Empowering Communities to Improve Indoor Air Quality

An Intervention During the 2023 Firesmoke Season

BREATHE
Building Resilience to Emerging Airborne Threats and Heat Events

SFU PACIFIC INSTITUTE ON PATHOGENS, PANDEMICS AND SOCIETY (PIPPS)

Dr. Anne-Marie Nicol, Ph.D.; Riley Condon, B.A.; Prem Gundarah, B.A.; Ravneet Mundi, B.Sc.; Genevieve Cheng, B.A.

Introduction

Climate change is increasing the severity and frequency of wildfires in British Columbia, worsening air quality indoors. For many people, wildfire smoke is a tangible source of concern. Recent evidence has shown that personal adaptation actions for climate risk can be useful for coping with climate anxiety (Fyke and Weaver, 2020).

The SFU BREATHE (Building Resilience to Emerging Airborne Threats and Heat Events) project was developed to provide people with education and tools that help navigate periods of smoke and heat. The workshops are held throughout different regions at community based sites and are designed to help participants take agency over their indoor air quality. The workshops also serve as a point of connection with people at greater risk from firesmoke and participants are invited to take part in a follow-up survey 4-6 months post workshop that assess resilience strategies and behaviors.

Objectives

1) Develop and refine a workshop model that trains to the public on climate preparedness and adaptative behaviors. Tailor content to the needs of those more affected by wildfire smoke.

2) Collect regional data on community member's current behaviors and attitudes around climate events.

3) Create a Train the Trainer Workshop Guides, tailored to regional and Indigenous communities, to help other agencies host BREATHE workshops.

5) Evaluate the impact of the workshops using exit and follow-up surveys.

Methods

Participant Recruitment and Data Collection

Study participants were recruited at SFU BREATHE workshops hosted by the BC Lung Foundation, municipalities, and regional districts throughout the Lower Mainland and Fraser Valley. Data was collected using consent forms and exit surveys which allowed participants to share comments and concerns around climate change and how the workshop impacted them. Information was gathered on how participants travelled to the workshop in order to better understand capacity to take units home.

The follow-up survey included questions about air cleaner use, filter replacement, and if participants built more units or disseminated instructions to others. Space for qualitative comments was provided.

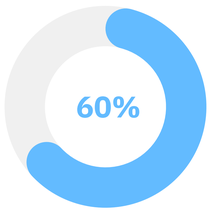
Participants who agreed to follow-up were emailed the survey or contacted via phone 4-6 months after the workshops. Data was analyzed usind descriptive statistics an qualitative data was collated into thematic areas.

Workshops

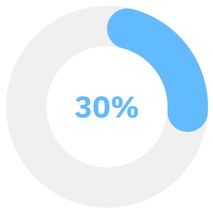
BREATHE workshops at 2 hour sessions where people are provided with basic education about the hazards associated with wildfire smoke and taught how to build DIY Air Cleaners. Held at accessible spaces, the workshops accomodate 15-30 people with 3-5 SFU staff present. Materials for Air Cleaners are provided for free to participants, funded by different agencies. Workshops are targeted to people at greater risk from wildfire smoke exposure, including people with existing lung conditions (COPD and asthma), people who are 55+ and low income families.

Why DIY Air Cleaners?

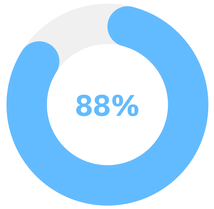
Evidence on the effectiveness of DIY Air Cleaners evolved during the COVID-19 pandemic. A robust evidence synthesis by Angela Eykelbosh (2023) determined that these units were effective at removing a range of particulates from air including PM2.5, pollen, dust, mould spores, viruses and bacteria. The unit cost under 100 dollars to build, with the effectiveness of approximately a 300 dollar commercial air cleaner. The US EPA has extensively studied the units and determined that they are safe, effective solutions during periods of extreme smoke.



