Spare the Air Tonight Study

2004-2005 Winter Wood Smoke Season

Conducted for the

Bay Area Air Quality Management District

April 2005

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INTRODUCTION

The Bay Area Air Quality Management District (BAAQMD) was established in 1955 by the California State Legislature as the first multi-county agency in the State to address the problem of air pollution on a regular basis. The BAAQMD's primary regulatory authority covers stationary sources of air pollution such as factories, industrial facilities, manufacturing operations, gasoline stations and dry cleaners. The BAAQMD is also responsible for transportation control measures to reduce emissions from mobile sources of air pollution in its Clean Air Plan.

Serving the counties of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, and the western half of Solano and southern half of Sonoma, one of the BAAQMD's primary charges is to increase public awareness of positive air quality choices. To facilitate this effort, the Spare the Air Program was established by the BAAQMD in 1991 to educate residents about air pollution and to encourage them to modify their behavior to reduce and prevent it. During the summer ozone season (May to October), the BAAQMD conducts episodic public education campaigns designed to encourage the public to reduce their driving and use of certain household products on days that are expected to violate ozone air quality standards. During the winter season (November to February), the focus of the Program shifts to reducing the impact of wood burning on air quality by encouraging the public to *not* burn wood and to replace their wood burning fireplaces and stoves with cleaner alternatives, such as natural gas fireplaces.

Although today many air quality management districts throughout the country administer similar programs, the Spare the Air program in the Bay Area was the first of its kind.

MOTIVATION FOR STUDY The primary motivation for this study was to better understand the public's attitudes and behavior with respect to burning wood, their awareness of the Spare the Air Tonight Program, as well as the impact that the Program has had on awareness, opinions and behavior relevant to burning wood and air quality. In this respect, this study is quite similar to past surveys conducted for the BAAQMD in 2001, 2002 and 2003.

OVERVIEW OF METHODOLOGY A full description of the methodology used for this study is included later in this report (see *Methodology* on page 38). A total of 700 randomly selected residents within the District's boundaries participated in a telephone survey between February 2 and February 13, 2005. Probability-based sampling techniques and monitoring of the demographics resulted in a sample that is representative of the adult population within the District. The interviews averaged 12 minutes in length.

When compared to the past surveys conducted for the District on wood burning and the Spare the Air Tonight Program, there are several methodological changes worth noting at the outset of this report. The most obvious difference is the substantially larger sample size (700) employed in this study when compared to past efforts, which improves the statistical reliability of the results. In the interest of improving the *validity* and *reliability* of select opinion and behavior measures, the questionnaire was also substantially revised for the 2004 season. The most notable of these changes addressed how the questionnaire measured the impacts of the Spare the Air Tonight Program. The changes were made so that the impacts of the winter program on wood burning behavior would be measured using the same basic methodology employed by the

BAAQMD -- and recommended by CARB and EPA[1] -- to measure the impacts of the summer Spare the Air Program on driving behavior.[2]

Because these improvements often involved changing the wording, format and/or response options for a particular question, it is not possible to statistically compare the results of the 2004 survey with previous surveys for select measures. Where such comparisons are possible, however, this report presents the results from past surveys.

ORGANIZATION OF REPORT This report is designed to meet the needs of readers who prefer a summary of the findings as well as those who are interested in the details of the results. For those who seek an overview of the findings, the sections titled *Just the Facts* and *Conclusions* are for you. They provide a summary of the most important factual findings of the survey in bullet-point format and a discussion of their implications. For the interested reader, this section is followed by a more detailed question-by-question discussion of the results from the survey by topic area (see *Table of Contents*), as well as a description of the methodology employed for collecting and analyzing the data. And, for the truly ambitious reader, the questionnaire used for the interviews is contained at the back of this report, and a complete set of crosstabulations for the survey results is contained in Appendix A.

ACKNOWLEDGEMENTS True North would like to thank Terry Lee, Emily Hopkins and Dr. David Fairely of the BAAQMD, as well as Eric Schreffler of ESTC, for their valuable input during the design and reporting stages of this study. Their expertise and insight improved the overall quality of the research presented here.

DISCLAIMER The statements and conclusions in this report are those of the authors, Dr. Timothy McLarney and Richard Sarles at True North Research, Inc. (True North) and not necessarily those of the BAAQMD. Any errors or omissions are the responsibility of the authors.

1. The CARB/EPA Method is summarized in the Transportation Research Board's (TRB) journal --*Transportation Research Record* -- for 2004 in an article entitled *Development of a Quantification Method for Measuring the Travel and Emissions Impacts of Episodic Ozone Alert Programs* (pages 153-159). It is described in detail in the following air resources guidance report: CARB, "Quantification Method Reference Manual: A Method to Measure Travel and Emissions Impacts of Ozone Action Public Education Programs," April 2003. In addition to Eric Schreffler, Dr. Timothy McLarney and Richard Sarles, the TRB paper and guidance report were co-authored by Joann Lu and Jeff Weir of CARB, as well as Thomas Higgins and Dr. Will Johnson of K.T. Analytics.
2. For a detailed description of the updated CARB/EPA Method and its application to the BAAQMD's summer Spare the Air Program, see the *Spare the Air Study: 2004 Summer Ozone Season* report prepared for the BAAQMD by True North & ESTC.

Just the Facts

The following is an outline of the main factual findings from the 2004 study. For the reader's convenience, we have organized the findings according to the section titles used in the body of this report. Thus, to learn more about a particular finding and how it may compare to findings from prior surveys (where applicable), simply turn to the appropriate report section.

WOOD BURNING BEHAVIOR

- Sixty-four percent (64%) of households in the District contain at least one fireplace, pellet stove or wood stove.
- Among households with a fireplace, the type of fuel most commonly used is wood (57%), followed by natural gas (20%) and artificial logs such as a Duraflame (4%).
- Households that contain a wood stove were the most likely (84%) to report that they would use the stove during the winter months of November through February. The rate of use was considerably lower for pellet stoves (56%) and fireplaces (56%).
- Approximately 12% of respondents who reported that they would *not* use their fireplace, wood stove or pellet stove this winter indicated that were refraining from using the device for air quality reasons.
- Among the minority of respondents who expected to burn wood this winter, approximately one-third (34%) indicated that they would burn wood on a weekly basis, followed by 28% who will burn wood two to three times per month, 16% who expect to burn wood once per month, and 18% who will burn wood less often than once per month.
- Approximately one-third (32%) of respondents who expected to burn wood during the winter months indicated that they had burned wood during the week prior to the interview. Thirteen percent (13%) had burned wood on the day prior to the interview.

CHANGES IN WOOD BURNING BEHAVIOR

- Forty-five percent (45%) of respondents who have a fireplace, wood stove and/or pellet stove *and* expected to burn wood during the 2004-2005 winter season indicated that -- on at least one occasion -- they refrained from burning wood.
- When asked *why* they chose not to burn wood on these occasions, 1.5% specifically mentioned the Spare the Air Tonight campaign and an additional 5% offered an air quality related reason.
- Approximately 4% of adults who live in a household with at least one fireplace, wood stove or pellet stove reduced the amount of wood they burned during the 2004-2005 winter season in response to the Spare the Air Tonight campaign.

RECALL AND AWARENESS OF SPARE THE AIR TONIGHT MESSAGING

- Overall, 39% of adults in the Bay Area recalled being exposed to news stories, advertisements or public service announcements related to the Spare the Air Tonight Program during the three months prior to the interview.
- When asked to indicate where they obtained the information about the Spare the Air Tonight Program, the most commonly cited sources were television (49%) and radio (38%).
- Most respondents who recalled being exposed to the Spare the Air Tonight campaign could also recall specific aspects of the message -- including the *objective* (don't burn wood) and some of the *reasons* for changing their behavior (air quality, environment and health).

ATTITUDES ABOUT WOOD SMOKE

- Two-thirds (67%) of Bay Area adults perceive negative health effects associated with breathing wood smoke.
- When asked to indicate in an open-ended manner to identify some of the specific negative health effects associated with breathing wood smoke, most respondents focused on lung disease in general or made mention of specific diseases, including allergies, asthma, emphysema, bronchitis and cancer.
- Nineteen percent (19%) of Bay Area adults perceive that their neighborhood periodically experiences air pollution from wood smoke.
- Among these individuals, 12% stated that the problem was a small one, 5% indicated it was a moderate or medium problem, and 1% felt that air pollution due to wood smoke was a big problem in their neighborhood. One percent were not sure.

CHANGING HEATING DEVICE

- Among individuals who own a wood stove or a pellet stove, 61% indicated that their stove is EPA certified.
- One-third (33%) of respondents who owned a wood burning fireplace and/or non-EPA certified wood stove or pellet stove were willing to replace their current device -- *without a financial incentive* -- with a gas fireplace.
- Thirty percent (30%) of respondents who owned a wood burning fireplace and/or non-EPA certified wood stove or pellet stove were willing to replace their current device -- *without a financial incentive* -- with an EPA certified wood stove or pellet stove.
- Nine percent (9%) of those who were initially unwilling to replace their current heating device for a cleaner alternative in the absence of a financial incentive were willing to do so if a $200 rebate were offered. As the amount of the rebate increased to $300 and $400, the proportion of these individuals who would participate in the rebate program increased to 13% and 16%, respectively.
- Just 6% of Santa Clara County residents -- and 7% of Marin County residents -- could recall hearing, reading or seeing a news story, advertisement or public service announcement about the rebate programs offered by the respective counties.
- Nearly two-thirds (63%) of Bay Area adults support a policy that would require all new housing construction to use only gas fireplaces or EPA certified fireplace inserts, wood stoves or pellet stoves.

PERCEPTIONS OF ENTITIES

- Prior to taking the survey, 57% of respondents had heard of the Bay Area Air Quality Management District. The percentage of respondents who had heard of MTC and the Spare the Air Tonight campaign was 40% and 48%, respectively.
- Among respondents who had heard of the BAAQMD, nearly half (45%) held a favorable opinion of the agency, whereas 47% held a neutral opinion or weren't sure of their opinion, and just 8% held an unfavorable opinion.
- Among respondents who had heard of MTC, 29% held a favorable opinion of the agency, whereas 57% held a neutral opinion or weren't sure of their opinion, and 15% held a negative opinion.

- Among respondents who had heard of the Spare the Air Tonight campaign, 63% held a favorable opinion of the Program, whereas 33% held a neutral opinion or weren't sure of their opinion, and 5% held an unfavorable opinion.
- Thirty-three percent (33%) of respondents recalled hearing, reading or seeing a news story, advertisement or public service announcement in the six months prior to taking the interview that pertained to the BAAQMD. The corresponding figures for MTC and the Spare the Air Tonight campaign were 29% and 49%, respectively.

Conclusions

As noted in the *Introduction*, this study was designed to provide a better understanding of the public's attitudes and behavior with respect to burning wood, their awareness of the Spare the Air Tonight Program, as well as the impact that the Program has had on awareness, opinions and behavior relevant to wood burning and air quality. Whereas subsequent sections of this report are devoted to conveying the detailed results of the study, in this section we attempt to 'see the forest through the trees' and note how the collective results answer some of the key questions that motivated the research.

How much does residential wood burning contribute to air pollution in the Bay Area?

Based on chemical analysis of particulate matter (PM) filters, wood burning emissions represent one of the largest sources of fine particles in the Bay Area. According to the data collected during this study and subsequent analyses conducted by Dr. David Fairely of the BAAQMD, it is conservatively[3] estimated that -- on an annual basis -- an average of 896 tons of wood are burned per day by Bay Area households. This translates to an average of approximately 12.5 tons per day of PM emissions.[4]

How effective was the Spare the Air Tonight campaign during the 2004-2005 winter?

The Spare the Air Tonight campaign seeks to shape public awareness and opinions about the District and air quality issues, as well as change behavior with respect to burning wood. Accordingly, the survey sought to measure the impacts that the campaign had on each of these dimensions.

In terms of attitudes and awareness, by most measures the 2004-2005 campaign was a notable success. Awareness of the BAAQMD and the Spare the Air Tonight campaign was widespread among Bay Area adults. Moreover, opinions about the BAAQMD and the Spare the Air Tonight Program were much more favorable in 2004 when compared to the 2003 and 2002 winter seasons. With respect to attitudes about wood smoke, public recognition of the negative health impacts of breathing wood smoke continues to increase, as does support for policies that would require all new housing construction to use only gas fireplaces or EPA certified fireplace inserts, wood stoves or pellet stoves.

So how did these positive changes in attitudes and awareness translate to actual changes in wood burning behavior? Due to improvements made to the survey methodology, it is not possible to compare the impacts of the 2004-2005 campaign on wood burning behavior to past seasons. However, it is possible to estimate the impacts for this season. Based on the survey data, it is estimated that 4% of adults who live in a household with at least one fireplace, wood stove or pellet stove reduced the amount of wood they burned during the 2004-2005 winter season in

3. As explained by Dr. Fairely, this represents a conservative estimate because it excludes residential wood burning that occurs in months other than November through February.
4. Dr. Fairely reported the results of his analyses in a BAAQMD office memorandum distributed on April 11, 2005.

direct response to the Spare the Air Tonight campaign.[5] Some respondents refrained from burning wood the entire season for air quality reasons, whereas those who did burn wood reported that they refrained from burning wood on an average 4.75 occasions during the season in response to the campaign.

Are there any opportunities that the Program can take advantage of to be more successful in the future?

The survey results suggest a clear opportunity for the Program to further reduce air pollution due to wood smoke by helping to establish and promote rebate programs for the replacement of traditional fireplaces and non-EPA certified wood stoves and pellet stove. Approximately 40% of respondents who owned a traditional fireplace and/or a non-EPA certified wood stove or pellet stove indicated that they were willing to replace the device if offered a modest incentive ($200), yet only two counties (Santa Clara and Marin) currently offer such a rebate program and public awareness of these existing programs is poor.

Helping to increase the awareness of the existing programs would be a natural first step in gauging the effectiveness of this approach to reducing air pollution due to wood smoke. If the promotion of the existing programs is determined to substantially increase participation in the programs, it would make sense to invest in establishing and promoting similar programs in the remaining Bay Area counties.

How can the study be improved for the 2005-2006 winter season?

As described in the *Introduction* and *Methodology* sections of this report, a number of methodological improvements were made to this study at the outset of the 2004-2005 winter season. Having now had the benefit of collecting and analyzing the data using the improved methodology, True North and Dr. David Fairely of the BAAQMD have identified several additional changes that should be considered for the 2005-2006 winter study, including:

- To better measure the impacts of the Spare the Air Tonight campaign as well as how wood burning behavior varies throughout the winter, the interviews should be spread throughout the winter months -- not concentrated at the end of the season.
- To more reliably measure the quantity of wood burned by each respondent, ask the respondent to specify the amount of wood they typically burn in a single fire -- rather than for the entire season -- and then project to seasonal totals using information on how frequently the respondent burns wood.
- Add questions about wood burning behavior during non-winter months, which is needed to develop more accurate annual wood-burning and emissions totals.

5. Stated differently, 136,375 adults out of the estimated 3,230,109 who live in a household with at least one fireplace, wood stove or pellet stove refrained from burning wood on at least one occasion in response to the Spare the Air Tonight campaign.

- Oversample for counties that have smaller populations to more reliably estimate wood burning behavior in these counties.
- Oversample for individuals who burn wood to enable the research team to develop a more refined profile of wood burning behavior by county.
- Conduct an online survey of the Air Alert database during the winter months using a quasi-experimental design to oversample, in a cost-effective way, for traits of interest to the research team -- including wood burning behavior, ownership of a traditional fireplace, residence in a particular county, etc.

