

SPARE THE AIR TONIGHT STUDY
2005-2006 WINTER WOOD SMOKE SEASON

CONDUCTED FOR THE



BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

APRIL 2006





TABLE OF CONTENTS

Table of Contents	i
List of Tables	iii
List of Figures	iv
Introduction	1
Motivation for Study.....	1
Overview of Methodology.....	2
Organization of Report.....	3
Acknowledgements	3
Disclaimer	3
Just the Facts	4
Wood Burning Behavior	4
Changes in Wood Burning Behavior	5
Recall and Awareness of Spare the Air Tonight Messaging	5
Attitudes About Wood Smoke.....	5
Changing Heating Device	5
Perceptions of Entities	6
Conclusions	7
Wood Burning Behavior	9
Heating Devices	9
Question 1	9
Fuel Type & Source.....	11
Question 2	12
Question 3	12
Question 4	13
Question 5	14
Primary Reason for Burning Wood	15
Question 6	15
Use of Fireplace, Wood Stove or Pellet Stove	16
Question 7	16
Question 8	18
Seasonal Wood Burning Behavior	19
Question 9	19
Question 10	19
Question 11	19
Wood Burning Behavior in Past Week	21
Question 12	21
Question 13	21
Duration & Volume of Wood Burning	23
Question 14	24
Question 15	25
Non-Winter Wood Burning	25
Question D1	26
Changes in Wood Burning Behavior	27
Changes in Wood Burning Behavior	27
Question 16	27
Question 17	27
Changes Among Those who Increased Burning.....	28
Question 18	28
Question 19	28
Question 20	28
Reductions in Wood Burning.....	29
Question 21	30

Question 22 30

Campaign Impacts on Wood Burning 30

Recall and Awareness of Spare the Air Tonight Messaging 32

 Recall Exposure to Spare the Air Messaging 32

 Question 24 32

 Information Source 34

 Question 25 34

Attitudes about Wood Smoke 35

 Question 27 35

 Question 28 37

 Wood Smoke a Neighborhood Problem? 37

 Question 29 38

 Question 30 38

Changing Heating Device 40

 Question 31 40

 Willingness to Change Heating Device 41

 Question 32 41

 Question 33 41

 Question 34 43

 Recall News Story, Advertisement or Announcement? 44

 Question 35 44

 Question 36 45

 Policy Attitudes 45

 Question 37 46

 Question 38 46

 Question 39 46

Perceptions of Entities 49

 Awareness 49

 Question 40 49

 Opinions 50

 Question 41 51

 Exposure to Information 51

 Question 42 52

Background & Demographics 54

Methodology 55

 Questionnaire 55

 CATI & Pre-Test 55

 Sample & Weighting 56

 Margin of Error 56

 Data Collection 58

 Data Processing 59

 Rounding 59

Questionnaire & Toplines 60



LIST OF TABLES

Table 1 Frequency of Burning Wood this Winter by Study Year (n = 864)	20
Table 2 Burned Wood in Past Seven Days by Study Year (n = 864)	21
Table 3 Wood Burning on Non-winter Months by Heating Device in Home	26
Table 4 Frequency of Wood Burning Among Those Burning More Often Because of Increased Energy Costs (n = 89)	29
Table 5 Spare the Air Reducers: Confidence Interval	31
Table 6 Background and Demographics (n = 2,625)	54
Table 7 Completed Interviews by County (Unweighted)	58
Table 8 Interview Dates (Unweighted)	58



LIST OF FIGURES

Figure 1	Types of Heating Devices in Home by Study Year (n = 2,625)	9
Figure 2	Types of Heating Devices in Home by County (n = 2,625)	10
Figure 3	At Least One Heating Device in Home by County (n = 2,625)	10
Figure 4	At Least One Heating Device in Home by Home Type & Age of Home in Years (n = 2,625)	11
Figure 5	Type of Fuel Burned (n = 1,547)	12
Figure 6	Type of Wood Burned (n = 813)	12
Figure 7	Type of Wood Burned by Expected Frequency of Winter Wood Burning (n = 813)	13
Figure 8	Wood Source (n = 813)	13
Figure 9	Wood Source by Expected Frequency of Winter Wood Burning (n = 813)	14
Figure 10	Status of Wood Typically Burned (n = 813)	14
Figure 11	Status of Wood Typically Burned by Expected Frequency of Winter Wood Burning (n = 813)	15
Figure 12	Primary Purpose of Wood Burning (n = 813)	15
Figure 13	Primary Purpose of Wood Burning by Expected Frequency of Winter Wood Burning (n = 813)	16
Figure 14	Heating Device Usage this Winter by Study Year (Fireplace: n = 1,547; Pellet Stove: n = 170; Wood stove: n = 165)	16
Figure 15	Household Heating Device Usage this Winter by County (n = 2,625)	17
Figure 16	Reason for Not Using Heating Device this Winter (Fireplace: n = 581; Pellet Stove: n = 42; Woodstove: n = 35)	18
Figure 17	Heating Device Households Not Burning Because of Air Quality Reasons (n = 1,679)	18
Figure 18	Frequency of Burning Wood this Winter (n = 864)	19
Figure 19	Frequency of Burning Wood this Winter Among All Heating Device Households by County (n = 1,679)	20
Figure 20	Burned Wood in Past Seven Days (n = 864)	21
Figure 21	Heating Device Households that Burned Wood in Past Seven Days by County (n = 1,679)	22
Figure 22	Heating Device Households that Burned Wood Yesterday / Last Night by County (n = 1,679)	22
Figure 23	Heating Device Households that Burned Wood Yesterday / Last Night by Day Type, Precipitation on Day Prior to Interview & Low Temperature on Day Prior to Interview (n = 1,679)	23
Figure 24	Hours of Burning in Typical Day of Wood Burning (n = 864)	24
Figure 25	Distribution and Average Hours of Burning in Typical Day of Wood Burning by County & Expected Frequency of Winter Wood Burning (n = 864)	24
Figure 26	Logs Burned in Typical Day of Wood Burning (n = 864)	25
Figure 27	Logs Burned in Typical Day of Wood Burning by County & Expected Frequency of Winter Wood Burning (n = 864)	25
Figure 28	Expected Frequency of Wood Burning this Winter Compared to Last Winter and Reasons for Burning More Often (n = 864)	27
Figure 29	Frequency of Wood Burning Last Winter Among Those Burning More Often Because of Increased Energy Costs (n = 89)	28
Figure 30	Chose not to Burn this Winter (n = 864)	30
Figure 31	Spare the Air Reducers by Study Year & County Showing Confidence Intervals (n = 1,679)	31
Figure 32	Heard, Read, or Saw Spare the Air Winter Information by Study Year (n = 2,625)	32
Figure 33	Heard, Read, or Saw Spare the Air Winter Information by County (n = 2,625)	33
Figure 34	Heard, Read, or Saw Spare the Air Winter Information by Age & Household Income (n = 2,625)	33
Figure 35	Source for Spare the Air Winter Information (n = 891)	34

Figure 36	Perceive Negative Health Effects are Associated with Wood Smoke by Study Year (n = 2,625)	35
Figure 37	Perceive Negative Health Effects are Associated with Wood Smoke by County (n = 2,625)	36
Figure 38	Perceive Negative Health Effects are Associated with Wood Smoke by Age (n = 2,625)	36
Figure 39	Perceived Negative Effects of Breathing Wood Smoke (n = 1,730)	37
Figure 40	Perception of Periodic Wood Smoke Problem in Neighborhood (n = 2,625)	38
Figure 41	Perception of Wood Smoke Problem in Neighborhood by Study Year & County (n = 2,625)	39
Figure 42	Woodstove or Pellet Stove EPA Certified by Study Year (n = 328)	40
Figure 43	Willingness to Replace Fireplace or Stove with EPA Certified Model (n = 913)	41
Figure 44	Willingness to Replace Fireplace or Stove with EPA Certified Model by County (n = 913)	42
Figure 45	Willingness to Replace Fireplace or Stove with EPA Certified Model by Age (n = 913)	42
Figure 46	Willingness to Participate in Government-Sponsored Rebate Program (n = 511)	43
Figure 47	Santa Clara County Program Awareness by Study Year (n = 637)	44
Figure 48	Marin County Program Awareness by Study Year (n = 109)	45
Figure 49	Support for Proposed Policy Changes (n = 2,625)	46
Figure 50	Support for Proposed EPA Certification Requirements in New Housing Construction by Study Year (n = 2,625)	47
Figure 51	Support for Proposed Policy Changes by County (n = 2,625)	47
Figure 52	Support for Proposed Policy Changes by Age (n = 2,625)	48
Figure 53	Support for Proposed Policy Changes by Household Income & Home Type (n = 2,625)	48
Figure 54	Awareness of BAAQMD & Spare the Air Tonight Campaign by Study Year (n = 2,625)	49
Figure 55	Awareness of BAAQMD & Spare the Air Tonight Campaign by County (n = 2,625)	50
Figure 56	Opinions of BAAQMD & Spare the Air Campaign by Study Year (BAAQMD: n = 1,466; STA Tonight Campaign: n = 1,218)	51
Figure 57	Encountered Info about BAAQMD & Spare the Air Tonight Campaign in Past Six Months by Study Year (BAAQMD: n = 1,466; STA Tonight Campaign: n = 1,218)	52
Figure 58	Encountered Info about BAAQMD & Spare the Air Tonight Campaign in Past Six Months by County (n = 2,625)	52
Figure 59	Encountered Info about BAAQMD & Spare the Air Tonight Campaign in Past Six Months by Heating Device in Home & Age (n = 2,625)	53
Figure 60	Maximum Margin of Error Plot	57



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, 2003 and 2004.

The passage of California Senate Bill 656 to reduce public exposure to particulate matter (PM10 and PM2.5) was another key motivation for the 2005 study.¹ SB 656 requires the California Air Resources Board (ARB), in consultation with local air districts, to develop and adopt a list of the most readily available, feasible and cost-effective control measures that could be used to reduce PM10 and PM2.5 -- with the goal of making progress in the near-term toward attainment of State and Federal PM10 and PM2.5 standards. Although the Bay Area is currently in attainment for the Federal PM10 and PM2.5 standards, like almost every other area in California it does not meet the stricter State standards.

1. Particulate matter (PM) consists of very small liquid and solid particles suspended in the air, and includes particles smaller than 10 microns (PM10) as well as finer particles smaller than 2.5 microns (PM2.5). Ambient PM is made up of particles that are emitted directly -- such as soot and fugitive dust -- as well as secondary particles that are formed in the atmosphere from reactions involving precursor pollutants such as oxides of nitrogen, sulfur oxides, volatile organic compounds, and ammonia. Exposure to PM is linked to increased frequency and severity of asthma attacks and even premature death in people with pre-existing cardiac or respiratory disease. Infants and children, the elderly, and persons with heart and lung disease are the most sensitive to PM pollution. For more on particulate matter, SB 656 and the BAAQMD's implementation schedule, see the *Particulate Matter Implementation Schedule* staff report prepared by the Planning and Research Division of the BAAQMD, November 9, 2005.

With a greater emphasis placed on reducing particulate matter in the Bay Area, the 2005 study presented a good opportunity to develop an updated profile of wood burning behavior in the Bay Area that would allow for statistically reliable estimates within each of the nine member counties. The most recent inventory prior to this study was conducted in 1988.²

OVERVIEW OF METHODOLOGY A full description of the methodology used for this study is included later in this report (see *Methodology* on page 55). A total of 2,625 randomly selected residents within the District's boundaries participated in a telephone survey on one of twenty-eight interviewing dates between November 22, 2005 and February 17, 2006. Probability-based sampling techniques and monitoring of the demographics resulted in a sample that is representative of the adult population within the District.

To accommodate the District's interest in obtaining statistically reliable estimates within each of the nine member counties, as well as to explore the relationship between both weather and special events on wood burning behavior, the study employed a sampling strategy that involved stratification by county, month, and day type with strategic oversampling for select counties and day types. To adjust for the oversampling, the raw data were then weighted by day type and adult population estimates by county prior to analyses and presentation. The results presented in this report are the weighted results, which are representative at the District-wide level, as well as within the nine member counties.

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 (2,625) 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 2005 study continued several questionnaire changes that were first implemented in 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 EPA³ -- to measure the impacts of the summer Spare the Air Program on driving behavior.⁴

Based on the 2004 results, several additional refinements were made to the 2005 questionnaire with respect to measuring wood burning behavior. Because these improvements often involved changing the wording, format and/or response options for a particular question, it is not possi-

2. *The California Residential Wood Consumption Survey*. Report prepared by Northern California Research Associates for the California Air Resources Board, 1988.
3. 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.
4. 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: 2005 Summer Ozone Season* report prepared for the BAAQMD by True North & ESTC.

ble to statistically compare the results of the 2005 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 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.



JUST THE FACTS

The following is an outline of the main factual findings from the 2005 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 (48%), followed by natural gas (16%) and manufactured logs such as a Duraflame or Presto (10%).
- Among wood-burning households, oak was the most commonly mentioned (39%) type of wood burned. Approximately 38% of households were unable to identify the type of wood that they burn.
- When asked how they typically acquire their wood, respondents were split between those who gather their own (35%), those who purchase the wood from a local store (32%), those who rely on a wood supplier (22%), those who use an alternative source (7%), and those who were unsure (4%).
- The vast majority (85%) of households that burn wood indicated that they burn dry, seasoned wood as opposed to fresh-cut, moist wood (5%). Approximately 10% were unsure as to the status of the wood that they burn.
- Half (50%) of all households that burn wood indicated that they *primarily* do so for ambiance rather than heat.
- Households that contain a wood stove were the most likely (74%) to report that they would use the stove during the winter months of November through February. The rate of expected use for pellet stoves and fireplaces was 72% and 60%, respectively.
- Approximately 8% of respondents who reported that they would *not* use their fireplace this winter indicated that were refraining from using the device for air quality reasons. An additional 8% referenced a health-related reason for not using their fireplace.
- Approximately half (49%) of households that expected to burn wood this winter anticipated doing so on a weekly basis.
- Forty-three percent (43%) of households with at least one fireplace, wood stove or pellet stove that expected to burn wood this winter indicated that they had burned wood in the week prior to the interview.
- Twenty-two percent (22%) of households with at least one fireplace, wood stove or pellet stove that expected to burn wood this winter indicated that they had burned wood on the day prior to the interview.
- On a typical burn day, wood-burning households averaged 3.8 hours of burning time.
- On a typical burn day, wood-burning households consumed an average 5.12 logs.
- Seventeen percent (17%) of *all* households indicated that they burn wood in a least one non-winter month.

CHANGES IN WOOD BURNING BEHAVIOR

- Overall, 56% of households that own a wood-burning heating device and expected to burn wood this season reported that they anticipated burning wood at about the same frequency this season as last.
- Among the 22% of households that expected to burn more frequently this winter when compared to last, approximately half stated that they were burning more often due to the high cost of energy/gas.
- Twenty-nine percent (29%) of respondents who have a fireplace, wood stove and/or pellet stove *and* expected to burn wood during the 2005-2006 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% specifically mentioned the Spare the Air Tonight Campaign and an additional 3% offered an air quality or health-related reason.
- Approximately 2% 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 2005-2006 winter season in response to the Spare the Air Tonight Campaign.

RECALL AND AWARENESS OF SPARE THE AIR TONIGHT MESSAGING

- Overall, 34% 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 (45%) and radio (38%).

ATTITUDES ABOUT WOOD SMOKE

- Approximately two-thirds (66%) of Bay Area adults perceive that there are negative health effects associated with breathing wood smoke.
- When asked 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 (36%) or made a specific reference to asthma (24%).
- Eighteen percent (18%) of Bay Area adults perceive that their neighborhood periodically experiences air pollution from wood smoke. Twelve percent (12%) stated that the problem was a small one, 4% 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.

CHANGING HEATING DEVICE

- Among individuals who own a wood stove or a pellet stove, 59% indicated that their stove is EPA certified.
- Twenty-eight percent (28%) 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-four percent (34%) 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.

- Ten percent (10%) 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, \$400 and \$500, the proportion of these individuals who would participate in the rebate program increased to 13%, 16% and 23%, respectively.
- Just 6% of Santa Clara County residents -- and 4% 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.
- Sixty-one percent (61%) 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.
- Seventy-four percent (74%) of Bay Area adults support a policy that would prohibit wood burning on nights when air pollution is expected to reach unhealthy levels.
- Half (50%) of Bay Area adults support a policy that would require older wood stoves to be removed or replaced with a cleaner burning model when a home is sold to a new owner.

PERCEPTIONS OF ENTITIES

- Prior to taking the survey, 56% of respondents had heard of the Bay Area Air Quality Management District and 46% had heard of the Spare the Air Tonight Program.
- Among respondents who had heard of the BAAQMD, half (51%) held a favorable opinion of the agency, whereas 41% held a neutral opinion or weren't sure of their opinion, and just 8% held an unfavorable opinion.
- Among respondents who had heard of the Spare the Air Tonight Program, 64% held a favorable opinion of the Program, whereas 30% held a neutral opinion or weren't sure of their opinion, and 5% held an unfavorable opinion.
- Thirty-five percent (35%) 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 figure for the Spare the Air Tonight campaign was 43%.



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.

What is the profile of wood burning behavior in the Bay Area?

Overall, nearly two-thirds (64%) of households in the Bay Area own at least one fireplace, wood stove or pellet stove, and one-third (33%) burned wood in the 2005-2006 winter months. Although the type of wood burned varies considerably, as does the source from which the wood is obtained, the vast majority (85%) of households report that they burn dry, seasoned wood.

Wood burning behavior varies considerably depending on how frequently a household burns. Wood-burning households can easily be divided between the 49% that burn at least once per week (frequent burners) and those that burn less often (infrequent burners). Not only do frequent burners build fires more often, then tend to burn significantly more hours per burn day (4.63 hours on average) and consume more wood per burn day (6.28 logs on average) when compared to infrequent burners. Their reasons for burning wood are also different. Whereas frequent burners primarily build fires for heat, infrequent burners primarily build fires for ambiance.

Wood burning behavior also varies considerably across the nine-county District. In the predominately rural counties of Marin, Sonoma, Solano and Napa, the proportion of households with a heating device that burn wood at least once per week is substantially greater than in the rest of the District. For example, whereas 43% of Sonoma County households with a heating device burn wood at least once per week, the corresponding figure for San Francisco County is just 21%. For more information about wood burning behavior in the Bay Area, see *Wood Burning Behavior* on page 9.

How effective was the Spare the Air Tonight Campaign during the 2005-2006 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 2005-2006 campaign was a success. Awareness of the BAAQMD and the Spare the Air Tonight Program was widespread among Bay Area adults. Moreover,

opinions about the BAAQMD and the Spare the Air Tonight Program were much more favorable in 2005 and 2004 when compared to the 2003 winter season. With respect to attitudes about wood smoke, the Program has succeeded in raising public recognition of the negative health impacts of breathing wood smoke by 17% since 2002.

The increased awareness of the health-related problems caused by wood smoke arguably underpins what is broad support for the adoption of new policies designed to improve the air quality in the region. Nearly two-thirds of adults favor requiring all new housing construction to use only gas fireplaces or EPA certified fireplace inserts, wood stoves or pellet stoves, and three-quarters (74%) favor prohibiting wood burning on evenings when air pollution is forecast to reach unhealthy levels.

So how did these positive changes in attitudes and awareness translate to actual changes in wood burning behavior? Based on the survey data, it is estimated that 2% 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 2005-2006 winter season in direct response to the Spare the Air Tonight Campaign.⁵ Some respondents refrained from burning wood the entire season for air quality or health-related reasons, whereas those who did burn wood reported that they refrained from burning wood on an average 2.5 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 stoves. Approximately 38% 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. Raising the amount of the rebate could also be expected to significantly increase the percentage of households that participate in the Program. 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.

5. Stated differently, 36,547 households out of the estimated 1,555,185 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.

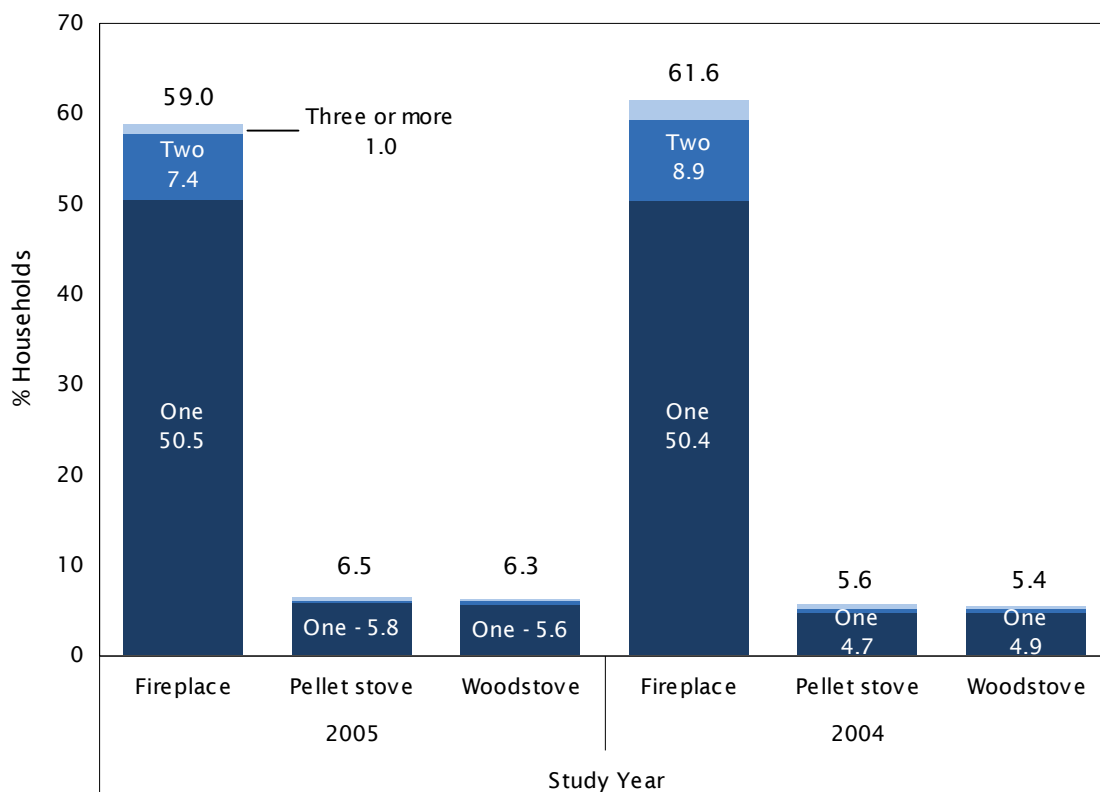
WOOD BURNING BEHAVIOR

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 2005-2006 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, 59% of households contain at least one fireplace, 7% contain at least one pellet stove, and 6% 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 For reference, the results from the 2004 survey are also shown in Figure 1.

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

FIGURE 1 TYPES OF HEATING DEVICES IN HOME BY STUDY YEAR (N = 2,625)⁷



6. Because some households contained more than one type of heating device -- e.g., a fireplace *and* a wood stove -- 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 interested reader, the following figures show how the presence of fireplaces, wood stoves and pellet stoves varied by county (see Figures 2 and 3), home type, and age of home (see Figure 4).

