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## Expanding Awareness of Air Quality and Health Impacts in the Clinical Setting

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### Recommended Citation

Early, Caitlin, "Expanding Awareness of Air Quality and Health Impacts in the Clinical Setting" (2023).

*Family Medicine Clerkship Student Projects*. 906.

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# **Expanding Awareness of Air Quality and Health Impacts in the Clinical Setting**

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**Hinesburg Family Medicine**

**July - August 2023**

**Mentored by Dr. Michelle Cangiano**



# Problem Identification

- **Wildfire activity has been increasing over the past several decades** and is likely to continue to do so as climate change progresses, leading to a continued decrease in air quality. Negative health impacts of wildfire smoke and is likely to grow in the future. (Liu, 2015 and Reid, 2019)
- Poor air quality has a higher risk of affecting people with **heart or lung disease, older adults, and children.** (Asthma - CDC, 2023)
- Throughout this summer, Hinesburg Clinic staff members have had a huge increase in patients calling in with **asthma exacerbation** or for **inhaler refills.**

Average Daily Air Quality from 6/1-8/1/2023 For Chittenden County, VT*	
Air Quality	Number of Days
Good	43
Moderate	15
Unhealthy for Sensitive Groups	2
Unhealthy	2
Very Unhealthy	0
Hazardous	0

\*Accessed From: <https://ephtracking.cdc.gov/DataExplorer>. Accessed on 08/02/2023

## AHEC Focus Areas: Current and Emerging Health Issues and Medical Practice Transformation

- Vermont has had multiple days this summer with moderate to unhealthy air quality due to wildfire smoke, which is impacting Vermonters' health.
- Guidance for providers on wildfire smoke and air quality is limited making it difficult for them to pass information along to patients.

# Public Health Cost

Poor air quality leads to exacerbations of existing lung and cardiovascular disease, causing an increase in healthcare utilization.

According to Vermont Asthma Surveillance Data Published in 2022 (Asthma Data Pages – VDH, 2022):

- **1 in 8** adults and **1 in 12** children have asthma
- Vermonters with a lower socioeconomic status, those unable to work, and those insured by Medicaid are **more likely to have asthma** than Vermonters in General.
- In 2015, hospitalizations and ED visits for asthma cost **\$6.4 million dollars**.
- U.S. health care spending on respiratory diseases totaled **\$170.8 billion** in 2016, representing **6.3% of total U.S. health care spending** that year. Spending was highest for asthma, COPD, and the aggregate category of other chronic respiratory diseases. (Duan, 2023)
- While the impact of the current air quality on health care cost is being monitored, exacerbations of asthma, other lung diseases, and cardiovascular disease is likely to have a **large financial impact in 2023**, particularly because of historical spending trends both in Vermont and nationally.



# Community Perspective

**"Air quality is a health equity issue, not everyone can go inside and breathe clean air from their air purifiers. People who work outside such as farmers, individuals without homes, and individuals without the financial means to invest money into air conditioners or purifiers will be impacted the most."**

David Grass, PhD.

*Senior Environmental Health Program Manager for the Vermont Department of Health*

**"I am very concerned we will continue to have more low air quality days in the future. The amount of fuel for Canadian wildfires is growing. This year we have had multiple days with air quality in the unhealthy range. We need to be prepared that these days will be around in the future."**

David Grass, PhD.

*Senior Environmental Health Program Manager for the Vermont Department of Health*

**"We have seen a substantial increase in patients calling in to refill their inhalers and more moms calling in with concerns about what to do with their children who have asthma that has gotten worse. Patients are also presenting with more inflammatory symptoms other than just shortness of breath, including swollen/sore throats, headaches, sinus pressure, and others. Finding resources on what guidance to provide is difficult right now."**

