



Centers for Disease Control
and Prevention (CDC)
Atlanta, GA 30341-3724

September 12, 2007

[REDACTED]

Dear Dr. [REDACTED]:

As you know, the Agency for Toxic Substances and Disease Registry has been working for several years to issue its Great Lakes Area of Concern Report (the Report). You may have reviewed an early draft.

We are now at the point of reviewing a near-final draft of the Report, and a number of concerns, some very central, have arisen. We would like to ask for your recommendations regarding these issues as we consider publication of the report. The issues fall into several categories.

The overall value of the report

ATSDR undertook the development of the report at the request of the International Joint Commission (IJC), to address an overall IJC objective to define “the threat to human health from critical pollutants” in the Great Lakes basin. A list of *critical pollutants* is provided in Table 1.1.

Fully achieving this objective would require extensive information about peoples’ exposures, health outcomes, and presence of confounders—information that is for the most part unavailable. The Report instead provides limited information about pollution (drawing from three data sources: ATSDR’s hazardous waste site data base, NPDES, and TRI) and certain health outcomes (county level vital statistics: birth measures, infant mortality, and mortality from certain cancers). If, because of data limitations, the report falls very far short of achieving its purpose then perhaps it should not be issued. Perhaps, in contrast, the report should be issued, principally to illustrate and support the need for further research. Or perhaps you believe that the report has value as currently configured. What is your opinion?

The value of the exposure data

As noted above the report presents data from three sources: ATSDR's files of assessments performed on over 100 hazardous waste sites, Toxics Release Inventory data, and National Pollutant Discharge Elimination System data. These data are presented not for the entire Great Lakes region, but for 28 "Areas of Concern" representing ecologically degraded locations. Other approaches to assessing human exposures, such as drinking water sampling, air sampling, river sampling, or biomonitoring, might have been included. Do you think the existing approach to assessing exposure is sufficient and valid? Does it add substantially to our understanding of the public health impact of toxic exposures in the Great Lakes Region?

The value of the health outcome data

The report drew its health data from Health Resources and Services Administration (HRSA) Community Health Status Reports, which were available for every county partly or entirely within an AOC. Comparative data are available for demographically similar "peer" counties. The HRSA data were released in 2000 and represent vital statistics from 1988-1997.

HRSA's data base contained dozens of indicators, but it is purely descriptive comparing a county's data with the distributions of data across the other counties in its peer group. No statistical analyses are conducted. For each indicator, HRSA documented if a county was above the median when compared to other counties in its peer group. HRSA also created a "peer range" variable which included eighty percent of all counties in a peer group. Counties falling outside of the peer range were below the 10th percentile or above the 90th percentile within their peer group. In the draft ATSDR report, all indicators are flagged if the county value falls above the median for that county's peer group and for all counties in the United States (see upper left hand cell of Relative Health Importance Table on page 8 of HRSA's Cuyhoga County, Ohio Report). Details on the HRSA's Community Health Status Report methodology can be found in several of the attached documents from HRSA and the report by Studnicki J. et al.

Although a list is not provided in the Report, the indicators eligible for inclusion in the Report were:

Birth Measures (*Vital statistics Reporting System 1988-1997*)

- low birth weight
- very low birth weight
- premature births
- teen mothers
- older mothers
- unmarried mothers

- no care in first trimester

Infant Mortality (*Vital statistics Reporting System 1988-1997*)

- infant mortality
- white infant mortality

- black infant mortality
- neonatal infant mortality
- post-neonatal infant mortality

Death Measures (*Vital statistics Reporting System 1988-1997*)

- breast cancer (female)
- colon cancer
- coronary heart disease
- lung cancer
- stroke

The health outcome data raise several questions.