FIGURE 2 TYPES OF HEATING DEVICES IN HOME BY COUNTY (N = 2,625)

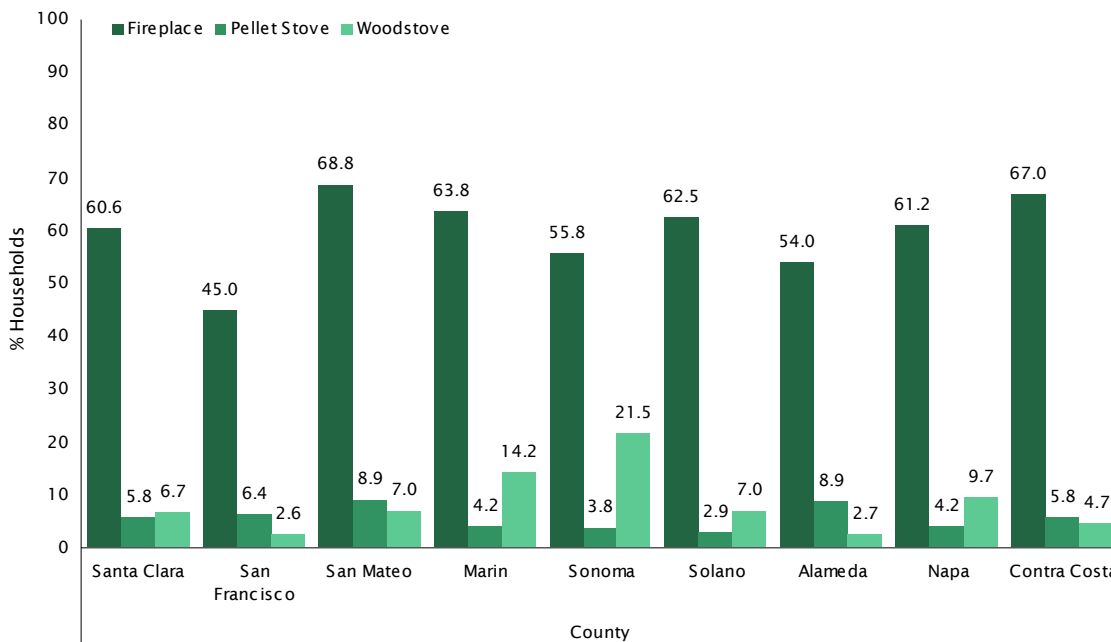
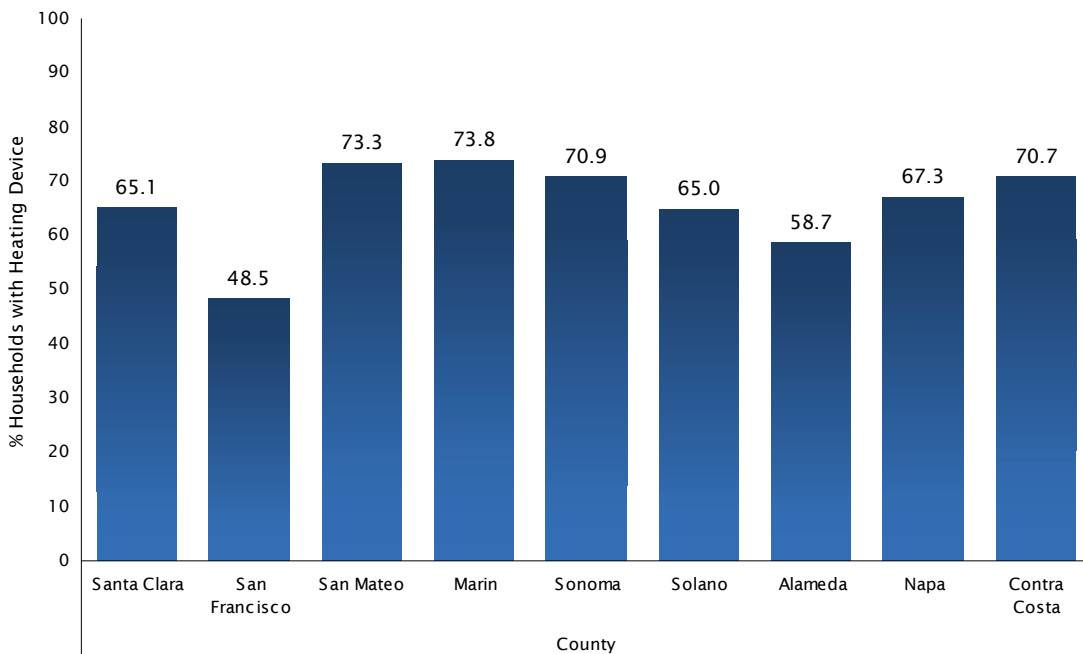
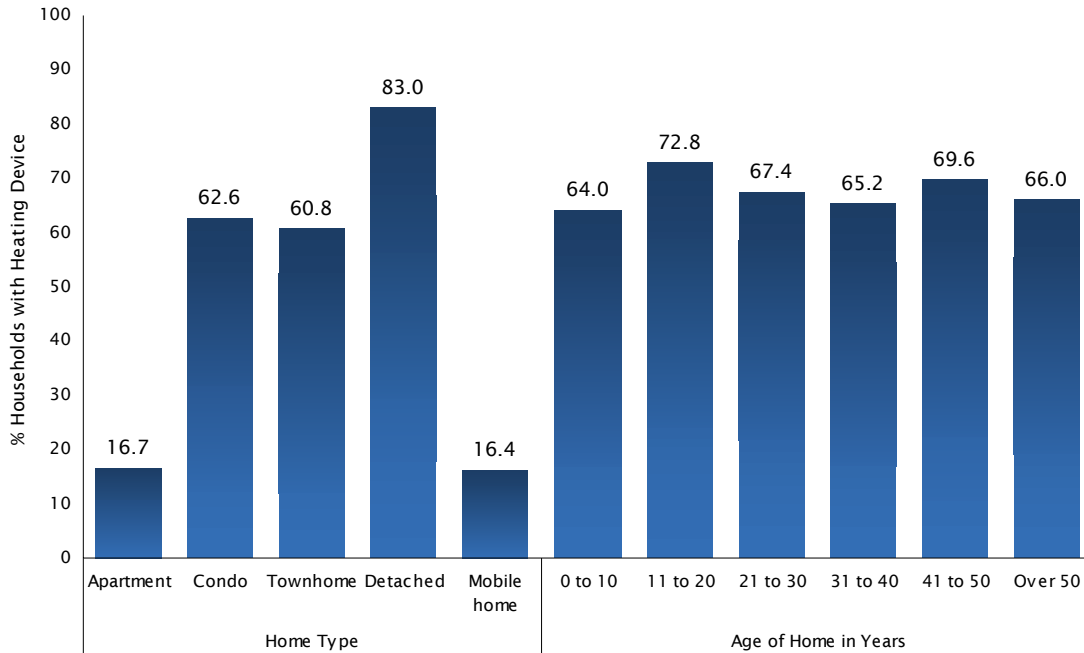


FIGURE 3 AT LEAST ONE HEATING DEVICE IN HOME BY COUNTY (N = 2,625)



7. The n = 2,625 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 figure.

FIGURE 4 AT LEAST ONE HEATING DEVICE IN HOME BY HOME TYPE & AGE OF HOME IN YEARS (N = 2,625)



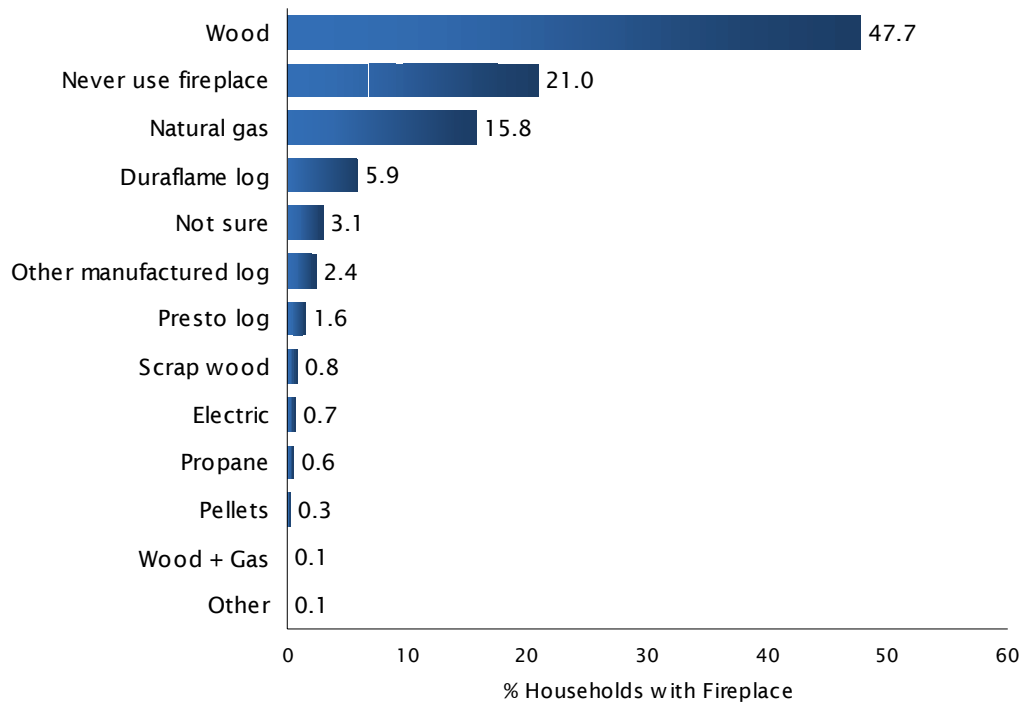
FUEL TYPE & SOURCE For the 59% of respondents who reported that their household contains a fireplace, the survey next inquired as to the type of fuel that they *primarily* use in the fireplace (see Figure 5). The most commonly used fuel was wood (48%), followed by natural gas (16%), and artificial logs such as a Duraflame (6%), Presto (2%) or other manufactured log (2%).⁸ Approximately 21% of respondents volunteered that they never use their fireplace.

Households with fireplaces that primarily burn wood, as well as households with wood stoves, were next asked a series of questions about the *type* of wood they burn (Question 3), from where they purchase their wood (Question 4), as well as their primary reason for burning wood (Question 5). As shown in Figure 6, 38% of respondents were unable to identify the type of wood that they burn. Of the specific woods mentioned, oak was the most common (39%), followed by pine/cedar (10%), almond (4%), and eucalyptus (3%). The ability to identify the type of wood burned was related to the frequency of burning, with those who burn at least once per week being less likely than their counterparts to be uncertain as to the type of wood that they burn (see Figure 7). Nevertheless, regardless of frequency, oak was the most commonly mentioned type of wood.

8. Note that some respondents initially identified their manufactured logs as 'wood' in Question 2, but subsequently clarified that they used manufactured logs in Question 3. Their responses to Question 2 were appropriately adjusted prior to analysis.

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

FIGURE 5 TYPE OF FUEL BURNED (N = 1,547)



Question 3 What type of wood do you typically burn?

FIGURE 6 TYPE OF WOOD BURNED (N = 813)

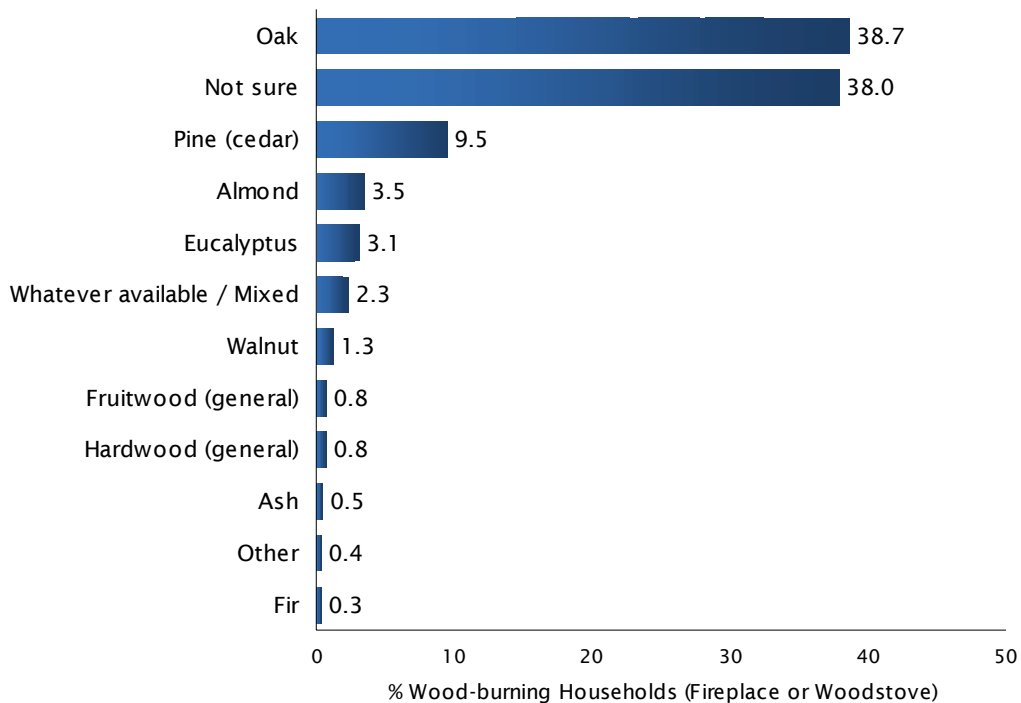
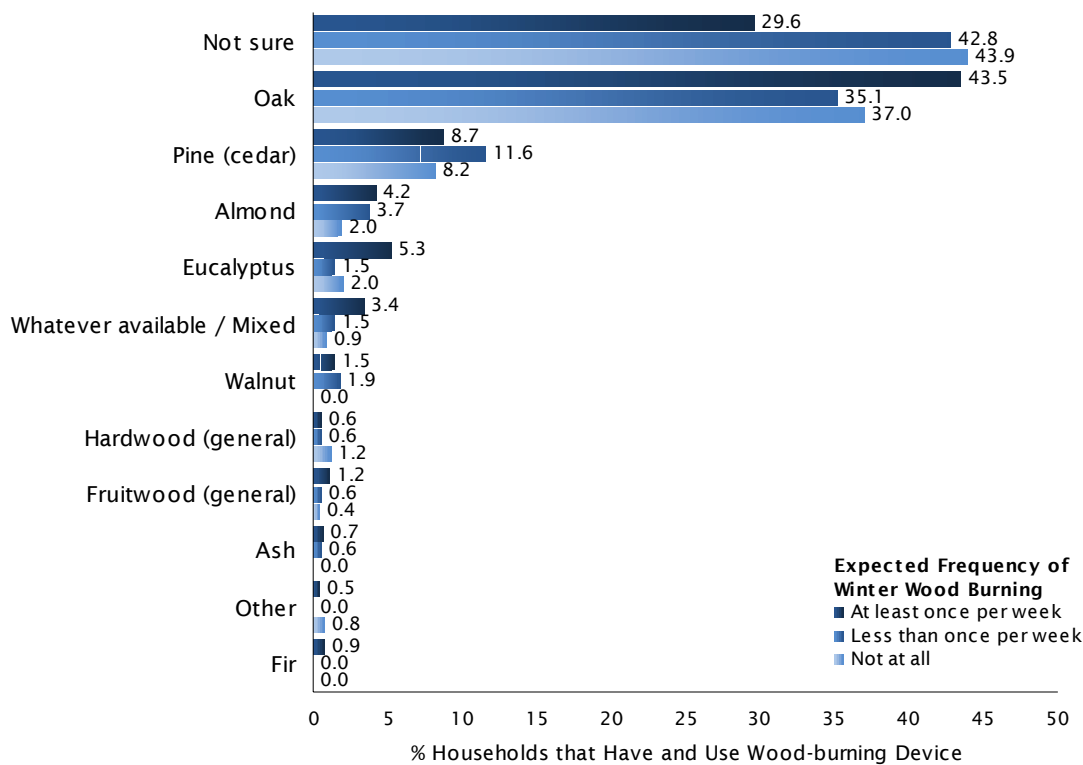


FIGURE 7 TYPE OF WOOD BURNED BY EXPECTED FREQUENCY OF WINTER WOOD BURNING (N = 813)



When asked how they typically acquire their wood, respondents were split between those who gather their own (35%), those who purchase the wood from a local store (32%), and those who rely on a wood supplier (22%). Seven percent (7%) mentioned an alternative source, and 4% were unsure of where their household acquires the wood that they burn (see Figure 8). When compared to their respective counterparts, those who burn wood frequently were more likely to gather their own wood or rely on a wood supplier (see Figure 9).

Question 4 Do you typically purchase your wood from a wood supplier, the local store, or do you gather your own wood?

FIGURE 8 WOOD SOURCE (N = 813)

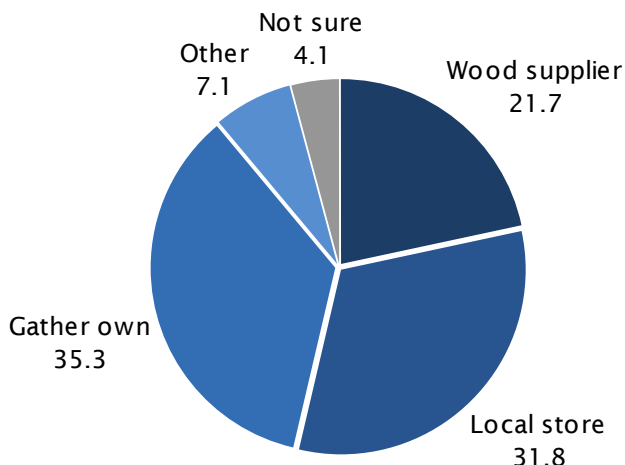
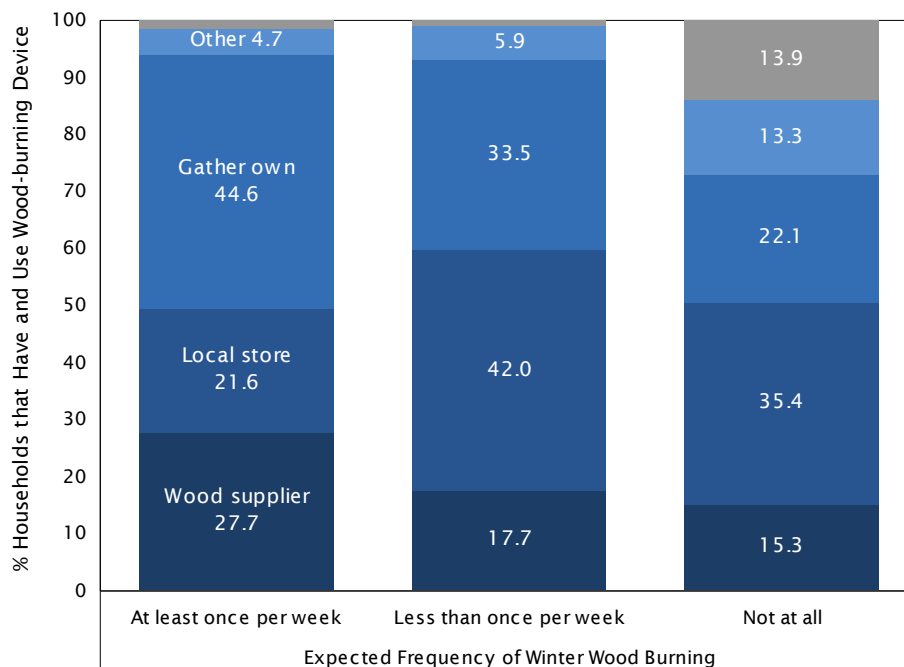


FIGURE 9 WOOD SOURCE BY EXPECTED FREQUENCY OF WINTER WOOD BURNING (N = 813)



The survey next inquired as to whether the respondent typically burns dry, seasoned wood or wood that is fresh-cut and somewhat moist. As shown in Figure 10, 85% of respondents stated that they burn dry, seasoned wood, 5% reported that they typically burn fresh-cut wood, and 10% were not sure. Although frequent burners were more likely to know the status of the wood that they burn, when one compares the responses among those who provided a specific answer to Question 5 it appears that frequency of wood burning is not related to the status of the wood burned. That is, infrequent burners were just as likely as frequent burners to burn dry, seasoned wood (see Figure 11).

Question 5 *Do you tend to burn dry, seasoned wood or wood that is fresh-cut and somewhat moist?*

FIGURE 10 STATUS OF WOOD TYPICALLY BURNED (N = 813)

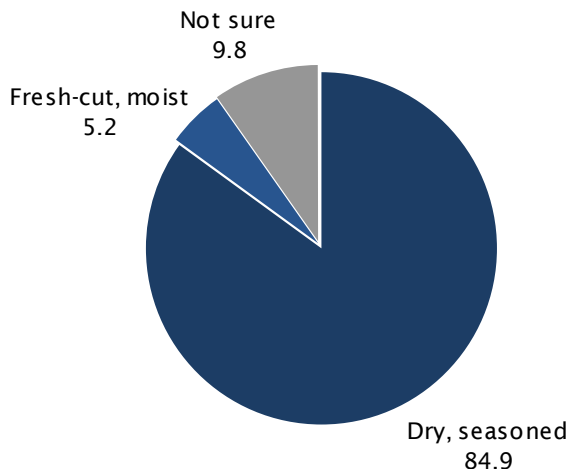
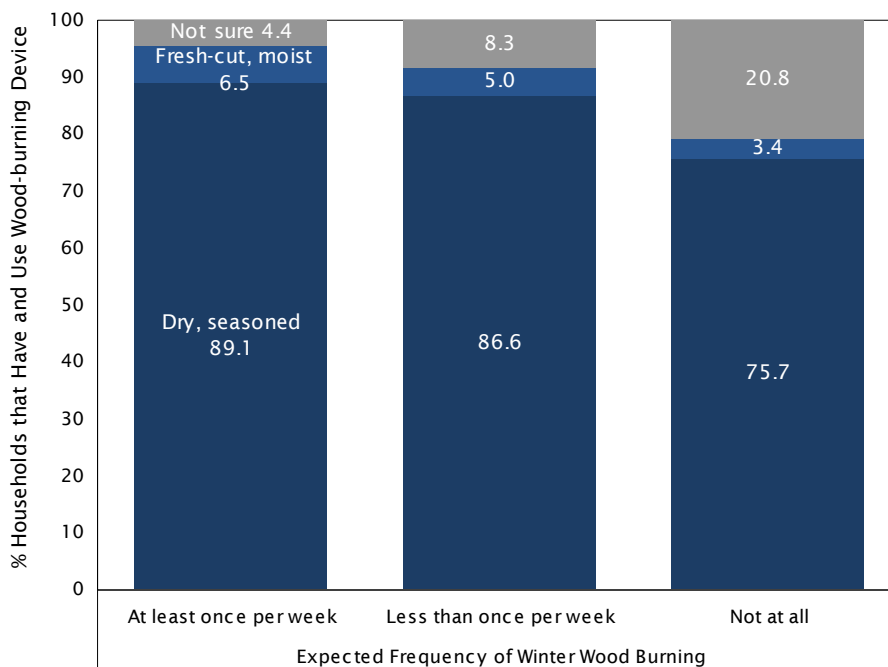


FIGURE 11 STATUS OF WOOD TYPICALLY BURNED BY EXPECTED FREQUENCY OF WINTER WOOD BURNING (N = 813)



PRIMARY REASON FOR BURNING WOOD Households that have a wood burning heating device and expected to use it during the winter were next asked to indicate the *primary* reason for why they use the device -- to heat their home, or for the ambiance of having a fire? Figure 12 shows that residents, as a whole, were rather evenly divided between those who primarily burn for heat (46%) and those who primarily burn for ambiance (50%). As expected, the reason for using a heating device was related to the frequency of burning. Frequent burners were much more likely (66%) to indicate that they burn wood for heating purposes, whereas infrequent burners much more likely (69%) to report that they burn for ambiance (see Figure 13).

Question 6 *When you use your fireplace or woodstove, which of the following would you say is the primary reason you do so? For heating your home, or for the ambiance of having a fire*

FIGURE 12 PRIMARY PURPOSE OF WOOD BURNING (N = 813)

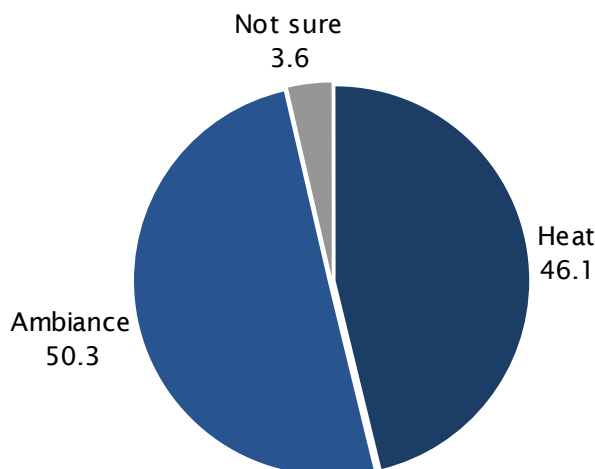
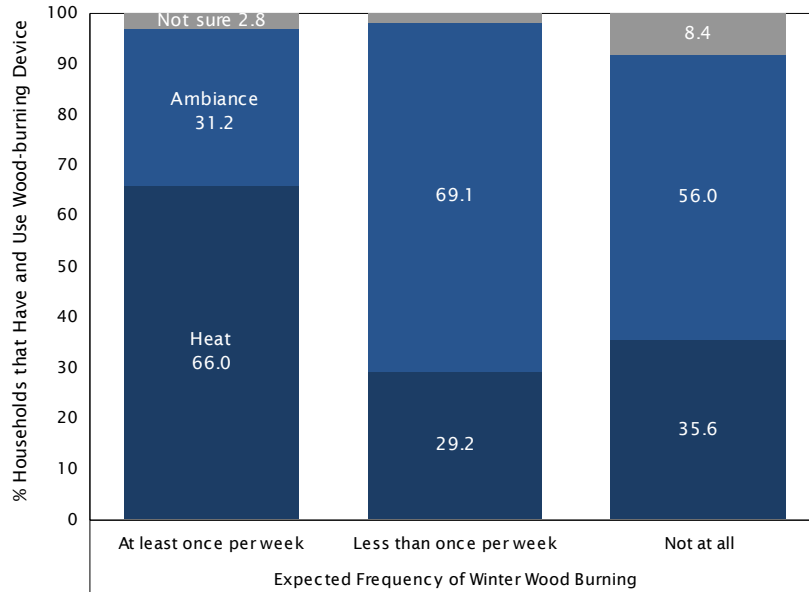


FIGURE 13 PRIMARY PURPOSE OF WOOD BURNING BY EXPECTED FREQUENCY OF WINTER WOOD BURNING (N = 813)



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 14, 74% of households that contain a wood stove indicated that they would use the device this winter. The rate of use was similar for pellet stoves (72%) and notably lower for fireplaces (60%). The results for the 2004 survey -- which was conducted at the end of the season rather than throughout -- are presented for comparison.

Question 7 Will you use your: _____ this winter?

