Climate impacts on air pollution could increase respiratory disease

Evidence from modelling studies suggests that climate change is likely to increase concentrations of ozone, one of the most important urban air pollutants responsible for respiratory problems. Under this assumption, rapid reductions of emissions from fossil fuel burning are needed to protect the health of both current and future generations.

Climate influences the state of the atmosphere and in turn has an impact on the development and flow of air pollutants, for example, it can change the height of different atmospheric layers and the rate of chemical reactions in the air. There is therefore concern that climate change could change the burden of illness and mortality associated with air pollution. However, it is difficult to predict exactly how air quality will be influenced by future climate change and in turn influence human health.

The researchers analysed available scientific literature for the impacts of climate change on air quality and the impact of air quality on health. However, there are relatively few studies of ozone concentrations in a changing climate, and even fewer for concentrations of particulate matter. Additional research is thus needed to improve our understanding of climate change’s possible impacts on air pollution-related health problems. In Europe, it is currently estimated that around 21,000 hospital admissions a year can be linked to ozone exposure, and admissions linked to particulate matter exposure are almost five times greater.

Of further concern, most studies so far into the impacts of climate change on air quality have focused on developed countries, when in fact air pollution is likely to be greater in the developing world.

The analysis finds that there are two main reasons why the precise future health impacts of air pollution – and specifically ozone – are difficult to predict. The first is that we cannot predict accurately how emissions of the chemicals that form ozone (the ‘precursor emissions’ - nitrogen oxides and volatile organic compounds) will change over time. The second is that we do not know how changes in weather patterns under climate change will affect ozone concentrations.

Although exact figures are difficult to predict, the overall available evidence suggests that regional ozone concentrations will increase to some degree under climate change. The researchers therefore argue that precursor emissions need to be reduced to protect vulnerable populations. They suggest that future air quality could decline without increased regulations to reduce greenhouse gas emissions, and the development and deployment of new emission abatement technologies.


Contact: kriseli@essllc.org

Theme(s): Air pollution, Climate change and energy, Environment and health