- Are these the right health outcome measures? That is, do these health indicators reflect health conditions likely to be influenced by low level exposure to the *critical contaminants* of concern? Does the use of these outcome measures imply to the public that they are linked to chemical exposures? If these outcome measures are used, does the Report add substantially to our understanding of the public health impact of toxic exposures in the Great Lakes Region?
- Is it appropriate to use the median value as a cut point to identify a health indicator of concern? This cut point results in identifying a large number of counties as “abnormal.” An alternative approach would be to use a higher cut point, say, the 90th percentile. Does the use of the median or the 90th percentile add substantially to our understanding of the public health impact of toxic exposures in the Great Lakes Region?
- The data used in the Report are from 1988 through 1997—now at least a decade old. If the health indicators used are appropriate, should the Report use more contemporary vital statistics? Does the use of the older data add substantially to our understanding of the public health impact of toxic exposures in the Great Lakes Region

Summary

We ask that you be objective and frank in answering these questions. We are committed to releasing information that is scientifically sound, of high quality, and useful for protecting the public’s health. Our staff and contractors have put significant effort into the preparation of this Report over several years, but if a major change in the Report (or even a decision not

to release it) is appropriate at this point, we will make that decision.

To assist you with this task, we have enclosed for your information the following:

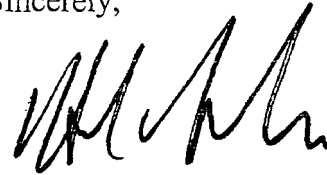
- Chapter 1 - Introduction of the 8/20/2007 draft of the Report.
- Chapter 7 - Summary of the 8/20/2007 draft of the Report.
- Draft rewritten introduction.
- Excerpt from Chapter 3 - Section 3.4 – Lake Erie, Cuyahoga River AOC from GLAOC
- Community Health Status Report: Data Sources, Definitions, and Notes HRSA July 2000
- Community Health Status Report: Cuyahoga County, Ohio July 2000
- Community health report card: Comprehensive Assessment for Tracking Community Health (CATCH). Best Practices and Benchmarking in Healthcare 1997;2(5):196-207.

Thank you very much for your assistance. We greatly value your input as we strive to identify the best ways to promote environmental public health in the Great Lakes region. We request you respond as expeditiously as possible – preferably no later than the middle of next week. If you have any questions please feel free to call either of us at (404) 498-0004.

Sincerely;



Thomas H. Sinks, Ph.D.
Deputy Director, National Center
for Environmental Health/Agency
for Toxic Substances and Disease
Registry



Howard Frumkin, M.D., Dr.P.H.
Director, National Center for Environmental
Health/Agency for Toxic Substances and
Disease Registry

September 24, 2007

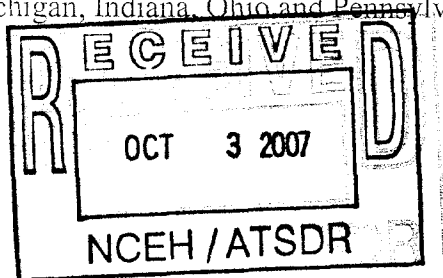
Howard Franklin, M.D., Dr.P.H.
Thomas H. Sinks, Ph.D.
Director and Deputy Director, National Center for
Environmental Health and Agency for Toxic
Substances and Disease Registry
Centers for Disease Control and Prevention
Atlanta, GA 30341-3724

Dear Howie and Tom:

Thanks for your letter of 12 September 2007 and the consideration of the draft Great Lakes Area of Concern Report. It is correct that I have reviewed an earlier draft of this report.

Let me provide background on the issue I understand it. As you may know I am a member of the Science Advisory Board of the International Joint Commission (IJC), and have been for a number of years. I am currently the US Co-Chair of the Workgroup on Ecosystem Health, a committee of which Chris DeRosa is also a member. In 1998 Health Canada released reports of the health status of individuals living within the 17 Areas of Concern (AOCs) in Ontario. These are extraordinary documents, in that they compared indicators of health within each of the 17 AOCs to statistics for all of Ontario. The indicators included mortality by cause, morbidity as reflected in rates of hospitalization by disease, cancers by organ site, and birth data including birth weights, congenital anomalies and infant mortality rates. Because of the health care system in Canada, data on all of these indicators was available. These reports documented serious disparities in the health of residents of most of the AOCs. Perhaps it is not surprising, given the rather dramatic results, that Health Canada has not given very much publicity to the results. A summary of the 17 reports was published by Elliott et al. (EHP 109, Suppl 6: 817-826: 2001).

