Conveying Public Health Messages about Wildfire Smoke Exposure

The University of Washington
Center for Exposures, Diseases,
Genomics & Environment

UW EDGE
ENVIRONMENTAL & OCCUPATIONAL HEALTH SCIENCES

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Contents

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Abstract

In Washington State, the Methow and Okanogan Valleys are at risk for devastating wildfires and associated smoke events. In 2020, Clear Air Methow and the University of Washington developed a campaign that used stories from trusted community members to share strategies for reducing wildfire smoke exposure and coping with wildfire smoke events. “The Fifth Season” was created as an audiovisual exhibit featuring portraits of diverse community members and listening stations to play short stories about their wildfire experiences. The effectiveness of this campaign was evaluated through surveys. Findings from seventeen evaluation survey respondents that listened to one or more of the stories indicate that personal stories and striking portraits involved in this campaign resonated with listeners and encouraged implementation of risk-reducing behaviors. The Fifth Season will continue to be displayed at locations throughout the region, and provides lessons learned for community-driven risk communications campaigns for emergent hazards.

Keywords:

Risk communication, wildfire smoke, community engagement, environmental health

Introduction

In August 2018, Washington State's Methow and Okanogan Valleys in Okanogan County, home to just over 43,000 Washingtonians (United States Census Bureau, 2023b), remained shrouded by heavy wildfire smoke for over three weeks. Oppressive smoke from wildfires in Washington and British Columbia blocked out the sun, causing noon to look like dusk (Image 1). Even those not in populations identified as "sensitive," reported headaches, scratchy throats, and anxiety after being outside for more than a few minutes (Partlow, 2021). Staying indoors did not provide much of a respite. Only 53% of Washington households have access to AC (U.S. Energy Information Administration, 2023), and it is common for residents to open windows, at least at night, to cool down homes and businesses in hot weather. The area's relatively low per capita income ($26,365 in Okanogan County, WA compared to $43,817 in Washington state) further precludes widespread access to air conditioning (United States Census Bureau, 2023c). With mega fires burning across the West (Xue et al., 2021; National Centers for Environmental Information, 2018), there was limited opportunity to escape.

Image 1: Wildfire smoke blocks out the sun in the Methow Valley. (Photo by Ryan Bell)

Lifelong Methow and Okanogan Valley residents will tell you that wildfire smoke is not a new phenomenon (Figure 1). They have dealt with it most summers, all their lives. But, they will also tell you that it is getting worse. Some will go so far as to say that they can't recall any time the smoke was thicker or lasted longer than it has during the past few summers. In fact, they now recognize five seasons in the rural west: fall, winter, spring, summer, and *wildfire*.

Rural communities, and those in proximity to wilderness areas, face tremendous risks each summer as uncontrollable fires inch closer to their homes, including injuries (Westerling, 2016; Squire et al., 2011; Bartholdson & von Schreeb, 2018) and clinically significant mental health impacts (Eisenman et al., 2015). As fires burn for longer periods across larger swaths of forest, wildfire smoke exposure is becoming an increasing concern. Smoke compounds the negative experiences of communities vulnerable to the physical impacts of wildfire and poses new threats to communities located further away from the flames (Munoz-Alpizar et al., 2017; Moeltner et al., 2013). Projected increases in wildfire events will expose an additional 25 million people in the Western United States to multi-day wildfire smoke events by mid-century (Liu et al., 2016).

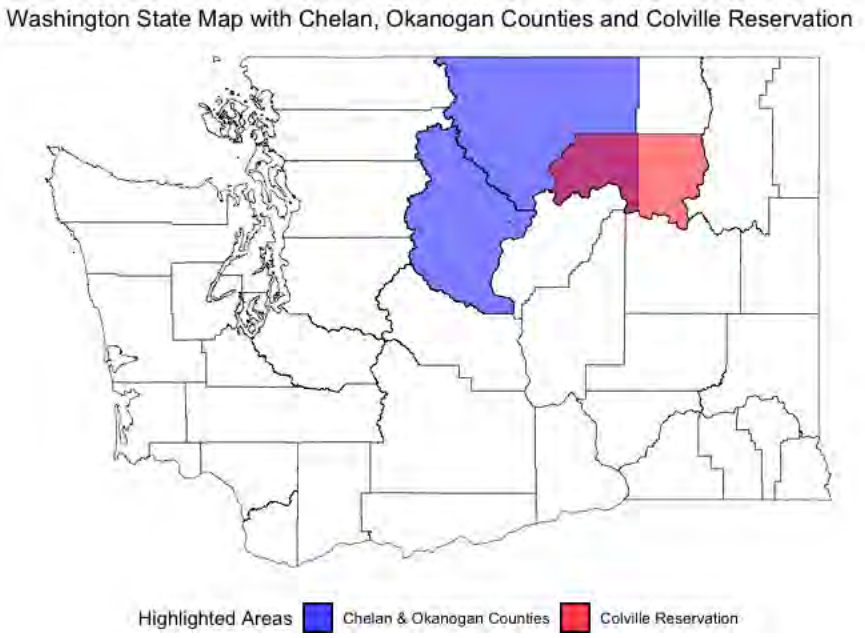

Figure 1: Map of the Area where Campaign Operated (United States Census Bureau, 2023a)

