

Oregon Wildfire Smoke Communications and Impacts: An Evaluation of the 2020 Wildfire Season



An evaluation conducted by University of Oregon in partnership with Oregon Health Authority
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Executive summary

Purpose and approach

Oregon Health Authority and the University of Oregon partnered to conduct a survey-based evaluation of wildfire smoke communications and impacts experienced by Oregon residents during the 2020 wildfire season. The purpose of this survey was to (1) understand how Oregonians respond to wildfire smoke and (2) provide an open-source evaluation tool and data to support wildfire smoke communication practitioners in Oregon.

This evaluation is intended to guide improvement of public risk communication, programs, and recommendations. This document is intended to inform practitioners and staff at public agencies (public health, emergency management, natural resource management), academics, and community members about key findings and recommendations from the survey related to:

1. patterns and correlations surrounding information sources and needs.
2. patterns around health behaviors related to preventing smoke exposure.
3. information relevant for raising awareness and preparedness of specific risk groups.
4. potential areas and questions for future research.

Recruitment methods. The survey was offered in both English and Spanish. Two recruitment methods (recruitments A and B) were used for a total of 1,200 validated responses (see Figure 2 on page 7 for a full description of the survey recruitment methods).

Summary of findings and recommendations

The survey produced the following key findings and recommendations regarding wildfire smoke communication and impacts experienced by Oregon residents during the 2020 wildfire season.

Patterns and correlations surrounding information sources and needs.

- » Many people relied on their own observations or the internet for information about air quality, but this was not equally true across all demographics. Communicators should become familiar with the ways different demographic groups access information and be prepared to leverage those channels of communication during smoke events.
- » Non-White and Hispanic/Latinx demographics were more likely to select friends and family as a source of information. It is important for communicators to remember the role friends and family play in these communities.
- » Respondents were most interested in having forecasts about air and smoke conditions, information about how to stay safe both indoors and outdoors, and about how to use personal protective equipment.

Patterns around health behaviors related to preventing smoke exposure.

- » Most respondents made changes to their outdoor activities to protect themselves. Many respondents reported not taking protective actions while indoors.
- » Lower-income respondents across recruitments were less likely to report that they avoided going outside during the 2020 smoke events. We recommend increasing access to personal protective equipment to low-income groups that may be less able to avoid going outside during smoke events.

Information relevant for raising awareness and preparedness of specific risk groups.

- » Many respondents reported that they would have felt more prepared for the 2020 wildfire smoke events if they had access to adequate household protections and information about what to do during a smoke event.
- » Respondents were most concerned about the effects of wildfire smoke on the health of vulnerable people followed by risks to their own health. Mass communications during smoke events should leverage messaging on health risks to self and vulnerable people to help meet this need.
- » Most respondents who felt prepared for the 2020 wildfire smoke events attributed their preparedness to previous experiences with smoke.



Potential areas and questions for future research.

- » Recruitment methods used for this survey may have unintentionally oversampled Hispanic/Latinx respondents that had experienced an evacuation during the 2020 wildfires, as well as respondents reporting a disability. We recommend future evaluation explore the possible implications this may have on research methodologies, information dissemination, or community engagement strategies.
- » Additional information is needed to adequately characterize the availability, access, and quality of in-home and community clean air spaces, and to identify best practices from programs designed to meet this need.
- » Further evaluation is suggested for understanding the knowledge, practices, attitudes, beliefs, and barriers surrounding the use of household protections (i.e., air filters, doors and windows that seal, and emergency supplies).
- » More information is needed to understand what factors contributed to the use of different protective measures by respondents across demographics and recruitment methods.
- » As many respondents relied heavily on their own observations as a source of information about air quality during the 2020 wildfire smoke events, further analysis is needed to understand the interplay between information sources and to better understand whether and how individuals might be supplementing their observations with other sources of information, how they interpret their observations, and the actions they take based on their observations.

Introduction

Survey purpose

Few, if any, evaluations have been conducted in Oregon to understand how people respond to wildfire smoke and their communication needs. The purpose of this survey was to fill this need and to provide an open-source evaluation tool and data to support wildfire smoke communication practitioners in Oregon.

Survey design

In partnership with Oregon Health Authority (OHA), faculty from the University of Oregon (UO) Ecosystem Workforce Program (EWP) and the Institute for Policy Research and Engagement (IPRE) designed and implemented a survey of Oregon residents (Figure 1). The survey was designed to specifically understand responses to hazardous air quality due to high levels of wildfire smoke experienced in Oregon during the 2020 wildfire season. In addition to basic demographic characteristics, the survey asked respondents about their concerns related to wildfire smoke, their opinions on wildfire smoke communications, and their responses to hazardous air quality during the 2020 wildfire season. Questions were reviewed and edited by members of the Smoke Ready Communities work group facilitated by Oregon State University. Survey questions are archived and available online at the UO Scholars' Bank: <https://scholarsbank.uoregon.edu/xmlui/handle/1794/26984>.

Figure 1. Survey development and administration process.



Survey administration and recruitment

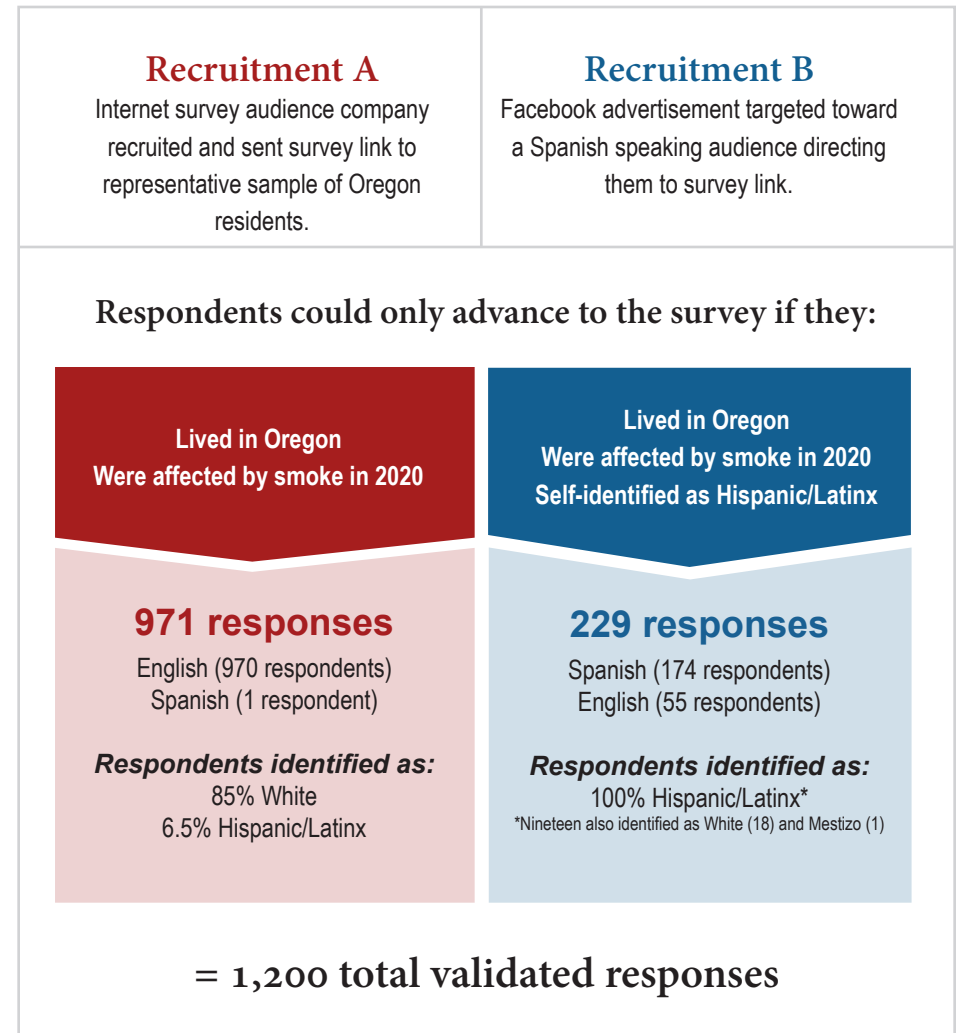
Rural and Spanish-speaking communities were prioritized in the survey development and recruitment method out of concern these populations are often underrepresented in data sets and are disproportionately impacted during severe smoke events. Respondents from these groups were intentionally oversampled and a Spanish version of the survey was offered to ensure robust representation.

The survey used two different recruitment efforts (referred to here as “recruitment A” and “recruitment B”) each with their own explicit goals (Figure 2). Goals for recruitment A were to obtain a representative, statewide sample with the caveat that rural areas would be oversampled to better understand their specific needs and responses related to wildfire smoke. Recruitment B was undertaken to obtain a larger sample of the Hispanic/Latinx population in Oregon, again to better understand their specific needs and responses related to wildfire smoke. In both recruitments, respondents were given the option to take the survey in Spanish.

Recruitment A relied on the internet survey audience company, Centiment, to recruit a representative sample of Oregon residents. Centiment recruits respondents through audience panels it maintains. The company conducted outreach with its panel members in Oregon and distributed links to the survey which was delivered through a UO subscription to Qualtrics. Respondents could only advance to the first question if they said they lived in Oregon and their community was affected by smoke in 2020. Responses were collected between June 30 and August 2, 2021.

Selection criteria for recruitment B relied on outreach through a Facebook advertisement targeted toward a Spanish speaking audience. Respondents could only advance the first question if they said they lived in Oregon, their community was affected by smoke in 2020, and they self-identified as Hispanic or Latinx. Respondents received a monetary incentive (\$10 gift card) to complete the survey. The survey for this recruitment effort was also delivered through a UO subscription to Qualtrics.

Figure 2. Description of recruitment efforts A and B.



Survey considerations and limitations

The survey featured:

- An intentional focus on collecting data on race, ethnicity, language, and disabilities to help advance understanding of the needs of subsections of the general population, many of whom are often underrepresented in evaluations and underserved by their results.
- Oversampling of rural and Hispanic/Latinx populations (among the largest underrepresented groups in Oregon) to ensure the needs of these groups are properly evaluated.
- The survey was offered in Spanish to broaden access to Spanish-speaking groups.
- Although the survey was not distributed in languages other than English and Spanish, it did ask respondents about their language preferences.

Representativeness of survey. This survey is not a true representative sample of everyone living in Oregon, so we recommend using these data in conjunction with other community data sources in decision-making. The survey recruitment methods collected a convenient sample, as opposed to a random sample. The respondents to this survey may have had more ability, willingness, or motivation to respond than a random sample of Oregon residents. These factors can result in bias which can affect survey results. Although the survey does not and was not intended to perfectly represent all communities in Oregon, it does provide useful information on how to better serve a range of people in Oregon.

Survey administration. The instrument was administered in an online-only format. We acknowledge that this format limits or excludes participation for those with limited language proficiency, limited electronic proficiency, limited internet or device access, those who are displaced or without houses, those whose primary language is not English or Spanish, and many others. Canvassing and paper options were not feasible for this survey given a combination of available funding and restrictions associated with the COVID-19 pandemic.

Presentation of results. Since the survey used two separate recruitment methodologies, with few noted exceptions, the results from the two recruitment efforts are reported separately. Although comparisons between the two recruitment effort datasets may be made, it is not the intent of this report to generalize the results of recruitment B to Oregon's diverse Hispanic/Latinx population even though this recruitment effort focused exclusively on that population. As will become evident throughout this report, recruitment B unintentionally sampled a segment of Oregon's Hispanic/Latinx population that experienced high rates of evacuations and other impacts during the 2020 wildfire season. Many recruitment B respondents also reported feeling prepared for wildfire smoke due to exposure in previous years. These factors make it especially difficult to generalize the responses of recruitment B to Oregon's Hispanic/Latinx population more broadly. For this reason, we note here and throughout this report that results from recruitment B must be interpreted with these considerations in mind.



Survey analysis

We used question responses as dependent variables and respondent demographic characteristics as independent, explanatory variables. In other words, the analysis we conducted sought to establish statistical associations between specific question responses and respondents' characteristics in terms of their age, language preferences, identity, etc. Positive associations are reported as "more likely" and negative associations are reported here as "less likely." For example, a negative association between rural respondents and an affirmative response to a given question would be reported in this way: rural respondents were less likely to select an answer to this question.

Survey data are archived and available online at the UO Scholar's Bank: <https://scholarsbank.uoregon.edu/xmlui/handle/1794/27175>



How to read this report

Results from the survey are presented in the two following sections: about the survey population and how people responded. Other details on the approach, and additional survey details are provided in the appendices.

We have separated results by respondent population into three groups: (1) recruitment A, (2) recruitment B, and (3) combined recruitments. Throughout the report, results are represented from each recruitment using the following unique colors for each group.

 **Results from recruitment A are displayed in red**

 **Results from recruitment B are displayed in blue**

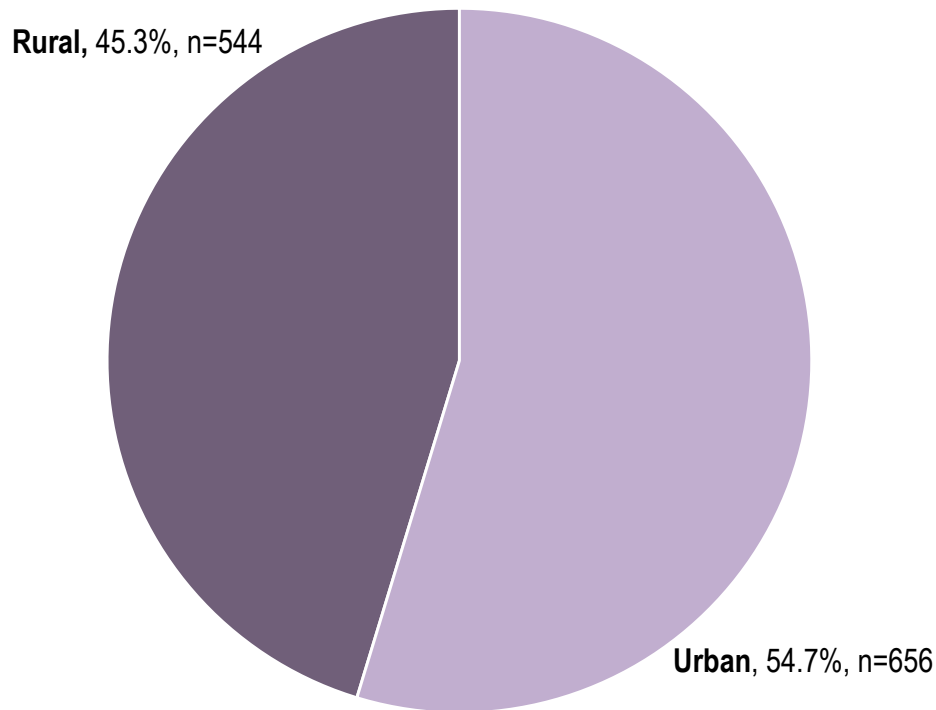
 **Results combining both recruitments are displayed in purple**

About the survey population

In this section we summarize descriptive statistics for the various demographic factors used in the analysis of survey responses. We received 971 validated responses to recruitment A and 229 to recruitment B, for 1,200 total validated responses from across Oregon (Figures 3 and 4).

Variables included for analysis of recruitment A, but not included for analysis of recruitment B were excluded because of the nature of the recruitment B population whereas all were Hispanic/Latinx, there were no respondents over 65

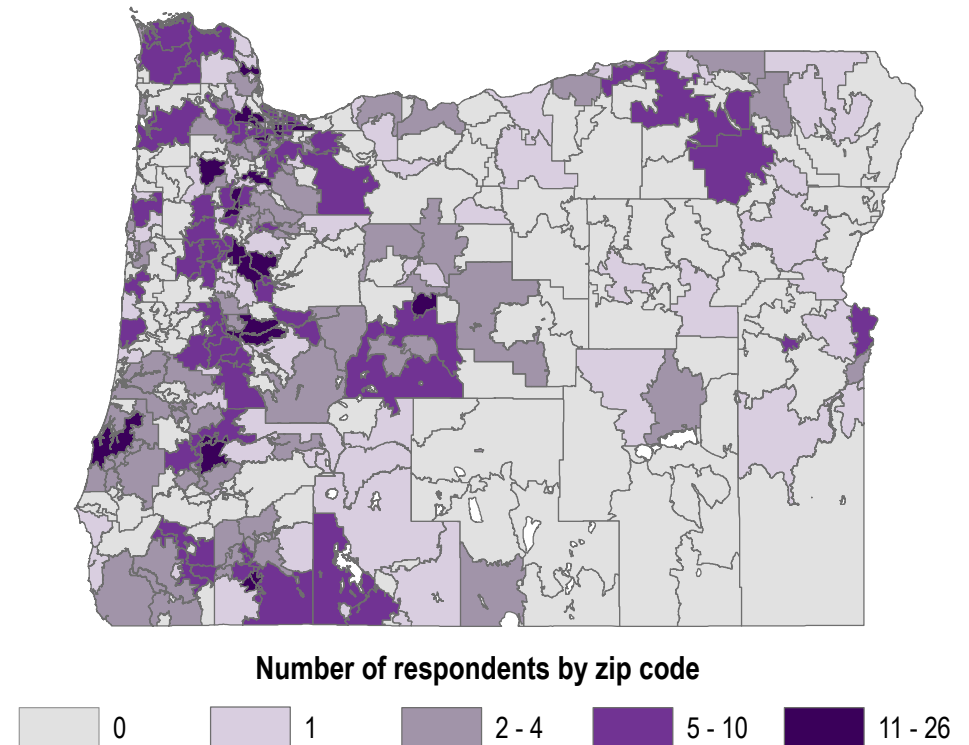
Figure 3. Distribution of survey responses by zip code.



years of age, selected language preferences were limited to English or Spanish, and nearly all respondents reported a vulnerable member of the household. We should also note again here that although all of Recruitment B reported that they identify as Hispanic or Latina/o/x, we do not suggest that this group is representative of Oregon's diverse Hispanic/Latinx community.