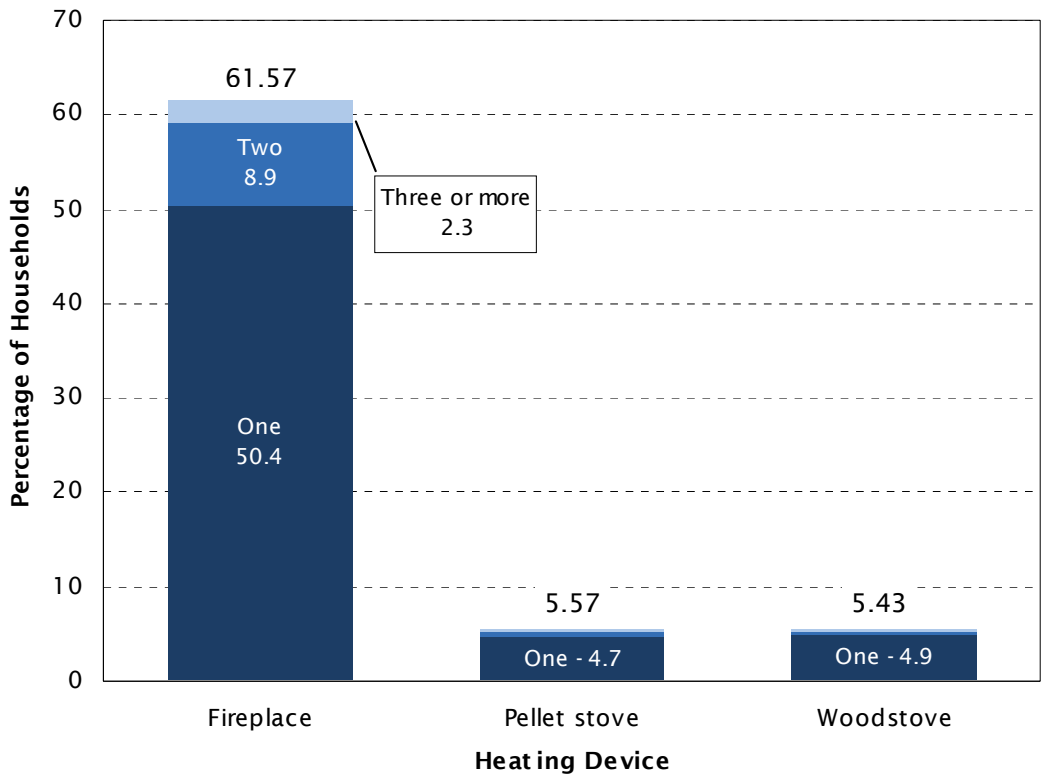
Wood Burning Behavior

One of the key objectives of the survey was to profile respondents' use of wood burning heating devices, including fireplaces, pellet stoves and wood stoves. Accordingly, the first series of questions in the survey asked respondents about the types of wood burning heating devices they have in their home, as well as their use of these devices during the 2004-2005 winter months of November through February.

HEATING DEVICES The first question in this series simply asked respondents to identify how many fireplaces, wood stoves and pellet stoves their household contains. As shown in Figure 1, approximately 62% of households contain at least one fireplace, 6% contain at least one pellet stove, and 5% contain at least one wood stove. Collectively, 64% of respondents reported that their household contained at least one fireplace, pellet stove *or* wood stove, whereas 36% of respondents indicated that their household does not contain a fireplace, pellet stove or wood stove.[6]

Question 1 *Do you have a: _____ in your home? If yes, ask: How many: _____s do you have in your home?*

FIGURE 1 HEATING DEVICES IN HOME (N=700)[7]

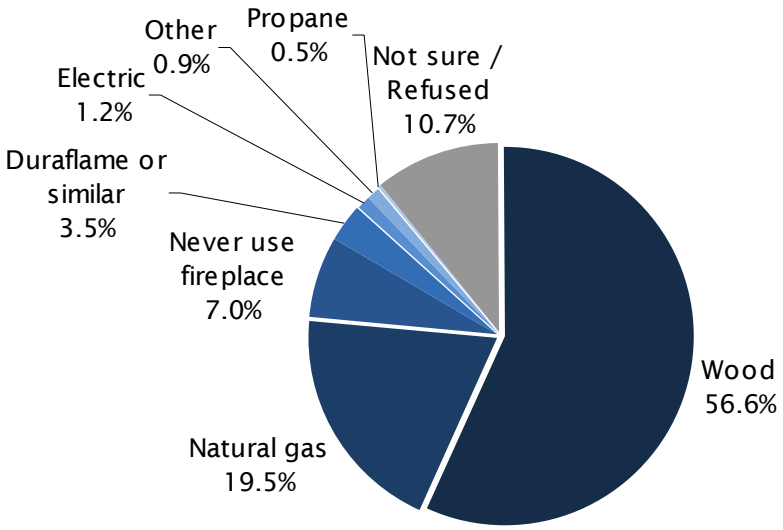


6. Because some households contained more than one type of heating device -- e.g., a fireplace *and* a woodstove -- one can not simply add the percentages shown in Figure 1 to determine the percentage of households that have at least one type of heating device.

For the 62% of respondents who reported that their household contains a fireplace, the survey next inquired as to the type of fuel that they *primarily* use in the fireplace (see Figure 2). The most commonly used fuel was wood (57%), followed by natural gas (20%), artificial logs such as a Duraflame (4%), electricity (1%), propane (1%) and other fuels (1%). Approximately 7% of respondents volunteered that they never use their fireplace and another 11% indicated that they weren't sure or refused to answer the question.

Question 2 *What type of fuel do you primarily use in your fireplace - Wood, natural gas or propane?*

FIGURE 2 TYPE OF FUEL BURNED (N=431)

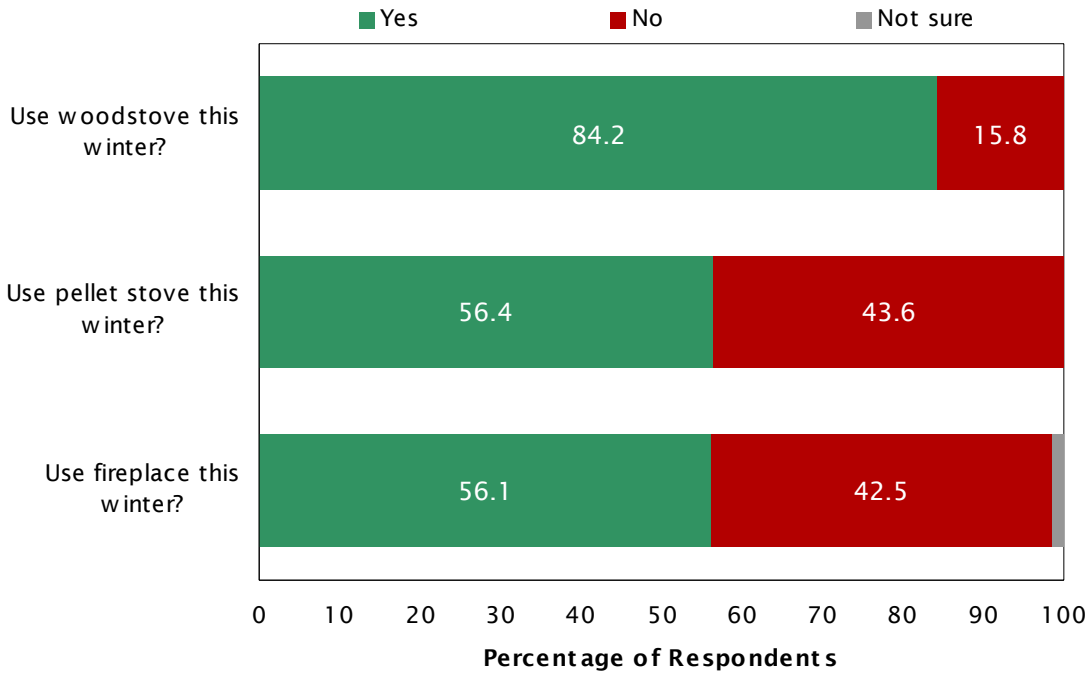


USE OF FIREPLACE, WOOD STOVE OR PELLET STOVE Respondents whose household contained at least one fireplace, pellet stove or wood stove were next asked -- for each device they own -- whether they have or intend to use the device this winter between the months of November through February. As shown in Figure 3, 84% of households that contain a wood stove indicated that they would use the device this winter. The rate of use was considerably lower for pellet stoves (56%) and fireplaces (56%).[8]

7. The n=700 refers to the number of respondents who received this question. This convention will be followed throughout the report to allow the reader to identify how many respondents are included in each figures.
8. The 2002 and 2003 surveys did not distinguish between the type of device used, and asked the question in a much different way. Respondents were asked: *"Generally speaking do you use your fireplace, pellet stove, or woodstove around the holidays only, throughout the fall and winter, both, or neither?"* A number of problems were identified with this question, perhaps the most important being that the response options were not mutually exclusive and *exhaustive*. For example, a respondent who used their fireplace once or twice during the season -- but not during the holidays -- does not have a response option that matches their behavior. Because the question was revised to distinguish between types of heating devices and improve both the validity and reliability of the measure, it is not possible to compare the results of the 2004 survey to the prior surveys on this topic.

Question 3 *Will you use your: _____ this winter?*

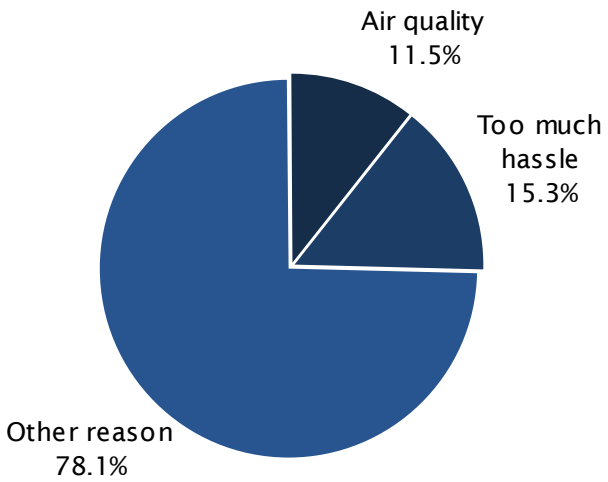
FIGURE 3 HEATING DEVICE USAGE THIS WINTER (N=450)



Respondents who indicated that they do not expect to use their fireplace, woodstove or pellet stove this winter in Question 3 were next asked to indicate *why* they do not intend to use the device. As shown in Figure 4, approximately 12% of fireplace owners offered a reason related to air quality, 15% indicated that it is simply too much hassle to use the device, and the remainder (78%) offered a reason unrelated to air quality or the Spare the Air Tonight Program.

Question 4 *Why do you not expect to use your: _____ this winter?*

FIGURE 4 REASON FOR NOT USING FIREPLACE THIS WINTER (N=183)



WOOD BURNING BEHAVIOR The next series of questions were only asked of respondents who owned at least one fireplace, pellet stove or wood stove *and* indicated that they will burn wood during the 2004-2005 winter months.

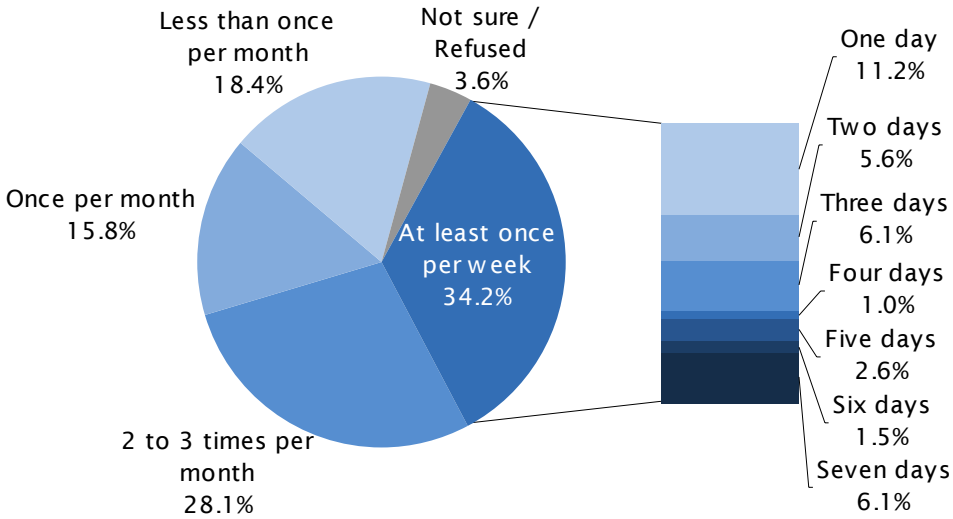
The first question (Question 5) asked each respondent how often they expected that they would burn wood this winter -- at least once per week, two to three times per month, once per month, or less often than once per month? For respondents who indicated that they expect to burn wood weekly, Question 6 asked how many days they expect to burn wood in a typical winter week. The results to both questions are combined in Figure 5.

Overall, just over one-third (34%) of respondents indicated that they expect to burn wood on a weekly basis, followed by 28% who will burn wood two to three times per month, 16% who expect to burn wood once per month, and 18% who will burn wood less often than once per month.

Question 5 *How often do you expect to burn wood this winter? At least once per week, two to three times per month, once per month, or less often than once per month?*

Question 6 *In a typical winter week, how many days do you expect to burn wood?*

FIGURE 5 FREQUENCY OF BURNING WOOD THIS WINTER (N=196)

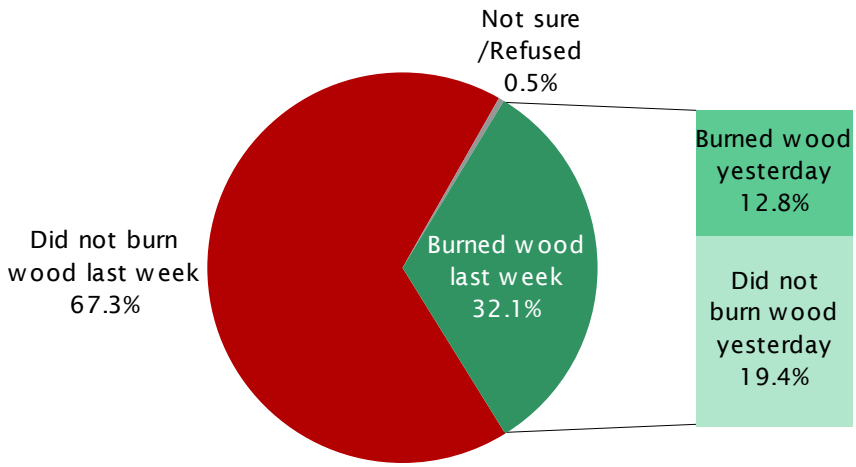


Respondents were also asked whether they burned wood in the past week and, if so, if they burned wood the day before the interview. The results to these two questions are combined in Figure 6. Approximately one-third of respondents whose household includes at least one fireplace, pellet stove and/or wood stove *and* expected to burn wood during the winter months indicated that they had burned wood during the week prior to the interview. Moreover, approximately 13% had burned wood on the day prior to the interview.

Question 7 *Did you burn wood in the past week?*

Question 8 *Did you burn wood yesterday?*

FIGURE 6 BURNED WOOD IN PAST WEEK (N=196)



ESTIMATES OF WOOD BURNING Using data collected in the 2004 survey and other secondary sources, Dr. David Fairley of the BAAQMD has estimated the proportion of households that burn wood, the amount of wood burned annually, and the estimated particulate matter (PM) emissions due to wood burning for each county in the BAAQMD's jurisdiction. Table 1 presents the results of his analyses, along with a comparison of the estimated PM emissions based on the 2004 survey data and the District's emissions inventory estimates that are drawn from a 1988 wood burning survey.[9]

TABLE 1 ESTIMATED DAILY WOOD BURNED IN THE BAY AREA & COMPARISON OF ESTIMATED PM EMISSIONS

		% wood burning households			Annual wood burned		Est'ed PM emissions (tons/day)	
County	# house-holds 2000	Total	Infre-quent*	Fre-quent*	lb per hh**	tons/day	survey	emissions inventory***
Alameda	523,366	24	16	7	124	89	1.2	4.1
Contra Costa	344,129	41	31	10	202	95	1.3	2.8
Marin	100,650	46	32	14	531	73	1	1
Napa	45,402	31	16	16	246	15	0.2	0.6
San Francisco	329,700	10	10	0	9	4	0.1	2.4
San Mateo	254,103	38	28	10	285	99	1.4	2.2
Santa Clara	565,863	27	13	15	336	260	3.6	4.4
Solano	130,403	32	14	18	683	122	1.7	0.9
Sonoma	172,403	46	23	23	929	219	3.1	2.3
Totals	2,466,019	29	19	10	265	896	12.5	20.5

*Infrequent is burn wood less than once per week. Frequent is burn wood more often than once per week.
**Assumes 25 lb. per burn-day for infrequent burners and 55 lb. per burn-day for frequent burners.
***Estimates for 2001, using the 1999 Base Year inventory, annual average.

9. *The California Residential Wood Consumption Survey*. Report prepared by Northern California Research Associates for the California Air Resources Board, 1988.

