COMPARISON OF LAND-USE REGRESSION MODELS OVER A THREE YEAR PERIOD IN OSLO, NORWAY

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Background and Aims: Spatial modelling of traffic-related air pollution by the use of land-use regression models have increasingly been applied in epidemiological studies. These models provide higher spatially resolved data, but assume that the spatial contrasts are stable over longer periods of time.
Methods: We tested the stability of measured and modelled spatial contrasts over a three year period in Oslo, Norway. A land-use regression model was previously developed to estimate individual exposures in the area based on samples of traffic-related air pollution during the winter of 2005. A total of 69 of these locations were sampled during the same period in 2008.
Results: The final regression models much of the variability in the measurements with an adjusted coefficient of determination (R^2) of 0.66 for nitrogen oxides (NO_x), 0.72 for nitrogen dioxide (NO_2), and 0.56 for nitric oxide (NO). Furthermore, the measurements from 2008 correlated well with the measurements sampled in 2005 (r = 0.91 - 0.95).
Conclusions: Our study found that the spatial contrasts which applied in the model based on the 2005 samples still applied to a large extent when used to predict the samples from 2008 or vice versa (r = 0.65 – 0.85). This suggests that this land-use regression approach for modelling of small-area variation in traffic-related nitrogen dioxide can be used to describe long-term concentrations for individual exposure.