Further details on respondent demographics are reported in Appendix A of this report.

Figure 4. Sample geography for combined recruitment efforts.



- Recruitment A B **Lower income respondents.** The majority of respondents (over 85 percent in both recruitment efforts) reported having sufficient income to pay bills always or most of the time. For the lower income demographic, we selected respondents who reported that their households rarely or sometimes had enough money to pay for food, bills, or housing (Figure 5).
- Recruitment A B **Older respondents.** The older respondent demographic is defined as those 65 year of age or older. Respondents' ages were fairly evenly distributed across age categories in recruitment A (Figure 5). There were 218 respondents from recruitment A who were 65 years or older that we identified as part of an older respondent demographic for statistical analysis. Respondents for recruitment B were concentrated in age groups between 25 and 65 and did not include any respondents 65 years or older. Please see Appendix A for a complete breakdown of respondent age categories for both recruitments.

Figure 5. Respondents belonging to the lower income respondent demographic for recruitments A and B, respectively.

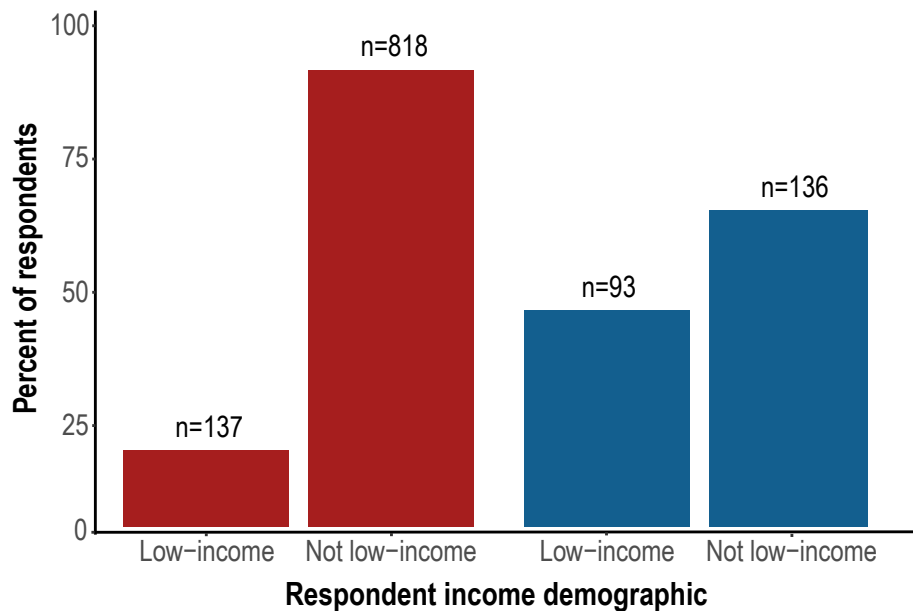
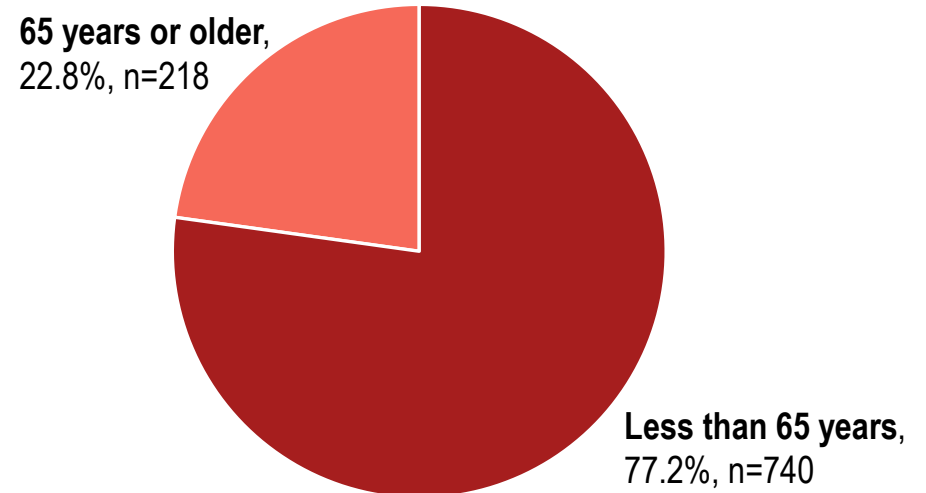


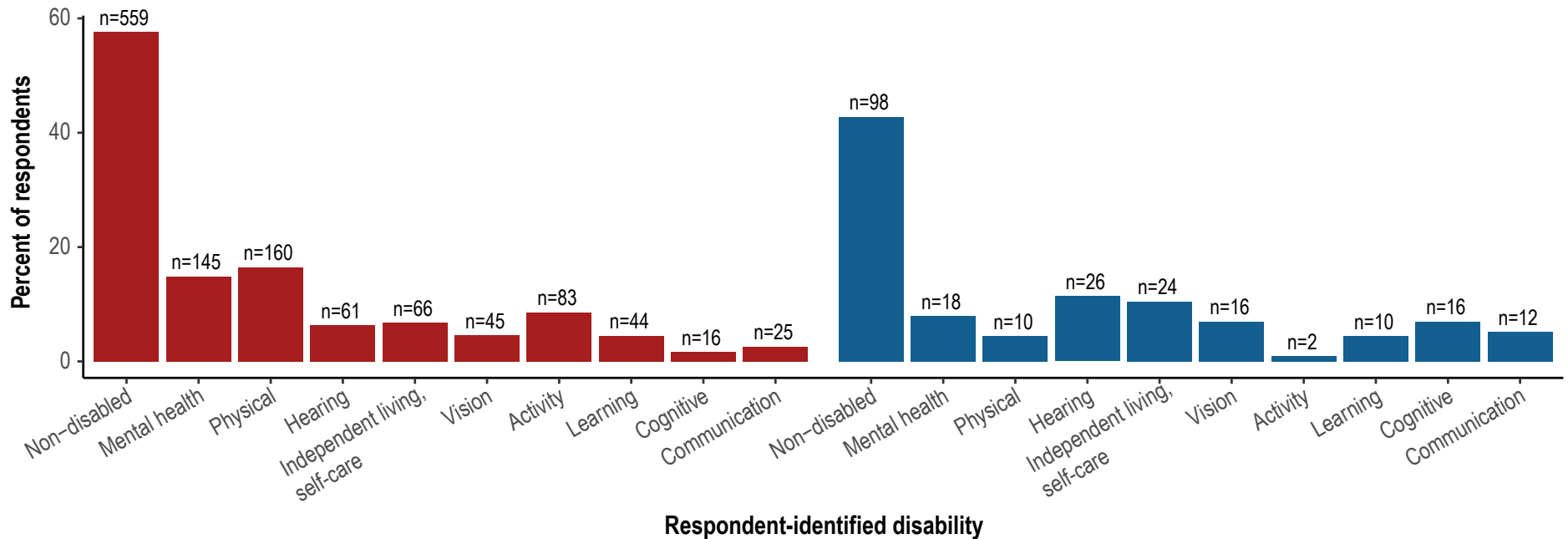
Figure 6. Recruitment A respondents belonging to the older respondent demographic.



Recruitment A B **Non-home owner respondents.** We asked respondents to identify whether or not they own their home or if they rent, live with others, or are currently unhoused. To identify a non-home owner respondent demographic we combined all respondents who did not indicate they own their home. 48 percent of respondents from both recruitment A and recruitment B did not own their home.

Recruitment A B **Respondents with disabilities.** Respondents who indicated that they have at least one or more disabilities were included in this demographic. Approximately 42 percent of respondents from recruitment A reported having at least one disability with physical disabilities (16 percent) and mental health disabilities (15 percent) being the most common. The percentage was higher for recruitment B with 57 percent of respondents reporting having at least one disability. Hearing disability (11 percent) and independent living, self-care disability (15 percent) were the most common for recruitment B. See Figure 7 for a breakdown of respondents with disabilities by recruitment.

Figure 7. Respondents from each recruitment effort reporting different disabilities. Respondents could select more than one category.

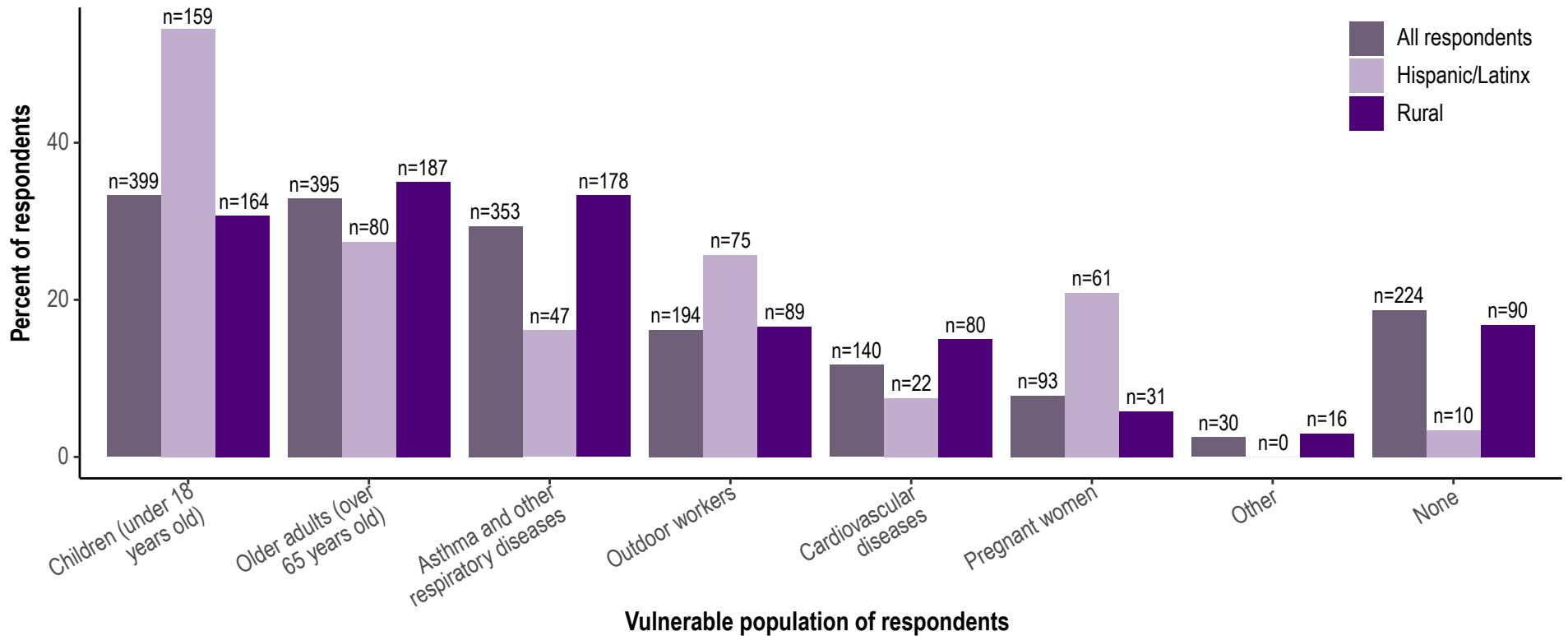


- Recruitment A B **Non-White respondents with racial and ethnic identities.** Ethnicities analyzed from recruitment A consisted of two groups: (1) 63 Hispanic/Latinx respondents, and (2) 79 non-White or Hispanic/Latinx respondents. We combined all non-White, non-Hispanic/Latinx identities in order to maximize statistical power. [Since 100 percent of recruitment B respondents identified as Hispanic/Latinx, we did not include this variable in our recruitment B analysis.](#)
- Recruitment A B **Respondents with language preferences.** Ninety-one percent of respondents (n=1,079) across recruitment efforts selected English as their preferred spoken language. Spanish was a preferred language for six respondents from recruitment A and 86 respondents (38 percent) from recruitment B. Some respondents (n=10) from recruitment A selected “other” as a preferred language; text entries for these included two Japanese speakers and one each for Norwegian, German, and Korean languages. For recruitment A, we combined the 27 respondents who selected a language other than English to identify a non-English respondent demographic and to maximize statistical power in evaluating the effects of language preferences on survey responses. For recruitment B, we grouped the 86 respondents who selected a Spanish language preference to identify a Spanish language respondent demographic for analysis.
- Recruitment A B **Respondents with high exposure.** To assess exposure to smoke, we asked respondents how often they think they are exposed to unhealthy air quality from wildfire smoke in a given year. The high exposure demographic was identified based on respondents who reported being exposed to wildfire smoke more than five days in a given year. For recruitment A, 367 respondents (38 percent) were highly exposed to wildfire smoke and for recruitment B, 98 respondents (43 percent) were highly exposed.
- Recruitment A B **Rural respondents.** Respondents were split between rural and urban zip codes with 491 rural and 480 urban respondents from recruitment A and 53 rural and 176 urban respondents from recruitment B. Combined, rural respondents made up about 45 percent of the total survey population (n=535) and urban respondents made up 55 percent (n= 665). Respondents from rural zip codes from each recruitment effort were identified as members of the rural demographic for use in statistical analysis.



Recruitment A **Recruitment B** **Respondents more vulnerable to smoke.** We asked respondents if any vulnerable populations lived in their houses during the wildfire smoke events of 2020. Vulnerable populations are defined as those that are considered at higher risk of health impacts from wildfire smoke. According to the US EPA, these groups include people with asthma or other respiratory diseases, people with cardiovascular disease, children, pregnant women, older adults (65 years or older), and outdoor workers. Respondents could select more than one category. Seven hundred and forty-eight respondents from recruitment A (77 percent of total responses) reported having at least one member of their household that could be considered more vulnerable to wildfire smoke. **Nearly 100 percent of all respondents in recruitment B reported a vulnerable member of the household, so we did not include this variable in our analysis of recruitment B.**

Figure 8. Respondents reporting that one or more household members fit into the described vulnerable population for all, Hispanic/Latinx, and rural respondents.



How people responded

The following pages showcase the results and statistically significant findings from questions about evacuations, concerns, information sources about smoke, preparedness, and changes to activities during the 2020 smoke events. Where relevant, results are separated by recruitment effort and significant findings are further grouped by respondent demographics.



Respondent demographic groups

Findings from discrete respondent demographic groups are represented by the following terms throughout the remainder of this section:

- » **Disabilities:** Respondents who reported having one or more disabilities.
- » **High exposure:** Respondents reporting greater than five days of exposure to smoke per year.
- » **Lower income:** Respondents reporting that their household rarely or sometimes has enough money to pay bills.
- » **Non-English preference:** Respondents reporting a preference for a language other than English.
- » **Non-home owner:** Respondents reporting they do not own their home.
- » **Non-White or Hispanic/Latinx:** Respondents identifying as an ethnicity other than “White,” “Hispanic,” or “Latinx.”
- » **Older:** Respondents 65 years or older.
- » **Rural:** Respondents from rural zip codes.
- » **Spanish preference:** Respondents reporting a Spanish language preference.
- » **Vulnerable:** Respondents who reported that a member of their household fit the US EPA definition for being at higher risk for adverse health effects from wildfire smoke.

Combined recruitments: Evacuations

We asked respondents if they evacuated to a different location because of smoke or wildfire in 2020. Respondents could select yes or no.

Takeaway. Hispanic/Latinx respondents showed the highest number of evacuations. While this result should not be taken as representative of the entire Hispanic/Latinx population in Oregon due to methods used in recruitment B, it is a notable finding.

Figure 9. Respondents that evacuated during the 2020 wildfires based on the statewide sample, rural respondents, and Hispanic/Latinx respondents.

