.08 ^{a, b} |
| 12 | Erectile dysfunction | 9.93 ^{a, b} | 1.50 ^{a, b} | 0.42 ^{a, b} | 2.40 ^{a, b} | 0.83 ^{a, b} | 0.35 ^{a, b} | 0.44 ^{a, b} | 0.20 ^{a, b} | 5.01 ^{a, b} |
| 13 | Amputation | 7.75 ^{a, b} | 3.12 ^{a, b} | 0.52 ^{a, b} | 2.39 ^{a, b} | 1.01 ^{a, b} | 0.42 ^{a, b} | 0.52 ^{a, b} | 0.39 ^{a, b} | 8.78 ^{a, b} |
| 14 | Diabetes | 18.16 ^{a, b} | 1.44 ^{a, b} | 0.28 ^{a, b} | 2.60 ^{a, b} | 0.74 ^{a, b} | 0.38 ^{a, b} | 0.73 ^{a, b} | 0.28 ^{a, b} | 4.38 ^{a, b} |
| 15 | Macular degeneration | 12.70 ^{a, b} | 1.94 ^{a, b} | 0.45 ^{a, b} | 2.68 ^{a, b} | 0.92 ^{a, b} | 0.29 ^{a, b} | 0.53 ^{a, b} | 0.24 ^{a, b} | 4.12 ^{a, b} |
| 16 | Cataracts | 20.89 ^{a, b} | 1.36 | 0.30 ^{a, b} | 2.54 ^{a, b} | 0.73 ^{a, b} | 0.34 ^{a, b} | 0.62 ^{a, b} | 0.31 ^{a, b} | 3.17 ^{a, b} |

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^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons. ^c Relevant health belief items are not scaled so the reported result is the interaction term from the ordinal regression rather than the DID. ^d Image of diseased lungs. ^e Image of man with oxygen. ^f Due to a technical error with the online survey platform, the question assessing accuracy of warning recall did not function properly for some Session 3 participants. These cases were removed from the analysis of recall. Thus, the analytic sample size in this table is 2,469.

Note: All results control for smoking status. OR = odds ratio. B = regression coefficient. DID = difference in difference score. DID scores represent: (follow-up session proportion for CHW – Session 1 proportion for CHW) – (follow-up session proportion for Control – Session 1 proportion for Control) where follow-up is either Session 2 or Session 3.

Table E-39. Current Smokers: Summary of Results for each CHW Compared with Average of SG Warnings

| | Session 1 (n = 4,128) | | | | | | Session 2 (n = 2,090) | Session 3 (n=1,469) | |
|------------------------------------|-----------------------|---------------------------|----------------------------|----------------------------|-------------------------------|----------------------------------|--|--|--------------------------|
| | New information (OR) | Thinking about risks (OR) | Perceived factualness (OR) | Self-reported learning (B) | Perceived informativeness (B) | Perceived understand-ability (B) | Health beliefs Session 2 vs. Session 1 (DID or interaction term) | Health beliefs Session 3 vs. Session 1 (DID or interaction term) | Recall ^f (OR) |
| 1 Addictive | 0.80 | 1.07 | 0.97 | -0.22 | -0.04 | 0.30 ^{a, b} | -0.94 ^{a, b, c} | -0.65 | 4.72 ^{a, b} |
| 2 Harm children | 1.77 ^{a, b} | 2.22 ^{a, b} | 0.81 | 0.62 ^{a, b} | 0.37 ^{a, b} | 0.36 ^{a, b} | 0.41 ^c | -0.51 | 10.01 ^{a, b} |
| 3 Kill you | 1.04 | 1.23 | 0.95 | -0.19 | -0.07 | 0.15 | -0.15 ^c | -0.61 | 10.20 ^{a, b} |
| 4 Fatal lung disease in nonsmokers | 2.15 ^{a, b} | 1.32 | 0.61 ^{a, b} | 0.69 ^{a, b} | 0.43 ^{a, b} | 0.23 ^{a, b} | 0.36 ^c | 0.22 | 4.55 ^{a, b} |
| 5 Quit now | 0.80 | 1.39 | 1.13 | -0.21 | -0.16 | 0.19 | 0.30 ^c | -0.10 | 5.31 ^{a, b} |
| 6 Head and neck cancer | 7.76 ^{a, b} | 2.06 ^{a, b} | 0.43 ^{a, b} | 1.93 ^{a, b} | 0.62 ^{a, b} | 0.20 | 0.36 ^{a, b} | 0.26 ^{a, b} | 5.65 ^{a, b} |
| 7 Bladder cancer | 15.47 ^{a, b} | 1.81 ^{a, b} | 0.37 ^{a, b} | 2.15 ^{a, b} | 0.78 ^{a, b} | 0.18 | 0.72 ^{a, b} | 0.49 ^{a, b} | 7.40 ^{a, b} |
| 8 Stunt fetal growth | 2.05 ^{a, b} | 1.74 ^{a, b} | 1.03 | 0.60 ^{a, b} | 0.77 ^{a, b} | 0.33 ^{a, b} | 1.33 ^{a, b, c} | 0.22 | 6.25 ^{a, b} |
| 9 Clogged arteries | 3.06 ^{a, b} | 1.40 ^a | 1.27 | 1.12 ^{a, b} | 0.68 ^{a, b} | 0.32 ^{a, b} | 0.24 ^{a, b} | -0.04 | 4.36 ^{a, b} |
| 10 COPD 1 ^d | 1.34 | 1.83 ^{a, b} | 1.20 | 0.56 ^{a, b} | 0.67 ^{a, b} | 0.28 ^{a, b} | 0.07 | -0.15 | 4.60 ^{a, b} |
| 11 COPD 2 ^e | 1.48 ^{a, b} | 1.62 ^{a, b} | 0.93 | 0.72 ^{a, b} | 0.62 ^{a, b} | 0.32 ^{a, b} | -0.01 | -0.11 | 3.48 ^{a, b} |
| 12 Erectile dysfunction | 7.15 ^{a, b} | 1.35 | 0.46 ^{a, b} | 2.03 ^{a, b} | 0.77 ^{a, b} | 0.26 ^{a, b} | 0.36 ^{a, b} | 0.16 | 5.60 ^{a, b} |
| 13 Amputation | 9.53 ^{a, b} | 3.02 ^{a, b} | 0.62 ^{a, b} | 2.15 ^{a, b} | 0.88 ^{a, b} | 0.38 ^{a, b} | 0.55 ^{a, b} | 0.42 ^{a, b} | 7.79 ^{a, b} |
| 14 Diabetes | 11.29 ^{a, b} | 1.64 ^{a, b} | 0.37 ^{a, b} | 2.38 ^{a, b} | 0.69 ^{a, b} | 0.23 ^a | 0.65 ^{a, b} | 0.24 | 5.19 ^{a, b} |
| 15 Macular degeneration | 11.25 ^{a, b} | 1.97 ^{a, b} | 0.58 ^{a, b} | 2.43 ^{a, b} | 0.85 ^{a, b} | 0.10 | 0.55 ^{a, b} | 0.19 | 4.26 ^{a, b} |
| 16 Cataracts | 14.00 ^{a, b} | 1.27 | 0.32 ^{a, b} | 2.18 ^{a, b} | 0.64 ^{a, b} | 0.18 | 0.62 ^{a, b} | 0.28 ^a | 3.49 ^{a, b} |

