Pennsylvania
Department of Health

Outdoor Allergens and Asthma

Outdoor Allergens in the Air: What to Know

Environmental allergens in the air such as pollen, dust, and smoke can trigger allergic reactions or make asthma symptoms worse. Asthma symptoms include wheezing, breathlessness, chest tightness, and coughing. Allergy and asthma symptoms are most common in the spring but can occur at any time depending on the source. Outdoor allergens may be worse due to more intense pollen seasons, wildfires, and heatwaves. According to the Centers for Disease Control and Prevention (CDC) and the Asthma and Allergy Foundation of America:

- 26% or one in four adults suffer from a seasonal allergy[1]
- 19% or one in five children under the age of 18 have a seasonal allergy[2]
- Asthma affects 9% of adults (one in 11) and 7% of children (one in 14) in the United States[3]
- Asthma affects 12.1% of adults (one in eight) and 8.2% children (one in 12) in Pennsylvania[4]

Common Sources of Outdoor Allergens

Two main sources of outdoor allergens are pollen and mold. Plant pollen is carried by insects or the wind. Different types of pollen are present throughout the year. In early spring, tree pollen is the most common allergen. Grass pollen is the most common in late spring and early summer followed by weed pollen in late summer and fall.

Mold is found in soil, plants, and rotting wood. Like pollen, mold spores travel through the air and increase in warmer weather. They are at peak levels in Pennsylvania from July through the first frost.

Air pollutants can make allergies and asthma worse. These pollutants come from many sources, such as vehicle exhaust, industrial emissions, agriculture, and wildfires.

Figure 1: Allergy Symptoms. Source: Cleveland Clinic.

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Some allergic reactions appear as a rash or hives. Others affect the airways and mucous membranes. Symptoms may include itchy, watery eyes, difficulty breathing or increased asthma symptoms, and runny nose. Some symptoms appear immediately and are extremely severe (anaphylaxis). Others last for days. Allergens can trigger or worsen asthma

[1] https://www.cdc.gov/nchs/products/databriefs/db460.htm
[2] https://www.cdc.gov/nchs/products/databriefs/db459.htm
[3] https://allergyasthmanetwork.org/news/asthma-awareness-for-world-asthma-day/
[4] Pennsylvania Department of Health. (2024). Behavioral risk factor surveillance system [Data Set]. Enterprise Data Dissemination Informatics Exchange. EDDIE (pa.gov)

symptoms. From 2011 to 2021, about 28,000 asthma-related emergency department (ED) visits occurred annually in PA.[5]

Asthma ED visits tend to be highest in colder months even though outdoor allergen-related visits are more likely to occur in the spring and summer. Asthma ED visits were highest among those aged five to nine years (172 per 10,000 ED visits per year).

Extreme Weather and Outdoor Allergens

Weather changes can impact allergies and asthma. Heat and sunlight increase ozone levels in the air, which can bother the lungs. Thunderstorms can increase humidity and winds, which circulate pollen and mold spores. Humidity increases the growth of mold and bacteria, which triggers allergies and asthma symptoms.

The September Asthma Peak

September is the peak month for asthma attacks, emergency room visits, and hospital stays due to people with asthma coming in contact with several asthma triggers at once. These include weed pollen, mold, respiratory infections, poor indoor air quality at schools, extreme weather and wildfires. The September asthma spike typically affects children first at the beginning of the school year.[6]

Limiting the Effects of Outdoor Allergens as Asthma Triggers

Most people with asthma also have allergies. In fact, allergens are the most common asthma trigger. The following actions can help limit exposure to and the effects of outdoor allergens:

- Check the allergy levels and pollen count forecasts and avoid the outdoors when pollen counts are high.
- Check local air quality on the AirNow website or mobile app and avoid the outdoors when air quality is poor.
- The Pennsylvania Environmental Health Indicators Map allows you to explore many potential sources of outdoor allergens near you including particulate matter (PM) 2.5, ozone, diesel PM, etc.
- Sign up for AlertPA notifications to receive emergency and weather-related alerts, health notifications, building alerts, and other updates from state and federal agencies.[7]
- Wear a mask while performing outdoor activities such as mowing grass, gardening, raking leaves, or working with loose materials such as hay.
- Keep windows closed when air quality is poor.
- Use indoor air purifiers with HEPA filters as they can reduce at least 99.97% of dust, pollen, mold, and other particles which cause allergy symptoms.
  Use certified asthma & allergy friendly® products.

[5] https://www.pa.gov/content/dam/copapwp-pagov/en/health/documents/topics/documents/programs/Asthma%20ED%20Visit%20Fact%20Sheet.pdf
[6] https://aafa.org/asthma/living-with-asthma/september-asthma-peak-month/
[7] AlertPA was unavailable to new subscribers at the time of this publication.

- Avoid drying clothes outside where they can collect allergen particles.
- Discuss allergy symptoms and medications with your primary care provider.

What Are We Doing to Address Asthma in Pennsylvania?

The Pennsylvania Department of Health, through a cooperative agreement with the CDC, is working to:

- Reduce asthma-related ED visits, hospitalizations, deaths, and disparities.
- Expand implementation of the EXHALE strategies in schools, homes, health care locations, and community locations in overburdened communities in the PA asthma capitals. The six evidence-based **EXHALE** strategies are:
  - **E**ducation on asthma self-management
  - E**X**tinguishing smoking and exposure to second-hand smoke
  - **H**ome visits for trigger reduction and asthma self-management education (AS-ME)
  - **A**chievement of guidelines-based medical management
  - **L**inkages and coordination of care
  - **E**nvironmental policies or best practices to reduce indoor and outdoor asthma triggers
- Improve organizational infrastructure to advance health equity and sustainability.

Asthma and Environmental Health Resources:

- American Lung Association Asthma Information
- Asthma and Allergy Foundation of America Asthma Information
- Allergy & Asthma Network Asthma Information
- Pennsylvania Department of Health Asthma Control Program
- Pennsylvania Department of Health Division of Environmental Health Epidemiology
- Centers for Disease Control and Prevention Asthma Program
- If you have any questions, contact the Asthma Control Program at RA-DHPAAsthma@pa.gov or the Division of Environmental Health Epidemiology at dehe@pa.gov