

Publication

Comparing the lung cancer burden of ambient particulate matter using scenarios of air quality standards versus acceptable risk levels

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Ambient particulate matter (PM) is regulated with science-based air quality standards, whereas carcinogens are regulated with a number of "acceptable" cases. Given that PM is also carcinogenic, we identify differences between approaches.; We assessed the lung cancer deaths for Switzerland attributable to exposure to PM up to 10 µm (PM₁₀) and to five particle-bound carcinogens. For PM₁₀, we used an epidemiological approach based on relative risks with four exposure scenarios compared to two counterfactual concentrations. For carcinogens, we used a toxicological approach based on unit risks with four exposure scenarios.; The lung cancer burden using concentrations from 2010 was 10-14 times larger for PM₁₀ than for the five carcinogens. However, the burden depends on the underlying exposure scenarios, counterfactual concentrations and number of carcinogens. All scenarios of the toxicological approach for five carcinogens result in a lower burden than the epidemiological approach for PM₁₀.; Air quality standards-promoted so far by the WHO Air Quality Guidelines-provide a more appealing framework to guide health risk-oriented clean air policymaking than frameworks based on a number of "acceptable" cases.

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