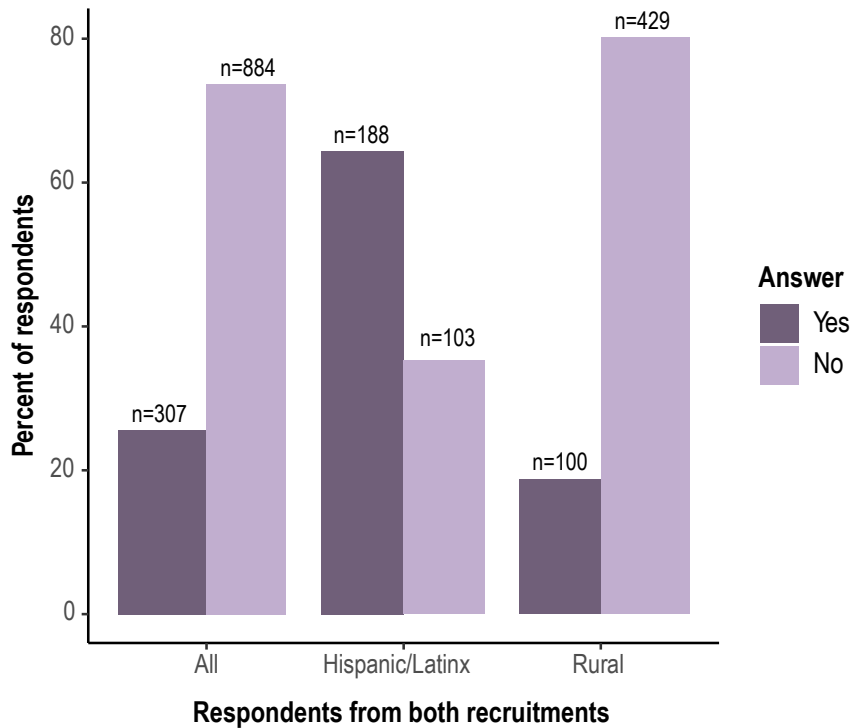
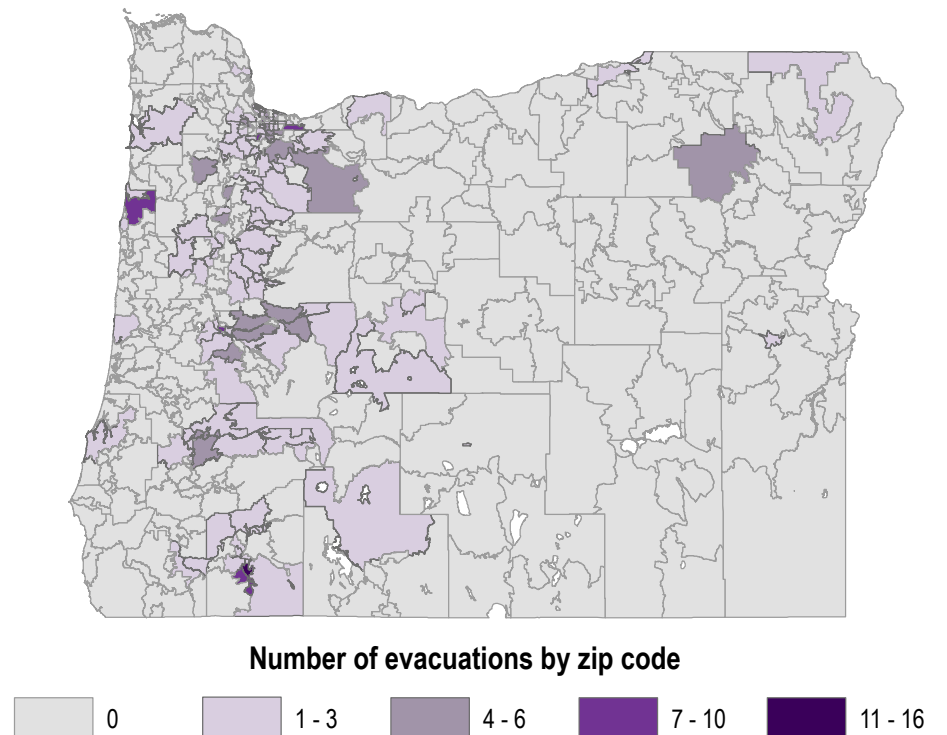


Figure 10. Number of respondents that evacuated during the 2020 wildfires by zipcode for combined recruitment efforts.



Recommendation

Factors contributing to the over-representation of Hispanic/Latinx populations that experienced evacuations during the 2020 wildfires should be explored to find opportunities for improving future evaluations.

Recruitments A and B: Preparedness for smoke events

We asked respondents if they were prepared for an air quality event like the 2020 smoke events before they happened. Respondents could select one response.

Takeaway. Most respondents from recruitment A felt unprepared for an air quality event like the 2020 wildfire smoke events while most respondents from recruitment B felt prepared. While this result should not be taken as representative of the entire Hispanic/Latinx population in Oregon due to methods used in recruitment B, it is a notable finding.

Figure 11. Respondents from recruitment A reporting whether they felt they were prepared for an air quality event like the 2020 wildfire smoke events before they happened.

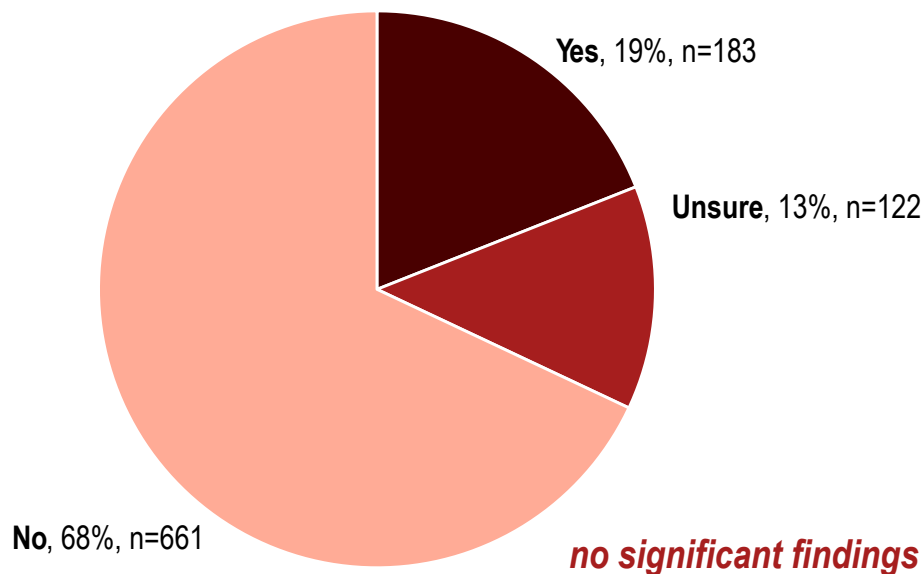
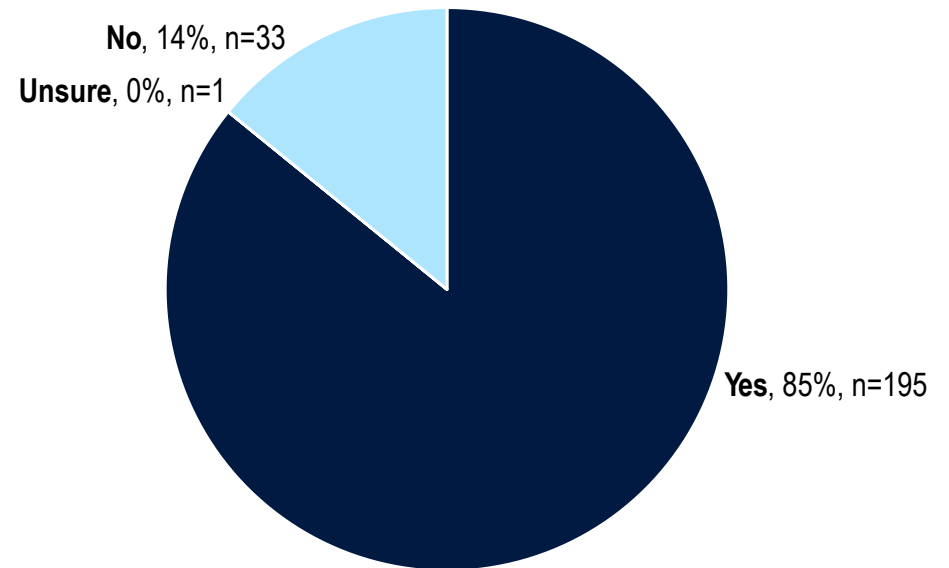


Figure 12. Respondents from recruitment B reporting whether they felt they were prepared for an air quality event like the 2020 wildfire smoke events before they happened.



Significant findings

Disabilities

» More likely to select Yes

Spanish preference

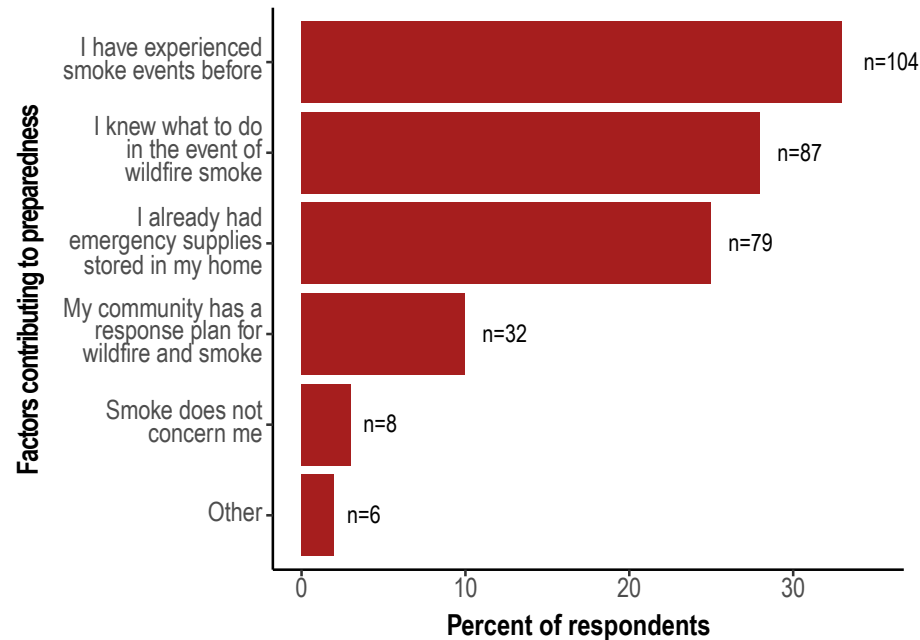
» More likely to select Yes

Recruitment A: Factors for feeling prepared for smoke events

We asked respondents which factors contributed the most to their preparedness. Only respondents that said they were prepared for the 2020 smoke events could view and respond. Respondents could select more than one response.

Takeaway. Most respondents reported feeling prepared because they had previously experienced smoke events.

Figure 13. Respondents from recruitment A who selected specific factors that made them feel prepared for the smoke events.



Significant findings

High exposure
 More likely to select
 » previous experience with smoke
 » already knowing what to do

Older
 More likely to select
 » having emergency supplies

Rural
 More likely to select
 » previous experience with smoke

Vulnerable
 More likely to select
 » having emergency supplies

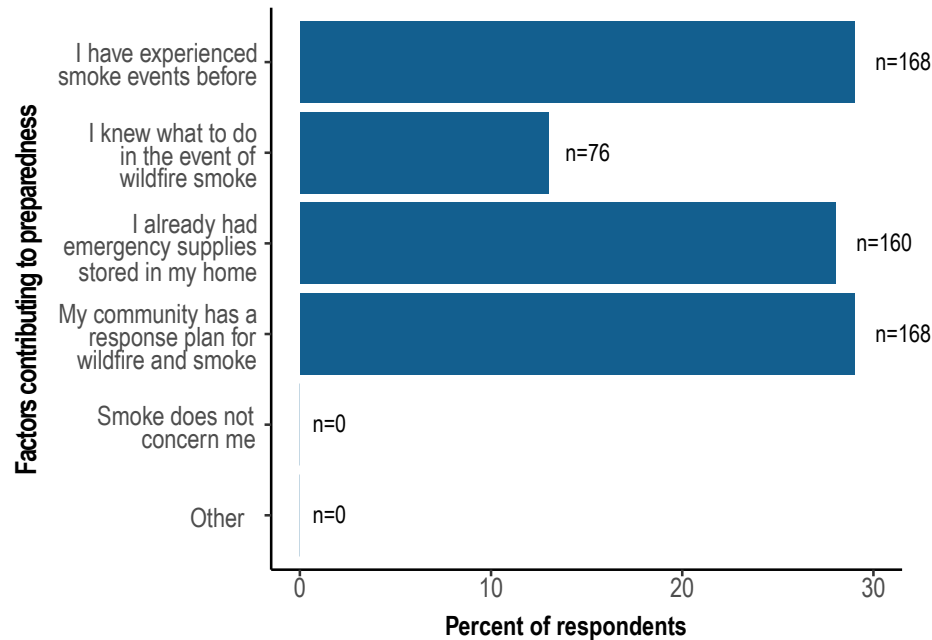
Recommendation Practitioners should experiment with safe ways for people to gain experience with protective actions during poor air quality conditions and find ways to harness the knowledge and experience of people that have been exposed to smoke to help prepare others.

Recruitment B: Factors for feeling prepared for smoke events

We asked respondents which factors contributed the most to their preparedness. Only respondents that said they were prepared for the 2020 smoke events could view and respond. Respondents could select more than one response.

Takeaway. Most respondents reported feeling prepared because they had previously experienced smoke events and their community has a response plan.

Figure 14. Respondents from recruitment B who selected specific factors that made them feel prepared for the smoke events.



Significant findings

Disabilities

More likely to select

- » previous experience with smoke
- » community plans for smoke
- » having emergency supplies

Lower income

Less likely to select

- » community plans for smoke
- » already knowing what to do

Non-home owner

Less likely to select

- » having emergency supplies

Spanish preference

More likely to select

- » previous experience with smoke
- » having emergency supplies
- » community plans for smoke

Recommendation

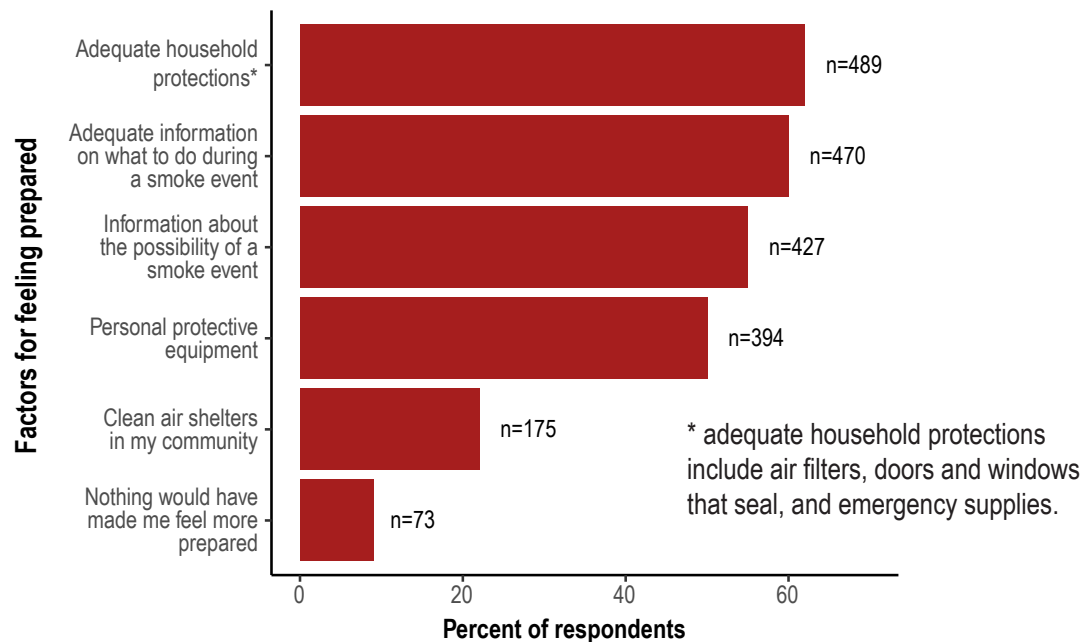
Practitioners should experiment with safe ways for people to gain experience with protective actions during poor air quality conditions and find ways to harness the knowledge and experience of people that have been exposed to smoke to help prepare others.

Recruitment A: Preparedness for smoke events

We asked respondents what would have made them feel more prepared for the 2020 smoke events. Only respondents who indicated that they were not prepared for the 2020 smoke events could view and respond. Respondents could select more than one response.

Takeaway. Most respondents would have felt more prepared if they had access to adequate household protections and information about what to do during a smoke event.

Figure 15. Respondents from recruitment A that selected specific factors that would have made them feel more prepared for the smoke events.



Recommendation

Information is available for how people can inexpensively protect themselves in their home and take other precautions. Additional evaluation is needed to understand barriers to taking household protections.

Significant findings

High exposure

- More likely to select
 - » access to personal protective equipment
 - » adequate household protections

Lower income

- More likely to select
 - » clean air shelters

Non-home owner

- Less likely to select
 - » access to personal protective equipment
- More likely to select
 - » clean air shelters
 - » information about possible events

Non-White or Hispanic/Latinx

- Less likely to select
 - » access to personal protective equipment

Older

- Less likely to select
 - » access to personal protective equipment
 - » adequate household protections
 - » clean air shelters

Rural

- Less likely to select
 - » any of the other choices
- More likely to select
 - » nothing

Vulnerable

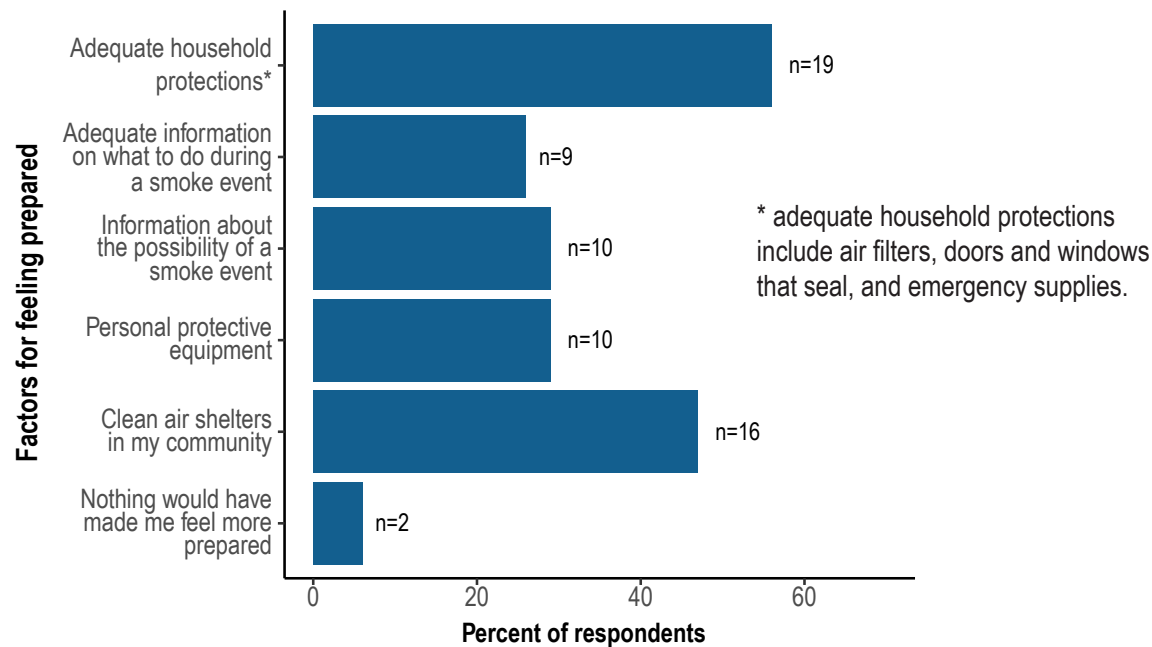
- More likely to select
 - » access to clean air shelters

Recruitment B: Preparedness for smoke events

We asked respondents what would have made them feel more prepared for the 2020 smoke events. Only respondents who indicated that they were not prepared for the 2020 smoke events could view and respond. Respondents could select more than one response.

