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Chronic pulmonary effects of ambient nano-PM: Lessons learned from PM

The presentation reviews the epidemiological evidence for the long-term pulmonary effects of ambient particulate matter. As the interest moves from ambient particulate matter of various size ranges to ambient nano-PM, approaches taken for the former become of relevance to the latter. However, the investigation of chronic effects of nano-PM bring new challenges and opportunities to the investigation of its long-term relevance. These will be discussed in the context of effects on the lung, and in particular the objective measures of lung function. The life-time course of lung-function offers the opportunity to investigate the contribution of endogenous and exogenous factors on the lung growth in adolescence and the decline among adults. Two seminal studies contribute to the understanding of the role of pollution during these periods of life, namely the Southern Californian Children's Health Study as the most important study ever initiated on this subject, and the Swiss SAPALDIA study with a unique characterization of individual-level exposure during an 11 year follow-up of the adult population. The novel tools of exposure assessment employed in these and other ongoing studies provide guidance on the future needs in exposure science to understand the relevance of ambient nano-sized particulate matter. This will be discussed in the context of epidemiological approaches as a fundamental research tool to address chronic effects in humans, exposed under real life conditions.