

Europe-wide study finds long-term exposure to even low levels of air pollution increases risk of lung cancer

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Prolonged exposure to particulate air pollution increases the risk of lung cancer (particularly adenocarcinoma) even at levels below the European Union limit values, according to one of the largest studies of its kind published in *The Lancet Oncology*.

"At this stage, we might have to add air pollution, even at current concentrations, to the list of causes of lung cancer and recognise that air pollution has large effects on public health", warns Takashi Yorifuji from Okayama University Graduate School of Environmental and Life Science and Saori Kashima from Hiroshima University in Japan in a linked Comment.

Ole Raaschou-Nielsen from the Danish Cancer Society Research Center led a European team of researchers to assess the impact of long-term exposure to nitrogen oxides and particulate matter (those with a diameter of less than 2.5 micrometers; PM2.5, and less than 10 micrometers; PM10) on the risk of lung cancer. Sources of particulate matter air pollution include traffic, industry, and domestic heating.

Using data from the European Study of Cohorts for Air Pollution Effects (ESCAPE), coordinated at the University of Utrecht, the investigators did a [meta-analysis](#) of 17 cohort studies in nine European countries including almost 313 000 people.

Air pollution concentration was estimated at the home addresses using land-use regression models. Participants were tracked for new lung cancer diagnoses in national and local cancer registries, and the researchers applied statistical modelling to separate the influence of air pollutants from other factors like smoking, diet, and occupation.

Among the participants, 2095 developed lung cancer during the average 13 years of follow up.

The analysis found that for every increase of 5 micrograms per cubic meter of PM_{2.5} pollution, the risk of lung cancer rose by 18%, and for every increase of 10 micrograms per cubic meter in PM₁₀ pollution the risk increased by 22%, with stronger effects indicated for adenocarcinomas. No association between lung cancer and [nitrogen oxides](#) was noted.

According to the authors, "The association between [particulate matter air pollution](#) and the risk for [lung cancer](#) persisted also at concentrations below the existing European Union air quality limit values for PM₁₀ (40 $\mu\text{g}/\text{m}^3$) and PM_{2.5} (25 $\mu\text{g}/\text{m}^3$). We found no threshold below which there was no risk; the results showed a picture that 'the more the worse, the less the better'."

More information: [www.thelancet.com/journals/lan ... \(13\)70279-1/abstract](http://www.thelancet.com/journals/lan... (13)70279-1/abstract)

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