Takeaway. Most of the 33 respondents in recruitment B that did not feel prepared for the 2020 smoke events would have felt more prepared if they had access to more adequate household protections or clean air shelters in their community.

Figure 16. Respondents from recruitment B that selected specific factors that would have made them feel more prepared for the smoke events.



no significant findings

Recommendation

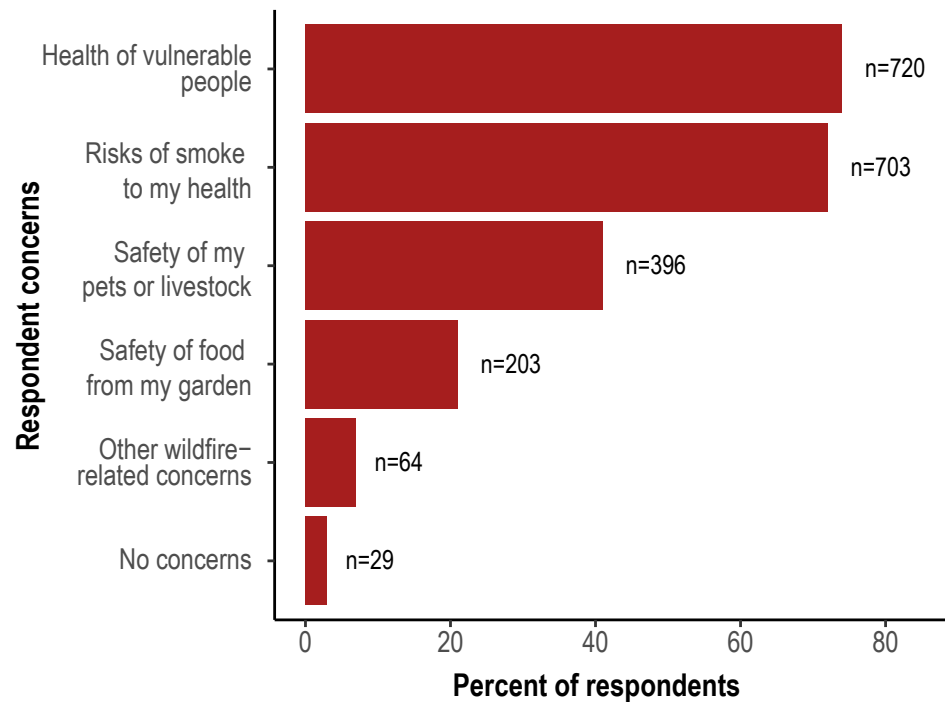
These findings suggest a need for additional information to characterize the availability, access, and quality of in-home and community clean air shelters, and to identify best practices from programs designed to meet this perceived need.

Recruitment A: Concerns during the 2020 wildfire season

We asked respondents if they had any concerns about air quality during the 2020 wildfire season. Respondents could select more than one response.

Takeaway. The majority of respondents were concerned about the effects of wildfire smoke on the health of vulnerable people followed by risks to their own health.

Figure 17. Recruitment A respondents' concerns about air quality.



Significant findings

High exposure
More likely to select

- » risk to their health
- » health of vulnerable people
- » safety of pets or livestock

Non-home owner
Less likely to select

- » health of vulnerable people

Older
Less likely to select

- » safety of pets or livestock
- » effects of smoke on food safety

Rural
Less likely to select

- » risks to their health
- » health of vulnerable people
- » effects of smoke on food safety

Vulnerable
More likely to select

- » safety of pets or livestock

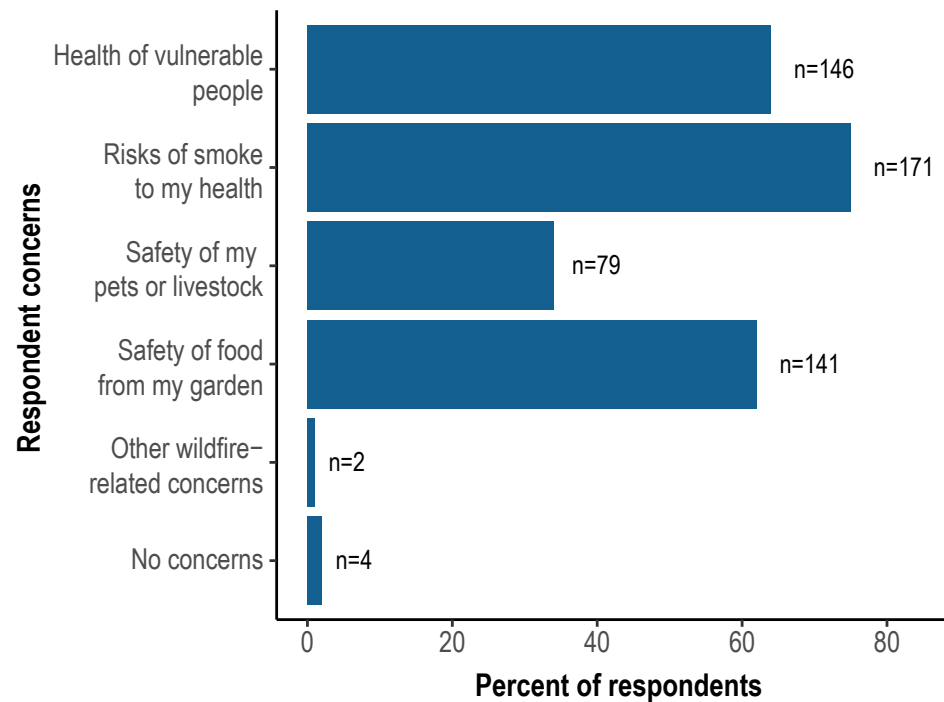
Recommendation Leverage messaging on health risks to self and vulnerable people in mass communications. Tailor messaging to meet specific demographics' needs and distribute tailored messaging through the preferred sources of information for each demographic. Communicators may wish to consider pairing human health protection with pet and livestock protection messages to better meet the information needs of vulnerable communities and people in communities with frequent smoke exposure.

Recruitment B: Concerns during the 2020 wildfire season

We asked respondents if they had any concerns about air quality during the 2020 wildfire season. Respondents could select more than one response.

Takeaway. The majority of respondents were concerned about the risks of wildfire smoke to their health followed by health of vulnerable people.

Figure 18. Recruitment B respondents' concerns about air quality.



Significant findings

Disabilities
 More likely to select
 » risks to their health
 » health of vulnerable people
 » effects of smoke on food safety
 Less likely to select
 » safety of pets or livestock

Lower income
 Less likely to select
 » safety of pets or livestock
 » health of vulnerable people
 » effects of smoke on food safety

High exposure
 More likely to select
 » effects of smoke on food safety
 Less likely to select
 » health of vulnerable people

Non-home owner
 Less likely to select
 » safety of pets or livestock

Spanish preference
 More likely to select
 » risks to their health
 » health of vulnerable people
 » effects of smoke on food safety

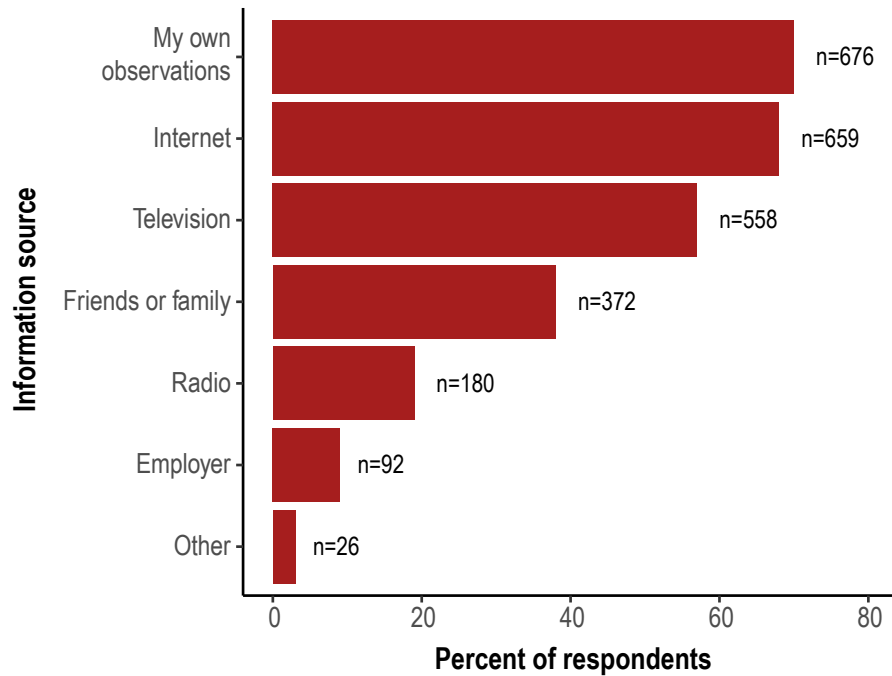
Recommendation Leverage messaging on health risks to self and vulnerable people in mass communications. Tailor messaging to meet specific demographics' needs and distribute tailored messaging through the preferred sources of information for each demographic.

Recruitment A: Information about air quality

We asked respondents where they got information about air quality during the 2020 wildfire season. Respondents could select multiple types of information sources.

Takeaway. Although most people relied on their own observations or the internet for information about air quality, this was not equally true across all demographics.

Figure 19. Sources of air quality information used by respondents from recruitment A.



Recommendation

It may be valuable to explore social networks, identify key influencers, and equip key community leaders with relevant smoke resources in communities where use of friends and family as information sources is higher. Further analysis is needed to understand the interplay between information sources and understand whether and how people are supplementing these with other sources of information.

Significant findings

High exposure
 More likely to select
 » television
 » radio
 » internet
 » friends or family

Lower income
 Less likely to select
 » television

Non-White or Hispanic
 More likely to select
 » friends or family

Older
 Less likely to select
 » radio
 » internet
 » employer
 More likely to select
 » television

Rural
 Less likely to select
 » television
 » employer

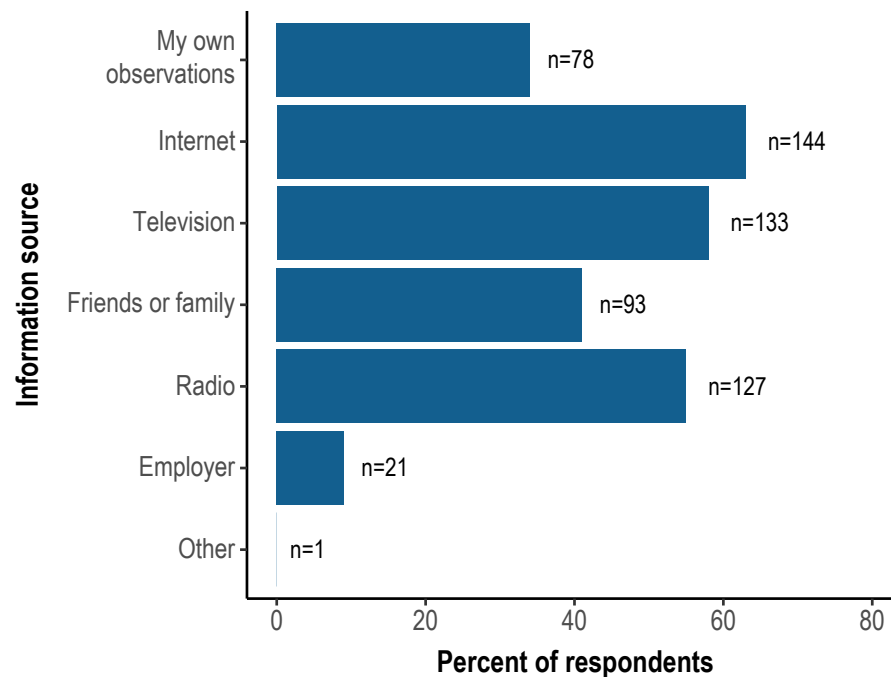
Vulnerable
 More likely to select
 » employer

Recruitment B: Information about air quality

We asked respondents where they got information about air quality during the 2020 wildfire season. Respondents could select multiple types of information source.

Takeaway. Although internet and television were popular choices for recruitment B, radio was also widely selected.

Figure 20. Sources of air quality information used by respondents from recruitment B.



Recommendation

More information is needed to determine why communities with higher exposure were more likely to use multiple sources of information and to determine the implications for communities experiencing less frequent smoke exposure.

Significant findings

Disabilities

Less likely to select

- » own observations

More likely to select

- » radio
- » friends and family

Lower income

Less likely to select

- » own observations
- » television
- » friends or family

More likely to select

- » internet

High exposure

More likely to select

- » television
- » friends or family
- » employer

Non-home owner

Less likely to select

- » television

Rural

More likely to select

- » internet

Spanish preference

More likely to select

- » television

Recruitment A: Information sources

We asked respondents to indicate the degree to which information about wildfire smoke, its potential hazards, and recommended protective actions met their needs during the 2020 wildfires. Respondents could only rate sources within the categories of internet, radio, and/or television if they said that they used those categories. Because respondents could rate multiple information sources within each category, we included an “I did not use this source” response.

Takeaway. Respondents indicated television, radio, and social media met their information needs and generally did not find the information overwhelming.

Table 1. Recruitment A respondents' opinions on how information sources of met their needs in terms of air quality information.

Answer	Information Source											
	Internet						Radio			Television		
	AirNow.gov	OHA website/emails	Online newspaper	Oregon Smoke Blog	Purple Air.com	Social media	Commercial radio	Public radio	Talk radio	Broadcast television	Cable or satellite television	Public television
The information did not meet my needs	4%	7%	6%	4%	3%	3%	17%	8%	13%	10%	9%	8%
The information met my needs	24%	44%	28%	15%	8%	52%	60%	39%	49%	71%	50%	30%
The information was overwhelming	2%	5%	2%	1%	1%	5%	2%	6%	9%	8%	3%	2%
I did not use this source	71%	45%	64%	80%	88%	41%	20%	47%	29%	11%	38%	60%
Total (n)	652	655	651	654	650	654	179	177	415	557	553	552

Recommendation

Oregon Smoke Blog is considered one of Oregon's most comprehensive sources of smoke information, yet, among those using internet sources for information, use was relatively low. More information is needed to understand why more people aren't using Oregon Smoke Blog, who is using it, and how they are using it.

Recruitment B: Information sources

We asked respondents to indicate the degree to which information about wildfire smoke, its potential hazards, and recommended protective actions met their needs during the 2020 wildfires. Respondents could only rate sources within the categories of internet, radio, and/or television if they said they used those sources. Because respondents could rate multiple information sources within each category, we included a “I did not use this source” response.

Takeaway. Respondents indicated public television, public radio, and AirNow.gov met their needs but many found information from social media, commercial radio, and Oregon Smoke Blog overwhelming.

Table 2. Recruitment B respondents' opinions on how information sources of met their needs in terms of air quality information.

