# New study provides framework for prioritizing investment in drinking water systems

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A team of researchers from Wayne State University and the University of Michigan have created a decision tool that will aid agencies and policymakers to identify implications and tradeoffs among various regulations or funding guidelines ahead of rulemaking. Credit: Alexis Wright, student, Department of Art & Art History, College of Fine, Performing and Communication Arts, Wayne State University

A team of researchers led by Wayne State University has published a study that aims to assist state and local water authorities in making decisions about where to prioritize funding for infrastructure improvements on drinking water lead service line replacement programs. The study, Improved Decision-Making: A Sociotechnical Utility-Based Framework for Drinking Water Investment, was published recently in *ACS ES&T Engineering*.

Driven by underinvestment, the investment gap between needed and available funds for the nation's drinking water and wastewater infrastructure is projected to grow to $136 billion by 2039. In light of such a funding gap, state agencies and local utilities must make decisions how to invest limited available funds by prioritizing public water systems with the most to gain.

According to the research team, states need to prioritize funding projects to not only ensure compliance with the Safe Drinking Water Act—the national drinking water regulations—but also to maximize the public health benefit.

The Wayne State and University of Michigan research team developed a decision framework that incorporates drinking water quality characteristics with community and environmental quality attributes.

"Drinking water infrastructure suffers from a lack of data," said Sara Schwetschenau, Ph.D., former post-doctoral fellow of Civil and Environmental Engineering at Wayne State and current postdoctoral researcher at the Columbia Water Center at Columbia University. "As a result, decisions are based on limited water system data and often without context to overall environmental exposures. Yet people do not experience health risks from water independent from other modes of environmental risk and this perspective needs to be included in infrastructure decision-making. This method was developed in response

to this concern and is intended to help water utility decision makers leverage existing sources of data, water data and other demographic and exposure data, to improve their existing decision-making practices."

In addition, this new decision tool will aid agencies and policymakers to identify implications and tradeoffs among various regulations or funding guidelines ahead of rulemaking.

"Utilizing this tool will aid policy makers in understanding the greatest benefits to be realized," said Shawn McElmurry, Ph.D., professor of Civil and Environmental Engineering at Wayne State. "Policy makers will have a better understanding of the sensitivity of funding allocation decisions and will be better able to identify communities that have an increased likelihood of lead exposure and that are at the greatest risk of negative health effects or have a reduced ability to cope as a consequence of exposure."

**More information:** Sara E. Schwetschenau et al, Improved Decision-Making: A Sociotechnical Utility-Based Framework for Drinking Water Investment, *ACS ES&T Engineering* (2022). DOI: 10.1021/acsestengg.2c00008

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