The Workgroup on Ecosystem Health considered these reports to be a clear call for action for obtaining comparable data in US AOCs. I'm sure, but don't have specific documentation, that this was the basis for the request to have ATSDR do this Great Lakes Report. The IJC also issued two small contracts – one to me to look at health data from the AOCs in New York, and one to Diane Henschel from the University of Indiana to try to obtain comparable information from the other Great Lakes states. Diane found that only Illinois among other Great Lakes states collected information at all comparable to that in Ontario, and their information was not readily available because of what they charged for it. The other states (Minnesota, Wisconsin, Michigan, Indiana, Ohio and Pennsylvania) either had no hospitalization, birth and death



registries, or had ones that were incomplete and inadequate. The only other state with good data is New York, and this was my responsibility. We published one report on health status around three of the New York AOCs (EHP 109, Suppl 6: 845-851: 2001), focusing on thyroid and reproductive diseases. However we realized almost immediately that the contaminants in the Great Lakes AOCs were found at many other sites, and therefore initiated a series of studies where we reported on rates of hospitalization for a number of different diseases in individuals living near identified hazardous waste sites, of which New York has about 900. We have publications on cardiovascular disease, stroke, hypertension, respiratory infections, asthma and diabetes, some of which I know you are familiar with. Even after adjustment for SES, age, race and other measures, in general we find that living near a hazardous waste site containing persistent organic pollutants results in an elevated risk of hospitalization for these diseases.

This long background brings me to review of this report. The report is unsatisfactory simply because the data to really evaluate the health of the people living in the US AOCs is simply not available. We do not have a national program for reporting hospitalization diagnoses, birth parameters or a really good national cancer program. These data-gathering responsibilities are left up to individual states, and as a result there is a patch-work of information that is essentially useless on a national basis. The ATSDR staff did what they could with the data available, but it is certainly less than satisfactory. The only health data available was from the Community Health Status Indicators Project, which is not a complete source, and the comparison to "peer" counties is not what is needed. The exposure data, from the TRI and NPDES, is interesting and important, but these alone do not really help in evaluating the threat to human health of living in an AOC. The AOCs were identified on the basis of existing contamination, not on the basis on new, ongoing contaminants.

All in all the Report is not very satisfactory. Even the reported positive health findings are very qualified because of lack of information about other factors, particularly SES. As we have found in New York, the contaminants present in the AOCs are not unique to the AOCs, but are found in many hazardous waste sites. The important question still, in my view, is whether living near a hazardous waste site constitutes a risk of exposure and of disease.

In spite of these concerns, I do not find the Report to be an embarrassment, and do see some positive features in it. The Report is a best effort to meet what was requested by the IJC. The limiting factor is in the lack of data, which was part of my previous review of an earlier draft. I would prefer to see much stronger discussion of the relative lack of available data for comparing health status across different states, and would suggest strengthening this in the Report. The data on each of the AOCs has some value, even if it is not possible to achieve the detailed information that was possible in Ontario. I do not think that yet another major revision would be of benefit, since there is really no additional data to use for strengthening the analysis.

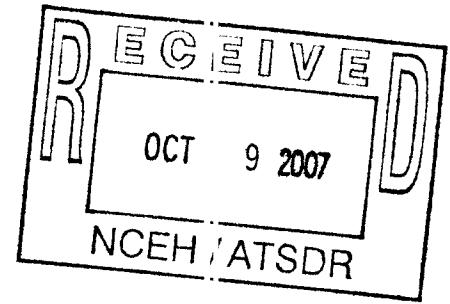
So my recommendation is to release the Report pretty much as is, but with some increased discussion on the inadequacy of data to really evaluate the health status of persons living in AOCs.

Thanks for the opportunity to comment on this Report, and very best regards.

Sincerely,

A handwritten signature in cursive script, appearing to read "David O. Carpenter".

David O. Carpenter, MD
Director and Professor



24 September 2007

Howard Frumkin, M.D., Dr.P.H.
Director
Thomas H. Sinks, Ph.D.
Deputy Director
National Center for Environmental health/
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Re: Great Lakes Area of Concern Report

Dear Drs. Frumkin and Sinks:

Thank you for giving me the opportunity to critique the above-mentioned document. I will address the questions in the sequence that you have raised them.

