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An Application of a Modified Health Belief Model: Assessing Health Beliefs and Health Protective Behaviors in Mining-Impacted Communities

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ABSTRACT

Purpose/Background: Toxic metal contamination poses public health risks in many mining-impacted communities. Improved understanding of risk perception and health protective behaviors is important to sustaining public health awareness. We co-developed a research study based on the Health Belief Model (HBM; Figure 1) and facilitated through a partnership with the health district in our study area, the Silver Valley of northern Idaho. Lead contamination caused by historical mining practices continues to impact both ecological and human health and contributes to health disparities. For this study, we assess how health belief constructs (i.e., perceived threats, expectations of behavioral outcomes, and confidence in personal knowledge) influence self-reported health protective behaviors and behavioral intentions.

Materials & Methods: We conducted a drop-off pick-up (DOPU) household survey (n~300; estimated response rate~60%) to assess risk perception and self-reported health behaviors among residents in three mining-impacted communities of the Silver Valley. Informational interviews and a pilot survey informed survey instrument development. Health protective behavior variables were modified from the health district's existing public recommendations. We assessed the frequency of past health protective behaviors and likelihood of future behaviors (e.g., handwashing following contact with lead contamination). Health belief constructs were modified from other HBM studies. We performed validity and reliability tests on the survey instrument.

Results: We will measure the impact of threats, expectations and confidence on health protective behaviors. We hypothesize that, overall, higher confidence in personal knowledge of lead contamination will be associated with higher likelihood of taking health protective behavior. Furthermore, confidence is mediated by perceived threat and expectations of behavioral outcomes.

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To test our hypothesis, we will use a structural equation model to test the relationships between constructs (Figure 1).

Discussion/Conclusion: By conducting a DOPU survey, we captured a range of health beliefs and health protective behaviors that are present across the study area. The challenge in educating and protecting the health of communities impacted by a persistent but low visibility contaminant such as lead is understanding the relationship between health beliefs and health protective behaviors. Our study is an initial step in this region to identify the constructs that influence decisions and actions for health protection. We will apply these findings to continue developing tailored resources for community health interventions and communication, including a youth-oriented computer game and targeted signage.

Figure 1. Hypothesized model of health protective behaviors to avoid health effects of lead contamination.

