



Undergraduate Research Symposium May 17, 2019 Mary Gates Hall

Online Proceedings

POSTER SESSION 2

Commons West, Easel 11

1:00 PM to 2:30 PM

Wildfire Smoke Risk Communication: Using the Extended Parallel Process Framework to Determine Risk and Efficacy of Public Health Messaging during a Statewide Smoke Event

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Justine Noemie Marecaux, Senior, Environmental Health
Mentor: Tania Busch Isaksen, DEOHS*

Climate change has increased the prevalence and intensity of wildfire events in the Pacific Northwest. Exposure to wildfire smoke has been linked to several adverse health outcomes, most notably respiratory-related morbidity and mortality. Local public health response to reducing a community’s exposure has primarily focused on communicating risks to the public and provide suggestions to reduce exposure risk. Effectively communicating the health effects of wildfire smoke and the interventions possible to reducing exposure is imperative for reducing adverse health outcomes during smoke events. In order to discern the messages the public received, we conducted a content analysis of wildfire smoke risk information communicated by local and state government organizations and by the mainstream media during the August 2018, statewide wildfire smoke event in Washington state. The Extended Parallel Process efficacy and risk framework was used to assess the presence and message content of wildfire smoke risk and efficacy information. Summary statistics were calculated to identify common messages about efficacy recommendations, vulnerable populations, and trusted sources of public health information. With these results, we hope public health jurisdictions will better understand the extent of their wildfire smoke risk messages and improve their standing as trusted sources of information in the community. Through the use of the extended parallel process framework– a “recipe” for future wildfire season communication can be created.

Establishing an Air Monitoring Network in the Methow Valley

*Amanda Durkin, Senior, Environmental Health
Mentor: Nicole Errett, Environmental and Occupational Health Sciences
Mentor: Tania Busch Isaksen, DEOHS*

The Methow Valley is a community located in Okanogan County, WA that has experienced wildfires in 4 of the past 5 years. The Methow Valley Clean Air Project (MVCAP) is a local volunteer group that promotes air quality awareness through outreach and programming. MVCAP’s Purple Air Network was designed to provide access to spatial air quality information to help community members make decisions about protective actions, to identify relatively clean air spaces, and to serve as a public health intervention for wildfire smoke. In collaboration with MVCAP, we worked to install a network of 20 purple air monitors in the summer of 2018. The monitors were placed in homes of “Clean Air Ambassadors” who committed to maintain and promote the monitor. For calibration, each monitor was placed according to federal guidelines and two were collocated with nephelometers maintained by Washington Department of Ecology. During the summer of 2018, two wildfires burned nearby which allowed the monitors to be utilized in a wildfire smoke event. The data from the monitors was downloaded and compared to the nephelometer data using linear regression. I worked to establish a correction factor by analyzing the data and found that the Purple Air monitor over reported the PM2.5 concentration by a factor of 0.53 and even more at high concentrations. The network proved the importance of high spatial concentration monitoring by capturing the air quality variation. In some areas, the air quality was good while in others it was hazardous. Having the network is a tool for individuals to know what the air quality is near their homes and other places in their community. It allowed individuals to access local air quality data and make choices about poor air quality. The next step for MVCAP is designing an online interface that applies the correction factor directly to accurately communicate risk.

POSTER SESSION 3

Commons West, Easel 40

2:30 PM to 4:00 PM

POSTER SESSION 4

Commons West, Easel 38

4:00 PM to 6:00 PM

Assessment of Wildfire Smoke Health-Risk Communication Needs of Organizations that Serve the Public in Clallam County

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Mentor: Tania Busch Isaksen, DEOHS

Mentor: Nicole Errett, Environmental and Occupational Health Sciences

Clallam County has recently been experiencing concerning air quality conditions due to smoke drift from wildfire events in nearby areas. The objective of this study was to assess the wildfire smoke health-risk communication needs of organizations that serve the public in Clallam County. Communication needs were assessed by surveying 10 organizations that serve sensitive populations. Surveys were conducted in person or over the phone, and summary statistics were calculated. In addition, a low-cost air monitor was installed to track summer time air quality. The low-cost air monitor was installed adjacent to a nephelometer administered by the Olympic Region Clean Air Agency (ORCAA). This was done to determine the accuracy of the low-cost air monitor by comparing air quality values registered from both devices. The majority (60%) of organizations responding to the survey reported that they had not received information about the health risks of wildfire smoke. Nearly all organizations (90%) reported that they have the capacity and are willing to communicate the health-risks of wildfire smoke to the people they serve in Clallam County. Analysis of air quality data shows the low-cost monitor may be a useful device in determining air quality conditions. The correlation coefficient for the daily averages (from July 12 to August 24) between the ORCAA nephelometer and the low-cost air monitor was determined to be 0.98, but closer examination of data for hourly averages show a correlation coefficient as low as 0.82. Future wildfire smoke events in Clallam County require public health interventions to address health-risk communication needs of sensitive populations. Implementation of a low-cost air monitor network accessible by the public is a promising prospect to protect sensitive populations in Clallam County.