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^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons. ^c Relevant health belief items are not scaled so the reported result is the interaction term from the ordinal regression rather than the DID. ^d Image of diseased lungs. ^e Image of man with oxygen. ^f Due to a technical error with the online survey platform, the question assessing accuracy of warning recall did not function properly for some Session 3 participants. These cases were removed from the analysis of recall. Thus, the analytic sample size in this table is 1,432.

Note: All results control for age group. OR = odds ratio. B = regression coefficient. DID = difference in difference score. DID scores represent: (follow-up session proportion for CHW – Session 1 proportion for CHW) – (follow-up session proportion for Control – Session 1 proportion for Control) where follow-up is either Session 2 or Session 3.

Table E-40. Nonsmokers: Summary of Results for each CHW Compared with Average of SG Warnings

| | | Session 1 (n = 5,632) | | | | | Session 2 (n = 2,823) | Session 3 (n=1,891) | | |
|----|----------------------------------|-----------------------|---------------------------|----------------------------|----------------------------|-------------------------------|----------------------------------|--|--|--------------------------|
| | | New information (OR) | Thinking about risks (OR) | Perceived factualness (OR) | Self-reported learning (B) | Perceived informativeness (B) | Perceived understand-ability (B) | Health beliefs Session 2 vs. Session 1 (DID or interaction term) | Health beliefs Session 3 vs. Session 1 (DID or interaction term) | Recall ^f (OR) |
| 1 | Addictive | 0.50 ^{a, b} | 1.15 | 1.22 | -0.60 ^{a, b} | -0.06 | 0.46 ^{a, b} | -1.17 ^{a, b, c} | -0.18 | 6.55 ^{a, b} |
| 2 | Harm children | 1.13 | 2.55 ^{a, b} | 1.15 | 0.08 | 0.65 ^{a, b} | 0.64 ^{a, b} | 0.25 ^c | 0.08 | 6.29 ^{a, b} |
| 3 | Kill you | 1.04 | 2.48 ^{a, b} | 1.04 | -0.39 ^{a, b} | 0.33 ^{a, b} | 0.61 ^{a, b} | 0.37 ^c | 0.18 | 8.80 ^{a, b} |
| 4 | Fatal lung disease in nonsmokers | 1.23 | 3.18 ^{a, b} | 0.84 | 0.60 ^{a, b} | 0.87 ^{a, b} | 0.54 ^{a, b} | 0.61 ^{a, c} | 0.87 ^{a, b} | 6.03 ^{a, b} |
| 5 | Quit now | 1.05 | 1.02 | 0.88 | -0.60 ^{a, b} | -0.46 ^{a, b} | 0.06 | 0.30 ^c | 0.00 | 5.05 ^{a, b} |
| 6 | Head and neck cancer | 8.39 ^{a, b} | 3.81 ^{a, b} | 0.69 | 1.97 ^{a, b} | 0.89 ^{a, b} | 0.61 ^{a, b} | 0.59 ^{a, b} | 0.27 ^{a, b} | 4.40 ^{a, b} |
| 7 | Bladder cancer | 14.08 ^{a, b} | 2.57 ^{a, b} | 0.50 ^{a, b} | 2.52 ^{a, b} | 1.06 ^{a, b} | 0.66 ^{a, b} | 0.52 ^{a, b} | 0.26 ^{a, b} | 4.25 ^{a, b} |
| 8 | Stunt fetal growth | 1.53 ^{a, b} | 2.32 ^{a, b} | 0.82 | 0.84 ^{a, b} | 1.01 ^{a, b} | 0.77 ^{a, b} | 0.75 ^{a, b, c} | -0.20 | 5.93 ^{a, b} |
| 9 | Clogged arteries | 2.38 ^{a, b} | 3.34 ^{a, b} | 1.01 | 1.26 ^{a, b} | 1.03 ^{a, b} | 0.72 ^{a, b} | 0.13 | 0.01 | 2.24 ^{a, b} |
| 10 | COPD 1 ^d | 1.59 ^{a, b} | 2.85 ^{a, b} | 1.26 | 0.80 ^{a, b} | 0.82 ^{a, b} | 0.62 ^{a, b} | 0.16 ^{a, b} | -0.02 | 3.75 ^{a, b} |
| 11 | COPD 2 ^e | 1.48 ^{a, b} | 2.94 ^{a, b} | 2.19 ^{a, b} | 0.83 ^{a, b} | 0.88 ^{a, b} | 0.69 ^{a, b} | 0.03 | -0.08 | 5.12 ^{a, b} |
| 12 | Erectile dysfunction | 8.15 ^{a, b} | 1.82 ^{a, b} | 0.64 ^{a, b} | 2.34 ^{a, b} | 1.08 ^{a, b} | 0.63 ^{a, b} | 0.45 ^{a, b} | 0.06 | 3.99 ^{a, b} |
| 13 | Amputation | 6.01 ^{a, b} | 4.21 ^{a, b} | 0.70 | 2.38 ^{a, b} | 1.30 ^{a, b} | 0.75 ^{a, b} | 0.56 ^{a, b} | 0.33 ^{a, b} | 9.77 ^{a, b} |
| 14 | Diabetes | 10.19 ^{a, b} | 2.82 ^{a, b} | 0.53 ^{a, b} | 2.46 ^{a, b} | 1.05 ^{a, b} | 0.76 ^{a, b} | 0.80 ^{a, b} | 0.24 ^a | 4.93 ^{a, b} |
| 15 | Macular degeneration | 12.44 ^{a, b} | 3.82 ^{a, b} | 0.61 ^{a, b} | 2.68 ^{a, b} | 1.33 ^{a, b} | 0.69 ^{a, b} | 0.61 ^{a, b} | 0.31 ^{a, b} | 5.48 ^{a, b} |
| 16 | Cataracts | 14.91 ^{a, b} | 2.38 ^{a, b} | 0.47 ^{a, b} | 2.51 ^{a, b} | 1.01 ^{a, b} | 0.69 ^{a, b} | 0.69 ^{a, b} | 0.37 ^{a, b} | 3.50 ^{a, b} |

