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**Characterizing Health Risks in Privately-Supplied Drinking Water due to Agricultural Practices in Rural Western Kentucky, Leading to an Intervention Study**

Karen Arrowood and Glenn Beck  
University of KY College of Public Health; \* [karro2@email.uky.edu](mailto:karro2@email.uky.edu)

**Abstract:**

Within Kentucky, limited data are available on the levels of domestic groundwater contamination from nitrates, herbicides, and bacteria, and the potential health effects from consumption of untested water supplies is an active area of research. We are currently undertaking a cross-sectional study to characterize the domestic drinking water supplies from groundwater sources with respect to current levels of nitrates, herbicides (e.g. atrazine, simazine, etc.), and bacteria (*E.coli*) among residents in the 8-county area of the Jackson Purchase region. Approximately 600 households have been sampled from the listing of residences on domestic well water supplies provided by the Kentucky Geologic Survey and are being contacted for participation in the study. Samples from tap water supplies are being obtained and analyzed for the contaminants of concern. A questionnaire which obtains information on demographic characteristics, drinking water usage patterns, specific health outcomes, and covariates associated with the health conditions is being administered to household residents. Statistical analysis of data will use regression methods for examining the association between levels of water contaminants and health outcomes, while controlling for necessary covariates. The series of health outcomes potentially associated with nitrate exposure and herbicides will include adverse birth outcomes (low-birth weight, congenital malformation, neural tube defects, spontaneous abortions, stillbirths, premature birth, or intrauterine growth retardation) and sitespecific cancers ( ; Non-Hodgkins lymphoma and bladder, ovarian, stomach, breast, and liver cancer. Gastroenteritis will be examined as an adverse health outcome related to bacteria (*E. coli*) contamination. This collaborative project between the University of Kentucky College of Public Health and the Kentucky Geological Survey (KGS) will establish a cohort of persons who receive their drinking water from groundwater sources, which can be used to further study health outcomes related to contaminants in well water sources.

**Impact Statement:**

Findings from this study will help to inform policymakers about the benefit of regularly testing domestic water wells and increase our knowledge of groundwater quality within various hydrogeological settings in the Jackson Purchase Region. This joint project between the University of Kentucky College of Public Health and the Kentucky Geological Survey will establish a growing cohort of Kentuckians, which can potentially be used to further study health issues related to groundwater quality throughout Kentucky.

Category: Human Dimensions

Type of Presentation: Poster Presentation