Yet, communicating the risk of wildfire smoke in rural and tribal communities requires an approach that recognizes historical harms and ongoing mistrust of government and academic organizations. In communities where there is a lack of trust in government organizations, trusted local organizations can be more effective at communicating risk (Fakhruddin et al., 2020). In risk communication, trust operates at multiple levels: trusted figures and institutions in a community deliver key messages and informed community members act as trusted individuals within their network to share information (Mabon, 2020). In the Okanogan Valley, qualitative research has demonstrated that information through a trusted source or intermediary may be more readily accepted than that from state and federal agencies (Wood et al., 2022). Trustworthiness was determined by perceived credibility of the source, quality of the information, and relationship with the source (Wood et al., 2022). Previous research in Okanogan County and the Colville Reservation also identified key elements of effective smoke risk communication, such as accounting for community perceptions of risk (D'Evelyn et al., 2023).

Recognizing the importance of trusted relationships and collaborations in wildfire smoke risk communication, in 2020, partners at Clean Air Methow and the University of Washington conceived a campaign that would elevate voices of trusted community members in North Central Washington to convey public health messages about reducing the negative health impacts of wildfire smoke exposure. The campaign built on work conducted by members of the study team, who used interviews with community members and local health providers to create a brochure about surviving wildfire smoke that was distributed before and during the 2020 smoke season, (Humphreys et al., 2022).

In the first phase of the new project, the project team conducted interviews with community members and used them to create a series of five-minute audio stories that played on the local radio station before and during the smoke season of 2021. In 2022, the project team created life-size portraits and listening stations featuring interviews with community members in an interactive installation at a brand-new library in Winthrop, WA. The team also worked with KUOW, a local National Public Radio station affiliate, to create an hour-long podcast about the issue of wildfire smoke that timed with the unveiling of the installation (Denkmann & Cowan, 2022). Also in 2022, the team led an evaluation effort to assess the effectiveness of the final phase of the project in raising awareness of how to mitigate the health impacts of wildfire smoke exposure.

Methods and Materials

Partner Organizations

Clean Air Methow (2020) is part of the Methow Valley Citizens Council (2024), a community-based non-profit organization founded in 1976 to protect the natural environment and rural character of the Methow Valley. Part of their mission is to educate and engage the public on issues related to the environment. Clean Air Methow was created in 2015 specifically to address year-round issues of poor air quality related to wood-burning stoves, outdoor burning, and wildfires.

The University of Washington Interdisciplinary Center for Exposures, Diseases, Genomics and Environment, or EDGE, (2024) is a National Institute of Environmental Health Sciences-funded "Center of Excellence" dedicated to conducting and communicating science that reduces the burden of environmentally related diseases through science translation into policy and practice. It sits within the Department of Environmental and Occupational Health Sciences in the University of Washington (UW) School of Public Health. The EDGE Center has been partnering with Clean Air Methow since 2017 on community-engaged research and risk communications related to wildfire smoke and health.

Selection of Interview Subjects

Selection of interview subjects for the audio stories portion of the campaign was conducted collaboratively between Clean Air Methow, the Colville Tribe, and EDGE. Interviewees were selected based on their professional role and/or leadership role in the community, as well as diversity in terms of age, income, lived experience and other factors. Eleven interviewees participated in a total of eight interviews (Appendix 1).

Phase 1: Audio Stories

In the first phase of the project, the study team and Clean Air Methow identified important local news sources, which included a local radio station and community Facebook group, and developed short audio stories.

Interviews were audio-recorded over Zoom and were used to create approximately five-minute audio stories (Clean Air Methow, 2020) narrated by a local youth and featuring music by a local composer.

The audio stories were played on KTRT, “The Root,” a local radio station based in the Methow Valley, three times a day, every day during wildfire smoke awareness week in June of 2021 and during subsequent

weeks when the Methow Valley was smoky. The stories were also featured on local social media accounts managed by Clean Air Methow and EDGE.

Phase 2: Portraiture and Listening Stations

For phase two of the project, a professional photographer based in the Methow Valley took portraits of each interviewee with a background of fake smoke and amber lights to mimic a wildfire smoke event and aspects of their professional and personal identities. After final editing, each portrait was printed on a 60-inch by 30-inch piece of alumna board. The result was an arresting series of portraits to engage audiences with messages about wildfire smoke from local voices.

For the final installation, each portrait was accompanied by a listening station designed to play a 1–2-minute version of the accompanying audio story through headphones. Each station consisted of a sound player in a wooden box with a large play button and attached pair of headphones. Boxes stood on metal stands at approximately waist height, displaying background information about each interviewee (Image 2).

Image 2: Fifth Season Installation at the Winthrop Library Opening (Photo by Lisa Hayward)

The interactive Fifth Season exhibit was installed at the new Winthrop library in time to be unveiled at their Grand Opening in June of 2022. Six portraits and listening stations were arranged around the reading area along with a memorial plaque and listening station commemorating one interviewee who had died in the spring of 2022. A foam core mounted poster at the entrance of the library introduced the project.