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^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons. ^c Relevant health belief items are not scaled so the reported result is the interaction term from the ordinal regression rather than the DID. ^d Image of diseased lungs. ^e Image of man with oxygen. ^f Due to a technical error with the online survey platform, the question assessing accuracy of warning recall did not function properly for some Session 3 participants. These cases were removed from the analysis of recall. Thus, the analytic sample size in this table is 1,731.

Note: All results control for age group. OR = odds ratio. B = regression coefficient. DID = difference in difference score. DID scores represent: (follow-up session proportion for CHW – Session 1 proportion for CHW) – (follow-up session proportion for Control – Session 1 proportion for Control) where follow-up is either Session 2 or Session 3.

Table E-41. All participants: Linear Regressions of Attention Comparing CHW with SG Warnings

| Condition | Description | Attention | |
|-------------|----------------------------------|-------------|-----------------------------------|
| | | Mean (SD) | Coeff. (95% CI) |
| 0 (Control) | Average of the 4 SG warnings | 3.39 (0.94) | REF |
| 1 | Addictive | 3.69 (0.90) | 0.36 (0.27, 0.45) ^{a, b} |
| 2 | Harm children | 4.02 (0.90) | 0.68 (0.60, 0.77) ^{a, b} |
| 3 | Kill you | 3.99 (0.89) | 0.67 (0.59, 0.76) ^{a, b} |
| 4 | Fatal lung disease in nonsmokers | 3.80 (0.92) | 0.51 (0.42, 0.60) ^{a, b} |
| 5 | Quit now | 3.68 (0.86) | 0.33 (0.24, 0.41) ^{a, b} |
| 6 | Head and neck cancer | 4.06 (0.84) | 0.66 (0.58, 0.75) ^{a, b} |
| 7 | Bladder cancer | 3.97 (0.88) | 0.61 (0.52, 0.69) ^{a, b} |
| 8 | Stunt fetal growth | 3.95 (0.83) | 0.67 (0.58, 0.75) ^{a, b} |
| 9 | Clogged arteries | 3.79 (0.88) | 0.52 (0.44, 0.61) ^{a, b} |
| 10 | COPD 1 ^c | 3.83 (0.84) | 0.51 (0.43, 0.60) ^{a, b} |
| 11 | COPD 2 ^d | 3.89 (0.88) | 0.57 (0.49, 0.66) ^{a, b} |
| 12 | Erectile dysfunction | 3.80 (0.84) | 0.47 (0.38, 0.56) ^{a, b} |
| 13 | Amputation | 4.18 (0.76) | 0.83 (0.75, 0.91) ^{a, b} |
| 14 | Diabetes | 3.94 (0.77) | 0.61 (0.53, 0.69) ^{a, b} |
| 15 | Macular degeneration | 3.98 (0.90) | 0.71 (0.62, 0.79) ^{a, b} |
| 16 | Cataracts | 3.88 (0.79) | 0.56 (0.48, 0.64) ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

^c Image of diseased lungs. ^d Image of man with oxygen.

Note: Control = average of the 4 Surgeon General warnings for the relevant health belief. We conducted a factor analysis of 3 items ("This warning grabbed my attention"; "I would notice this health warning if I saw it"; "I would read or look closely at this health warning if I saw it on cigarette packages or ads"; all with response options 1= Strongly disagree to 5 = Strongly agree) and examined their internal consistency. The items represented as a single factor with an alpha > 0.70 , thus, we averaged them into a scale and analyzed them using linear regression. Regressions control for age group and smoking status.

Table E-42. Youth: Linear Regressions of Attention Comparing CHW with SG Warnings

| Condition | Description | Attention | |
|-------------|----------------------------------|-------------|-----------------------------------|
| | | Mean (SD) | Coeff. (95% CI) |
| 0 (Control) | Average of the 4 SG warnings | 3.32 (0.98) | REF |
| 1 | Addictive | 3.73 (0.82) | 0.41 (0.24, 0.58) ^{a, b} |
| 2 | Harm children | 4.16 (0.63) | 0.84 (0.70, 0.99) ^{a, b} |
| 3 | Kill you | 4.02 (0.71) | 0.70 (0.54, 0.85) ^{a, b} |
| 4 | Fatal lung disease in nonsmokers | 3.94 (0.78) | 0.61 (0.44, 0.78) ^{a, b} |
| 5 | Quit now | 3.76 (0.78) | 0.44 (0.27, 0.61) ^{a, b} |
| 6 | Head and neck cancer | 3.95 (0.79) | 0.63 (0.46, 0.80) ^{a, b} |
| 7 | Bladder cancer | 3.95 (0.85) | 0.63 (0.45, 0.81) ^{a, b} |
| 8 | Stunt fetal growth | 4.18 (0.67) | 0.86 (0.71, 1.01) ^{a, b} |
| 9 | Clogged arteries | 3.92 (0.72) | 0.59 (0.44, 0.75) ^{a, b} |
| 10 | COPD 1 ^c | 3.89 (0.85) | 0.56 (0.39, 0.74) ^{a, b} |
| 11 | COPD 2 ^d | 4.01 (0.69) | 0.69 (0.54, 0.85) ^{a, b} |
| 12 | Erectile dysfunction | 3.82 (0.83) | 0.50 (0.32, 0.67) ^{a, b} |
| 13 | Amputation | 4.20 (0.83) | 0.88 (0.70, 1.05) ^{a, b} |
| 14 | Diabetes | 3.94 (0.80) | 0.62 (0.45, 0.79) ^{a, b} |
| 15 | Macular degeneration | 4.12 (0.71) | 0.80 (0.64, 0.96) ^{a, b} |
| 16 | Cataracts | 3.95 (0.80) | 0.63 (0.46, 0.80) ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons. ^c Image of diseased lungs. ^d Image of man with oxygen.

