

The association of noise and air pollution from road traffic with cardiovascular mortality

Danny Houthuijs¹, Rob Beelen², Gerard Hoek², Bert Brunekreef², Piet A. van den Brandt³, Leo J. Schouten³, R. Alexandra Goldbohm⁴, Paul Fischer⁵, Ben Armstrong⁶

1 National Institute for Public Health and the Environment, The Netherlands

2 Institute for Risk Assessment Sciences (IRAS), University Utrecht, The Netherlands

3 Department of Epidemiology, Maastricht University, The Netherlands

4 TNO Quality of Life, Department of Prevention and Health, Leiden, The Netherlands

5 National Institute for Public Health and the Environment, The Netherlands

6 Public and Environmental Research Unit, London School of Hygiene and Tropical Medicine, United Kingdom

* Corresponding author: e-mail: danny.houthuijs@rivm.nl

Cardiovascular mortality has been associated with exposure to traffic-related noise and air pollution, but both exposures have previously been studied separately. We investigated associations between cardiovascular mortality and noise and air pollution together.

We used data from an ongoing cohort study on diet and cancer (NLCS, 120,852 subjects) with follow-up from 1987 to 1996. We evaluated cardiovascular causes of death. Exposure to road traffic noise was modeled with a 25 x 25 m resolution. Exposure to black smoke (BS) and traffic intensity on the nearest road were assessed at the home address. We conducted Cox proportional hazard analyses for the association between exposure and cardiovascular mortality.

Traffic intensity on the nearest road was associated with cardiovascular mortality, with highest relative risk for ischemic heart disease mortality. There was an excess of cardiovascular mortality in the highest noise category (> 65 dB Letmaal), which was concentrated in ischemic heart disease and especially heart failure mortality. Relative risk for background BS concentrations were elevated for cerebrovascular and heart failure mortality. After adjustment for BS concentrations and traffic intensity, effects of road traffic noise were reduced. The associations for background BS concentrations and traffic intensity were insensitive for the adjustment of traffic noise.