

APHEKOM: HEALTH IMPACT ASSESSMENT OF SHORT AND LONG-TERM EXPOSURE TO OZONE AND PM IN 25 EUROPEAN CITIES

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Background In Europe, improvements in air quality were observed between 1990 and 1997. Since then concentrations of particulate matter (PM) and ozone have not shown a significant decrease. European citizens are still exposed to concentrations exceeding the recommendations of the World Health Organization (WHO). The Aphekom project assessed the mortality and morbidity impacts of this pollution in 25 European cities: Athens, Barcelona, Bilbao, Bordeaux, Bucharest, Brussels, Budapest, Dublin, Granada, Le Havre, Lille, Ljubljana, London, Lyon, Malaga, Marseille, Paris, Rome, Rouen, Seville, Stockholm, Strasbourg, Toulouse, Valencia and Vienna, using standardized health impact assessments (HIA).

Methods HIAs were performed using routine health and air quality data. All cities used common guidelines to define the study area, the health and the exposure indicators. Concentration response functions, linking PM_{10} , $PM_{2.5}$ and ozone to mortality and hospitalizations, were selected from multicenter studies. They were applied to a scenario where the air pollutants levels are decreased to the WHO-air quality guidelines.

Results In the 25 cities, the largest health burden was attributable to the long-term impacts of chronic exposure to $PM_{2.5}$. The compliance with the WHO guideline of $10 \mu g/m^3$ in annual mean would increase by 22 months the life expectancy for people aged 30 years and older, depending on the city. This corresponds to a burden on mortality of nearly 19,000 deaths per annum. Considering PM_{10} , in 22 cities the compliance with the WHO guideline of $20 \mu g/m^3$ in annual mean would prevent more than 2500 hospitalizations for cardiac diseases and more than 5300 for respiratory diseases each year.

Conclusions Aphekom provided robust estimates confirming that further steps to reduce PM_{10} and $PM_{2.5}$ would result in significant health gains in Europe. This should be considered when revising the current EU legislation in 2013.