

2003 Project Abstract

For the Period Ending June 30, 2005

JUL 14 2006

TITLE: Economic-based Analysis of Children's Environmental Health Risks

PROJECT MANAGER: Pamela Shubat

ORGANIZATION: Minnesota Department of Health

ADDRESS: P.O. Box 64075, St. Paul, MN 55164-0975

WEB SITE ADDRESS: <http://www.health.state.mn.us/divs/eh/children/environmental.html>

FUND: trust fund

LEGAL CITATION: ML 2003, Ch. 128, Art. 1, Sec. 9, Subd.12(b)

APPROPRIATION AMOUNT: \$ 95,000.00

Overall Project Outcome and Results

The Minnesota Department of Health met with environmental economic advisors and collaborators, convened focus groups of Minnesota citizens, and designed and administered a survey to one thousand Minnesota residents in a two-year effort to learn the advantages and decision-making. Specifically, the MDH explored the use of economics in gauging public concerns about protecting children from environmental threats. The department learned the basics of environmental health economics and the limitations in methods of generating monetary values for reduction of health risks. The department found that the application of economic data is controversial (particularly when applied to decisions about children), but may offer useful information and explanation to support decisions that are made about public health protections.

The major work undertaken was to survey one thousand Minnesota residents about their willingness to increase protection from environmental causes of cancer to the public (adults compared to children) or their families (themselves compared to their children). The survey results indicated that adults were more willing to spend money to reduce risks to all children than to reduce risks to all adults. Similarly adults were more willing to spend money to reduce risks to their children than to themselves.

Project Results Use and Dissemination

The department will use this experience to critique willingness-to-pay data that are used by the federal government to evaluate and support risk assessment decision-making such as the risk reduction benefits of setting air and water pollutant regulations. The work will be considered and cited in department rulemaking for water and air contaminants.

Copies of the survey and the results of the survey can be viewed on the Minnesota Department of Health survey website (<http://www.health.state.mn.us/divs/eh/children/environmental.html>). Future publications and meeting abstracts will be listed on the MDH website.

FINAL REPORT

JUL 14 2006

LCMR 2003 Work Program

Date of Report: May 23, 2006
Date of Next Status Report: FINAL
Date of Work Program Approval: June 26, 2003
Project Completion Date: June 30, 2005

I. PROJECT TITLE: Economic-based Analysis of Children's Environmental Health Risks

Project Manager: Pamela Shubat
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Web Page address: www.health.state.mn.us/divs/eh/children/

Total Biennial LCMR Project Budget:	LCMR Appropriation:	\$ 95,000.00
	Minus Amount Spent:	\$ 95,000.00
	Equal Balance:	\$ 0

Legal Citation: ML 2003, [Chap.128], Sec.[9], Subd. 12b.

Appropriation Language:

12(b) Economic-based Analysis of Children's Environmental Health Risks
\$47,000 the first year and \$48,000 the second year are from the trust fund to the commissioner of health to assess economic strategies for children's environmental health risks.

II. and III. FINAL PROJECT SUMMARY

Overall Project Outcome and Results

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The Minnesota Department of Health met with environmental economic advisors and collaborators, convened focus groups of Minnesota citizens, and designed and administered a survey to a thousand Minnesota residents in a two-year effort to learn the advantages and disadvantages of using economics in environmental health decision-making. Specifically, the MDH explored the use of economics in gauging public concerns about protecting children from environmental threats. The department learned the basics of environmental health economics and the limitations in methods of generating monetary values for reduction of health risks. The department found that the application of economic data is controversial (particularly when applied to decisions

about children), but may offer useful information and explanation to support decisions that are made about public health protections.

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IV. OUTLINE OF PROJECT RESULTS:

Result 1: "Environmental Health Economics Conference"

Description: A consortium of environmental health scientists and economists from academia and government will plan and carry out a workshop or series of seminars that will be open to the public and designed with economists, risk assessors and managers, and policy makers as the primary audience. The unique aspects of environmental health economics (compared to health economics or environmental economics) will be discussed. Participants will learn about the most current research, the agencies and organizations researching this area, and practical and historical applications of economics for environmental health decision-making. The workshop or seminars will focus on the unique challenges in children's health valuation (e.g., children as consumers; using economic decision making to contrast choices adults make for themselves compared to choices they make on behalf of their children). Participants will contrast the health protection actions in children's environmental health that are regulatory in nature (pollution control and clean-up) and those that are based on personal decisions such as transportation, home improvement, and consumer spending.

