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Soot Particles Strongly Tied to Lung Cancer, Study Finds

By ANDREW C. REVKIN

Prolonged exposure to air tainted with tiny particles of soot significantly raises the risk of dying of lung cancer or other lung and heart diseases, according to a new study of 500,000 people in 116 American cities.

In fact, the authors say, many city residents face a long-term risk of fatal lung cancer similar to that of someone living with a smoker.

Because lung cancer is so rare among nonsmokers, that translates into just two additional lung cancer fatalities per 100,000 people, said a leader of the research project, Dr. George D. Thurston, associate professor of environmental medicine at the New York University School of Medicine. But, Dr. Thurston added, the finding helps suggest a cause for many otherwise unexplained lung cancer deaths and adds urgency to efforts to reduce fine-particle pollution, which comes from power plants and motor vehicles.

Earlier studies had hinted at a link between fine soot particles and lung cancer. But this one, whose results appear today in The Journal of the American Medical Association, was the first with sufficient breadth (involving the 500,000 subjects) and duration (16 years) to show a strong relationship.

The Environmental Protection Agency has written rules to crack down on soot pollution, but they have been held up by lawsuits brought by the power industry and by vehicle manufacturers and operators. Now, in the aftermath of a Supreme Court ruling favorable to the agency, the regulations could take effect late next year, and a senior E.P.A. official said yesterday that the new study suggested that "we're on the right track" in pressing for them.

Microscopic soot particles, far smaller than those that collect on urban windowpanes, have increasingly been identified as a leading pollution threat. The average level of them in American cities has declined by more than 30 percent since 1980, a result of existing broader regulations that do not make a target of these fine particles specifically. But a growing body of studies pointing to their threat prompted the environmental agency in 1997 to issue the restrictions subsequently delayed in court.

The average urban level of these particles in 1980 was 21 micrograms per cubic meter of air. In 2000, it was 14 micrograms. The E.P.A. standard would set an average annual limit of 15 micrograms for cities, but even so, experts expect many metropolitan areas to fail to meet the target.

The 500,000 adults on whom the new study focused were recruited in 1982 by the

American Cancer Society for a lifelong project tracking their lifestyles, diets, work conditions and, ultimately, causes of death.

Experts who have spent years analyzing theorized links between pollution and illness generally gave the study high marks.

"One study alone doesn't answer these questions, but it opens the door wider on the issue of lung cancer and pollution," said Daniel S. Greenbaum, president of the Health Effects Institute, a pollution research group in Boston that is financed equally by the E.P.A. and manufacturing industries.

Dr. Thurston, co-author of the new study, said it carried both good news and bad.

"The bad news is that fine-particle air pollution is even more toxic than we thought before," he said. "The good news is we are addressing this problem and there are ways we can further reduce this risk, by moving forward with the Clean Air Act and cleaning up these power plants that are a major source."