Given that the objective of the report was to address “the threat to human health from critical pollutants” in the Great Lakes basin, it is my considered professional opinion that the report fails to do this. From the information that I have, the authors have utilized “outcome data” which precede their ‘exposure data’. This cannot possibly address the concern. The “exposure assessment” is neither sufficient nor valid. I believe that the report adds nothing to our understanding of the public health impact of toxic exposures in the Great Lakes Region.

The health outcomes which were utilized are not appropriate, and the method of comparing to the ‘median’ value for the ‘peer counties’ and the U.S. rates gives potentially misleading findings. The Community Health Report Card was never intended to be used for this purpose.

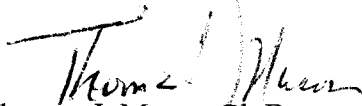
I would recommend that the health outcomes could be greatly improved by using more contemporary vital statistics, events occurring after exposure, and specifically investigating trends in age-specific rates. Pediatric outcomes are important, and using cause-specific mortality, by gender and ethnicity would be appropriate. Among adults, a similar approach could be utilized. Wherever practicable, morbidity by age gender and ethnicity should be assessed. Summary mortality rates are not appropriate, in my considered opinion. Measures of variability in these rates should be calculated, and comparisons made utilizing these measures.

The authors state that 'far more science needs to be done in order to reach a more complete understanding of the health effects of chemical exposures in the Great Lakes'.

What I have suggested should be seen as an intermediate step to a rigorous prospective epidemiologic study of biologically-plausible health events among defined populations in the Great Lakes region for whom specific information could be obtained on exposure(s) and outcome(s).

If I can be of any further assistance to you, please contact me at 813 974 6675 or tmason@health.usf.edu

Sincerely,

A handwritten signature in black ink that reads "Thomas J. Mason". The signature is written in a cursive style with a large initial 'T'.

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and Former Chairperson
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December 20, 2007

Howard Frumkin, M.D., D.P.H.
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Thomas Sinks, Ph.D.
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Dear Drs. Frumkin and Sinks:

I apologize for the long delay in response to your letter of September 12, 2007 concerning the ATSDR Report on *Public Health Implications of Great Lakes Areas of Concern*. This has been a difficult letter to get to. While I helped with the production of the International Joint Commission's letter to you on this topic, I do owe one of my own as I was an external reviewer of the manuscript. This will be a straight forward, and I am afraid, critical letter. Therefore, let me say at the outset that I write this with the outmost respect for both of you as scientists and advocates for our environment and reductions in threats to human health.

As you recall, for many years environmental researchers, physicians, and advocates have been asking that the Federal Government organize existing health and environmental data bases into a form that can be correlated and compared. This call was made with full knowledge of the deficits of the individual data bases and the difficulty in gleaning anything useful from their interconnection. Despite these problems, we were and are convinced that these correlations will raise interesting hypotheses of possible concern about potential interactions of environmental toxins in an area and health conditions of the public.

Historically such hypotheses were raised by scientists, physicians, and most importantly by the public at large have been the driving force in securing public and private funds for research to assess the accuracy of these evidence based speculations. This engine has enabled elected officials on both sides of the aisle to secure funding for research, and needed interventions if the hypotheses have proven to represent a true human health impact of environmental toxins.

A World Health Organization Collaborating Center

I recall a Congressman in your area some years ago who had entered the Congress at the head of a "revolution" to reduce Government spending. When presented with a situation in his district was a great supporter of ATSDR and its full assessment of an environmental exposure which was raised as a potential hazard by his constituents. Without this engine little attention would be directed toward these seemingly invisible dangers.

With this in mind, I was most gratified some years ago that, at the request of the IJC, ATSDR agreed to undertake a significant review of available information to produce the first systematic evaluation of the contribution of hazardous waste sites to the environmental chemical contaminant burden and their potential impacts on public health in Great Lakes' Areas of Concern. Your agency agreed to focus on the 11 Critical Pollutants identified by the IJC that have been described as immediate priorities, targeted for virtual elimination; and banned from production and/or highly toxic substances that have been commonly associated with specific health outcomes observed at one or more AOC sites. The report was projected to include data covering over 100 hazardous waste sites in the 26 U.S. IJC designated Areas Of Concern. This report was projected as part of the US responsibilities under Annex 2 of the Great Lakes Water Quality Agreement (GLWQA).

