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New study links stream quality and human cancer rates

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(PhysOrg.com) -- A new study demonstrates that the health of streams can help predict human health in nearby areas. This research provides a new screening tool for human cancer in Appalachia and demonstrates the importance of environmental quality for public health.

The first-of-its-kind study, published this month in the peer-reviewed journal "*EcoHealth*," evaluated the relationship between human cancer mortality rates and the organisms that live in streams known as benthic macroinvertebrates. This study provides the first peer-reviewed analysis of the relationship between stream ecosystem integrity and human health.

The authors of the study, Nathaniel Hitt, Ph.D., of Virginia Tech, and Michael Hendryx, Ph.D., of West Virginia University, used data from state and federal databases to compare stream quality and cancer rates in West Virginia. They observed the highest cancer rates in areas with the most biologically-impoverished streams and vice versa. They also observed that streams provided information about public health above and beyond known risk factors including smoking, poverty and urbanization.

"Our research shows the importance of streams for people," Dr. Hitt said. "We learned that some of the smallest organisms living in streams can provide a warning system for one of the largest human health problems, cancer."

"We found that cancer rates are linked to environmental quality even after accounting for other major risks such as smoking," Dr. Hendryx said. "Furthermore, we saw that the most impaired streams were in close proximity to coal surface mines. This adds to the body of evidence that coal mining is harmful to ecosystems and human health."

This research required a new interdisciplinary collaboration. Dr. Hendryx is an epidemiologist in the WVU Department of Community Medicine. Dr. Hitt is a stream ecologist and conducted this research with the Department of Fisheries and Wildlife Sciences at Virginia Tech. The combination of their diverse backgrounds enabled this groundbreaking research.

"Regulation of coal mining is often portrayed as a choice between 'mayflies and miners,'" Emily Bernhardt, Ph.D., assistant professor of biology at Duke University, said. "However, this study shows how streams are important for the health and welfare of miners and their communities."

"This paper really drives home the fact that it is not just streams and stream animals that we are losing in the surface mining regions of Appalachia, but also the health and well-being of women, children and men," Margaret Palmer, Ph.D., professor of entomology and biology at the University of Maryland, said.

Colin Soskolne, Ph.D., associate editor of "EcoHealth" and professor of public health and environmental epidemiologist at the University of Alberta in Edmonton, Canada, said the approach taken by Hitt and Hendryx exemplifies how innovative methods can improve the understanding of the complex connections between environmental quality and public health.

More information: The study can be accessed online at

www.springerlink.com/content/l … 01c45aa7546d3a2&pi=0

Provided by West Virginia University