FIGURE 14 HEATING DEVICE USAGE THIS WINTER BY STUDY YEAR (FIREPLACE: N = 1,547; PELLET STOVE: N = 170; WOOD STOVE: N = 165)

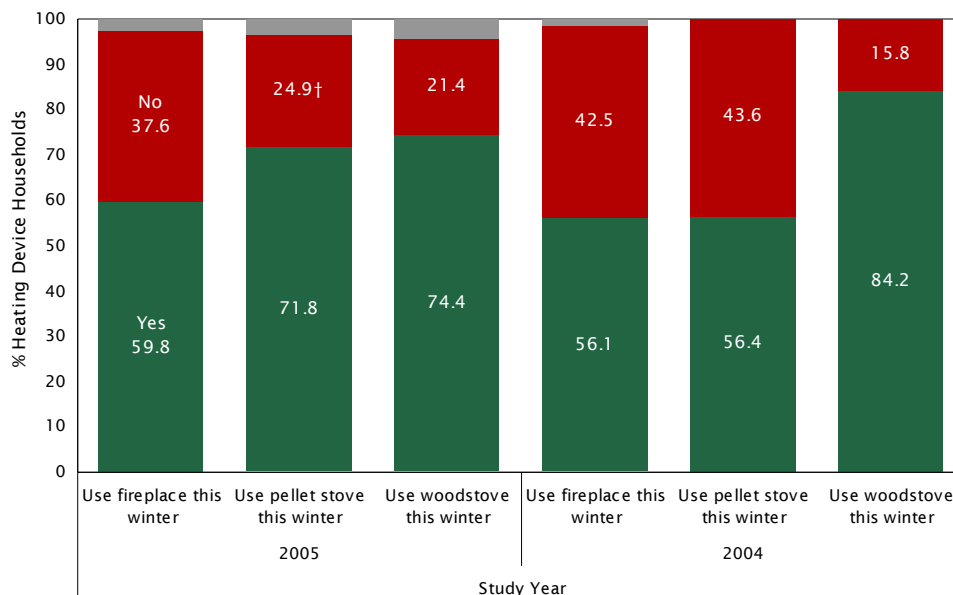
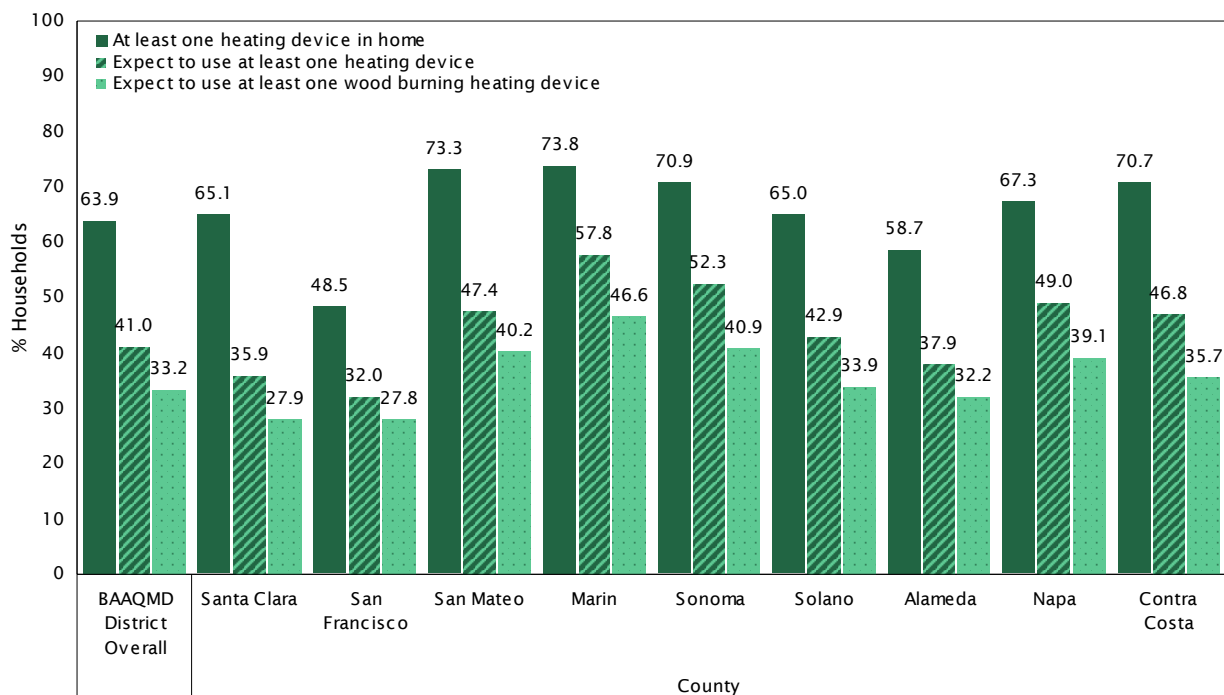


Figure 15 provides a useful summary of the presence and expected use of heating devices for the District as a whole, as well as by the nine member counties. Overall, 64% of households surveyed in the District contained at least one heating device (fireplace, wood stove or pellet stove), 41% expected to use a heating device this winter, and one-third (33%) expected to use at least one *wood burning* heating device this winter. Among the nine counties, households in Marin had the highest rate of expected heating device use (58%), as well as the highest expected use of wood burning heating devices (47%). San Francisco County residents reported the lowest rates of the presence and use of heating devices.

FIGURE 15 HOUSEHOLD HEATING DEVICE USAGE THIS WINTER BY COUNTY (N = 2,625)



Respondents who indicated that they do not expect to use their fireplace, wood stove or pellet stove this winter in Question 7 were next asked to indicate *why* they do not intend to use the device. As shown in Figure 16, approximately 8% of fireplace owners who did not intend to use the device this winter offered a reason related to air quality and an additional 8% mentioned a specific health-related reason. Approximately 3% of pellet stove owners and 9% of wood stove owners who did not intend to use the devices also mentioned air quality as a reason for not using the device this winter. The remaining respondents offered a reason unrelated to air quality or health.

For the interested reader, Figure 17 displays the percentage of households that own a fireplace, wood stove or pellet stove and offered air quality as a reason for why they did not expect to use the device this winter, by county. San Mateo County had the highest percentage (6%) of device owning households that fit this description, whereas Sonoma County had the lowest (2%).

Question 8 Why do you not expect to use your: _____ this winter?

FIGURE 16 REASON FOR NOT USING HEATING DEVICE THIS WINTER (FIREPLACE: N = 581; PELLET STOVE: N = 42; WOODSTOVE: N = 35)

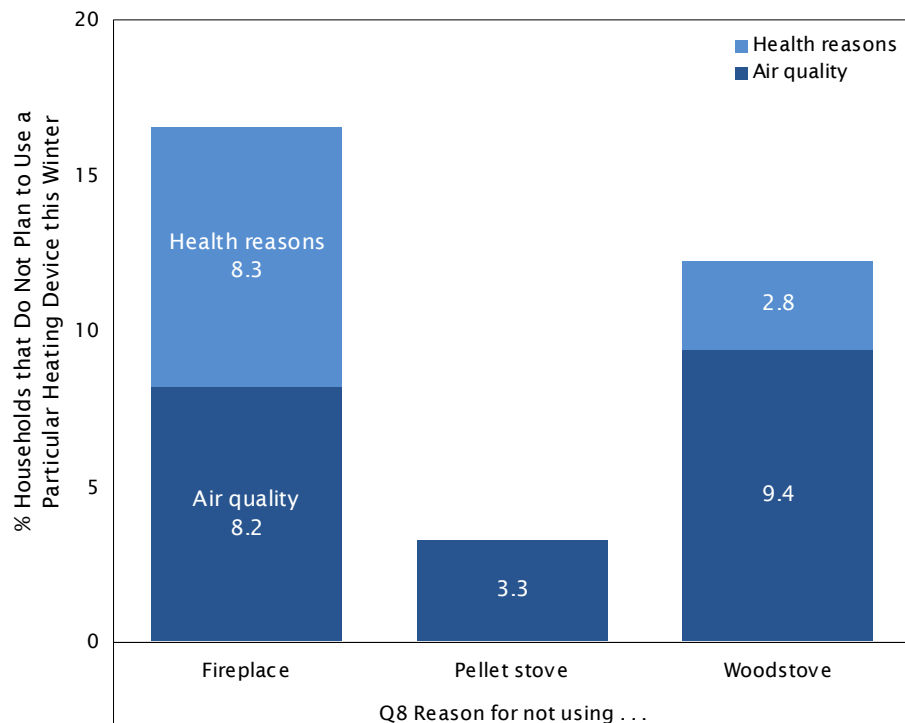
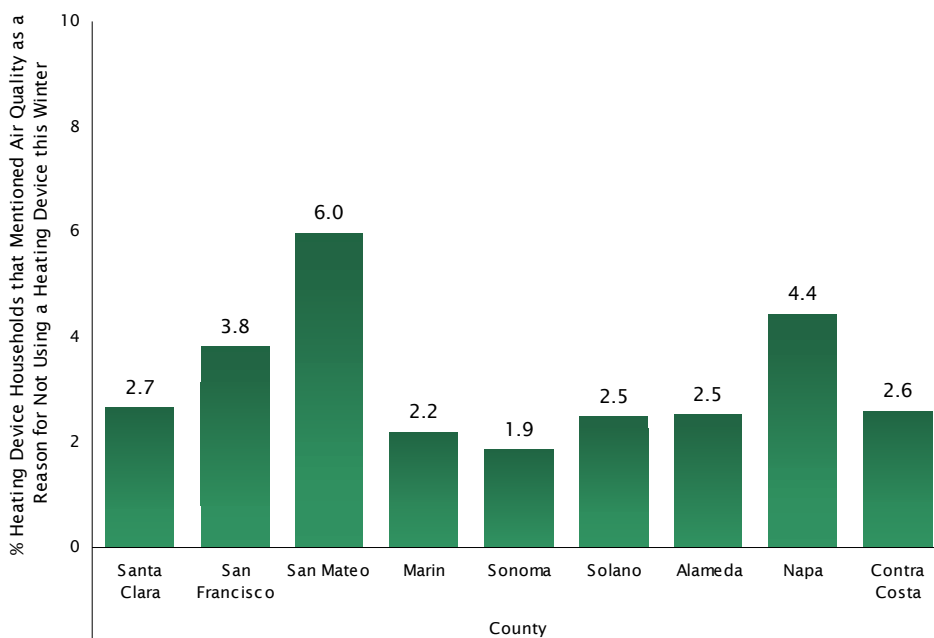


FIGURE 17 HEATING DEVICE HOUSEHOLDS NOT BURNING BECAUSE OF AIR QUALITY REASONS (N = 1,679)



SEASONAL 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 2005-2006 winter months.

The first question (Question 9) asked each respondent how often they expected that they would burn wood this winter -- at least once per week or less often? Respondents who indicated that they expected to burn wood less often than once per week were next asked to be more specific as to how often they expected to burn wood -- two to three times per month, once per month, or less often than once per month? For respondents who indicated that they expected to burn wood weekly, Question 11 asked how many days they expected to burn wood in a typical winter week. The results to all three questions are combined in Figure 18.

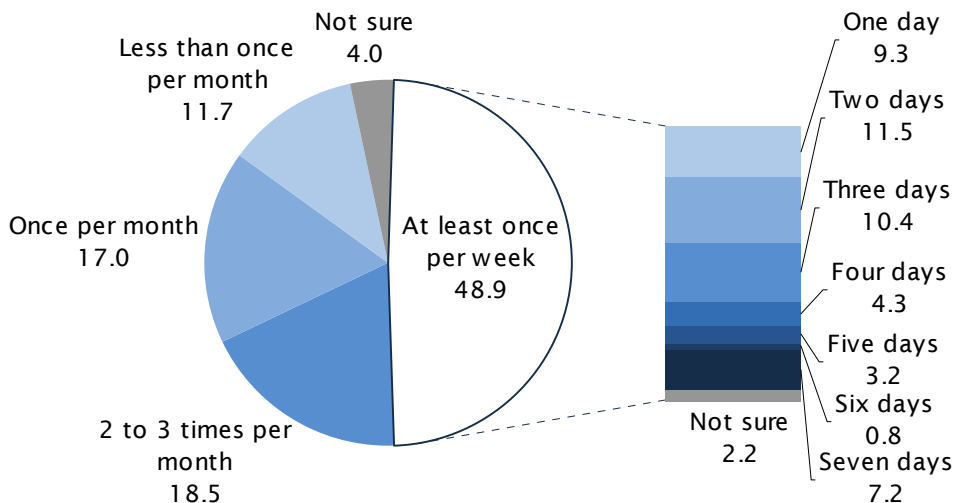
Overall, nearly half (49%) of respondents indicated that they expected to burn wood on a weekly basis, although most (31%) stated that they would burn wood three days or less per week. Overall, 19% indicated that they expected to burn wood two to three times per month, 17% once per month, and 12% expected to burn wood less often than once per month.

Question 9 *How often do you expect to burn wood this winter? At least once per week or less often than that?*

Question 10 *Would you say that you will burn wood about two to three times per month, once per month, or less often than once per month?*

Question 11 *In a typical winter week, how many days do you expect to burn wood?*

FIGURE 18 FREQUENCY OF BURNING WOOD THIS WINTER (N = 864)



When compared to 2004, there was a statistically significant increase in the percentage of respondents who indicated that their household would burn wood at least once per week (see Table 1). Whereas in 2004 just over one-third (34%) expected to burn wood weekly, the percentage in 2005 was much higher at 49%. A portion of this increase is clearly due to the higher cost

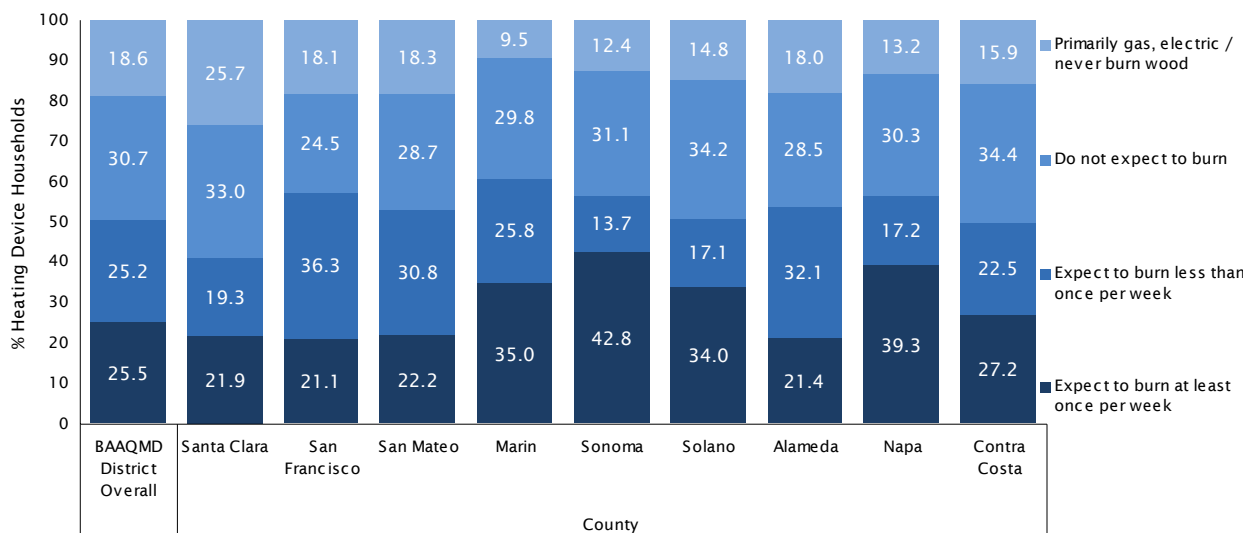
of natural gas and propane in 2005, as some households were relying on wood as a substitute fuel (see *Changes in Wood Burning Behavior* on page 27).

TABLE 1 FREQUENCY OF BURNING WOOD THIS WINTER BY STUDY YEAR (N = 864)

		Study Year	
		2005	2004
Frequency of Burning Among Households with a Wood-burning Device Expected to be Used During Winter Season (Q9/Q10/Q11)	At least once per week	48.9%†	34.2%
	One day	9.3%	11.2%
	Two days	11.5%†	5.6%
	Three days	10.4%	6.1%
	Four days	4.3%†	1.0%
	Five days	3.2%	2.6%
	Six days	0.8%	1.5%
	Seven days	7.2%	6.1%
	Not sure # of days	2.2%	0.0%
	2 to 3 times per month	18.5%†	28.1%
	Once per month	17.0%	15.8%
	Less than once per month	11.7%†	18.4%
	Not sure of frequency	4.0%	3.6%

Figure 19 provides a useful summary of wood burning behavior among households that own a heating device in the District overall, as well as by county. Overall, 26% of households expected to burn wood weekly, 25% expected to burn wood less frequently than once per week, 31% own a wood burning heating but indicated that they do not expect to burn wood, and 19% own a heating device that primarily burns fuels other than wood. Among the nine member counties, Sonoma County had the highest percentage of heating device-owning households that expected to burn wood weekly (43%), where San Francisco had the lowest (21%).

FIGURE 19 FREQUENCY OF BURNING WOOD THIS WINTER AMONG ALL HEATING DEVICE HOUSEHOLDS BY COUNTY (N = 1,679)

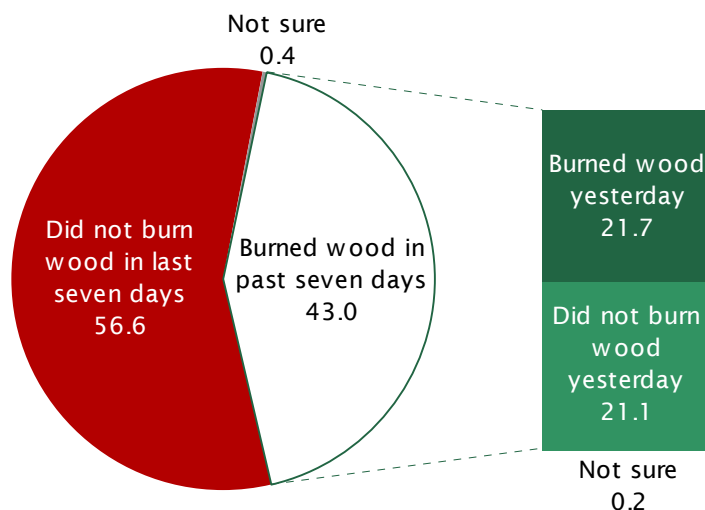


WOOD BURNING BEHAVIOR IN PAST WEEK Respondents were also asked whether they burned wood in the past week and -- if yes -- if they burned wood the day or evening prior to the interview. The results to these two questions are combined in Figure 20. Forty-three percent (43%) of respondents whose household 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 22% had burned wood the day prior to the interview.

Question 12 *Did you burn wood in the past seven days?*

Question 13 *Did you burn wood yesterday or last night?*

FIGURE 20 BURNED WOOD IN PAST SEVEN DAYS (N = 864)



When compared to 2004, a significantly higher percentage of households reported that they had burned wood in the week prior to the interview. Whereas approximately one-third (32%) reported burning wood during this period in 2004, the corresponding figure for 2005 was 43% (see Table 2).⁹

TABLE 2 BURNED WOOD IN PAST SEVEN DAYS BY STUDY YEAR (N = 864)

		Study Year	
		2005	2004
Frequency of Burning in Past Seven Days Among Households with a Wood-burning Device Expected to be Used During Winter Season (Q12/Q13)	Burned wood in past seven days	43.0%†	32.1%
	Burned wood yesterday	21.7%	12.8%
	Did not burn wood yesterday	21.1%	19.4%
	Not sure of burning yesterday	0.2%	0.0%
	Did not burn wood in last seven days	56.6%†	67.3%
	Not sure of burning in past seven days	0.4%	0.5%

9. This discrepancy may be partially due to the timing of the interviews. In 2004, the interviews were conducted in the last two weeks of the season, whereas in 2005 the interviews were conducted throughout the season.

The following two figures show the percentage of heating device-owning households that burned wood in the seven days prior to the interview (Figure 21) and on the day prior to the interview (Figure 22) for the District as a whole, as well as by the nine member counties. Consistent with prior measures of wood burning frequency, Sonoma County residents reported the highest rate of wood burning behavior.

FIGURE 21 HEATING DEVICE HOUSEHOLDS THAT BURNED WOOD IN PAST SEVEN DAYS BY COUNTY (N = 1,679)

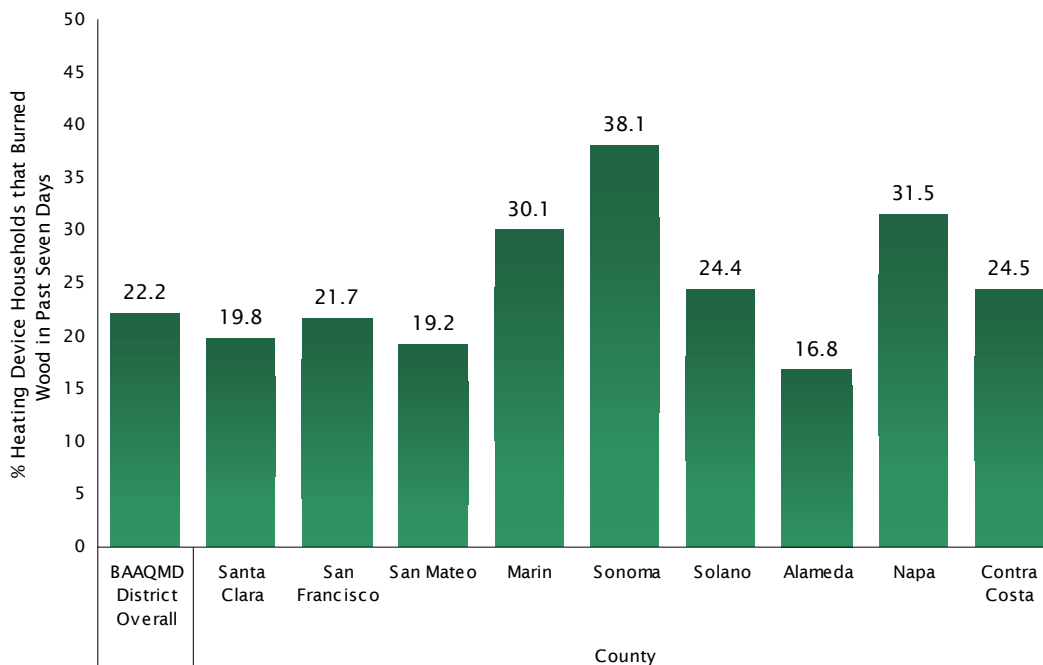
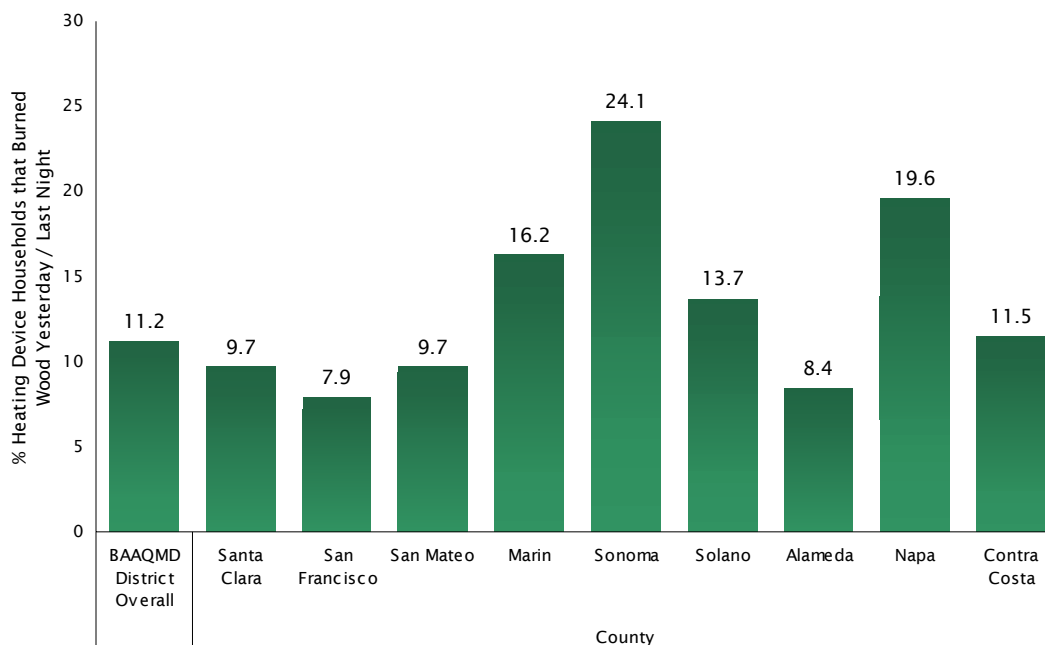
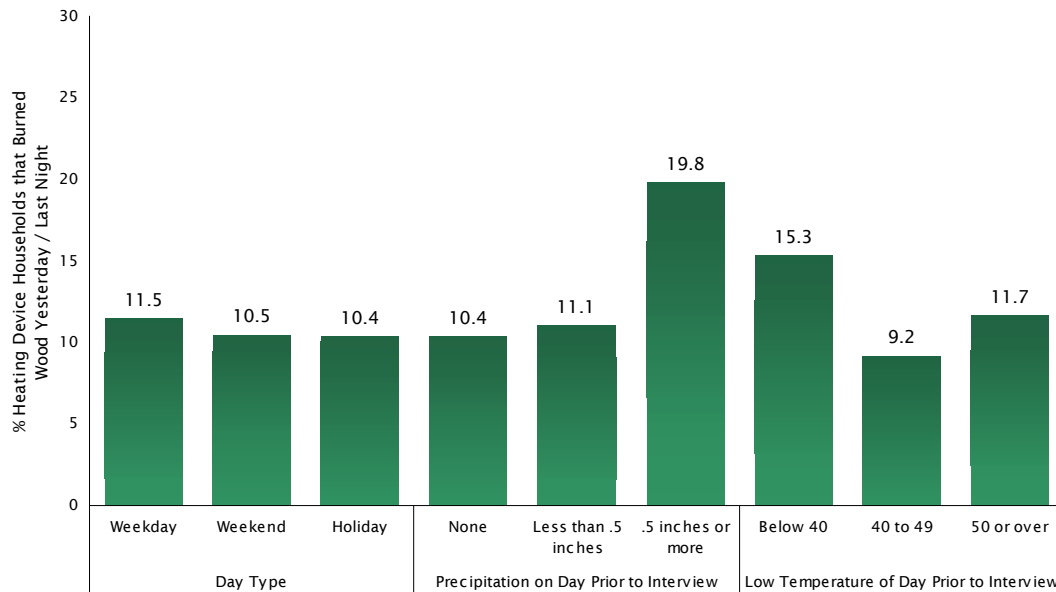


FIGURE 22 HEATING DEVICE HOUSEHOLDS THAT BURNED WOOD YESTERDAY / LAST NIGHT BY COUNTY (N = 1,679)



During the design stage of the study, it was expected that wood burning behavior could be linked to both the type of day (weekday, weekend and holiday) and weather-related factors such as precipitation and temperature. Figure 23 shows that although precipitation and temperature on the reference day for the interview was clearly related to wood burning behavior on said day in the expected manner, the type of day did not bare a statistical relationship to wood burning behavior. Overall, households were no more likely (or unlikely) to burn wood on a holiday or on weekends than they were on weekdays.

