



Project Summary

Evaluation of the Methods Used to Determine Potential Health Risks Associated with Organic Contaminants in the Great Lakes Basin

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The results of a pilot study to establish whether epidemiological investigations should be conducted on commercial fishermen to form an association between PCB exposure and health suggest that "lake-bordering" populations (i.e., white populations) experience higher rates of mortality due to stomach and esophageal cancers than "non-lake bordering" counties. This trend is consistent when the potential confounding factor of large urban centers is removed.

This Project Summary was developed by EPA's Environmental Research Laboratory, Duluth, MN, to announce key findings of the research project that is fully documented in a separate report of the same title (see Project Report ordering information at back).

Introduction

A pilot study was initiated to determine the feasibility of an epidemiologic investigation among commercial fishermen, to assess the association between exposure to PCBs and health. Commercial fishermen were selected as a potential high-risk population because of their fish consumption habits and the availability of licensing records from which a cohort could be extracted. The purpose of this pilot study was to evaluate three research protocols to determine their effectiveness as epidemiologic tools and the appropriateness of commercial fishermen as a cohort.

Results and Conclusions

The pilot study accomplished the following:

1. The addresses of all study subjects in Protocols I and II were verified. The format of Protocol III was structured such that the verification of subject location was not applicable.
2. The response rates for Protocols I and II were similar (72% and 76% of the total cohort respectively).
3. The response rate for Protocol III was 44% after two mailings.
4. Protocols I and II were more effective in producing:
 - (a) answers in the correct format,
 - (b) the highest response rates, and
 - (c) the most accurate information.
5. The differences between Protocols I and II regarding accuracy of information are slight. Therefore, Protocol I appears to be the most efficient and cost-effective of the three protocols tested.
6. The fish consumption patterns among this cohort, obtained by compiling the information from

Protocols I and II, indicate the following trends:

- (a) a good distribution of fish consumption per month among the cohort,
- (b) a good distribution of the number of years fish have been consumed with this frequency among the cohort,
- (c) a good distribution of the quantity of fish consumed per year among the cohort, and
- (d) the preferred consumption of several target fish species from the Great Lakes among this cohort.

These results suggest that commercial fishermen were appropriate as a study cohort and that Protocol I would be the most effective and cost-efficient method of epidemiological ascertainment.

Additional Findings

An analysis of the morbidity and mortality patterns of the Great Lakes populations was conducted. State vital statistics regarding county fetal, neonatal, and infant death rates and congenital anomaly rates were examined for Minnesota, Wisconsin, Illinois, Indiana, Michigan, and Ohio for every fifth year from 1950 to 1975 and for the year 1977. Furthermore, an evaluation of the county site, race, sex, and age-adjusted cancer mortality rates from the National Cancer Institute's publication, *U.S. Cancer Mortality: 1950-1969* was conducted.

These analyses generated the following conclusions:

1. There were no significant trends regarding the percent differences for neonatal death rates and fetal death rates among "lake-bordering" and "non-lake bordering" counties having rates ≥ 1 standard deviation higher than their respective state means.
2. There was a slight trend regarding the difference between percent of live births with congenital anomalies among "lake-bordering" and "non-lake bordering" counties having rates ≥ 1 standard deviation higher than their respective state means. This trend favored the "non-lake bordering" counties.
3. The fertility rates for the eight states were not analyzed due to inconsistent reporting between states.

4. An evaluation of the cancer rates of the counties of the Great Lakes states, stratified according to proximity to the lake, indicated an increasing trend with proximity to the Lakes for esophageal and stomach cancers. These trends are still apparent after counties with population centers $\geq 100,000$ have been excluded from the analysis.

These results suggest that "lake-bordering" populations (i.e., white populations) experience higher rates of mortality due to stomach and esophageal cancers than "non-lake bordering" counties. This trend is consistent when the potential confounding factor of large urban centers is removed. There were no apparent trends regarding the fetal death rate, the neonatal death rate, and the percent of live births with congenital anomalies, among "lake-bordering" and "non-lake bordering" counties.

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The complete report, entitled "Evaluation of the Methods Used to Determine Potential Health Risks Associated with Organic Contaminants in the Great Lakes Basin," (Order No. PB 84-128 305; Cost: \$34.00, subject to change) will be available only from:

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