



TITLE OF THE ABSTRACT

The Respiratory System and Air Pollution

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Exposure to urban air pollution causes respiratory health problems. Acute effects of such exposures have been well established in many studies, showing – for example – an increase in respiratory health problems in patients with asthma or those with chronic obstructive pulmonary diseases (COPD). As a consequence, it has been shown that on day with higher concentrations of ambient air pollution, more patients need to seek for help, visit a doctor or an emergency room, and more asthma or COPD patients will be hospitalized. In the most extreme cases, such short term exposure can result in death. Urban air pollutants compromise the natural defence mechanisms in the respiratory tract, which results also in a higher risk to suffer a pneumonia – a typical feature of exacerbations seen in COPD patients.

Of particular relevance is also the question whether, in the long run, air pollution would cause or contribute to the development of chronic respiratory diseases such as asthma or COPD. Studies in children and adults have shown that the long-term or life-time exposure to urban air pollutants do affect the development of the lungs. This means that lungs of children and adolescents do not grow as fast as and as much as they do among children growing up in cleaner places. Among adults, it means instead that the lung function loss – a normal process of aging – is accelerated. Lower lung function is a very strong determinant of chronic diseases and life expectancy, which has been shown to be shortened due to air pollution as well.

Whether air pollution is a cause of the new development of childhood asthma – the most prevalent chronic disease in children – has been debated for decades. Current evidence indicates that near-road traffic related pollutants such as diesel soot or ultrafine particles do indeed promote the new onset of asthma. The policy implications of these findings need to be discussed since a high number of people do live along very busy traffic arteries where concentrations of these pollutants can be some 5-10 times higher than in smaller streets, only 100-200 meters away.