

Health impacts of ozone levels in Sweden -a national assessment

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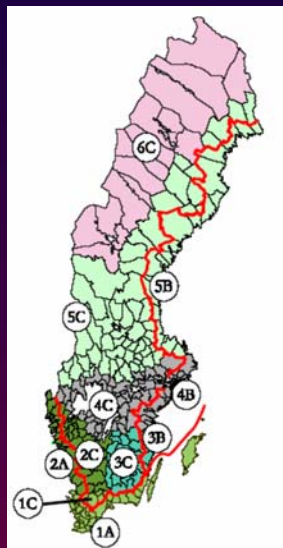
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Aim

The aim of this study is to quantify the health impacts of ground level ozone in Sweden, and at the same time to indicate a possible method for a national estimate of the health impacts of certain types of air pollution.

Method

The Swedish population (8.9 million) was divided into 29 sub populations for which time series of daily maximum 8-hour ozone averages during the year 2000 have been estimated. For seven large cities we obtained data from urban background measurements. For the rest of the country 22 series of ozone levels (11 for urban areas) were estimated from 6 rural EMEP stations.



Population data were collected from Statistics Sweden. **Baseline data (2000) on all cause mortality and respiratory hospital admissions at county level were obtained from registers kept by The National Board of Health and Welfare.**

Calculations were done using the AirQ tool developed by WHO/ECEH. As exposure-response coefficients we used an increase of 0.4% and 0.7% in mortality and admissions, respectively, per 10 µg/m³ increase in ozone.

Results

In total (Table 1) it is calculated that more than 1000 deaths per year are brought forward due to ozone levels above 60 µg/m³. Approximately 2000 respiratory hospital admissions per year are estimated due to ozone levels above 60 µg/m³. The cumulative number of excess cases can be quantified from any level for every sub population (Figure 1)

Table 1. Estimated yearly reduction in number of deaths and admissions by avoiding levels above 60 and 80 µg/m³, respectively.

	>60 µg/m ³	>80 µg/m ³
Fatalities	1121	434
Resp hosp adm	1808	700

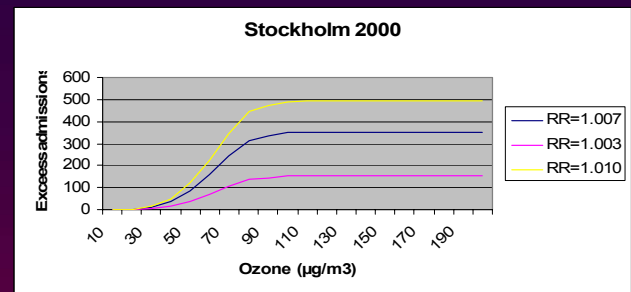
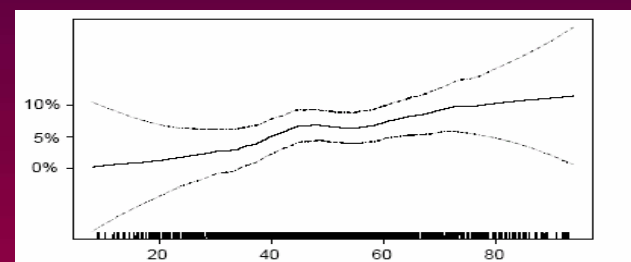


Figure 1. The cumulative number of respiratory admissions related to ozone exposure in Stockholm (1.2 million people) according to AirQ calculations.



Figur 2. The ozone induced increase (%) in respiratory hospital admissions in Stockholm (1997-1999) as a smooth function of the 8-hour maximum lag O1.

Conclusions and uncertainties

Ground level ozone is a major air pollution problem in Sweden, resulting in increased mortality and morbidity

Swedish studies tend to show stronger ozone effects than typical, why the magnitude of the impact may be underestimated (Figure 2).

The impact may be overestimated if a threshold exists, but the literature and Swedish data do not support the existence (Figure 2)