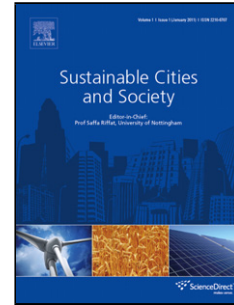


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Temperature and air pollution relationship during heatwaves in Birmingham, UK

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HIGHLIGHTS

- Assessing the relationship between temperature and air pollution during heatwaves.
- Birmingham was selected as study location.
- Results reveal a positive linear relationship between temperature and air pollution during heatwaves.

Abstract

While temperature has long been known as a catalyst for pollutants to be more airborne, it is unclear how an increase in temperature affects air pollution during heatwaves. Through a regression analysis of the relationship between ozone (O₃), particulate matter (PM₁₀, particles less than 10 µm in diameter), nitrogen dioxide (NO₂), and temperatures in urban and rural areas of Birmingham, it was found that during heatwaves, all pollutant levels rose at each site, with the maximum temperature coinciding with the peak levels of O₃ and PM₁₀. These findings established that the influence of temperature on air pollution did not change according to rural or urban locations although air pollutants (O₃, PM₁₀, and NO₂) increased with increasing temperatures, particularly during heatwaves. Levels of ozone were found to increase by more than 50% with increases in temperature. This supports studies where the incidence of high levels of pollutants has conclusively been found to be much more prevalent during prolonged heatwaves. The implications of these findings are important to the establishment of long-term prevention measures in heatwave plans. When a heatwave is forecast, additional measures to reduce air pollutant concentrations may be appropriate when commencing emergency responses.

Keywords: Heatwave; Temperature; Ozone; Nitrogen dioxide; Particulate matter less than 10µm.

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