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Air Pollution Linked to Deaths From Lung Cancer

Risk for Other Diseases Is Increased As Well

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Air pollution – mainly from vehicles, industry, and power plants – raises the chances of [lung cancer](#) and heart disease in people exposed to it long term, according to a report in the March 6 *Journal of the American Medical Association* (Vol. 287, No. 9: 1132-1141).

"There's an excess risk of both lung cancer and cardiopulmonary disease associated with increased exposure to fine particles [in air pollution]," said study co-author C. Arden Pope III, PhD, at Brigham Young University in Provo, Utah.

The risk comes when gases from auto exhaust and smokestacks combine with oxygen in the air to form very small particles that are breathed in, said Pope.

Smoking is the main cause of lung cancer, said Pope.

But breathing very polluted air long-term can raise the risk of lung cancer as much as breathing second-hand smoke, he added.

The largest effect of bad air on deaths from heart disease and lung cancer was on non-smokers. And, bad air increased all study participants' chance of death by the same amount as if they were all "moderately" overweight, the report noted.

Study Longest, Largest Yet

Earlier studies suggested air pollution might be linked to disease and death, but some studies were too small or didn't follow people exposed to air pollution long enough for scientists to be sure of the connection.

The new study looked at the health of about 500,000 people in over 100 US cities from 1982 to 1998, long enough for lung cancer or heart disease – which can take decades to develop – to show up.

The data for the study came from the American Cancer Society's Cancer Prevention Study II study, an ongoing program that has tracked the health of over 1.2 million people since 1982.

Risk Increases As Pollution Increases

The study found there was no level of air pollution that was safe, and that

the more air pollution increased, the higher the risk became of dying from lung cancer, heart disease, or from any cause.

Pollution drove up the risk of dying from lung cancer the most, followed by risk of death from heart disease, and then by risk of dying from all causes.

The risk of lung cancer death went up by 8% for every 10 micrograms of fine particles in a cubic meter (about 3 feet by 3 feet) of air, the study found. Heart disease deaths went up 6%, and deaths from all causes 4%, for every such increase.

A 1994 study by Pope estimated 50,000 to 100,000 Americans died yearly from the effects of outdoor particulate air pollution.

Limits Imposed by the EPA

Scientists had known since the 1970s that very high rates of particles in the air caused death rates to jump. By the late 1980s and 1990s studies were showing that even at very low levels, air pollution was causing damage to health, the authors noted.

So in 1997, the Environmental Protection Agency (EPA) put limits on power plant emissions that produce the gases that help form fine particle pollution.

Air pollution has lessened since the 1970s, Pope said, but was still above the current EPA limits in some US cities as late as 1999 and 2000.

Benefit of Cleaner Air Seen

The researchers couldn't find a level of air pollution that didn't increase death rates.

That means it's more difficult for regulators to decide pollution limits than if harm didn't occur below a certain level, Pope said.

But it also means every reduction in air pollution will likely lower death rates, he said.

"We can expect to see health benefits from the air pollution decline since the 1970s, but there appear to be opportunities for additional benefits from further improvement in our air quality," he added.

"The results of this research suggest that further public policy efforts to improve our air quality will result in significant benefits," Pope concluded.

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