Your agency agreed that this approach of utilizing environmental and public health information in the 26 U.S. AOCs, is a part of its role under the U.S. Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (Superfund) to assess health hazards at designated hazardous waste sites.

The agency hired the Syracuse Research Corporation to produce a first draft and assigned senior staffer Dr. Annette E. Ashizawa, (now a member of IJC Health Professionals Task Force) as Project Manager. Further, the obvious difficulty inherent in developing this report was underlined when Toxicology Division Chief Dr. Christopher T. De Rosa gave much of his personal attention to this project. These steps were particularly gratifying as I have been impressed by the high quality, well balanced, work of these agency scientists in the past. I have utilized the Toxicologic Profiles of ATSDR as teaching and reference tools for well over a decade. I had seen these scientists handle the complex issues of association without causation and precautionary approaches to preventing harm, with a calm reliance on science and data when economic and political winds swirled around them.

I note that this report, which has taken years in production, was subjected to independent expert review by the IJC's Health Professionals Task Force and other Boards, over 20 EPA scientists, state agency scientists from New York and Minnesota, 3 academics (including myself), and multiple reviews within ATSDR. As such, this is perhaps the most extensively critiqued report, internally and externally, that I have heard of. It was exciting therefore to hear from the IJC that a joint release was planned for last spring and disappointing to hear that ATSDR delayed this release.

It is with this background that I read of your last minute concerns with this report contained in the letter that you sent on September 12, 2007. In response, I should like to restate my impression formed during my more careful review of the draft as an

A World Health Organization Collaborating Center

external reviewer last fall. This is a well done useful piece of work that raises a series of interesting questions that should stimulate further evaluation.

The authors clearly and amply note the limitations of the study and specifically say that this report “does not attempt” to demonstrate “links between specific exposures and corresponding health effects”. In fact, they conclude:

“Thus, this report should be considered only an overview of patterns of exposure and general health measures in the Great Lakes region... it does not accomplish the goal of defining the threat to human health posed by pollutants in the Great Lakes region....Perhaps the major conclusion that can be drawn from this Report is that far more science needs to be done in order to reach a more complete understanding of the health effects of chemical exposures in the Great Lakes.”

As such this report is exactly what I had originally expected. It will permit the educated lay public to form hypotheses based on available data. I should add that the exciting use of GIS mapping modalities will help the public understand the correlations and their limitations. I believe it is of utmost importance that the public be allowed to see the information that the government has available without spin or obfuscation. It will stimulate interest and a research agenda for subsequent years.

I believe I have answered your question concerning whether the report “falls very far short of achieving its purpose” and that “perhaps it should not be issued.” I would only add a more general note that all surveillance data is available to multiple interpretations which it should be and this should never lead to misguided attempts to protect the public from available data. I would add that this is frequently a problem of full epidemiologic studies as well and has been used by those with secondary gain to keep the public in the dark about important information.

In response to the statement in the next paragraph that this report does not include “other approaches to assessing human exposures” and questions whether the “existing approach to assessing exposure is sufficient and valid?” After all the discussion in this report of its limitations, this straw man borders on the ridiculous. Of course, as the authors have said, it is not in and of itself sufficient and valid – but unfortunately it is probably necessary for the creation of further efforts that may come closer to sufficiency.

As to “The value of the health outcome data” which you observe was not subjected to an analysis utilizing a 90th percentile criterion to identify those counties that have elevated rates due to real causative factors rather than by chance alone. You both well know that a 90th percentile criteria is quite specific and allows the identification of those outlier counties that have a 9 in 10 chance of a real causative factor in their elevated rates (the low end not as relevant for these purposes). Yet you also know that this causes you to over look those counties which have an 8 in 10, 7 in 10, 6 in 10 chance that the differences seen have statistically non random reasons for existing. After the caveats in this report about not implying causation, why not leave it up to the public to

decide whether their rate of a particular disease is above average by chance or necessitates further investigation.