Michelle Cangiano, MD

*Hinesburg Family Medicine*

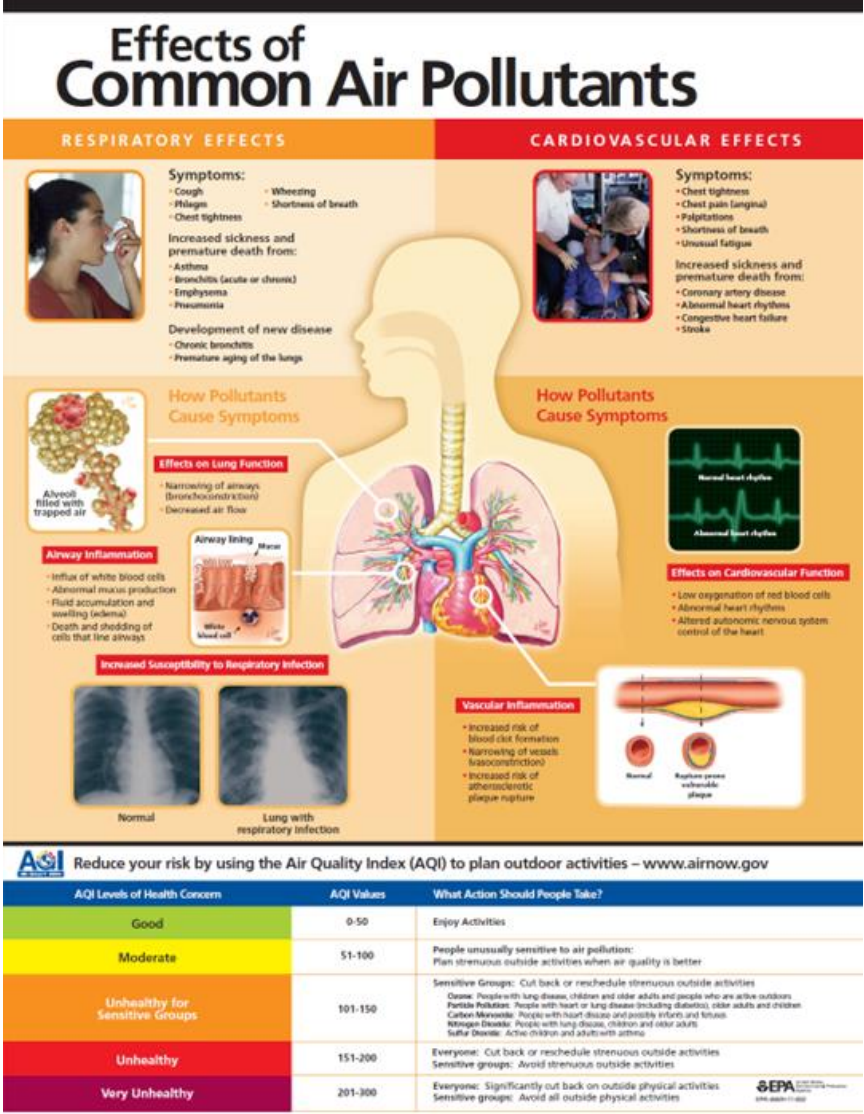
# Intervention: Patient Education Posters

At the clinic, there was no information about air quality and health impacts visible to patients.

Research was completed to find educational poster that can inform patients of the health impacts of air quality in a clear, colorful, and concise way.

Posters were selected to spark discussion with providers and to display links to additional resources that patient can follow-up with.

Expanding Awareness of Air Quality and Health Impacts in the Clinical Setting



## Vermont Children and Youth Activities Guide for Air Quality



Check air quality index at [AirNow.gov](http://AirNow.gov) and learn more about air quality, wildfire smoke and your health at [HealthVermont.gov/AirQuality](http://HealthVermont.gov/AirQuality).

The following public health recommendations are to protect children and youth (18 years and younger) from fine particle air pollution (PM2.5), for example, wildfire smoke. Apply this guide to school, child care, athletic practices and games, before and after school programs, camps, field trips, and other outdoor programming and activities. Air quality forecasts for the following day can be found at AirNow.gov, typically by 4:00pm. As conditions can change quickly, be sure to check back for updates.

Outside Air Quality Index (AQI): PM2.5					ADDITIONAL CONSIDERATIONS
Activity Duration	Good (0-50 AQI)	Moderate (51-100 AQI)	Unhealthy for Sensitive Groups (101-150 AQI)	Unhealthy, Very Unhealthy or Hazardous (Red, Purple, Maroon (≥ 151 AQI))	
15 mins to 1 hour (for example, recess, PE, classes typically held outside)	No restrictions.	Allow children and youth with health conditions to opt out or stay indoors. Limit intensity of activities for these children and youth if needed.	Limit to moderate intensity activities outside. For children and youth with health conditions, further limit intensity or move to an area with safer air quality if needed.	Cancel outdoor activity or move to an area with safer air quality, either indoors with filtered air or to a different location. Limit to light intensity activities indoors if indoor PM2.5 levels are elevated.	Close windows and doors when activities are moved indoors. Pay attention to heat and ensure indoor spaces have clean air. Use air purifiers with a HEPA filter and set air conditioning to recirculate indoor air.
1-4 hours (for example, athletic events and practices)	No restrictions.	Allow children and youth with health conditions to opt out or stay indoors. Limit intensity of activities for these children and youth if needed.	Limit to light intensity activities or to a 1-hour total duration with moderate intensity activities. If intensity level and time cannot be modified, consider canceling outdoor activity or move to an area with safer air quality, either indoors or to a different location. For children & youth with health conditions, further limit time or intensity if needed.	Cancel outdoor activity or move to an area with safer air quality, either indoors with filtered air or to a different location. Limit to light intensity activities indoors if indoor PM2.5 levels are elevated.	All children and youth 18 and younger are considered a sensitive group. Health conditions include but are not limited to asthma and other lung disease, heart disease, diabetes, and respiratory infection (for example, RSV and pneumonia).
> 4 hours (for example, outdoor school or programming, day camp, overnight camp)	No restrictions.	Move children and youth with health conditions to an area with safer air quality, either indoors or to a different location if needed. Allow children and youth without health conditions to opt out or stay indoors and limit intensity of activities.	Limit to light intensity activities and under 4-hr total duration. If intensity level and time cannot be modified, cancel outdoor activity, or move it to an area with safer air quality, either indoors or to a different location. For children and youth with health conditions, further limit time or intensity if needed.	Cancel outdoor activity or move to an area with safer air quality, either indoors with filtered air or to a different location. Limit to light intensity activities indoors if indoor PM2.5 levels are elevated.	Activity Examples: <ul style="list-style-type: none"> <li><b>Light Intensity Activities</b> - playing board games, playing catch</li> <li><b>Moderate Intensity Activities</b> - softball, volleyball, climbing on playground</li> <li><b>Vigorous Intensity Activities</b> - running, swimming, soccer</li> </ul>