Answer	Information Source											
	Internet						Radio			Television		
	AirNow.gov	OHA website/emails	Online newspaper	Oregon Smoke Blog	Purple Air.com	Social media	Commercial radio	Public radio	Talk radio	Broadcast television	Cable or satellite television	Public television
The information did not meet my needs	30%	35%	48%	17%	44%	36%	46%	27%	55%	51%	36%	6%
The information met my needs	49%	42%	29%	38%	33%	26%	26%	54%	28%	23%	37%	56%
The information was overwhelming	5%	8%	0%	28%	2%	35%	28%	8%	6%	21%	24%	24%
I did not use this source	16%	15%	24%	17%	22%	2%	1%	11%	11%	5%	3%	14%
Total (n)	121	122	110	119	113	141	126	113	113	127	129	114

Recommendation

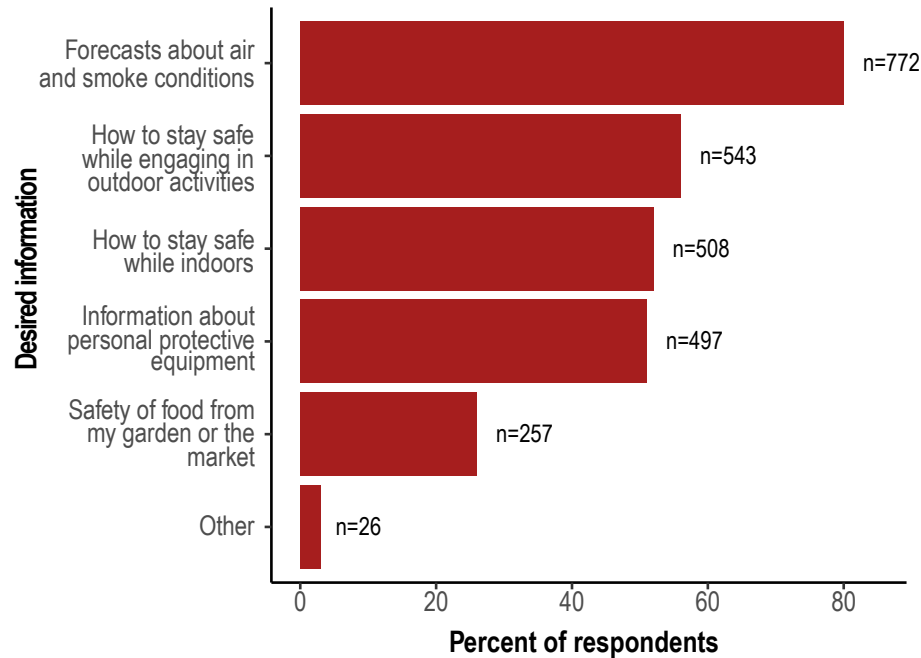
More information is needed to adequately characterize the communication needs of Hispanic/Latinx communities.

Recruitment A: Desired information about air quality

We asked respondents what information about smoke-related air quality they would like to have. Respondents could select more than one response.

Takeaway. Most respondents would like to have more information about air and smoke conditions and how to stay safe during outdoor activities and while indoors.

Figure 21. Information about smoke-related air quality respondents from recruitment A would like to have.



Significant findings

High exposure

- More likely to select
- » staying safe outdoors
 - » personal protective equipment
 - » smoke forecasts and conditions
 - » safety of food

Lower income

- Less likely to select
- » smoke forecasts and conditions

Non-English preference

- Less likely to select
- » staying safe outdoors

Older

- Less likely to select
- » how to stay safe indoors
 - » safety of food
- More likely to select
- » smoke forecasts and conditions

Rural

- Less likely to select
- » how to stay safe indoors
 - » personal protective equipment

Vulnerable

- More likely to select
- » staying safe outdoors
 - » safety of food

Recommendation

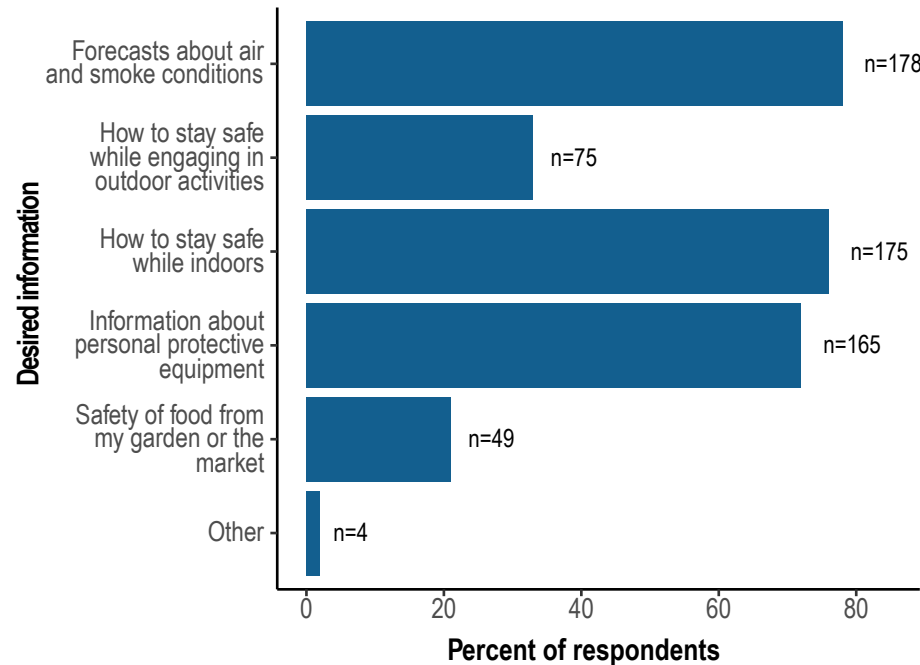
Airshed monitoring efforts should expand and diversify current efforts to simplify and communicate air quality conditions. Communicators should continue to intensify efforts to educate the public about personal protective equipment and other ways to stay safe both indoors and outdoors.

Recruitment B: Desired information about air quality

We asked respondents what information about smoke-related air quality they would like to have. Respondents could select more than one response.

Takeaway. Most respondents would like to have more information about air and smoke conditions, how to stay safe indoors, and personal protective equipment.

Figure 22. Information about smoke-related air quality respondents from recruitment B would like to have.



Recommendation

Airshed monitoring efforts should expand and diversify current efforts to simplify and communicate air quality conditions. Communicators should continue to intensify efforts to educate the public about personal protective equipment and other ways to stay safe both indoors and outdoors.

Significant findings

Disabilities

Less likely to select

- » staying safe outdoors

More likely to select

- » staying safe indoors
- » personal protective equipment
- » smoke forecasts and conditions

Lower income

Less likely to select

- » staying safe outdoors
- » safety of food

High exposure

More likely to select

- » staying safe outdoors

Non-home owner

Less likely to select

- » staying safe indoors
- » safety of food

More likely to select

- » smoke forecasts and conditions

Rural

More likely to select

- » staying safe outdoors
- » safety of food

Spanish preference

More likely to select

- » personal protective equipment
- » smoke forecasts and conditions
- » safety of food

Recruitments A and B: Changes to outdoor activities

We asked respondents if they took any protective measures or made changes to their routine outdoor activities. Respondents could select only one response.

Takeaway. Most respondents reported that they made changes to their outdoor activities to protect themselves.

Figure 23. Respondents from recruitment A reporting whether they took protective actions or made changes to their routine outdoor activities.

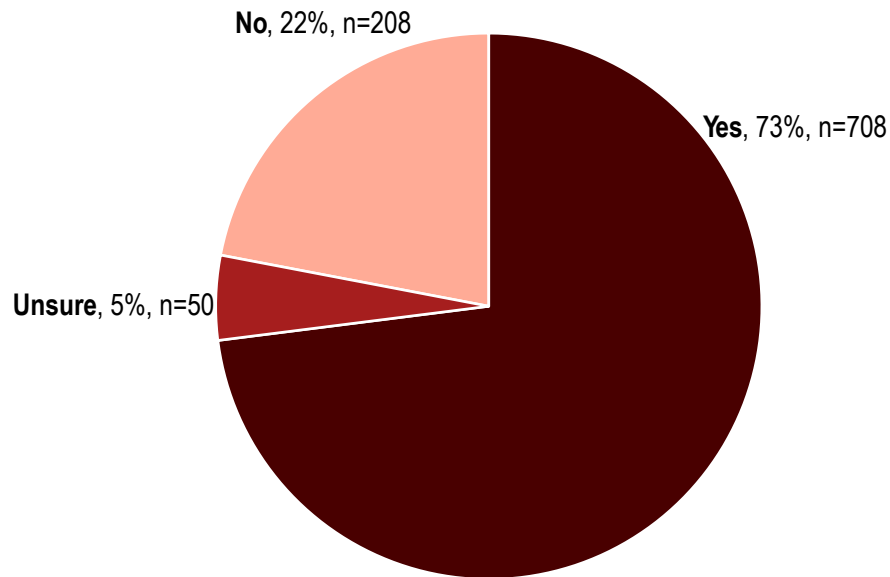
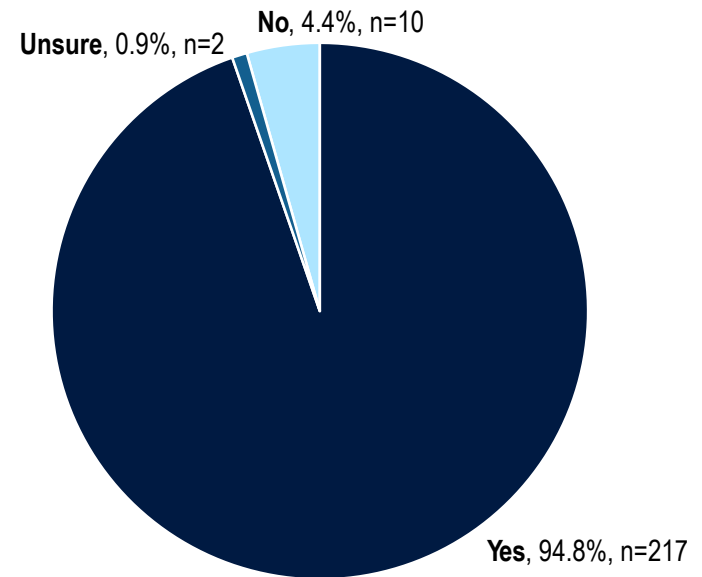


Figure 24. Respondents from recruitment B reporting whether they took protective actions or made changes to their routine outdoor activities.



Significant findings

<p>Non-home owner</p> <p>» Less likely to select Yes</p>	<p>Lower income</p> <p>» Less likely to select Yes</p>
<p>High exposure</p> <p>» More likely to select Yes</p>	<p>Vulnerable</p> <p>» More likely to select Yes</p>

Significant findings

<p>Lower income</p> <p>» Less likely to select Yes</p>

Recruitments A and B: Changes to indoor activities

We asked respondents if they took any protective measures while indoors. Respondents could select only one response.

Takeaway. Less than half of respondents from recruitment A indicated that they took protections while indoors while the vast majority of respondents from recruitment B indicated that they took protective measures indoors.

Figure 25. Respondents from recruitment A reporting whether they took protective actions while indoors.

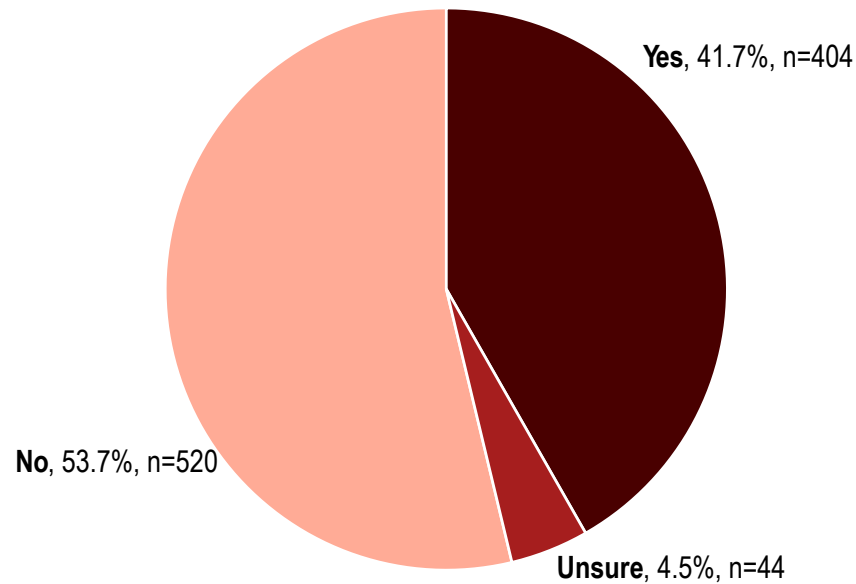
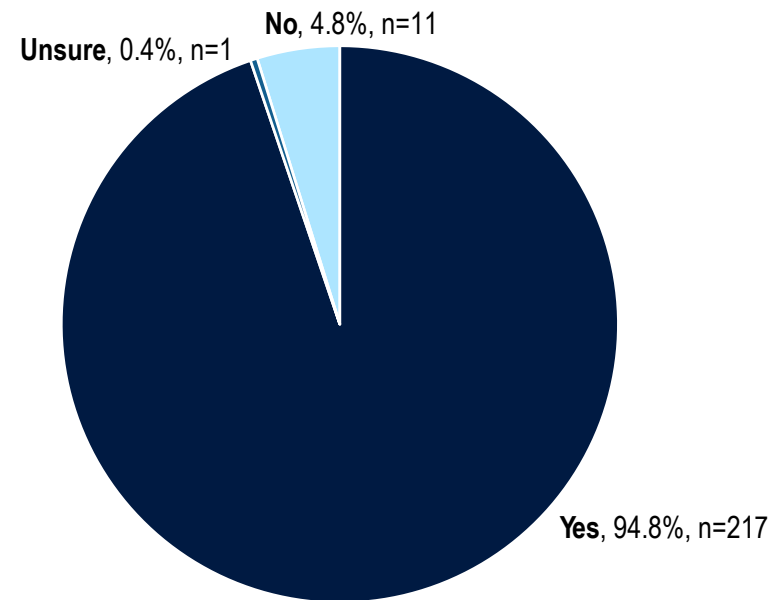


Figure 26. Respondents from recruitment B reporting whether they took protective actions while indoors.



Significant findings

- High exposure**
 - » More likely to select Yes
- Lower income**
 - » Less likely to select Yes
- Vulnerable**
 - » More likely to select Yes

Significant findings

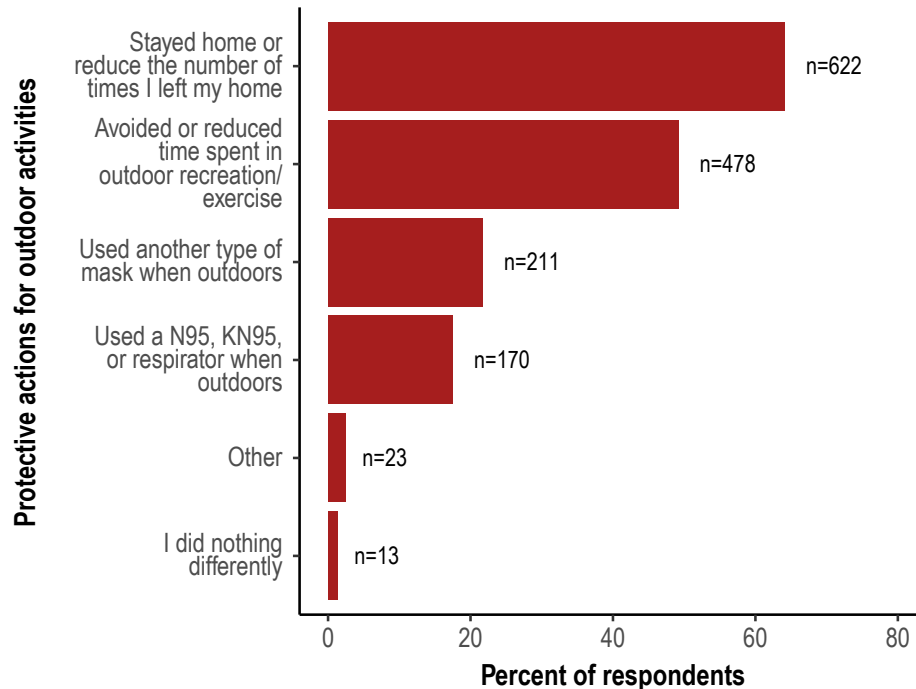
- Disabilities**
 - » More likely to select Yes

Recruitment A: Changes to outdoor activities

We asked respondents what protective actions from outdoor air they took. Only respondents that said they made changes to their routine outdoor activities could respond. Respondents could select more than one response.

Takeaway. Few respondents chose to do nothing differently to protect themselves while outdoors. The two most frequently chosen protective actions by respondents were that they stayed home or avoided spending time outdoors.

Figure 27. Respondents from recruitment A that selected changes they made to their routine outdoor activities during the 2020 wildfire smoke events.



Significant findings

High exposure
More likely to select

- » used another type of mask

Lower income
Less likely to select

- » stayed home
- » avoided going outside

Non-home owner
Less likely to select

- » avoided going outside

Non-English preference
More likely to select

- » used N95, KN95, or respirator

Rural
Less likely to select

- » avoided going outside
- » used N95, KN95, or respirator
- » used another type of mask

Vulnerable
More likely to select

- » used N95, KN95, or respirator

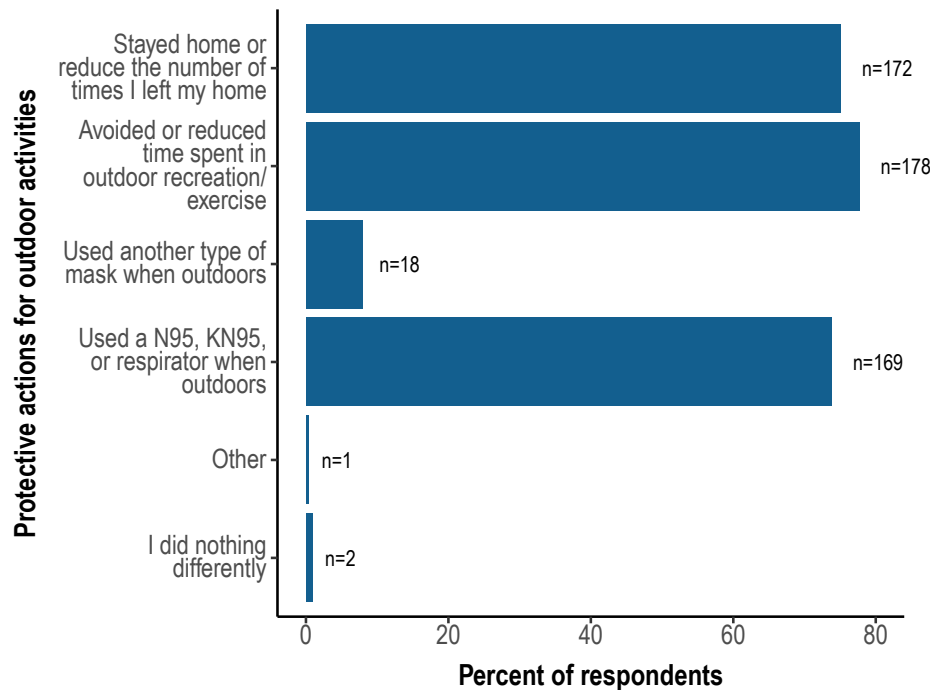
Recommendation Though not conclusive, education may be needed to ensure proper selection of masks as a slightly higher number of respondents indicated using “another type of mask” while outdoors.