Note: Control = average of the 4 Surgeon General warnings for the relevant health belief. We conducted a factor analysis of 3 items ("This warning grabbed my attention"; "I would notice this health warning if I saw it"; "I would read or look closely at this health warning if I saw it on cigarette packages or ads"; all with response options 1= Strongly disagree to 5 = Strongly agree) and examined their internal consistency. The items represented as a single factor with an alpha > 0.70 , thus, we averaged them into a scale and analyzed them using linear regression. Regressions control for smoking status.

Table E-43. Young Adults: Linear Regressions of Attention Comparing CHW with SG Warnings

| Condition | Description | Attention | |
|-------------|----------------------------------|-------------|-----------------------------------|
| | | Mean (SD) | Coeff. (95% CI) |
| 0 (Control) | Average of the 4 SG warnings | 3.30 (1.00) | REF |
| 1 | Addictive | 3.74 (0.87) | 0.44 (0.25, 0.64) ^{a, b} |
| 2 | Harm children | 3.94 (0.89) | 0.64 (0.44, 0.84) ^{a, b} |
| 3 | Kill you | 4.14 (0.74) | 0.84 (0.67, 1.01) ^{a, b} |
| 4 | Fatal lung disease in nonsmokers | 3.94 (0.84) | 0.65 (0.46, 0.84) ^{a, b} |
| 5 | Quit now | 3.58 (0.81) | 0.29 (0.10, 0.47) ^{a, b} |
| 6 | Head and neck cancer | 3.97 (0.83) | 0.67 (0.49, 0.86) ^{a, b} |
| 7 | Bladder cancer | 3.94 (0.71) | 0.65 (0.48, 0.81) ^{a, b} |
| 8 | Stunt fetal growth | 4.02 (0.84) | 0.72 (0.53, 0.91) ^{a, b} |
| 9 | Clogged arteries | 4.06 (0.79) | 0.76 (0.58, 0.94) ^{a, b} |
| 10 | COPD 1 ^c | 3.96 (0.87) | 0.66 (0.47, 0.86) ^{a, b} |
| 11 | COPD 2 ^d | 3.92 (0.83) | 0.63 (0.44, 0.81) ^{a, b} |
| 12 | Erectile dysfunction | 3.90 (0.84) | 0.60 (0.41, 0.79) ^{a, b} |
| 13 | Amputation | 4.18 (0.86) | 0.88 (0.69, 1.07) ^{a, b} |
| 14 | Diabetes | 4.06 (0.73) | 0.76 (0.59, 0.93) ^{a, b} |
| 15 | Macular degeneration | 4.21 (0.71) | 0.91 (0.75, 1.08) ^{a, b} |
| 16 | Cataracts | 3.95 (0.75) | 0.65 (0.48, 0.83) ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons. ^c Image of diseased lungs. ^d Image of man with oxygen.

Note: Control = average of the 4 Surgeon General warnings for the relevant health belief. We conducted a factor analysis of 3 items ("This warning grabbed my attention"; "I would notice this health warning if I saw it"; "I would read or look closely at this health warning if I saw it on cigarette packages or ads"; all with response options 1= Strongly disagree to 5 = Strongly agree) and examined their internal consistency. The items represented as a single factor with an alpha >0.70, thus, we averaged them into a scale and analyzed them using linear regression. Regressions control for smoking status.

Table E-44. Older Adults: Linear Regressions of Attention Comparing CHW with SG Warnings

| Condition | Description | Attention | |
|-------------|----------------------------------|-------------|-----------------------------------|
| | | Mean (SD) | Coeff. (95% CI) |
| 0 (Control) | Average of the 4 SG warnings | 3.39 (0.94) | REF |
| 1 | Addictive | 3.69 (0.90) | 0.30 (0.18, 0.42) ^{a, b} |
| 2 | Harm children | 4.02 (0.90) | 0.63 (0.51, 0.75) ^{a, b} |
| 3 | Kill you | 3.99 (0.89) | 0.60 (0.48, 0.72) ^{a, b} |
| 4 | Fatal lung disease in nonsmokers | 3.80 (0.92) | 0.41 (0.29, 0.53) ^{a, b} |
| 5 | Quit now | 3.68 (0.86) | 0.29 (0.18, 0.41) ^{a, b} |
| 6 | Head and neck cancer | 4.06 (0.84) | 0.67 (0.56, 0.79) ^{a, b} |
| 7 | Bladder cancer | 3.97 (0.88) | 0.58 (0.46, 0.70) ^{a, b} |
| 8 | Stunt fetal growth | 3.95 (0.83) | 0.56 (0.45, 0.68) ^{a, b} |
| 9 | Clogged arteries | 3.79 (0.88) | 0.40 (0.29, 0.52) ^{a, b} |
| 10 | COPD 1 ^c | 3.83 (0.84) | 0.44 (0.32, 0.55) ^{a, b} |
| 11 | COPD 2 ^d | 3.89 (0.88) | 0.50 (0.38, 0.62) ^{a, b} |
| 12 | Erectile dysfunction | 3.80 (0.84) | 0.41 (0.29, 0.52) ^{a, b} |
| 13 | Amputation | 4.18 (0.76) | 0.79 (0.69, 0.90) ^{a, b} |
| 14 | Diabetes | 3.94 (0.77) | 0.55 (0.44, 0.66) ^{a, b} |
| 15 | Macular degeneration | 3.98 (0.90) | 0.59 (0.47, 0.71) ^{a, b} |
| 16 | Cataracts | 3.88 (0.79) | 0.49 (0.38, 0.60) ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons. ^c Image of diseased lungs. ^d Image of man with oxygen.

Note: Control = average of the 4 Surgeon General warnings for the relevant health belief. We conducted a factor analysis of 3 items ("This warning grabbed my attention"; "I would notice this health warning if I saw it"; "I would read or look closely at this health warning if I saw it on cigarette packages or ads"; all with response options 1= Strongly disagree to 5 = Strongly agree) and examined their internal consistency. The items represented as a single factor with an alpha > 0.70 , thus, we averaged them into a scale and analyzed them using linear regression. Regressions control for smoking status.

