

Understanding the Translation of Scientific Knowledge about Arsenic Risk Exposure Among Private Well Water Users in Nova Scotia¹

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Arsenic is a class I human carcinogen that has been identified as the second most important global health concern in groundwater supplies after contamination by pathogenic organisms. Hydrogeological assessments have shown naturally occurring arsenic to be widespread in groundwater across the northeastern United States and eastern Canada. Knowledge of arsenic risk exposure among private well users in these arsenic endemic areas has not yet been fully explored but research on water quality perceptions indicates a consistent misalignment between public and scientific assessments of environmental risk.

This paper evaluates knowledge of arsenic risk exposure among a demographic cross-section of well users residing in five areas of Nova Scotia assessed to be at variable risk (high-low) of arsenic occurrence in groundwater based on water sample analysis. An integrated knowledge-to-action methodological approach is utilized to comprehensively assess the personal, social and local factors shaping perception of well water contaminant risks and the translation of knowledge into routine water testing behaviors.

Analysis of well user survey data ($n = 420$) reveals a high level of confidence in well water quality that is unrelated to the relative risk of arsenic exposure or homeowner adherence to government testing recommendations. Further analysis from the survey and in-depth well user interviews ($n = 32$) finds that well users' assessments of risk are influenced by personal experience, local knowledge, social networks and convenience of infrastructure rather than by formal information channels, which are largely failing to reach their target audiences. Insights from interviews with stakeholders representing government health and environment agencies ($n = 15$) are used to reflect on the institutional barriers that mediate the translation of scientific knowledge into public awareness and stewardship behaviors. The utilization of local knowledge brokers, community-based networks and regulatory incentives to improve risk knowledge and support routine testing among private well users is discussed.

¹in Science of The Total Environment, v. 505, p. 1259-1273, Available online January 2014 (<http://www.sciencedirect.com/science/article/pii/S0048969713015982>)

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