

US EPA ARCHIVE DOCUMENT

Biomonitoring in the DiNEH Project

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Why do biomarker analysis?

- Identify changes that occur before disease symptoms to allow for earlier diagnoses
 - Early intervention generally leads to better outcomes
- Cross-validate self-report data
 - Increase acceptance and confidence in survey analyses

Biomedical Confirmation of Survey and Geospatial Modeling

- Urine-uranium analyses
 - Small subset of participants
 - For comparison with NM, US values
 - Generally, indicates recent U exposure -- DiNEH looked at lifetime exposures
- Blood and urine sample analysis
 - Laboratory assessments of “biomarkers” of kidney disease, immune function, cardiovascular impairment
 - Analyses of laboratory results ongoing
 - Analyzing results against exposure, proximity, and drinking water

Increased Urine-Uranium Levels

(ug-U/g creatinine)



Study →	DiNEH Kidney Study (2007)	NMDOH (2003-2008)	NHANES (2001-2002)
Participants →	22 residents* near U mines	NM statewide N=817	Nationwide N=2,689
Median	0.0441	0.026	0.007
3 rd Quartile	0.0818	0.058	.014
95 th percentile	0.3562	0.354	.040

**No current exposure to uranium in water sources*

Results consistent with CDC Navajo and earlier NMDOH volunteer study

NMDOH 2010 survey Laguna-Grants-Milan area (n=99): 29% urine-uranium >0.08 ug/l (0.08 ug/g creatinine) — the state reporting level — no correlation with uranium in drinking water.

“What happened to the blood and urine samples we gave?”



- 14 uranium screening events (**DiNEH Project** in collaboration with **CUE-JTH**)
 - **Crownpoint, Smith Lake, Baca, GIMC, Church Rock, Pueblo Pintado**

- So far:
 - Immune dysregulation -- aum proximity -- increase in activated T-cells, decrease in activated B-cells
 - Early indicators of high blood pressure seem linked to arsenic in drinking water
 - Continuing to refine models, characterize exposure and cross-link biomarkers to clinical results

- Results will guide analyses in Birth Cohort study

- ***More preliminary results to be reported at NNHRRB conference in November 2011***