The U.S. Environmental Protection Agency (EPA) and the MDH will provide funding so that this activity can be planned and initiated prior to the beginning of the LCMR project period and so that the majority of state funds can be used for implementing strategies.

Summary Budget Information for Result 1:	LCMR Budget	\$ 0
	Balance	\$ 0

Completion Date: June 30, 2005

Final Report Summary: Two EPA speakers (Ed Chu and Nathalie Simon) made presentations to the Minnesota Department of Health (MDH) and the general public on February 27, 2003. The seminars described the role of environmental health economics on children's environmental health activities at the federal level. The slide shows from the seminars were posted on the MDH children's environmental health website under science seminars (<http://www.health.state.mn.us/divs/eh/children/seminars/index.html#9>) and will continue to be available to the public.

Consortium member Chris Dockins made presentations to MDH staff on May 1, 2003, to discuss the ways that data from economic surveys are analyzed. Consortium member Patrick Welle participated in a national conference on children's environmental health economics in October 2003 and informally shared information from this conference with the MDH. Additional information on developing and analyzing surveys were presented to the MDH through conference calls with EPA staff and with their contractors involved in statistical analysis. In addition, during the search for a survey contractor the MDH received additional input and guidance from consortium members Patrick Welle and Rebecca Judge.

Department staff listened to presentations via webcast at an EPA workshop held in Washington, D.C. on April 11-12, 2006. The workshop, titled "Morbidity and Mortality: How Do We Value the Risk of Illness and Death?" included a session on collecting valuation data for risks to children as they age. Surveys were described that were remarkably similar to the Minnesota survey. This is an example of staff's continuing education on environmental economics related to children's health.

The MDH has been offered an additional opportunity to sponsor a seminar (by EPA staff) during 2006. EPA staff would travel to Minnesota to participate. The MDH is also looking for meeting venues at which to present survey results and engage researchers and the public in discussing the survey research.

Result 2: Minnesota Values

Description: A consortium of economists and state staff will use environmental health economics (see project partners, below) to analyze the value that Minnesotan's place on protecting children from environmental hazards. Values associated with protecting children and adults will be investigated using environmental health economics research tools such as economic data analysis (e.g., existing health economics data related to quality or quantity of life), surveys, and focus groups.

According to the EPA Office of Children's Health Protection (OCHP), no other state has attempted a children's environmental health valuation study. This project is of sufficient interest to the EPA that the OCHP spent (in 2002/2003) about \$50,000 in staff time and contracted services to assist the MDH in learning about economic analysis, exploring options for achieving the mutual goals of the MDH and the EPA, and in designing and testing survey options. The EPA intends to commit an additional \$50,000 in staffing and services during the next year (2003/2004) to assist the MDH in preparing and testing a survey.

EPA economists have worked closely with the consortium to research the environmental health issues of greatest interest to the consortium. Economists proposed strategies for investigating the children's environmental health issues. The strategy selected by the consortium is to develop a survey on perceived risks of cancer from environmental exposures, willingness-to-pay to reduce cancer risks, and spending to reduce risk.

EPA economists are providing technical assistance to develop the survey. The survey will consist of a cancer risk scenario and questions about spending to reduce risk. Multiple scenarios have been developed and two of the most promising were field-tested using focus groups. The next step (July 2003) is testing the survey questions in focus groups and interviews. This work will be conducted in different locations in Minnesota with the assistance of the EPA using a focus group testing company based in Minneapolis. The consortium created the scenarios, is reviewing each step of the survey development, and will determine when the survey development is completed. At this time, the consortium recommends the survey be developed as a computer-based survey that requires the participant to sit at a terminal to read and view materials and answer questions. The two populations from which a sample will be drawn are households in which children under 14 years of age are currently living and the rest of the population, including parents and non-parents. The survey will be administered to adults.

The MDH will write the request for proposals to solicit competitive bids on administering the survey. The MDH will select a company that can administer the computer based survey in multiple locations in the state, can recruit adequate numbers of participants from the two populations (a total of approximately 1,000 participants), and can collect, collate, and summarize the data.

In addition to the summary data prepared by the survey company, data analysis will be conducted by members of the consortium for varying purposes including detecting any differences between the values adults place on adult and child health protection and the dollar value associated with protection from a specific cancer risk levels (probabilities of getting cancer). At the end of the project period, summary data on the raw data collected from the survey will be available for decision makers and state risk assessors and managers. However, additional detailed analysis conducted by individual members of the consortium will not be immediately available.