Table E-45. Current Smokers: Linear Regressions of Attention Comparing CHW with SG Warnings

| Condition | Description | Attention | |
|-------------|----------------------------------|-------------|-----------------------------------|
| | | Mean (SD) | Coeff. (95% CI) |
| 0 (Control) | Average of the 4 SG warnings | 3.30 (0.98) | REF |
| 1 | Addictive | 3.63 (0.92) | 0.33 (0.19, 0.47) ^{a, b} |
| 2 | Harm children | 3.98 (0.92) | 0.68 (0.54, 0.82) ^{a, b} |
| 3 | Kill you | 3.96 (0.89) | 0.66 (0.52, 0.80) ^{a, b} |
| 4 | Fatal lung disease in nonsmokers | 3.75 (0.94) | 0.45 (0.31, 0.60) ^{a, b} |
| 5 | Quit now | 3.70 (0.83) | 0.40 (0.27, 0.53) ^{a, b} |
| 6 | Head and neck cancer | 3.93 (0.89) | 0.63 (0.49, 0.77) ^{a, b} |
| 7 | Bladder cancer | 3.91 (0.86) | 0.61 (0.47, 0.74) ^{a, b} |
| 8 | Stunt fetal growth | 3.98 (0.80) | 0.68 (0.56, 0.81) ^{a, b} |
| 9 | Clogged arteries | 3.75 (0.87) | 0.45 (0.31, 0.58) ^{a, b} |
| 10 | COPD 1 ^c | 3.80 (0.87) | 0.50 (0.37, 0.64) ^{a, b} |
| 11 | COPD 2 ^d | 3.81 (0.92) | 0.51 (0.37, 0.65) ^{a, b} |
| 12 | Erectile dysfunction | 3.76 (0.87) | 0.46 (0.32, 0.59) ^{a, b} |
| 13 | Amputation | 4.18 (0.78) | 0.88 (0.75, 1.00) ^{a, b} |
| 14 | Diabetes | 3.91 (0.77) | 0.61 (0.49, 0.74) ^{a, b} |
| 15 | Macular degeneration | 3.96 (0.86) | 0.67 (0.53, 0.80) ^{a, b} |
| 16 | Cataracts | 3.77 (0.84) | 0.47 (0.34, 0.60) ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons. ^c Image of diseased lungs. ^d Image of man with oxygen.

Note: Control = average of the 4 Surgeon General warnings for the relevant health belief. We conducted a factor analysis of 3 items ("This warning grabbed my attention"; "I would notice this health warning if I saw it"; "I would read or look closely at this health warning if I saw it on cigarette packages or ads"; all with response options 1= Strongly disagree to 5 = Strongly agree) and examined their internal consistency. The items represented as a single factor with an alpha > 0.70 , thus, we averaged them into a scale and analyzed them using linear regression. Regressions control for age group.

Table E-46. Nonsmokers: Linear Regressions of Attention Comparing CHW with SG Warnings

| Condition | Description | Attention | |
|-------------|----------------------------------|-------------|-----------------------------------|
| | | Mean (SD) | Coeff. (95% CI) |
| 0 (Control) | Average of the 4 SG warnings | 3.39 (0.95) | REF |
| 1 | Addictive | 3.77 (0.84) | 0.38 (0.27, 0.49) ^{a, b} |
| 2 | Harm children | 4.08 (0.78) | 0.68 (0.58, 0.79) ^{a, b} |
| 3 | Kill you | 4.08 (0.77) | 0.68 (0.58, 0.79) ^{a, b} |
| 4 | Fatal lung disease in nonsmokers | 3.94 (0.81) | 0.55 (0.44, 0.66) ^{a, b} |
| 5 | Quit now | 3.67 (0.84) | 0.27 (0.16, 0.38) ^{a, b} |
| 6 | Head and neck cancer | 4.08 (0.78) | 0.68 (0.58, 0.79) ^{a, b} |
| 7 | Bladder cancer | 4.00 (0.82) | 0.60 (0.49, 0.71) ^{a, b} |
| 8 | Stunt fetal growth | 4.05 (0.81) | 0.65 (0.54, 0.76) ^{a, b} |
| 9 | Clogged arteries | 3.97 (0.79) | 0.58 (0.47, 0.69) ^{a, b} |
| 10 | COPD 1 ^c | 3.92 (0.83) | 0.52 (0.41, 0.63) ^{a, b} |
| 11 | COPD 2 ^d | 4.01 (0.75) | 0.62 (0.51, 0.72) ^{a, b} |
| 12 | Erectile dysfunction | 3.87 (0.81) | 0.48 (0.37, 0.59) ^{a, b} |
| 13 | Amputation | 4.19 (0.81) | 0.80 (0.69, 0.91) ^{a, b} |
| 14 | Diabetes | 4.00 (0.77) | 0.61 (0.50, 0.71) ^{a, b} |
| 15 | Macular degeneration | 4.13 (0.79) | 0.74 (0.63, 0.85) ^{a, b} |
| 16 | Cataracts | 4.01 (0.71) | 0.62 (0.52, 0.72) ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons. ^c Image of diseased lungs. ^d Image of man with oxygen.

Note: Control = average of the 4 Surgeon General warnings for the relevant health belief. We conducted a factor analysis of 3 items ("This warning grabbed my attention"; "I would notice this health warning if I saw it"; "I would read or look closely at this health warning if I saw it on cigarette packages or ads"; all with response options 1= Strongly disagree to 5 = Strongly agree) and examined their internal consistency. The items represented as a single factor with an alpha > 0.70 , thus, we averaged them into a scale and analyzed them using linear regression. Regressions control for age group.

Table E-47. All Participants: Ordinal Regression of Perceived Helpfulness in Understanding Health Effects Comparing CHW with SG Warnings

