Researchers suggest air pollution be included as risk factor for patients with lung cancer and have never smoked

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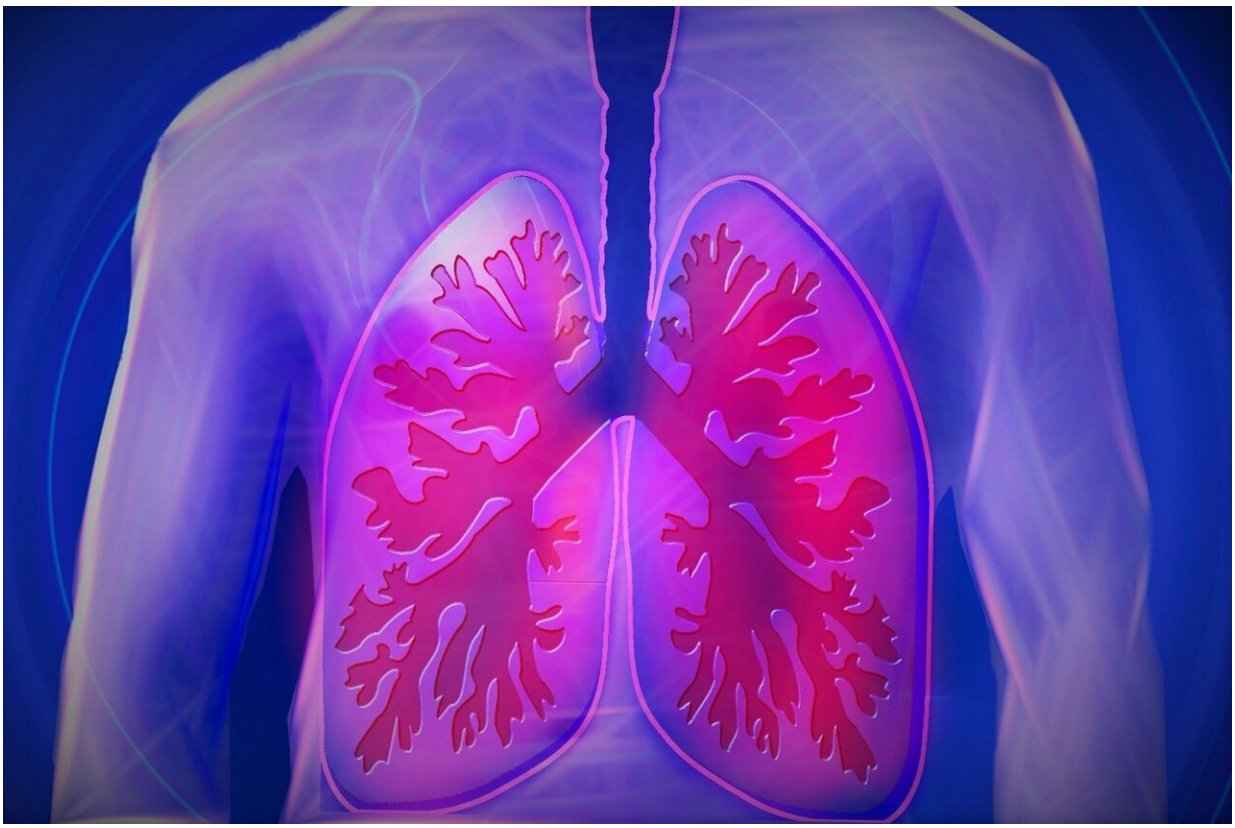

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Researchers from Vancouver, British Columbia examine the effect of duration of past exposure to air pollution with lung cancer diagnosis.

In 2013, the International Agency of Research on Cancer classified outdoor air pollution and particulate matter of 2.5 micrograms/meter3 (PM 2.5) in outdoor air pollution as carcinogenic to humans, but the effects of air pollution exposure may take 15 to 20 years to be reflected in the lung adenocarcinoma incidence rate. To assess the connection between pollution and lung cancer diagnosis, Renelle Myers, BC Cancer, in Vancouver, B.C. compared the cumulative three-year versus 20-year exposure in females with newly diagnosed lung cancer who have never smoked.

Dr. Myers and her colleagues invited Vancouver-area women with lung cancer who had never smoked to participate in the study. The researchers collected detailed information on the patients' age, sex, race, country of birth, age of arrival in Canada (for foreign born Canadians), their occupation, family history of lung cancer, and secondhand smoke exposure. A detailed residential history from birth to cancer diagnosis for residences within Canada, and prior residences outside of Canada (for foreign born immigrants) were recorded. This geographical data included street and city address with postal codes, which allowed accurate linking of residential locations to satellite-derived PM 2.5 exposure data that were available from 1996 onwards. Cumulative exposure to PM 2.5 was quantified with a high-spatial resolution global exposure model. The magnitude of three-years versus 20-years exposure were compared.

Myers acknowledged that even a 20-year cumulative exposure does not capture childhood exposure and is an underestimate of lifetime exposure and depends on countries of residence

Of the 236 female patients with lung cancer who had never smoked, 190 (83.3%) were foreign born; 71% were Asians. The mean years lived in a foreign country was 37.3 years. The mean age of lung cancer diagnosis was 66 years; 92.8% of them had adenocarcinoma and 55.9% were Stage

III/IV lung cancer. For foreign-born Canadian females, only4/190 (2%) had 3-year cumulative PM2.5 exposure of >10 ug/m^3 whereas 38/190 (20%) had a 20-year cumulative PM2.5 of >10 ug/m^3 ($p \geq 0.0001$). All had a PM2.5 exposure greater than 5 ug/m^3. Shorter term (3-years) assessment significantly under-estimate the cumulative exposure to PM2.5 prior to lung cancer diagnosis especially among foreign-born Canadians.

"Our study demonstrates the important of incorporating long-term cumulative exposure to ambient air pollutants in the assessment of individual lung cancer risk in combination with traditional risk factors," said Dr. Myers. "Research is needed regarding the best method to incorporate the effects of air pollution exposure prior to 1996 when accurate satellite data became available. Our finding has important clinical implication in assessing lung cancer risk with global migration."

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