FIGURE 23 HEATING DEVICE HOUSEHOLDS THAT BURNED WOOD YESTERDAY / LAST NIGHT BY DAY TYPE, PRECIPITATION ON DAY PRIOR TO INTERVIEW & LOW TEMPERATURE ON DAY PRIOR TO INTERVIEW (N = 1,679)



DURATION & VOLUME OF WOOD BURNING Questions 14 and 15 asked respondents with wood-burning devices who also expected to use the device this winter to estimate the number of hours they have a fire burning -- as well as the number of logs they burn -- on a typical day that they burn wood.

In terms of hours, more than half (53%) of respondents indicated that they burn three to four hours on a typical day. The remaining respondents were split between those who burn for shorter durations (27%) and those who burn for five hours or longer (21%). The average duration among all respondents who received this question was 3.8 hours.

Figure 25 presents the distribution of burning hours on a typical day by county and expected frequency of burning during the 2005-2006 winter season. When compared to their respective counterparts, Marin County residents reported the longest average duration of wood burning on a typical burn day at 5.19 hours, followed closely by Sonoma County at 4.88 hours. Frequent burners also reported a longer duration (4.63 hours) for a typical burn day when compared to those who burn less than once per week (3.03 hours).

Question 14 *In a typical day that you burn wood, how many hours of the day do you have a fire burning?*

FIGURE 24 HOURS OF BURNING IN TYPICAL DAY OF WOOD BURNING (N = 864)

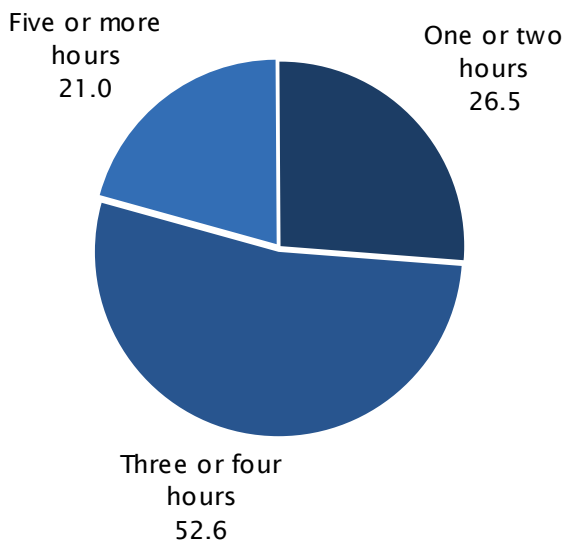
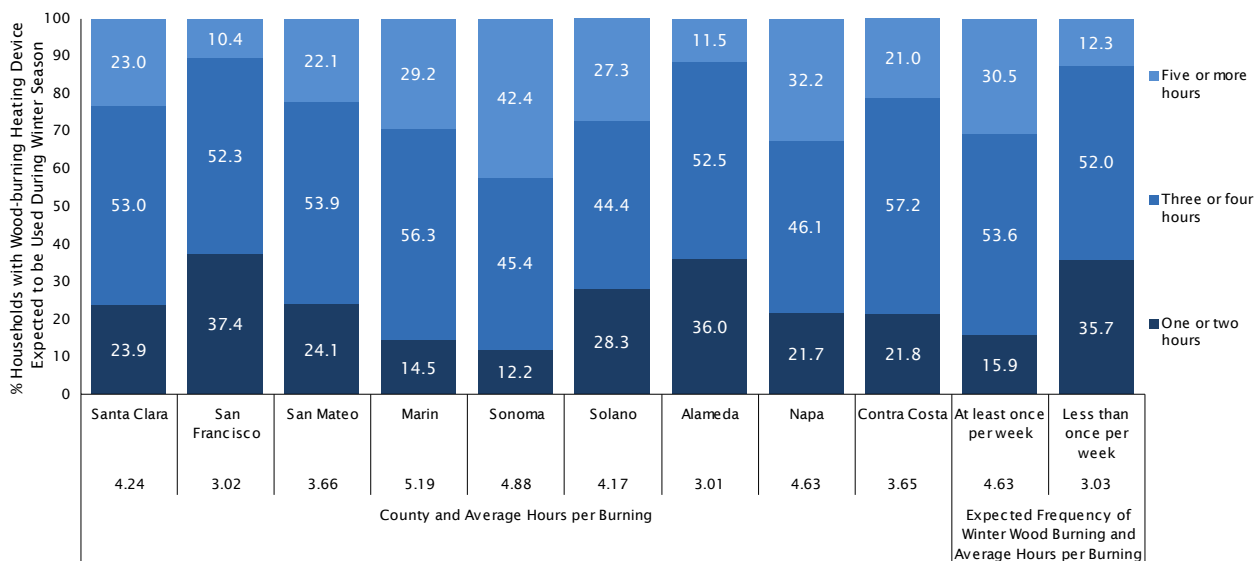


FIGURE 25 DISTRIBUTION AND AVERAGE HOURS OF BURNING IN TYPICAL DAY OF WOOD BURNING BY COUNTY & EXPECTED FREQUENCY OF WINTER WOOD BURNING (N = 864)



In terms of volume, respondents were rather evenly split between those who burn one or two logs per typical burn day (34%), those who estimated that they burn three to five logs (34%), and those who reported burning more than five logs per day (32%). The average number of logs reported per burn day was 5.12 (see Figure 26). As shown in Figure 27, those counties that reported the longest duration of burning on a typical burn day (Marin and Sonoma) also reported the highest volume of logs burned per burn day (7.0 and 7.6, respectively). Frequent burners

also reported a higher number of logs burned (6.28) per burn day when compared to their counterparts (3.94) who burn less frequently than once per week.

Question 15 *In a typical day that you burn wood, how many logs do you burn throughout the entire day?*

FIGURE 26 LOGS BURNED IN TYPICAL DAY OF WOOD BURNING (N = 864)

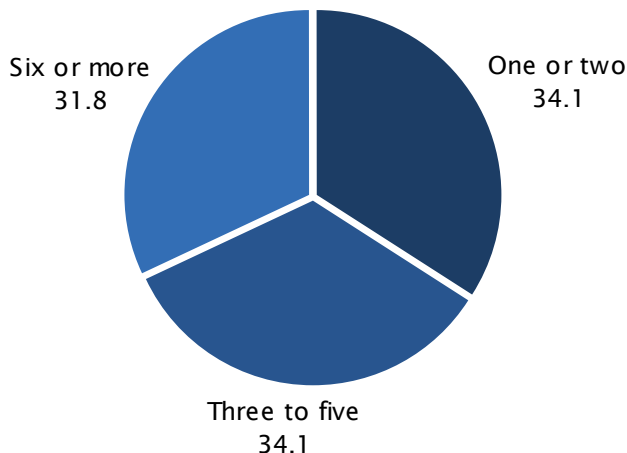
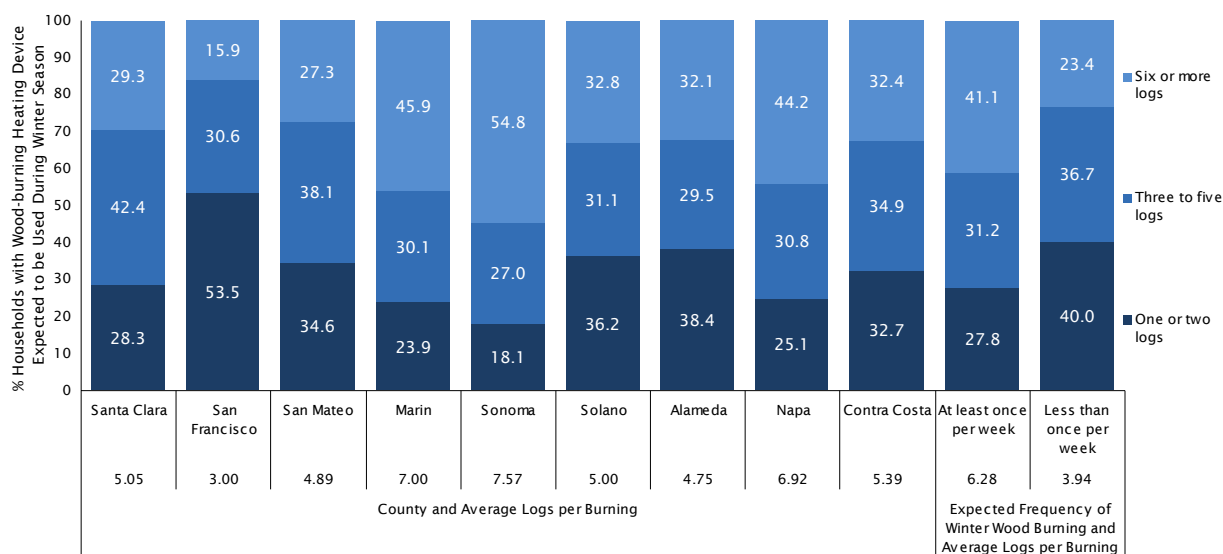


FIGURE 27 LOGS BURNED IN TYPICAL DAY OF WOOD BURNING BY COUNTY & EXPECTED FREQUENCY OF WINTER WOOD BURNING (N = 864)



NON-WINTER WOOD BURNING Whereas the bulk of the questions on wood burning focused on the winter season, respondents were also asked about their wood burning behavior during non-winter months. This line of inquiry was administered to *all* respondents -- not just those with a heating device in the home -- in order to capture wood burning that occurs at campfires and beaches, in chimineas and at other locations in addition to their home. As shown in

Table 3, the vast majority of households (83%) reported that they do *not* burn wood in non-winter months. The percentage of respondents that indicated they do burn wood is shown for each non-winter month overall, as well as according to whether they own a heating device in their home.

Question D1 *Do you ever burn wood in non-winter months, between March and October? If no, record. If yes, ask: Which months during this period to you tend to burn wood?*

TABLE 3 WOOD BURNING ON NON-WINTER MONTHS BY HEATING DEVICE IN HOME

		BAAQMD District Overall	Heating Device in Home	
			Yes	No
QD1 Non-winter months anticipated for wood-burning	March	7.2	8.8	4.3
	April	5.3	6.3	3.7
	May	3.7	4.0	3.3
	June	4.8	4.9	4.7
	July	5.1	5.2	4.9
	August	4.3	4.2	4.5
	September	4.5	4.7	4.2
	October	6.4	7.8	3.9
	None	82.9	78.8	90.2
	Not sure	4.1	5.3	2.0

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 2005-2006 winter season in response to the Spare the Air Tonight Campaign or other factors such as the higher cost of natural gas and propane this season.

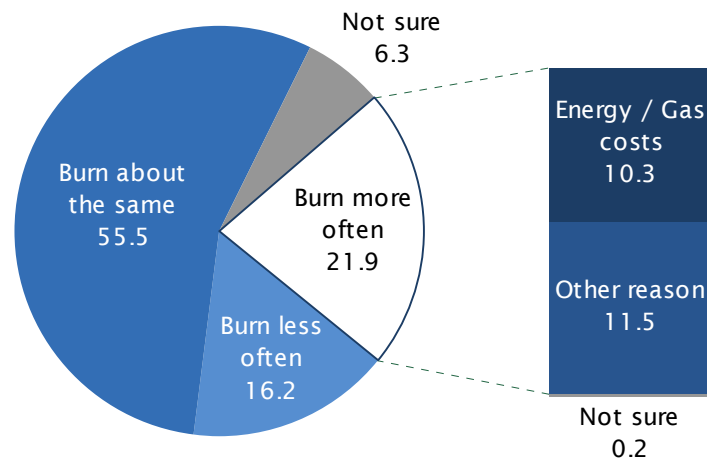
CHANGES IN WOOD BURNING BEHAVIOR The first question in this series simply asked the respondent if they expected that they would burn wood more frequently, less frequently, or at about the same frequency as the prior winter season. Respondents who indicated that they expected to burn wood more frequently this season were subsequently asked *why* they expected to burn more frequently this season. The responses to both questions are combined in Figure 28.

Overall, 56% of households that own a wood-burning heating device and expected to burn wood this season reported that they anticipated burning wood at about the same frequency this season as last. Approximately 16% anticipated burning wood less frequently, whereas 22% expected to burn wood more frequently in winter 2005-2006 when compared to the prior season. The 22% who expected to burn more frequently this season were divided rather evenly between those who were doing so due to the increased cost of energy and gas (10%) and those who were doing so for other reasons (12%).

Question 16 *This winter, do you expect that you will burn wood more often, less often, or about the same frequency as you did last winter?*

Question 17 *Why are you burning wood more frequently this year?*

FIGURE 28 EXPECTED FREQUENCY OF WOOD BURNING THIS WINTER COMPARED TO LAST WINTER AND REASONS FOR BURNING MORE OFTEN (N = 864)



CHANGES AMONG THOSE WHO INCREASED BURNING Approximately 10% of households that own a wood-burning heating device and anticipated burning wood this winter *also* indicated that they expected to increase their frequency of wood burning in winter 2005-2006 in response to the high cost of energy and/or gas (see Figure 28). Questions 18, 19 and 20 were designed to profile these respondents' wood burning during the *prior* winter season, thereby allowing a comparison to their expected burning behavior in 2005-2006 which was previously measured in the survey.

Figure 29 shows the distribution of *recalled* wood burning frequency during the 2004-2005 winter season among respondents who expected to increase their frequency of wood burning in 2005-2006 due to high energy/gas costs. Approximately 62% expected to burn wood at least once per week, and 22% expected to burn wood at least four days per week.

Question 18 *How often did you burn wood last winter? At least once per week or less often than that?*

Question 19 *Last winter, would you say that you burned wood about two to three times per month, once per month, or less often than once per month?*

Question 20 *Last winter, how many days did you burn wood in a typical week?*

FIGURE 29 FREQUENCY OF WOOD BURNING LAST WINTER AMONG THOSE BURNING MORE OFTEN BECAUSE OF INCREASED ENERGY COSTS (N = 89)

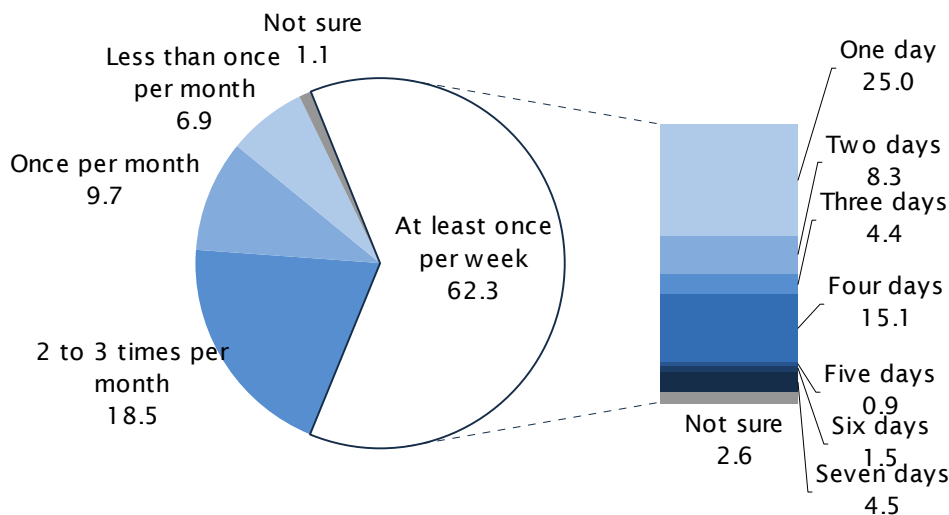


Table 4 on the next page compares the expected frequency of wood burning for the 2005-2006 season and the recalled burning behavior from 2004-2005 among households that expected to burn wood more frequently this season in response to high energy costs. For reference, the far right column also shows the frequency of wood burning reported during the 2004 season among all wood-burning households. The results are consistent with the respondents' reported behavior. For example, 80% of households that expected to increase their wood burning due to energy costs anticipated burning at least once per week this winter, compared to just 62% in 2004.

TABLE 4 FREQUENCY OF WOOD BURNING AMONG THOSE BURNING MORE OFTEN BECAUSE OF INCREASED ENERGY COSTS (N = 89)

		Households that Will Burn More Wood Because of Increased Energy / Gas Costs		All Wood-burning Households from 2004 Study Year
		2005	Recalled 2004	
Frequency of Burning Among Households with a Wood-burning Heating Device Expected to be Used During Winter Season that Will Burn More Wood Because of Increased Energy / Gas Costs	At least once per week	80.2%	62.3%	34.2%
	One day	9.2%	25.0%	11.2%
	Two days	14.9%	8.3%	5.6%
	Three days	20.3%	4.4%	6.1%
	Four days	6.2%	15.1%	1.0%
	Five days	7.6%	0.9%	2.6%
	Six days	0.6%	1.5%	1.5%
	Seven days	16.9%	4.5%	6.1%
	Not sure # of days	4.5%	2.6%	0.0%
	2 to 3 times per month	10.7%	20.0%	28.1%
	Once per month	4.3%	9.7%	15.8%
	Less than once per month	3.7%	6.9%	18.4%
	Not sure of frequency	1.1%	1.1%	3.6%

REDUCTIONS IN WOOD BURNING Respondents were next 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.¹⁰

The manner in which these questions were asked, as well as their placement in the survey relative to specific questions about the Spare the Air Tonight Campaign, was changed in 2004 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 and 2005 surveys 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.

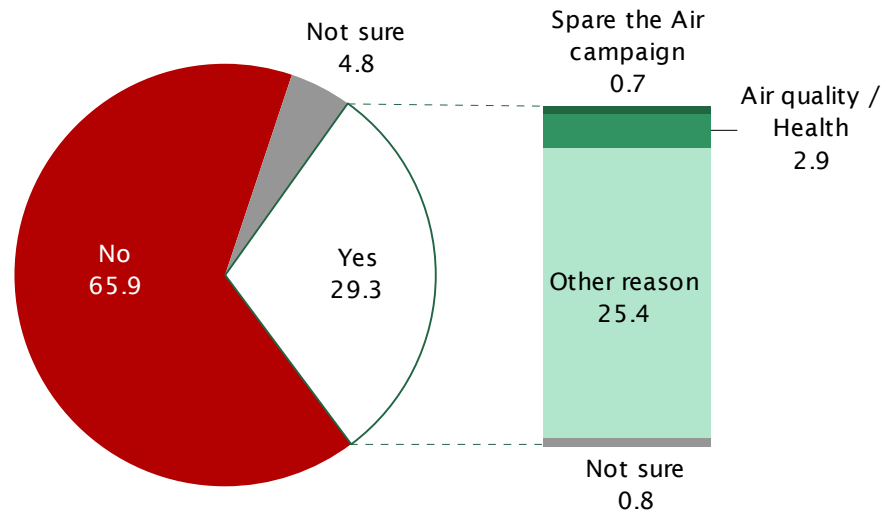
As shown in Figure 30, 29% of respondents who have a fireplace, wood stove and/or pellet stove *and* expected to burn wood during the 2005-2006 winter season indicated that -- on at least one occasion -- they refrained from burning wood. When asked *why* they chose not to burn wood on these occasions, 1% specifically mentioned the Spare the Air Campaign and an additional 3% offered an air quality or health-related reason.

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

Question 21 *Were there occasions this winter when you normally would have burned wood, but decided not to?*

Question 22 *Why did you decide not to burn wood on these occasions?*

FIGURE 30 CHOSE NOT TO BURN THIS WINTER (N = 864)



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 7), did so because of air quality reasons (Question 8), *and* were aware of the Spare the Air Tonight Program (Question 40) 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 21), did so because of the campaign or for air quality/health reasons (Question 22), *and* were aware of the Spare the Air Tonight Program (Question 40).

Table 5 shows that of the 1,679 respondents in the survey who were eligible to respond to the campaign, 39 (2.3%) reduced their wood burning behavior on at least one occasion during the 2005-2006 winter in response to the Spare the Air Tonight Program.¹¹ This represents 36,547 households out of the estimated 1,555,185 households with a heating device.

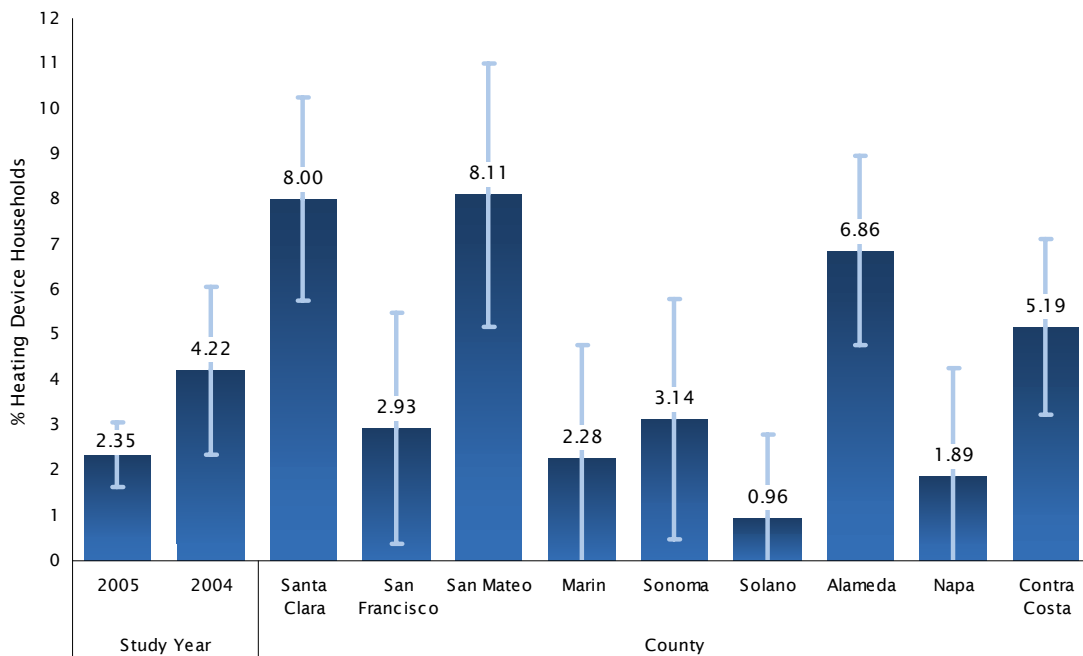
11. The survey included a follow-up question (Question 23) which asked respondents who refrained from burning wood for campaign-related reasons (Question 22) how many times they refrained from burning wood for air quality reasons during the winter season. The average response was 2.52 times, although 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.

TABLE 5 SPARE THE AIR REDUCERS: CONFIDENCE INTERVAL

Winter Spare the Air Tonight Reducers	
Universe Estimate (households with heating device)	1,555,185
Sample Size (surveyed households with heating device)	1,679
STA Reducers	39
Non-STA Reducers	1639
Proportion of STA Reducers	2.35%
Proportion of Non-STA Reducers	97.65%
Maximum Margin of Error (95% confidence)	0.72%
Confidence Interval for Proportion of Winter STA Reducers	Lower Bound
	Upper Bound
	1.62%
	3.07%

Figure 31 displays the estimated percentage of heating-device owning households that reduced their wood burning on at least one occasion due to the Spare the Air Tonight Program by study year (2005 and 2004), as well as by county for 2005. For reference, the confidence intervals are also shown to provide a sense for the reliability of the estimates.¹²

FIGURE 31 SPARE THE AIR REDUCERS BY STUDY YEAR & COUNTY SHOWING CONFIDENCE INTERVALS (N = 1,679)



12. The confidence intervals indicate the range within which one can be 95% confident that the true value exists.

RECALL AND AWARENESS OF SPARE THE AIR TONIGHT MESSAGING

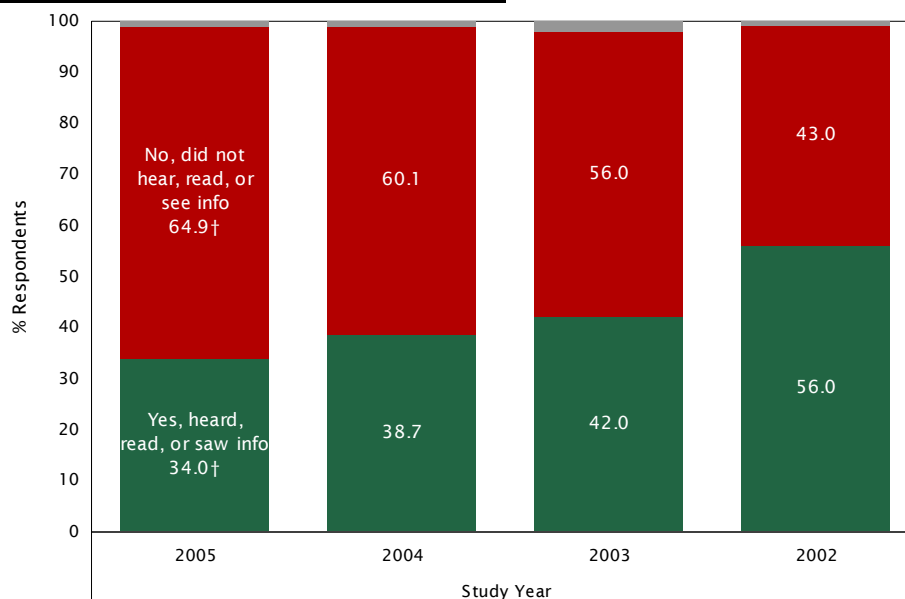
Although the ultimate goal of the Spare the Air Tonight Campaign is to persuade individuals to reduce the amount of wood that they burn and to replace wood burning devices with cleaner alternatives, there are a series of related objectives which must be met in order for this to occur. For example, regardless 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. 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?*

Figure 32 presents the results to this question for the study years 2002 through 2005. In 2005, 34% of respondents recalled being exposed to news stories, advertisements or public service announcements related to the Spare the Air Tonight Program during the winter months. Recalled exposure was significantly lower in 2005 when compared to prior winters, perhaps in part due to the timing of interviews. In prior years, the interviews were all conducted at the end of the season -- as opposed to throughout the season as in 2005 -- which increases a respondent's opportunities to be exposed to the campaign.

