

Environmental Public Health Tracking and Biomonitoring

REPORT TO THE LEGISLATURE

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Environmental Public Health Tracking and Biomonitoring Program

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Contents

Introduction.....	3
Environmental Health Tracking & Biomonitoring Advisory Panel	4
Biomonitoring Fact Sheet	6
Environmental Public Health Tracking Fact Sheet.....	8
Public Health Data Access Portal Fact Sheet	10
Appendix 1 – Environmental Health Tracking and Biomonitoring Statute	12
144.995 Definitions; Environmental Health Tracking and Biomonitoring	12
144.996 Environmental Health Tracking; Biomonitoring.....	12
144.997 Biomonitoring Pilot Program.	14
144.998 Environmental Health Tracking and Biomonitoring Advisory Panel.....	16
Appendix 2 - Environmental Health Tracking and Biomonitoring Advisory Panel Roster	18

Introduction

First established by the Minnesota Legislature in 2007, Minnesota's Environmental Health Tracking and Biomonitoring program today brings together, in one place, data from statewide monitoring and surveillance of environmental hazards, human exposures and population health. Environmental epidemiologists study the connections between environment, exposures, health and social conditions, all of which are important to understanding how best to protect the health of Minnesota communities. Data and information gained from this work help inform, evaluate and guide policy decisions; support new funding for local actions; and track the progress of community and state programs working to improve public health.



In this report, we highlight key accomplishments of the program over the past two years, 2015 to 2017. Our format for this report includes three parts of the state program, each presented as individual fact sheets for copying and sharing.

Biomonitoring measures chemicals in people or *exposure* — the level of a chemical hazard in samples of blood or urine. Monitoring harmful chemicals in people helps us understand the sources of exposures, actions needed to prevent exposure and how environmental hazards impact public health. Biomonitoring in the public health laboratory builds capacity for emergency response, research and surveillance of population exposure to metals, pesticides, perfluorochemicals, endocrine disrupting chemicals and more.

Environmental Public Health Tracking gathers existing data on environmental *hazards*, such as radon and outdoor air pollution, along with data on their related *health* problems and analyzes it for geographic patterns, trends over time and associations.

Minnesota Public Health Data Access provides public health data on over 20 topic areas accessible to everyone through a web-based data portal. This product of the Minnesota Environmental Public Health Tracking program provides efficient, user-friendly and innovative access to data, saving state resources.

Since 2009, a federal cooperative agreement award has supported Minnesota's Tracking Program and the Minnesota Public Health Data Access portal as part of the National Tracking Network at the U.S. Centers of Disease Control and Prevention (CDC).

Environmental Health Tracking & Biomonitoring Advisory Panel

Minnesota Statute 144.995-998 directed the Minnesota Department of Health (MDH) to establish the Environmental Health Tracking and Biomonitoring Advisory Panel to guide the Department's implementation of the program. Members representing key stakeholder groups, with a background in public health or related sciences, provide important guidance to the Commissioner of Health on program decisions. The panel advises the Commissioner and staff on the selection of chemicals and communities for ongoing biomonitoring, as well as data and topics for environmental public health tracking. They review project plans, progress, results, data interpretation and results communication.

The Environmental Health Tracking and Biomonitoring (EHTB) Advisory Panel meets regularly, 3-4 times each year, and meetings are open to the public. Agendas, notes and members' contact information are posted on the MDH website. A current roster of the EHTB Advisory Panel and the complete statute can be found in the appendices of this report.

Advisory Panel Highlights (2015-2017):

East Metro PFC Biomonitoring

- Reviewed ongoing University of Minnesota research into perfluorochemical (PFC) soil contamination and uptake in farm produce, and the potential for exposure to Hmong farmers. Supported ongoing engagement with the community to resolve concerns.
- Advised on analyses for comparing homeowners' and renters' exposure to PFCs.
- Advised on cancer risk messaging and state cancer registry analyses in the East Metro.

