Strong Heart Water Study
Participatory Interventions to Reduce Arsenic Exposure among Private Well Users in American Indian Communities

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Ethical Approvals

- Indian Health Service Great Plains Area Institutional Review Board (IRB)
- Oglala Sioux Tribal Research Review Board
- Johns Hopkins Bloomberg School of Public Health IRB
Study Rationale

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Arsenic levels in private wells in Oglala Sioux Nation in 2007 (N=97)
Data provided by Oglala Sioux Tribe Land Office
Summary of Health Findings in Strong Heart Study

Chronic Elevated Arsenic Exposure Associated with:

- ↑ Heart Disease
- ↑ Cancer Mortality of Lung, Prostate, and Pancreas
- ↑ Diabetes
- ↑ Kidney Disease

References:
Objective of Strong Heart Water Study

Develop and evaluate the effectiveness of participatory interventions to reduce arsenic exposure among private well users in American Indian communities from North Dakota and South Dakota who have participated in the Strong Heart Study.
Aim 1 of Strong Heart Water Study

Aim 1: Develop sustainable participatory arsenic interventions through formative research and community engagement.

- In-Depth Interviews
- Community Workshops
- Intervention Development
- Pilot of Interventions
Multi-Level Model for Strong Heart Water Study

Tribal Nations
- Environmental Factors
  - Arsenic mitigation policies for private well users

Community
- Environmental Factors
  - Access to water, arsenic testing and mitigation options for private well users

Family/Household
- Environmental Factors
  - Access to arsenic mitigation options for private well users

Individual
- Environmental Factors
  - Access to arsenic safe water and to resources on the health implications of arsenic
Water Arsenic Testing

Laboratory Testing
Installing Arsenic Removal Device
Use of Arsenic Removal Device
Replacing Arsenic Filter Cartridge
Aim 2 of Strong Heart Water Study

Aim 2. Evaluate the effectiveness of an arsenic intervention program in reducing arsenic exposure

- Conduct a randomized controlled trial
- Compare arsenic in urine and markers of heart disease and respiratory health pre and post intervention
- Evaluate long-term sustainability of intervention (1-3 years post intervention)
Strong Heart Water Study for Private Wells

Randomized Controlled Trial

Tribal Level Intervention
Policy planning and sustainability

Community Level Intervention
Community promoter training program
Water arsenic testing program

Household and Individual Level Interventions

Standard Program
150 Households
300 Participants (2 per home)
• Arsenic removal device
• Written maintenance instructions (1 visit)

Intensive Health Promotion Program
150 Households
300 Participants (2 per home)
• Arsenic removal device
• Health promotion program including maintenance instructions (5 visits)

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Aim 3 of Strong Heart Water Study

Aim 3. Disseminate the study findings to American Indian Nations and Indian Health Service

• Disseminate the Strong Heart Study arsenic findings
• Inform sustainable arsenic mitigation policies based on the results of the developed intervention program
Questions