**Background:** In the United States, power outage incidence and duration are increasing with climate change, and power outage exposure is prevalent. In 2018, US counties experienced an average of 7 8+ hour power outages. Data from New York State show that power outages may increase hospitalizations for cardiovascular disease and respiratory disease in vulnerable populations such as older adults (adults age 65+). Limited power outage exposure data has constrained research on power outage and health.

**Question:** Are power outages associated with emergency cardiovascular disease and respiratory disease-related hospitalizations among older adults in the US nationally?

**Methods**: In our previous work, we developed a new US national dataset of hourly county-level power outage exposure. We used these data to identify county-days exposed to 8+ hour power outages affecting >1% of county electrical customers in 2018. We used data on emergency hospitalizations with cause for 23 million Medicare fee-for-service beneficiaries age 65+ to produce daily county-level rates of cardiovascular and respiratory-related hospitalizations. We used a case-crossover design with a conditional Poisson model to measure the association between daily county-level power outage exposure and cardiovascular and respiratory hospitalization rates separately. Using gridMET county-level data, we measured precipitation, wind speed, and temperature, potential time-varying confounders, and included lag terms in our model.

**Results**: We found power outages increased both emergency CVD and respiratory hospitalizations. Effects of outage on CVD hospitalizations were largest the day after power outage exposure (RR: 1.02; CI: 1.00, 1.01), while effects of outage on respiratory hospitalizations were largest the day of outage exposure (RR: 1.05, CI: XXX,XXX).

**Conclusion**: Power outages likely cause CVD and respiratory hospitalizations among older adults. Improving electricity reliability could improve community health and protect older adults from CVD and respiratory disease exacerbations from increasing power outage. Since hospitalization risks from power outage may be greater when outages co-occur with severe weather, more research is needed to evaluate the effects of co-occurring power outages and climate hazards.