Mercury, Lead and Cadmium in Newborns and Pregnant Women

- Advised on strategies for recruiting pregnant women in diverse communities, including Hmong, Somali and Latina families.
- Reviewed early results and supported comparison of blood spots to cord blood levels.
- Advised on follow-up of elevated cases and communication.

Rural initiatives

- In response to a community request for biomonitoring, recommended that MDH do foundational work to gather available data on pesticide exposure, health concerns and feasibility of a project in the Central Sands region.
- Reviewed statewide private well sampling data from the Department of Agriculture for nitrates, manganese and pesticides.

Tracking

- Guided the development of new traffic hazard data and measures, and new drinking water quality data and measures; discussed ways to enhance online data on public water quality.
- Advised on the interpretation and communication of a report on impacts of air pollution reduction strategies for improving public health and reducing health disparities.

“Since it began 10 years ago, the MDH Environmental Health Tracking and Biomonitoring Program has been very successful in gathering data on environmental hazards, chemicals in people and chronic diseases in Minnesota, and in sharing this information with the public. But, the work is not done! This program will continue to help policy makers, citizens and communities make decisions that best protect public health in Minnesota, now and for future generations.”

*Pat McGovern, Advisory Panel Member
University of Minnesota*

“This coordinated approach to environmental health builds the support and evidence needed to protect the health of Minnesotans for the prevention and control of chronic disease.”

*Jill Heins Nesvold, Advisory Panel Member
American Lung Association of Minnesota*

Appendix 1 – Environmental Health Tracking and Biomonitoring Statute

144.995 Definitions; Environmental Health Tracking and Biomonitoring

(a) For purposes of sections 144.995 to 144.998, the terms in this section have the meanings given.

(b) "Advisory panel" means the Environmental Health Tracking and Biomonitoring Advisory Panel established under section 144.998.

(c) "Biomonitoring" means the process by which chemicals and their metabolites are identified and measured within a biospecimen.

(d) "Biospecimen" means a sample of human fluid, serum, or tissue that is reasonably available as a medium to measure the presence and concentration of chemicals or their metabolites in a human body.

(e) "Commissioner" means the commissioner of the Department of Health.

(f) "Community" means geographically or nongeographically based populations that may participate in the biomonitoring program. A "nongeographical community" includes, but is not limited to, populations that may share a common chemical exposure through similar occupations, populations experiencing a common health outcome that may be linked to chemical exposures, populations that may experience similar chemical exposures because of comparable consumption, lifestyle, product use, and subpopulations that share ethnicity, age, or gender.

(g) "Department" means the Department of Health.

(h) "Designated chemicals" means those chemicals that are known to, or strongly suspected of, adversely impacting human health or development, based upon scientific, peer-reviewed animal, human, or in vitro studies, and baseline human exposure data, and consists of chemical families or metabolites that are included in the federal Centers for Disease Control and Prevention studies that are known collectively as the National Reports on Human Exposure to Environmental Chemicals Program and any substances specified by the commissioner after receiving recommendations under section 144.998, subdivision 3, clause (6).

(i) "Environmental hazard" means a chemical or other substance for which scientific, peer-reviewed studies of humans, animals, or cells have demonstrated that the chemical is known or reasonably anticipated to adversely impact human health.

(j) "Environmental health tracking" means collection, integration, analysis, and dissemination of data on human exposures to chemicals in the environment and on diseases potentially caused or aggravated by those chemicals.

