Effects of Low-Level Air Pollution: A Study in Europe (ELAPSE)

Studies have consistently found associations between long-term exposure to outdoor air pollution and a range of morbidity and mortality endpoints. Recent evaluations by the World Health Organization and the Global Burden of Disease study have suggested that these associations may be non-linear and persist at very low concentrations. Uncertainty about the shape of the concentration response function exists especially for the low and high end of the concentration distribution, partly related to the scarcity of observations in the low range. In the current project we focus on analyses contributing to knowledge about spatially resolved air pollution concentrations at the low end of the exposure distribution, defined as less than current EU Limit Values for $PM_{2.5}$, NO_2 and Ozone.

We will address the issue of health effects at low air pollution levels by performing targeted analyses of all-cause and cause-specific mortality and morbidity endpoints within selected cohorts of the ESCAPE study and, in addition, in recent large European administrative cohorts (ELAPSE project, http://www.elapseproject.eu/). The analysis will focus on the pollutants $PM_{2.5}$, NO_2, and O_3, but it will also exploit the rich data of black carbon (BC) available for the ESCAPE cohorts with high spatial resolution. Our exposure assessment will characterize fine-scale intra-urban as well as between-urban air pollution contrasts. By combining ESCAPE cohorts and large administrative cohorts in one proposal, we will substantially increase sample size while utilizing in-depth individual characterization. The project will also address research questions regarding the development of correction methods for exposure measurement error, the analysis of co-occurring pollutants, and indirect approaches for confounder control.

Funding	Health Effects Institute (2016-202019)
Duration	1.1.2016 – 31.12.2019
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External collaborators	Bert Brunekreef (coordinator), Universität Utrecht, and ELAPSE consortium

Publications

de Hoogh K, et al. Spatial PM2.5, NO2, O3 and BC models for Western Europe – evaluation of spatiotemporal stability. Environment International 2018. In press.

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