Recruitment B: Changes to outdoor activities

We asked respondents what protective actions from outdoor air they took. Only respondents that said they made changes to their routine outdoor activities could view and respond. Respondents could select more than one response.

Takeaway. Although most respondents appear to have taken appropriate protective actions to stay safe outdoors, lower-income respondents were less likely to say that they avoided going outside or that they used a N95, KN95, or respirator.

Figure 28. Respondents from recruitment B that selected changes they made to their routine outdoor activities during the 2020 wildfire smoke events.



Significant findings

Disabilities
 More likely to select
 » stayed home
 » avoided going outside
 » used N95, KN95, or respirator
 Less likely to select
 » used another type of mask

Lower income
 Less likely to select
 » avoided going outside
 » used a N95, KN95, or respirator
 » used another type of mask

High exposure
 More likely to select
 » avoided going outside
 » used N95, KN95, or respirator
 Less likely to select
 » used another type of mask

Non-home owner
 Less likely to select
 » avoided going outside

Spanish preference
 More likely to select
 » stayed home

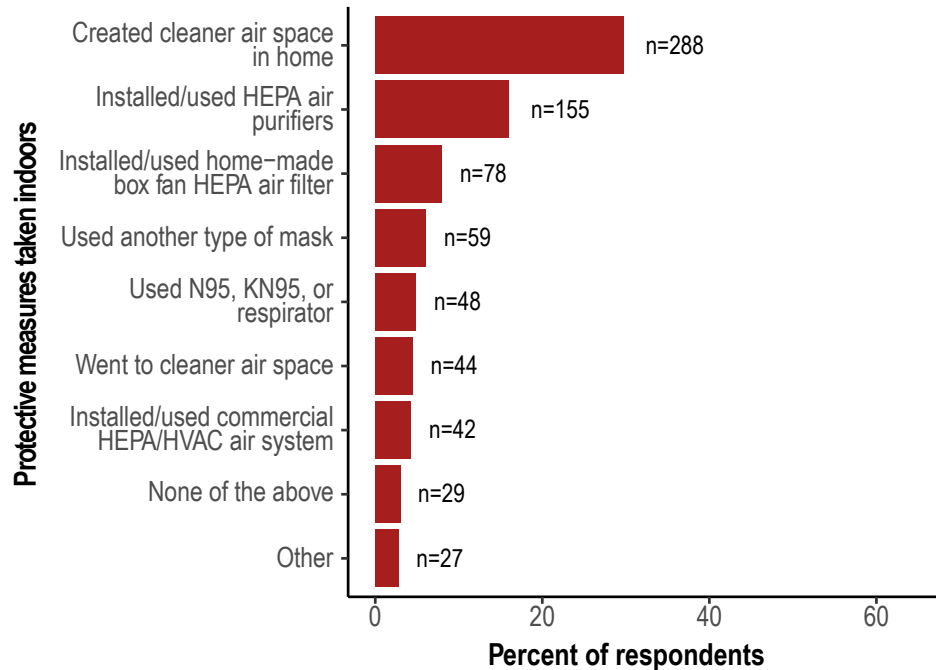
Recommendation Increasing access to personal protective equipment for lower income populations could reduce their exposure to smoke, especially for those that are less able to avoid going outside during smoke events

Recruitment A: Changes to indoor activities

We asked respondents what protective actions they took while indoors. Only respondents that said they took protective measures while indoors could respond. Respondents could select more than one response.

Takeaway. Many respondents created a clean airspace within their homes. Others installed or used HEPA air purifiers.

Figure 29. Respondents from recruitment A that selected protective actions they took while indoors during the 2020 wildfire smoke events.



Significant findings

High exposure

- More likely to select
 - » commercial HEPA/HVAC air system
- Less likely to select
 - » portable HEPA air filter

Lower income

- Less likely to select
 - » created cleaner air space
 - » went to cleaner air space

Non-English Preference

- More likely to select
 - » portable HEPA air filter

Non-home owner

- Less likely to select
 - » commercial HEPA/HVAC air system
 - » home-made box fan HEPA air filter

Rural

- Less likely to select
 - » portable HEPA air purifier

Vulnerable

- More likely to select
 - » portable HEPA air purifier
 - » home-made box fan HEPA air filter

Recommendation

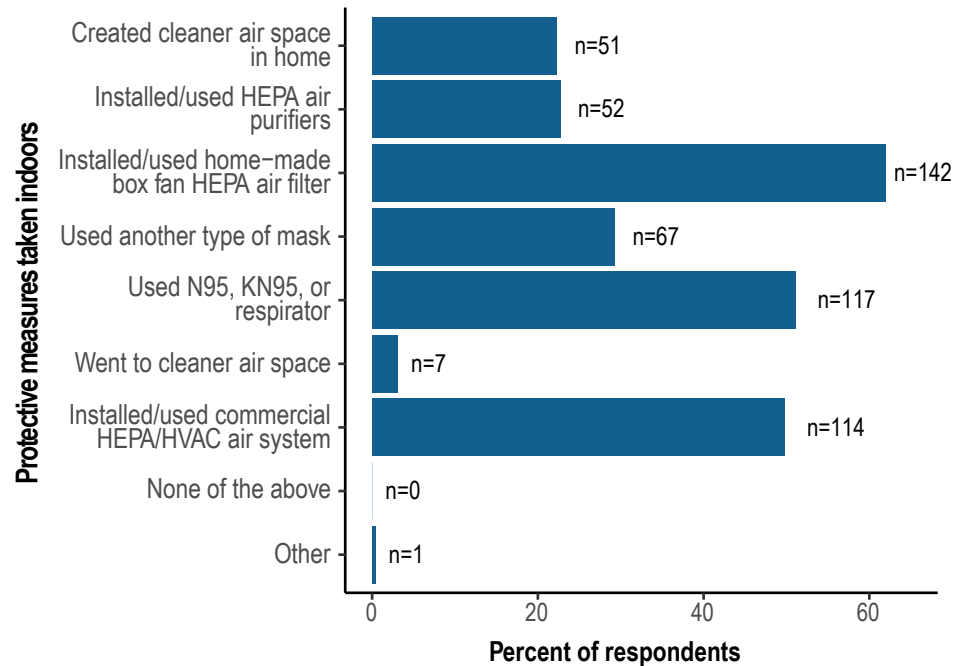
More information is needed to understand what factors contributed to the creation of a cleaner air space and the use of filters.

Recruitment B: Changes to indoor activities

We asked respondents what protective actions they took while indoors. Only respondents that said they took protective measures while indoors could respond. Respondents could select more than one response.

Takeaway. Most respondents said that they used a home-made box fan HEPA air filter, used N95, KN95, or respirators, or used a HEPA/HVAC commercial air system in their homes.

Figure 30. Respondents from recruitment B that selected protective actions they took while indoors during the 2020 wildfire smoke events.



Recommendation

More information is needed to understand what factors contributed to the creation of a cleaner air space and the use of filters.

Significant findings

Disabilities

Less likely to select

- » portable HEPA air purifier
- » created cleaner air space

More likely to select

- » commercial HEPA/HVAC air system
- » home-made box fan HEPA air filter
- » N95, KN95, or respirator

Lower income

More likely to select

- » commercial HEPA/HVAC air system

Less likely to select

- » created cleaner air space
- » used another type of mask

High exposure

More likely to select

- » created cleaner air space
- » N95, KN95, or respirator

Non-home owner

Less likely to select

- » portable HEPA air purifier
- » created cleaner air space

Spanish preference

Less likely to select

- » used another type of mask

More likely to select

- » portable HEPA air purifier

Key findings and recommendations

Patterns and correlations surrounding information sources and needs. Communicators should become familiar with the ways different demographic groups access information and be prepared to leverage those channels of communication during a smoke event. Although most people relied on their own observations or the internet for information about air quality, this was not equally true across all demographics. For example, internet and television were popular choices for respondents in recruitment B, but radio was also widely selected. Older adults were more likely to use television as a common source of information but less likely to select radio, internet, and their employer as sources of information. Radio was an important source of information for respondents in recruitment B and for frequently exposed respondents in recruitment A.

Non-White and Hispanic demographics from recruitment A were more likely to select friends or family as a source of information. As communications become increasingly reliant on digital platforms, it is important to remember the role that friends and family play in these communities. Communicators and policymakers may wish to consider investments in grassroots communication strategies, trusted community spokespersons, and recognized online social influencers to advance health equity.

Respondents from recruitment A who selected television or radio as an information source indicated that broadcast television and commercial radio met their information needs. By contrast, respondents from recruitment B who selected television, radio, or internet indicated that public television, public radio, and AirNow.gov met their needs but social media, commercial and talk radio, and broadcast television either did not meet their needs or were overwhelming.

Large numbers of respondents were interested in having forecasts about air and smoke conditions, information about how to stay safe both indoors and outdoors, and about how to use personal protective equipment. Airshed monitoring efforts should expand and diversify current efforts to simplify and communicate air quality conditions. Communicators should continue to intensify their efforts to educate the public about personal protective equipment and other ways to stay safe in both indoor and outdoor settings.

Patterns around health behaviors related to preventing smoke exposure. Most respondents made changes to their outdoor activities to protect themselves. However, lower-income respondents across recruitments were less likely to report that they avoided going outside. Lower-income respondents in recruitment B were also less likely to use an N95 mask, KN95 mask, or respirator. Increasing access to this type of personal protective equipment could reduce exposure to this group, especially if they are less able to avoid going outside during smoke events.

Less than half of the respondents in recruitment A indicated that they took protective actions indoors and use of N95 masks, KN95 masks, and respirators were reported less often than other protective actions taken while outdoors. Though not conclusive, education may be needed to ensure proper selection of masks as a higher number of respondents indicated using other types of masks while indoors. However, we note that the 2020 wildfires and this evaluation occurred during a statewide indoor mask mandate due to the COVID-19 pandemic.

Information relevant for raising awareness and preparedness of specific risk groups. Although 85 percent of respondents from recruitment B reported feeling prepared for the 2020 smoke events, 68 percent of respondents from recruitment A reported feeling unprepared. Most respondents from recruitment A would have felt more prepared if they had access to adequate household protections and information on what to do during a smoke event. Over half of respondents in recruitment B who felt unprepared would have felt more prepared for the smoke events if they had adequate household protections or cleaner air spaces in their community.

The majority of respondents were concerned about the effects of wildfire smoke on the health of vulnerable people followed by risks to their own health. Mass communications during smoke events should leverage messaging on health risks to self and vulnerable people to help meet this need. To further meet this need, we recommend tailoring messages by demographic to be distributed through their preferred sources of information in advance of smoke events. For example, people in communities with frequent smoke exposures and rural communities indicated greater concern for safety of pets and livestock. However, while more exposed respondents reported using a variety of information sources, rural respondents were less likely to select television as a source of information. In considering what type of media to use for messaging about information about pet and livestock protection, communicators should emphasize sources other than television to reach rural audiences.

Based on the finding that most respondents felt prepared because they had previously experienced smoke events, we recommend practitioners experiment with and find safe ways for people to gain experience with protective actions for poor air quality conditions. Alternatively, we recommend harnessing the knowledge and experience of people that have previously been exposed to smoke to help prepare others in their community.

Respondents from recruitment B reported having much more experience with smoke than those in recruitment A, including the Hispanic/Latinx respondents in recruitment A. This factor indicates a potential sampling bias, especially given that recruitment A did not show that Oregon's Hispanic/Latinx population are disproportionately more exposed than other groups in the state. Although we recognize that the recruitment B sample of Hispanic/Latinx respondents is not likely to be representative of the larger Hispanic/Latinx population of Oregon, communicators should find ways to engage with similarly prepared and invested communities to inform how they communicate with less informed and/or prepared communities across the state.



Potential areas and questions for future research. In addition to potentially oversampling Hispanic/Latinx respondents that experienced an evacuation during the 2020 wildfires, the survey also sampled a larger than expected number of respondents reporting a disability. Future evaluations should explore the possible implications this may have on research methodologies, information dissemination, or community engagement strategies. Furthermore, it may be necessary to administer the survey tool through non-internet based methods to evaluate whether preferred information sources were biased in any way due to the survey being distributed through a web-based platform.

Respondents from recruitment A would have felt more prepared if they had access to adequate household protections and information on what to do during a smoke event. This finding suggests further evaluation is needed to determine why the use of indoor protections were lower for this group, including an evaluation of knowledge, practices, attitudes, beliefs, and potential barriers to the use of household protections.

Respondents in recruitment B would have felt more prepared for the smoke events if they had adequate household protection or cleaner air spaces in their communities. This finding suggests a need for additional information to characterize the availability, access, and quality of in-home and community clean air spaces, and to identify best practices from programs designed to meet this perceived need.

Respondents from recruitments A and B reacted to the 2020 wildfire smoke events by taking different protective actions in their home. Respondents from recruitment A were more likely to create a clean airspace and use a HEPA air purifier. Respondents from recruitment B were more likely to use a home-made box fan, N95 mask, KN95 mask, or a respirator, or use HEPA/HVAC commercial air system in their homes. More information is needed to understand what factors contributed to the use of different protective measures.

Respondents relied heavily on their own observations of smoke conditions, closely followed by use of internet sources and television as sources of information. Further analysis is needed to understand the interplay between information sources and to better understand whether and how individuals might be supplementing their observations with other sources of information, how they interpret their observations, and the actions they take based on their observations.

Although Oregon Smoke Blog is considered Oregon's most comprehensive source of smoke information, few respondents reported using it. More information is further needed to understand who uses Oregon Smoke Blog, how they are using it, and why it is not more widely utilized.

Results show that use of information sources varied across demographics. It is encouraging that communities with higher exposure were more likely to use multiple sources of information, which may provide communicators with more viable options for communicating with those in most immediate need of air quality information. However, more information is needed to determine why this is the case and to determine the implications for communities experiencing less frequent smoke exposure. Additional information is further needed to adequately characterize the communication needs of Hispanic/Latinx communities.

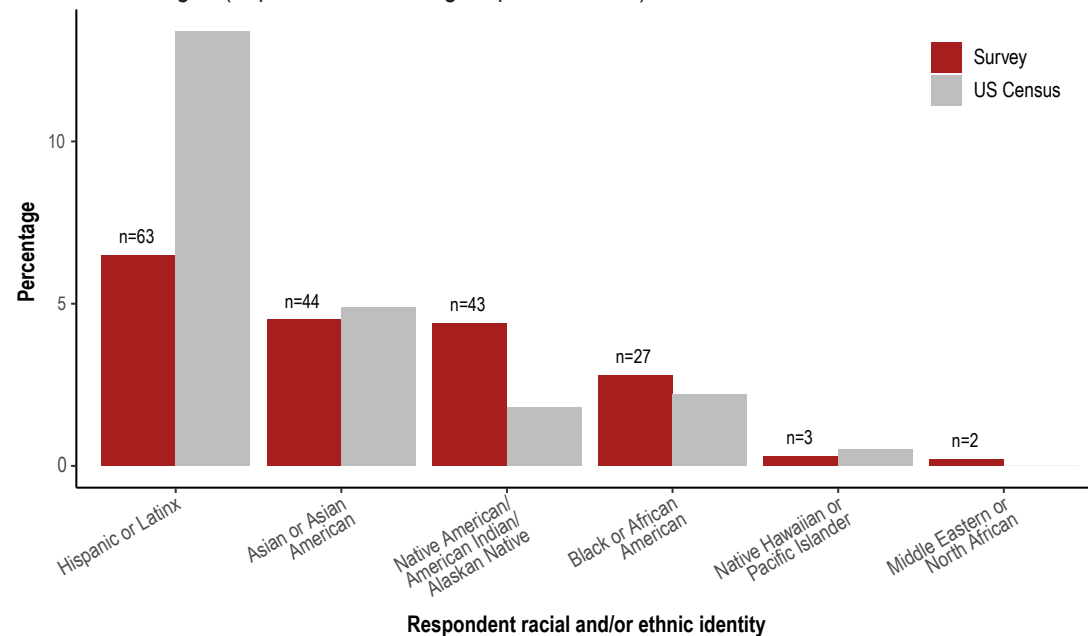
Appendix A. Findings from respondent demographic questions

Racial and ethnic identity

As a proxy for unmeasured social factors that may be associated with racial and ethnic identity, the survey asked respondents “how do you identify yourself?”* Following precedent set in the 2000 US Census, the question allowed for multiple responses and offered race/ethnicity categories common to the United States. For recruitment A, approximately 85 percent of respondents identified as “White.” This result is comparable to US Census data which reports the 87 percent of Oregon’s population identifies as White. Hispanic/Latinx represented the largest non-White identity (Figure 31), at just over 6 percent. Ethnic

respondent demographics for recruitment A consisted of two groups: the Hispanic/Latinx respondent demographic and non-White or Hispanic/Latinx respondent demographic, which combines all non-White, non-Hispanic/Latinx identities in order to maximize statistical power. Recruitment B required that respondents initially identify as Hispanic/Latinx, but they were also asked how they identify themselves. This means that 100% of respondents in recruitment B identified as Hispanic/Latinx. Eighteen of these respondents also identified as White, and one respondent identified as “Other,” writing in “Mestiza.”

