



Particulate Matter (PM)

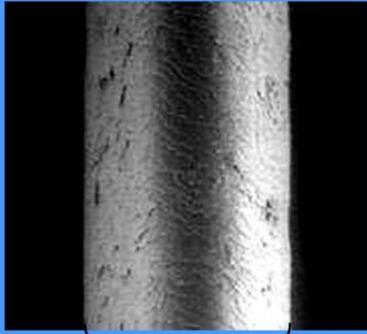
What is PM? It is a kind of air pollution called particles or particulate matter. These particles are so small that most of them are invisible to the naked eye and yet particulate matter impacts human health the most.

Their size and shape can take on many forms and can range from 2.5 to 10 micrometers.

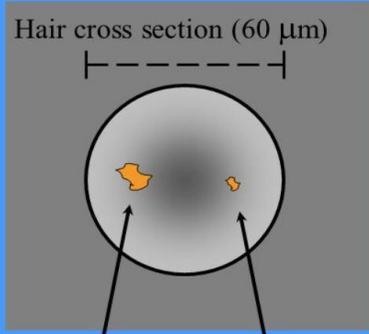
They can also be made of different compositions and exists in different states of matter like solid particles or liquid droplets. Smaller particles are called PM2.5 and larger ones are PM10. We are surrounded every day by many producers of particulate matter and it's important to understand their sources and impacts on our health.

Particulate matter can come from many sources like smoke, dust, dirt roads, mold, pollen, spores, water vapor, emission from power and chemical plants, volcanoes, mining waste piles, crushing rocks/soils, controlled burns and wildfires. They can also very fine heavy metal compounds or toxic organic compounds. They can be created in many ways from factories to driving your car down a dirt road.

HOW SMALL IS PM?



Human Hair
(60 μm diameter)



Hair cross section (60 μm)

PM10
(10 μm)

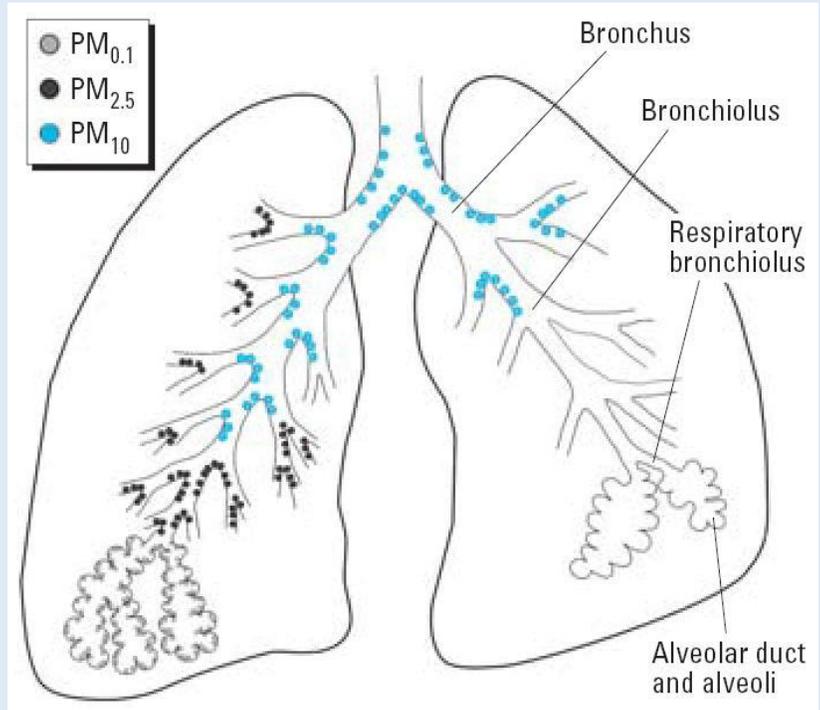
PM2.5
(2.5 μm)

Bad Air Day	Good Air Day
 <p>Baltimore</p> <p>Downtown Baltimore ~10 miles away NOT Visible!</p>	 <p>Baltimore</p> <p>Downtown Baltimore ~10 miles away CLEARLY Visible!</p>
 <p>Frostburg</p> <p>Meadow Mountain ~6 miles away BARELY Visible! in Background!</p>	 <p>Frostburg</p> <p>Negro Mountain Range (on the Horizon) ~13-15 miles away CLEARLY Visible!</p>

Because of their sizes particulate matter can travel some distances. Bigger particles can travel from as little as a couple hundred yards to 30 miles. Whereas smaller sized particles can stay in the air for days or weeks and can travel many hundreds of miles. Therefore, the idea that we possess our airshed is incorrect. Air can travel from one country to another bringing with it sources of pollution. There is only the one air and we share this air with every other living and breathing thing on this earth. Therefore, protection of clean air is so vital not just in our own country but in all countries.



Fine Particles (PM_{2.5}) can play a role in serious illnesses and even death as they are small enough to settle deep into the lungs and pass into the blood stream. From there they can impact the heart and blood vessels as well as the lungs. People exposed to fine particles over an extended period are a higher risk of heart and lung problems. Communities at risk for heart and lung problems related to air pollution include groups and individuals impacted by poverty, lack of health insurance, obesity and diabetes prevalence, smoking, truck and car exhaust, factory emissions. Symptoms of exposure to particles in lungs are premature death in people with heart or lung disease, nonfatal heart attacks, irregular heartbeat, aggravated asthma, decreased lung function, increased respiratory symptoms, such as irritation of the airways and coughing or difficulty breathing.



Particulate Matter damage can cause several environmental effects such as visibility impairment. “Fine particles are also the main cause of reduced visibility (haze) in parts of the United States, including many of our treasured national parks and wilderness areas”, stated by the EPA. Particulate Matter also causes environmental damage this happened by particles being carried over long distances then settling on the ground and water. Depending on the chemical composition effects of this could be making lakes and streams acidic, changing the nutrient balance in coastal waters and large river basins, depleting the nutrients in soil, damaging sensitive forests and farm crops, affecting the diversity of ecosystems and contributing to acid rain effects.

Sources:

<https://ephtracking.cdc.gov/showAirHIA.action>

<https://www.epa.gov/pm-pollution/health-and-environmental-effects-particulate-matter-pm>