



Mortality estimation based on Business as Usual Scenario

Andrea Pozzer (1), Jos Lelieveld (1,2), and Ceren Barlas (2)

(1) Max Planck Institute for Chemistry, Atmospheric Chemistry, Mainz, Germany (andrea.pozzer@mpic.de, +49 6131 305 4009), (2) The Cyprus Institute, Nicosia, Cyprus

Air pollution by fine particulate matter ($PM_{2.5}$) and ozone (O_3) has increased strongly with industrialization and urbanization. Epidemiological studies have shown that these pollutants increase lung cancer, cardiopulmonary and respiratory mortality. The atmospheric chemistry general circulation model EMAC has been used to estimate the concentration of such pollutants in recent and future years (2005, 2010, 2025 and 2050), based on a Business as Usual scenario. The emission scenario assumes that population and economic growth largely determine energy consumption and consequent pollution sources ("business as usual"). Based on the modeled pollutants concentrations and the UN estimates of population growth in the future, we assessed the premature mortality and the years of human life lost (YLL) caused by anthropogenic $PM_{2.5}$ and O_3 for epidemiological regions defined by the World Health Organization. The premature mortality for people of 30 years and older were estimated using a health impact function using parameters derived from epidemiological studies. Our results suggest that with a Business as Usual scenario, the ratio between mortality and population would increase of $\sim 50\%$ by 2050. This ratio, together with the increase of world population, would lead by the year 2050 to 8.9 millions premature deaths, equivalent to 79 millions of YLL.