

## Summary

The goal of this study was to develop or update a health indicator for exposure of the Flemish population to increased ozone (O<sub>3</sub>) concentrations. Short-term exposure to increased O<sub>3</sub> concentrations causes respiratory effects. In other words, there is a causal link. An example of a respiratory effect is a decrease in lung function indicated with FEV1 (*Forced Expiratory Volume in 1 second*). The FEV1 is the volume exhaled during the first second of a forced expiratory maneuver started from the level of total lung capacity.

The previous MIRA health indicator was based on a dose-response curve in which the reduction of the spirometric marker FEV1 is expressed as a function of ozone exposure (Rombout, 1989) which was based on a human controlled exposure study. In such studies, adults were exposed to controlled O<sub>3</sub> levels (= dose) in a chamber for several hours and the effect on FEV1 reduction (= response) was analysed.

In this study the marker FEV1 was retained but the underlying dose-response curve was updated (according to McDonnell et al., 2010). The indicator is based here on peak exposures of ozone for which in 5% of the time (18 days/year) a larger decrease than the indicator FEV1 is expected. The reduction of the respiratory marker FEV1 with increased exposure to ozone is valid for persons between 5-55 year. Above 55 years, the effect of ozone exposure on FEV1 reduction is marginal. Taking into account this observation, the decision was taken to include a second indicator.

The indicator “number of hospitalisations for respiratory disorders attributable to increased ozone concentrations” for people > 65 years was added. The dose-response curve for this calculation is based on the epidemiological study of Anderson et al. (2004) which is also used in the Burden of Disease (BOD) approach by the World Health Organisation (WHO). This indicator is based here on yearly increased ozone concentrations (SOMO35).