A report is now available that summarizes the work conducted for this project (see attached). This report will be made available to the public on the MDH children's website as well as reported to decision makers. The consortium anticipates publishing the results of analyses in peer reviewed science journals.

Summary Budget Information for Result 2:	LCMR Budget	\$ 95,000.00
	Balance	\$ 95,000.00

Completion Date: June 30, 2005

Final Report Summary:

The MDH established a consortium of state academics and state government staff, along with EPA staff, to assist the MDH in developing the project. In the early stages of the survey planning, the consortium was made up of three EPA economists, three MDH staff, two MPCA staff, and four academics. In the early stages this large group conferred by telephone and in person in order to develop the goals for the research, a basic scenario to include in the survey, and members of the group observed focus group testing of the early versions of the scenario. In addition, the MDH invited children's environmental health advocates (Minnesota Center for Environmental Advocacy, Institute for Agriculture and Trade Policy, Women's Cancer Resource Center) and industry representatives (Minnesota Chamber of Commerce) to be observers at focus groups that discuss the survey instrument. Representatives of the Institute for Agriculture and Trade Policy and the Minnesota Chamber of Commerce observed one focus group.

During the course of the planning, sometimes sharply differing ideas and attitudes about willingness-to-pay surveys surfaced. The MDH learned about differing ideas on altruism and the difficulty that economists have in assuming a value is altruistic versus an accrual of value to the individual. The MDH learned that there were differing approaches to surveying public values but that the most acceptable (in the discipline of economic surveys) surveys for valuation tended to be willingness-to-pay questions limited to personal estimates of benefit. The difference in ideas and research goals within the consortium led to some tension and presented a challenge for the MDH in making decisions about the type of survey to plan.

As planning intensified, a core group continued planning and remained active through the selection of the survey contractor. These individuals represented EPA (Nathalie Simon, and Chris Dockins), MDH (Pam Shubat, Chuck Stroebel, and Amy Lockheart), and academia (Patrick Welle of Bemidji State, Rebecca Judge of St. Olaf). This same group has received the results and reports.

The survey that was drafted as a mechanism to measure the difference between adult and child valuation was a compromise of different interests and was intended to address:

- Cancer as the health endpoint and risk as defined as the probability of getting cancer
- Public and private good

- Exposure during childhood contrasted with exposure as adults, but cancer developing after a relatively long latency (at least 20 years)

A scenario that adapted to all of these features was developed. The scenario was a hypothetical food-testing program in which government (public scenario) or food suppliers (private scenario) assured that foods sold were low in persistent environmental carcinogens. The survey was intended to contrast a person's willingness to incur higher costs when the benefit accrued to everyone in Minnesota compared to personal benefits, and benefits to children compared to benefits to adults.

The scenario, educational materials that conveyed risk concepts, and survey questions were tested with randomly selected Minnesotans in focus group format. Focus groups were held February 26-27, 2003 in Mankato and Minneapolis; April 30-May1, 2003 in Duluth and Minneapolis; August 26-27, 2003 in Rochester and Minneapolis; and Oct 6-7, 2003 in Bemidji and Minneapolis. In each case, EPA staff traveled to Minnesota to conduct the focus groups and MDH staff were present at each session.

The survey and survey protocol were approved by the MDH Institutional Review Board (IRB); a necessary step in conducting a study involving human subjects.

A contractor was selected by the MDH according to standard procedures for a request for proposals. The contract was awarded to the University of Kansas Survey Research Center in November 2004 after proposals from four respondents were reviewed in a competitive process. The contractor converted the survey into a web version and MDH and EPA staff field-tested the programmed version early in 2005. The resulting final survey was tested in a one-on-one protocol interview with randomly selected participants. Both the focus group testing and protocol interviews were sponsored by the EPA.

The contractor began recruiting participants in March 2005 and completed the recruitment by August 2005. MDH funding was used to add to the LCMR approved funding and to extend the time needed to complete the survey.

The University of Kansas transmitted data to the MDH in September 2005 for analysis and submitted a final report with the computed recruitment rates and demographic analysis in December 2005. Early analysis by the MDH and EPA collaborators was conducted by February 2006.

