

The Impact of Asthma Triggers in Vermont

Reducing the Burden of Asthma in Vermont

Background

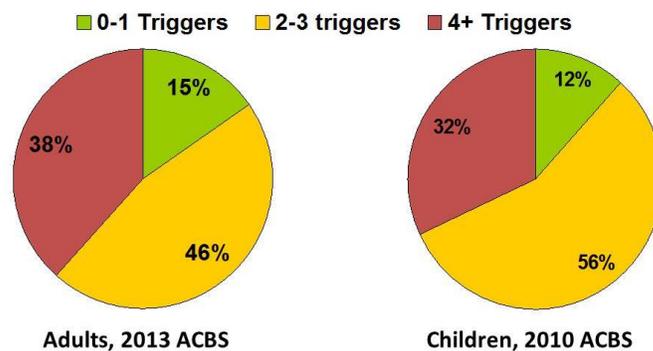
An asthma trigger is a substance, environmental factor, or condition that makes asthma worse. Being exposed to a trigger can cause a sudden worsening of symptoms which is often called an asthma attack or episode. Common asthma triggers include allergens, irritants, exercise, strong emotions, and medical conditions such as respiratory infections. Knowing what causes an individual's asthma symptoms is an important step to controlling asthma. If an individual's specific asthma triggers are known, steps can be taken to reduce and avoid them. This brief presents data related to common asthma triggers for Vermont adults and children drawing from the Behavioral Risk Factor Surveillance System (BRFSS), Asthma Call Back Survey (ACBS) and air-quality monitoring stations within Vermont.

Indoor Environmental Triggers

A number of indoor environmental items such as pet dander from furry or feathered pets, dust-mite excretion, mold, tobacco smoke, smoke from wood-burning stoves or cooking with gas, household pests, and some cleaning products are common allergens or irritants and are known triggers for people with asthma. Exposure to more triggers can make management of asthma more difficult. Controlling access of pets to bedrooms and frequent vacuuming may help reduce asthma symptoms if it is not possible to completely remove triggers from the home.

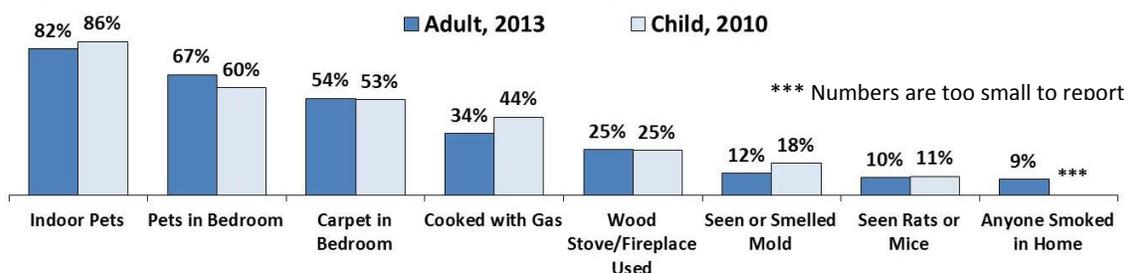
- Approximately one third of Vermonters with current asthma, 38% of adults and 32% of children, were exposed to four or more common environmental triggers in their home (Figure 1).¹ Roughly half of Vermonters with asthma were exposed to 2-3 triggers in their home. Triggers assessed included having indoor pets, allowing pets in the bedroom, having carpeting in the bedroom, cooking with gas, using a woodstove or fireplace, seeing or smelling mold, seeing rodents, and exposure to secondhand smoke in the home.

Figure 1. Exposure to Environmental Triggers among Vermonters with Current Asthma



- The most common indoor environmental trigger among Vermonters was having an indoor pet; 82% of adults and 86% of children with current asthma reported living with an indoor pet (Figure 2).¹ The majority of Vermont adults and children with asthma reported that pets were allowed in the bedroom and that there was carpet in the bedroom. More than one third of Vermonters with asthma cooked with gas and 25% used a wood stove or fireplace in their home. Less prevalent indoor environmental triggers among Vermonters with asthma included exposure to mold, rodents, or secondhand smoke.