Overall, it is estimated that wood burning particulate matter emissions from residential fireplaces, pellet stoves and wood stoves in the Bay Area average 12.5 tons per day on an annual basis, which is quite close to the 20.5 tons estimate contained in the District's emissions inventory from 1988 that is based on a different methodology.[10]

10.The 2004 survey measured how frequently respondents burn wood (Questions 5 and 6). It also included a question (Question 9) which asked respondents to estimate how much wood they expect to burn during the entire winter using the unit of measurement they are most familiar with: cords, boxes, logs or some other unit. Analyses revealed that although respondents appeared to be able to estimate their frequency of wood burning with little difficulty, a substantial number of respondents appeared to not be able to provide a reliable response when asked to quantify the amount of wood that expect to burn for the entire season. It is recommended that this question be modified for the 2005-2006 winter Spare the Air Tonight survey to more reliably measure the amount of wood consumed. It may be easier, for example, for the respondent to specify the amount of wood they burn in a typical fire -- rather than for an entire season -- and then project to seasonal totals using information on how frequently the respondent burns wood.

Changes in Wood Burning Behavior

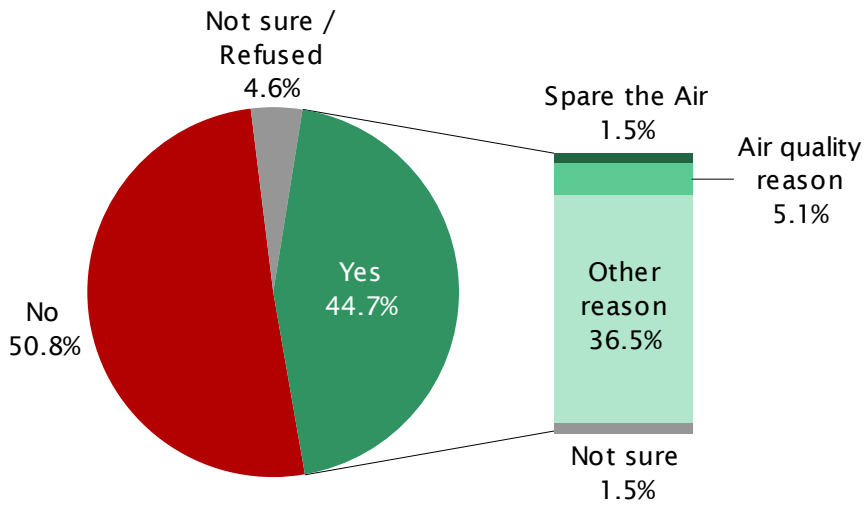
Having measured respondents' basic wood burning behavior, the survey next focused on whether respondents had made changes in their wood burning behavior during the 2004-2005 winter season in response to the Spare the Air Tonight campaign. Respondents were first asked whether there were occasions this winter when they normally would have burned wood, but decided not to. If a respondent indicated that they had refrained from burning wood on at least one occasion, they were then asked in an open-ended manner to indicate *why* they reduced their wood burning.[11]

The manner in which this question was asked, as well as its placement in the survey relative to specific questions about the Spare the Air Tonight campaign, was changed from prior surveys. Previous surveys first introduced the Spare the Air Tonight Program and then asked if individuals responded to the Program by reducing the amount of wood they burned. Asking the question in this manner is likely to prompt a *socially desirable* response from some respondents that they had reduced their wood burning even if they had not -- which leads to artificially high estimates of the campaign's impact. To more accurately measure reductions in wood burning that can be attributed to the campaign, the 2004 survey employed an indirect approach similar to that used in the CARB/EPA Method for estimating reductions in driving due to the summer Spare the Air campaign.

Question 10 *Were there occasions this winter when you normally would have burned wood, but decided not to?*

Question 11 *Why did you decide not to burn wood on these occasions?*

Figure 7 Chose not to Burn this Winter (n=196)



11. Respondents were allowed to provide multiple responses to this question, as their reason for not burning wood could vary from occasion to occasion.

As shown in Figure 7, 45% of respondents who have a fireplace, wood stove and/or pellet stove *and* expected to burn wood during the 2004-2005 winter season indicated that -- on at least one occasion -- they refrained from burning wood. When asked *why* they chose not to burn wood on these occasions, 1.5% specifically mentioned the Spare the Air campaign and an additional 5% offered an air quality related reason.

CAMPAIGN IMPACTS ON WOOD BURNING To estimate the proportion of adults in the District who reduced the amount of wood that they burned during the winter season in response to the campaign, one must combine the responses from several questions in the survey. Naturally, respondents who do not live in a household that contains a fireplace, wood stove or pellet stove (Question 1) should not be included in the analysis since they could not respond to the campaign by reducing their wood burning behavior. Respondents who chose not to burn wood *at all* during the winter (Question 3), did so because of air quality reasons (Question 4), *and* were aware of the Spare the Air Tonight Program (Question 13) can be considered a Spare the Air (STA) reducer. So too can respondents who indicated that although they did burn wood, they refrained from doing so on occasion (Question 10), did so because of the campaign or for air quality reasons (Question 11), *and* were aware of the Spare the Air Tonight Program (Question 13).

Table 2 shows that of the 450 respondents in the survey who were eligible to respond to the campaign, 19 (4.2%) reduced their wood burning behavior on at least one occasion during the 2004-2005 winter in response to the Spare the Air Tonight Program. This represents 136,375 adults out of the estimated 3,230,109 who live in a household with at least one fireplace, wood stove or pellet stove.[12]

TABLE 2 SPARE THE AIR REDUCERS: CONFIDENCE INTERVAL

Winter Spare the Air Tonight Reducers		
Universe Estimate (adults with heating device in home)		3,230,109
Sample Size		450
STA Reducers		19
Non-STA Reducers		431
Proportion of STA Reducers		4.222%
Proportion of Non-STA Reducers		95.778%
Margin of Error (95% confidence)		1.858%
95% Confidence Interval for Proportion of Winter STA Reducers	Lower Bound	2.364%
	Upper Bound	6.080%

12. The survey included a follow-up question (Question 12) which asked respondents who refrained from burning wood for campaign-related reasons (Question 11) how many times they refrained from burning wood for air quality reasons during the winter season. The average response was 4.75 times, although the small sample size for this question means that the statistical margins of error around the estimate are large. Moreover, respondents who did not burn wood at all during the winter were not asked this question, so the figure represents the average reduction among individuals who normally burn wood.

Recall and Awareness of Spare the Air Tonight Messaging

Although the ultimate goal of the Spare the Air Tonight campaign is to persuade individuals to reduce the amount of wood that they burn and to replace wood burning devices with cleaner alternatives, there are a series of related objectives which must be met in order for this to occur. For example, regardless of how compelling the message may be, if the message does not reach the target audience then the campaign can not succeed in its primary goal. Thus, an instrumental objective of the campaign is to simply increase awareness of the Spare the Air Tonight Program and related events.

RECALL EXPOSURE TO SPARE THE AIR MESSAGING Accordingly, a series of questions was asked of respondents about their recall of Spare the Air Tonight messaging -- including the medium and content of the information. The first of these questions asked: *During this winter, have you heard, read, or seen any new stories, advertisements or public service announcements about Spare the Air Tonight, poor air quality, or requests not to use your fireplace, pellet stove or wood stove?*

Question 13 *During this winter, have you heard, read, or seen any news stories, advertisements, or public service announcements about Spare the Air Tonight, poor air quality, or requests not to use your fireplace, pellet stove, or woodstove?*

Figure 8 Heard, Read, or Saw Spare the Air Winter Information (n=700)

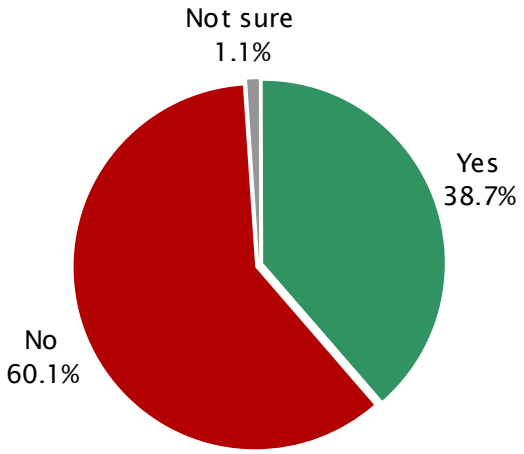


Figure 8 shows that -- overall -- 39% of adults in the Bay Area recalled being exposed to news stories, advertisements or public service announcements related to the Spare the Air Tonight Program during the winter months. For the interested reader, Figures 9, 10 and 11 show how recall varied by county, respondent age and household income. In general, older respondents (see Figure 10), those with annual family incomes between $75,000 and $100,000 (see Figure 11), and those who reside in Contra Costa and Marin counties (see Figure 9) were the most likely to recall being exposed to the Spare the Air Tonight campaign.

FIGURE 9 HEARD, READ, OR SAW SPARE THE AIR WINTER INFORMATION BY COUNTY (N=700)

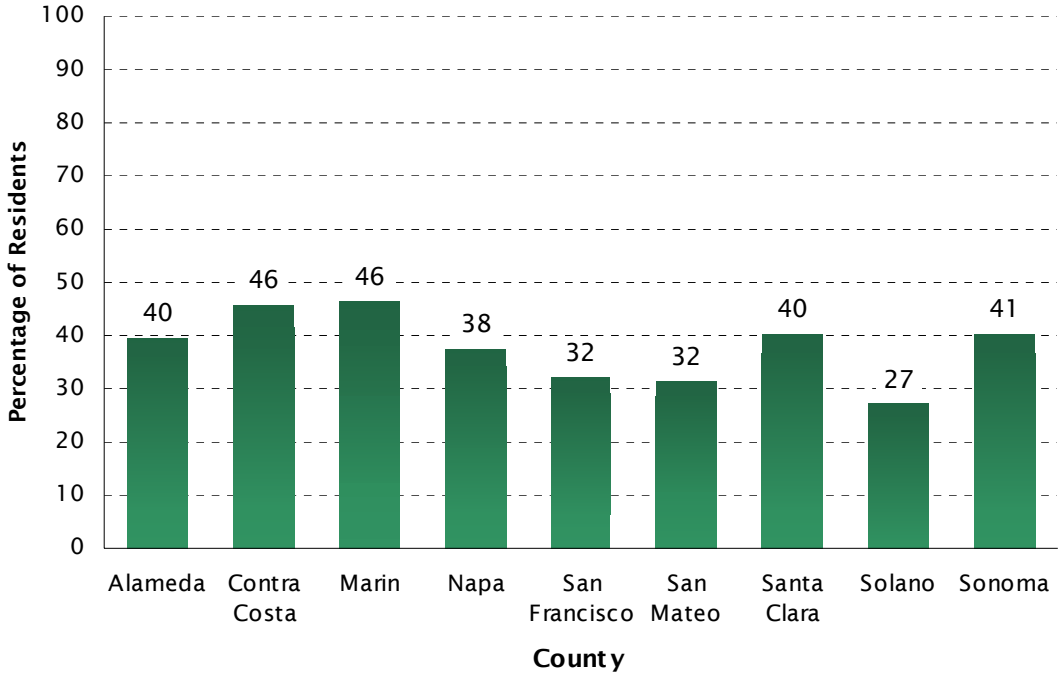


FIGURE 10 HEARD, READ, OR SAW SPARE THE AIR WINTER INFORMATION BY AGE (N=700)

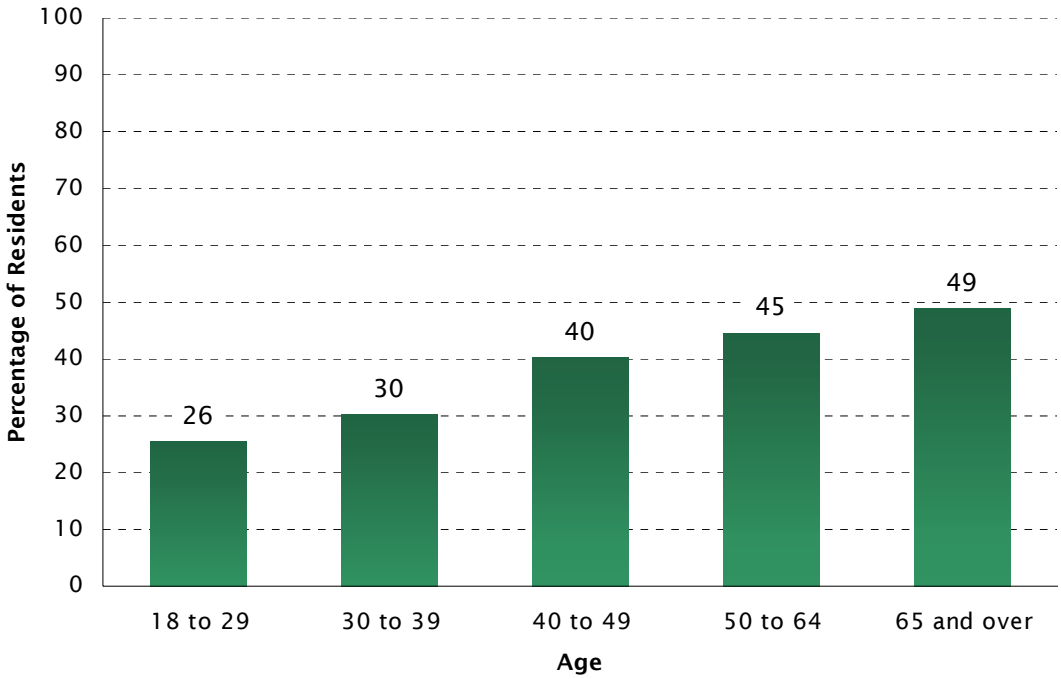


FIGURE 11 HEARD, READ, OR SAW SPARE THE AIR WINTER INFORMATION BY HOUSEHOLD INCOME (N=700)

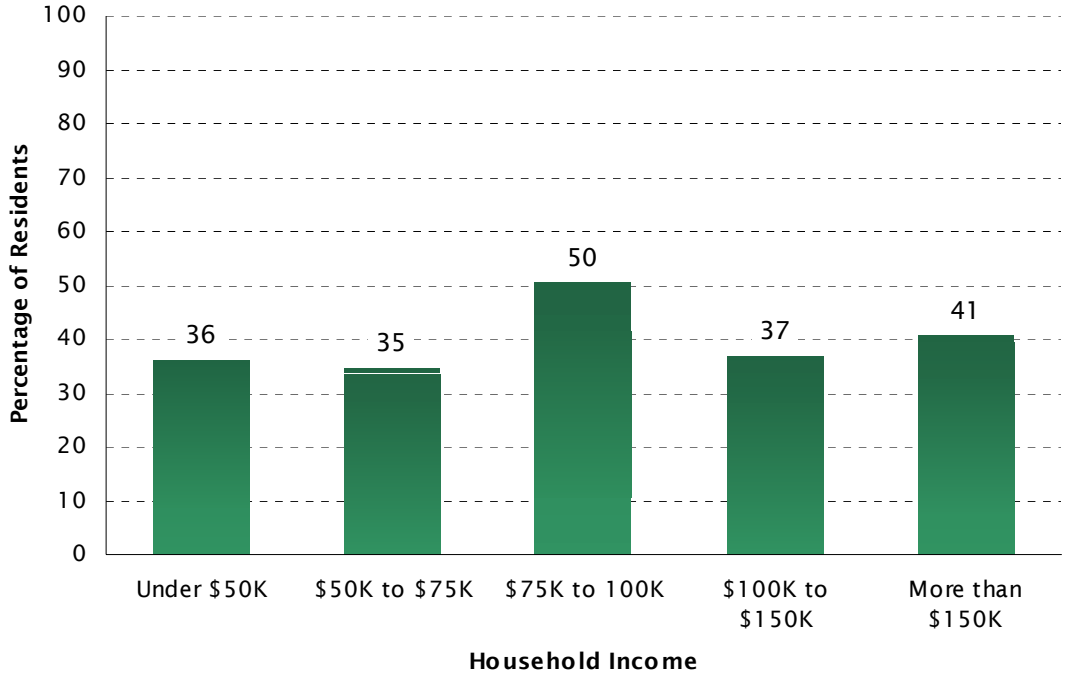


Table 3 shows how recall of the Spare the Air Tonight campaign has changed during the past three years of the Program. The 2004 rates of recall were statistically similar to the rates recorded in the previous year (2003), although lower than the 2002 rates.