Question 24 *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 32 HEARD, READ, OR SAW SPARE THE AIR WINTER INFORMATION BY STUDY YEAR (N = 2,625)



For the interested reader, Figures 33 and 34 display the percentage of respondents who recalled being exposed to news stories, advertisements or public service announcements related to the Spare the Air Tonight Program during the winter months by county, age and household income. When compared to their respective counterparts, those who reside in Marin and Contra Costa counties, those 45 years of age or older, and those who enjoy annual family incomes of \$200,000 or more were the most likely to recall being exposed to the Spare the Air Tonight Program.

FIGURE 33 HEARD, READ, OR SAW SPARE THE AIR WINTER INFORMATION BY COUNTY (N = 2,625)

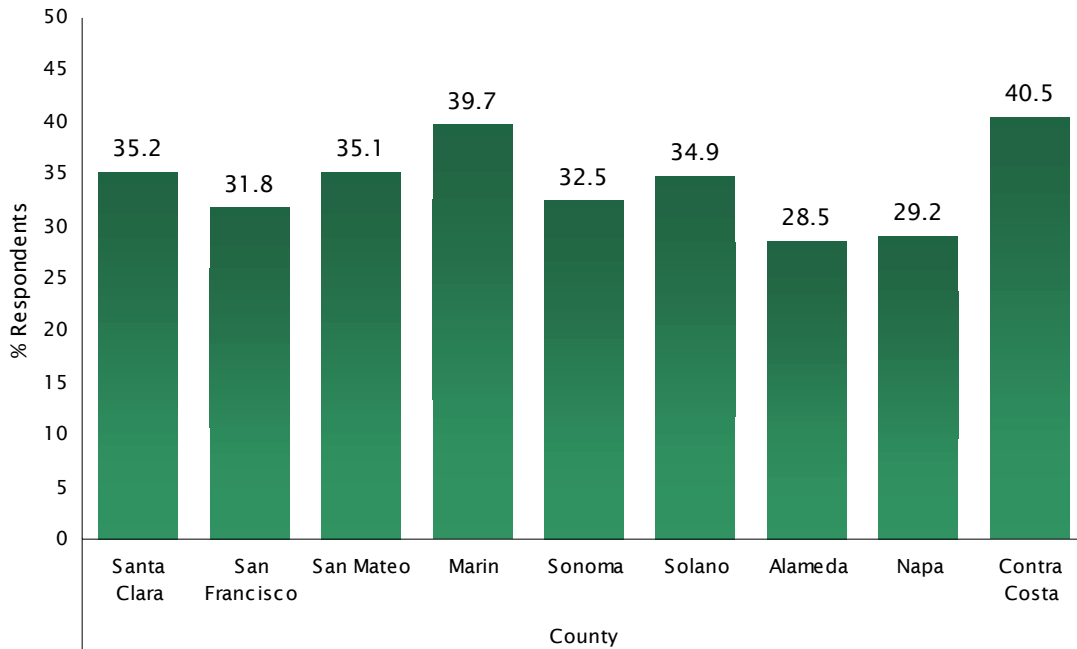
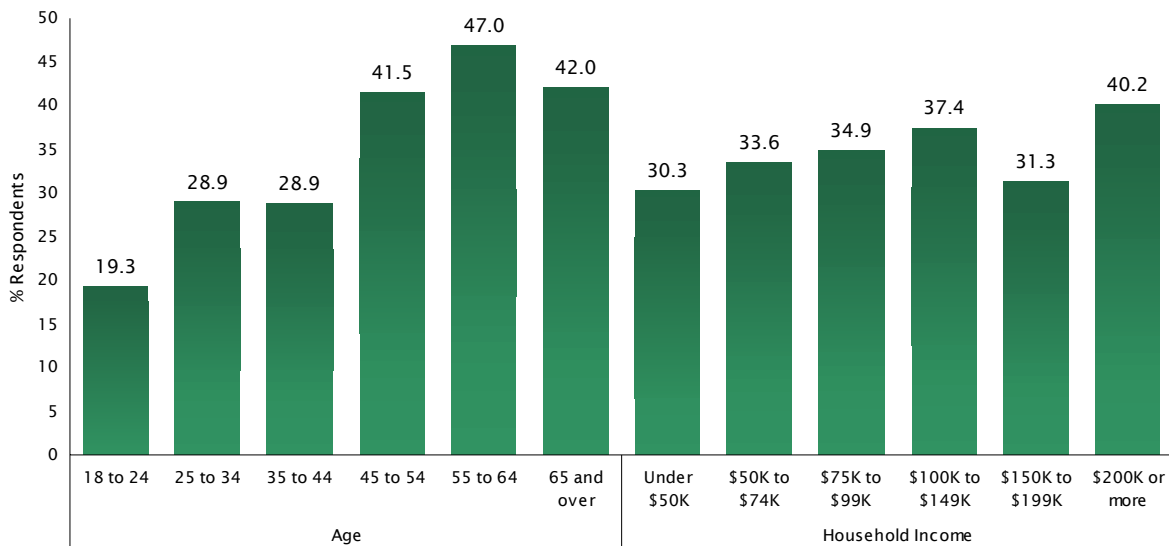


FIGURE 34 HEARD, READ, OR SAW SPARE THE AIR WINTER INFORMATION BY AGE & HOUSEHOLD INCOME (N = 2,625)

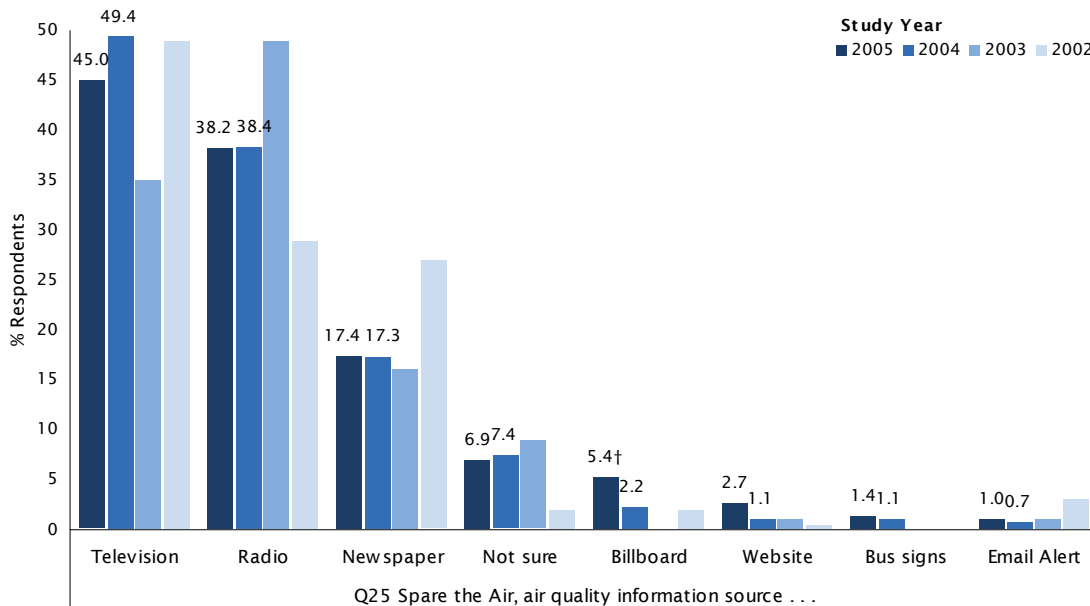


INFORMATION SOURCE Those who indicated that they recalled hearing, reading, or seeing Spare the Air Tonight related information during the winter were next asked where they obtained the information. Multiple responses to the question were allowed, so the percentages shown in Figure 35 represent the percentage 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, 2003 and 2004 surveys, the results from these surveys are also included in Figure 35 for comparison.

As in the previous three surveys, the most popular methods of obtaining information related to Spare the Air Tonight and air quality during the winter of 2005-2006 were television (45%) 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 25 *Where did you see the news story, advertisement or public service announcement?*

FIGURE 35 SOURCE FOR SPARE THE AIR WINTER INFORMATION (N = 891)



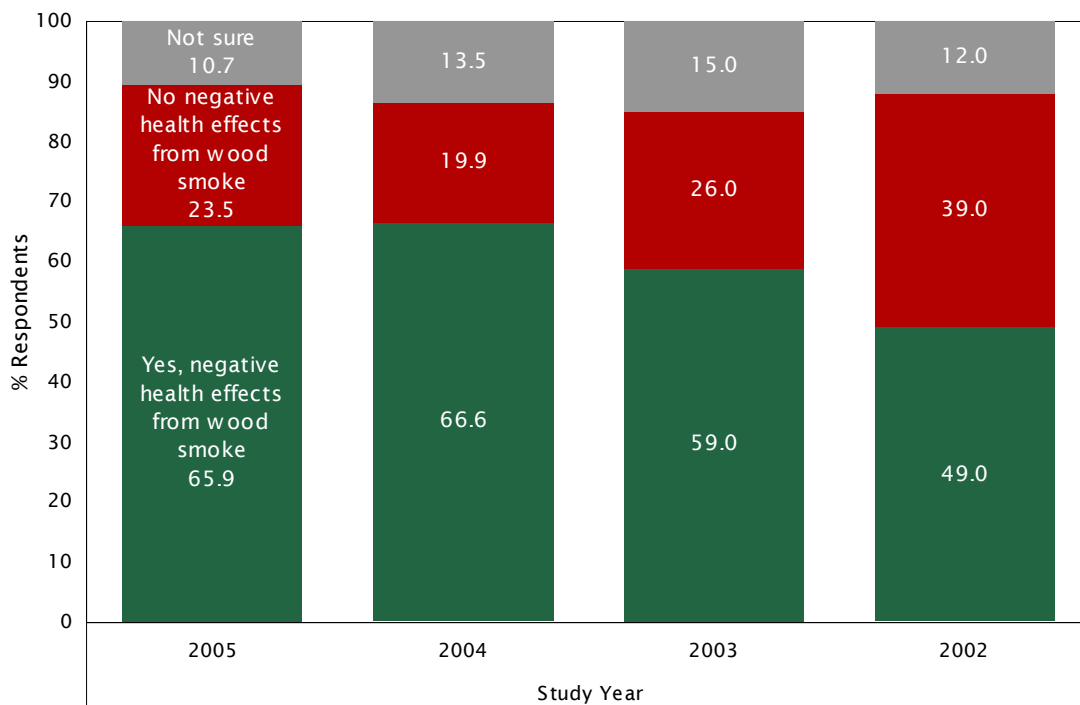
ATTITUDES ABOUT WOOD SMOKE

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 36, approximately two-thirds (66%) 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 four years -- in part due to the Spare the Air Tonight Program. The proportion of adults that perceive wood smoke to have negative health impacts has increased by nearly 17% since 2002.

Question 27 *Do you think there are any negative health effects associated with breathing wood smoke?*

FIGURE 36 PERCEIVE NEGATIVE HEALTH EFFECTS ARE ASSOCIATED WITH WOOD SMOKE BY STUDY YEAR (N = 2,625)



Figures 37 and 38 display how adults in the Bay Area differ in their opinions about the health impacts of wood smoke based on their county of residence and age, respectively. Although there were some notable differences by county, attitudes about the health-impacts of wood smoke bore little relationship to respondent age.

FIGURE 37 PERCEIVE NEGATIVE HEALTH EFFECTS ARE ASSOCIATED WITH WOOD SMOKE BY COUNTY (N = 2,625)

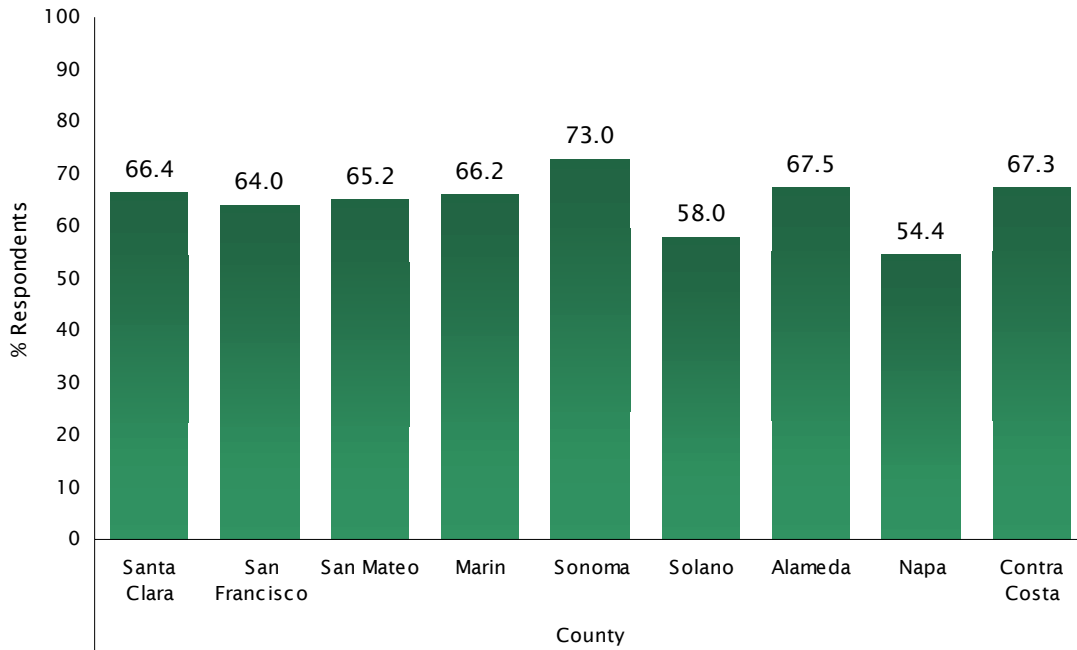
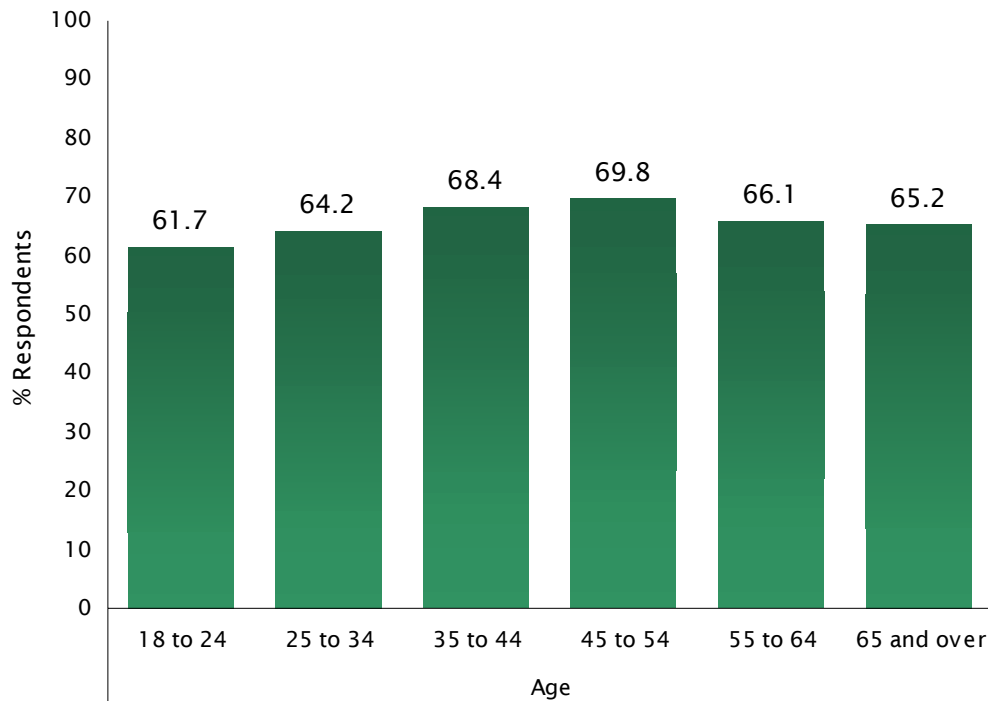


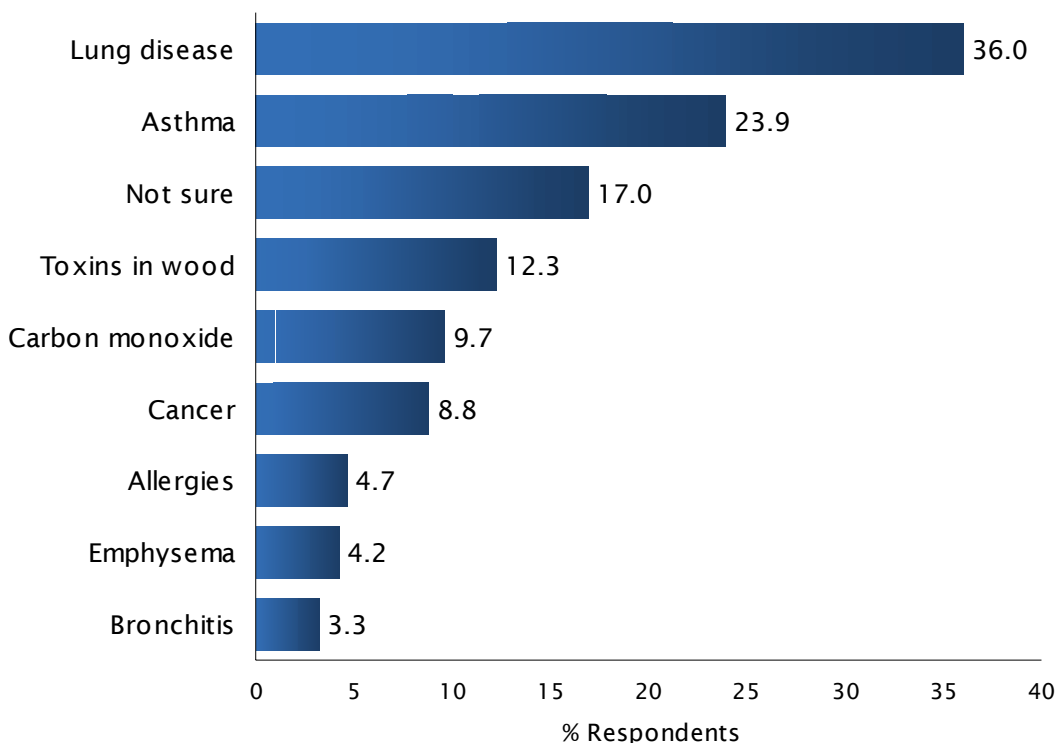
FIGURE 38 PERCEIVE NEGATIVE HEALTH EFFECTS ARE ASSOCIATED WITH WOOD SMOKE BY AGE (N = 2,625)



Respondents who perceived wood smoke to have negative health impacts (Question 27) were next asked to identify what the specific health effects are of breathing wood smoke. Multiple responses were allowed for this question, so the percentages shown in Figure 39 represent the percentage of respondents who mentioned a particular health effect. The most common response (36%) was a general reference to lung disease, followed by a specific reference to asthma (24%). Approximately 12% of respondents mentioned properties of wood -- chemicals, carcinogens and toxins -- that are released when burned, and an additional 10% mentioned carbon monoxide. Overall, 17% of those who perceived that wood smoke had negative health impacts could not name a specific impact.¹³

Question 28 *What are the negative health effects associated with breathing wood smoke?*

FIGURE 39 PERCEIVED NEGATIVE EFFECTS OF BREATHING WOOD SMOKE (N = 1,730)



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

13. The structure of this question was changed somewhat from that used in 2004, so a direct comparison of results is not provided.

the magnitude of the problem. The answers to both of these questions are combined in Figure 40.

Overall, 18% of adults surveyed indicated that their neighborhood periodically experiences air pollution from wood smoke. Twelve percent (12%) stated that the problem was a small one, 4% 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 29 *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 30 *Would you say that periodic air pollution from wood smoke in your neighborhood is a big problem, medium problem or a small problem?*

FIGURE 40 PERCEPTION OF PERIODIC WOOD SMOKE PROBLEM IN NEIGHBORHOOD (N = 2,625)

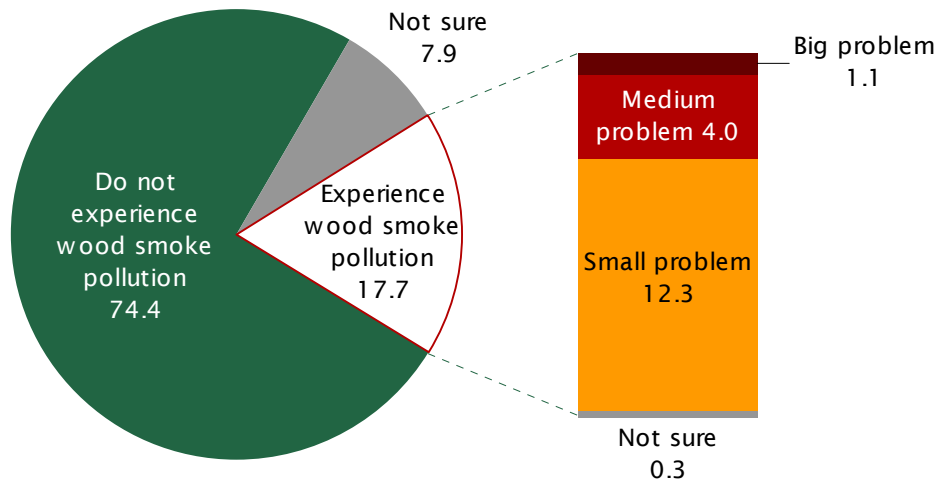
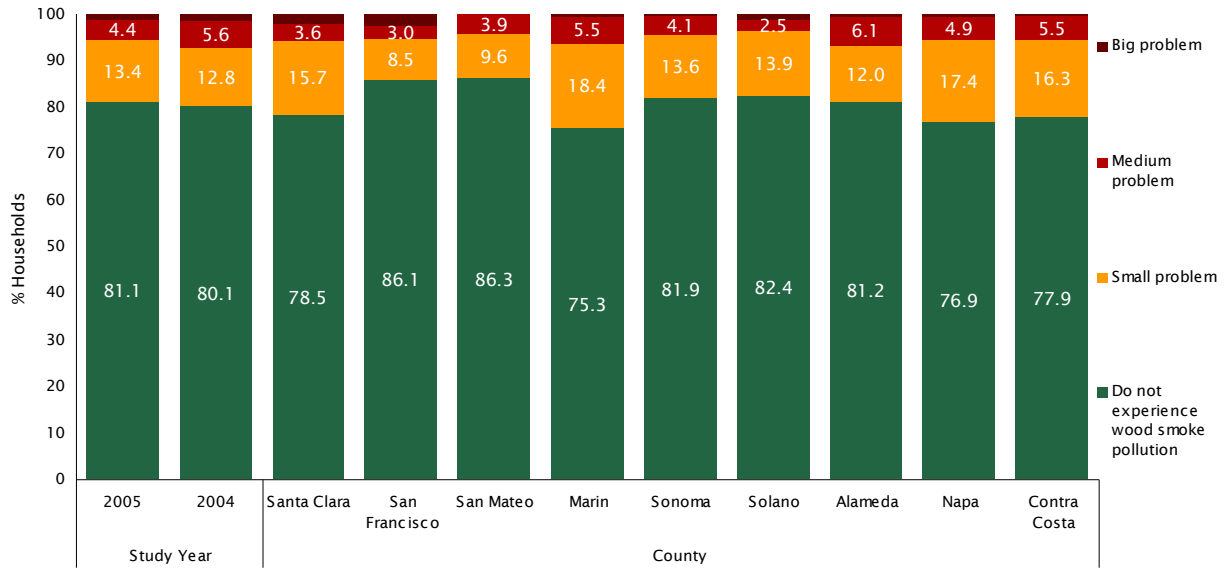


Figure 41 shows how the answers to Questions 29 and 30 varied by study year and by county within the Bay Area in 2005. Overall, perceptions of wood smoke being a neighborhood problem did not change significantly between 2004 and 2005. Among the nine member counties, perceptions of wood smoke as being at least a moderate problem were greatest in Marin (24%), Napa (22%), and Contra Costa (22%) counties.

FIGURE 41 PERCEPTION OF WOOD SMOKE PROBLEM IN NEIGHBORHOOD BY STUDY YEAR & COUNTY (N = 2,625)



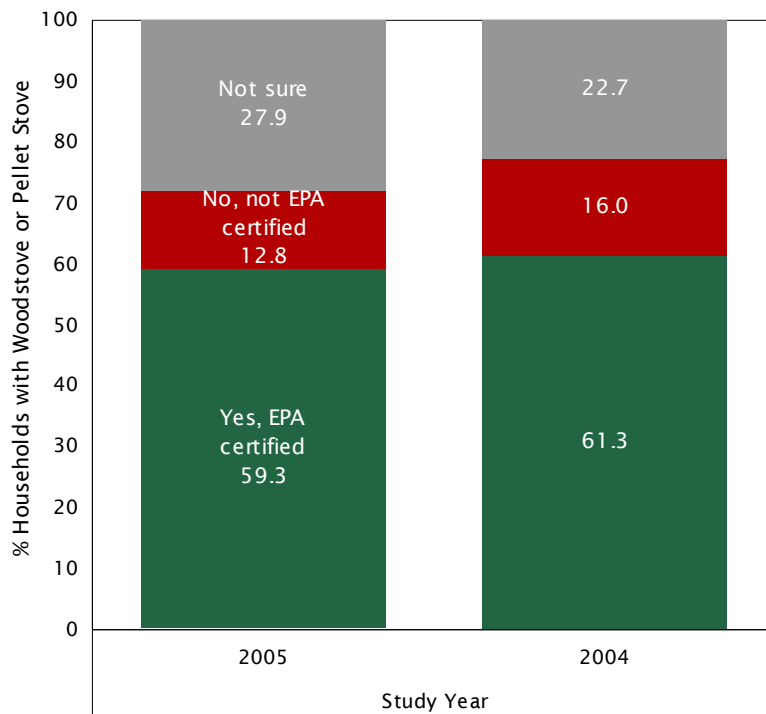
CHANGING HEATING DEVICE

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 (see *Fuel Type & Source* on page 11), respondents with wood stoves or pellet stoves were also asked to identify whether their stove is EPA certified. Figure 42 shows that in 2005 most respondents (59%) thought that their stove was EPA certified, whereas 13% indicated that it was not and 28% were unsure. The 2004 results are also shown in Figure 42 for comparison.