Figure 31. Respondents with non-white identities in recruitment A compared to US Census data for the state of Oregon (<https://www.census.gov/quickfacts/OR>).



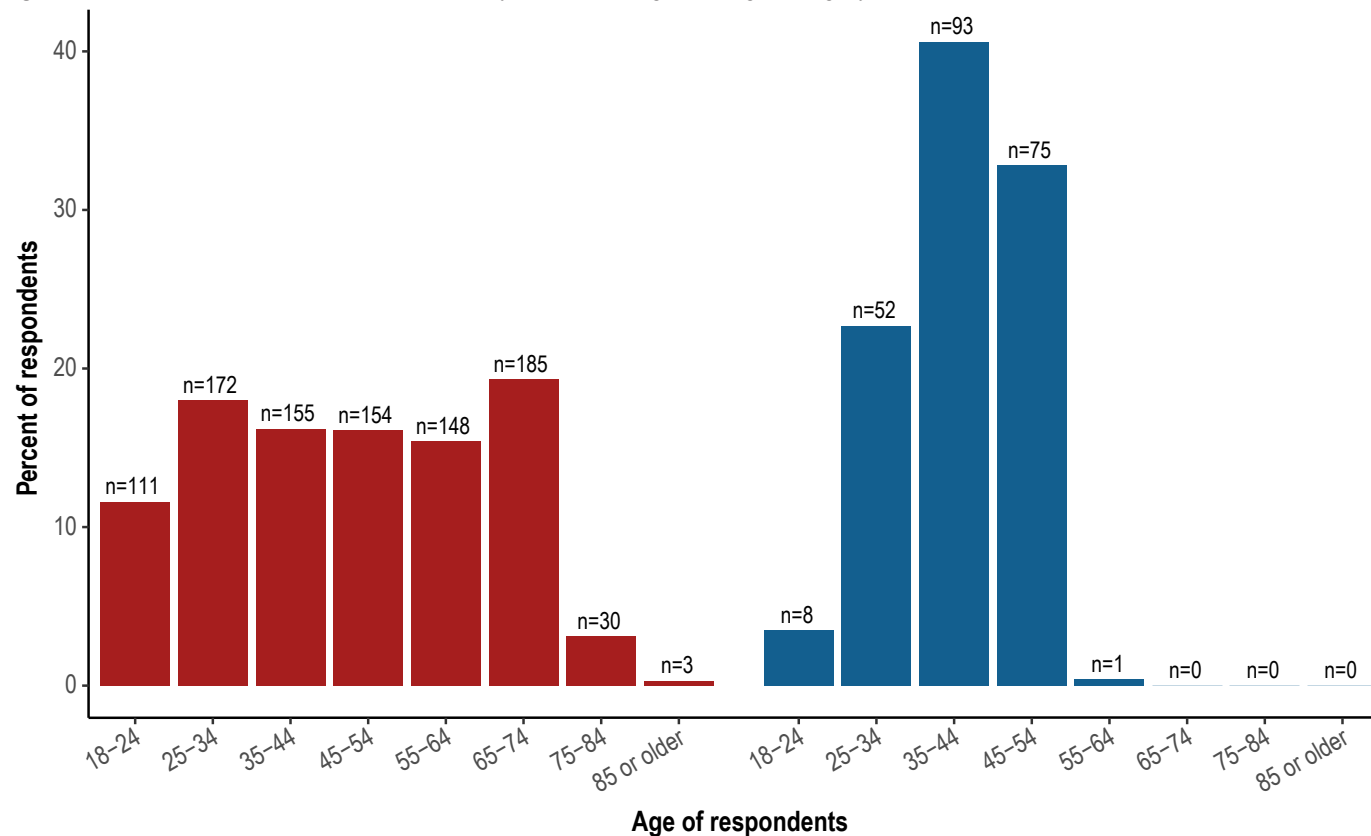
* See Mays, V.M., Ponce, N.A., Washington, D.L., & Cochran, S.D. (2003). Classification of race and ethnicity: Implications for public health. *Annual Review of Public Health*, 24: 83-110. <https://www.doi.org/10.1146/annurev.publhealth.24.100901.140927>

Age

The age of respondents in recruitment A ranged between 18 to 24 and 85 or older. The largest number of responses from recruitment A came from people with ages between 65 and 74.

The age of respondents in recruitment B were generally younger, ranging between 18 to 24 and 55 to 64 years of age. The majority of responses from recruitment B came from respondents between 35 and 54 years old.

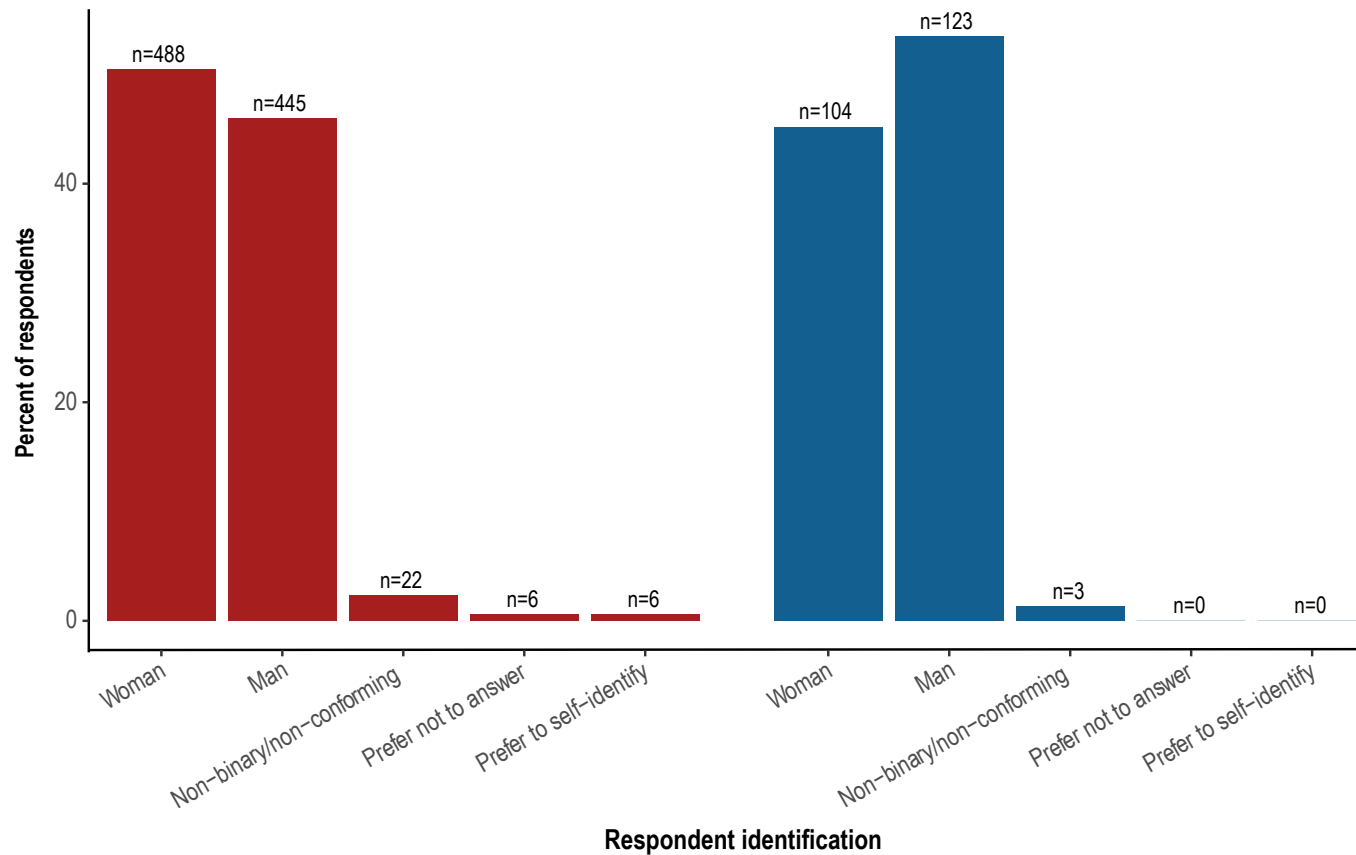
Figure 32. Recruitment A and B respondents by their predesignated age category..



Gender

Recruitment A selected gender identities were 46 percent “man”, 51 percent “woman”, 2 percent “non-binary/non-conforming”, 0.6 percent “prefer to self-identify”, and 0.6 percent “prefer not to answer.” Recruitment B selected gender identities were 54 percent “man”, 45 percent “woman” and less than one percent “non-binary/non-conforming.” The other categories did not receive responses.

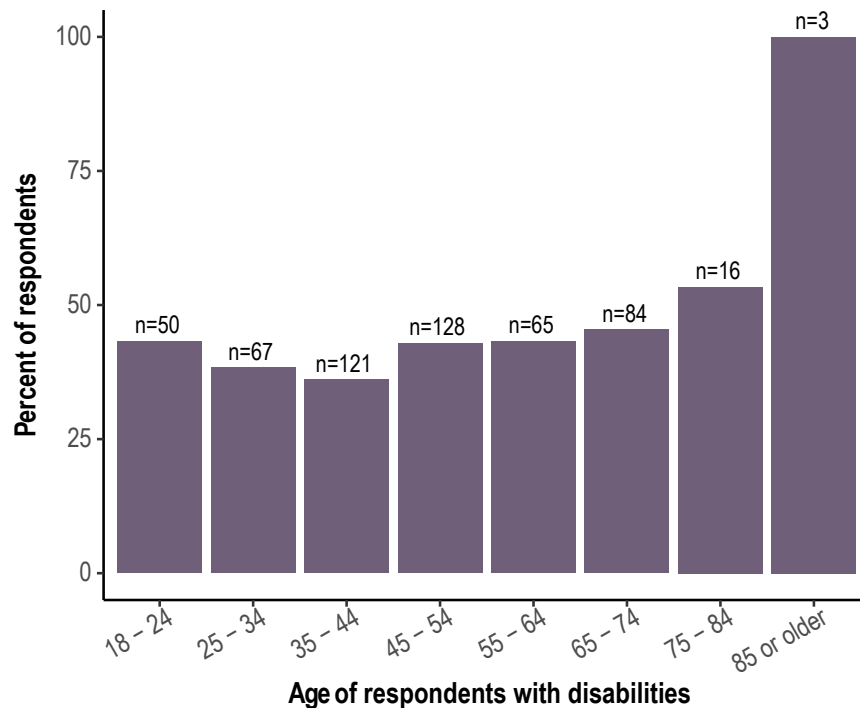
Figure 33. Gender identities from respective recruitment efforts.



Respondents with disabilities

According to the Centers for Disease Control and Prevention, 26 percent of Oregon adults have at least one disability. In 2012, the Oregon Office on Disability and Health reported at least one disability for 20 percent of 18-39 year olds, 29 percent of 40-59 year olds, 39 percent 60-79 year olds, and 52 percent of persons 80 years or older*. Although, definitions of what constitutes a disability vary, given this distribution, it is clear that both of our recruitment efforts oversampled persons with disabilities across all age groups (Figure 34).

Figure 34. Respondents with at least one disability by age category.



Household characteristics

Respondents' households varied in size (Table 3) with either two (recruitment A) or three (recruitment B) members being most common. Fifty-two percent of respondents from both recruitment efforts owned their own home (recruitment A n=506, recruitment B n=119). Renters constituted 37 percent (n=360) for recruitment A and 16 percent (n=37) for recruitment B. Eight percent (n=81) and 31 percent (n=70) lived with family or friends for recruitment A and B, respectively. Eleven respondents from recruitment A and two from recruitment B reported being unhoused. Finally, 13 respondents from recruitment A and one from recruitment B selected "other," explaining that they live in an RV or that they live rent-free at their workplace (e.g., on a farm).

Table 3. Respondent household sizes for recruitments A and B. Recruitment A had 36 missing responses.

	Number of household members						
	1	2	3	4	5	6	> 6
Recruitment A	19%	38%	14%	13%	8%	3%	2%
Recruitment B	0%	2%	63%	29%	5%	1%	0%

* Oregon Office on Disability and Health. (2012). Disability in Oregon: 2012 annual report on the health of Oregonians with disabilities. Portland, OR: Institute on Development & Disability, Oregon Health & Science University.

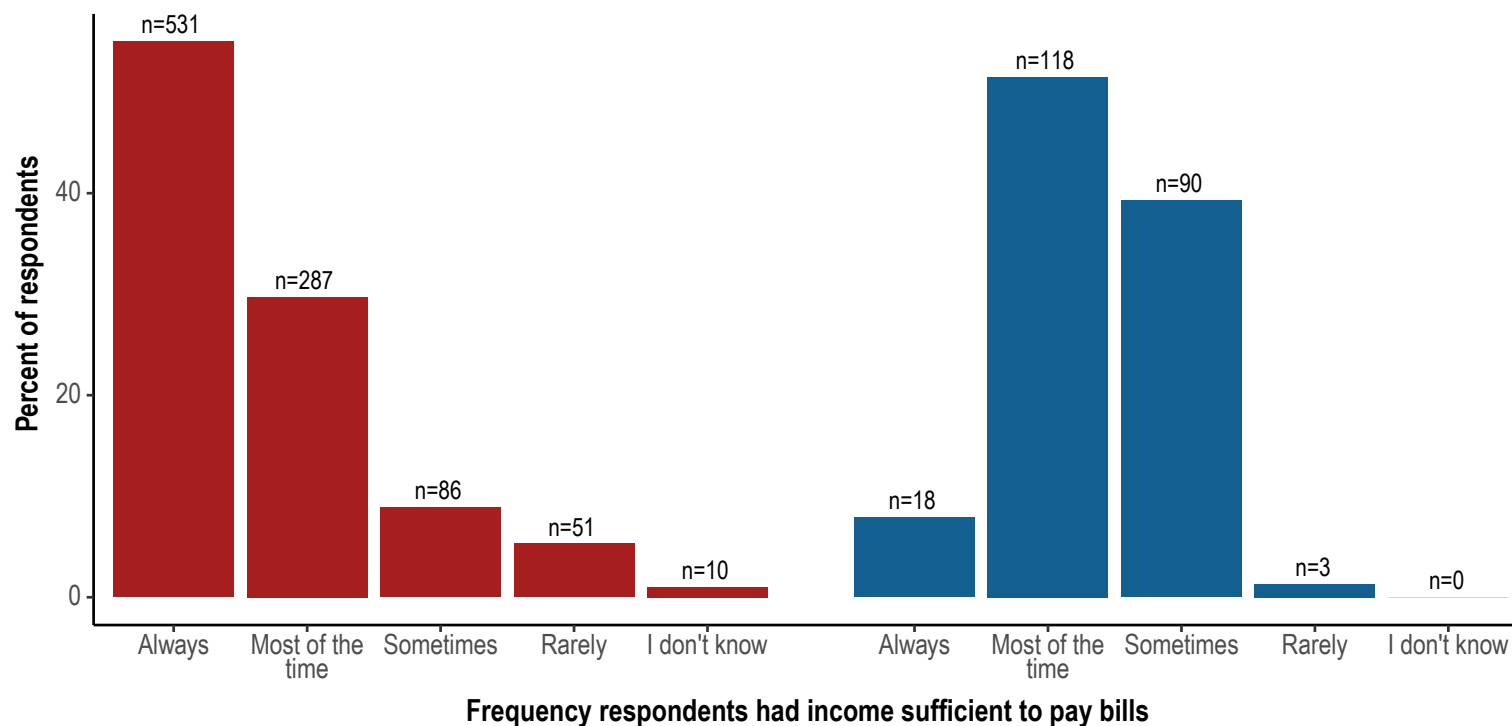
Lower-income respondents

Fifty-five percent of respondents in recruitment A reported that their household income was always sufficient to pay bills compared with only eight percent of those from recruitment B. Instead, 52 percent of recruitment B reported that their income was sufficient “most of the time” and 36 percent reported that it was only “sometimes” sufficient.

Vulnerable populations

We asked respondents if any vulnerable populations lived in their houses during the 2020 wildfire smoke events. Vulnerable populations are those that are considered at higher risk of health impacts from wildfire smoke. According to the US EPA, these groups include people with asthma or other respiratory diseases, people with cardiovascular disease, children, pregnant women, older adults (65 years or older), and outdoor workers. Respondents could select more than one category. Seven hundred forty-eight respondents from recruitment A (77 percent of total responses) reported having at least one member of their household that could be considered more vulnerable to wildfire smoke.

