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Study Doubles Estimate of Smog Deaths

USC researchers amass measurements of lethal particulate matter from hundreds of locations in the L.A. Basin. State may raise its official figures.

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The number of deaths from breathing sooty smog in California may be more than twice as high as previously estimated, based on a recent USC study that examined the risk of such deaths in the Los Angeles Basin.

A team of researchers headed by Michael Jerrett, associate professor of preventive medicine, found two to three times greater risk of mortality from heart attacks, lung cancer and other serious illness tied to chronic exposure to fine particulate matter than did previous studies.

The study looked at specific soot measurements and deaths in hundreds of neighborhoods -- rather than relying on citywide annual averages used in the past -- and detected the largest increased risks in the Inland Empire, Jerrett said.

Fine particulate matter spewed out by cars, trucks, locomotives, ships, planes, refineries and other sources lodges deep in the lungs and is widely considered the most lethal form of air pollution.

The staff of the California Air Resources Board said this week they are considering boosting statewide death estimates based on the USC data, pending independent review.

"I think candidly it's likely," said Michael Scheible, deputy executive director of the board. "The research suggests we will end up raising our estimates ... but we want to be cautious."

Currently, state officials estimate 9,000 Californians die annually from diseases caused or aggravated by air pollution, more than half of them in Southern California.

That number could double or even triple if the Air Resources Board incorporates the USC data into its estimates, Scheible said.

He said the board decided Thursday that the USC study and two others examining the effect of air pollution on mortality should undergo one more layer of review to determine the best possible way of applying them statewide. That review could be completed by the end of summer.

The other studies include one by researchers at Harvard University who found that as soot pollution declined in six northeastern cities, related deaths declined as well. The other, a recent study by Loma Linda University, found increased coronary deaths among women exposed to both fine particulate matter and ozone.

The Times reported earlier this week that one in every 15,000 Californians -- about 66 per million -- is at risk of contracting cancer from breathing chemicals in the air over his or her lifetime, according to the U.S. Environmental Protection Agency's recent National-Scale Air Toxics Assessment. The study was based on emissions of 177 chemicals in 1999.

"The more we learn about particulate, the worse the news is," said Jerry Martin, a spokesman for the Air Resources Board, who added that as recently as 10 years ago, ozone and toxics were considered the problem. "Part of that is the technology for looking at very fine particles keeps improving.... A fine particle is less than one-twenty-eighth the size of a human hair. At that size, it can actually permeate right through your lungs into your bloodstream and cause heart problems."

Other air regulators and clean-air advocates said the USC study points to the need to toughen national standards for fine particulate.

"The study underscores the extremely grave severity of the threat from air pollution," said Frank O'Donnell of Clean Air Watch in Washington, D.C. "It draws a huge line under the need for the federal government to take aggressive action against existing sources of diesel soot."

Sam Atwood, spokesman for the South Coast Air Quality Management District, said the agency's chief health expert "considers it a significant study that bolsters the need to strengthen particulate matter standards."

EPA administrator Stephen L. Johnson has drawn criticism for proposing new standards for particulates considered too lax by his own scientific advisory panel. He is facing a court-ordered September deadline to make a final decision.

The highest death rates from smog-related illnesses in the USC study were found in the Inland Empire, where diesel soot is blown by prevailing winds. In western Riverside and San Bernardino counties, the soot is trapped by four mountain ranges.

"Somebody living in San Bernardino is two or three times more likely to die from smog during a given period than someone in Venice," Jerrett said.

The risk of fatal heart attacks tied to soot was as much as 39% higher in the smoggiest areas. Deaths from diabetes, though few, were twice as high in those areas.

The current mortality estimate is based on a 2002 national study of 500,000 people that found a 6% increased risk of death with each additional 10 micrograms of fine particulate per cubic meter of air. But the national study used just three monitors in the L.A. basin, missing major pockets of pollution, according to Jerrett.

He said the new study, co-written by the lead researcher on the 2002 work, found sharply higher rates of risk, between 11% and 17%, because it analyzed soot measurements and deaths in 269 ZIP Codes and 23 monitoring sites across the basin.

He said researchers studied nearly 23,000 Los Angeles-area residents who are part of a long-term study of the effects of air pollution begun by the American Cancer Society in 1982. He said more than 40 variables, including smoking habits and diet, were taken into consideration.

A separate USC study published this week in Environmental Health Perspectives Journal found that ozone, a different type of air pollution, reduced sperm counts in Los Angeles men. Other pollutants did not affect sperm counts.

"The data indicated that for every 14 parts per billion increase in ozone, we had an approximate drop of 3 million sperm per millimeter," said lead author Rebecca Sokol, a USC endocrinologist. That is about a 3% drop in sperm as the ozone level rose, especially on smoggy summer days.

The smoggiest day measured was 50 parts per billion, but she said that such heavy smog days were rare.

"These changes are not going to put men in the infertile scenario," she said. Still, she noted that all the days measured had smog levels below the current California legal standard of 80 parts per billion.

More than 5,000 samples from men known to be fertile were taken. Next, the researchers plan to study the possible relationship between ozone and infertile men.