Long - term Effect of Air Pollution in Europe

Results from a recent European study show that air pollution assessed in France in the 1970s is associated with increased mortality over 25 years. These results emphasise the need for additional long term studies for the development of effective strategies for reducing the risks related to long - term exposure to air pollution.

Air quality is one of the areas in which Europe has been most active in recent years from both scientific and political perspectives. However, while numerous studies evidenced short-term associations between the level of air pollution and the risk of death, studies of long term effects of air pollution on mortality are severely lacking in Europe.

In their efforts to contribute to filling the gap of knowledge about the long term effects of air pollution in Europe, a group of French scientists analysed associations between air pollution and mortality in more than 10 000 adults from seven French cities over 25 years.

The study population was enrolled in the 1974 survey aimed at investigating the effects of air pollution on chronic respiratory diseases (PAARC). During a three years period (1974–76) daily measurements of sulphur dioxide, total suspended particles, black smoke, nitrogen dioxide, and nitric oxide were performed in 24 French urban areas. The selected population was at the time aged between 25 and 59 years. The mobility of the population during the follow-up period (1974-2000) was assessed by searching the subjects on national phone files in 2000, using name and address in 1974. Their vital status and eventual causes of death were obtained through specialised departments of National Institute of Health and Medical Research and a computerised search through a national register.

Analyses have been performed taking into account individual risk factors, various indicators of air pollution, namely traffic pollution, and potential spatial variability. The scientists used models controlling for individual confounders (smoking, educational level, body mass index, occupational exposure) and eventual spatial correlation.

Their results demonstrated that urban air pollution assessed in the 1970s was associated with increased mortality over 25 years. Furthermore, they showed that inclusion of air monitoring data from stations particularly exposed to local traffic can overestimate the mean population exposure and bias the results.

After exclusion of six areas heavily influenced by local traffic, the analyses showed an increased risk of non-accidental mortality related to 10 µg/m³ increase in mean concentrations of total suspended particles, black smoke, nitrogen dioxide, and nitric oxide. Consistent patterns for lung cancer and cardiopulmonary causes were also observed.

Because of the vastly larger number of short-term effect studies performed, the assessors of health risk from air pollution have often had more confidence in these studies than in results from the few long-term studies. But more emphasis on the latter can be expected in the future. Indeed, the authors highlight that additional long term studies with a fine exposure assessment are needed for the development of effective air quality policies.

Contact: laurent.filleul@sante.gouv.fr
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