Figure 2. Prevalence of Indoor Environmental Triggers among Vermonters with Current Asthma



Smoking

Tobacco smoke is a powerful asthma trigger. When tobacco smoke is inhaled, irritating substances settle in the lining of the airways and can set off asthma episodes. Tobacco smoke also damages tiny hair-like projections in the airways called "cilia" that normally sweep dust and mucus out of the airways. This causes the lungs to make more mucus than normal and results in a buildup of mucus and other irritating substances in the airways. Avoiding environments with smoke or quitting smoking can reduce the impact of this asthma trigger.⁴

- Nearly one out of four of Vermont adults (24%) with current asthma are current smokers compared to 17% of Vermonters without asthma.^{2†} The rate of smoking was even higher among Vermont adults with severe persistent asthma (38%) and those with poorly controlled asthma (33%) in 2012-2013.^{1†}

Outdoor Triggers

Outdoor air pollution is caused by small particles and ground level ozone that comes from car exhaust, smoke, road dust and factory emissions. Outdoor air quality is also affected by pollen from plants. Particle pollution can be high any time of year and is higher near busy roads and where people burn wood.⁶ In Vermont, wood smoke is a common trigger which collects in populated areas within mountain valleys. Local pollen counts are collected by a local medical practice for research purposes and shared with news media and weather services in the state.⁷

- Particulate air quality is measured at 4 monitoring stations within 3 counties in Vermont.³ The average concentration of particulate material less than 2.5 micrometers in diameter (PM2.5) has generally trended downward over the last 10 years, with all years being under the National Ambient Air Quality Standard (NAAQS) of 12 $\mu\text{g}/\text{m}^3$ (Figure 3). Since 2004, Vermont particulate air quality has exceeded the national standard fewer than 2% of the days annually (Figure 4). Vermont has had very few days annually in which the maximum 8-hour ozone concentration is over the NAAQS of 0.075 ppm (Figure 5).

Figure 3. Particulates: Average Ambient Concentration of PM2.5 by County

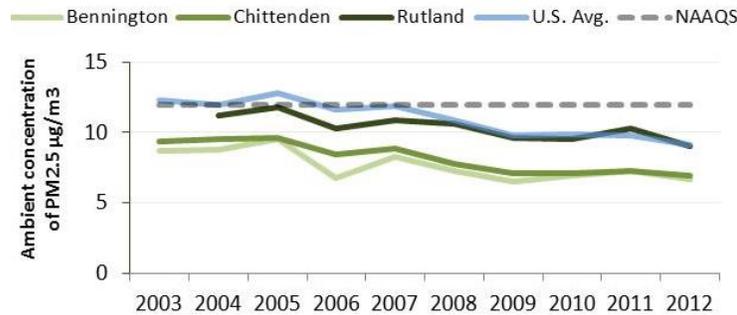


Figure 4. Particulates: Percent of Days with PM2.5 Level over the NAAQS by County

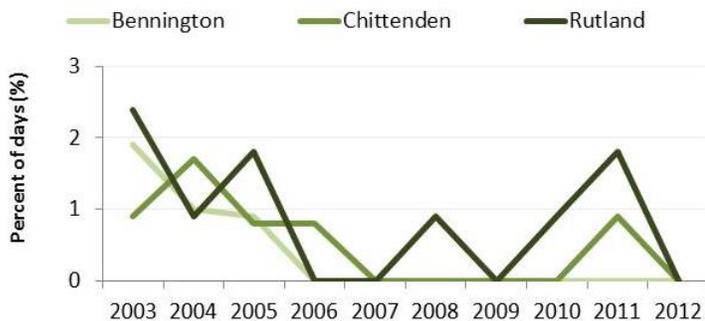
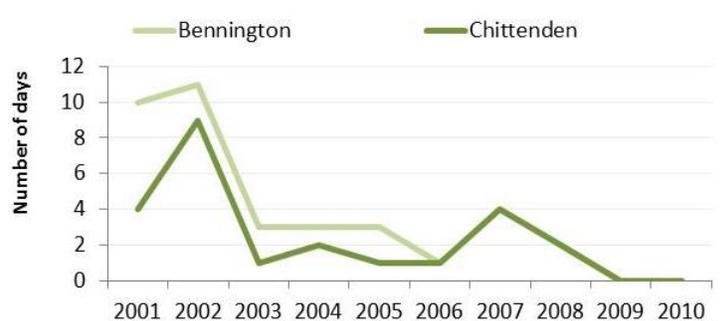


