Informing recommendations for the use of N95 respirators and their relative training and communication mediums as a public health intervention for wildfire smoke

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Introduction

Climate change is increasing the frequency, intensity, and duration of wildfires. To reduce personal exposure to wildfire smoke and resulting adverse health effects, N95 respirators have been used by the general public to filter out particulate matter present in smoke.

- In Washington state in 2017, a total of 72,460 respirators were distributed across several counties, and the number increased to 249,040 in 2018.
- The mandatory use of N95 respirators in an occupational setting requires medical clearance, proper training, and individual fit testing. This practice is not required for public distribution or use of respirators, and the description of information and/or training provided is incomplete.
- A need for better understanding of evidence-based intervention and risk communication strategies (specifically N95 respirators) during prolonged and extreme smoke events has been identified by the University of Washington and practice partners.

Objectives

- Quantify the transference of knowledge from different training and communication mediums into N95 respirator fit in a convenience sample of the lay public
- Identify challenges and gaps in knowledge and actions for proper use of N95 respirators by the lay public
- Inform recommendations for training materials for the lay public surrounding N95 respirator mask use

Preliminary Results

We expect data analysis and translation of results to be completed in spring 2020.

Figure 1. Change in fit factor before and after training, by intervention.

<table>
<thead>
<tr>
<th># of participants above</th>
<th>No Training</th>
<th>Video</th>
<th>Manufacturer’s Instructions</th>
<th>Factsheet</th>
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</thead>
<tbody>
<tr>
<td>Fit Factor &gt; 2</td>
<td>8</td>
<td>8</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Fit Factor &gt; 5</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>9</td>
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<td>1</td>
</tr>
<tr>
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<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fit Factor &gt; 100</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</tr>
</tbody>
</table>

Figure 2. Change in the number of participants achieving fit factors of 2, 5, 10, 50, and 100 before and after training, by intervention.

Discussion

Wildfires are an increasingly important issue in the Western United States as human populations live at the wildland-urban interface. Wildfire smoke exposure is associated with respiratory morbidity in the general population, as well as exacerbations for those with asthma and chronic obstructive pulmonary disease, and all-cause mortality.¹ This study will help evaluate the appropriateness of N95 respirators and training materials as an intervention to reduce wildfire smoke exposure. We expect our results to inform the communication and recommendation of use by practice partners.

Materials & Methods

- Sliding caliper, spreading caliper
- TSI PortaCount Plus
- HDX N95 Respirator Masks: H950S, H950, H950V
- “Smoke From Fires: N95 Respirator Masks” video, “Wildfire Smoke and Face Masks” factsheet, HDX User Instructions

References:

Acknowledgements:
This project was funded by the Pacific Northwest Agricultural Safety and Health (PNASH) Center through Grant Number #61-1999