The repeated recitation of the deficiencies of the data available on the next page of your letter and the anguish about the lack of causative information is merely a repetition of the cautions in the report itself. Finally, as if repeating the criticisms once again, whose answers have delayed the production of this report over the years and now have caused you to delay it another half a year after its promised release, you raise the issue of the age of the data itself. This even without an argument that that the intervening years have seen such a major shift in health status or exposures as to invalidate these data that the agency has been messaging for so long. If you hurry you could start on edition 2 of this report with new data just in time to respond to questions from the covered communities as to what are the time trends of both exposure and health data.

Let me then conclude again with a strongly worded endorsement of this report, with all of its blemishes, and the wisdom of the public to utilize this information to define hypotheses about the frequently invisible effects of the environment on human health. In an era when less and less health and environmental data is collected, what does exist should not be hidden in a government vault or warehouse popularized in the first Indiana Jones movie as the resting place for the Arc of the Covenant.

All of my best to you both and your families in this holiday season. Thank you for the opportunity to comment upon this report again. Of course, I am available to discuss this further at any time you may find it useful.

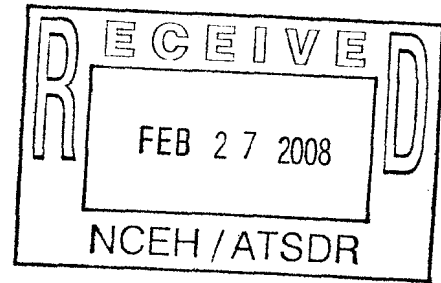
Sincerely,

A handwritten signature in black ink, appearing to read "Peter Orris". The signature is fluid and cursive, with a large initial "P" and "O".

Peter Orris, MD, MPH

UQÀM CINBIOSE

Centre de recherche interdisciplinaire
sur la biologie, la santé, la société et l'environnement
Université du Québec à Montréal



Howard Frumkin M.D. Dr. P.H.
Director,
National Center for Environmental Health
Agency for Toxic Substances and Diseases Registry

February 21, 2008

Dear Dr. Frumkin,

I was informed that in a letter that you sent to the International Joint Commission on the Great Lakes, you indicated that I was a reviewer for the report: *Public Health Implications of Great Lakes Areas of Concern*. Indeed, following our brief conversation in Mexico in September, 2007, I agreed to read the documents that you sent me and provide my opinion on certain aspects. I received the following information : Chapter 1; Chapter 7; Draft rewritten introduction; excerpt from Chapter 3 - Section 3.4; Community Health Status Report: Data Sources, Definitions and Notes HRSA July 2000; Community Health Status Report : Cuyahoga County, Ohio 2000; Community Health Report Card: Comprehensive Assessment for Tracking; Community Health (CATCH). Best Practices and Benchmarking in Healthcare 1997;2(5):196-207.

I read the documents that you sent with much interest, but was unable to respond quickly due to professional and personal constraints. Since I was unable to answer you in the time frame that we established, I assumed that you no longer required my response. I have since learned that there have been some difficulties surrounding the release of the report and I hope that my failure to respond to your request did not contribute to this delay.

I am now able to take the time to respond and if this is useful, my responses to your queries are written below. I feel that it is important to clarify that this is not a review of the report. I have not read the entire report or the annexes and can only provide comments on the aspects that I have read. In your letter of September 12, 2007, you pose a series of questions, that I will try to answer here.

- Your question on the overall value of the report. You ask me whether because of the data limitations, the report falls very short of achieving its purpose and then should not be issued or issued principally to illustrate the need for further research.



CENTRE COLLABORATEUR OMS-OPS



Unfortunately, historically neither environmental nor health data has been collected with a view to examining the relations between environmental exposure and health outcomes. Thus, faced with this situation, the authors of the report have attempted to use proxies, each with its limits and shortcomings. This is frequently stated in the text.

I do not know if in one of the other chapters, there is a review of the literature on the studies that have been performed in the Great Lakes Region with respect to exposure to the critical pollutants in the area and health outcomes (including early alterations, such as neurobehavioral and hormonal changes). This review would certainly help in understanding both exposure and health outcomes and, coupled to the findings of the present report, help to direct future research.

There is a clear need for research that would address the issues that are raised in this report. To my mind, this should be one of the important outcomes of the report. The chapters that I have read and the scientific studies that have been performed to date indicate that there is reason for concern, but we need to devise systems that will allow us to collect adequate data that will be able to link exposure to a series of contaminants from the region and short and long term health effects. The longer the report is delayed, the more time it will take to determine the impact of these pollutants.

