Particulate matter takes away 125,000 years of healthy life from Europe's child population

April 25 2019

Credit: CC0 Public Domain

A study led by the Barcelona Institute for Global Health (ISGlobal), a centre supported by "la Caixa," has estimated the disease burden for various environmental exposure factors among the child population of Europe, and once again highlights the risk posed by air pollution. The study calculates that every year exposure to particulate matter of less

than 10 micrograms (PM10) in diameter and less than 2.5 micrograms (PM2.5) takes away 125,000 years of healthy life from children in Europe.

This analysis, published in the *International Journal of Environmental Research and Public Health*, assessed the burden of disease for the child population of the 28 countries in the European Union for seven environmental risk factors: air pollution—PM10, PM2.5 and ozone—passive tobacco smoke, humidity, lead and formaldehyde.

Population and health data were compiled from several European databases and the analysis of the environmental burden of disease was conducted in line with the comparative risk assessment approach proposed by the World Health Organisation (WHO) and the Global Burden of Disease (GBD) project. The researchers calculated disability-adjusted life years (DALYs), a measure of overall burden of disease expressed as the number of years of healthy life lost to illness, disability or premature death.

The conclusions show that the environmental exposure factors included in this study take away 211,000 years of healthy life from the European population under 18 years old, accounting for 2.6% of the total. Air pollution (PM10, PM2.5 and ozone) was the most harmful exposure, causing up to 70% of the years of healthy life lost, followed by passive tobacco smoking at 20%.

"The environmental factors included in the study were chosen according to various criteria: they are the exposures for which the most data exist at national level and also those for which there is evidence of a causal relationship with effects on health, among others," states David Rojas, the lead author of the study.

The researcher emphasises that "out of all the risks studied, particulate

matter are those that cause the greatest burden of disease, as they are associated with respiratory, cardiovascular and neurological illnesses, among others, as well as with higher infant mortality." "In fact, their real impact may be higher than that indicated by our estimates, as we have only taken into account their effects on infant mortality and asthma in the case of PM10, and lower respiratory tract infections in the case of PM2.5."

Out of the 28 countries included in the study, 22—the exceptions were Luxembourg, Ireland, Sweden, Estonia, Finland and Denmark—reported PM10 levels above those recommended by the WHO (annual average below 20 g/m3) and all of them showed ozone levels above those considered safe (an average of 100 g/m3 over eight hours).

Mark Nieuwenhuijsen, coordinator of the study and of the Urban Planning, Environment and Health Initiative at ISGlobal, points out that "this study shows the pressing need to implement effective policies to reduce children's exposure to environmental risk factors throughout Europe, paying special attention to air pollution and passive smoking." The researcher also points out that "Common European databases need to be created to compile and harmonise exposure data for environmental risk factors, especially in childhood, as well as conducting epidemiological studies of multiple environmental risk factors."

More information: David Rojas-Rueda et al, Environmental Burden of Childhood Disease in Europe, *International Journal of Environmental Research and Public Health* (2019). DOI: 10.3390/ijerph16061084

Provided by Barcelona Institute for Global Health