TABLE 3 HEARD, READ, OR SAW SPARE THE AIR WINTER INFORMATION: 2002 TO 2004

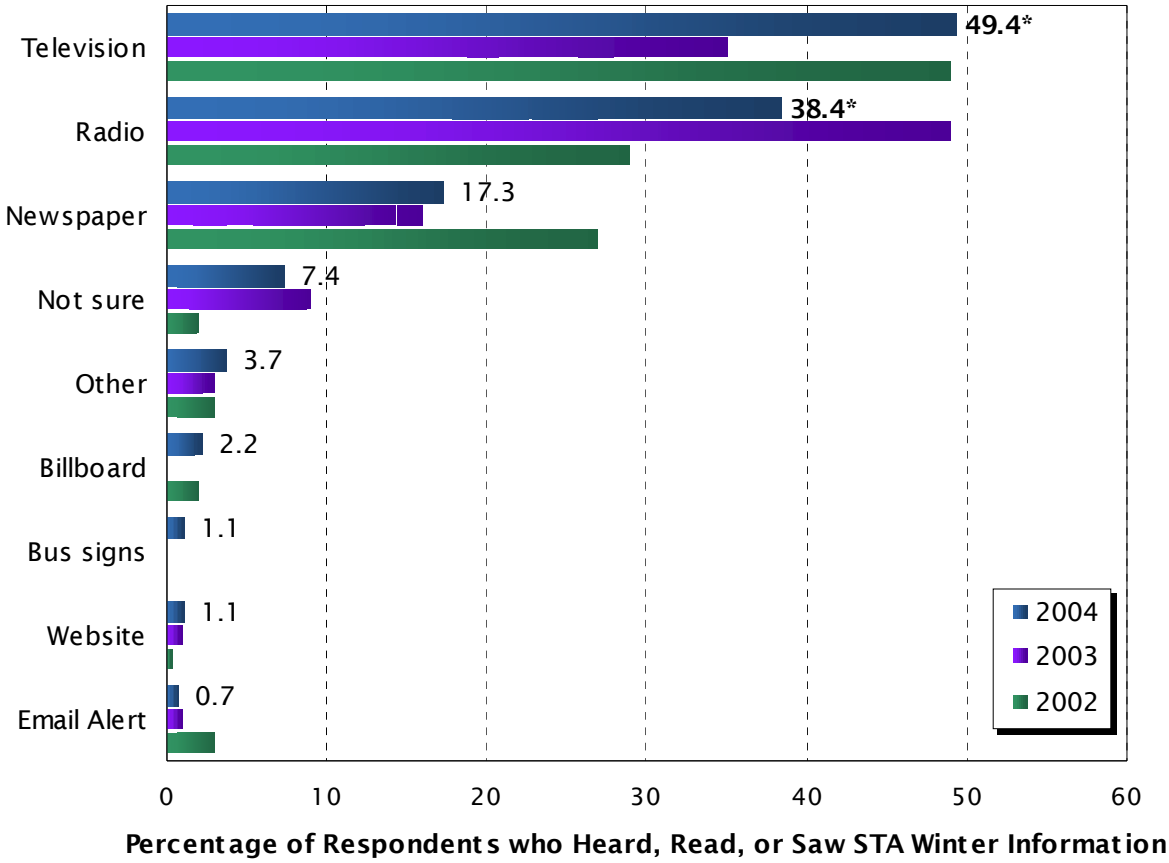
Q13 Heard, read, or saw STA winter info	2004	2003	2002
Yes	39%	42%	56%
No	60%	56%	43%
Not sure	1%	2%	1%

INFORMATION SOURCE Those who indicated that they recalled hearing, reading, or seeing Spare the Air Tonight related information during the winter were next asked where they obtained the information. Multiple responses to the question were allowed, so the percentages shown in Figure 12 represent the percentage of respondents who mentioned a particular source and thus add to more than 100%. Because this question was asked in an identical manner in the 2002 and 2003 surveys, the results from these surveys are also included in Figure 12 for comparison.

As in the previous two surveys, the most popular methods of obtaining information related to Spare the Air and air quality during the winter of 2004-2005 were television (49%) and radio (38%). Within these two sources, however, there appears to be a significant shift since 2003 toward a greater reliance on television and less reliance on radio for this information. Newspapers (17%) were the only other information source mentioned by at least 10% of respondents.

Question 14 *Where did you see the news story, advertisement or public service announcement?*

FIGURE 12 INFORMATION SOURCE FOR SPARE THE AIR WINTER INFORMATION (N=271)



*Statistically significant change ($p < 0.05$) between the 2003 and 2004 studies.

CONTENT OF MESSAGE Respondents who indicated that they recalled hearing, reading, or seeing Spare the Air Tonight related information during the winter were also asked in an open-ended manner what they remembered from the story, advertisement, or public service announcement. Interviewers recorded up to three verbatim responses, which were later coded into the list of categories shown in Figure 13. Again, as participants were allowed multiple responses, the numbers presented in Figure 13 represent the percentage of adults who mentioned a particular response.

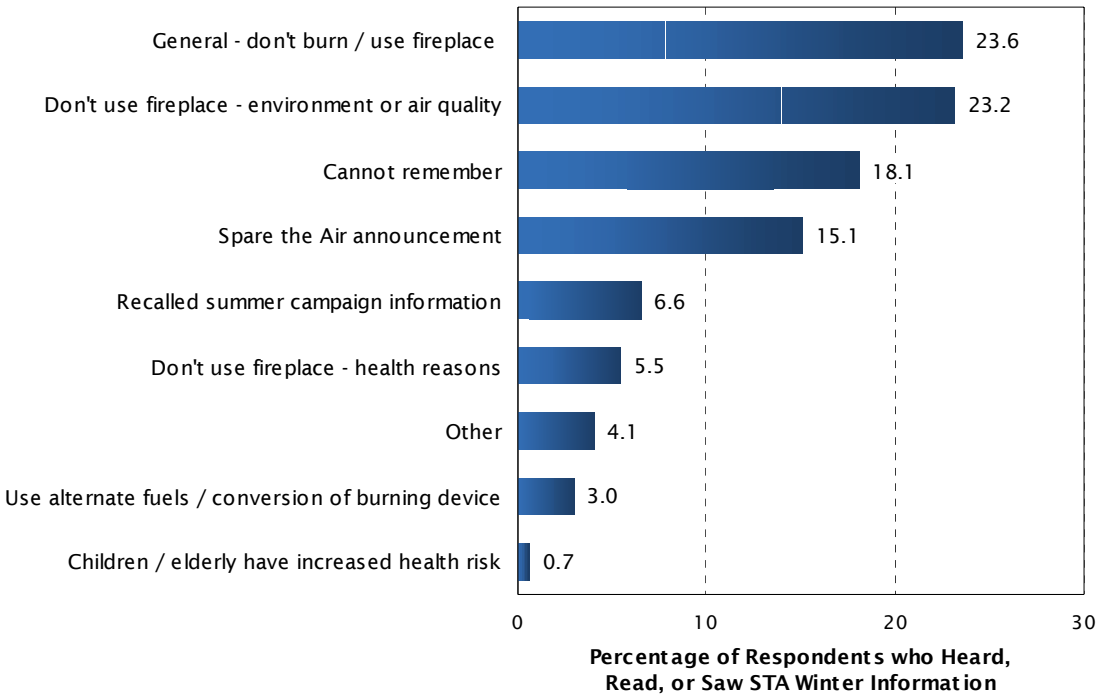
Approximately one-quarter (24%) of respondents recalled the objective of the message -- don't burn wood and/or don't use your fireplace -- whereas 23% recalled the objective *and* that the reason was for environmental or air quality reasons. Fifteen percent (15%) of respondents specifically recalled the 'Spare the Air' phrase, 7% recalled content from the summer season Spare the Air campaign,[13] and 6% recalled that the instruction not to use their fireplace was for health rea-

13.For example, some respondents mentioned that the message was to not use lighter-fluid and garden equipment, which was a message of the summer campaign, but not the winter Spare the Air Tonight program.

sons. It is worth noting that 18% could not recall anything specific about the news story, advertisement or public service announcement.

Question 15 *What do you remember about the story, advertisement or announcement?*

FIGURE 13 INFORMATION RECALL FROM STA WINTER CAMPAIGN (N=271)



Attitudes about Wood Smoke

In addition to changing wood burning behavior, one of the goals of the Spare the Air Tonight program is to change how residents think about wood smoke and its impact on public health. To track how effective the Program has been in achieving this goal, the survey included several measures of residents' opinions and perceptions about wood smoke.

The first of these questions simply asked the respondent whether they think there are any negative health effects associated with breathing wood smoke. As shown in Figure 14, two-thirds (67%) of adults in the Bay Area do perceive wood smoke to have negative health impacts. Moreover, public opinion on this matter has changed substantially in the past three years -- in part due to the Spare the Air Tonight Program. Table 4 reveals that the percentage of adults who perceive wood smoke to have negative health effects has increased by 18% since 2002.

Question 16 *Do you think there are any negative health effects associated with breathing wood smoke?*

Figure 14 Perceive Negative Health Effects are Associated with Wood Smoke (n=700)

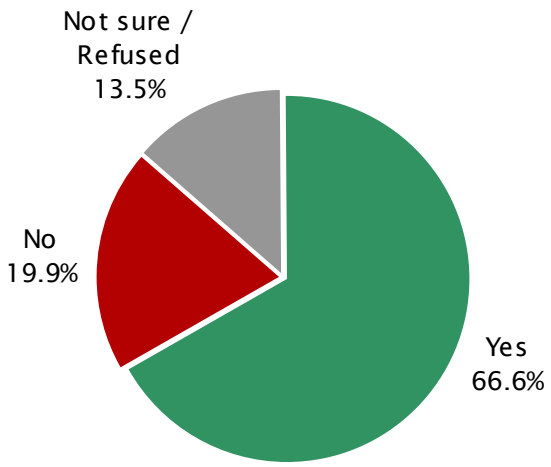


Table 4 Perceive Negative Health Effects are Associated with Wood Smoke: 2002 to 2004

Q16 Feel there are negative effects associated with wood smoke	2004	2003	2002
Yes	**67%***	59%	49%
No	**20%***	26%	39%
Not sure	13%	16%	12%

*Statistically significant change ($p < 0.05$) in opinion between the 2003 and 2004 studies.

For the interested reader, Figures 15, 16 and 17 display how adults in the Bay Area differ in their opinions about the health impacts of wood smoke based on their county of residence, age and family income, respectively.

FIGURE 15 PERCEIVE NEGATIVE HEALTH EFFECTS ARE ASSOCIATED WITH WOOD SMOKE BY COUNTY (N=700)

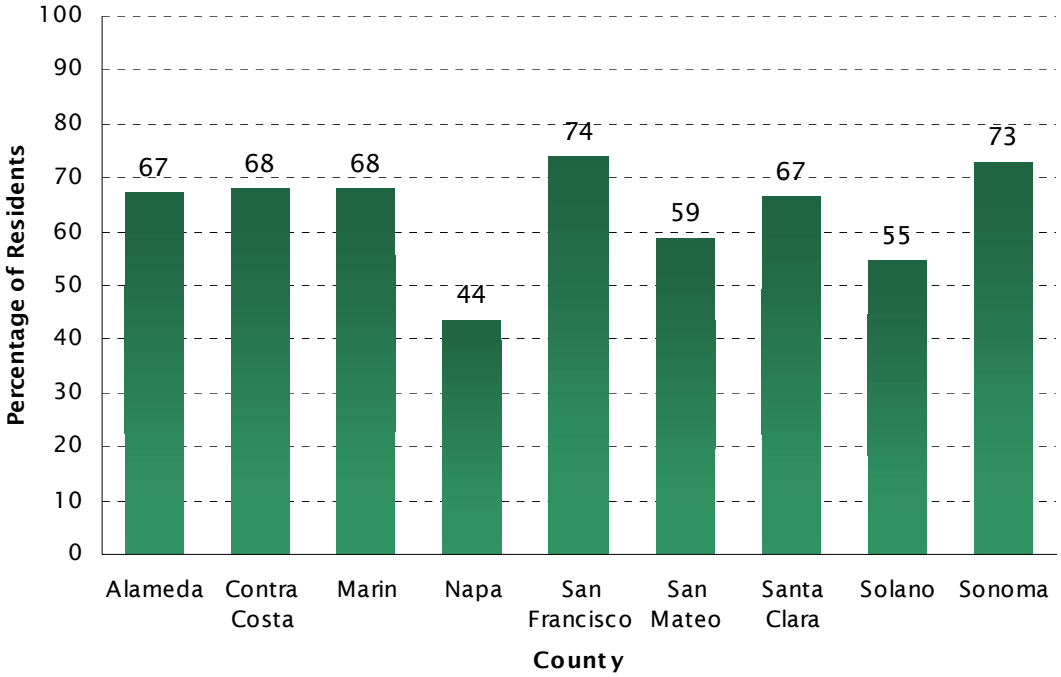


FIGURE 16 PERCEIVE NEGATIVE HEALTH EFFECTS ARE ASSOCIATED WITH WOOD SMOKE BY AGE (N=700)

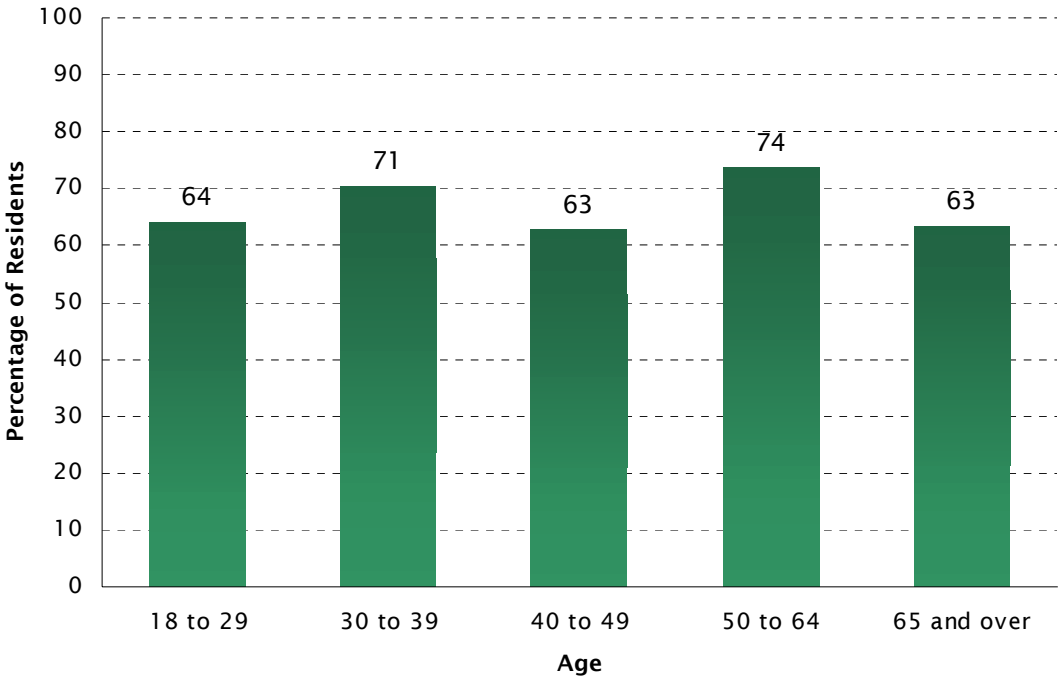
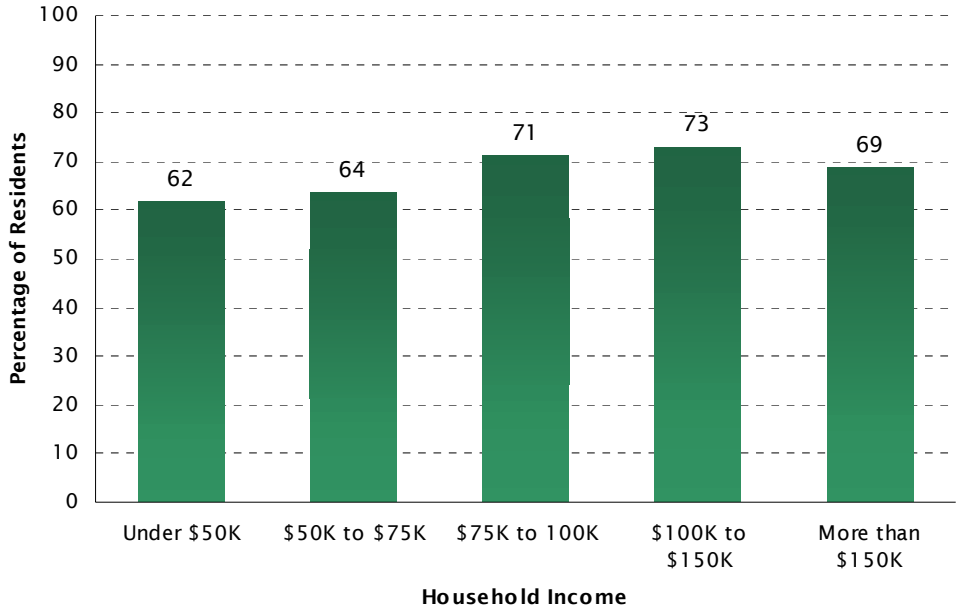