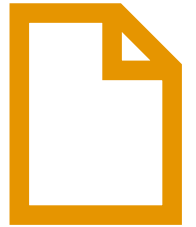
If you have questions, visit [www.HealthVermont.gov/AirQuality](http://www.HealthVermont.gov/AirQuality) or contact [AHS.VDHVTEPHT@vermont.gov](mailto:AHS.VDHVTEPHT@vermont.gov). This information was adapted from guidance developed by the Washington State Department of Health.

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# Results

## Posters were distributed to patient rooms throughout the clinic

- **Started discussions on air quality health impacts**, particularly on vulnerable populations
- Encouraged rooming staff to have **patients look over the education boards** while they are waiting for their provider



## After a longer time of the posters being seen in the clinic, we hope:

- Patients will be more likely to **ask about precautions they could take** on poor air quality days
- **Increased communication** regarding the need for refills during scheduled appointments
- **Improved symptom awareness and outreach** to providers



# Effectiveness and Limitations

## Proposed Evaluation of Effectiveness:

- Monitor patient engagement with the material through **assessing** the number of **patient visits** where asthma or lung disease was discussed.
- Survey **patients' attitudes** towards discussing air quality with clinic staff.
- **Record the number of medication refills** for asthma or lung disease during scheduled appointments.

## Limitations:

- **Engagement:** Patients must engage with the materials in the posters for the intervention to be successful.
- **Time:** Patient visits are often directed on a specific concern and limited on time so patients may not have time for questions.
- **Information Gaps:** There is still limited data on the health impacts of long-term wildfire smoke inhalation, and this is a new problem in Vermont. It will take more time for additional information and guidelines to become available.



# Recommendations



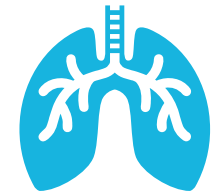
Continue communication between the Vermont Department of Health and primary care clinics to help with **information dissemination as new guidance is determined.**



Consider **linking a handout or creating a resource for patients** that can be a part of their after-visit summary to help provide information for patients outside of the clinical setting.



Provide **education to primary care providers** on the health impacts of air quality that they will be able to relay to patients when asked.



Consider prompting providers to **ask all patients with asthma or other lung diseases if they have had any changes or increases in symptoms**, regardless of the topic of the appointment.

# References

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Duan KI, Birger M, Au DH, Spece LJ, Feemster LC, Dieleman JL. Health Care Spending on Respiratory Diseases in the United States, 1996-2016. *Am J Respir Crit Care Med*. 2023 Jan 15;207(2):183-192. doi: 10.1164/rccm.202202-0294OC. PMID: 35997678; PMCID: PMC9893322.

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- **Title Slide Photo:** Jenn Jarecki / Vermont Public <https://www.vermontpublic.org/local-news/2023-07-03/a-vermonters-guide-to-wildfire-smoke-and-air-quality>
- **Poster Sources:**
  - EPA Poster: Environmental Protective Agency. Effects of Common Air Pollutants. Available from: <https://www.epa.gov/pmcourse/patient-education-tools-particle-pollution>
  - Vermont Department of Health Poster: Vermont Department of Health. Vermont Children and Youth Activities Guide for Air Quality. Available from: <https://www.healthvermont.gov/environment/climate/air-quality-alerts-wildfires-your-health>