The MDH found that adults who were asked about reducing their children's exposures or their personal exposures were more willing to pay for that reduction than adults who were asked about reducing exposures for the general public. The largest number of adults willing to pay to reduce exposures (87 percent) were those who were asked about reducing exposures to their own children (82 percent were willing to pay to reduce their own exposures). The number of adults willing to pay to reduce exposures to benefit all children (79 percent) was larger than the number of adults who were willing to pay to reduce exposures to all adults in the population (75 percent). The MDH had expected to find that people would be more willing to pay to improve health of their own

or other children, whether or not those benefits accrued during childhood, and these preliminary analyses support that hypothesis.

The results also indicated that there was some price sensitivity in a participant's willingness-to-pay to reduce exposures (that is, the lower the price, the larger the number of people were willing to pay). Further work needs to be done to determine whether or not the dollar amounts that people were willing to pay were proportional to the household income. Further work also needs to be done to calculate the amounts that participants were willing to pay and to determine whether or not amounts varied by survey. For example, the EPA and MDH plan to analyze the data to determine if the dollar amounts that the adults who were asked about reducing exposures to their own children were willing to pay differed from the dollar amounts that the adults who were asked about reducing exposures to the general public were willing to pay.

The preliminary analysis conducted by the EPA, however, indicates that the survey responses on dollar amounts do not follow the anticipated distribution of, for example, people willing to pay higher amounts for a short term benefit compared to a long term benefit and people willing to pay higher amounts for a large risk benefit compared to a lower risk benefit. There are many reasons why the survey results did not fit the anticipated distribution of answers. Some reasons include the possibility that the differences in scenarios (high risk benefit compared to low risk benefit) could have been too subtle or the price structure offered to participants was not sufficiently varied. However, the EPA collaborators had successfully conducted a similar survey in the past. One of the greatest differences between past successes and the current survey is that there were more participants in other surveys. Further analysis may indicate that this survey required a larger sample size to detect significant differences in responses.

V. TOTAL LCMR PROJECT BUDGET:

All Results: Personnel:	\$0
All Results: Equipment:	\$0
All Results: Development:	\$0
All Results: Acquisition:	\$0
All Results: Contracts for professional/technical services:	\$ 95,000.00

TOTAL LCMR PROJECT BUDGET: \$ 95,000.00

Explanation of Capital Expenditures Greater Than \$3,500: Not applicable

VI. PAST, PRESENT AND FUTURE SPENDING:

A. Past Spending:

In-kind planning and consultation from the US EPA (0.05 FTE) and \$50,000 in EPA funding have been spent to support the project to date. The exact breakdown of these funds has not been shared with the MDH. Work to date includes:

Result 1: EPA staff traveled to Minnesota to meet with the consortium (September 2002) and present one seminar to MDH staff. EPA staff traveled to Minnesota in February 2003 to present two seminars that were open to the public and were attended by approximately 50 people. The seminars were videotaped and shared with staff of other state agencies and the content of the seminars was posted on the Minnesota Department of Health Science Seminar web site (<http://www.health.state.mn.us/divs/eh/children/seminars/index.html>).

Result 2: Three EPA staff supported the MDH by spending hours on conference calls with the consortium and traveling to Minnesota. Technical assistance included drafting questions, developing or commenting on scenarios for inclusion in the survey, developing ideas for tables and charts of risk comparisons and risk reduction, discussing and selecting subpopulations to sample, and discussing and selecting cancer disease progression that results from exposures at different ages and is expressed in different age groups. Technical support also includes using focus groups to test multiple versions of the survey scope and content with different audiences. Four focus groups have been held to date in Mankato (February 26, 2003), Duluth (April 30, 2003), and Minneapolis (February 27 and May 1, 2003). The EPA arranged and paid for the focus group testing.

B. Current Spending:

The EPA contributed in-kind planning and consultation from the US EPA (0.05 FTE), a data analyst (part-time), and approximately \$100,000 in EPA funding for the focus groups, protocol interviews, statistical consultation, and travel by EPA staff.

The MDH added \$10,000 to the project funds in creating a contract with the University of Kansas in order to ensure a high quality survey is conducted (the total contract with the University of Kansas was \$104,991).