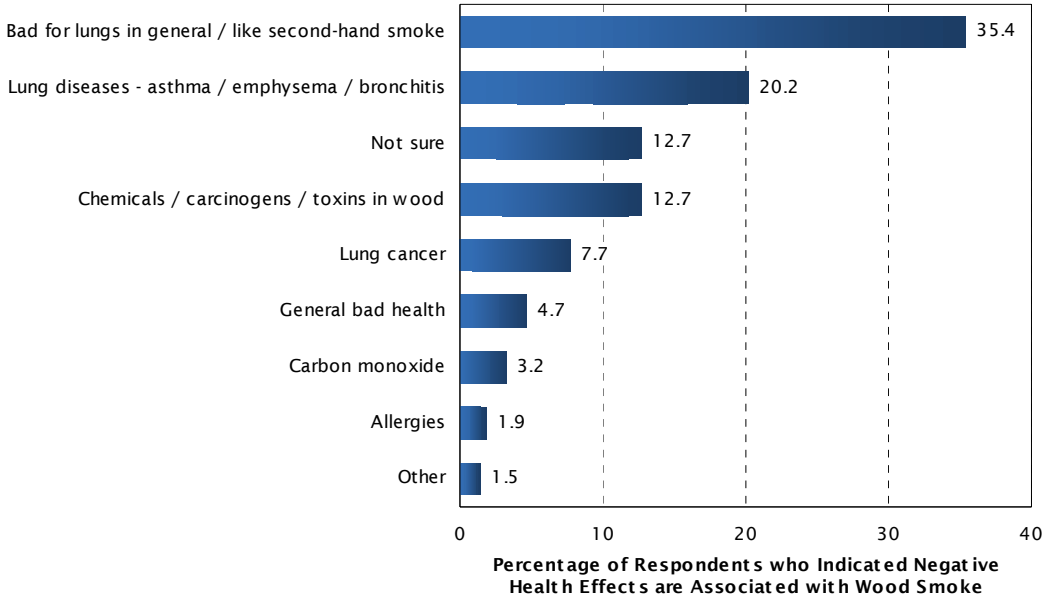
FIGURE 17 PERCEIVE NEGATIVE HEALTH EFFECTS ARE ASSOCIATED WITH WOOD SMOKE BY HOUSEHOLD INCOME (N=700)



Respondents who perceived wood smoke to have negative health impacts (Question 16) were next asked in an open-ended manner to identify what the specific health effects are of breathing wood smoke (see Table 5). The most common response (35%) was a general reference to wood smoke being bad for a person's lungs, followed by specific references to asthma, emphysema and bronchitis (20%) or lung cancer (8%). Approximately 13% of respondents mentioned the properties of wood -- chemicals, carcinogens and toxins -- that are released when burned.

Question 17 *What are the negative health effects associated with breathing wood smoke?*

TABLE 5 PERCEIVED NEGATIVE EFFECTS OF BREATHING WOOD SMOKE (N=466)



WOOD SMOKE A NEIGHBORHOOD PROBLEM? Most adults recognize that there are negative health impacts due to wood smoke. But do they think that *their* neighborhood has a wood smoke problem? To answer this question, the survey first informed respondents that different neighborhoods in the Bay Area experience different levels of air pollution from wood smoke. Respondents were then asked to indicate whether, in their opinion, their neighborhood periodically experiences air pollution from wood smoke. Those who perceived their neighborhood to have an occasional wood smoke problem were asked in a follow-up question to identify the magnitude of the problem. The answers to both of these questions are combined in Figure 18.

Overall, 19% of adults surveyed indicated that their neighborhood periodically experiences air pollution from wood smoke. Among these individuals, 12% stated that the problem was a small one, 5% indicated it was a moderate or medium problem, and 1% felt that air pollution due to wood smoke was a big problem in their neighborhood.

Question 18 *Different neighborhoods in the Bay Area experience different levels of air pollution from wood smoke. In your opinion, does your neighborhood periodically experience air pollution from wood smoke?*

Question 19 *Would you say that periodic air pollution from wood smoke in your neighborhood is a big problem, medium problem or a small problem?*

FIGURE 18 PERCEPTION OF PERIODIC WOOD SMOKE PROBLEM IN NEIGHBORHOOD (N=700)

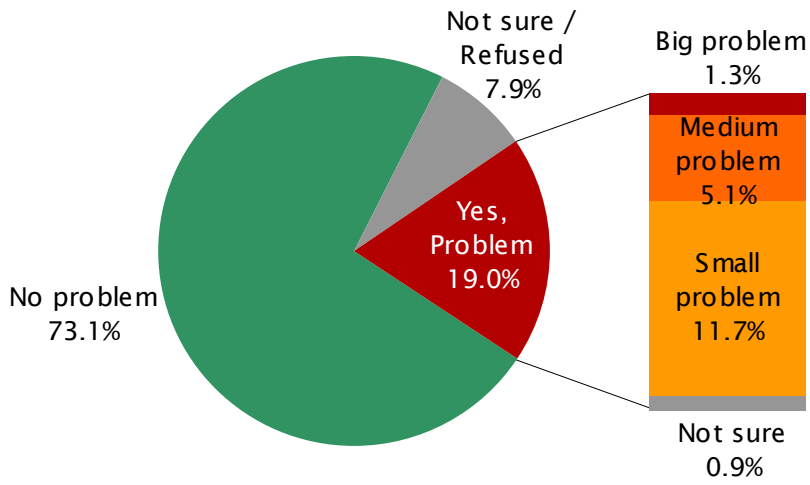
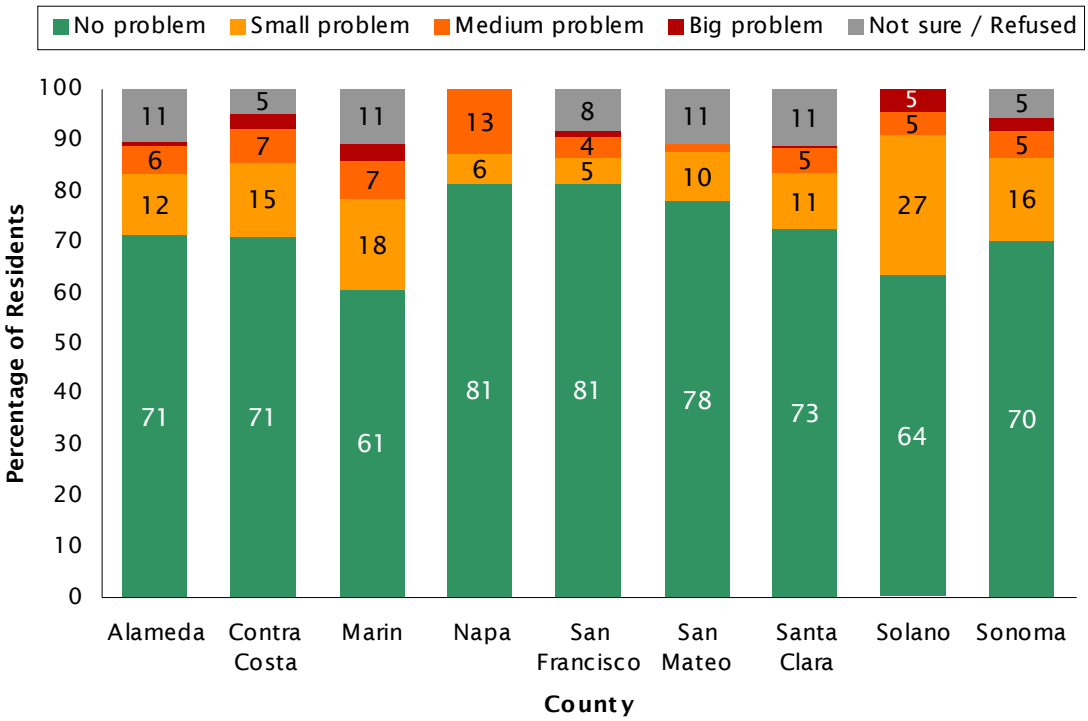


Figure 19 shows how the answers to Questions 18 and 19 varied by county within the Bay Area. Overall, perceptions of wood smoke being a neighborhood problem were greatest in Contra Costa, Marin, Solano and Sonoma counties.

FIGURE 19 PERCEPTION OF WOOD SMOKE PROBLEM IN NEIGHBORHOOD BY COUNTY (N=700)



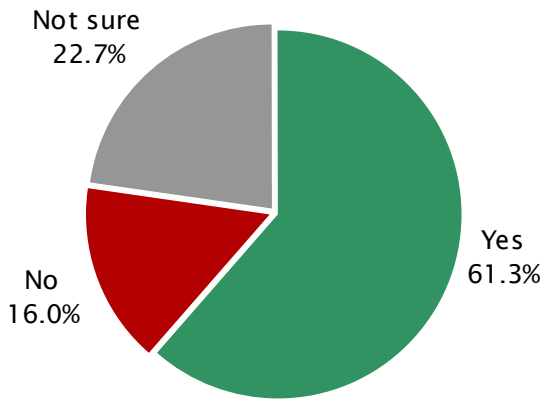
Changing Heating Device

Reducing the amount of air pollution caused by wood burning is the ultimate goal of the Spare the Air Tonight Program. Toward this end, the Program adopts both direct and indirect strategies. Direct strategies encourage individuals to simply not use their fireplace, wood stove or pellet stove -- or to use it less frequently. For respondents who depend on their fireplace or stove for heat, however, this strategy may not be practical or effective. For these and other individuals, the Program also employs strategies to reduce wood smoke pollutants indirectly -- that is, by changing the type of fuel burned and/or the efficiency of the heating device, rather than the frequency of burning.

To understand the potential impact that these indirect strategies may have on air pollution from wood smoke, the first task is to develop a profile of the specific type of heating devices that are owned by Bay Area residents. In addition to understanding the *number* of fireplaces, wood stoves and pellet stoves that are owned by respondents (see "Heating Devices" on page 9) and the type of fuel that they burn, respondents with wood stoves or pellet stoves were also asked to identify whether their stove is EPA certified. Figure 20 shows that most respondents (61%) thought that their stove was EPA certified, whereas 16% indicated that it was not and 23% were unsure.

Question 20 *Is your woodstove or pellet stove EPA certified? If not sure, clarify: Wood stoves and pellet stoves manufactured after 1992 are EPA certified, while older ones are not.*

Figure 20 Woodstove or Pellet Stove EPA Certified (n=75)

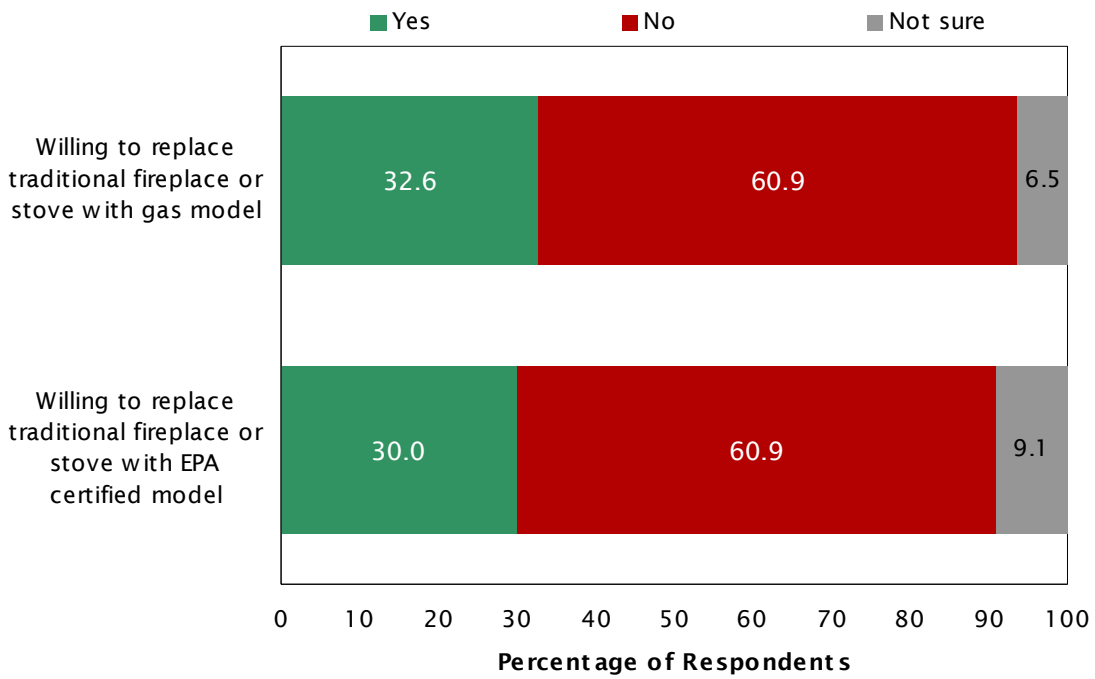


WILLINGNESS TO CHANGE HEATING DEVICE For respondents who owned a wood-burning fireplace and/or a non-EPA certified wood stove or pellet stove, the survey next inquired as to whether the respondent would be willing to replace their current device with a gas fireplace (Question 21) or EPA wood stove or pellet stove (Question 22) that would burn much cleaner and be less polluting. The responses to both of these questions are presented in Figure 21. Overall, 33% of respondents were willing to replace their current device with a gas fireplace, whereas a slightly lower percentage (30%) were willing to replace their device with an EPA certified wood stove or pellet stove.

Question 21 *Gas fireplaces and EPA certified wood stoves, inserts or pellet stoves burn much cleaner and are less polluting than traditional fireplaces or old wood stoves. Would you be willing to replace your traditional fireplace, non-EPA certified woodstove or pellet stove with a gas fireplace?*

Question 22 *Would you be willing to replace your traditional fireplace, non-EPA certified woodstove or pellet stove with an EPA certified woodstove or pellet stove?*

FIGURE 21 WILLINGNESS TO REPLACE FIREPLACE OR STOVE WITH EPA CERTIFIED MODEL (N=230)



Figures 22 and 23 show how willingness to replace one's wood-burning fireplace and/or non-EPA certified stove with a gas fireplace or EPA certified stove varied by age and household income. Although family income does not appear to systematically shape willingness to replace heating devices (see Figure 23), residents under the age of 40 were more likely than their older counterparts to be willing to replace their current heating devices for cleaner-burning alternatives (see Figure 22).