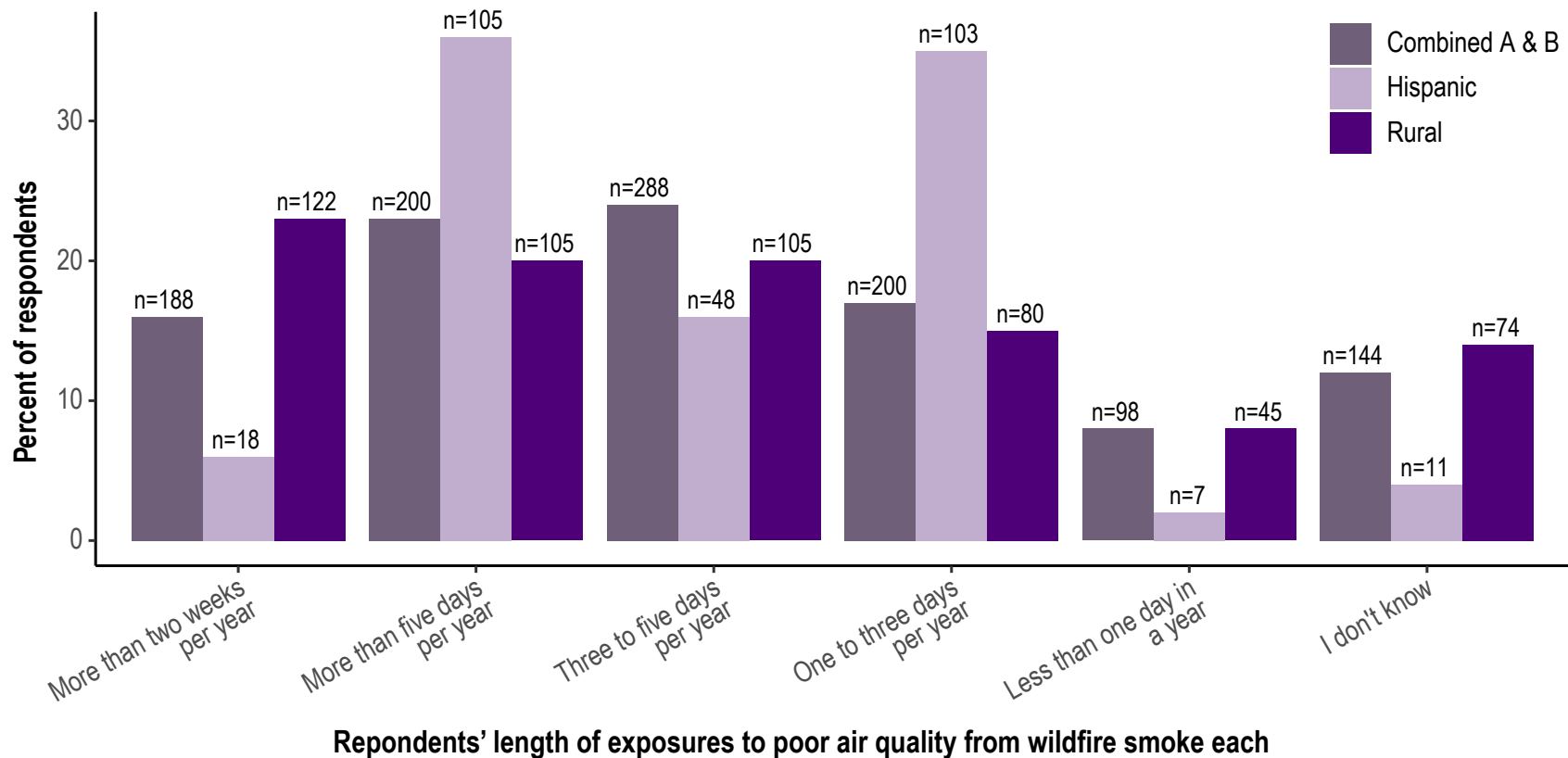
Figure 35. Respondents that selected how often their household income was sufficient to pay bills for each recruitment.



Respondents with high exposure to smoke

We asked respondents how often they think they are exposed to unhealthy air quality from wildfire smoke in a given year. In our combined recruitment efforts, 24 percent of respondents said three to five days per year followed by 23 percent reporting more than five days per year. For Hispanic/Latinx respondents, 36 percent reported more than five days per year while 35 percent reported one to three days per year. For rural residents, 23 percent reported more than two weeks per year, compared to 16 percent statewide.

Figure 36. Respondents reporting different levels of exposure to poor air quality from wildfire smoke in a given year.



Appendix B. Significant findings by respondent demographic

Rural respondents in recruitment A represent 50 percent (n=482) of the sample. They were significantly:

- » more likely to say that they experience more than five days of smoke in any given year.
- » more likely to feel prepared for the smoke events due to previous experience with smoke events.
- » more likely to select the response that “nothing” would have made them feel more prepared for the smoke events and less likely to say that access to personal protective equipment, adequate household protections, or clean air shelters in their community would have made them feel more prepared.
- » less likely to report that during the 2020 smoke events they used an N95 mask, KN95 mask, or respirator or another type of mask outdoors.
- » less likely to say they had used HEPA air purifiers indoors.
- » less likely to say they were concerned with risks of smoke to their health, to the health of vulnerable people, or about the effects of smoke on the safety of food from their garden or from the store.
- » less likely to select television or their employer as a source of information about smoke.
- » less likely to want information about how to stay safe indoors and about personal protective equipment.

Rural respondents in recruitment B represent 23 percent (n=53) of the sample. They were significantly:

- » more likely to have evacuated during the 2020 smoke events.
- » more likely to have obtained information from the internet.
- » more likely to want information on how to stay safe outdoors and about the safety of food from their garden or store.
- » less likely to have evacuated during the 2020 wildfire season.

Older respondents (65 years or older) in recruitment A constitute 22 percent (n=218) of the sample. These respondents were significantly:

- » more likely to report the use of television and less likely to report the radio, internet, or employer as a source for information during the 2020 smoke events.
- » more likely to say they would like more information about smoke forecasts and conditions, but less likely to say that they would like information on how to stay safe outdoors or about the safety of food from the garden or store.
- » more likely to attribute their preparedness to having emergency supplies and the perception that they already knew what to do in the case of a smoke event.
- » less likely to express concerns for the safety of their pets or livestock or the effects of smoke on the safety of food from their garden or the store.
- » less likely to suggest that access to personal protective equipment, adequate household protections, or clean air shelters would have helped them feel more prepared.
- » less likely to report that they installed or used a homemade box fan HEPA filter or that they used an N95 mask, KN95 mask, or respirator indoors during the 2020 smoke events.

There were no respondents 65 years or older in recruitment B.

Lower income respondents in recruitment A (those that reported rarely or only sometimes having enough money to pay household bills) represented 14 percent (n=137) of the recruitment A sample. They were significantly:

- » more likely to say that access to clean air shelters in their community would help them feel more prepared for a smoke event.
- » less likely to say they obtained their information from television.
- » less likely to say they would like more information about smoke forecasts.
- » less likely to report that they took protective actions for smoke either indoors or outdoors.
- » less likely to say they stayed home or avoided going outside.
- » less likely to say that they use portable HEPA air purifiers, that they created a cleaner airspace in their home, or that they went to a cleaner air space.

Lower income respondents in recruitment B represented 41 percent (n=93) of the recruitment B sample. They were significantly:

- » more likely to have evacuated to another location during the smoke events.
- » less likely to be concerned for the health of vulnerable people, the safety of their pets or livestock, or the effects of smoke on food from their garden or the store.
- » less likely to get their information about smoke from the television or friends and family, but more likely to get information from the internet.
- » less likely to want information about how to stay safe indoors, personal protective equipment, and smoke forecasts and conditions.
- » less likely to say that they were prepared because their community has a plan for wildfire smoke or that they knew what to do during a wildfire smoke event.
- » less likely to report that they took precautions outdoors.

- » less likely to totally avoid or reduce the time they spent outdoors; have used a N95 mask, KN95 mask, or respirator when outdoors; or to use another type of mask outdoors.
- » less likely to say they used another type of mask indoors or that they created a cleaner airspace in their home by keeping windows and doors shut.

Respondents with at least one disability in recruitment A represented 42 percent (n=412) of the recruitment A sample and were significantly:

- » more likely to have experienced evacuation during the 2020 smoke events.
- » more likely to have reported that they are exposed to more than five days of smoke in a year.

Respondents with at least one disability in recruitment B represented 57 percent (n=131) of the recruitment B sample. They were significantly:

- » more likely to be concerned about the risks of smoke to their own health and for the health of vulnerable peoples.
- » more likely to be concerned about the effects of smoke on the safety of food from their garden or the store, but less likely to be concerned for the safety of pets or livestock.
- » more likely to want information about how to stay safe while indoors, about personal protective equipment, and forecasts about air and smoke conditions.
- » more likely to say there were prepared for the 2020 smoke events.
- » more likely to say that previous experience with smoke events, community plans for wildfire smoke, and having emergency supplies contributed to their preparedness.
- » more likely to have stayed home; totally avoided or reduced time outdoors; or have used a N95 mask, KN95 mask, or respirator outdoors, but less likely to have used another type of mask outdoors.
- » more likely to have taken protective actions while indoors.

- » more likely to have evacuated during the 2020 smoke events.
- » more likely to report that they are exposed to five or more days of wildfire smoke per year.
- » more likely to have installed a HEPA HVAC, a home-made HEPA box fan, or to have used a N95 mask, KN95 mask, or respirator indoors.
- » less likely to get information about smoke from their own observations, and more likely to get their information about smoke from the radio and from friends and family.
- » less likely to want information about how to stay safe while engaged in outdoor activities.
- » less likely to have used a portable HEPA air purifier or to have created a cleaner airspace in their home by keeping windows and doors shut.

Respondents with a language preference other than English in recruitment A represent 4 percent (n=35) of the sample. They were significantly:

- » more likely to have used an N95 mask, KN95 mask, or respirator outdoors.
- » more likely to have used a portable HEPA air purifier indoors.
- » less likely to want information about how to stay safe while engaged in outdoor activities.

Respondents with a Spanish-language preference in recruitment B represent 38 percent (n=86) of the sample. They were significantly:

- » more likely to be concerned for their health during the 2020 smoke events.
- » more likely to have obtained information about smoke from the television.
- » more likely to want information about personal protective equipment, smoke forecasts and conditions, as well as the safety of food from their garden or store.

- » more likely to feel prepared for the 2020 smoke events.
- » more likely to say they were prepared because they had experienced smoke in the past, emergency supplies, or knew what to do in the case of a smoke event.
- » more likely to say they stayed home or reduced time spent outdoors.
- » more likely to say they used a portable HEPA air purifiers, but less likely to wear a mask indoors.
- » less likely to have experienced evacuation during the 2020 smoke events.
- » less likely to report being exposed to five or more days of smoke in a year.

Respondents with vulnerable household members in recruitment A represent 77 percent (n=748) of the sample. They were significantly:

- » more likely to say they were concerned about the safety of pets or livestock.
- » more likely to get information about smoke from their employer.
- » more likely to want information on how to stay safe outdoors and the safety of food.
- » more likely to take protective actions outdoors and indoors.
- » more likely to feel more prepared if they had information on what to do or access to clean air shelters, but less likely to say that nothing would make them feel more prepared.
- » more likely to have used N95 mask, KN95 mask, or respirator outdoors.
- » more likely to have used a portable HEPA air purifier and to have installed a homemade HEPA box fan.
- » more likely to have been evacuated during the 2020 smoke events.

Nearly 100 percent (n=228) of the recruitment B sample had vulnerable household members

Respondents with high exposure to smoke (>5 days per year) in recruitment A made up 38 percent (n=367) of the sample. They were significantly:

- » more likely to be concerned about risks to their health, the health of vulnerable people, and their pets or livestock.
- » more likely to get their information from the television, radio, internet, and from friends or family.
- » more likely to want more information about how to stay safe outdoors, personal protective actions, smoke forecasts or conditions, and the safety of food from their garden or the market.
- » more likely to say they felt prepared because they had experienced smoke events in the past and that they knew what to do in the event of wildfire smoke.
- » more likely to feel more prepared if had access to personal protective equipment and adequate household protections.
- » more likely to take protective actions outdoors and indoors.
- » more likely to have used another type of mask outdoors.
- » less likely to have used a portable HEPA air purifier, but more likely to have installed a commercial HEPA/HVAC air system.

Respondents with high exposure to smoke in recruitment B made up 43 percent (n=98) of the sample. They were significantly:

- » more likely to be concerned with the health of vulnerable people and food from their garden or the store.
- » more likely to have obtained information on smoke from the television, friends or family, or their employer.
- » more likely to want information about how to stay safe while engaging in outdoor activities.

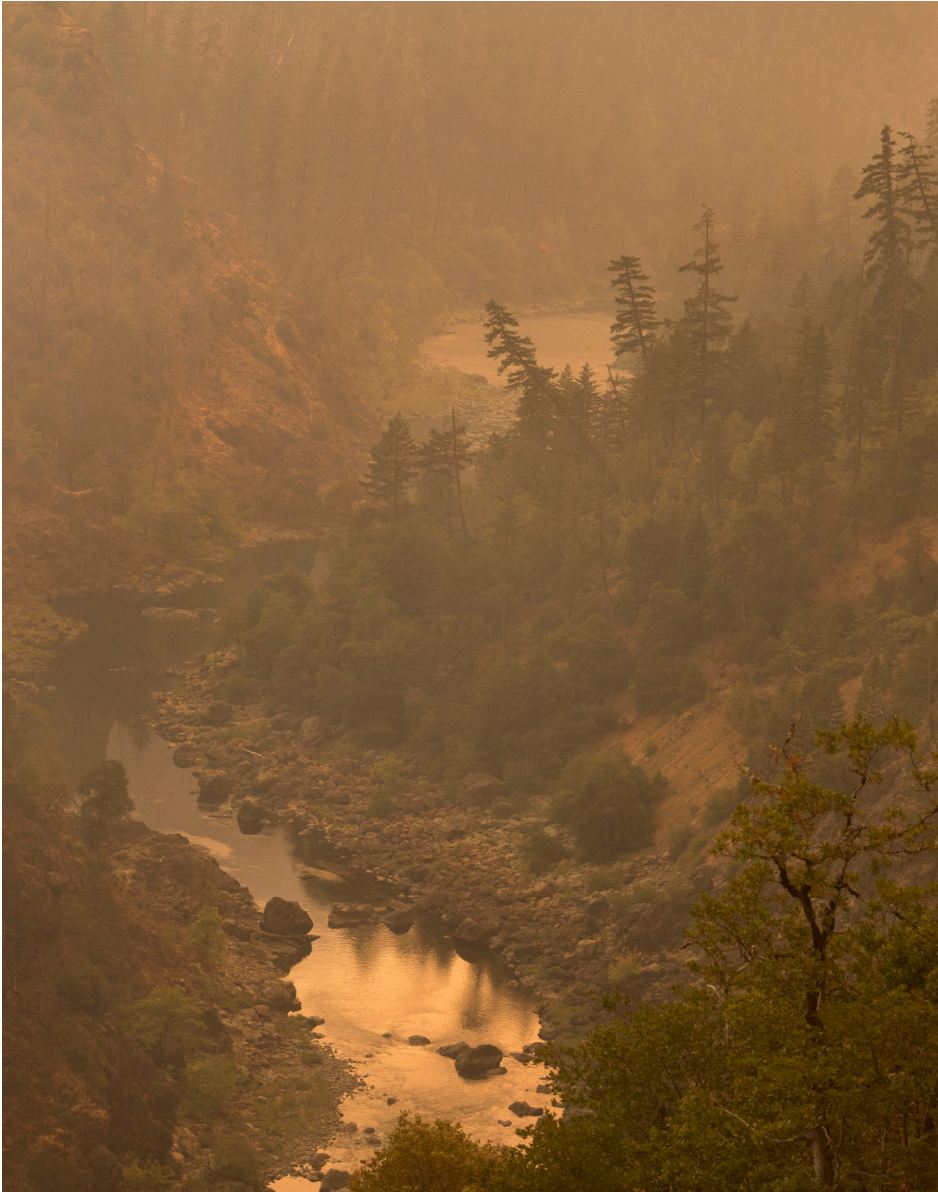
- » more likely to have stayed home/reduced number of time left home and have used a N95, KN95, or other respirator while outdoors.
- » more likely to have used N95, KN95, or other respirator while indoors and to have created a clean air space in their home.

Respondents who were not White or Hispanic in recruitment A represent 13 percent (n=127) of the sample. They were significantly:

- » more likely to get information about smoke from friends and family.
- » more likely to have felt prepared if they had access to personal protective equipment.

Respondents who did not own their home in recruitment A made up 48 percent (n=465) of the sample. They were significantly:

- » more likely to feel more prepared for a smoke event if they had access to clean air shelters in their community or information about the possibility of a smoke event.
- » less likely to be concerned for the health of vulnerable people.
- » less likely to feel more prepared for a smoke event if they had access to personal protective equipment.
- » less likely to have taken protective measures or made changes to their routine outdoor activities.
- » less likely to have totally avoided or reduced the time they spend in usual outdoor recreation or exercise.
- » less likely to have installed a HEPA/HVAC air system or to have used a home-made box fan HEPA air filter indoors



Respondents who did not own their home in recruitment B

made up 48 percent (n=367) of the sample. They were significantly:

- » more likely to have evacuated to a different location during the 2020 smoke events.
- » more likely to want forecasts about air and smoke conditions.
- » less likely to be concerned about the safety of their pets or livestock.
- » less likely to have obtained information on smoke from the television.
- » less likely to want information about how to stay safe while indoors or information about the safety of food from their garden or the market.
- » less likely to say they were prepared for the 2020 smoke events because they already had emergency supplies stored in their home.
- » less likely to have totally avoided or reduced the time they spend in usual outdoor recreation or exercise.
- » less likely to have used portable HEPA air purifiers and less likely to have created a cleaner air space in their home.



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