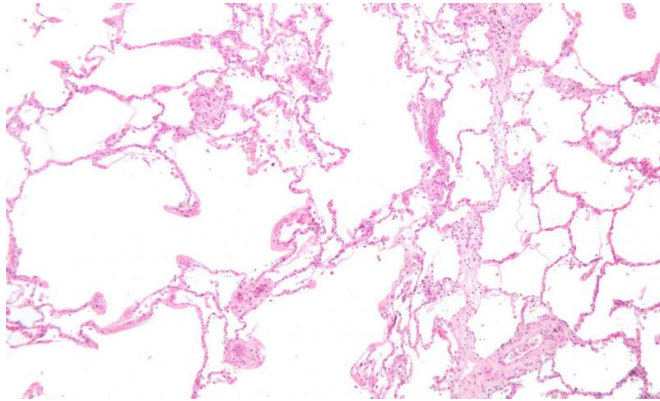


Hotter weather is linked to increases in COPD exacerbations

3 September 2021



Micrograph showing emphysema (left – large empty spaces) and lung tissue with relative preservation of the alveoli (right). Credit: Wikipedia

Warmer weather is linked to a worsening of chronic obstructive pulmonary disease (COPD) symptoms, according to research to be presented on Sunday at the 'virtual' European Respiratory Society International Congress.

Analysis of data from 1,177 current and former smokers with COPD in the U.S. showed that approximately two days after an increase in ambient temperatures, there was an increase in COPD exacerbations.

Dr. Supaksh Gupta, a pulmonary and critical care fellow at the University of Washington, U.S., told the Congress: "We found that each one-degree Celsius increase in [ambient temperature](#) was associated with a 2% increase in the likelihood of COPD exacerbations in the following two days among this group of patients.

"This study is one of the few to explore the impact of ambient [temperature](#) on the risk of COPD exacerbations in a group of people with established COPD for whom we have detailed

medical information. Overall, it contributes to the emerging body of knowledge regarding ambient temperature and risk of COPD-related health problems. A major strength of the study is the number of people included, who live in various major US towns and cities.

"Other studies have shown a connection between extreme heat exposure and increased risk of health problems and death in people with COPD. There are concerns that these problems will accelerate with the ongoing and worsening climate crisis. Therefore, it is important to quantify the health risks associated with changes in ambient temperature, while also determining who is most at risk to inform policy-makers and healthcare providers."

Dr. Gupta and colleagues looked at current and former smokers who had enrolled in the SubPopulations and InteRmediate Outcome Measures in COPD Study (SPIROMICS) between 2010 and 2015, and who had had at least one COPD [exacerbation](#) since joining the study. They assessed the risk of COPD exacerbations based on local, ambient temperatures recorded on the day of the exacerbation and in the preceding seven days.

The average age of the participants was 64 and the average time to the first exacerbation was 603 days (just over a year and a half). The risk of exacerbations increased with increasing temperatures during the preceding six days, with the highest risk two days after temperatures rose. The researchers were able to adjust their results to take account of humidity levels, which have been implicated in the risk of exacerbations.

"Our findings raise concerns about the risk of increased exacerbations with climate change. While not conclusive, the study suggests that those living with COPD may want to avoid exposure to adverse and extreme environmental conditions by limiting outdoor activities during periods of elevated temperatures relative to normal. Moreover, while

not within the scope of this paper but based on previously existing literature, those who reside in areas with increased temperature, or increased temperature variability, may benefit from access to [indoor air](#) cooling," said Dr. Gupta.

The mechanisms involved in the link between heat and COPD exacerbations are not entirely understood, but may include hyperventilation, which increases the possibility of a process called dynamic hyperinflation. During dynamic hyperinflation, a person does not exhale completely before starting to inhale again. This can lead to less efficient and effective breaths. At its extreme, dynamic hyperinflation could lead to increased pressure in the chest cavity and a subsequent decrease in blood flow back to the heart. Elderly patients are also less able to adjust their body temperatures and maintain adequate hydration. Additionally, some asthma studies have suggested that breathing hot, humid air can result in constriction of the airways.

Dr. Gupta concluded: "I wanted to contribute to research involving a disease process that affects the lives of many of my patients. My goal is to help inform our understanding of the ongoing climate crisis on healthcare outcomes and utilisation. I hope our research will help guide public policy recommendations and promote health precaution guidelines for people with COPD during periods of increased ambient temperature."

Zorana J. Andersen, who was not involved in the study, is Chair of the European Respiratory Society Environment and Health Committee Chair and Professor in Environmental Epidemiology at the Department of Public Health, University of Copenhagen, Denmark. She said: "The climate emergency is proving to have far-reaching effects in areas of everyday life where it might not necessarily be expected to have an impact. This study offers a fascinating insight into the way it could be affecting the lives of people living with COPD and is yet more proof of the urgent need to tackle climate change and the world's rising temperatures."

More information: Abstract no: OA103, "Effects of ambient temperature on COPD symptoms and

exacerbations in the SubPopulations and Intermediate Outcome Measures in COPD Study (SPIROMICS) cohort", presented by Supaksh Gupta. Environment and respiratory health session, 09:30-11:00 CEST on Sunday 5 September 2021, [k4.ersnet.org/prod/v2/Front/Pr ... ?e=262&session=13719](https://k4.ersnet.org/prod/v2/Front/Pr...?e=262&session=13719)

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