Estimating road traffic noise exposure in the Swedish SCAPIS cohort

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ABSTRACT

The Swedish cardiopulmonary bioimage study (SCAPIS) is a population-based cohort study of more than 30 000 persons from five areas recruited 2013-18 to predict and prevent cardiopulmonary diseases. The participants of the cohort have been extensively examined in terms of cardiovascular and pulmonary imaging, biomarkers and standard clinical measurements. The cohort provides unique possibilities for studying health effects of noise exposure. The Nordic prediction method for road traffic noise revised 1996 was used to estimate the exposure to road traffic noise at the home address of all participants in the cohort. Due to the large size of the mapped areas a simplified procedure was developed for the time-consuming search for multiple reflections in building facades. Compared to detailed calculations for a test area the simplified procedure had a trueness better than 0.5 dB and a precision of 2.5 dB in terms of the standard deviation. The noise mapping was also performed in parallel with mapping of several air pollution parameters, using the same input data for traffic flow, both for efficiency and comparability of the exposures. The paper will illustrate the estimated exposures in terms of histograms, statistics and maps.

Keywords (3-6): road traffic noise, noise exposure, cohort study