Evaluation Approach

Goals

Efforts to evaluate the impact of the Fifth Season began as the installation was in the final stages of production. The goal of the evaluation was to measure the effectiveness of the campaign, find opportunities to improve the campaign, and identify additional community needs. The evaluation was guided by the following questions:

1. How effective was the campaign at communicating wildfire smoke risk and preparedness?
2. What opportunities are there to improve the campaign?
3. What are additional community needs related to wildfire smoke?

Designing the Evaluation

The study team designed an internal evaluation plan to answer these questions given their close familiarity with the development and implementation of the Fifth Season campaign and in an effort to directly inform decision-making for future Fifth Season campaigns and similar activities in the region. Internal evaluation, while not without limitations and considerations (Frey, 2018), enabled members of the study team to convey feedback and evaluative insights in near-real-time. As part of the evaluation plan, a logic model (Figure 2) was created to summarize the campaign and capture its intended impacts (W.K. Kellogg Foundation, 2004). Based on the short-term outcomes of the campaign, a short questionnaire was designed (Appendix 2) to capture knowledge and assess ability to reduce wildfire smoke exposure. Additional questions asked about wildfire smoke impacts on health, trusted sources of information, and coping mechanisms.

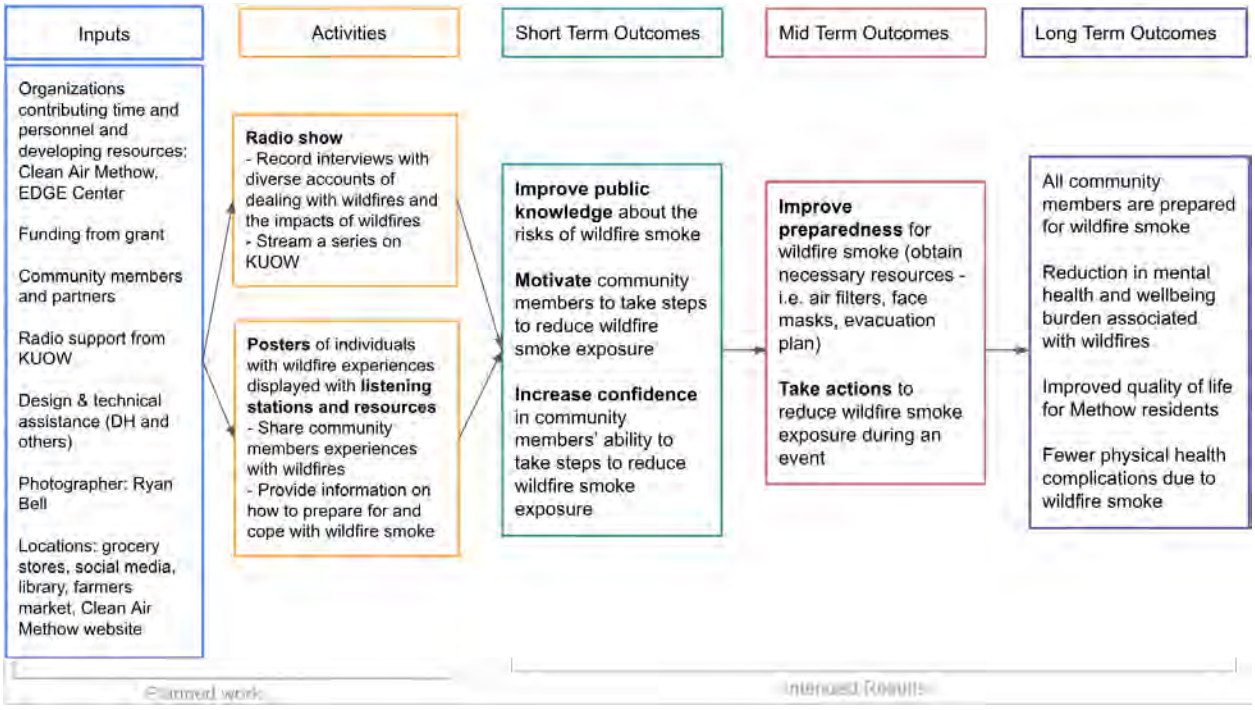

Figure 2: Logic Model for the Fifth Season audiovisual installation

Data Collection

Surveys were initially left near the installation at the library for people to fill out when viewing the installation. Envelopes and a lockbox were used to keep surveys confidential. However, this passive method of data collection resulted in only a few responses.

To increase the response rate, a table was set up at two farmer's markets in the area and a grocery store, where passersby were encouraged to listen to a story from the portable listening station and fill out a survey (Image 3). The study team also attended the Okanogan River Airshed Partners (ORAP) meeting in December 2022 to showcase the Fifth Season and distribute surveys. A social media graphic with a link to the survey was also created and shared but did not garner any responses.

Image 3: Survey collection at Hank's Grocery in Twisp (Photo by Maria Bajenov)

IRB Exemption

This evaluation was determined to be human subjects research that qualified for exempt status (Category 2) by the University of Washington Human Subjects Division (STUDY00015791). As this was a program evaluation (i.e., not research), an abbreviated informed consent statement was provided at the beginning of the evaluation survey, describing the purpose of the evaluation and emphasizing that participation was voluntary.