Question 31 *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 42 WOODSTOVE OR PELLET STOVE EPA CERTIFIED BY STUDY YEAR (N = 328)

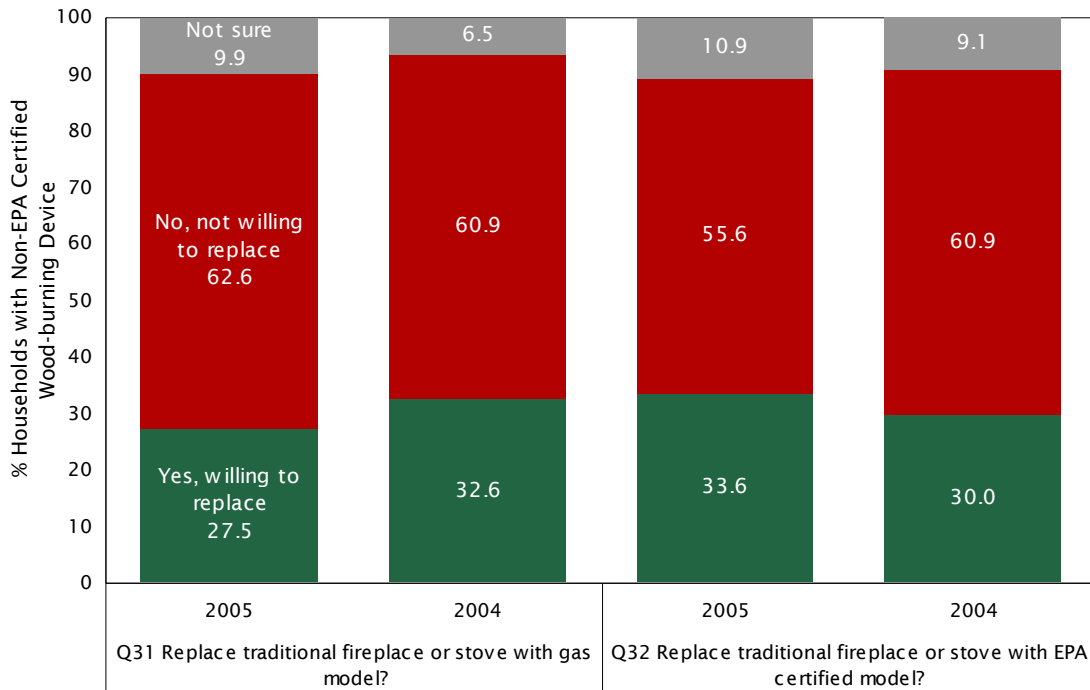


WILLINGNESS TO CHANGE HEATING DEVICE For respondents who owned a wood-burning fireplace and/or a non-EPA certified wood stove or pellet stove, the survey next inquired as to whether the respondent would be willing to replace their current device with a gas fireplace (Question 32) or EPA certified wood stove or pellet stove (Question 33) that would burn much cleaner and be less polluting. The responses to both of these questions are presented in Figure 43. Overall, 28% of respondents in 2005 were willing to replace their current device with a gas fireplace, whereas a slightly higher percentage (34%) were willing to replace their device with an EPA certified wood stove or pellet stove. The results are statistically similar to those found in 2004.

Question 32 *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 33 *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 43 WILLINGNESS TO REPLACE FIREPLACE OR STOVE WITH EPA CERTIFIED MODEL (N = 913)



Figures 44 and 45 show the proportion of respondents who were administered these questions that were willing to replace their fireplace or non-EPA certified stove, respectively, with a cleaner burning model by county and age. Interestingly, although residents in all counties displayed a greater willingness to replace a current device with an EPA certified wood burning model when compared to a gas model, this disparity was particularly pronounced among Sonoma County residents -- who also happen to be the group with the highest proportion of frequent wood burners.

Willingness to replace an existing device with an EPA certified device generally declined with age (see Figure 45).

FIGURE 44 WILLINGNESS TO REPLACE FIREPLACE OR STOVE WITH EPA CERTIFIED MODEL BY COUNTY (N = 913)

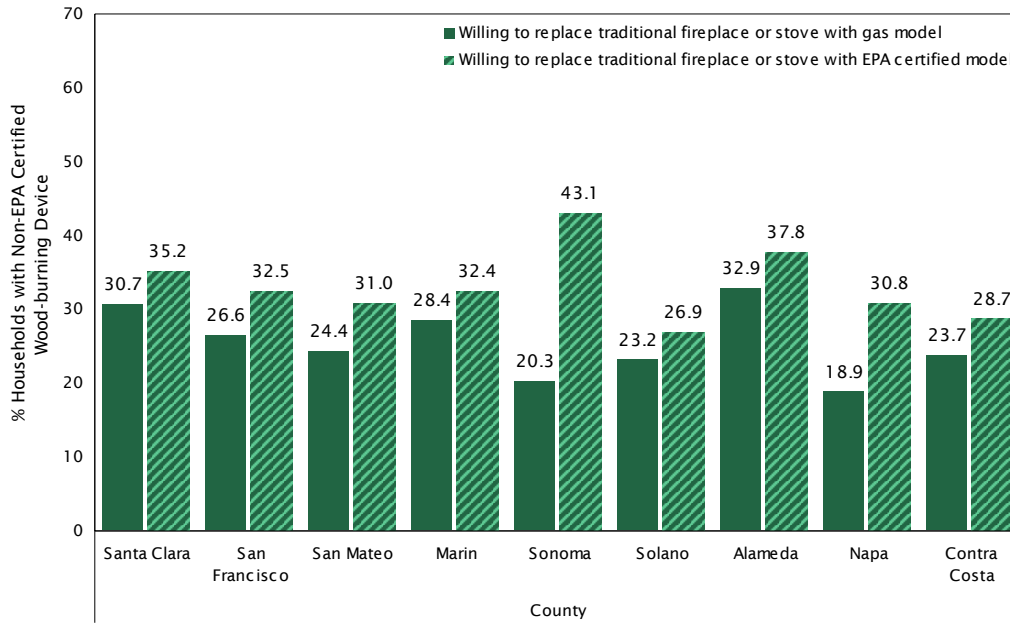
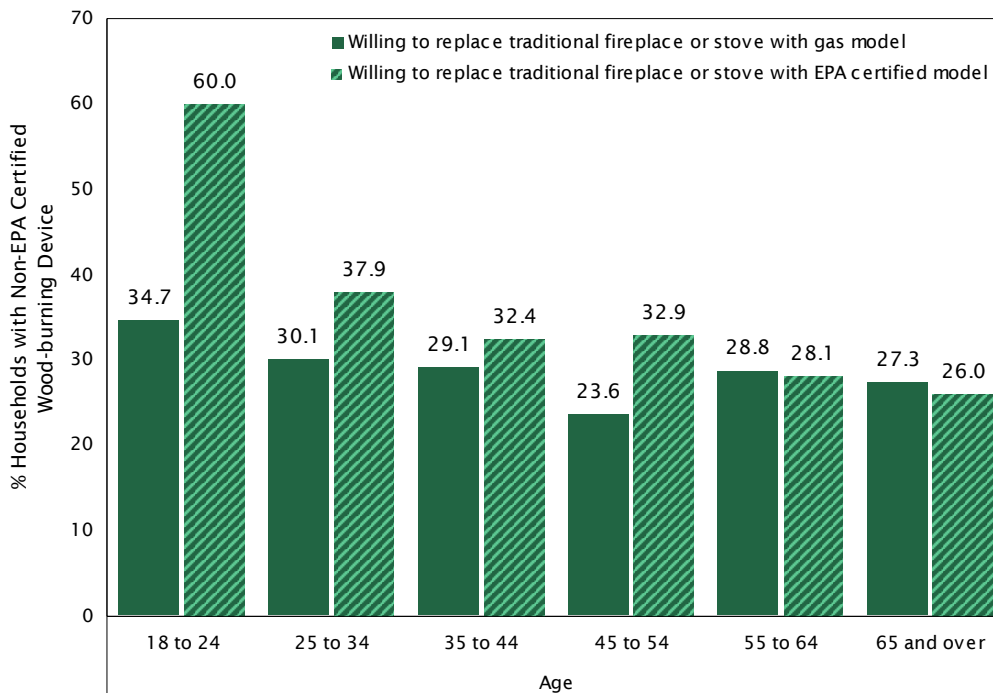


FIGURE 45 WILLINGNESS TO REPLACE FIREPLACE OR STOVE WITH EPA CERTIFIED MODEL BY AGE (N = 913)



Questions 32 and 33 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

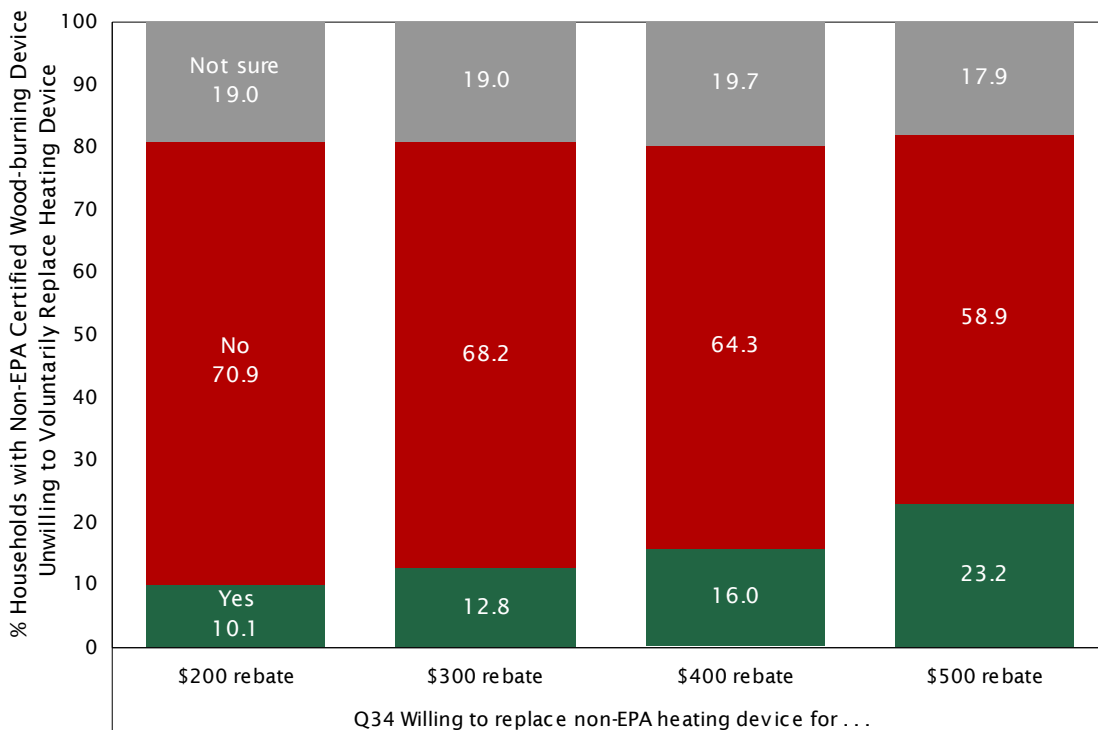
replace their current device in this context, the survey next inquired as to whether they would do so if they were offered a financial incentive.

In Question 34, respondents who indicated that they were unwilling to replace their current heating device for a cleaner alternative (Questions 32 and 33) 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, \$400 and \$500 were tested in sequential order.

As shown in Figure 46, 10% 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, \$400 and \$500, the proportion of respondents who indicated that they would participate in the program increased to 13%, 16% and 23%, respectively. Combining residents who are willing to replace their current devices without a financial incentive (see Figure 43) with those who require \$200 suggests approximately 38% of the target population would be receptive to a modest rebate program.

Question 34 *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 46 WILLINGNESS TO PARTICIPATE IN GOVERNMENT-SPONSORED REBATE PROGRAM (N = 511)

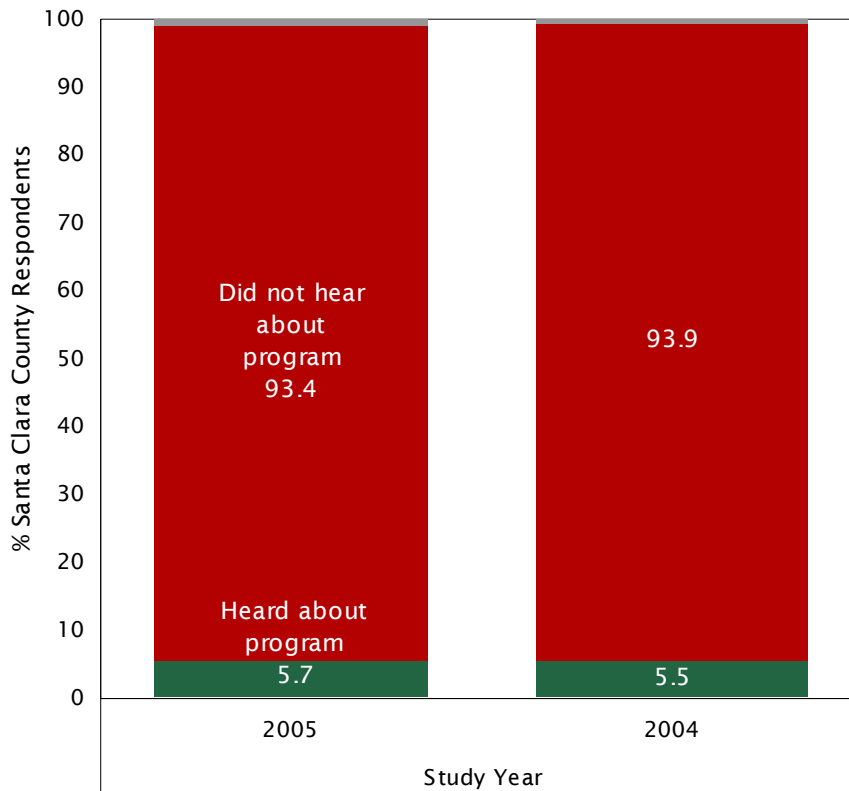


RECALL NEWS STORY, ADVERTISEMENT OR ANNOUNCEMENT? Two counties (Santa Clara and Marin) that are served by the BAAQMD currently offer rebate programs similar to that described above that partially reimburse residents for the cost of replacing a traditional fireplace with a gas fireplace or an EPA certified fireplace, wood stove or pellet stove. In Questions 35 and 36, 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 47 and 48, respectively.

Overall, just 6% of Santa Clara County residents -- and 4% of Marin County residents -- could recall hearing, reading or seeing a news story, advertisement or public service announcement about the rebate program. The proportion of those who recalled exposure to the rebate program remained virtually unchanged from that recorded in 2004 for Santa Clara residents, but was lower in 2005 among Marin County residents.

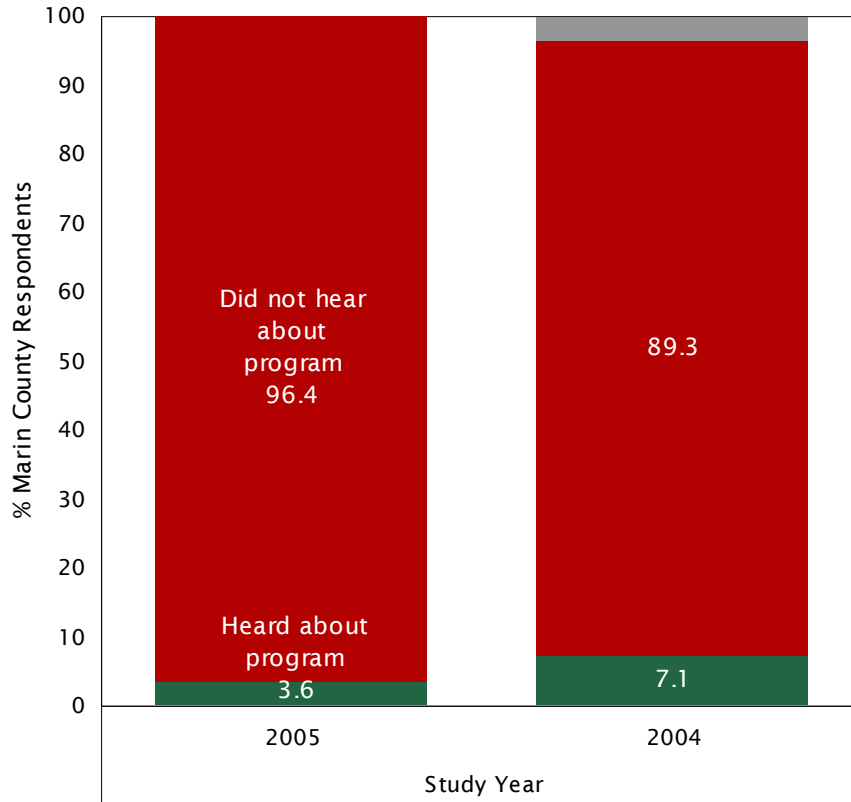
Question 35 *Santa Clara County has a program to offer residents a rebate for replacing a traditional fireplace with a gas burning fireplace or an EPA certified fireplace, woodstove or pellet stove. In the past three months, have you heard, read or seen any news stories, advertisements or public service announcements about this program?*

FIGURE 47 SANTA CLARA COUNTY PROGRAM AWARENESS BY STUDY YEAR (N = 637)



Question 36 *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 48 MARIN COUNTY PROGRAM AWARENESS BY STUDY YEAR (N = 109)



POLICY ATTITUDES The final three questions in this series measured residents’ support for several policy changes designed to improve the air quality in the region. In Question 37, all respondents were asked 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. Question 38 measured respondent support for a local policy that prohibits wood burning on nights when air pollution is expected to reach unhealthy levels. Finally, Question 39 inquired as to residents’ willingness to support a policy that would require older wood stoves to be removed or replaced with a less polluting model when a home is sold to a new owner. The answers to all three questions have been combined in Figure 49.

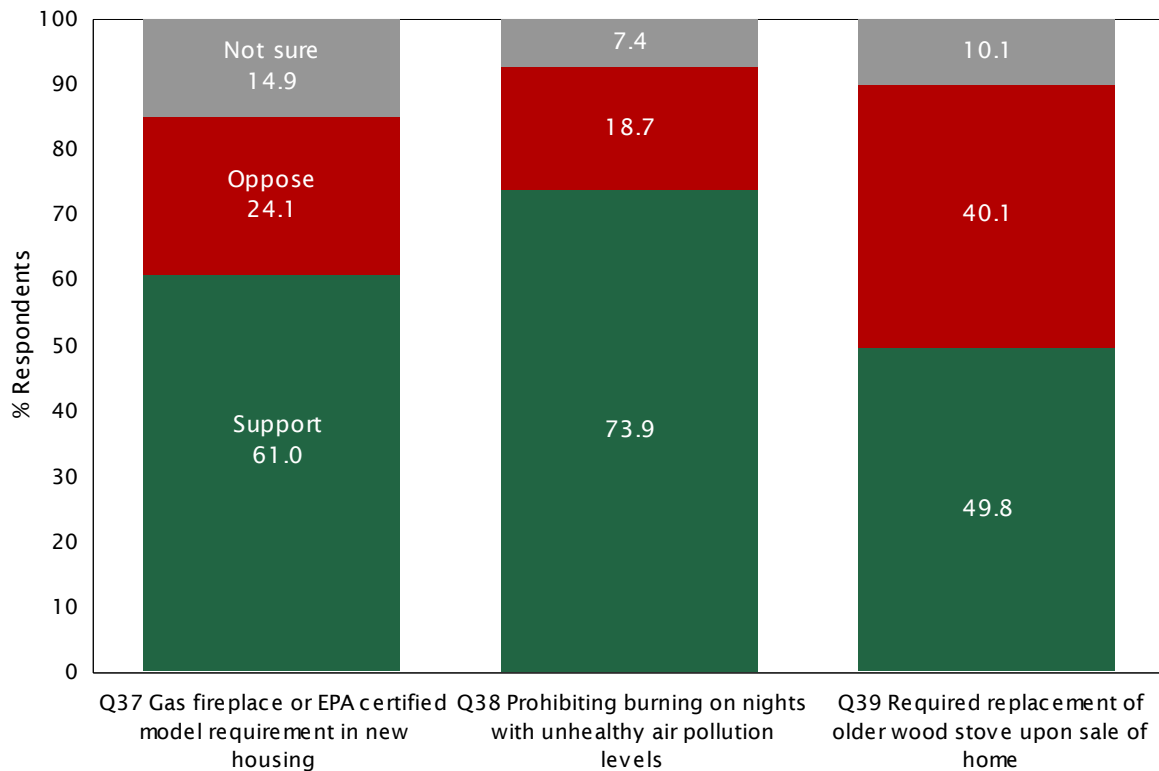
For each of the policies tested, the predominant position was one of support for the policy. Sixty-one percent (61%) supported requiring all new housing construction to use only gas or EPA certified models, 74% favored prohibited wood burning on nights when air pollution is expected to reach unhealthy levels, and 50% favored requiring the replacement of older woodstoves with a cleaner burning model when a home is sold to a new owner.

Question 37 *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?*

Question 38 *In some areas, local governments have a policy that prohibits wood burning on nights when air pollution is expected to reach unhealthy levels. Would you support or oppose a policy like this in your area?*

Question 39 *In some areas, local governments require that when a home that contains an older woodstove is sold to a new owner, the stove must be removed -- or replaced with a new stove or fireplace that causes less pollution. Would you support or oppose a policy like this in your area?*

FIGURE 49 SUPPORT FOR PROPOSED POLICY CHANGES (N = 2,625)



Question 37 was also asked in 2004 and -- as shown in Figure 50 -- public opinion on this matter has not changed in the past year. For the interested reader, Figures 51-53 show how support for each policy varied by county, age, household income, and the type of home in which a respondent lived. Perhaps the most interesting pattern in the results is that support for the replacement of older woodstoves when a home is sold to a new owner was notably lower among those age groups and income brackets that are likely to be home owners, as well as those who live in the type of home (detached) that is most likely to have a wood stove.

