

**State of Wisconsin
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Environmental Research Program

Executive Summary

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Population-Based Methylmercury Exposure Assessment

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EXECUTIVE SUMMARY

Date of Report: August 12, 2005

Title of Project: Population-Based Methylmercury Exposure Assessment

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Wisconsin Department of Health and Family Services, Division of Public Health, Bureau of Environmental and Occupational Health

Research Category: IA. Electrical generation and human health. Mercury: Body burden and levels of exposure in Wisconsin.

Project Code: 4900-02-03, ERP Research

Project Period: July 1, 2003 to June 30, 2005

Object of Research: This study was designed to evaluate fish consumption patterns and mercury body burdens among a representative cross section of Wisconsin's adult population. This research allowed us to identify subpopulations in Wisconsin that consume fish several times a week and populations that had elevated mercury body burdens. Study findings allow us to compare current mercury body burdens among Wisconsin residents to national exposure data from CDC's NHANES study and from the US EPA. Comparison of hair mercury levels with information on types and quantities of fish eaten by study volunteers provides important information on dietary sources of methylmercury. Hair mercury and fish consumption data from this study provide a baseline for future mercury exposure assessments.

Summary of Results/Accomplishments

Based on weighted analysis of BRFSS responses, 83% of the adults who live in Wisconsin eat fish and/or shellfish. Estimates show that men are more likely to eat fish and shellfish than women, but this difference is not statistically significant. The percentage of people who include fish and shellfish in their diets increases with age, household income, and educational attainment. Ethnicity is an important predictor of fish consumption, as well, with people who report their race as white, American or Alaskan Indian or multiple races, being more likely to eat fish/shellfish than others. Among people who don't eat fish or shellfish, slightly more than half of them simply don't like fish/shellfish and nearly 20% were raised in households that never ate fish.

Approximately 5% are vegetarians and a similar percentage (4.4%) avoids fish because of concern about contaminants in fish and shellfish.

Average fish consumption frequency ranges from 4 meals/month among all Wisconsin residents to almost 5 meals/month among those who include fish in their diets. The frequency of fish intake varies by ethnicity and fishing license status. Mean fish consumption is highest among Native Americans/Alaskans and multiracial residents and among people who live in a household where at least one individual has a valid Wisconsin fishing license. Other variables including gender, age, income and education are not significant predictors of fish meal frequency. The highest intake rate reported was 60 fish meals/month which equates with two fish meals per day.

Quantity of fish consumed per meal

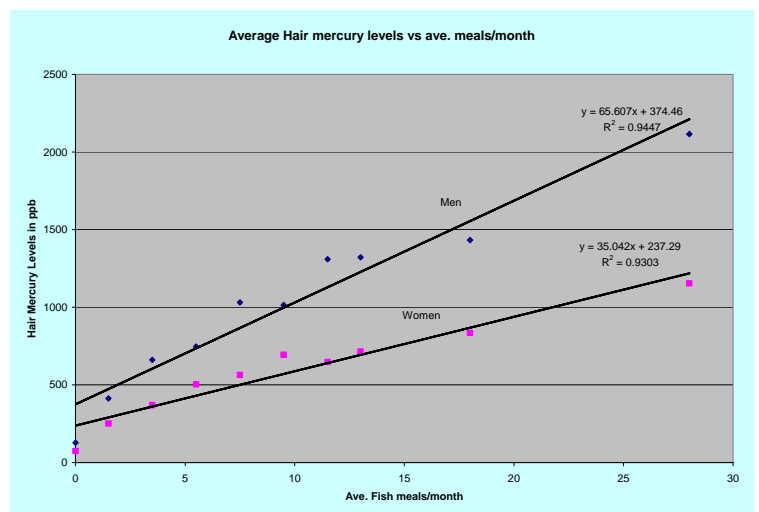
Among people who eat fish and shellfish, the amount of fish consumed at each meal averages slightly more than six ounces and is significantly higher among men than women (7.06 vs 5.08). On average, those over the age of 64 years ate significantly less fish per meal than younger individuals.

Monthly fish intake

Based on weighted meal frequency and quantity per meal estimates, the average fish intake among men and women who include fish in their diets is 35.8 and 23.6 ounces/month, respectively.

Hair Mercury Levels vs Fish Consumption

Hair samples were provided by 981 men and 1050 women. Hair donors were somewhat more likely to consume fish than the general population. Mercury levels ranged from 0.012 to 15.2 ug/g (ppm) and exceeded the guideline value of 1 ppm in 29% of the men and 13% of the women who participated in this phase of our research. Average hair mercury levels were higher in men (0.918 ppm) than in women (0.525 ppm) and were significantly correlated with monthly fish consumption estimates (see inset).



Fish Consumption Advisory Awareness

Most Wisconsin residents are aware that consumption of some types of fish should be limited due to mercury contamination. Based on a weighted analysis of BRFSS responses, 78% of adults living Wisconsin had heard something about this issue. Awareness rates are similar among men and women, but vary by race being highest among Native Americans and white residents. Awareness of this issue increases with household income and educational attainment. While the majority of Wisconsin residents

have heard about mercury contamination in fish, less than half of them are familiar with the Wisconsin Sport-fish Consumption Advisory which is issued annually by the Department of Natural Resources. Familiarity with this advisory, which is issued in the form of a published pamphlet, was highest among men and licensed fishermen. Familiarity was also higher among whites and increased with household income, age and education.