To my mind, the report should be issued with the qualifiers of what we know (and its limitations), what we don't know and what we need to know and to do.

- Your question on the value of the exposure data. You indicate that the data are presented for the 28 Areas of Concern and not for the entire Great Lakes Basin and ask if I think that the existing approach to assessing exposure is sufficient and valid and does it add substantially to our understanding of the public health impact of toxic exposures in the Great Lakes Region.

The Areas of Concern are regions designated by the International Joint Commission because of the environmental and ecological degradation. I think that the focus on these areas was well chosen. To my mind, this is the logical place to start since there are existing environmental data for these areas, which are the most ecologically impacted and are often the source of pollution into the Great Lakes and surrounding regions. This would be the region where one would expect to observe effects on human health.

You ask if the approach is sufficient. Again, the response is that the existing data has been generated with prerogatives other than human health. It is very difficult to reconstruct human exposure because of the many routes of

exposure and the time frames. I think that this constitutes a very good beginning.

- Your question on the value of the human health outcome. Here I address the issues globally and then the questions one by one.

Although there are limits to an ecological approach to epidemiology, there is also a lot that can be gleaned, particularly for generating hypotheses for future health surveillance and research. Unfortunately, in the United States, there is not a universal health system and thus it is difficult to collect health data from specific regions. The NHANES has proved very useful for examining the relations between exposures and a wide variety of health outcomes, but it covers the entire United States and it is very difficult to extract meaningful regional data. The authors used the Community Health Status Reports from HRSA, which provide countywide information for a series of health outcome measures. Comparison with peer counties with similar population size is likewise of interest and useful. Because of the nature of the data, the authors rightfully did not conduct statistical analyses, but presented the information as is. It would be useful to better qualify the validity of the data and its application to the present situation.

Are these the right health outcome measures?

Given the exploratory nature of the presentation of the data, we do need as many health outcomes as possible. The choice of birth outcomes, infant mortality and mortality for certain cancers and cardiovascular disorders is certainly relevant. I would have added, if the data exist: diabetes, obesity and thyroid disorders. The inclusion of information like care in the first trimester, teen mothers and older mothers is relevant since these factors are known to be associated with birth measures and it allows the reader to compare these rates between counties with respect to outcomes. Thus, one could question why, for example there would be a high prevalence of very low birth weight with a low prevalence of teen mothers, older mothers and unmarried mothers. This does not mean that exposure is responsible, but asks the question: Is there something other in this social and physical environment that accounts for this discrepancy?

Does the use of these outcome measures imply to the public that they are linked with chemical exposures?

My experience of working with the public is that contrary to the belief among many intellectuals, scientists, public health officials, media, and others, the public can understand complex messages. The message to the public could be: this is what we know, this is what we don't know, this is what we want to know and this is how we are going to go about it. It is my opinion that the public is wary of messages of good tidings or messages bad

ting, which too often have been wrong. I think the public might provide important input into what could be done.

If these outcomes measures are used, does the Report add substantially to our understanding of the public health impact of toxic exposures in the Great Lakes?

My reply to this is yes. It provides the basis for asking new questions and particularly the need for devising new systems for generating data that will allow us to adequately answer the question.

Is the median an appropriate measure, why not a higher cut-off?

It depends upon what one is looking for and in this instance I think that the median might be more appropriate since one is looking for a shift in population outcomes. It would probably be useful to provide both since that would provide a better idea of the distribution. However, Table 7.2 should be redone for clarity.

Should more contemporary data be used?

It is my understanding that when the report was initiated, these were the available data. If more data is now available, it would be interesting to update the report, but not at the detriment of prolonging its release. Since many of the contaminants have long term effects, the pattern of change in health status would certainly be relevant.

I hope that this opinion is useful to you and to the International Joint Commission. If you require further clarification, do not hesitate to call upon me and I will do my best to answer in a timely fashion.

Sincerely,



Donna Mergler PhD
Emeritus professor
Université du Québec à Montréal

c.c Thomas H. Sinks ✓
Deputy Director
National Center for Environmental Health
Agency for Toxic Substances and Diseases Registry