FIGURE 22 WILLINGNESS TO REPLACE FIREPLACE OR STOVE WITH EPA CERTIFIED MODEL BY AGE (N=230)

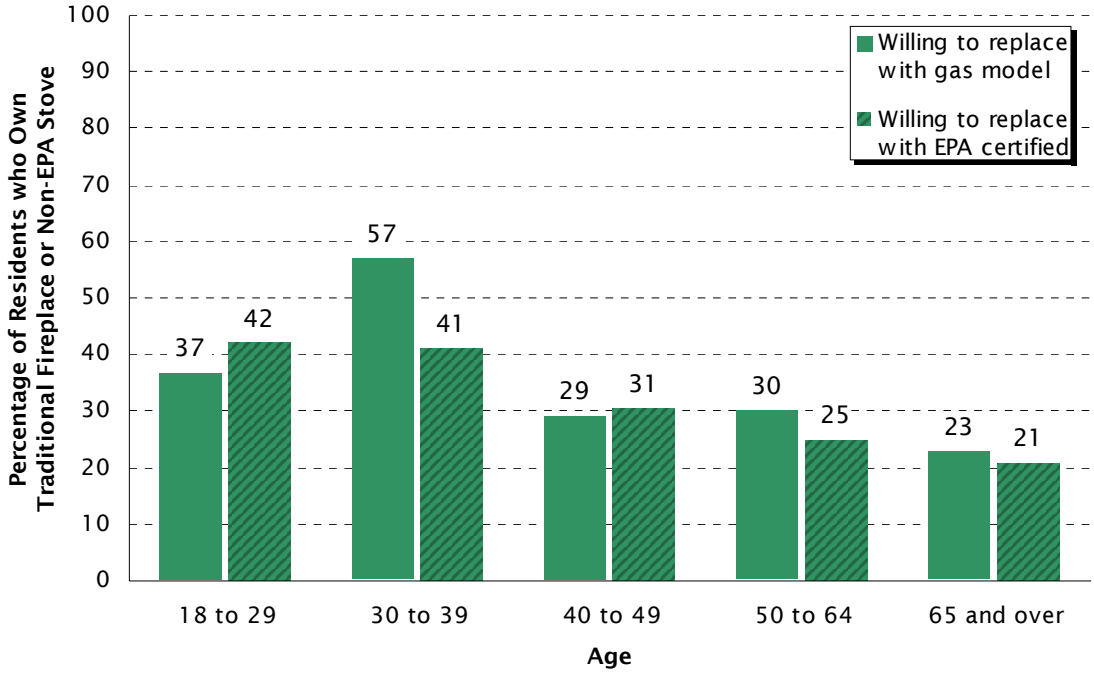
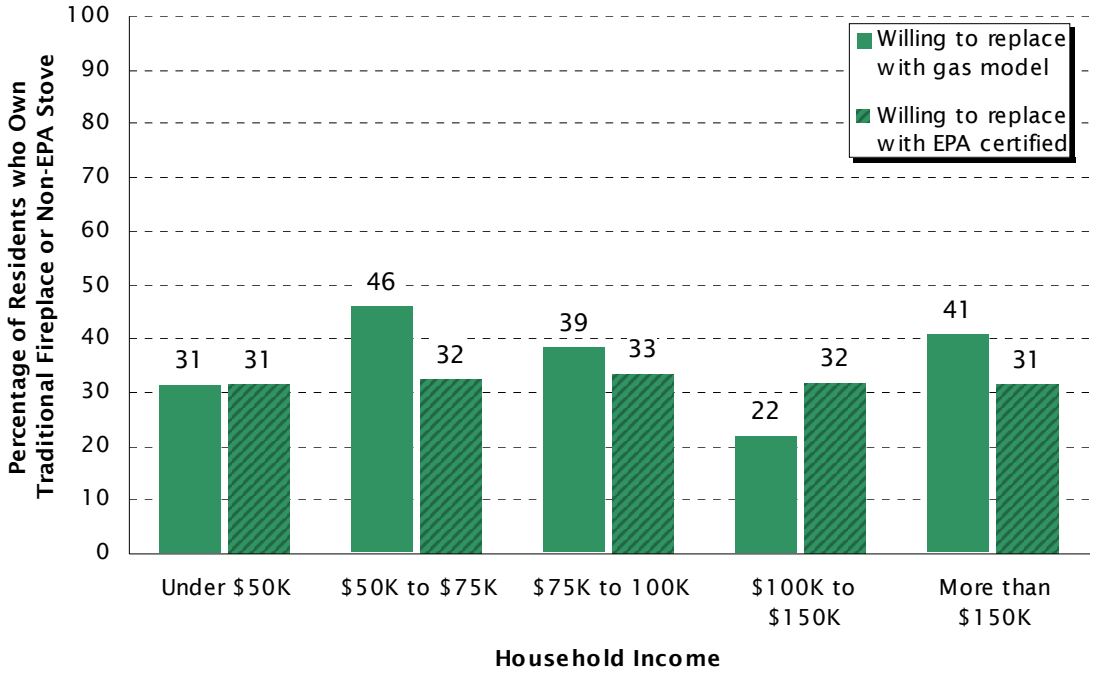


FIGURE 23 WILLINGNESS TO REPLACE FIREPLACE OR STOVE WITH EPA CERTIFIED MODEL BY COUNTY (N=230)



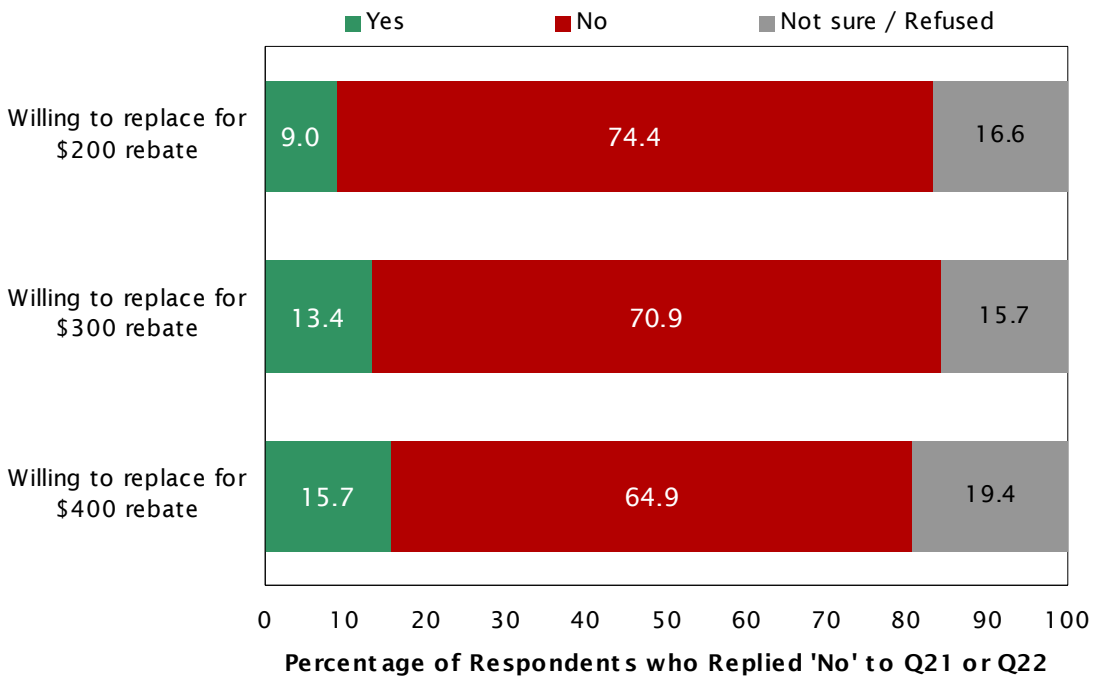
Questions 21 and 22 measured respondents' willingness to replace their current heating devices *in the absence* of a financial incentive to do so. For those respondents who were unwilling to replace their current device in this context, the survey next inquired as to whether they would do so if they were offered a financial incentive.

In Question 23, respondents who indicated that they were unwilling to replace their current heating device for a cleaner alternative (Questions 21 and 22) were first informed that there is a government sponsored program that offers rebates to residents who replace their traditional fireplace or non-EPA certified stove with a gas fireplace or EPA certified wood stove or pellet stove. They were then asked if they would participate in this program knowing that they would receive a $200 rebate. For those who remained unwilling at $200, rates of $300 and $400 were tested in sequential order.

As shown in Figure 24, 9% of those who were initially unwilling to replace their heating device for a cleaner alternative were willing to do so if a $200 rebate were offered. As the amount of the rebate increased to $300 and $400, the proportion of respondents who indicated that they would participate in the program increased to 13% and 16%, respectively. Combining residents who are willing to replace their current devices without a financial incentive (see Figure 21) with those who require $200 suggests approximately 40% of the target population would be receptive to a modest rebate program.

Question 23 *There is a government sponsored program that offers rebates to residents who replace their traditional fireplace or non-EPA certified woodstove or pellet stove with a gas fireplace or EPA certified woodstove or pellet stove. If you knew that you could receive a rebate of: _____ dollars, would you participate in this program?*

FIGURE 24 WILLINGNESS TO PARTICIPATE IN GOVERNMENT-SPONSORED REBATE PROGRAM (N=130)

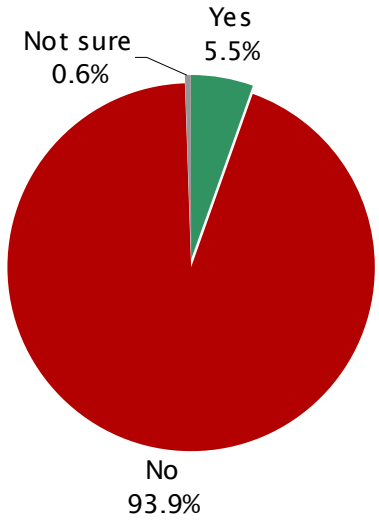


RECALL NEWS STORY, ADVERTISEMENT OR ANNOUNCEMENT? Two counties (Santa Clara and Marin) that are served by the BAAQMD currently offer rebate programs similar to that described above that partially reimburse residents for the cost of replacing a traditional fireplace with a gas fireplace or an EPA certified fireplace, wood stove or pellet stove. In Questions 24 and 25, respondents who reside in these two counties were asked if -- in the three months prior to taking the interview -- they had heard, read or seen any news stories, advertisements or public service announcements about their county's program. The answers to this question are shown for Santa Clara County and Marin County in Figures 25 and 26, respectively.

Overall, just 6% of Santa Clara County residents -- and 7% of Marin County residents -- could recall hearing, reading or seeing a news story, advertisement or public service announcement about the rebate program.

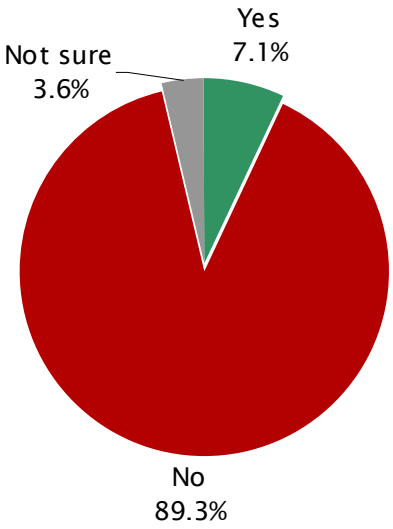
Question 24 *Santa Clara County has a program to offer residents a rebate for replacing a traditional fireplace with a gas burning fireplace or an EPA certified fireplace, woodstove or pellet stove. In the past three months, have you heard, read or seen any news stories, advertisements or public service announcements about this program?*

FIGURE 25 SANTA CLARA COUNTY PROGRAM AWARENESS (N=164)



Question 25 *Marin County has a program to offer residents a rebate for replacing a traditional fireplace with a gas burning fireplace or an EPA certified fireplace, woodstove or pellet stove. In the past three months, have you heard, read or seen any news stories, advertisements or public service announcements about this program?*

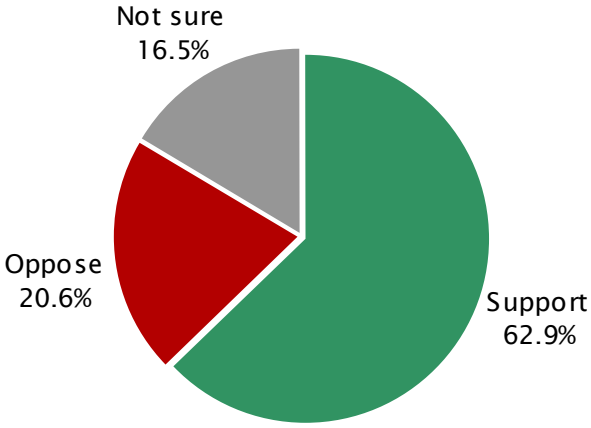
FIGURE 26 MARIN COUNTY PROGRAM AWARENESS (N=28)



POLICY ATTITUDE The final question in this series asked all respondents whether they would support a local policy that would require all new housing construction to use only gas fireplaces or EPA certified fireplace inserts, wood stoves or pellet stoves. In general, a policy change of this nature is supported by Bay Area residents. Nearly two-thirds (63%) of respondents indicated that they would support such a policy, whereas 17% were unsure and just 21% opposed the policy.

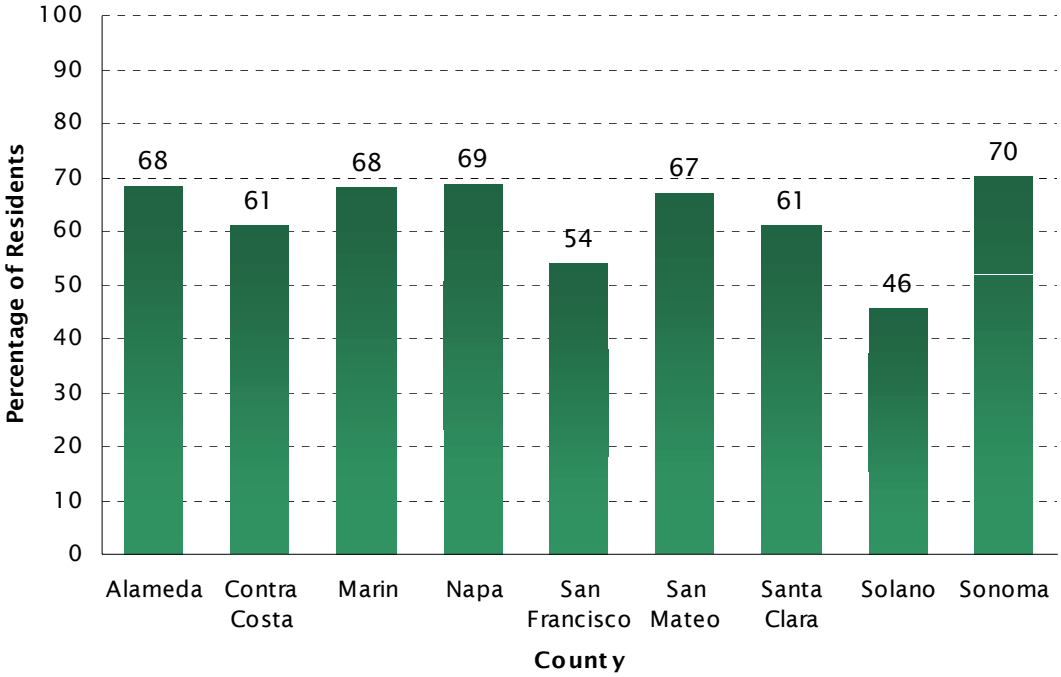
Question 26 *Local governments throughout the Bay Area are considering a policy that would require all new housing construction to use only gas fireplaces or EPA certified fireplace inserts, wood stoves or pellet stoves. Would you support or oppose this policy?*

FIGURE 27 SUPPORT FOR PROPOSED EPA CERTIFICATION REQUIREMENTS IN NEW HOUSING CONSTRUCTION (N=700)



Support for the proposed policy change was widespread among those surveyed, eclipsing two-thirds in 5 of the 9 Bay Area counties and reaching a simple majority in all counties with the exception of Solano (see Figure 28). It is worth noting, moreover, that support for the proposed policy has steadily increased in recent years -- from 47% in 2002, to 54% in 2003, to 63% in 2004.

FIGURE 28 SUPPORT FOR PROPOSED EPA CERTIFICATION REQUIREMENTS IN NEW HOUSING CONSTRUCTION BY COUNTY (N=700)



Perceptions of Entities

To identify and track perceptions of the BAAQMD, MTC, and the Spare the Air Tonight Campaign, a series of three questions was presented to respondents to measure their awareness and opinions of the entities, as well their recent exposure to information about each entity. Because these questions were asked in an identical manner in the 2003 and 2002 winter surveys, the results from these studies are also shown for comparison.

Table 6 shows that awareness of the BAAQMD (57%) remained statistically similar to awareness of the agency in prior years. The same is true of awareness of MTC (40%) and the Spare the Air Tonight Campaign (48%)

Question 27 *Let's change gears a bit. Have you ever heard of the _____?*

Table 6 Awareness of BAAQMD, MTC, and Spare the Air Campaign (n=700)

	BAAQMD			MTC			STA Campaign		
Q27 Heard of entity	2004	2003	2002	2004	2003	2002	2004	2003	2002
Yes	57%	61%	59%	40%	39%	45%	48%	50%	48%
No	43%	40%	41%	60%	61%	55%	52%	50%	53%

Respondents who had heard of an entity were next asked whether their opinion of the entity was favorable, unfavorable, or neutral. Table 7 displays the findings of these questions. Following the convention used throughout this report, bolded percentages with an asterisk identify statistically significant changes in opinion between the 2003 and 2004 studies.