Results

Seventeen of 26 total survey respondents indicated listening to one or more of the Fifth Season stories. Six of these respondents were participants in the ORAP meeting, and 11 were Methow Valley community members. Twelve out of 17 participants listened to less than half of the eight stories.

Table 1 describes participants' level of agreement with the following statements:

1. I learned something new about how wildfire smoke impacts human health from the Fifth Season.
2. After experiencing the Fifth Season, I am motivated to take steps to reduce wildfire smoke exposure for me or someone in my household.
3. After experiencing the Fifth Season, I feel more confident about my ability to take steps to reduce wildfire smoke exposure for me or someone in my household.

Survey results from all 26 participants are included in Table 1. For the 17 respondents who listened to one or more stories, 59% of respondents indicated that they agree or strongly agree that they learned something new. Open-ended responses indicated that some participants perceived they already had extensive knowledge on the topic. This may have been due to the region's prior experience with and communications around smoke, as well as the audience for the second data collection attempt, which included professionals working on air quality in the region. For example, one participant shared, "I am well aware of the dangers of wildfire smoke" and another stated "Already fairly familiar with wildfire smoke from [a] group up here in the valley."

In addition, 71% of respondents indicated they agree or strongly agree with feeling confident in their ability to take steps to reduce wildfire smoke exposure, and 77% of respondents indicated that they agree or strongly agree to feeling motivated to take steps to reduce wildfire smoke exposure after listening to the stories.

Table 1: Level of Agreement for Impacts of Fifth Season Campaign

Survey Question	**Level of Agreement**					
	Strongly Disagree n (%)	Disagree n (%)	Neutral n (%)	Agree n (%)	Strongly Agree n (%)	No Response n (%)
Learned Something New						
ORAP Participants (N = 6)	0 (0)	0 (0)	2 (33.3)	2 (33.3)	2 (33.3)	0 (0)
Community Members (N = 11)	1 (9.1)	2 (18.2)	2 (18.2)	5 (45.5)	1 (9.1)	0 (0)
All Participants (N = 17)	1 (5.9)	2 (11.8)	4 (23.5)	7 (41.2)	3 (17.6)	0 (0)
All participants (including 0 audios listened or blank) (N=26)	1 (3.8)	2 (7.7)	8 (30.8)	8 (30.8)	3 (11.5)	4 (15.4)
Motivated to Reduce Wildfire Smoke Exposure						
ORAP Participants (N = 6)	0 (0)	0 (0)	2 (33.3)	3 (50.0)	1 (16.7)	0 (0)
Community	0 (0)	1 (9.1)	2 (18.2)	3 (27.3)	5 (45.5)	0 (0)

Members (N = 11)						
All Participants (N = 17)	0 (0)	1 (5.9)	4 (23.5)	6 (35.3)	6 (35.3)	0 (0)
All participants (including 0 audios listened or blank) (N=26)	0 (0)	1 (3.8)	6 (23.1)	7 (26.9)	7 (26.9)	5 (19.2)
Confident in Ability to Take Steps						
ORAP Participants (N = 6)	0 (0)	0 (0)	1 (16.7)	3 (50.0)	2 (33.3)	0 (0)
Community Members (N = 11)	0 (0)	1 (9.1)	2 (18.2)	2 (18.2)	6 (54.5)	0 (0)
All Participants (N = 17)	0 (0)	1 (5.9)	3 (17.6)	5 (29.4)	8 (47.1)	0 (0)
All participants (including 0 audios listened or blank) (N=26)	0 (0)	1 (3.8)	6 (23.1)	6 (23.1)	8 (30.8)	5 (19.2)

Participants' open-ended comments reaffirmed the ability of local voices to effectively convey messages about wildfire smoke. Related comments included: "Emotional;" "Very effective presentation of personal accounts;" and "These personal stories are more impactful than any chart or data point."

Participants also suggested areas for improvement, including suggesting that stories could include more information specific to smoke and to share the audiovisual installation at libraries in other counties.

A brief evaluation report summarizing these findings was developed and shared with Clean Air Methow and other local partners (Appendix 3). To communicate with the public, a social media graphic was shared on Clean Air Methow's Instagram (Appendix 4).

Discussion

The audiovisual installation with stories from local community members was able to meet a need for public health messaging about wildfire smoke in an area where trust in academic and government partners is not universal. Stories from community members related to wildfire smoke were authentic,

place-based, and emotionally-charged in a way that could not be recreated through direct communications from an academic or government institution. Despite the negative impacts of wildfire smoke events, the stories from community members included in this project reflected hope and positivity.

A primary goal of this project was to share information about protective measures to reduce the health effects of wildfire smoke exposure. Interviewees shared ways to protect their own health and the health of their family members to stay in a place they love, despite health conditions in their families that increase their vulnerability to smoke exposure. Stories from interviewees highlighted many tactics that have worked locally including the following:

- Using HEPA air purifiers
- Using purple air monitors and online resources to monitor local air quality
- Sealing doors and windows
- Advance planning
- Maintaining strong lines of communication and connectivity within the community
- Wearing properly fitted N95 masks when outdoors

However, some details and suggestions were lost when the stories were cut down to 1-2 minutes for our listening stations. This is one consideration in adapting a project for an engaging public installation.