POSTER SESSION 4

Commons West, Easel 40

4:00 PM to 6:00 PM

N95 Mask Distribution Effectiveness in Okanogan County

Katelyn Lorraine (Katie) Kern, Senior, Environmental Health

Mentor: Tania Busch Isaksen, DEOHS

Mentor: Nicole Errett, Environmental and Occupational Health Sciences

Okanogan County, Washington is known for unpredictable and persistent wildfires. In 2014, it had the largest wildfire known in Washington State history. Over the past few years,

N95 masks provided by the Public Health Department have been given out to community members at 72 different distribution locations throughout the county in order to protect against some of the harmful airborne contaminants caused by wildfire smoke. In order to determine the effectiveness of the N95 mask distribution system and the public service announcements regarding N95 masks, a survey was given to residents and visitors of the county. Focus areas of this survey were the availability and use of free N95 masks, knowledge of the N95 mask distribution locations, desired information on the N95 masks, and the awareness of public service announcements regarding N95 masks during wildfire smoke events. Results showed that many are still unaware of the free N95 masks in the county and those who picked them up had unresolved questions about them. Of the total 87 respondents, 34.5% were not aware that there were free masks available to them throughout the county. Of those who were aware, 81.3% wanted to know how long the masks could be worn before disposing and 56.3% wanted to know for who the masks were not appropriate for. The survey also found that 40% of people prefer to receive their information through Facebook. In order to combat the issues found, an N95 mask infographic was created for distribution along with the masks.

POSTER SESSION 4

Commons West, Easel 41

4:00 PM to 6:00 PM

Content Needs Assessment and Evaluation of N95 Mask Video-Based Education for Wildfire Smoke Events

Veda Kalliyaa Ting, Senior, Biochemistry, Environmental Health

Mentor: Tania Busch Isaksen, DEOHS

Mentor: Nicole Errett, Environmental and Occupational Health Sciences

Research has shown that wildfire smoke exposure is associated with various respiratory health effects. To help protect the lungs, respirator masks that are labeled as N95 can be worn to filter out fine particulate matter produced from wildfire smoke. Previous studies show that video-based education is effective in increasing knowledge and intervention practices among viewers, and it was hypothesized that an N95 mask instructional video could help educate the lay-public. A video-content needs assessment was conducted using semi-structured key informant interviews. Eight experts knowledgeable in air quality, message communication, N95 respirators, and respiratory and cardiovascular health were interviewed for important content needs. Response themes were identified and used to inform the content and style of the video entitled, *Smoke from Fires: N-95 Respirator Masks*. A Knowledge, Attitude, and Practice (KAP) survey, using a 5-point likert scale, was created to assess the video's knowledge transference, and effect on attitudes and commitment to

practice use. The KAP survey was given to undergraduate students before and after viewing the video. The results from our key informant interviews included instruction on proper use, mask limitations, incorrect alternatives, and appropriate use of language, images, and tone. The KAP survey results indicate the video enhanced the participants' knowledge of N95 masks with regards to proper fit, incorrect alternatives, and limitations. Additionally, attitudes of increased ease of use and mask effectiveness were demonstrated. Since this study investigated a video-based intervention, possible future research includes testing the effectiveness of different education methods on N95 mask fit, in addition to knowledge, attitudes, and commitment to practice.

to improve the sustainability of Bellevue's food trucks but to hopefully serve as a guide for other cities who are looking to incorporate sustainable practices into their own food truck programs.

POSTER SESSION 4

Commons West, Easel 6

4:00 PM to 6:00 PM

Food Trucks and Food Waste: Recommendations for the City of Bellevue's Food Truck Permitting Process

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UW Honors Program

Mentor: Tania Busch Isaksen, DEOHS

Food trucks in the United States have grown exponentially in the past decade. In many major cities, these mobile kitchens have given entrepreneurs the opportunity to start a business at a relatively low start-up cost, provided consumers with more diverse dining options, and improved the overall quality of life in their communities. However, due to their design, these operations also produce a lot of waste, particularly in regards to plastic packaging and leftover food. The City of Bellevue, a community with a robust food truck culture, is looking to revise its current food truck permitting process and is interested in incorporating a sustainable waste management component. This policy analysis will identify successful existing sustainable food truck practices as well as barriers to these best practices in order to provide sound recommendations to be included in Bellevue's new permitting process. To identify current practices, a framework based off of pre-existing literature will be used to assess successful sustainable food truck operations around the country with the goal of elucidating best-sustainable food truck practices. This formative research will then be used to formulate interview questions about the main barriers to waste prevention, waste reduction, and food rescue for food trucks. Informational interviews will then be conducted with key stakeholders in Bellevue and will include food truck operators, waste management contractors, food donation organizations, and customers. Findings from this research will be used to inform key recommendations to the City of Bellevue as well as the creation of a deliverable to be provided to food truck operators such as a map, infographic, brochure, etc. The goal of this research is not only