| Condition | Warning | Proportion | | | | | Odds Ratio (95% CI) |
|-------------|----------------------------------|-------------------|----------|----------------------------|-------|----------------|--------------------------------------|
| | | Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly agree | |
| 0 (Control) | Average of the 4 SG warnings | 0.04 | 0.11 | 0.16 | 0.48 | 0.21 | REF |
| 1 | Addictive | 0.06 | 0.14 | 0.19 | 0.35 | 0.25 | 0.92 (0.76, 1.11) |
| 2 | Harm children | 0.03 | 0.03 | 0.17 | 0.45 | 0.31 | 1.83 (1.53, 2.20) ^{a, b} |
| 3 | Kill you | 0.05 | 0.14 | 0.19 | 0.32 | 0.31 | 1.36 (1.12, 1.65) ^{a, b} |
| 4 | Fatal lung disease in nonsmokers | 0.03 | 0.04 | 0.16 | 0.44 | 0.33 | 2.09 (1.75, 2.50) ^{a, b} |
| 5 | Quit now | 0.05 | 0.18 | 0.18 | 0.43 | 0.16 | 0.67 (0.56, 0.80) ^{a, b} |
| 6 | Head and neck cancer | 0.02 | 0.06 | 0.10 | 0.40 | 0.41 | 2.43 (2.01, 2.94) ^{a, b} |
| 7 | Bladder cancer | 0.03 | 0.06 | 0.13 | 0.41 | 0.38 | 2.31 (1.92, 2.78) ^{a, b} |
| 8 | Stunt fetal growth | 0.02 | 0.05 | 0.13 | 0.48 | 0.32 | 2.35 (1.96, 2.82) ^{a, b} |
| 9 | Clogged arteries | 0.02 | 0.04 | 0.12 | 0.47 | 0.35 | 2.43 (2.03, 2.90) ^{a, b} |
| 10 | COPD 1 ^c | 0.03 | 0.04 | 0.10 | 0.45 | 0.38 | 2.71 (2.26, 3.25) ^{a, b} |
| 11 | COPD 2 ^d | 0.02 | 0.05 | 0.10 | 0.46 | 0.36 | 2.22 (1.86, 2.65) ^{a, b} |
| 12 | Erectile dysfunction | 0.03 | 0.03 | 0.11 | 0.51 | 0.31 | 2.06 (1.74, 2.44) ^{a, b} |
| 13 | Amputation | 0.03 | 0.02 | 0.08 | 0.42 | 0.46 | 3.91 (3.22, 4.76) ^{a, b} |
| 14 | Diabetes | 0.01 | 0.06 | 0.14 | 0.45 | 0.33 | 2.27 (1.89, 2.71) ^{a, b} |
| 15 | Macular degeneration | 0.04 | 0.05 | 0.09 | 0.45 | 0.36 | 2.76 (2.28, 3.35) ^{a, b} |
| 16 | Cataracts | 0.03 | 0.06 | 0.12 | 0.46 | 0.33 | 2.28 (1.92, 2.72) ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

Note: This table presents results for level of agreement with the statement, "This warning helps me understand the negative health effects of smoking." Control = average of the 4 Surgeon General warnings for the relevant health belief. Analyses were conducted using ordered logit models, controlling for age group and smoking status.

Table E-48. Youth: Ordinal Regression of Perceived Helpfulness in Understanding Health Effects Comparing CHW with SG Warnings

| Condition | Warning | Proportion | | | | | Odds Ratio (95% CI) |
|-------------|----------------------------------|-------------------|----------|----------------------------|-------|----------------|--------------------------------------|
| | | Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly agree | |
| 0 (Control) | Average of the 4 SG warnings | 0.07 | 0.17 | 0.11 | 0.42 | 0.23 | REF |
| 1 | Addictive | 0.04 | 0.18 | 0.21 | 0.41 | 0.17 | 0.82 (0.59, 1.15) |
| 2 | Harm children | 0.02 | 0.08 | 0.10 | 0.42 | 0.38 | 2.23 (1.54, 3.22) ^{a, b} |
| 3 | Kill you | 0.04 | 0.11 | 0.14 | 0.41 | 0.30 | 1.47 (1.02, 2.11) ^{a, b} |
| 4 | Fatal lung disease in nonsmokers | 0.02 | 0.04 | 0.10 | 0.47 | 0.37 | 2.37 (1.67, 3.37) ^{a, b} |
| 5 | Quit now | 0.04 | 0.25 | 0.19 | 0.37 | 0.16 | 0.72 (0.51, 1.01) |
| 6 | Head and neck cancer | 0.02 | 0.10 | — | 0.50 | 0.38 | 2.56 (1.78, 3.69) ^{a, b} |
| 7 | Bladder cancer | 0.04 | 0.07 | 0.06 | 0.42 | 0.40 | 2.34 (1.59, 3.43) ^{a, b} |
| 8 | Stunt fetal growth | 0.02 | 0.04 | 0.05 | 0.42 | 0.46 | 3.25 (2.24, 4.70) ^{a, b} |
| 9 | Clogged arteries | 0.02 | 0.04 | 0.08 | 0.48 | 0.39 | 2.62 (1.85, 3.72) ^{a, b} |
| 10 | COPD 1 ^c | 0.03 | 0.04 | 0.04 | 0.50 | 0.40 | 2.84 (2.00, 4.05) ^{a, b} |
| 11 | COPD 2 ^d | 0.02 | 0.04 | 0.06 | 0.54 | 0.35 | 2.42 (1.74, 3.38) ^{a, b} |
| 12 | Erectile dysfunction | 0.02 | 0.03 | 0.12 | 0.58 | 0.26 | 1.82 (1.33, 2.48) ^{a, b} |
| 13 | Amputation | 0.04 | — | 0.04 | 0.34 | 0.58 | 4.77 (3.18, 7.17) ^{a, b} |
| 14 | Diabetes | — | 0.04 | 0.09 | 0.46 | 0.40 | 2.74 (1.93, 3.88) ^{a, b} |
| 15 | Macular degeneration | 0.04 | 0.04 | 0.04 | 0.39 | 0.49 | 3.47 (2.35, 5.13) ^{a, b} |
| 16 | Cataracts | 0.01 | 0.03 | 0.04 | 0.55 | 0.38 | 2.94 (2.11, 4.09) ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

Note: This table presents results for level of agreement with the statement, "This warning helps me understand the negative health effects of smoking." Control = average of the 4 Surgeon General warnings for the relevant health belief. Analyses were conducted using ordered logit models, controlling for smoking status. — = no youth endorsed this response.

