Summary:

The authors conducted a pilot study to assess the use of toenail arsenic concentrations as an indicator of ingestion of arsenic-containing water. Twenty-one participants were interviewed regarding use of their private (unregulated) wells for drinking and cooking, and each provided a sample of water and toenail clippings. Trace concentrations of arsenic were detected in 15 of the 21 well-water samples and in all toenail clipping samples. The overall Spearman correlation between toenail and well-water arsenic was 0.67 (p=0.009), and among those with detectable well water levels of arsenic, the Spearman correlation was 0.83 (p=0.0001). Based on regression analysis of those who had detectable water levels of arsenic, a ten-fold increase in well-water concentrations of arsenic was reflected in about a two-fold increase in toenail concentrations These results indicate that concentrations of arsenic in toenails reflect use of arsenic-containing drinking water.

Authorization: Contact Authors

Reference:

Karagas MR, Morris JS, Weiss JE, Spate V, Baskett C, Greenberg ER. Toenail Samples as an Indicator of Drinking Water Arsenic Exposure. Cancer Epidemiology, Biomarkers and Prevention 1996;5:849-852.

Description: This datafile contains measurements of drinking water and toenail levels of arsenic, as well as related covariates, for 21 individuals with private wells in N.H. This data set can be used to demonstrate regression diagnostics and transformations.

Variable names in order from left to right:

AGE: Age (years).

SEX: Sex of person ( 1=Male, 2=Female).

DRINKUSE: Household well used for drinking (1=<1/4 2=1/4 3=1/2 4=3/4 5=>3/4).

COOKUSE: Household well used for cooking (1=<1/4 2=1/4 3=1/2 4=3/4 5=>3/4).

ARSWATER: Arsenic in water (ppm).

ARSNAILS: Arsenic in toenails (ppm).

44 2 5 5 .00087 .119

45 2 4 5 .00021 .118

44 1 5 5 0 .099

66 2 3 5 .00115 .118

37 1 2 5 0 .277

45 2 5 5 0 .358

47 1 5 5 .00013 .08

38 2 4 5 .00069 .158

41 2 3 2 .00039 .31

49 2 4 5 0 .105

72 2 5 5 0 .073

45 2 1 5 .046 .832

53 1 5 5 .0194 .517

86 2 5 5 .137 2.252

8 2 5 5 .0214 .851

32 2 5 5 .0175 .269

44 1 5 5 .0764 .433

63 2 5 5 0 .141

42 1 5 5 .0165 .275

62 1 5 5 .00012 .135

36 1 5 5 .0041 .175

Therese Stukel

Dartmouth Hitchcock Medical Center

One Medical Center Dr.

Lebanon, NH 03756

e-mail: stukel@dartmouth.edu