Long-term exposure to traffic pollution increases mortality

Annually, air pollution is estimated to result in several hundred thousand premature deaths in Europe. According to a new study, long-term exposure to air pollution from traffic emissions is associated with higher rates of mortality than previously thought. The impact on public health in Europe may be significant because of the large number of people exposed to vehicle pollutants.

Chemical pollutants and fine particles can be inhaled and deposited in the respiratory system, causing ill health. Particles in the air are classified according to size, with PM$_{2.5}$ referring to all particles with a diameter less than 2.5 micrometers. This latest scientific evidence confirms that PM$_{2.5}$ is responsible for serious negative effects on human health, leading to a substantial loss of life.

The researchers calculated exposure to nitrogen dioxide, sulfur dioxide, PM$_{2.5}$ and black smoke, formed from the incomplete combustion of fossil fuels, at the homes of 120,852 participants across the Netherlands. The participants were aged between 55 and 69, and their mortality was assessed over a 10-year period (1987-1996). Around 15 per cent of the participants died during this period and the cause of death was noted.

The findings show that long-term exposure to traffic-related air pollution is associated with an increase in risk of dying from respiratory-related conditions, such as lung cancer. These associations were most notable for exposure to nitrogen dioxide and black smoke. The researchers also suggest that the mortality risk related to black smoke exposure was increased in participants with lower education levels, particularly those who ate less fruit. It has been suggested that eating fruit may protect against oxidative stress, a key symptom of exposure to air pollution.

For the first time in Europe, a relative risk estimate for PM$_{2.5}$ was calculated. The results suggested that ill-health associated with exposure to PM$_{2.5}$ concentrations in cities might be higher than previously thought because a large part of the population is exposed to traffic-related pollution.

Even though emissions per vehicle have decreased because of technical advances and the use of catalytic converters, the number of vehicles has increased. Furthermore, important pollutants including nitrogen dioxide, ultra-fine particles and soot from diesel are still being emitted. Reducing air pollution and risks to human health is a key priority of the sixth Environment Action Programme (EAP), under which the Commission developed a Thematic Strategy on Air Pollution, which aims to cut annual premature deaths from air pollution-related diseases by half by 2020. Strategies include the control of emissions from traffic, improving fuel quality and promoting environmental protection requirements in the transport and energy sectors.

It is important to regulate emissions of fine particles, as they can pose a risk to human health, even in low quantities. The European Commission’s new Air Quality Directive, adopted by Council on 14 April 2008, requires Member States to reduce exposure of PM$_{2.5}$ in urban areas by 20 per cent by 2020. Additionally, the Clean Air for Europe programme (EU CAFÉ) has set new quality and monitoring requirements for these particles.


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2. http://ec.europa.eu/environment/newprg/index.htm Acting through EC legislation and through work at the wider international level in order to reduce cross-border pollution.
4. EU CAFÉ is a programme of technical analysis and policy development to underpin strategies on controlling air pollution. http://ec.europa.eu/environment/air/index.htm