Of the individuals who received the question in 2004, nearly half (45%) held a favorable opinion of the BAAQMD, whereas 42% held a neutral opinion and just 8% held an unfavorable opinion. When compared to the opinions recorded in the previous studies, the percentage of respondents with favorable opinions of the BAAQMD increased significantly in the past year -- from 29% in 2003 to 45% in 2004.

The same is also true of public opinion regarding the Spare the Air Tonight Campaign. Whereas 56% of respondents who had heard of the campaign held a favorable opinion of it in 2003, the corresponding percentage for 2004 was significantly higher at 63%. Statistically speaking, opinions about MTC remained largely unchanged during this period.

Question 28 *Generally speaking, would you say you have a favorable or unfavorable opinion of the _____, or do you have no opinion either way? Get answer and ask: Would that be very or somewhat favorable / unfavorable?*

Table 7 Opinions of BAAQMD, MTC, and Spare the Air Campaign (n=400, 281 & 334, respectively)

	BAAQMD			MTC			STA Campaign		
Q28 Opinion of entity	2004	2003	2002	2004	2003	2002	2004	2003	2002
Favorable	**45%***	29%	31%	29%	22%	30%	**63%***	56%	52%
Neutral	**42%***	58%	50%	52%	57%	51%	**28%***	35%	41%
Unfavorable	8%	10%	14%	15%	17%	14%	5%	6%	6%
Not sure	5%	3%	5%	5%	3%	5%	5%	4%	2%

*Statistically significant change ($p < 0.05$) in opinion between the 2003 and 2004 studies.

The last question in this series asked respondents whether they recalled hearing, reading or seeing any news stories, advertisements or public service announcements about the entity in the six months prior to the interview. As shown in Table 8, the proportion of respondents who recalled being exposed to information about each entity in 2004 remained similar to that recorded in previous studies. The exception to this pattern is found with respect to the BAAQMD: the proportion of respondents who indicated that they had *not* encountered information about the agency decreased from 71% in 2003 to 60% in 2004. Although this change was associated with a small increase in the proportion who indicated that they *had* been exposed to information about the agency during this period (29% to 33%), most of the change is accounted for by an increase in the proportion of individuals who were unsure.

Question 29 *In the past six months, have you heard, read, or seen any news stories, advertisements, or public service announcements about the _____?*

TABLE 8 ENCOUNTERED INFO ABOUT BAAQMD, MTC, AND SPARE THE AIR CAMPAIGN IN PAST SIX MONTHS (N=400, 281 & 334, RESPECTIVELY)

Q29 Heard, read, or saw info in last 6 months	BAAQMD			MTC			STA Campaign		
	2004	2003	2002	2004	2003	2002	2004	2003	2002
Yes	33%	29%	40%	29%	28%	30%	49%	52%	45%
No	**60%***	71%	59%	65%	72%	69%	46%	47%	54%
Not sure	**7%***	0%	1%	6%	1%	1%	5%	1%	1%

*Statistically significant change ($p < 0.05$) in opinion between the 2003 and 2004 studies.

Background & Demographics

Tables 9 and 10 display the demographic and background information collected during the survey. Because of the sampling methodology used in the study, the results shown below are representative of the adult population within the nine-county District.[14] The demographic and background information was used to monitor the sample during data collection, as well as provide insight into how the results of the substantive questions of the survey vary across important subgroups of adults.

Table 9 Background and Demographics (n=700)

	2004	2003	2002
Drivers in Household			
Zero to one	27%	31%	32%
Two to three	65%	59%	60%
Four or more	7%	10%	8%
Refused	2%	1%	1%
Age			
18 to 29	11%	16%	15%
30 to 39	19%	19%	18%
40 to 49	23%	21%	18%
50 to 64	18%	25%	27%
65 and over	21%	13%	18%
Refused	8%	7%	5%
Home Type			
Apartment	20%	21%	16%
Condo	4%	5%	2%
Town home	8%	5%	4%
Single-family detached	63%	66%	73%
Mobile home	2%	2%	4%
Refused	3%	3%	1%
Age of Home			
0 to 10 years	10%	14%	20%
11 to 20 years	10%	9%	18%
21 to 30 years	12%	14%	20%
31 to 40 years	13%	15%	10%
41 to 50 years	11%	14%	8%
Over 50 years	30%	18%	10%
Not sure / Refused	14%	16%	15%
Ethnicity			
Caucasian	59%	63%	64%
Latino	9%	7%	11%
African American	7%	6%	6%
Asian American	10%	10%	4%
Mixed or other	7%	5%	8%
Not sure / Refused	8%	10%	8%

14.For more information on the sampling method and data collection protocol, please refer to *Methodology* on page 38.

TABLE 10 BACKGROUND AND DEMOGRAPHICS, CONTINUED (N=700)

	2004	2003	2002
Household Income			
Under $50,000	22%	24%	33%
$50,000 to $74,999	18%	17%	20%
$75,000 to $99,999	16%	16%	13%
$100,000 to $149,999	14%	15%	9%
$150,000 to $199,999	6%	3%	3%
$200,000 or more	4%	6%	2%
Not sure / Refused	19%	20%	21%
Gender			
Male	43%	45%	44%
Female	57%	55%	56%
County			
Alameda	23%	22%	-
Contra Costa	15%	14%	-
Marin	4%	4%	-
Napa	2%	2%	-
San Francisco	14%	14%	-
San Mateo	10%	11%	-
Santa Clara	23%	23%	-
Solano	3%	5%	-
Sonoma	5%	6%	-

METHODOLOGY

This section of the report outlines the methodology and procedures used when conducting this study, as well as the motivation for employing certain techniques.

QUESTIONNAIRE With the questionnaire used in the 2002 and 2003 studies as a starting point, Dr. McLarney of True North Research worked closely with ESTC and the BAAQMD to develop and refine an improved survey instrument for the 2004 study. In the interest of improving the *validity* and *reliability* of select opinion and behavior measures, the questionnaire was substantially revised for the 2004 season. The most notable of these changes addressed how the questionnaire measured the impacts of the Spare the Air Tonight Program. The changes were made so that the impacts of the winter program on wood burning behavior would be measured using the same basic methodology employed by the BAAQMD -- and recommended by CARB and EPA[15] -- to measure the impacts of the summer Spare the Air Program on driving behavior.[16] Questions were also added to the survey to better measure the frequency of wood burning, as well as the amount of wood burned by a respondent during the winter season.

Because these improvements often involved changing the wording, format and/or response options for a particular question, it is not possible to statistically compare the results of the 2004 survey with previous surveys for select measures. Where such comparisons are possible, however, this report presents the results from past surveys.

CATI & PRE-TEST Before fielding the survey, the questionnaire was CATI (Computer Assisted Telephone Interviewing) programmed to assist the live interviewers when conducting the interviews. The CATI program automatically navigates the skip patterns, randomizes the appropriate question items, and alerts the interviewer to certain types of keypunching mistakes should they happen during the interview. The integrity of the questionnaire was pre-tested internally by True North and by dialing into random homes within the District prior to formally beginning the survey. Two training sessions were conducted to familiarize interviewers with the study and to answer questions and clarify details of the study.

SAMPLE Because the primary focus of the study was to gather information from adults who reside within the District, households were chosen for this study using a random digit dial (RDD) sampling method. An RDD sample is drawn by first selecting all of the active phone exchanges (first three digits in a seven digit phone number) and working blocks that service the area. After estimating the number of listed households within each phone exchange that are located within the area, a sample of randomly selected phone numbers is generated with the number of phone

15. The CARB/EPA Method is summarized in the Transportation Research Board's (TRB) journal --*Transportation Research Record* -- for 2004 in an article entitled *Development of a Quantification Method for Measuring the Travel and Emissions Impacts of Episodic Ozone Alert Programs* (pages 153-159). It is described in detail in the following air resources guidance report: CARB, "Quantification Method Reference Manual: A Method to Measure Travel and Emissions Impacts of Ozone Action Public Education Programs," April 2003. In addition to Eric Schreffler, Dr. Timothy McLarney and Richard Sarles, the TRB paper and guidance report were co-authored by Joann Lu and Jeff Weir of CARB, as well as Thomas Higgins and Dr. Will Johnson of K.T. Analytics.
16. For a detailed description of the updated CARB/EPA Method and its application to the BAAQMD's summer Spare the Air Program, see the *Spare the Air Study: 2004 Summer Ozone Season* report prepared for the BAAQMD by True North & ESTC.

numbers per exchange being proportional to the estimated number of households within each exchange in the area. This method ensures that both listed and unlisted households are included in the sample. It also ensures that new residents and new developments have an opportunity to participate in the study, which is not true if the sample were based on a telephone directory.

Although the RDD method is widely used for local and regional surveys, the method also has several known limitations that must be adjusted for to ensure representative data. Research has shown, for example, that individuals with certain demographic profiles (e.g., older women) are more likely to be at home and are more likely to answer the phone even when other members of the household are available. If this tendency is not adjusted for, the RDD sampling method will produce a survey that is biased in favor of women -- particularly older women. To adjust for this behavioral tendency, the survey included a screening question which initially asked to speak to the youngest male adult available in the home. If a male adult was not available, then the interviewer was instructed to speak to the youngest female adult currently available. This protocol was followed -- to the extent needed -- to ensure a representative sample of adults. In addition to following this protocol, the sample demographics were monitored as the interviewing proceeded to make sure they were within certain tolerances.

Additionally, because the District is composed of seven complete counties and two partial counties, respondents were initially asked the zip code of their residence so that only those within the District's boundaries were included in the study.

MARGIN OF ERROR By using an RDD probability-based sample and monitoring the sample characteristics as data collection proceeded, True North ensured that the sample was representative of adults in the District. The results of the sample can thus be used to estimate the opinions of *all* adults in the District. Because not every adult in the District participated, however, the results have what is known as a statistical margin of error due to sampling. The margin of error refers to the difference between what was found in the survey of 700 respondents for a particular question and what would have been found if all 5,024,614 adults who reside in the District had been interviewed.

For example, in estimating the percentage of residents who have at least one fireplace in their home (Q1a), the margin of error can be calculated if one knows the size of the population, the size of the sample, a chosen confidence level, and the distribution of responses to the question. The appropriate equation for estimating the margin of error, in this case, is shown below.

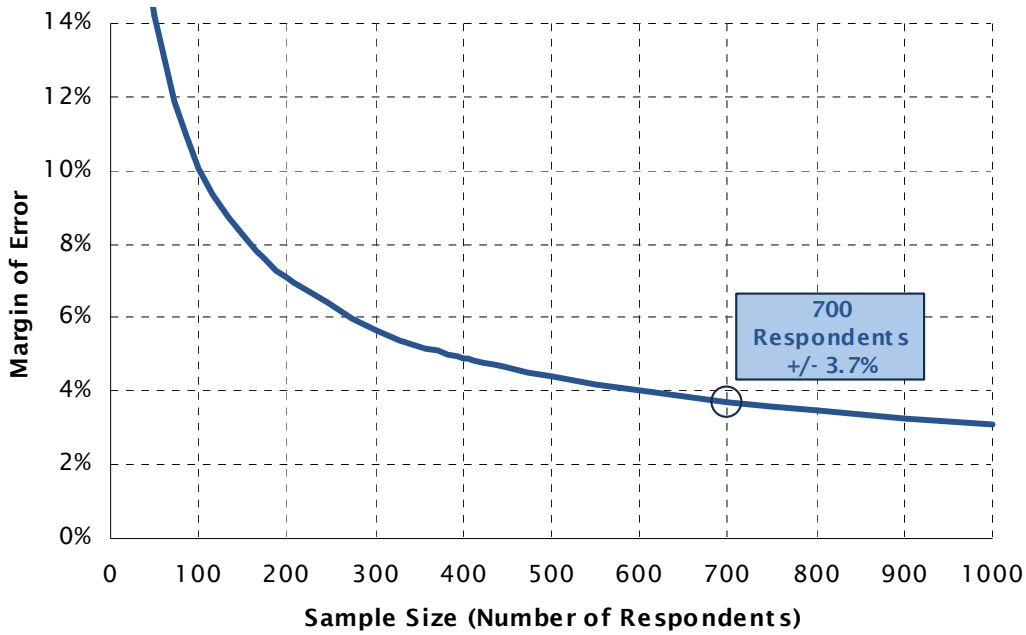
$$\hat{p} \pm t\sqrt{\left(\frac{N-n}{N}\right)\frac{\hat{p}(1-\hat{p})}{n-1}}$$

where $\hat{p}$ is the proportion of residents who indicate they have at least one fireplace in their home (0.616 for 61.6%, for example), N is the population size of adults (5,024,614), n is the sample size that received the question (700), and t is the upper $\alpha/2$ point for the t-distribution with $n-1$ degrees of freedom (1.96 for a 95% confidence interval). Solving this equation using these values reveals a margin of error of +/- 3.6 percent. This means that, with 61.6% of respon-

dents indicating they own at least one fireplace in the survey, one can be 95 percent confident that the actual percentage is between 58.0% and 65.2%.

Figure 29 provides a graphic plot of the *maximum* margin of error in this study. The maximum margin of error for a dichotomous percentage result occurs when the answers are evenly split such that 50% provide one response and 50% provide the alternative response (i.e., $\hat{p}$=0.5). For this survey, the maximum margin of error is 3.7%.

FIGURE 29 MAXIMUM MARGIN OF ERROR PLOT



Because the margin of error grows exponentially as the sample size decreases (see the left side of Figure 29), the reader should use caution when generalizing and interpreting the results of questions received by only a small percentage of the sample or when comparing results within subgroups of respondents (e.g., across counties).

DATA COLLECTION Interviews were conducted via telephone during weekday evenings (5:30PM to 9PM) and on weekends (10AM to 5PM) between February 2 and February 13, 2005. It is standard practice not to call during the day on weekdays because most working adults are unavailable and thus calling during those hours would bias the sample. Interviews averaged 12 minutes in length.

DATA PROCESSING Data processing consisted of checking the data for errors or inconsistencies, coding and recoding responses, categorizing open-end responses, and preparing frequency analyses and crosstabulations. Because the research objectives involved comparing the 2004 results with those of prior studies, where appropriate, True North also accessed and processed data from the 2003 and 2002 winter season surveys to allow for meaningful comparisons.

ROUNDING Numbers that end in 0.5 or higher are rounded up to the nearest whole number, whereas numbers that end in 0.4 or lower are rounded down to the nearest whole number. These same rounding rules are also applied, when needed, to arrive at numbers that include a decimal place in constructing figures and charts. Occasionally, these rounding rules lead to small discrepancies in the first decimal place when comparing tables and pie charts for a given question.

