

RRI Seed Grant Final Report Form

Date: May 7, 2008

Project title: Proximity to Coal Mining and Health

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Project summary:

As stated in our original RRI grant application: "this research will test hypotheses stating that, after statistical adjustments for social and economic confounds, population hospitalizations and mortality rates for health conditions that are sensitive to exposure to coal mining byproducts will be elevated as a function of the amount of coal mined in Appalachian counties, while hospitalizations and mortality rates for other health conditions will not be elevated."

After in-depth study of hospitalization data, we decided not to pursue this data source but to focus on mortality instead. The hospitalization data that we had access to contained a major limitation, namely, hospitalizations were coded with the county where the hospital was located, not the county where the patient was from, and we realized that there were many reasons why a patient would travel from one county to another for hospital care. This introduced too much error into the estimates of coal mining effects.

However, we have had very good success with the mortality data. We have three papers published or in press, and one more in development, that confirm the study hypotheses. After adjustments for poverty, smoking rates, education, sex, race, health insurance, rural-urban setting and other variables, age-adjusted mortality rates remain significantly elevated in areas where coal mining is heaviest. These effects were found for total mortality and for chronic heart, lung and kidney disease, and lung cancer. Other conditions hypothesized to be insensitive to exposure, including infectious illness, diabetes, and others, were not higher as a function of increased mining.

Research products:

1. Hendryx M. Mortality rates in Appalachian coal mining counties: 24 years behind the nation. In press, *Environmental Justice*.
2. Hendryx M, O'Donnell K, Horn K. Lung cancer mortality is elevated in coal mining areas of Appalachia. In press, *Lung Cancer*.
3. Hendryx M. Mortality from heart, respiratory and kidney disease in coal mining areas of Appalachia. In press, *International Archives of Occupational and Environmental Health*.

An R01 grant application is being finalized for submission to NIH (specifically NIEHS) for the June 5, 2008 deadline. Title: Coal Mining and Health in West Virginia Communities. Total direct budget estimate is approximately \$2,000,000.