

NC coal plant emissions might play role in state suicide numbers

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New research from Wake Forest Baptist Medical Center finds that suicide, while strongly associated with psychiatric conditions, also correlates with environmental pollution.

Lead researcher John G. Spangler, M.D., M.P.H., a professor of [family medicine](#) at Wake Forest Baptist, looked specifically at the relationship between [air pollution](#) and emissions from coal-fired electricity plants.

"This study raises interesting questions about [suicide rates](#) in counties where coal-fired electrical plants operate and suggests that the quality of air can affect people suffering from different mood disorders," Spangler said.

For this ecological study, Spangler evaluated air level contaminates in 20 North Carolina counties where coal-fired electricity plants existed, using data from the 2000 U.S. Census, 2001-2005 [mortality rates](#) from the N.C. State Center for Health Statistics and the U.S. [Environmental Protection Agency](#).

County-level suicide rates were higher overall in North Carolina (12.4 per 100,000 population) compared to the U.S. population (10.8 per 100,000). The study found that for each additional coal-fired electricity plant per N.C. county, there were about two additional suicides per 100,000 population annually per county. As there were 20 coal-fired electricity plants in North Carolina when this study was carried out, that means there were about 40 suicides a year per 100,000 population

related to the plants. When applied to the state's year 2,000 population of 8,049,313, this equals about 3,220 suicides a year associated with coal-fired electricity plants.

The study is published in the most recent online edition of the *Journal of Mood Disorders*.

"The presence of a coal-fired [electricity plant](#) correlated with airborne levels of nickel, mercury, lead, chromium, cadmium, beryllium and arsenic," Spangler said.

While prior research has evaluated the association between environmental contamination and mood disorders and suicide, coal emissions have not been looked at in this fashion, Spangler said. "This is the first study to show that the existence of coal-fired electricity plants is related to population-level suicide rates. Because suicide might be associated with [environmental pollution](#), this study may help inform regulations not only of air pollutants, but also of coal-fired electrical power plant emissions."

Spangler has conducted previous ecological research into environmental heavy metals, looking at their correlation to diabetes mortality, chronic liver disease death, cancer mortality and infant mortality. Spangler said the study was subject to a number of limitations because it only looked at county-level characteristics and could not control for factors in individual residents.

"Still, it raises the interesting question of whether suicide in a given population is related to the presence or absence of coal-fired electricity plants and the air quality," he said. "Further research is needed to understand what factors related to coal burning actually are at play and suggest that tighter regulation of coal-fired power plant emissions might cut down on county suicide rates in North Carolina."

Provided by Wake Forest University Baptist Medical Center

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