Lessons Learned

The project team identified several lessons learned that can be considered by other teams interested in similar endeavors. The project was logistically complex and required coordination of interviews and portrait sessions; the construction of listening stations; the development of evaluation surveys; and the mounting and display of all components of the installation. Accordingly, the team recommends a formal project management plan be developed prior that accounts for unexpected project delays.

Including listening stations in the installation greatly increased its vulnerability to technical failure. Throughout the duration of the installation, troubleshooting was required to address issues related to the engineering of the relatively low-cost units that played the audio stories. As a result, several audio stories were offline for unknown periods of time. Future projects should integrate plans and associated budgetary support for local technical assistance.

Limitations

This project was conducted in a relatively small community among partners with a long-standing community-engaged research collaboration that informed the project design and facilitated access to community members and may not be broadly replicable. While our team did not include any government

agencies, inclusion of such partners at the state or local level may help expand reach or resources of similar projects.

Our evaluation design had several limitations, including use of a cross-sectional design, convenience sample approach and attainment of a relatively small sample size, several of whom had professional roles related to wildfires, wildfire smoke, or air quality. However, it revealed several useful insights that can improve future efforts. For example, the project included narratives related to the effects of the fires themselves, and therefore, evaluation survey participants suggested that stories could be improved by focusing more on smoke rather than wildfires in general.

Furthermore, participants suggested moving the exhibit to other locations across North Central Washington to reach a larger audience as many were unaware of this campaign. In response to these findings, we have moved forward with plans to move the exhibit, and it is currently on display at the Colville Tribal Museum in Nespelem, WA. An extra set of portraits are at the new Civic Building and Emergency Response Center in Twisp, WA (within the Methow Valley). Kittitas County, WA also expressed interest in displaying the Fifth Season.

While the internal evaluation used in this project provided a unique perspective in terms of the study team's proximity and involvement in the campaign, there are recognized concerns regarding objectivity. The study team addressed concerns through careful and critical development of the campaign logic model, team discussions, and transparency in reporting study results. Given the limitations of the evaluation design, future evaluations should gather qualitative information through a focus group or interviews.

Conclusion

This project leveraged local voices to communicate wildfire smoke risk in North Central Washington through a multi-media approach, including short radio stories, a podcast, and an audiovisual exhibit. Stories highlighted community members' experiences with smoke, bypassing traditional–and potentially less locally trusted–communications mechanisms undertaken by government and/or academic organizations. Overall, the associated project evaluation showed that a campaign that highlights community members' experiences can be effective at communicating strategies to reduce wildfire smoke exposure and encouraging community members to implement these strategies. Future campaigns should be more intentional at focusing the interview and story content on the risk of interest and promote broad geographic reach by rotating physical exhibits to multiple locations.

Disclosure of interest

The authors report no conflicts of interest.

Funding

Funding for this project was provided by the UW EarthLab and National Institute of Environmental Health Sciences grant #P30ES007033 to the UW EDGE Center.

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Appendix 1:

Interview Summaries

Albert Isensee: Mr. Isensee was a retired heavy-machine operator living on a fixed income who resided in North Central Washington since the 1950s. Mr. Isensee suffered from multiple chronic health conditions exacerbated by smoke exposure, including asthma and COPD. His health improved significantly when he received a HEPA air purifier from the American Lung Association.

Tom Venable: Mr. Venable is the Superintendent of the Methow Valley School District. As such he's responsible for creating policies to protect all students in the Methow Valley from the harmful effects of wildfire smoke exposure, including student athletes and others who engage in outdoor activities associated with school. Responding to conditions as they evolve, Mr. Venable is on the frontlines- mostly having to write the playbook as he goes in order to manage school activities in a way that's protective of student health.

Kathy Moses: In her 60s, Ms. Moses is an enrolled member of the Colville Tribe, the communications specialist for the Colville Tribe Environmental Trust Program, and a public information officer for the Mt. Tolman Fire Center. It's her job to tell people where fires are, what the evacuation plans are, and how to stay safe. That often puts her outside during wildfire smoke events and she has experienced lingering health effects as a result. At home she uses an air purifier to help protect her elderly mother.

Mayor Soo Ing-Moody: Before she became the Mayor of Twisp in 2010, Mayor Ing-Moody studied wildfire resilience in rural communities as a graduate student in Germany. So, when the Carlton Complex Fire broke out near her community in 2014, she found herself uniquely qualified to help lead the response. In the time since, she has had to respond to many more wildfire events and learned some lessons worth sharing with other towns. Mayor Ing-Moody is of Korean descent and was raised in Canada.

Dr. James Wallace: Dr. Wallace is a family physician working and raising his family in Okanagan County. He routinely treats patients who experience mental health effects from wildfire smoke events. He himself has experienced similar impacts after losing his home to wildfire several years back. He thinks it's important to convey that these effects are both common and normal and that simple acts may help lift moods.