C. Required Match (if applicable): Not applicable

D. Future Spending: None currently planned with the exception of EPA staff travel to Minnesota at some point.

Two members of the consortium (Patrick Welle and Rebecca Judge) submitted a proposal to EPA and were approved for a related economics project in Minnesota. The original proposal for this grant funding was intended to complement the work of the MDH. However, only a portion of the original proposal was approved and the EPA chose not to fund that portion of the original proposal that compared methods for contingency valuation surveys with dichotomous choice willingness-to-pay surveys. While there is no longer as close a connection between the two projects, the MDH is pleased that Minnesota research expertise in environmental economics is recognized and increasing as a result of the grant. While this project was approved, it has not been carried out and it is unclear if the work will take place.

VII. Project Partners:

A. Partners Receiving LCMR Funds: None anticipated

B. Project Cooperators

Consortium members:

U.S. Environmental Protection Agency
Nathalie Simon, Ph.D., Economist, National Center for Environmental Economics
Chris Dockins, Ph.D., Economist, National Center for Environmental Economics
Edward Chu, Economist, Office of Children's Health Protection

Academia

Patrick Welle, Ph.D., Professor of Economics and Director of Environmental Studies, Bemidji State University
Rebecca Judge, Ph.D., Associate Professor of Economics and Environmental Studies, St. Olaf College
Andrew Klemer, Ph.D., Professor of Biology, University of Minnesota, Duluth
Jay Coggins, Ph.D., Professor of Economics, University of Minnesota, Twin Cities

Minnesota Department of Health staff (Health Risk Assessment Unit, Division of Environmental Health)

Pamela Shubat, Ph.D., Environmental Toxicologist
Chuck Stroebel, M.S., Environmental Health Scientist
Amy Lockheart, M.P.H., Research Scientist

Other interested individuals, occasional participants in the Consortium

Robert McCarron, Economist, Minnesota Pollution Control Agency (original member of the consortium, no longer able to fully participate due to staffing changes)
Sherryl Livingston, M.P.H., Minnesota Pollution Control Agency (original member of the consortium, no longer able to fully participate due to staffing changes)
John Adgate, Ph.D., Assistant Professor, Department of Environmental and Occupational Health, University of Minnesota, Twin Cities
Karen Gervais, Ph.D., Director, Minnesota Center for Health Care Ethics, College of St. Catherine
Kathleen Schuler, Institute for Agriculture and Trade Policy
Jeanette Brimmer, Minnesota Center for Environmental Advocacy
Keith Hanson, Minnesota Power

VIII. DISSEMINATION:

All seminar or workshop activities are posted to the MDH website. A brief description of the project is posted on the MDH website at <http://www.health.state.mn.us/divs/eh/children/environmental.html>. A final report(s) will be posted to the MDH website. A final workshop has been discussed, as has participation in national meetings of professional societies. The survey development has been presented at one national workshop and results will continue to be presented. References for these presentations, abstracts or other products of these presentations will be posted to the website.

IX. LOCATION:

The survey was statewide and represented statewide demographics.

X. REPORTING REQUIREMENTS:

Periodic work program progress reports were be submitted not later than January 2004, September 2004, and March 2005.

A final work program report and associated products was submitted by March 30, 2006.

XI. RESEARCH PROJECTS: Not applicable

Attachment A: Budget Detail for 2003 Projects - Summary and a Budget page for each partner

Proposal Title: Economics-based Analysis of Children's Environmental Health Risks 12(d)

Project Manager Name: Pamela Shubat

LCMR Requested Dollars: \$95,000.00

2003 LCMR Proposal Budget	<u>Result 1 Budget:</u>	<u>Result 2 Budget:</u>	<u>Balance (Jan2004- Sep2004)</u>	<u>Balance (Mar2005)</u>	<u>Balance (July 2005)</u>	
	Conference	Minnesota Values				
BUDGET ITEM						TOTAL FOR BUDGET ITEM
PERSONNEL: Staff Expenses, wages, salaries						0
PERSONNEL: Staff benefits						0
Contract (University of Kansas)*		95,000	95,000	95,000	0	95,000
Space rental: NOT ALLOWED	X	X				X
Other direct operating costs						0
Equipment / Tools						0
Office equipment & computers						0
Other Capital equipment						0
Land acquisition						0
Land rights acquisition						0
Printing						0
Advertising						0
Communications, telephone, mail, etc.						0
Office Supplies						0
Other Supplies						0
Travel expenses in Minnesota						0
Travel outside Minnesota						
Construction						0
Other land improvement						0
Other						0
COLUMN TOTAL	0	95,000	95,000	95,000	0	95,000

*University of Kansas Survey Research Center, professional/technical contract for conducting the survey