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Fact Sheet

December 2010

Smoke, Particulate Pollution & Your Health

Particulate matter (PM) consists of very tiny solid and liquid particles that are in the air we breathe. The particles themselves are different sizes. Some are one-tenth the diameter of a strand of hair. Many are even smaller. Because of their size, you can't see the individual particles. You can only see the haze that forms when millions of particles blur the spread of sunlight. You may not be able to tell when you are breathing particle pollution, but the effects can shorten your life.

What is particle pollution?

This pollution, also known as particulate matter, is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, soil or dust particles, and allergens (such as fragments of pollen or mold spores).

The size of particles is directly linked to their potential for causing health problems. Small particles less than 10 micrometers in diameter pose the greatest problems, because they can get deep into your lungs, and some may even get into your bloodstream. Exposure to such particles can affect both your lungs and your heart. Larger particles are of less concern, although they can irritate your eyes, nose, and throat.

Small particles of concern include "fine particles" (such as those found in smoke and haze), which are 2.5 micrometers in diameter or less; and "coarse particles," which have diameters between 2.5 and 10 micrometers. There are a number of air pollutants in smoke that blow downwind from grassland fires including several pollutants that form fine particles.

People at risk

People with heart or lung disease, older adults, and children are considered at greater risk from particles than other people, especially when they are physically active. Exercise and physical activity cause people to breathe faster and more deeply and to take more particles into their lungs.

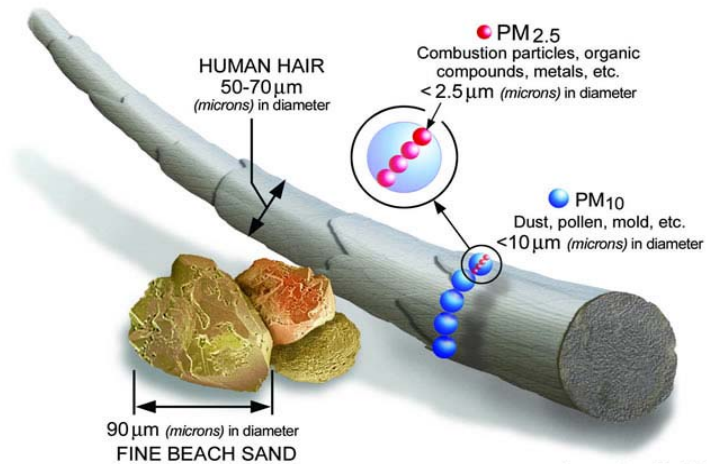


Image courtesy of the U.S. EPA

People with heart or lung diseases such as coronary artery disease, congestive heart failure, and asthma or chronic obstructive pulmonary disease (COPD) are at increased risk, because particles can aggravate these diseases. Older adults are at increased risk, possibly because they may have undiagnosed heart or lung disease or diabetes.

Children are likely at increased risk for several reasons. Their lungs are still developing; they spend more time at high activity levels; and they are more likely to have asthma or acute respiratory diseases, which can be aggravated when particle levels are high.

Health effects

Particle exposure can lead to a variety of health effects. For example, numerous studies link particle levels to

increased hospital admissions and emergency room visits and even to death from heart or lung diseases. Both long- and short-term particle exposures have been linked to health problems.

Long-term exposures, such as those experienced by people living for many years in areas with high particle levels, have been associated with problems such as reduced lung function and the development of chronic bronchitis and even premature death.

Short-term exposures to particles (hours or days) can aggravate lung disease, causing asthma attacks and acute bronchitis, and may also increase susceptibility to respiratory infections. In people with heart disease, short-term exposures have been linked to heart attacks and arrhythmias. Healthy children and adults have not been reported to suffer serious effects from short-term exposures, although they may experience temporary minor irritation when particle levels are elevated.

Symptoms of Particle Exposure

Even if you are healthy, you may experience temporary symptoms, such as irritation of the eyes, nose, and throat; coughing; phlegm; chest tightness; and shortness of breath.

If you have lung disease, you may not be able to breathe as deeply or as vigorously as normal, and you may experience coughing, chest discomfort, wheezing, shortness of breath, and unusual fatigue. If you have any of these symptoms, reduce your exposure to particles and follow your doctor's advice. Contact your doctor if symptoms persist or worsen. If you have asthma, carefully follow your asthma management plan when particle levels are high. Your doctor can help you develop a plan if you don't have one.

If you have heart disease, particle exposure can cause serious problems in a short period of time even heart attacks with no warning signs. So don't assume that you are safe just because you don't have symptoms. Symptoms such as chest pain or tightness, palpitations, shortness of breath, or unusual fatigue may indicate a serious problem. If you have any of these symptoms, *follow your doctor's advice.*

How to Protect Your Family from the Health Effects of Smoke

The biggest health threat from smoke comes from fine particles. Still, it's a good idea to avoid breathing smoke if you can help it. Smoke is made up of a complex mixture of gases and fine particles produced when wood and other organic matter burn.

Pay attention to local air quality reports and stay alert to any news coverage or health warnings related to smoke.

Use common sense. If it looks smoky outside, it's probably not a good time to mow the lawn or go for a run. And it's probably not a good time for your children to play outdoors.

If you are advised to stay indoors, take steps to keep indoor air as clean as possible. Keep your windows and doors closed - unless it's extremely hot outside.

Run your air conditioner, if you have one. Keep the fresh air intake closed and the filter clean to prevent bringing additional smoke inside. Note: If you don't have an air conditioner, staying inside with the windows closed may be dangerous in extremely hot weather. In these cases, seek alternative shelter.

Help keep particle levels inside lower. When smoke levels are high, try to avoid using anything that burns, such as wood fireplaces, gas logs, gas stoves - and even candles! Don't vacuum. That stirs up particles already inside your home. And don't smoke. That puts even more pollution in your lungs, and in the lungs of people around you. If you have asthma or other lung disease, make sure you follow your doctor's directions about taking your medicines and following your asthma management plan. Call your doctor if your symptoms worsen.

If you have heart or lung disease, if you are an older adult, or if you have children, talk with your doctor about whether and when you should leave the area. When smoke is heavy for a prolonged period of time, fine particles can build up indoors even though you may not be able to see them.

Air cleaners can help indoors-but buy before a fire. Some room air cleaners can help reduce particle levels indoors, as long as they are the right type and size for your home. If you choose to buy an air cleaner, don't wait until there's a fire - make that decision beforehand. Note: Don't use an air cleaner that generates ozone. That just puts more pollution in your home.

For more information about home air cleaners, go to: www.epa.gov/iaq/pubs/residair.html

Dust masks aren't enough. Paper "comfort" or "dust" masks - the kinds you commonly can buy at the hardware store - are designed to trap large particles, such as sawdust. These masks generally will not protect your lungs from the fine particles in smoke.