Laura Rivera: Ms. Rivera is in her twenties and has two young children. She's lived in North Central Washington since she was three. Her family is from Mexico. When she was younger no one told her much about the wildfire smoke that choked her and burned her eyes. Now she works with the Community for the Advancement of Family Education (CAFÉ) in Wenatchee, WA to educate others about how to limit the health impacts of smoke exposure- a message with particular importance for those who work outdoors. Ms. Rivera was interviewed with her supervisor, Alma Chacon who is also from Mexico. Ms. Chacon also appears in the portrait with Alma.

The Godwin family: Colm Godwin was born in the Methow Valley and diagnosed with asthma the age of two. His parents Cara, an architect, and Eric, a software engineer, have found ways to protect him from smoke while he's at home. These include using air quality monitors and air quality tracking networks,

sealing windows and doors, staying indoors when air quality is poor, and coordinating with neighbors to arrange toy swaps and other activities that make being cooped up inside more bearable.

Cody Desautel: Mr. Desautel is the Natural Resources Division Director for the Confederated Tribes of the Colville Reservation and a member of the Colville Tribe. Desautel has had a long career in fire management and forestry in North Central Washington. He understands the historical context of fire in the region dating back to a time when there were significantly more tribal inhabitants on the landscape.

Appendix 2:

Fifth Season Evaluation Survey

The Fifth Season is an audiovisual exhibit of North Central Washington residents' experience with wildfire smoke. We are partnering with the University of Washington to evaluate the impact of the Fifth Season and other smoke outreach communications throughout Okanogan County. As part of this evaluation, we would like to invite you to complete this short survey. Please only complete this survey if you are at least 18 years old.

Please note that your participation is completely voluntary. Your responses will be kept confidential. There are no consequences to not participating. In order to protect your privacy, we have provided an envelope along with this survey. When you are ready to turn the survey back in, you can fold up the survey and place it in the envelope. You can then place it in the survey collection box.

Today's Date : _____

How many Fifth Season audio stories did you listen to (0-8)? _____

Please rate your level of agreement with each of these statements about the Fifth Season.

	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
I learned something new about how wildfire smoke impacts human health from the Fifth Season.					
After experiencing the Fifth Season, I am motivated to take steps to reduce wildfire smoke exposure for me or someone in my household.					
After experiencing the Fifth Season, I feel more confident about my ability to take steps to reduce wildfire smoke exposure for me or someone in my household.					

Please share any additional feedback about the Fifth Season audiovisual installation.

Please indicate how many people live in your household, including yourself?

Older adults (at least 65 years old) _____
Adults (18 - 64 years old) _____
Children (under 18 years old) _____

Does anyone in your household (including yourself) have any of the following health conditions, that are known to make people more susceptible to wildfire smoke: asthma, COPD, other lung disease, heart disease, circulatory disease, pregnancy, previous stroke?

☐ Yes ☐ No ☐ Unsure

Over the last year, has anyone in your household experienced any of the following symptoms that you believe to be associated with wildfire smoke exposure? Choose all that apply.

☐ Coughing
☐ Difficulty breathing
☐ Chest pain/tightness
☐ Headache
☐ Sore throat
☐ Congestion
☐ Other (Please describe): _____

□ None of the above
□ Unsure

Please indicate your level of concern about the effects of wildfire smoke on:

	Not at all concerned	Moderately concerned	Highly concerned
Your personal physical health	□	□	□
Your personal mental health/wellbeing	□	□	□
Your quality of life	□	□	□
The physical health of your family/friends	□	□	□
The mental health/wellbeing of your family/friends	□	□	□
The community culture of the Methow Valley	□	□	□
The economic vitality of the Methow Valley	□	□	□

Over the last year, has anyone in your household experienced any of the following mental health or well being impacts that you believe to be associated with wildfire smoke exposure? Choose all that apply.

□ Trouble sleeping
□ Trouble concentrating
□ Increased stress
□ Anxiety
□ Depression
□ Other (Please describe): _____
□ None of the above
□ Unsure

Do you currently have any of the following portable air cleaners in your home? If so, please indicate the **number** you have in your home.

□ HEPA air purifier _____
□ Box fan with attached MERV filter _____
□ Other air cleaner (please describe) _____
□ None of the above

Do you have the ability to circulate air through your home via a forced air system (e.g., furnace with air vents)?

□ Yes □ No □ Unsure

Do you have air conditioning in your home?

□ Yes, through a whole-house heating, ventilation and air conditioning (HVAC) system
□ Yes, through portable air conditioning units
□ No

When it's smokey outside, how do members of your household cope? (Select all that apply)

□ Close windows and doors
□ Attempt to clean indoor air with air purifying devices or systems
□ Look at air quality information/data sources (e.g., AirNow, PurpleAir)
□ Reduce outdoor activities
□ Seek clean air within the valley (e.g., at a neighbor's, local business)
□ Seek clean air outside the valley (e.g., by traveling to a neighboring community)
□ Other (please describe) _____
□ No change in routine

Which of these do you consider to be a trusted source of information about the health impacts of wildfire smoke and ways to protect yourself?