FIGURE 50 SUPPORT FOR PROPOSED EPA CERTIFICATION REQUIREMENTS IN NEW HOUSING CONSTRUCTION BY STUDY YEAR (N = 2,625)

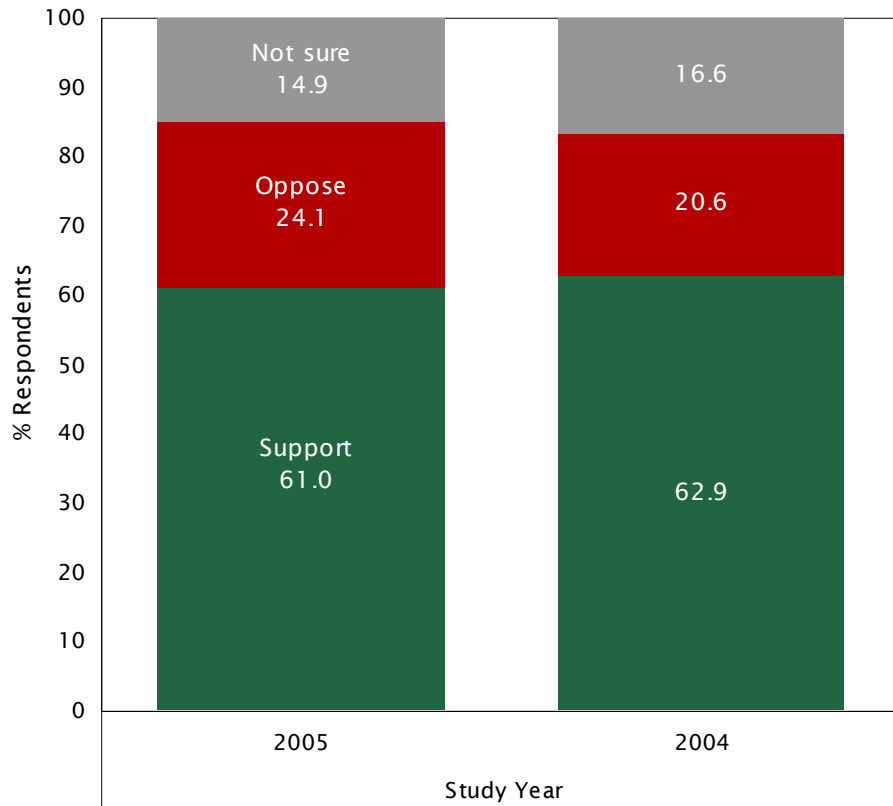


FIGURE 51 SUPPORT FOR PROPOSED POLICY CHANGES BY COUNTY (N = 2,625)

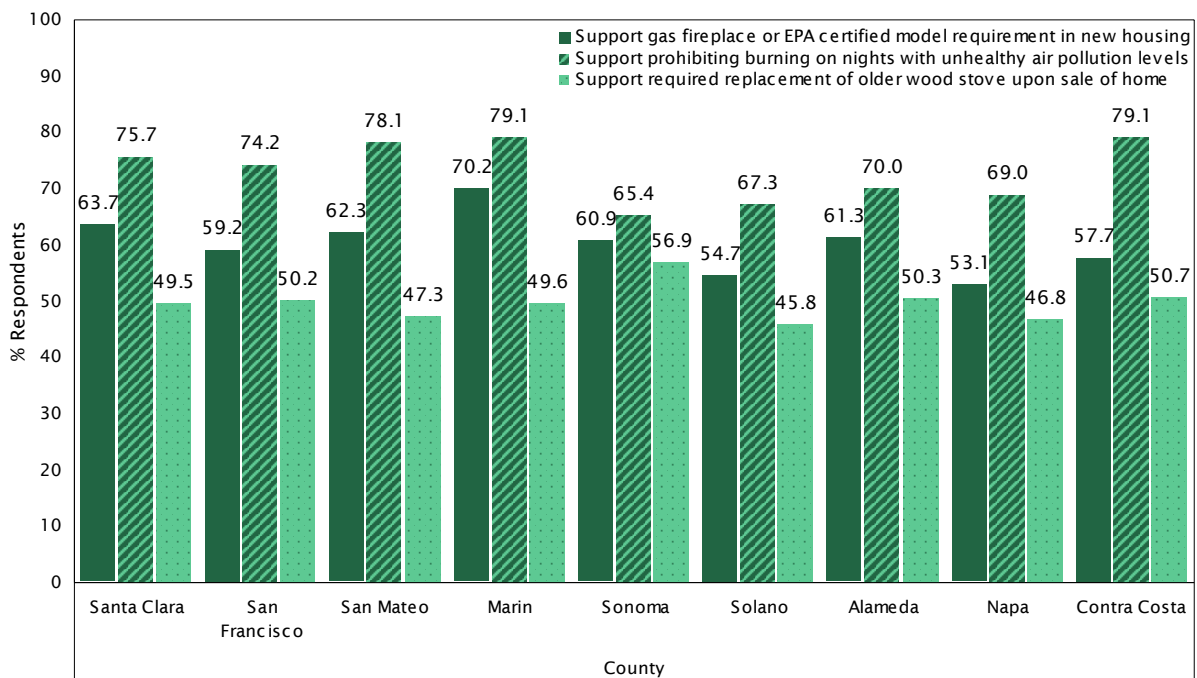


FIGURE 52 SUPPORT FOR PROPOSED POLICY CHANGES BY AGE (N = 2,625)

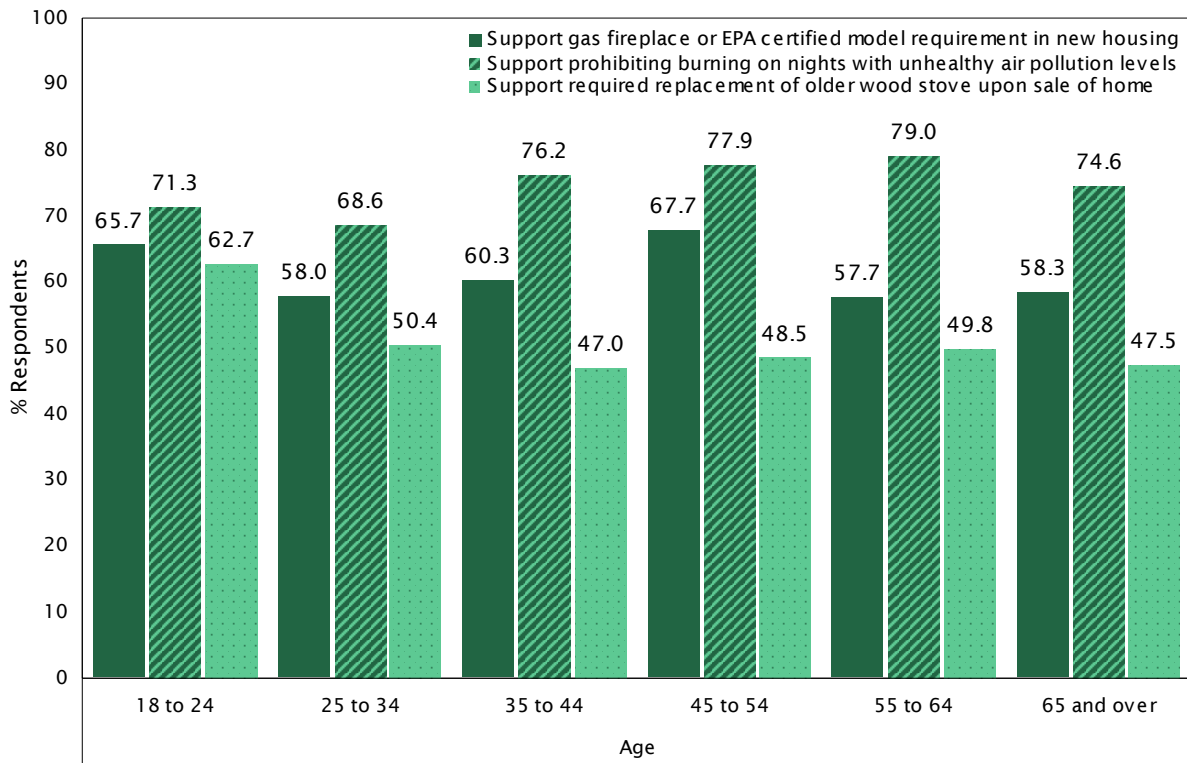
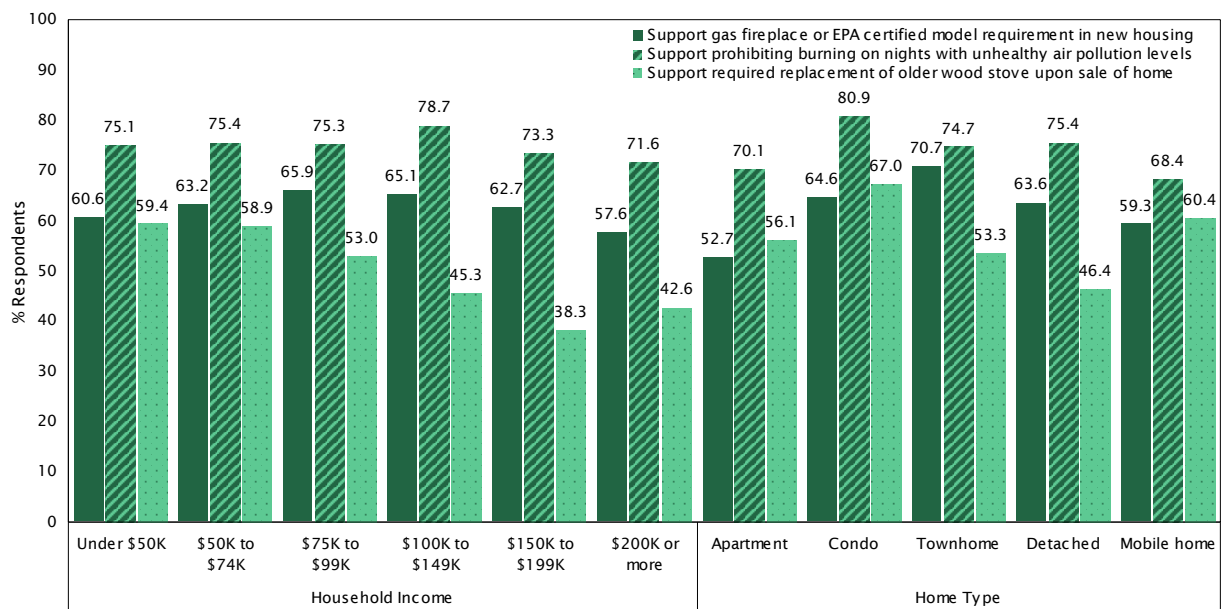


FIGURE 53 SUPPORT FOR PROPOSED POLICY CHANGES BY HOUSEHOLD INCOME & HOME TYPE (N = 2,625)



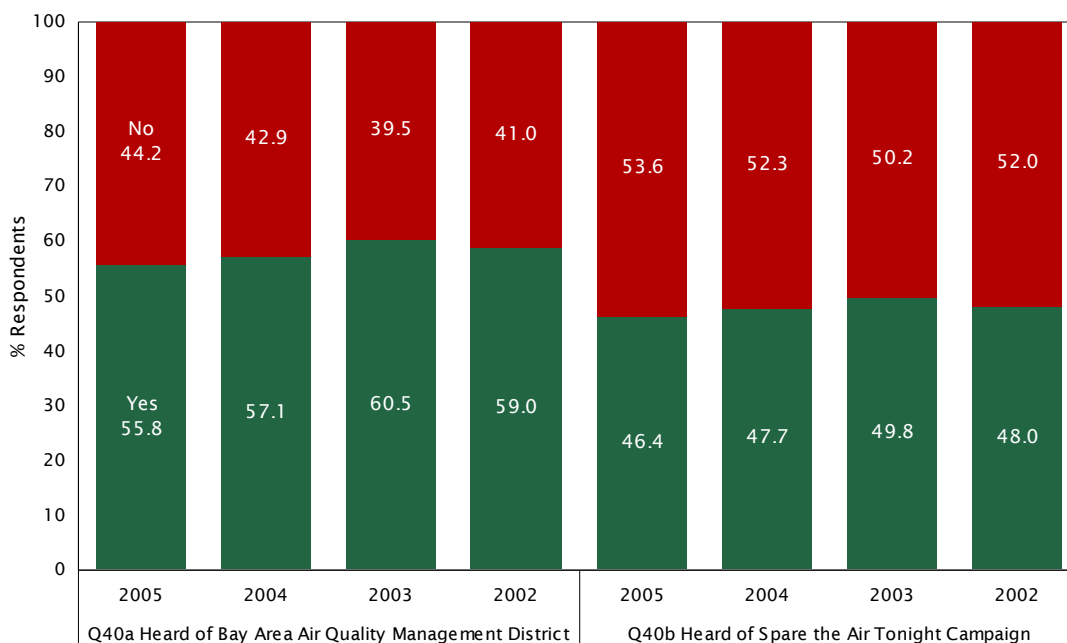
PERCEPTIONS OF ENTITIES

To identify and track perceptions of the BAAQMD and the Spare the Air Tonight Campaign, a series of three questions was presented to respondents to measure their awareness and opinions of the agency and the program, as well their recent exposure to information about each. Because these questions were asked in an identical manner in the 2004, 2003 and 2002 winter surveys, the results from these studies are also shown for comparison.

AWARENESS Figure 54 shows that awareness of the BAAQMD (56%) remained statistically similar to awareness of the agency in prior years. The same is true of awareness of the Spare the Air Tonight Campaign (46%).

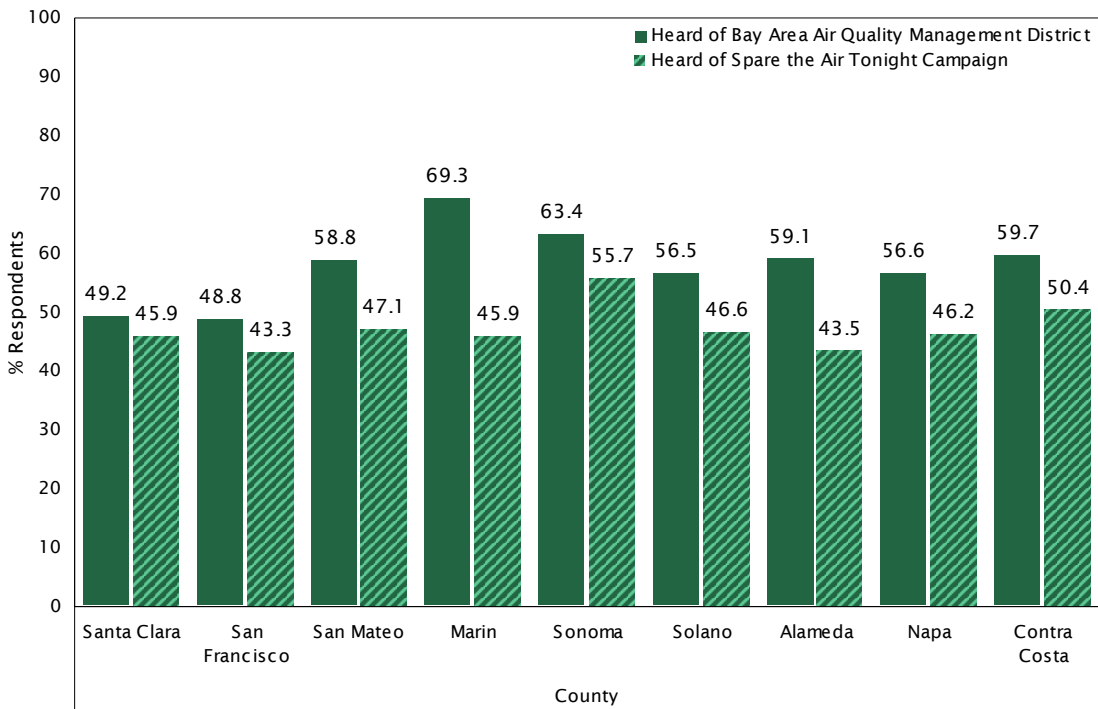
Question 40 *Let's change gears a bit. Have you ever heard of the _____?*

FIGURE 54 AWARENESS OF BAAQMD & SPARE THE AIR TONIGHT CAMPAIGN BY STUDY YEAR (N = 2,625)



Across the nine member counties, awareness of the BAAQMD was highest in Marin County (69%) and lowest in San Francisco (49%). Awareness of the Spare the Air Tonight Program displayed less variation, ranging from a high of 56% in Sonoma County to a low of 43% in San Francisco County (see Figure 55).

FIGURE 55 AWARENESS OF BAAQMD & SPARE THE AIR TONIGHT CAMPAIGN BY COUNTY (N = 2,625)



OPINIONS Respondents who had heard of an entity were next asked whether their opinion of the entity was favorable, unfavorable, or neutral. Figure 56 displays the findings of these questions in 2005, as well as the findings from the 2004 and 2003 studies.¹⁴

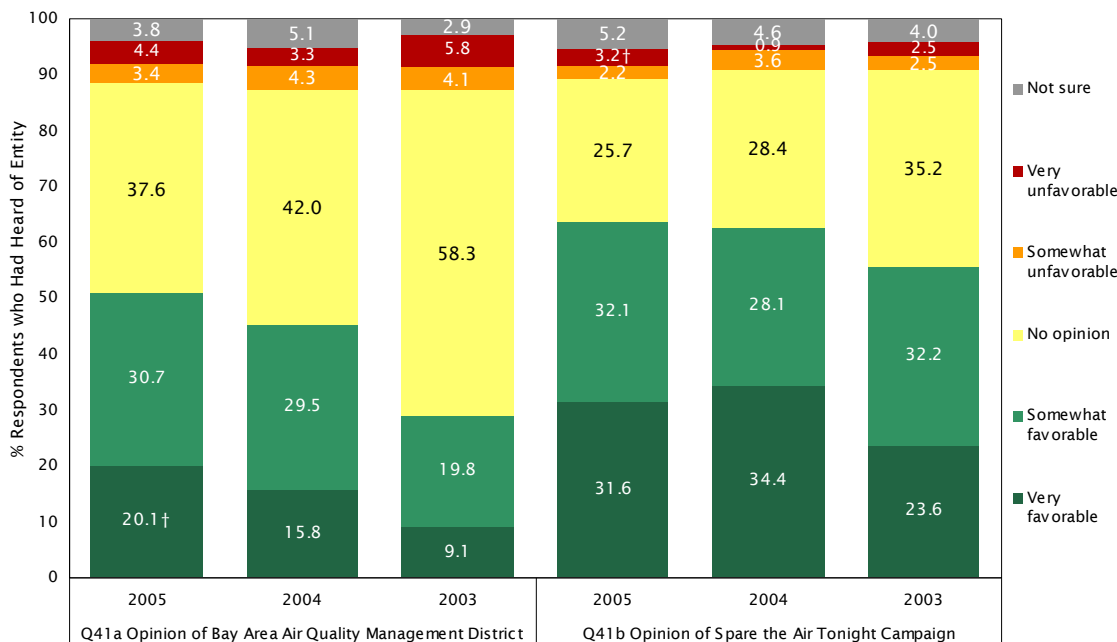
Of the individuals who received the question in 2005, half (51%) held a favorable opinion of the BAAQMD, whereas 38% held a neutral opinion and just 8% held an unfavorable opinion. When compared to the opinions recorded in the previous studies, opinions of the BAAQMD have become increasingly favorable -- from 29% favorable in 2003 to 51% favorable in 2005.

The same is also true of public opinion regarding the Spare the Air Tonight Campaign, although the trend is less pronounced. Whereas 56% of respondents who had heard of the campaign held a favorable opinion of it in 2003, the corresponding percentage for 2005 was substantially higher at 64%.

14. The response options for these questions were more limited in the 2002 study, so comparisons are not provided in Figure 56.

Question 41 *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?*

FIGURE 56 OPINIONS OF BAAQMD & SPARE THE AIR CAMPAIGN BY STUDY YEAR (BAAQMD: N = 1,466; STA TONIGHT CAMPAIGN: N = 1,218)



EXPOSURE TO INFORMATION 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 BAAQMD and/or the Spare the Air Tonight Program in the six months prior to the interview. As shown in Figure 57, the proportion of respondents who recalled being exposed to information about the BAAQMD during this period was 35%, up slightly from 33% in 2004. On the other hand, the proportion of respondents who recalled exposure to the Spare the Air Tonight Program was 43%, down slightly from 49% in 2004. With respect to the Program, however, it may be that the disparity between 2004 and 2005 is partially a reflection of the timing of the interviewing. As noted previously in this report, the 2004 surveys were conducted at the end of the season, which maximized a respondent’s opportunity to be exposed to information about the Program. Interviews for the 2005-2006 season were distributed throughout the season, which meant that some respondents would have had a much more limited opportunity to be exposed to the campaign.

For the interested reader, Figures 58 and 59 display the percentage of *all* respondents who recalled hearing, reading or seeing information about the BAAQMD and the Spare the Air Tonight Program -- not just among those who had heard of the agency or program as shown in Figure 57. Among all respondents, recalled exposure was greatest for both the agency and the program among Contra Costa residents (see Figure 58), those with heating devices in the home (see Figure 59), and respondents between the ages of 45 and 54 (see Figure 59).

Question 42 *In the past six months, have you heard, read, or seen any news stories, advertisements, or public service announcements about the _____?*

FIGURE 57 ENCOUNTERED INFO ABOUT BAAQMD & SPARE THE AIR TONIGHT CAMPAIGN IN PAST SIX MONTHS BY STUDY YEAR (BAAQMD: N = 1,466; STA TONIGHT CAMPAIGN: N = 1,218)

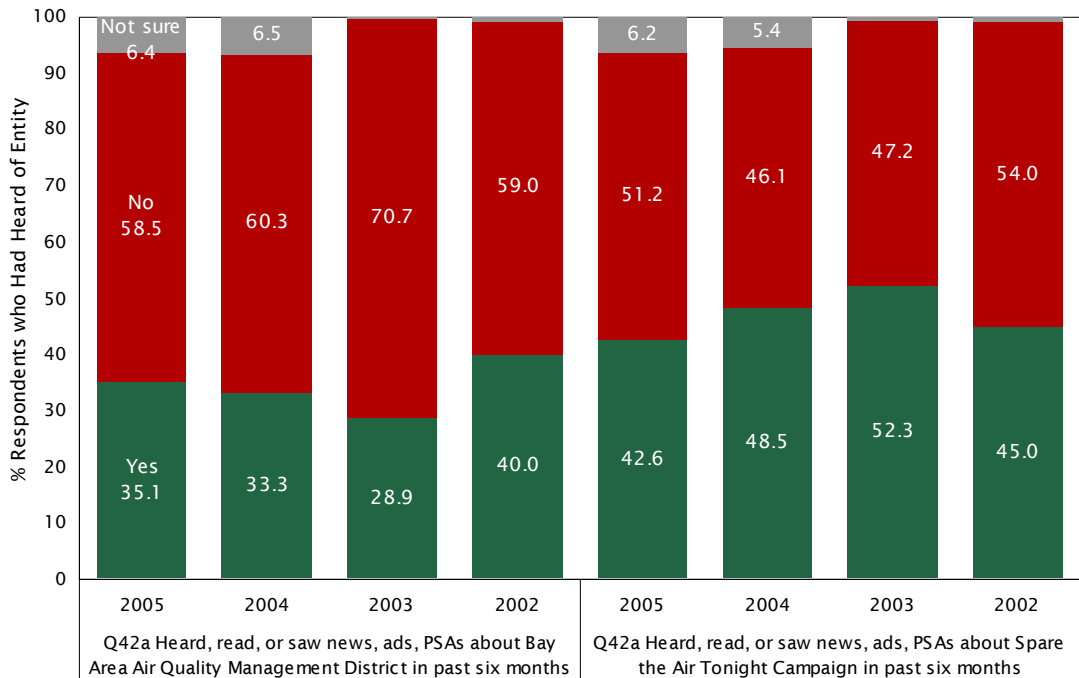


FIGURE 58 ENCOUNTERED INFO ABOUT BAAQMD & SPARE THE AIR TONIGHT CAMPAIGN IN PAST SIX MONTHS BY COUNTY (N = 2,625)

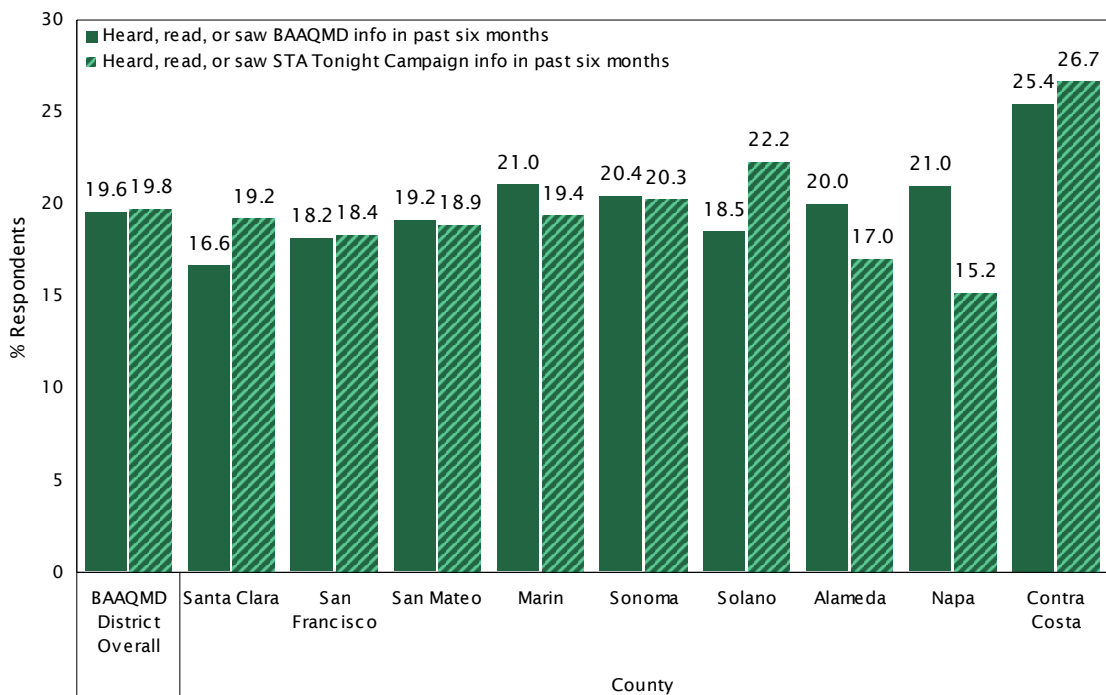
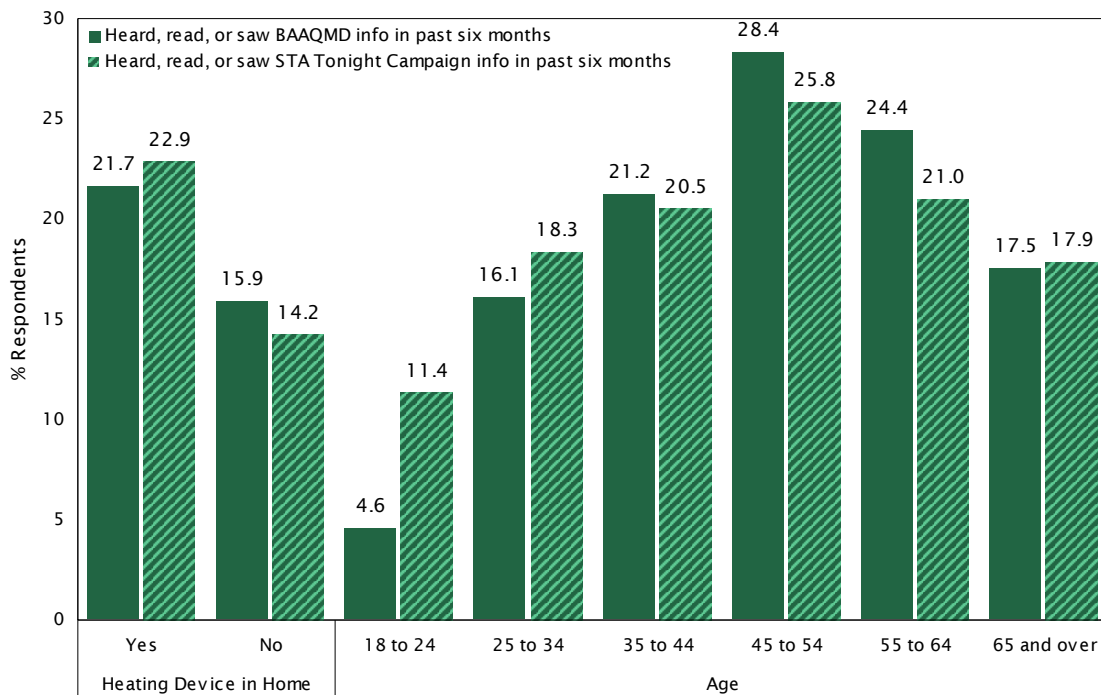


FIGURE 59 ENCOUNTERED INFO ABOUT BAAQMD & SPARE THE AIR TONIGHT CAMPAIGN IN PAST SIX MONTHS BY HEATING DEVICE IN HOME & AGE (N = 2,625)



BACKGROUND & DEMOGRAPHICS

Table 6 displays the demographic and background information collected during the survey. Because of the sampling methodology used in the study as well as the weighting scheme, the results shown below are representative of the adult population within the nine-county District.¹⁵ 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 6 BACKGROUND AND DEMOGRAPHICS (N = 2,625)

	Study Year			
	2005	2004	2003	2002
Total Respondents	2,625	700	400	400
Drivers in Household	%	%	%	%
Zero to one	27	27	31	32
Two to three	64	65	59	60
Four or more	7	7	10	8
Refused	2	2	1	1
Age				
18 to 29	20	11	16	15
30 to 39	22	19	19	18
40 to 49	20	23	21	18
50 to 64	19	18	25	27
65 and over	14	21	13	18
Refused	5	8	7	5
Home Type				
Apartment	21	20	21	16
Condo	6	4	5	2
Town home	8	8	5	4
Single-family detached	60	63	66	73
Mobile home	2	2	2	4
Refused	4	3	3	1
Age of Home				
0 to 10 years	11	10	14	20
11 to 20 years	14	10	9	18
21 to 30 years	13	12	14	20
31 to 40 years	13	13	15	10
41 to 50 years	10	11	14	8
Over 50 years	27	30	18	10
Not sure / Refused	13	14	16	15
Household Income				
Under \$50,000	21	22	24	33
\$50,000 to \$74,999	16	18	17	20
\$75,000 to \$99,999	15	16	16	13
\$100,000 to \$149,999	17	14	15	9
\$150,000 to \$199,999	6	6	3	3
\$200,000 or more	7	4	6	2
Not sure / Refused	18	19	20	21
Gender				
Male	48	43	45	44
Female	52	57	55	56
County				
Alameda	21	23	22	-
Contra Costa	14	15	14	-
Marin	4	4	4	-
Napa	2	2	2	-
San Francisco	13	14	14	-
San Mateo	11	10	11	-
Santa Clara	24	23	23	-
Solano	6	3	5	-
Sonoma	5	5	6	-

15. For more information on the sampling method and data collection protocol, please refer to *Methodology* on page 55.



M E T H O D O L O G Y

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

QUESTIONNAIRE With the questionnaire used in 2004 as a starting point, Dr. McLarney of True North Research worked closely with the BAAQMD to develop and refine an improved survey instrument for the 2005 study. To more reliably measure the quantity of wood burned by each person, the relevant questions were revised in 2005 to focus on the amount they burned in a typical fire -- rather than for the entire season as in 2004. Questions were also added to the 2005 instrument to capture the type of wood burned, the source of the wood, the duration of the typical fire, the primary reason for burning wood, as well as changes in wood burning when compared to the prior season.

