Dear editor,

We are excited to submit “Assessing potential sources of bias in measuring power outage exposure with simulations” for publication to *Environmental Epidemiology*.

In 2020, U.S. electrical consumers faced over 8 hours of power outages, the longest annual average duration at the time of reporting, primarily due to severe weather. With climate change and aging power grids, outages and their health consequences including temperature-related illness and hospitalizations are likely to increase. Understanding the consequences of power outages and developing strategies to cope can improve climate resilience.

Research on power outages and health outcomes has been constrained by lack of reliable exposure data, but since 2020, two new national power outage exposure datasets have become available. In our submitted paper, we developed a strategy to assign spatial unit-level power outage exposure with newly available power outage exposure datasets. Because these new datasets are also missing large amounts of data, we conducted this simulation study assessing bias from missing data, aiming to determine if exposure datasets are usable for epidemiologic studies.

We found that that the available data are useful for epidemiologic studies. Though missing data may introduce substantial bias, we found that it is possible to estimate effects with low bias from available datasets by restricting use to locations missing less person-time outage data. We provided recommendations for other researchers about how to assign power outage exposure and reduce bias when studying power outages and health.

We believe our findings are relevant to the recent call for papers which states, ‘contributions describing novel approaches for measuring and characterizing exposures and associated biological stress are especially encouraged.’ Our study presents comprehensive, new information about measuring power outage exposure, an under-studied exposure linked to climate change with major health consequences.

This manuscript has not been published elsewhere or previously submitted, and is not under consideration for other journals.

Sincerely,

Heather McBrien

Joan A. Casey

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