VALIDATION OF EXPOSURE ASSESSMENT IN ESCAPE, THE VE3SPA PROJECT

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Background and aims Land use regression (LUR) models can be used to provide individual estimates of outdoor air pollution concentrations at the residential address. There is limited information on how closely these residential exposure estimates are related to personal exposure. The objective of the VE3SPA project is to measure the personal exposure to PM2.5 and NOx for volunteers living at a busy street, an urban background location or a suburban/regional background location. The results will be used to quantify the agreement between modelled outdoor concentrations at the home address and measured personal exposures.

Methods In Barcelona, Helsinki and Utrecht fifteen volunteers participated, five from each location type. Volunteers were asked to adhere to predetermined time activity patterns representative for schoolchildren and elderly adults. The volunteers participated for two weeks in three different seasons (winter, summer and spring/autumn). During every 2-week measuring period, three participants (one from every site type) were selected.
At the house of the volunteer, three identical PM2.5 filter sampling units and NOx/NO2 (Ogawa) badges were placed. One unit was placed outdoors, one indoors in the living room and another was a mobile unit placed in a backpack. The participants took the backpack to different locations for a prescribed amount of hours.

Results We will present the differences in outdoor, indoor and personal exposures between busy street, urban and suburban/regional background sites for the three cities. In the Netherlands, average PM2.5 concentrations were 14, 11 and 11 µg/m^3 for outdoor, indoor and personal exposure respectively. Average absorbance values (a marker for elemental carbon) were 1.1, 0.8 and 0.8 for outdoor, indoor and personal exposure.

Conclusions Measured personal and indoor exposure to PM2.5 and black carbon were slightly lower than measured outdoor concentrations. A comparison between exposure modeled with LUR and measured exposures will be presented at the conference.