Bay Area Air Quality Management District
Winter Spare the Air Survey
Final Toplines
April 2005

Section 1: Introduction to Study
Hi, my name is _____ and I'm calling on behalf of TNR, a public opinion research firm. We're conducting a survey concerning issues of importance to residents in the Bay Area region and we'd like to get your opinions.
If needed: This is only a survey about important issues in the Bay Area – I'm NOT trying to sell anything. *If needed:* The survey should take no more than 15 minutes to complete. *If needed:* If now is not a convenient time, can you let me know a better time so I can call back? *If the person says they are an elected official or is somehow associated with the survey, politely explain that this survey is designed to the measure the opinions of those not closely associated with the study, thank them for their time, and terminate the interview.*

Section 2: Screener for Inclusion in the Study							
For statistical reasons, I would like to speak to the youngest adult male currently at home that is at least 18 years of age. I*f there is no male currently at home that is at least 18 years of age, then ask:* Ok, then I'd like to speak to the youngest female currently at home that is at least 18 years of age. *If there is no adult currently available, then ask for a callback time.* *NOTE: Adjust this screener as needed to match sample quotas on gender & age*							
SC1	To begin, what is the zip code of your residence?						
Data on File	Record 5 digit zip code						
SC2	*If a respondent lives in Solano County or Sonoma County, they must provide one of the following zip codes in order to qualify for the study. Otherwise, terminate residents in these counties.*						
	Solano	94510 94512 94533 94535	94571 94585 94589 94590	94591 94592 95620 95625	95687 95688 95696		
	Sonoma	94951 94952 94953 94954	94955 94972 94975 94999	95401 95402 95403 95404	95405 95406 95407 95408	95409 95416 95431 95433	95439 95442 95444 95452	95472 95476 95487 95492

SC3	County of Residence [700]		
	7	Alameda	23.0%
	9	Contra Costa	14.7%
	4	Marin	4.0%
	8	Napa	2.3%
	2	San Francisco	13.7%
	3	San Mateo	10.4%
	1	Santa Clara	23.4%
	6	Solano	3.1%
	5	Sonoma	5.3%

Section 3: Heating Device Use		
I'd like to begin by asking you a few questions about heating devices that you may have in your home.		
Q1	Do you have a: _____ in your home? *If yes, ask:* How many: _____s do you have in your home?	
Do Not Randomize		
A	Fireplace [700]	
	None	38.4%
	One	50.4%
	Two	8.9%
	Three	1.9%
	Four or more	0.4%
B	Pellet stove [700]	
	None	94.4%
	One	4.7%
	Two	0.6%
	Three or more	0.3%

C	Woodstove [700]	
	None	94.6%
	One	4.9%
	Two	0.4%
	Three	0.1%
If Q1.1a, Q1.1b AND Q1.1c= (2,98), skip to Q13		
Only ask Q2 if Q1.1a=1, otherwise skip to instructions preceding Q3		
Q2	What type of fuel do you primarily use in your fireplace – Wood, natural gas or propane? [431]	
	1 Wood	56.6%
	2 Natural gas	19.5%
	3 Propane	0.5%
	5 Duraflame or similar	3.5%
	6 Electric	1.2%
	7 Never use fireplace	7.0%
	4 Other	0.9%
	98 Don't Know	10.7%
	99 Refused	0.2%
Read the following introduction		
For the next series of questions, when I refer to "winter" I mean the months of November through February.		
Only ask Q3 for each appliance where Q1.1=1		
Q3	Will you use your: _____ this winter?	

Do Not Randomize		Yes	No	Not Sure	Refused
A	Fireplace [431]	56.1%	42.5%	1.4%	0.0%
B	Pellet stove [39]	56.4%	43.6%	0.0%	0.0%
C	Woodstove [38]	84.2%	15.8%	0.0%	0.0%

Only ask Q4 for each appliance where Q3=2.				
Q4	Why do you not expect to use your: _____ this winter? *Do Not Read Responses. Multiple Responses OK.*			
Do Not Randomize		Air Quality Reasons	Too Much Hassle	Other
A	Fireplace [183]	11.5%	15.3%	78.1%
B	Pellet stove [17]	0.0%	5.9%	94.1%
C	Woodstove [6]	0.0%	16.7%	83.3%
Only ask Q5 if (Q2=1 AND Q3a=1), Q3b=1 or Q3c=1. Otherwise, skip to Q13.				
Q5	How often do you expect to burn wood this winter? At least once per week, two to three times per month, once per month, or less often than once per month? [196]			
	1	At least once per week	34.2%	*Ask Q6*
	2	Two to three times per month	28.1%	*Skip to Q7*
	3	Once per month	15.8%	*Skip to Q7*
	4	Less often than once per month	18.4%	*Skip to Q7*
	98	Don't Know	3.1%	*Skip to Q7*
	99	Refused	0.5%	*Skip to Q7*
Q6	In a typical winter week, how many days do you expect to burn wood? *If unsure, ask them to estimate.* [67]			
	1	One day	32.8%	
	2	Two days	16.4%	
	3	Three days	17.9%	
	4	Four days	3.0%	
	5	Five days	7.5%	
	6	Six days	4.5%	
	7	Seven days	17.9%	
	98	Don't Know	0.0%	
	99	Refused	0.0%	
Q7	Did you burn wood in the past week? [196]			
	1	Yes	32.1%	*Ask Q8*
	2	No	67.3%	*Skip to Q9*
	98	Don't Know/No opinion	0.0%	*Skip to Q9*
	99	Refused	0.5%	*Skip to Q9*

Q8	Did you burn wood yesterday? [63]		
	1	Yes	39.7%
	2	No	60.3%
	98	Don't Know/No opinion	0.0%
	99	Refused	0.0%
Q9	In total, how much wood to you expect to burn this winter? You may answer in whatever terms are most familiar to you, such as cords, boxes, bundles, logs or some other unit. *If respondent is unsure, ask them to estimate.* [196]		
Indicate the unit type in Q9.1 and the amount in Q9.2			
Q9.1 unit type			Q9.2 amount (Aggregate amounts presented below)
	1	Cord (35.7%)	67.96
	2	Box (19.9%)	237.00
	3	Bundle (6.1%)	38.00
	4	Log (18.9%)	454.00
	5	Other (3.1%)	-
	98	Don't Know (15.8%)	-
	99	Refused (0.5%)	-

Section 4: Changes in Wood Burning Behavior				
Only ask Q10 if (Q2=1 AND Q3a=1), Q3b=1 OR Q3c=1. Otherwise, skip to Q13.				
Q10	Were there occasions this winter when you normally would have burned wood, but decided not to? [196]			
	1	Yes	44.4%	*Ask Q11*
	2	No	51.0%	*Skip to Q13*
	98	Don't Know/No opinion	4.1%	*Skip to Q13*
	99	Refused	0.5%	*Skip to Q13*
Q11	Why did you decide not to burn wood on these occasions? *Do NOT Read Response Options. Multiple Responses OK.* [87]			
	1	Spare the Air campaign/advertisements asking people not to burn wood/Don't Light the Night campaign	3.4%	*Ask Q12*
	2	Air quality reason	11.5%	*Ask Q12*
	3	Other	82.8%	*Skip to Q13*
	98	Don't Know/No opinion	3.4%	*Skip to Q13*
	99	Refused	0.0%	*Skip to Q13*

Q12	So far this winter, how many times did you choose not to burn wood because of air quality reasons? *If respondent is unsure, ask them to estimate.* [12]	
	Total number of times [8]	38
	Not sure [4]	-

Section 5: Awareness of Campaign				
Q13	During this winter, have you heard, read, or seen any news stories, advertisements, or public service announcements about Spare the Air Tonight, poor air quality, or requests not to use your fireplace, pellet stove, or woodstove? [700]			
	1	Yes	38.7%	*Ask Q14*
	2	No	60.1%	*Skip to Q16*
	98	Don't Know/No opinion	1.1%	*Skip to Q16*
	99	Refused	0.0%	*Skip to Q16*
Q14	Where did you see the news story, advertisement or public service announcement? *Don't read choices – multiple responses OK.* [271]			
	1	Television	49.4%	
	2	Radio	38.4%	
	3	Newspaper	17.3%	
	4	Website	1.1%	
	5	Billboard	2.2%	
	6	E-mail/E-mail Air Alert	0.7%	
	7	Fax/Fax Alert	0.0%	
	8	Bus signs	1.1%	
	9	Other	3.7%	
	98	Don't Know/Not Sure	7.4%	
	99	Refused	0.0%	

Q15	What do you remember about the story, advertisement or announcement? (Verbatim responses recorded and grouped into the following categories.) [271]	
	General - don't burn / use fireplace	23.6%
	Don't use fireplace - environment or air quality	23.2%
	Cannot remember	18.1%
	Spare the Air announcement	15.1%
	Recalled summer campaign information	6.6%
	Don't use fireplace - health reasons	5.5%
	Other	4.1%
	Use alternate fuels / conversion of burning device	3.0%
	Children / elderly have increased health risk	0.7%

Section 6: Attitudes about Wood Smoke				
Q16	Do you think there are any negative health effects associated with breathing wood smoke? [700]			
	1	Yes	66.6%	*Ask Q17*
	2	No	19.9%	*Skip to Q18*
	98	Don't Know/No opinion	13.4%	*Skip to Q18*
	99	Refused	0.1%	*Skip to Q18*
Q17	What are the negative health effects associated with breathing wood smoke? (Verbatim responses recorded and grouped into the following categories.) [466]			
	Bad for lungs in general/pollution/like second-hand smoke		35.4%	
	Lung disease - asthma/emphysema/bronchitis		20.2%	
	Chemicals/carcinogens/toxins in wood		12.7%	
	Not sure		12.7%	
	Lung cancer		7.7%	
	General bad health		4.7%	
	Carbon monoxide		3.2%	
	Allergies		1.9%	
	Other		1.5%	
Q18	Different neighborhoods in the Bay Area experience different levels of air pollution from wood smoke. In your opinion, does your neighborhood periodically experience air pollution from wood smoke? [700]			
	1	Yes	19.0%	*Ask Q19*
	2	No	73.1%	*Skip to Section 7*
	98	Don't Know/No opinion	7.6%	*Skip to Section 7*
	99	Refused	0.3%	*Skip to Section 7*

Q19	Would you say that periodic air pollution from wood smoke in your neighborhood is a big problem, medium problem or a small problem? [133]		
	1	Big problem	6.8%
	2	Medium problem	27.1%
	3	Small problem	61.7%
	98	Don't Know/No opinion	4.5%
	99	Refused	0.0%

Section 7: Willingness to Change Heating Device				
If Q1.1a, Q1.1b AND Q1.1c= (2,98), skip to Section 8.				
Only ask Q20 if Q1b=1 or Q1c=1. Otherwise, skip to instruction preceding Q21				
Q20	Is your woodstove or pellet stove EPA certified? *If not sure, clarify:* Woodstoves and pellet stoves manufactured after 1992 are EPA certified, while older ones are not. [75]			
	1	Yes, EPA certified	61.3%	*Skip to Section 8*
	2	No, not EPA certified	16.0%	*Go to Q21*
	98	Don't Know	22.7%	*Go to Q21*
	99	Refused	0.0%	*Skip to Section 8*
Only ask Q21 if (Q2=1) or (Q1b=1 AND Q20=2,98) or (Q1c=1 AND Q20=2,98). Otherwise, skip to Section 8.				
Q21	Gas fireplaces and EPA certified woodstoves, inserts or pellet stoves burn much cleaner and are less polluting than traditional fireplaces or old woodstoves. Would you be willing to replace your traditional fireplace, non-EPA certified woodstove or pellet stove with a gas fireplace? [230]			
	1	Yes	32.6%	
	2	No	60.9%	
	98	Don't Know/No opinion	6.1%	
	99	Refused	0.4%	
Q22	Would you be willing to replace your traditional fireplace, non-EPA certified woodstove or pellet stove with an EPA certified woodstove or pellet stove? [230]			
	1	Yes	30.0%	
	2	No	60.9%	
	98	Don't Know/No opinion	8.3%	
	99	Refused	0.9%	
If Q21=1 OR Q22=1, skip to Section 8. Otherwise, ask Q23				

Q23	There is a government sponsored program that offers rebates to residents who replace their traditional fireplace or non-EPA certified woodstove or pellet stove with a gas fireplace or EPA certified woodstove or pellet stove. If you knew that you could receive a rebate of: _____ dollars, would you participate in this program? [133]

If respondent says 'yes', record 'yes' for all higher dollar amounts and go to Section 8.

Do Not Randomize		Yes	No	Not Sure/Don't Know	Refused
A	200	9.0%	74.4%	15.0%	1.5%
B	300	13.4%	70.9%	14.2%	1.5%
C	400	15.7%	64.9%	18.7%	0.7%

Section 8: Santa Clara County Program Awareness

Only ask questions in this section if SC3=1. Otherwise, skip to Section 9.

Q24	Santa Clara County has a program to offer residents a rebate for replacing a traditional fireplace with a gas burning fireplace or an EPA certified fireplace, woodstove or pellet stove. In the past three months, have you heard, read or seen any news stories, advertisements or public service announcements about this program? [164]		
	1	Yes	5.5%
	2	No	93.9%
	98	Don't Know/No opinion	0.6%
	99	Refused	0.0%

Section 9: Marin County Program Awareness

Only ask questions in this section if SC3=4. Otherwise, skip to Section 10.

Q25	Marin County has a program to offer residents a rebate for replacing a traditional fireplace with a gas burning fireplace or an EPA certified fireplace, woodstove or pellet stove. In the past three months, have you heard, read or seen any news stories, advertisements or public service announcements about this program? [28]		
	1	Yes	7.1%
	2	No	89.3%
	98	Don't Know/No opinion	0.0%
	99	Refused	3.6%

Section 10: Policy Attitude			
Q26	Local governments throughout the Bay Area are considering a policy that would require all new housing construction to use only gas fireplaces or EPA certified fireplace inserts, woodstoves or pellet stoves. Would you support or oppose this policy? [700]		
	1	Support	62.9%
	2	Oppose	20.6%
	98	Don't Know/No opinion	16.3%
	99	Refused	0.3%

Section 11: BAAQMD and Spare the Air Tonight Name Recognition			
Q27	Let's change gears a bit. Have you ever heard of the _____? *Code 'Not sure' as 'No'.* [700]		
Randomize		Yes	No
A	Bay Area Air Quality Management District	57.1%	42.9%
B	Metropolitan Transportation Commission	40.1%	59.9%
C	Spare the Air Tonight Campaign	47.7%	52.3%

Only ask Q28 and Q29 for each item in Q27 that respondent had heard of (i.e., ask if Q27=1).

Q28	Generally speaking, would you say you have a favorable or unfavorable opinion of the _____, or do you have no opinion either way? *Get answer and ask:* Would that be very or somewhat favorable / unfavorable?						
		Very Favorable	Somewhat Favorable	Neutral/ No Opinion Either Way	Somewhat Unfavorable	Very Unfavorable	Not Sure (Don't Read)
A	Bay Area Air Quality Management District [400]	16%	30%	42%	4%	3%	5%
B	Metropolitan Transportation Commission [281]	8%	21%	52%	9%	5%	5%
C	Spare the Air Tonight Campaign [334]	34%	28%	28%	4%	1%	5%

Q29	In the past six months, have you heard, read, or seen any news stories, advertisements, or public service announcements about the _____?			
		Yes	No	Unsure
A	Bay Area Air Quality Management District [400]	33.3%	60.3%	6.5%
B	Metropolitan Transportation Commission [281]	29.2%	65.1%	5.7%
C	Spare the Air Tonight Campaign [334]	48.5%	46.1%	5.4%

Section 12: Background/Demographics			
Thank you so much for your participation. I have just a few background questions for statistical purposes.			
D1	Including yourself, how many licensed drivers live in your household? [700]		
	1	One	26.6%
	2	Two	51.1%
	3	Three or more	20.4%
	99	Refused	1.9%
D2	In what year where you born? [700]		
	1	18 to 29	11.1%
	2	30 to 39	18.9%
	3	40 to 49	23.4%
	4	50 to 64	17.9%
	5	65 and over	21.0%
	99	Refused	7.7%
D3	Do you live in an apartment, condo, town home, single-family detached home, or mobile home? [700]		
	1	Apartment	19.9%
	2	Condo	4.4%
	3	Town home	7.7%
	4	Single-family detached home	63.0%
	5	Mobile home	2.3%
	99	Refused	2.7%
D4	How many years ago was your home built? [700]		
	1	0 to 10 years	10.3%
	2	11 to 20 years	9.9%
	3	21 to 30 years	12.0%
	4	31 to 40 years	13.3%
	5	41 to 50 years	11.0%
	6	Over 50 years	29.7%
	98	Don't Know	12.0%
	99	Refused	1.9%

D5	What ethnic group do you consider yourself to be a part of or feel closest to? *If respondent hesitates, read list.* [700]		
	1	Caucasian / White	59.1%
	2	Latino / Hispanic	9.0%
	3	African-American / Black	6.7%
	4~8	Asian-American	10.1%
	9	Pacific Islander	2.0%
	10	Mixed heritage	2.1%
	11	Other	2.7%
	12	Not sure or Refused *(Don't read)*	8.1%
D6	This last question is for statistical purposes only. As I read the following income categories, please stop me when I reach the category that best represents your household's total annual income before taxes. [700]		
	1	Under $50,000	22.4%
	2	$50,000 to $74,999	18.0%
	3	$75,000 to $99,999	16.4%
	4	$100,000 to $149,999	14.3%
	5	$150,000 to $199,999	6.0%
	6	$200,000 or more	4.1%
	7	Not sure or Refused *(Don't read)*	18.7%
Those are all of the questions that I have for you! Thanks very much for participating. This survey is sponsored by the Bay Area Air Quality Management District.			

Post-Interview Items			
D7	Gender [700]		
	1	Male	42.6%
	2	Female	57.4%