

Air Pollution and Health—for Health Care Providers

Recent studies show that air pollution worsens certain health conditions, especially respiratory and cardiovascular diseases.

These studies show that exposure to some air pollutants increases symptoms of respiratory irritation, use of asthma medications, and hospitalization for asthma. These effects all occur even when levels of some air pollutants meet federal health standards. Exposure to some kinds of air pollution has also been linked to increased deaths, higher rates of lung cancer, and decreases in lung function.

Fine particle pollution

Fine particle pollution is made up of tiny pieces of soot, dust, and unburned fuel suspended in the air. Fine particles are one of the most dangerous kinds of pollution because they can be carried deep into the lungs where they cause serious health problems such as asthma, lung disease, heart disease, and death. The main sources of fine particles in Washington State are wood smoke and motor vehicles. During the winter months when fine particle pollution is highest, over half of it comes from wood smoke. Fine particles from diesel and gasoline vehicles are a major concern for people living, working, or attending school near busy roadways.

Breathing air containing fine particles can:

- reduce lung function, especially in children;
- worsen existing lung diseases such as asthma, emphysema, pneumonia and bronchitis;
- aggravate heart disease;
- increase the chances of getting lower respiratory diseases;
- irritate eyes, lungs, throat and sinuses; and
- trigger headaches and allergies.

Long term exposure to particulate matter may lead to:

- lung disease;
- chronic bronchitis;
- increased risk of cancer; and
- heart disease.

Ozone

Ozone, a major ingredient of smog, is formed when nitrogen oxides and volatile organic compounds react with one another in the presence of sunlight and warm temperatures. Major sources of the raw ingredients for ozone in Washington are motor vehicles.

Ozone irritates the eyes, nose, throat and respiratory system. It is especially bad for those with chronic lung disease, as well as the very young and old. Ozone can trigger asthma attacks in some people. Chronic exposure to ozone impairs lung development in children.

Washington Air Quality Advisory (WAQA)

Ecology developed WAQA to tell people when air quality is unhealthy so that they can take steps to protect themselves. The WAQA includes information about particulate matter, ozone, and carbon monoxide. WAQA is very similar to the Environmental Protection Agency's (EPA's) national information tool, the Air Quality Index (AQI). Both use color-coded categories to show when air quality is good, moderate or unhealthy. The difference is that WAQA shows the health effects of PM 2.5 at lower levels than the AQI does. In other words, WAQA shows that air quality is unhealthy earlier – when there is less PM2.5 in the air.

Sensitive individuals can use the WAQA to protect themselves from harmful pollutants, and health care providers can help their patients by directing them to this resource. When the WAQA shows high levels of pollution, sensitive individuals should take the following precautions:

Category	WAQA Health Effects
Good (0-50)	None
Moderate (51-100)	Some people with lung and heart disease, stroke, diabetes, or a current respiratory infection may be sensitive to air pollution at this level and should consider limiting outdoor activity
Unhealthy for Sensitive Groups (101-150)	People with lung and heart disease, stroke, diabetes or a current respiratory infection, infants, children, and older adults, should limit outdoor activity.
Unhealthy (151-200)	Everyone should try and limit outdoor activity. If possible, people with lung and heart disease, stroke, or respiratory infections, infants, children, and older adults should stay indoors
Very Unhealthy (201-300)	Everyone should try to stay inside. People with lung and heart disease, stroke, diabetes, or a current respiratory infection should limit indoor activity levels low. Shut windows and doors if it is not too hot. Set air conditioners on the recirculate mode if this is available.
Hazardous (301-500)	Everyone should try to stay indoors. Limit physical activity. Shut windows and doors, if it is not too hot. Set air conditioners on the recirculate mode if this is available. If it is too hot to shut windows and doors, consider leaving the area until air quality improves.

See the following links for more information

- [Air Quality Data](#) (WAQA)
- Air Pollution and Health (general information)
http://www.ecy.wa.gov/programs/air/Health_community/Health_info.html
- Ecology's diesel page: http://www.ecy.wa.gov/programs/air/cars/diesel_exhaust_information.htm
- Pope, et. al on PM and life expectancy: <http://content.nejm.org/cgi/content/full/360/4/376>
- Laden study on life expectancy <http://ajrccm.atsjournals.org/cgi/content/short/173/6/667>
- NHI Guidelines: <http://www.nhlbi.nih.gov/guidelines/asthma/asthsumm.pdf>
- ATSDR on environmental asthma triggers: <http://www.atsdr.cdc.gov/csem/asthma/index.html>
- USC Children's Health Study: <http://www.arb.ca.gov/research/chs/chs.htm>
- Article by Luke Naeher, et. al., [Critical review of the health effects of woodsmoke](#)
- EPA information on ozone and asthma: <http://www.epa.gov/o3healthtraining/index.html>

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