

## MCALEXANDER ET AL. (2020): UNCONVENTIONAL NATURAL GAS DEVELOPMENT AND HOSPITALIZATION FOR HEART FAILURE IN PENNSYLVANIA

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There have been a number of important studies related to unconventional oil and gas development (UOGD) conducted by Dr. Brian Schwartz and his colleagues at the Johns Hopkins School of Public Health, using data from Geisinger, a large health care system in Pennsylvania. The most recent, [Unconventional Natural Gas Development and Hospitalization for Heart Failure in Pennsylvania](#), was published in December 2020, with Tara P. McAlexander as the lead author. The researchers approached this study with the knowledge that exposure to air pollution, traffic, and noise – all of which are associated with UOGD – can affect cardiovascular functioning.

Involving over 9,000 cases, the study evaluated associations between UOGD activity exposure and hospitalizations among patients with heart failure (a condition that leads to reduced blood flow to critical organs). Secondly, the study examined whether associations between UOGD exposure and hospitalization differed by severity of the disease. That is, were people who were hospitalized with more serious disease more likely to have experienced more intensive UOGD development exposure?

To consider individuals' exposures, McAlexander and colleagues looked at the four phases of well pad activity: pad preparation, well drilling, hydraulic fracturing, and production. Along with these phases, the researchers incorporated the number, size, and location of wells into an overall metric of the well activity an individual was exposed to. Hypothesizing that it took 30 days for exposures to contribute to hospitalization, they calculated the activity metrics for the 30 days before hospitalization for each study subject.

Put simply, the study suggests that UOGD environmental stressors exacerbate heart failure, which can lead to a stay in the hospital. McAlexander and her research team found that individuals living with heart failure were more likely to be hospitalized when exposed to greater UOGD activity. More specifically, they found that exposure to well pad prep, hydraulic fracturing, and the production phases were each associated with hospitalization, while the drilling phase was not. They also found that those with more severe heart failure seem to be more susceptible to the adverse effects of UOGD activity and had greater odds of hospitalization.

The study makes an important contribution to the growing body of research on the health consequences of UOGD. Some health categories, such as reproductive effects, have gotten more attention, while much less has (thus far) been written about cardiovascular effects. Given what we know about the impacts of air contamination, noise, and psychosocial stressors on the cardiovascular system, it is good to see a deep and careful dive into the plausible associations of this disease with UOGD.