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Exposure to malodors can affect the state of health (Dalton et al., 2016). Therefore, our study aimed to analyse associations of odor perception and state of wellbeing is limited, especially as measuring odor is difficult, but the health issues more often as it extends outcomes and prevalence of diseases associated with air pollution. The cross-sectional examinations in three administrative districts close to the nuclear test site, which was carried out as part of government programs on environmental health risks. The long-term legacies of nuclear testing in the vicinities of regions exposed to radiation due to Nuclear Tests and (3) environmental worries (measured by a scale by Rethage (2007)).

### Methods:
We utilized residential NO2 concentrations modelled by use of chemistry transport models to calculate contributions from emission sources to air pollution. We used exposure-response functions linking NO2 concentration estimates with the risk of diabetes, cardiovascular diseases, and respiratory diseases derived from a large Danish study. The DYNAMO-HIA model was applied to the population of Copenhagen by using residential NO2 concentrations combined with demographic data and data from nationwide registers on incidence and prevalence of diseases associated with air pollution. Different scenarios were modelled to estimate the impact of NO2 exposure on related diseases and the potential health benefits of lowering the NO2 level in Copenhagen.

### Results:
If NO2 exposure was restricted to the rural level life expectancy in 2040 would increase by two years for men and almost a half year for women. The greatest gain in disease-free life expectancy for men would be lifetime without ischemic heart disease (2.2 years), chronic obstructive pulmonary disease (2.1 years), and asthma (2.3 years). Among women the greatest increase would be lifetime without diabetes (1.2 years) and without stroke (1.1 years).

### Conclusions:
Reducing the NO2 exposure by controlling traffic-related air pollution reduces the occurrence of some of the most prevalent diseases and increases life expectancy which can be quantified by DYNAMO-HIA with a high resolution exposure modelling. This tool has demonstrated how traffic planners can assess health benefits from reduced levels of traffic-related air pollution.

### Key messages:
- Lowering NO2 exposure by reducing traffic-related air pollution would reduce occurrence of cardiovascular, respiratory and metabolic diseases, lung cancer, and increase disease-free life expectancy.
- The full potential of health gain by reducing NO2 exposure level to that of rural areas would increase life expectancy in Copenhagen by two years for men and almost a half year for women.