Health effects of air pollution underestimated?

New study of the relationships between air pollution and mortality at within-city scale demonstrates that the contribution of particulate matter to chronic health problems may be two to three times greater than current estimates which are based on conventional between-cities approach.

A variety of outdoor and indoor sources of air pollution poses great risks for human health. In particular, WHO reports that air pollution with fine particles of less than 2.5 μm in diameter (PM2.5) shows the strongest association to mortality, indicating a 6% increase in the risk of death from all causes per 10 μg/m3 increase in long-term PM2.5 concentrations.

These estimations are based on between-cities exposure comparisons that assume that all residents of a city have the same average exposure concentrations. But a team of American and Canadian researchers recently showed that the assessment of air pollution exposure that use only community average concentrations may lead to significant underestimation of the health risks attributable to poor air quality.

The scientists reached this conclusion by studying two decades worth of data at intra-urban scale from nearly 23 000 residents from 260 Los Angeles neighbourhoods. Pollution measures were taken at 23 sites within Los Angeles to more accurately reflect air pollution exposure where residents live and work.

They found that the increase of 10 μg/m3 of PM2.5 corresponded to a 11 to 17% increase in the risk of dying from any cause. They also found specificity in cause of death, with PM2.5 associated more strongly with heart diseases, such as heart attack, than with cardiopulmonary or all-cause mortality.

Furthermore, the researchers also noted more than twofold increased risk of death from diabetes in areas of higher pollution levels. However these findings are less reliable and more research must be done to better understand the effects of air pollution on diabetes. One possible hypothesis is that people suffering from diabetes might experience a state of greater inflammation that makes their lungs more receptive to receiving harmful particles.

In any event, the results of the study suggest that experts may be significantly underestimating air pollution’s role in causing early death. They also highlight the urgent need for immediate measures to reduce the concentrations and the long-term exposure to PM2.5 whose primary sources include anthropogenic activities, such as combustion from car engines, solid-fuel combustion in households and industrial activities.

Therefore, the most efficient methods to prevent, eliminate or reduce air pollution health risks should integrate health issues with sustainable development. The recent EU Thematic Strategy on air pollution represents the right step in this direction.

Source: M. Jerrett; R.T. Burnett; R. Ma; C. A. Pope III; D.Krewski; K. B. Newbold; G. Thurston; Y. Shi; N.Finkelstein; E.E. Calle; M.I J. Thunvol “Spatial Analysis of Air Pollution and Mortality in Los Angeles” Epidemiology

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