□ Social media (e.g., Facebook)

□ Community bulletin/sandwich boards
□ Local news (e.g., radio and newspaper)
□ Friends/family/community members
□ Clear Air Methow
□ Other Okanogan County non-profit organizations (Please describe) _____
□ Washington Smoke Blog
□ Local government (e.g., Okanogan County Public Health)
□ State government agencies (e.g., WA Dept of Ecology, WA Dept of Health)
□ Federal government agencies (e.g., EPA, U.S. Forest Service)
□ Tribal organizations
□ None
□ Other (please list) _____

Did you receive an Instabrand HEPA Portable Air Cleaner from the 2021 free distribution events in Methow Valley?

□ Yes □ No □ Unsure

Are you a full or part time resident of Okanogan County?

□ Full-time □ Part-time □ Not a resident

If you are full-time or part-time resident, what is your five-digit Okanogan County zip code? __ __ __ __ __

Would you be willing to participate in additional research and evaluation studies on wildfire smoke?

□ Yes □ No

If yes, please provide the following information. Your identity will not be shared beyond the study team:

Your name:	
Your email address:	
Your phone number:	

Thank you!

Appendix 3:

Fifth Season Evaluation

Prepared for: Elizabeth Walker at Clear Air Methow & Nicole Errett at University of Washington

By: Maria Bajenov

CAMPAIGN DESCRIPTION

This communication campaign sought to amplify wildfire smoke experiences of diverse community members. The goal was to highlight ways to reduce health impacts from wildfire smoke and increase coping strategies. The multimedia exhibit of large portraits with listening stations was displayed at the Winthrop library.

PURPOSE: To summarize efforts to evaluate the impact of the Fifth Season communication campaign on wildfire smoke preparedness in Methow Valley

EVALUATION DESCRIPTION

A survey was used to capture knowledge and ability to reduce wildfire smoke exposure. The survey was available near the exhibit and online.

Evaluation goals:

- Measure the effectiveness of the campaign
- Find opportunities to improve the campaign
- Identify additional community needs

EVALUATION SUMMARY

Overall, there were 17 participants that indicated listening to one or more Fifth Season stories out of a total of 26 respondents. Six respondents were participants in the ORAP meeting, and 11 were Methow Valley community members.

The key questions related to the Fifth Season asked participants to rate their level of agreement with the following statements:

(1) I learned something new about how wildfire smoke impacts human health from the Fifth Season.

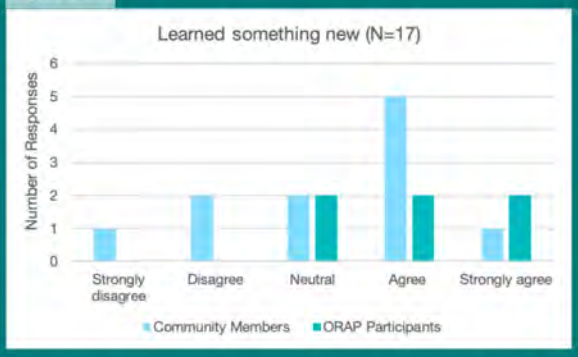
(2) After experiencing the Fifth Season, I am motivated to take steps to reduce wildfire smoke exposure for me or someone in my household.

(3) After experiencing the Fifth Season, I feel more confident about my ability to take steps to reduce wildfire smoke exposure for me or someone in my household.

Additional questions asked about wildfire smoke impacts on health, trusted sources of information, and coping mechanisms.

KEY FINDINGS

Figure 1



12 out of 17 participants listened to 4 or less of the 8 stories. 59% of respondents indicated agree or strongly agree for learning something new (Figure 1).

Comments on previous knowledge:

"I am well aware of the dangers of wildfire smoke"

"Already fairly familiar with wildfire smoke from group up here in the valley"

These comments indicate that a portion of those who listened to the Fifth Season were already familiar with wildfire smoke which is likely why some did not indicate learning something new.

Comments on the personal nature of the stories:

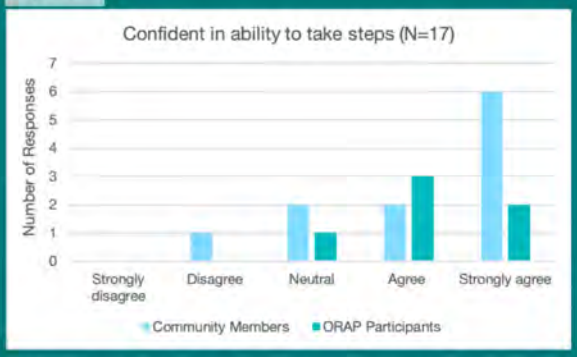
"Emotional"

"Very effective presentation of personal accounts"

"These personal stories are more impactful than any chart or data point"

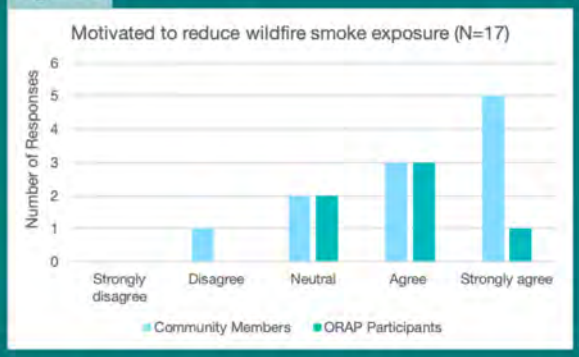
The comments above indicated a similar sense amongst participants that these stories have the potential to be more effective given their personal nature. Many other health risk communication campaigns utilize statistics, but personal stories can be more relatable.