Figure 5. Ozone: Days with Maximum 8-hr Ozone Concentration over the NAAQS by County



Medical Conditions

Respiratory infections, such as a cold, flu, or sinus infection, are the most common medical conditions that worsen asthma symptoms. Those with asthma are at higher risk for serious flu complications due to swollen airways. Frequent hand washing and avoiding people who are sick will help to reduce exposure to cold and flu. The best way to prevent influenza is to get a flu vaccine every year⁵ as recommended by the CDC for everyone with asthma who is six months of age or older.

- Approximately half of Vermont adults (51%)² and three quarters of children (73%)¹ with current asthma report receiving a flu shot or spray within the last year. Nearly half of Vermont adults with asthma (47%) have received a pneumonia vaccine.²

Discussion

Vermonters with asthma were commonly exposed to indoor pets, carpet in the bedroom and the use of wood stoves. In addition, those with the most severe or poorly controlled asthma smoked at a higher rate than other Vermonters. For those with asthma, evaluating their surroundings for potential triggers, identifying their particular triggers, and reducing these triggers hold potential to reduce the burden of asthma. Those with dog allergies may be allergic to all dogs or to just some breeds. Removing carpeting in a home can reduce space where triggers such as dust and dander accumulate. If using gas or wood stoves make sure they vent properly, are well-maintained, and only use dry wood in fireplaces and stoves. Numerous materials in addition to the common triggers listed above have been identified as triggers for asthma. Additional indoor triggers include cleaning products containing volatile organic compounds (VOCs), airborne dusts, fumes, and fragrances. Common asthma triggers at schools are exhaust from idling vehicles, furry or feathered pets in the classroom, and biomass-based heating systems. In the workplace, animal dander, particulates, and chemicals (including latex, formaldehyde, adhesives, isocyanates, and epoxy resins) or food products (such as flour or seafood) which induce allergic response are common triggers. Identifying and removing or avoiding known asthma triggers can improve asthma control and decrease severity.

Action Steps to Reduce Exposure to Asthma Triggers and Improve Asthma Control

- ① Learn how to reduce asthma triggers in your environment
<https://apps.health.state.mn.us/asthmahealthyhomes/>
- ② Learn how to reduce asthma triggers in the workplace
<http://www.cdph.ca.gov/programs/ohsep/Documents/WRAWhatYouShouldKnow.pdf>
- ③ Find support for you or a loved one to quit smoking <http://802quits.org/>

Data Sources and References

¹ Asthma Call Back Survey, Adult 2013, Child 2010; Adult 2012-2013; † data are age adjusted to the 2000 U.S. Standard population

² Behavioral Risk Factor Surveillance System, 2013; † data are age adjusted to the 2000 U.S. Standard population

³ Air Monitoring Section in the Air Quality and Climate Division of the Vermont Department of Environmental Conservation (DEC) within the Agency of Natural Resources [VT Air Quality](#), accessed 2/8/2015

⁴ The Cleveland Clinic, [Smoking and Asthma](#) accessed 2/8/2015

⁵ American Lung Association lung.org/lung-disease/asthma/taking-control-of-asthma/reduce-asthma-triggers.html, accessed 2/8/2015

⁶ Environmental Protection Association <http://www.epa.gov/asthma/outdoorair.html>, accessed 2/10/2015

⁷ Vermont Pollen Count <http://tlaaresearch.com/index.php#pollen>

For More Information on Asthma Data

Asthma Surveillance: http://healthvermont.gov/research/asthma/asthma_surv.aspx

Maria Roemhildt, PhD, Research, Epidemiology & Evaluation, Vermont Department of Health, 108 Cherry Street, Burlington, VT 05401, 802-951-4076, maria.roemhildt@state.vt.us