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## Alaska Hair Mercury Biomonitoring Program Update, July 2002–May 2010

### Background

In July 2002, the Alaska Section of Epidemiology (SOE) began the Statewide Maternal Hair Mercury Biomonitoring Program, offering free and confidential hair mercury testing to all pregnant women in Alaska. All women of childbearing age (i.e., women aged 15–45 years) are eligible to participate.

People are most commonly exposed to mercury through consumption of fish and marine mammals. This program focuses on women of childbearing age because the growing fetus is particularly vulnerable to the neurotoxic effects of mercury. Having their hair tested for mercury permits individual Alaska women to assess their own mercury exposures and to learn whether dietary changes are necessary. The purpose of this *Bulletin* is to present updated Alaska Hair Mercury Biomonitoring Program results.

### Results

#### Hair Samples

Through May 31, 2010, the Alaska State Public Health Laboratory analyzed hair samples from 308 pregnant women and 505 women of childbearing age who lived in 113 communities throughout Alaska (Table 1). Hair samples tested to date are low in mercury (Figure 1).

**Table 1. Hair Mercury Concentrations by Group — Alaska, July 2002–May 2010**

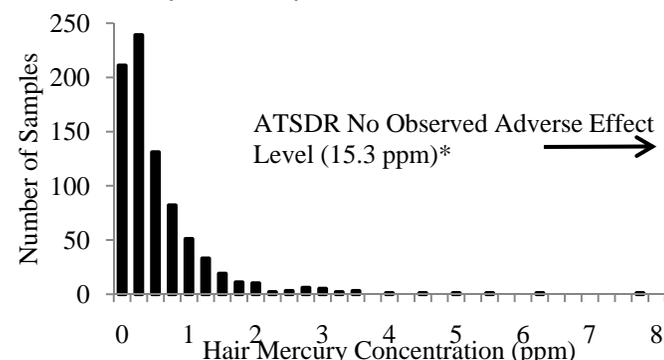
Category	Number	Median Hair Mercury (ppm)	Range (ppm)	Median Age (yrs)
Total	813	0.46	0.01–7.82	30
Pregnant	308	0.44	0.02–6.35	29
WCBA <sup>§</sup>	505	0.46	0.01–7.82	31
Urban*	356	0.37 <sup>†</sup>	0.01–3.40	29
Rural*	457	0.54 <sup>†</sup>	0.01–7.82	31
Northern	55	0.54	0.03–1.46	24
Interior	82	0.29	0.02–1.75	33
Anchorage/Mat-Su	289	0.37	0.01–3.48	29
Southwest	153	0.78	0.04–7.82	30
Gulf Coast	127	0.52	0.01–4.04	33
Southeast	107	0.45	0.02–3.01	30

<sup>§</sup>Women of childbearing age

\*Urban definition: Anchorage and vicinity (excluding MatSu Valley), Fairbanks and vicinity, and Juneau; rural definition: all other

<sup>†</sup>Differences in median values for urban vs. rural are statistically significant ( $P < 0.001$ )

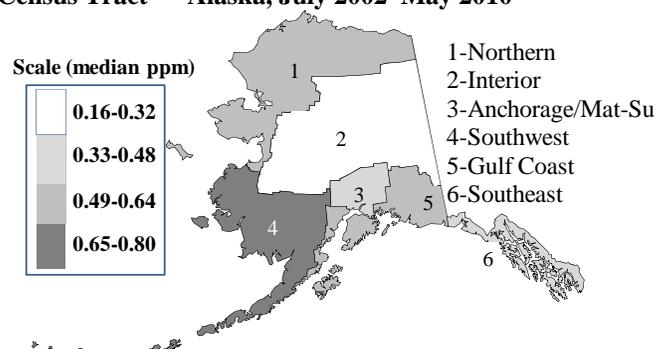
**Figure 1. Hair Mercury Concentrations among Pregnant Women (n=308) and Women of Childbearing Age (n=505) — Alaska, July 2002–May 2010**



\*The Agency for Toxic Substances and Disease Registry (ATSDR) analysis of epidemiological studies determined that there were no adverse health effects to the fetus associated with maternal hair mercury levels under 15.3 ppm.<sup>1</sup> SOE conducts follow-up investigations on all hair mercury levels of 5 ppm and higher.

Hair mercury results by census tract show that the highest median hair mercury level occurred in the Southwest (Figure 2).

**Figure 2. Median Hair Mercury Concentrations among Pregnant Women and Women of Childbearing Age by Census Tract — Alaska, July 2002–May 2010**



#### Follow-up Investigations

Follow-up investigations were conducted for the four women whose hair samples were 5 ppm or higher; all were from the Southwest region. Three women reported consuming large amounts of marine mammal livers and kidneys, and one woman reported regularly consuming large pike. The women were informed of ways to reduce their mercury exposure by choosing to eat marine mammal tissues and species of fish that contain lower concentrations of mercury.<sup>2</sup>

#### Discussion

Fish and other seafoods are excellent sources of protein, omega-3 fatty acids, and antioxidants and are a healthy part of a balanced diet for everyone. Moreover, seafood consumption by pregnant women results in beneficial health effects on fetal and childhood development.<sup>3</sup> The biomonitoring results reported here indicate that mercury levels are low among the Alaska women who have been tested to date. For these reasons, SOE strongly encourages pregnant women and women of childbearing age to continue unrestricted consumption of fish from Alaska waters that are low in mercury, which include all five species of Alaska salmon, Pacific cod, walleye pollock, black rockfish, Pacific Ocean perch, halibut under 20 pounds, and lingcod <30 inches.<sup>2</sup>

#### Recommendations

1. Health care providers should encourage pregnant women and non-pregnant women of childbearing age to participate in the Alaska Hair Mercury Biomonitoring Program in order to better monitor mercury exposures throughout Alaska, ensure optimal Alaska fish consumption recommendations, and enable individual participants to learn about their mercury exposure. Contact SOE's Environmental Public Health Program (call 907-269-8000 during business hours) for information on how to collect and submit hair samples.
2. Health care providers should encourage women of childbearing age and parents of young children to follow the SOE fish consumption guidance.<sup>2</sup>

#### 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 Section of Epidemiology. Fish Consumption Advice for Alaskans: A Risk Management Strategy to Optimize the Public's Health. *Epidemiology Recommendations and Reports*, Volume 11, No.4, October 15, 2007. Available at: [http://www.epi.hss.state.ak.us/bulletins/docs/rr2007\\_04.pdf](http://www.epi.hss.state.ak.us/bulletins/docs/rr2007_04.pdf)
3. Hibbeln JR, Davis JM, Steer C, et al. Maternal seafood consumption in pregnancy and neurodevelopmental outcomes in childhood (ALSPAC Study): an observational cohort study. *Lancet* 2007; 369: 578-85.