Table E-49. Young Adults: Ordinal Regression of Perceived Helpfulness in Understanding Health Effects Comparing CHW with SG Warnings

| Condition | Warning | Proportion | | | | | Odds Ratio (95% CI) |
|-------------|----------------------------------|-------------------|----------|----------------------------|-------|----------------|--------------------------------------|
| | | Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly agree | |
| 0 (Control) | Average of the 4 SG warnings | 0.11 | 0.16 | 0.13 | 0.39 | 0.21 | REF |
| 1 | Addictive | 0.06 | 0.19 | 0.14 | 0.39 | 0.23 | 1.13 (0.77, 1.67) |
| 2 | Harm children | 0.05 | 0.08 | 0.11 | 0.46 | 0.30 | 1.94 (1.34, 2.82) ^{a, b} |
| 3 | Kill you | 0.01 | 0.13 | 0.12 | 0.41 | 0.33 | 2.03 (1.39, 2.97) ^{a, b} |
| 4 | Fatal lung disease in nonsmokers | 0.03 | 0.04 | 0.08 | 0.47 | 0.38 | 2.89 (1.99, 4.20) ^{a, b} |
| 5 | Quit now | 0.03 | 0.33 | 0.12 | 0.44 | 0.08 | 0.68 (0.49, 0.95) ^{a, b} |
| 6 | Head and neck cancer | 0.05 | 0.07 | 0.09 | 0.42 | 0.37 | 2.41 (1.63, 3.58) ^{a, b} |
| 7 | Bladder cancer | 0.01 | 0.03 | 0.05 | 0.56 | 0.35 | 3.08 (2.19, 4.33) ^{a, b} |
| 8 | Stunt fetal growth | 0.05 | 0.03 | 0.10 | 0.37 | 0.45 | 3.17 (2.10, 4.78) ^{a, b} |
| 9 | Clogged arteries | 0.01 | 0.03 | 0.10 | 0.43 | 0.43 | 3.41 (2.34, 4.97) ^{a, b} |
| 10 | COPD 1 ^c | 0.03 | 0.04 | 0.04 | 0.45 | 0.44 | 3.60 (2.45, 5.29) ^{a, b} |
| 11 | COPD 2 ^d | 0.05 | 0.05 | 0.10 | 0.50 | 0.30 | 2.09 (1.45, 3.01) ^{a, b} |
| 12 | Erectile dysfunction | 0.02 | 0.03 | 0.08 | 0.51 | 0.36 | 2.90 (2.03, 4.14) ^{a, b} |
| 13 | Amputation | 0.03 | 0.04 | 0.05 | 0.28 | 0.60 | 5.57 (3.54, 8.75) ^{a, b} |
| 14 | Diabetes | 0.02 | 0.03 | 0.11 | 0.44 | 0.40 | 3.03 (2.09, 4.40) ^{a, b} |
| 15 | Macular degeneration | 0.03 | 0.05 | 0.05 | 0.33 | 0.54 | 4.53 (2.96, 6.95) ^{a, b} |
| 16 | Cataracts | 0.02 | 0.03 | 0.08 | 0.52 | 0.35 | 2.83 (1.99, 4.03) ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

Note: This table presents results for level of agreement with the statement, "This warning helps me understand the negative health effects of smoking." Control = average of the 4 Surgeon General warnings for the relevant health belief. Analyses were conducted using ordered logit models, controlling for smoking status.

Table E-50. Older Adults: Ordinal Regression of Perceived Helpfulness in Understanding Health Effects Comparing CHW with SG Warnings

| Condition | Warning | Proportion | | | | | Odds Ratio (95% CI) |
|-------------|----------------------------------|-------------------|----------|----------------------------|-------|----------------|--------------------------------------|
| | | Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly agree | |
| 0 (Control) | Average of the 4 SG warnings | 0.04 | 0.11 | 0.16 | 0.48 | 0.21 | REF |
| 1 | Addictive | 0.06 | 0.14 | 0.19 | 0.35 | 0.25 | 0.88 (0.67, 1.16) |
| 2 | Harm children | 0.03 | 0.03 | 0.17 | 0.45 | 0.31 | 1.63 (1.26, 2.09) ^{a, b} |
| 3 | Kill you | 0.05 | 0.14 | 0.19 | 0.32 | 0.31 | 1.09 (0.82, 1.44) |
| 4 | Fatal lung disease in nonsmokers | 0.03 | 0.04 | 0.16 | 0.44 | 0.33 | 1.70 (1.32, 2.19) ^{a, b} |
| 5 | Quit now | 0.05 | 0.18 | 0.18 | 0.43 | 0.16 | 0.65 (0.50, 0.83) ^{a, b} |
| 6 | Head and neck cancer | 0.02 | 0.06 | 0.10 | 0.40 | 0.41 | 2.36 (1.81, 3.07) ^{a, b} |
| 7 | Bladder cancer | 0.03 | 0.06 | 0.13 | 0.41 | 0.38 | 1.99 (1.52, 2.60) ^{a, b} |
| 8 | Stunt fetal growth | 0.02 | 0.05 | 0.13 | 0.48 | 0.32 | 1.79 (1.40, 2.29) ^{a, b} |
| 9 | Clogged arteries | 0.02 | 0.04 | 0.12 | 0.47 | 0.35 | 2.01 (1.57, 2.58) ^{a, b} |
| 10 | COPD 1 ^c | 0.03 | 0.04 | 0.10 | 0.45 | 0.38 | 2.33 (1.81, 3.00) ^{a, b} |
| 11 | COPD 2 ^d | 0.02 | 0.05 | 0.10 | 0.46 | 0.36 | 2.16 (1.68, 2.78) ^{a, b} |
| 12 | Erectile dysfunction | 0.03 | 0.03 | 0.11 | 0.51 | 0.31 | 1.89 (1.48, 2.40) ^{a, b} |
| 13 | Amputation | 0.03 | 0.02 | 0.08 | 0.42 | 0.46 | 3.15 (2.43, 4.07) ^{a, b} |
| 14 | Diabetes | 0.01 | 0.06 | 0.14 | 0.45 | 0.33 | 1.83 (1.43, 2.34) ^{a, b} |
| 15 | Macular degeneration | 0.04 | 0.05 | 0.09 | 0.45 | 0.36 | 2.05 (1.59, 2.65) ^{a, b} |
| 16 | Cataracts | 0.03 | 0.06 | 0.12 | 0.46 | 0.33 | 1.84 (1.43, 2.36) ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

Note: This table presents results for level of agreement with the statement, "This warning helps me understand the negative health effects of smoking." Control = average of the 4 Surgeon General warnings for the relevant health belief. Analyses were conducted using ordered logit models, controlling for smoking status.

