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Alaska Hair Mercury Biomonitoring Program Update, July 2002–December 2012

Background

The Alaska Section of Epidemiology (SOE) began a statewide Hair Mercury Biomonitoring Program in July 2002 that offers free hair mercury testing to all pregnant women and women of childbearing age (WCBA; i.e., those aged 15–45 years).

Direct exposures to mercury occur most often through consuming fish and marine mammals. Fetuses are exposed indirectly through maternal exposure. Adverse neurodevelopment effects in fetuses and young children are the most important health concern.¹ Having their hair tested for mercury allows women to assess their own mercury exposures and to learn whether dietary changes are necessary. The purpose of this *Bulletin* is to update program results and encourage health care providers to advise eligible women to participate in the program.

Results

Hair Samples

Through 2012, the Alaska State Public Health Laboratory analyzed the hair samples of 312 pregnant and 685 non-pregnant women of childbearing age from 127 communities throughout Alaska (Table). The state median hair mercury level was 0.44 parts per million (ppm). Since 2002, all but two hair mercury results were below the state follow-up level of 5 ppm (Figure).

Table. Hair Mercury Concentrations among WCBA (n=997) — Alaska, July 2002–December 2012

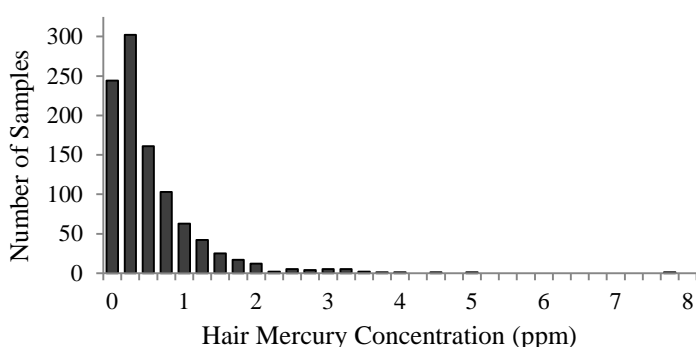
Category	Number	Median Hair Mercury (ppm)	Range (ppm)	Median Age (yrs)
Total	997	0.44	0.01 – 7.82	30
Pregnant	312	0.43	0.02 – 3.76	28
Non-pregnant	685	0.46	0.01 – 7.82	31
Urban*	412	0.39†	0.01 – 3.01	29
Rural*	585	0.49†	0.01 – 7.82	30
Anchorage/Mat-Su	333	0.38	0.01 – 3.48	29
Gulf Coast	165	0.53	0.01 – 4.04	32
Interior	97	0.30	0.03 – 1.99	32
Northern	65	0.47	0.01 – 2.16	25
Southeast	123	0.45	0.02 – 3.01	30
Southwest	214	0.59	0.03 – 7.82	30

*Urban = Anchorage/Mat-Su, Fairbanks and vicinity (including North Pole and Fort Wainwright), and Juneau

Rural = all other Alaska communities

†Differences in median values for urban vs. rural are statistically significant ($P < 0.001$) with alpha at 0.05.

Figure. Hair Mercury Concentrations among WCBA (n=997) — Alaska, July 2002–December 2012



Hair Mercury Levels ≥ 5 ppm

Since July 2002, SOE received reports of eight women with hair mercury levels ≥ 5 ppm; two were WCBA and six were aged >45 years, and all were from the Southwest. Results ranged from 5.06 to 10.56 ppm (median 6.17 ppm). Four of the eight women participated in follow-up investigations, and pike and marine mammal consumption were identified as their primary mercury exposure sources.² Hair mercury levels ≥ 5 ppm have not been identified since 2009.

Discussion

Mercury biomonitoring results continue to indicate that hair mercury levels in Alaska women are below a level of health concern. SOE recommends women follow the state's fish consumption guidelines released in 2007.³ Fish is an excellent source of protein and omega-3 fatty acids, and when consumed by pregnant and lactating women, contributes to the healthy development of fetuses and young children. The Environmental Public Health Program plans to update the existing Alaska fish consumption recommendations, based on new fish monitoring data, in the near future.

We also plan to obtain more hair samples from WCBA living in under-represented areas of the state, such as the Interior and Northern regions. The Program is working with the Alaska Section of Public Health Nursing to ensure that women across Alaska have easy access to hair mercury testing. Broader program participation will provide a better understanding of existing mercury risk in the state and inform future recommendations for safe fish consumption.

A mercury hair test takes about 2 minutes to administer. It consists of cutting a small piece of hair from the back of the patient's head, placing it in a labeled zip-lock bag, then sending it to the laboratory in a pre-addressed envelope. Patients and their providers receive the results by mail within a month of sample submission. The Environmental Public Health Program performs follow-up activities to investigate hair mercury levels ≥ 5 ppm, and assists in devising strategies to reduce further exposure.

Recommendations

1. Health care providers should encourage WCBA and parents of young children to follow the state's fish consumption guidance.³
2. Health care providers should encourage WCBA, especially pregnant women, to participate in the Alaska Hair Mercury Biomonitoring Program.
3. Contact SOE's Environmental Public Health Program (907-269-8000) for information on how to collect hair samples and to request testing kits.
4. For more information about the Alaska Statewide Maternal Hair Biomonitoring Program, go to: <http://www.epi.alaska.gov/eh/biom/>

References

1. Agency for Toxic Substances and Disease Registry (ATSDR). 1999. Toxicological profile for Mercury. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.
2. Alaska Epidemiology *Bulletin*. "Alaska Hair Mercury Biomonitoring Program Update, July 2002–May 2010." No. 18, June 24, 2010. Available at: http://www.epi.alaska.gov/bulletins/docs/b2010_18.pdf
3. Alaska Epidemiology *Bulletin Recommendations and Reports*. "Fish Consumption Advice for Alaskans: A Risk Management Strategy to Optimize the Public's Health." Volume 11, No. 4, October 15, 2007. Available at: http://www.epi.alaska.gov/bulletins/docs/rr2007_04.pdf