

# DETERMINANTS OF URINARY ARSENIC CONCENTRATION IN A MEXICAN POPULATION

**Dana Loomis**, *University of Nebraska Medical Center, USA*

**Gonzalo Garcia-Vargas**, *Juarez University, Mexico*

**Luz M. Del Razo**, *CINVESTAV-IPN, Mexico*

**Zuzana Drobna**, *University of North Carolina, USA*

**Miroslav Styblo**, *University of North Carolina, USA*

**Background and Aims.** Millions of people worldwide are exposed to inorganic arsenic (iAs), a known carcinogen, in drinking water. This study examined potential predictors of urinary arsenic concentration in two areas in central Mexico with historically high iAs levels in village water supplies.

**Methods.** Participants were adults and children age  $\geq 5$  years residing in the La Laguna and Zimapán regions in Durango-Coahuila and Hidalgo states, respectively. Information on residential history and water use was obtained by questionnaire and participants provided samples of drinking water and spot urine. Concentrations of iAs in water and As species in urine, iAs, MAs and DMAs, were determined by hydride-generation atomic absorption spectrometry. Potential predictors of iAs in water and urine were examined using linear regression and linear mixed models on log-transformed concentrations.

**Results.** The concentration of iAs in water samples was significantly associated with the source of drinking water and place of residence, including the village as well as the region. Interactions of location and water source were significant. Total arsenic (tAs) in urine was significantly associated with iAs concentration in water, source of drinking water and region of residence, as well as with sex and urinary creatinine. Higher urinary tAs concentrations were observed among those drinking municipal tap water rather than bottled water or water from springs or dug wells. Other environmental and personal factors including source of cooking water, length of residence, duration of water use, recent absence from the area, age and obesity were not associated with urinary tAs. Trivalent and pentavalent species of iAs in urine were associated with tAs in urine but not with environmental or personal factors.

**Conclusions.** The level of tAs is strongly related to the concentration of iAs in drinking water, but sex and factors specific to location also play a role.