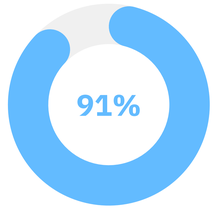
of 196 participants disclosed pre-existing medical conditions



of workshop sessions were live translated into Chinese



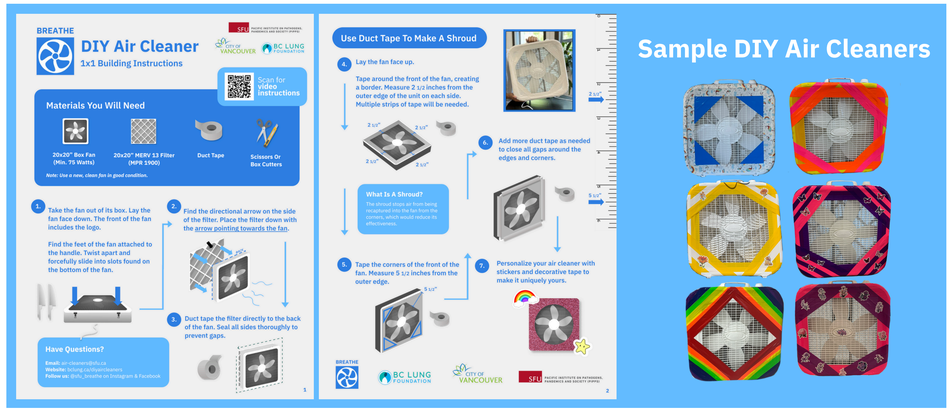
of 51 participants perceived their indoor air to be cleaner with the use of the DIY air cleaner fan

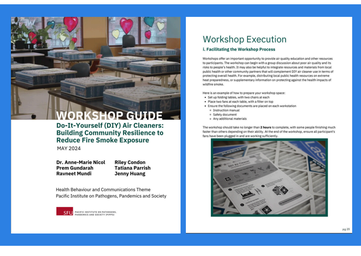


of 51 participants said they used the fan between the workshop and the follow-up

How to Build a DIY Air Cleaner

The most simple version of a DIY Air Cleaner, known as a 1x1, was selected for the project as our target population was low-income seniors living in the city in smaller homes who took the units home via transit. The required materials to build a DIY air cleaner are: one 20x20 inch Lasko fan (min. 75 watts), one MERV-13 20x20x1 inch filter, box cutter or scissors, and duct tape.





Instructions available in ***12 languages, safety considerations document, and Train the Trainer Resources*** *available on our BC Lung website page*

BCLUNG.CA/DIYAIRCLEANERS

Results

25 workshops were held over the summer and fall of 2023 across Vancouver Coastal and Fraser Health Regions.

Of those who participated (n=196)

- **60%** disclosed that they had pre-existing medical conditions, with lung conditions the most prevalent.
- **43%** of workshop participants were greater than or equal to 70 years old.
- **30%** of sessions were live translated into Chinese.

From follow-up survey (n=51) conducted 6+ months from workshop:

- **88%** perceived their indoor air to be improved
- **61%** shared the instructions with others
- **91%** had used the air cleaner between the workshop and the follow-up

Conclusion

The BREATHE workshops helped participants mitigate climate anxiety and provided a tool to help reduce exposure to wildfire smoke. There was an overwhelming number of requests for workshops which could not be fulfilled due to staff and budget limitations. This led to the development of the Train-the-Trainer Guide so that other agencies could host their own workshops. Overall, this project reflects a very real and ongoing concern amongst community members about wildfire smoke and is threat to human health. Providing tangible steps for people to follow may help address concerns and lower anxiety. Participants will continue to be followed up in a 2024 survey that explores climate anxiety in more detail.

Next Steps

In 2024, 35 workshops have been hosted in Vancouver Coastal, Fraser, Interior Health and the First Nations Health Authority. The project also partnered with the Metis Nation of BC, delivering 15 sessions to chartered communities. The project has spawned partnered programs with municipalities across the Interior Health region including in West Kelowna and Vernon and a partnership with the United Way BC.

The project has also expanded to include social media in order to disseminate the workshop contents to a broader audience. Visit us at SFU BREATHE Project on LinkedIn and @sfu_breathe on Instagram and Facebook for updates on the project.

Acknowledgements

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