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# A Prospective Birth Cohort Study Involving Environmental Uranium Exposure in the Navajo Nation

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## Why a Prospective Birth Cohort Study?

- ❑ Congenital anomalies are the leading cause of infant deaths on the Navajo reservation
- ❑ Limited epidemiological and toxicological data available on the association between uranium exposure and adverse birth and reproductive outcomes
- ❑ Increased exposure potential on reservation because of historical mining and milling operations
- ❑ Navajo mothers are a well defined, accessible cohort



## Navajo Birth Cohort Study (NBCS)



- ❑ Evaluate the potential association between environmental contaminants (uranium and other heavy metal exposures) and reproductive birth outcomes
- ❑ Recruit Navajo mothers, assess their uranium exposure at key developmental milestones, and then follow their children post-birth to evaluate any associations with birth defects or developmental delays

## Research Goals

- ❑ Evaluate potential associations between uranium exposure during pregnancy and birth defects/developmental delays
- ❑ Assess potential interactions with other heavy metals in the environment (arsenic, mercury)
- ❑ Determine activities and source contributions that lead to increased maternal/fetal uranium exposure
- ❑ Use biomonitoring to assess environmental exposures and evaluate impacts at different developmental stages



## Applied Public Health Goals

- ❑ Increase the use of prenatal care among Navajo mothers through community outreach and education
- ❑ Ensure early intervention to reduce the impact of birth defects and developmental delays
- ❑ Strengthen the environmental health capacity of Navajo area agencies
- ❑ Improve understanding of risks to guide policies that prioritize effective public health prevention and intervention



# Study Partners



UNM

HEALTH SCIENCES CENTER



## Timeline of Study Activities

**September 2010**

- Published the Navajo Birth Cohort Study (NBCS) Funding Opportunity Announcement

**Spring/Summer 2011**

- Received approval of study protocols by all participating Institutional Review Boards

**Fall 2011 – Jan 2013**

- Raise community awareness of the NBCS

**February 2013**

- Received OMB approval for study initiation

**Spring 2013**

- Conducted training sessions and initiated participant recruitment

**2013-2015**

- Complete recruitment, participant follow-up and analyses

**2015-2016**

- Disseminate results to participants/communities/scientific literature





## Potential Future Studies

- ❑ **Expand the biomonitoring component of the study**
  - **Include other confounders (PAHs, Hydrogen Sulfide)**
  - **Evaluate exposure levels in fathers**
- ❑ **Conduct follow-up to assess developmental delays in infants from birth to 6 years**
- ❑ **Evaluate barriers to prenatal care utilization on the Navajo Reservation (Tribal Epidemiology Center/PRAMS)**
- ❑ **Determine best practices for conducting outreach and education on environmental exposures on the Navajo Reservation**

