

## **ASSOCIATIONS BETWEEN SMALL AREA LEVELS OF AIR POLLUTION AND SOCIO-ECONOMIC CHARACTERISTICS IN THE NETHERLANDS AND ENGLAND**

**Paul Fischer**, *National Institute for Public Health and the Environment (RIVM), Centre for Environmental Health (MGO), P.O. Box 1, 3720 BA Bilthoven, Netherlands, Email: paul.fischer@rivm.nl*

**Kees de Hoogh**, *Imperial College London, Department of Epidemiology and Biostatistics, London, United Kingdom*  
**Marten Marra**, *National Institute for Public Health and the Environment (RIVM), Centre for Environmental Health (MGO), Bilthoven, Netherlands*

**Hanneke Kruize**, *National Institute for Public Health and the Environment (RIVM), Centre for Environmental Health (MGO), Bilthoven, Netherlands*

**Gerard Hoek**, *Institute for Risk Assessment Sciences (IRAS), University Utrecht, Netherlands*

**Rob Beelen**, *Institute for Risk Assessment Sciences (IRAS), University Utrecht, Netherlands*

**Danielle Vienneau**, *Imperial College London, Department of Epidemiology and Biostatistics, London, United Kingdom*

**David Briggs**, *Imperial College London, Department of Epidemiology and Biostatistics, London, United Kingdom*

**Background and aims:** Several studies have shown that elevated levels of air pollution are concentrated among social deprived neighbourhoods and areas. As inhabitants of these areas may be especially vulnerable to the negative health effects of air pollution, insight in local associations between population characteristics and air pollution levels is of public health interest. We assessed the relation between long term exposure to (traffic-related) air pollution and several population characteristics.

**Methods:** Detailed 100m maps of air pollution levels of PM<sub>10</sub> and NO<sub>2</sub>, were developed using land use regression. Population characteristics were collected from Statistics Netherlands and the Office of National Statistics (UK). We linked the socio-economic population characteristics at the lowest possible aggregation level, which was the 6-digit postal code level in the Netherlands (appr. 20 addresses) and the Census Super Output Area in the England, with modelled air pollution averaged at the same level of aggregation. We then assessed the association between area air pollution levels and population characteristics by descriptive statistics.

**Results:** In a national analysis in the Netherlands, pollution levels increased with higher degree of urbanization, percentage non-western immigrants, lower house price, while average monthly person income was unrelated to air pollution levels. We found that city results could deviate between cities and from the national results. For England associations with income, education, employment, ethnicity and urbanisation will be analysed.

**Conclusion:** This study on small area differences in air pollution and population characteristics shows that in the Netherlands postal code areas with lower social economic status (and probably the highest traffic density) encounter the highest air pollution levels. The use of small area information based on land use regression techniques can be helpful to elucidate such information for local (environmental) policy.