Figure 2



71% of respondents indicated agree or strongly agree for feeling confident in their ability to take steps to reduce wildfire smoke exposure (Figure 2).

Figure 3



77% of respondents indicated agree or strongly agree to feeling motivated to take steps to reduce wildfire smoke exposure (Figure 3). The stories impacted motivation the most likely because participants wanted to prevent the experiences shared in the Fifth Season.

Comments on areas of improvement:

"Not sure I could tell it was about smoke more info about wildfire"

"Would be helpful to share AV installation at libraries in other counties"

CAMPAIGN STRENGTHS

- Interactive installation to allow for more engagement
- Ability to trust and relate to other community members
- Share key messages about wildfire smoke from different perspectives
- Displayed at central community locations

CAMPAIGN CHALLENGES

- Reaching vulnerable groups in the community
- Overwhelming the community with wildfire information
- Issues with listening stations

EVALUATION CHALLENGES

- Insufficient responses in guest book to get qualitative data
- Passive methods of survey collection were not effective

RECOMMENDATIONS:

Campaign: To improve the effectiveness of wildfire smoke risk communication, the Fifth Season stories could be more focused on smoke rather than wildfires in general. It would also be useful to move this exhibit to other locations in Methow Valley to reach a larger audience as many were unaware of this campaign.

Evaluation: Based on the implementation of the evaluation and responses received, it would be beneficial to gather qualitative information through a focus group or interviews. Since passive methods were not effective in getting responses, an incentive for participation could help increase responses. The survey could also be modified to better capture informational needs.

Overall, this evaluation shows that a campaign that highlights community members' experiences can be effective in communicating wildfire smoke risk and coping strategies.

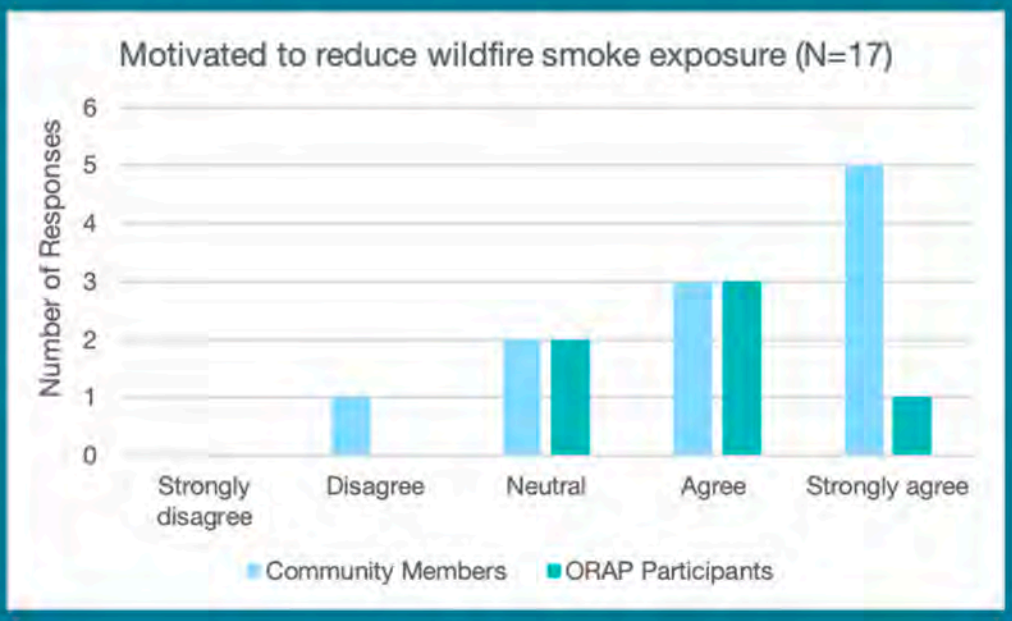
Clean Air Methow

ENVIRONMENTAL & OCCUPATIONAL HEALTH SCIENCES

Appendix 4:


EVALUATING WILDFIRE SMOKE
COMMUNICATION EFFORTS
The Fifth Season: Key Findings
Clean Air Methow
UNIVERSITY of WASHINGTON


CLEAN AIR
METHOW
www.cleanairmethow.org



KEY STATS:

- **17 out of 26** participants listened to **1+ stories**
- **59%** indicated agree or strongly agree for **learning something new**
- **77%** indicated agree or strongly agree to **feeling motivated** to take steps to **reduce wildfire smoke exposure**


"Emotional"
"Very effective presentation of personal accounts"
"These personal stories are more impactful than any chart or data point"
Check out the Fifth Season installation at a location near you soon!
• Colville Tribes
• Twisp Civil building & emergency response center
• Kittitas County