The 2005 questionnaire also incorporated several improvements that were first implemented in 2004. 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 EPA¹⁶ -- to measure the impacts of the summer Spare the Air Program on driving behavior.¹⁷

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 2005 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.

16. 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.

17. 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.

SAMPLE & WEIGHTING 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 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. 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.

To accommodate the District's interest in obtaining statistically reliable estimates within each of the nine member counties, as well as to explore the relationship between both weather and special events on wood burning behavior, the study employed a sampling strategy that involved stratification by county, month, and day type with strategic oversampling for select counties and day types. To adjust for the oversampling, the raw data were then weighted by day type, respondent age, and adult population estimates by county prior to analyses and presentation. The results presented in this report are the weighted results, which are representative at the District-wide level, as well as within the nine member counties.

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 and households in the District. The results of the sample can thus be used to estimate the opinions of *all* adults -- and characteristics of *all* households -- in the District. Because not every adult or household in the District participated, however, the results have what is known as a statistical margin of error due to sampling. For household characteristics, the margin of error refers to the difference between what was found in the survey of 2,625 households for a particular question and what would have been found if all of the estimated 2,432,147 households in the District had been interviewed.

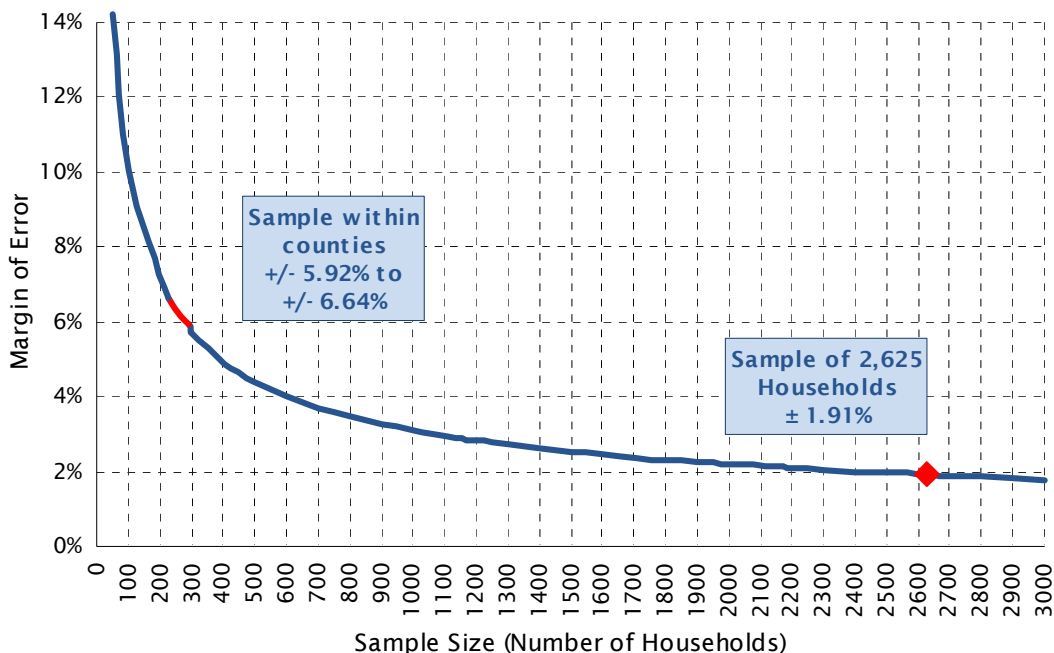
For example, in estimating the percentage of households who have at least one heating device in their home, the margin of error can be calculated if one knows the number of households in the District, the size of the sample, a chosen confidence level, and the distribution of responses to the question. 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 households who indicated that they have at least one heating device in their home (0.639 for 63.9%, for example), N is the total number of households in the District (2,432,147), n is the sample size that received the question (2,625), 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 +/- 1.84%. This means that, with 63.9% of sampled households indicating that they own at least one heating device, one can be 95 percent confident that the actual percentage is between 62% and 66%.

Figure 60 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 1.91% for District-wide estimates, and ranges from 5.92% to 6.64% for estimates within counties.

FIGURE 60 MAXIMUM MARGIN OF ERROR PLOT



Within this report, figures and tables show how responses to certain questions varied by county, as well as by demographic characteristics such as presence of a heating device, respondent age, etc. Because the margin of error grows exponentially as the sample size decreases (see the left side of Figure 60), 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.

DATA COLLECTION Interviews were conducted via telephone during weekday evenings (5:30PM to 9PM) and on weekends (10AM to 5PM) on randomly selected dates between November 22, 2005 and February 17, 2006. 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. Table 7 displays the number of interviews completed in each county, and Table 8 displays the date, day type, and number of interviews completed for the entire season.

TABLE 7 COMPLETED INTERVIEWS BY COUNTY (UNWEIGHTED)

County	Completed Interviews
Alameda	305
Contra Costa	337
Marin	292
Napa	309
San Francisco	284
San Mateo	293
Santa Clara	288
Solano	288
Sonoma	229

TABLE 8 INTERVIEW DATES (UNWEIGHTED)

Date	Completed Interviews	Day Prior to Interview
Nov 22	108	Weekday
Nov 25	105	Holiday
Nov 26	104	Holiday
Nov 28	103	Weekend
Nov 30	100	Weekday
Dec 6	101	Weekday
Dec 7	100	Weekday
Dec 12	103	Weekend
Dec 13	104	Weekday
Dec 16	106	Weekday
Dec 22	112	Weekday
Dec 26	99	Holiday
Dec 27	67	Holiday
Jan 3	101	Weekday
Jan 4	101	Weekday
Jan 9	105	Weekend
Jan 12	98	Weekday
Jan 21	98	Weekday
Jan 22	92	Weekend
Jan 23	105	Weekend
Jan 24	100	Weekday
Jan 27	100	Weekday
Jan 29	80	Weekend
Feb 13	131	Weekend
Feb 14	45	Weekday
Feb 15	72	Weekday
Feb 16	47	Weekday
Feb 17	38	Weekday

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 2005 results with those of prior studies, where appropriate, True North also accessed and processed data from the 2004, 2003 and 2002 winter season surveys to allow for meaningful comparisons. Additionally, meteorological data supplied by the BAAQMD including precipitation, temperature and heating degree days was merged to the survey data based on the reference day and ZIP code.

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.

QUESTIONNAIRE & TOPLINES



**Winter 05-06 Spare the Air Survey
Designed by True North Research
Final Toplines for Season
2,625 Respondents**

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 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. *If 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?
Read zip code back to respondent to confirm before submitting. Terminate those that fall outside District.

Data on File	Record 5 digit zip code
--------------	-------------------------

SC2	County of Residence [2,625]	
	1	Santa Clara 24%
	2	San Francisco 13%
	3	San Mateo 11%
	4	Marin 4%
	5	Sonoma 5%
	6	Solano 6%
	7	Alameda 21%
	8	Napa 2%
	9	Contra Costa 14%

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 [2,625]	
	None	41%
	One	50%
	Two	7%
	Three or more	1%
B	Pellet stove [2,625]	
	None	94%
	One	6%
	Two	0%
	Three or more	0%
C	Woodstove [2,625]	
	None	94%
	One	6%
	Two	0%
	Three or more	0%
<i>If Q1.1a, Q1.1b AND Q1.1c = (2,98), skip to Q24</i>		
<i>Only ask Q2 if Q1.1a = 1, otherwise skip to instructions preceding Q3.</i>		

Q2	What type of fuel do you primarily use in your fireplace – Wood, natural gas, propane or some other fuel? <i>If 'other', ask: what type?</i> [1,547]			
1	Wood		47.7%	
2	Natural gas		15.8%	
3	Propane		0.6%	
4	Duraflame log		5.9%	
5	Presto log		1.6%	
6	Other manufactured log		2.4%	
7	Scrap wood		0.8%	
8	Electric		0.7%	
9	Never use fireplace		21.0%	<i>Skip to Q7</i>
10	Wood + Gas		0.1%	
11	Pellets		0.3%	
12	Other		0.1%	
13	Not sure		2.6%	
14	Refused		0.5%	
<i>Only ask Q3 if (Q1.1a = 1 and Q2 = 1) or (Q1.1c = 1), otherwise skip to introduction preceding Q7</i>				
Q3	What type of wood do you typically burn? [813]			
1	Ash		0.5%	
2	Eucalyptus		3.1%	
3	Oak		38.7%	
4	Pine (cedar)		9.5%	
5	Walnut		1.3%	
6	Hardwood (general)		0.8%	
7	Fruitwood (general)		0.8%	
8	Fir		0.3%	
9	Almond		3.5%	
10	Whatever available / Mixed		2.3%	
11	Other		0.4%	
12	Not sure		38.0%	
99	Refused		0.8%	

Q4	Do you typically purchase your wood from a wood supplier, the local store, or do you gather your own wood? [813]				
	1	Wood supplier	22%		
	2	Local store	32%		
	3	Gather own wood	35%		
	4	Other	7%		
	98	Don't Know	3%		
	99	Refused	1%		
Q5	Do you tend to burn dry, seasoned wood or wood that is fresh-cut and somewhat moist? [813]				
	1	Dry, seasoned wood	85%		
	2	Fresh-cut & moist	5%		
	98	Don't Know	9%		
	99	Refused	0%		
Q6	When you use your fireplace or woodstove, which of the following would you say is the primary reason you do so? For heating your home, or for the ambiance of having a fire? [813]				
	1	Heat	46%		
	2	Ambiance	50%		
	98	Don't Know	3%		
	99	Refused	0%		
For the next series of questions, when I refer to "winter" I mean the months of November through February.					
<i>Only ask Q7 for each appliance where Q1.1 = 1</i>					
Q7	Will you use your _____ this winter?				
<i>Do Not Randomize</i>		Yes	No	Not Sure	Refused
A	Fireplace [1,547]	60%	38%	3%	0%
B	Pellet stove [170]	72%	25%	2%	2%
C	Woodstove [165]	74%	21%	4%	0%
<i>Only ask Q8 for each appliance where Q7 = 2.</i>					

Q8 Why do you not expect to use your _____ this winter? <i>Do Not Read Responses. Multiple Responses OK.</i>					
<i>Do Not Randomize</i>		Air Quality Reasons	Too Much Hassle	Heath Reasons	Other
A	Fireplace [581]	8%	34%	8%	56%
B	Pellet stove [42]	3%	21%	0%	76%
C	Woodstove [35]	9%	36%	3%	56%
<i>Only ask Q9 if [Q2 = (1,4,5,6 or 7) AND Q7a = 1], Q7b = 1 or Q7c = 1. Otherwise, skip to Q24.</i>					
Q9 How often do you expect to burn wood this winter? At least once per week or less often than that? <i>If unsure, ask them to estimate.</i> [864]					
	1	At least once per week	49%	<i>Skip to Q11</i>	
	2	Less often than once per week	48%	<i>Ask Q10</i>	
	98	Don't Know	2%	<i>Skip to Q12</i>	
	99	Refused	0%	<i>Skip to Q12</i>	
Q10 Would you say that you will burn wood about two to three times per month, once per month, or less often than once per month? <i>If unsure, ask them to estimate.</i> [416]					
	1	Two to three times per month	38%	<i>Skip to Q12</i>	
	2	Once per month	35%	<i>Skip to Q12</i>	
	3	Less often than once per month	24%	<i>Skip to Q12</i>	
	98	Don't Know	2%	<i>Skip to Q12</i>	
	99	Refused	1%	<i>Skip to Q12</i>	
Q11 In a typical winter week, how many days do you expect to burn wood? <i>If unsure, ask them to estimate.</i> [423]					
	1	One day	19%		
	2	Two days	24%		
	3	Three days	21%		
	4	Four days	9%		
	5	Five days	6%		
	6	Six days	2%		
	7	Seven days	15%		
	98	Don't Know	4%		
	99	Refused	0%		

Q12	Did you burn wood in the past seven days? [864]			
	1	Yes	43%	Ask Q13
	2	No	57%	Skip to Q14
	98	Don't Know/No opinion	0%	Skip to Q14
	99	Refused	0%	Skip to Q14
Q13	Did you burn wood yesterday or last night? [372]			
	1	Yes	50%	
	2	No	49%	
	98	Don't Know/No opinion	0%	
	99	Refused	0%	
Q14	In a typical day that you burn wood, how many hours of the day do you have a fire burning? <i>If unsure, ask them to estimate.</i> [864]			
	One or two		26%	
	Three or four		53%	
	Five or more		21%	
Q15	In a typical day that you burn wood, how many logs do you burn throughout the entire day? <i>If unsure, ask them to estimate.</i> [864]			
	One or two		34%	
	Three to five		34%	
	Six or more		32%	

Section 4: Changes in Wood Burning Behavior

*Only ask Q16 if [Q2 = (1,4,5,6 or 7) AND Q7a = 1], Q7b = 1 OR Q7c = 1.
Otherwise, skip to Q24.*

Q16	This winter, do you expect that you will burn wood more often, less often, or about the same frequency as you did last winter? [864]			
	1	More often	22%	Ask Q17
	2	Less often	16%	Skip to Q21
	3	About the same	56%	Skip to Q21
	98	Don't Know/No opinion	6%	Skip to Q21
	99	Refused	0%	Skip to Q21

Q17	Why are you burning wood more frequently this year? <i>Don't read choices.</i> [190]			
	1	Price of gas/Energy costs/Wood is cheaper/More affordable	47%	Ask Q18
	2	Other	52%	Skip to Q21
	98	Don't Know/No opinion	1%	Skip to Q21
	99	Refused	0%	Skip to Q21
Q18	How often did you burn wood last winter? At least once per week or less often than that? <i>If unsure, ask them to estimate.</i> [89]			
	1	At least once per week	62%	Skip to Q20
	2	Less often than once per week	37%	Ask Q19
	98	Don't Know	1%	Skip to Q21
	99	Refused	0%	Skip to Q21
Q19	Last winter, would you say that you burned wood about two to three times per month, once per month, or less often than once per month? <i>If unsure, ask them to estimate.</i> [33]			
	1	Two to three times per month	55%	Skip to Q21
	2	Once per month	26%	Skip to Q21
	3	Less often than once per month	19%	Skip to Q21
	98	Don't Know	0%	Skip to Q21
	99	Refused	0%	Skip to Q21
Q20	Last winter, how many days did you burn wood in a typical week? <i>If unsure, ask them to estimate.</i> [56]			
	1	One day	40%	
	2	Two days	13%	
	3	Three days	7%	
	4	Four days	24%	
	5	Five days	1%	
	6	Six days	2%	
	7	Seven days	7%	
	98	Don't Know	4%	
	99	Refused	0%	
Q21	Ok, back to this winter. Were there occasions this winter when you normally would have burned wood, but decided not to? [864]			
	1	Yes	29%	Ask Q22
	2	No	66%	Skip to Q24
	98	Don't Know/No opinion	5%	Skip to Q24
	99	Refused	0%	Skip to Q24

Q22	Why did you decide not to burn wood on these occasions? <i>Do NOT Read Response Options. Multiple Responses OK.</i> [253]			
	1	Spare the Air campaign/advertisements asking people not to burn wood/Don't Light the Night campaign	2%	Ask Q23
	2	Air quality reason/health reason	10%	Ask Q23
	3	Other	86%	Skip to Q24
	98	Don't Know/No opinion	3%	Skip to Q24
	99	Refused	0%	Skip to Q24
Q23	So far this winter, how many times did you choose not to burn wood because of air quality reasons? <i>If respondent is unsure, ask them to estimate.</i> [31]			
	Total number of times		78 (Average of 2.52 times)	

Section 5: Awareness of Campaign

Q24	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? [2,625]			
	1	Yes	34%	Ask Q25
	2	No	65%	Skip to Q26
	98	Don't Know/No opinion	1%	Skip to Q26
	99	Refused	0%	Skip to Q26
Q25	Where did you see or hear the news story, advertisement or public service announcement? <i>Don't read choices - multiple responses OK.</i> [891]			
	1	Television	45%	
	2	Radio	38%	
	3	Newspaper	17%	
	4	Website	3%	
	5	Billboard	5%	
	6	E-mail/E-mail Air Alert	1%	
	7	Fax/Fax Alert	0%	
	8	Bus signs	1%	
	9	Other	5%	
	98	Don't Know/Not Sure	7%	
	99	Refused	0%	
<i>Only ask Q25 if interviewing the day after a Spare the Air event. Otherwise, skip to Q27.</i>				

Q26	Prior to taking this survey, were you aware that there was a "Spare the Air Tonight" advisory yesterday? [0]		
	1	Yes	N/A
	2	No	N/A
	98	Don't Know/No opinion	N/A
	99	Refused	N/A

Section 6: Attitudes about Wood Smoke

Q27	Do you think there are any negative health effects associated with breathing wood smoke? [2,625]		
	1	Yes	66% Ask Q28
	2	No	23% Skip to Q29
	98	Don't Know/No opinion	11% Skip to Q29
	99	Refused	0% Skip to Q29
Q28	What are the negative health effects associated with breathing wood smoke? <i>Don't read options -- Multiple response OK</i> [1,730]		
	1	Lung Disease - general reference	36%
	2	Asthma	24%
	3	Allergies	5%
	4	Bronchitis	3%
	5	Cancer	9%
	6	Emphysema	4%
	7	Chemicals/Carcinogens/Toxins in wood	12%
	8	Carbon monoxide	10%
	9	Other health issue	21%
	98	Don't Know/No opinion	17%
	99	Refused	0%
Q29	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? [2,625]		
	1	Yes	18% Ask Q29
	2	No	74% Skip to Section 7
	98	Don't Know/No opinion	8% Skip to Section 7
	99	Refused	0% Skip to Section 7

Q30	Would you say that periodic air pollution from wood smoke in your neighborhood is a big problem, medium problem or a small problem? [464]		
	1	Big problem	6%
	2	Medium problem	23%
	3	Small problem	69%
	98	Don't Know/No opinion	2%
	99	Refused	0%

Section 7: Willingness to Change Heating Device

If Q1.1a, Q1.1b AND Q1.1c = (2, 98), skip to Section 8.

Only ask Q31 if Q1b = 1 or Q1c = 1. Otherwise, skip to instruction preceding Q32.

Q31	Is your woodstove or pellet stove EPA certified? <i>If necessary:</i> Most woodstoves and pellet stoves manufactured after 1992 are EPA certified, while older ones are not. [328]			
	1	Yes, EPA certified	59%	<i>Skip to Section 8</i>
	2	No, not EPA certified	13%	<i>Go to Q32</i>
	98	Don't Know	28%	<i>Go to Q32</i>
	99	Refused	0%	<i>Skip to Section 8</i>

Only ask Q32 if (Q2 = 1,4,5,6 or 7) or (Q1b = 1 AND Q31 = 2, 98) or (Q1c = 1 AND Q31 = 2, 98). Otherwise, skip to Section 8.

Q32	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? [913]			
	1	Yes	27%	
	2	No	63%	
	98	Don't Know/No opinion	10%	
	99	Refused	0%	
Q33	Would you be willing to replace your traditional fireplace, non-EPA certified woodstove or pellet stove with an EPA certified woodstove or pellet stove? [913]			
	1	Yes	34%	
	2	No	56%	
	98	Don't Know/No opinion	11%	
	99	Refused	0%	
<i>If Q32 = 1 OR Q33 = 1, skip to Section 8. Otherwise, ask Q34.</i>				

Q34		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? [511]			
<i>If respondent says 'yes', record 'yes' for all higher dollar amounts and go to Section 8.</i>					
<i>Do Not Randomize</i>		Yes	No	Not Sure/Don't Know	Refused
A	200	10%	71%	19%	0%
B	300	13%	68%	19%	0%
C	400	16%	64%	20%	0%
D	500	23%	59%	18%	0%

Section 8: Santa Clara County Program Awareness					
<i>Only ask questions in this section if SC2 = 1. Otherwise, skip to Section 9.</i>					
Q35		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? [637]			
	1	Yes			6%
	2	No			93%
	98	Don't Know/No opinion			1%
	99	Refused			0%

Section 9: Marin County Program Awareness					
<i>Only ask questions in this section if SC2 = 4. Otherwise, skip to Section 10.</i>					
Q36		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? [109]			
	1	Yes			4%
	2	No			96%
	98	Don't Know/No opinion			0%
	99	Refused			0%

Section 10: Policy Attitude		
Q37	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? [2,625]	
	1 Support	61%
	2 Oppose	24%
	98 Don't Know/No opinion	15%
	99 Refused	0%
Q38	In some areas, local governments have a policy that prohibits wood burning on nights when air pollution is expected to reach unhealthy levels.	
	Would you support or oppose a policy like this in your area? [2,625]	
	1 Support	74%
	2 Oppose	19%
	98 Don't Know/No opinion	7%
	99 Refused	0%
Q39	In some areas, local governments require that when a home that contains an older woodstove is sold to a new owner, the stove must be removed -- or replaced with a new stove or fireplace that causes less pollution.	
	Would you support or oppose a policy like this in your area? [2,625]	
	1 Support	50%
	2 Oppose	40%
	98 Don't Know/No opinion	10%
	99 Refused	0%

Section 11: BAAQMD and Spare the Air Tonight Name Recognition			
Q40	Let's change gears a bit. Have you ever heard of the _____? Code 'Not sure' as 'No'. [2,625]		
	<i>Randomize</i>	Yes	No
A	Bay Area Air Quality Management District	56%	44%
B	Spare the Air Tonight Campaign	46%	54%
<i>Only ask Q41 and Q42 for each item in Q40 that respondent had heard of.</i>			

Q41		Generally speaking, would you say you have a favorable or unfavorable opinion of the _____, or do you have no opinion either way? <i>Get answer and ask: Would that be very or somewhat favorable / unfavorable?</i>					
		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 [1,466]	20%	31%	38%	3%	4%	4%
B	Spare the Air Tonight Campaign [1,218]	32%	32%	26%	2%	3%	5%
Q42		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 [1,466]	35%	58%	6%			
B	Spare the Air Tonight Campaign [1,218]	43%	51%	6%			

Section 12: Background/Demographics

Thank you so much for your participation. I have just a few background questions for statistical purposes.

D1		Do you ever burn wood in non-winter months, between March and October? <i>If no, record. If yes, ask: Which months during this period to you tend to burn wood? Check all months that apply.</i> [2,625]	
1	March		7%
2	April		5%
3	May		4%
4	June		5%
5	July		5%
6	August		4%
7	September		4%
8	October		6%
9	No		83%
98	Don't Know		3%
99	Refused		1%
D2		Including yourself, how many licensed drivers live in your household? [2,625]	
	None		3%
	One		24%
	Two		49%
	Three or more		21%
	Refused		2%

D3	In what year were you born? Recoded to age. [2,625]	
	18 to 24	11%
	25 to 34	21%
	35 to 44	22%
	45 to 54	18%
	55 to 64	10%
	65 and over	14%
	Refused	5%
D4	Do you live in an apartment, condo, townhome, single-family detached home, or mobile home? [2,625]	
	1 Apartment	21%
	2 Condo	6%
	3 Townhome	8%
	4 Single-family detached home	60%
	5 Mobile home	2%
	99 Refused	4%
D5	Approximately how many years ago was your home built? [2,625]	
	1 0 to 10 years	11%
	2 11 to 20 years	14%
	3 21 to 30 years	13%
	4 31 to 40 years	13%
	5 41 to 50 years	10%
	6 Over 50 years	27%
	98 Don't Know	11%
	99 Refused	2%
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. [2,625]	
	1 Under \$50,000	21%
	2 \$50,000 to \$74,999	16%
	3 \$75,000 to \$99,999	15%
	4 \$100,000 to \$149,999	17%
	5 \$150,000 to \$199,999	6%
	6 \$200,000 or more	7%
	7 Not sure or Refused (<i>Don't read</i>)	18%

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 [2,625]		
	1	Male	48%
	2	Female	52%
D8	Day Type (day prior to interview) [2,625]		
		Weekday	69%
		Weekend	22%
		Holiday	9%