Table E-51. Current Smokers: Ordinal Regression of Perceived Helpfulness in Understanding Health Effects Comparing CHW with SG Warnings

| Condition | Warning | Proportion | | | | | Odds Ratio (95% CI) |
|-------------|----------------------------------|-------------------|----------|----------------------------|-------|----------------|--------------------------------------|
| | | Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly agree | |
| 0 (Control) | Average of the 4 SG warnings | 0.06 | 0.11 | 0.16 | 0.45 | 0.22 | REF |
| 1 | Addictive | 0.05 | 0.14 | 0.20 | 0.38 | 0.23 | 0.89 (0.67, 1.19) |
| 2 | Harm children | 0.03 | 0.05 | 0.14 | 0.44 | 0.33 | 1.79 (1.35, 2.38) ^{a, b} |
| 3 | Kill you | 0.04 | 0.15 | 0.21 | 0.35 | 0.25 | 0.91 (0.68, 1.23) |
| 4 | Fatal lung disease in nonsmokers | 0.04 | 0.05 | 0.18 | 0.44 | 0.29 | 1.48 (1.12, 1.95) ^{a, b} |
| 5 | Quit now | 0.06 | 0.21 | 0.13 | 0.43 | 0.17 | 0.73 (0.55, 0.98) ^{a, b} |
| 6 | Head and neck cancer | 0.03 | 0.10 | 0.10 | 0.42 | 0.33 | 1.69 (1.25, 2.28) ^{a, b} |
| 7 | Bladder cancer | 0.03 | 0.08 | 0.12 | 0.40 | 0.36 | 1.85 (1.37, 2.50) ^{a, b} |
| 8 | Stunt fetal growth | 0.02 | 0.04 | 0.13 | 0.47 | 0.34 | 2.03 (1.55, 2.67) ^{a, b} |
| 9 | Clogged arteries | 0.01 | 0.06 | 0.13 | 0.46 | 0.33 | 1.84 (1.40, 2.43) ^{a, b} |
| 10 | COPD 1 ^c | 0.03 | 0.04 | 0.10 | 0.46 | 0.38 | 2.31 (1.75, 3.07) ^{a, b} |
| 11 | COPD 2 ^d | 0.03 | 0.06 | 0.12 | 0.48 | 0.31 | 1.76 (1.33, 2.32) ^{a, b} |
| 12 | Erectile dysfunction | 0.03 | 0.03 | 0.14 | 0.51 | 0.29 | 1.72 (1.32, 2.24) ^{a, b} |
| 13 | Amputation | 0.03 | 0.03 | 0.08 | 0.40 | 0.46 | 3.03 (2.26, 4.07) ^{a, b} |
| 14 | Diabetes | 0.02 | 0.07 | 0.15 | 0.46 | 0.31 | 1.67 (1.27, 2.20) ^{a, b} |
| 15 | Macular degeneration | 0.03 | 0.07 | 0.10 | 0.44 | 0.35 | 1.99 (1.49, 2.65) ^{a, b} |
| 16 | Cataracts | 0.03 | 0.04 | 0.14 | 0.51 | 0.27 | 1.57 (1.21, 2.05) ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

Note: This table presents results for level of agreement with the statement, "This warning helps me understand the negative health effects of smoking." Control = average of the 4 Surgeon General warnings for the relevant health belief. Analyses were conducted using ordered logit models, controlling for age group.

Table E-52. Nonsmokers: Ordinal Regression of Perceived Helpfulness in Understanding Health Effects Comparing CHW with SG Warnings

| Condition | Warning | Proportion | | | | | Odds Ratio (95% CI) |
|-------------|----------------------------------|-------------------|----------|----------------------------|-------|----------------|--------------------------------------|
| | | Strongly disagree | Disagree | Neither agree nor disagree | Agree | Strongly agree | |
| 0 (Control) | Average of the 4 SG warnings | 0.07 | 0.15 | 0.13 | 0.44 | 0.21 | REF |
| 1 | Addictive | 0.05 | 0.18 | 0.18 | 0.36 | 0.23 | 0.94 (0.73, 1.20) |
| 2 | Harm children | 0.03 | 0.06 | 0.13 | 0.45 | 0.32 | 1.86 (1.47, 2.36) ^{a, b} |
| 3 | Kill you | 0.03 | 0.12 | 0.13 | 0.37 | 0.36 | 1.82 (1.40, 2.35) ^{a, b} |
| 4 | Fatal lung disease in nonsmokers | 0.02 | 0.03 | 0.09 | 0.46 | 0.39 | 2.70 (2.13, 3.41) ^{a, b} |
| 5 | Quit now | 0.03 | 0.25 | 0.19 | 0.41 | 0.12 | 0.63 (0.51, 0.79) ^{a, b} |
| 6 | Head and neck cancer | 0.02 | 0.05 | 0.06 | 0.43 | 0.44 | 3.17 (2.48, 4.04) ^{a, b} |
| 7 | Bladder cancer | 0.03 | 0.04 | 0.07 | 0.47 | 0.39 | 2.69 (2.12, 3.41) ^{a, b} |
| 8 | Stunt fetal growth | 0.03 | 0.05 | 0.09 | 0.43 | 0.41 | 2.61 (2.04, 3.34) ^{a, b} |
| 9 | Clogged arteries | 0.02 | 0.02 | 0.08 | 0.47 | 0.41 | 2.96 (2.34, 3.75) ^{a, b} |
| 10 | COPD 1 ^c | 0.03 | 0.04 | 0.05 | 0.47 | 0.42 | 3.04 (2.39, 3.86) ^{a, b} |
| 11 | COPD 2 ^d | 0.02 | 0.04 | 0.07 | 0.50 | 0.37 | 2.63 (2.09, 3.31) ^{a, b} |
| 12 | Erectile dysfunction | 0.02 | 0.03 | 0.08 | 0.54 | 0.33 | 2.35 (1.89, 2.94) ^{a, b} |
| 13 | Amputation | 0.03 | 0.01 | 0.05 | 0.35 | 0.56 | 4.77 (3.66, 6.22) ^{a, b} |
| 14 | Diabetes | 0.00 | 0.04 | 0.10 | 0.45 | 0.41 | 2.84 (2.25, 3.60) ^{a, b} |
| 15 | Macular degeneration | 0.04 | 0.03 | 0.05 | 0.39 | 0.49 | 3.55 (2.74, 4.60) ^{a, b} |
| 16 | Cataracts | 0.01 | 0.04 | 0.05 | 0.49 | 0.41 | 3.02 (2.40, 3.82) ^{a, b} |

^a Significant at $p < .05$ in unadjusted analyses. ^b Significant after adjustment for multiple comparisons.

Note: This table presents results for level of agreement with the statement, "This warning helps me understand the negative health effects of smoking." Control = average of the 4 Surgeon General warnings for the relevant health belief. Analyses were conducted using ordered logit models, controlling for age group and smoking status.