144.996 Environmental Health Tracking; Biomonitoring.

Subdivision 1. **Environmental health tracking.** In cooperation with the commissioner of the Pollution Control Agency, the commissioner shall establish an environmental health

tracking program to:

(1) coordinate data collection with the Pollution Control Agency, Department of Agriculture, University of Minnesota, and any other relevant state agency and work to promote the sharing of and access to health and environmental databases to develop an environmental health tracking system for Minnesota, consistent with applicable data practices laws;

(2) facilitate the dissemination of aggregate public health tracking data to the public and researchers in accessible format;

(3) develop a strategic plan that includes a mission statement, the identification of core priorities for research and epidemiologic surveillance, and the identification of internal and external stakeholders, and a work plan describing future program development and addressing issues having to do with compatibility with the Centers for Disease Control and Prevention's National Environmental Public Health Tracking Program;

(4) develop written data sharing agreements as needed with the Pollution Control Agency, Department of Agriculture, and other relevant state agencies and organizations, and develop additional procedures as needed to protect individual privacy;

(5) organize, analyze, and interpret available data, in order to:

(i) characterize statewide and localized trends and geographic patterns of population-based measures of chronic diseases including, but not limited to, cancer, respiratory diseases, reproductive problems, birth defects, neurologic diseases, and developmental disorders;

(ii) characterize statewide and localized trends and geographic patterns in the occurrence of environmental hazards and exposures;

(iii) assess the feasibility of integrating disease rate data with indicators of exposure to the selected environmental hazards such as biomonitoring data, and other health and environmental data;

(iv) incorporate newly collected and existing health tracking and biomonitoring data into efforts to identify communities with elevated rates of chronic disease, higher likelihood of exposure to environmental hazards, or both;

(v) analyze occurrence of environmental hazards, exposures, and diseases with relation to socioeconomic status, race, and ethnicity;

(vi) develop and implement targeted plans to conduct more intensive health tracking and biomonitoring among communities; and

(vii) work with the Pollution Control Agency, the Department of Agriculture, and other relevant state agency personnel and organizations to develop, implement, and evaluate preventive measures to reduce elevated rates of diseases and exposures identified through activities performed under sections 144.995 to 144.998; and

(6) submit a biennial report to the chairs and ranking members of the committees with jurisdiction over environment and health by January 15, beginning January 15, 2009, on the status of environmental health tracking activities and related research programs, with recommendations for a comprehensive environmental public health tracking program.

Subd. 2. **Biomonitoring.** The commissioner shall:

(1) conduct biomonitoring of communities on a voluntary basis by collecting and analyzing biospecimens, as appropriate, to assess environmental exposures to designated chemicals;

(2) conduct biomonitoring of pregnant women and minors on a voluntary basis, when scientifically appropriate;

(3) communicate findings to the public, and plan ensuing stages of biomonitoring and disease tracking work to further develop and refine the integrated analysis;

(4) share analytical results with the advisory panel and work with the panel to interpret results, communicate findings to the public, and plan ensuing stages of biomonitoring work; and

(5) submit a biennial report to the chairs and ranking members of the committees with jurisdiction over environment and health by January 15, beginning January 15, 2009, on the status of the biomonitoring program and any recommendations for improvement.

Subd. 3. **Health data.** Data collected under the biomonitoring program are health data under section 13.3805.

144.997 Biomonitoring Pilot Program.

Subdivision 1. **Pilot program.** With advice from the advisory panel, and after the program guidelines in subdivision 4 are developed, the commissioner shall implement a biomonitoring pilot program. The program shall collect one biospecimen from each of the voluntary participants. The biospecimen selected must be the biospecimen that most accurately represents body concentration of the chemical of interest. Each biospecimen from the voluntary participants must be analyzed for one type or class of related chemicals. The commissioner shall determine the chemical or class of chemicals to which community members were most likely exposed. The program shall collect and assess biospecimens in accordance with the following:

(1) 30 voluntary participants from each of three communities that the commissioner identifies as likely to have been exposed to a designated chemical;

(2) 100 voluntary participants from each of two communities:

(i) that the commissioner identifies as likely to have been exposed to arsenic; and (ii) that the commissioner identifies as likely to have been exposed to mercury; and

(3) 100 voluntary participants from each of two communities that the commissioner identifies as likely to have been exposed to perfluorinated chemicals, including perfluorobutanoic acid.

Subd. 2. **Base program.** (a) By January 15, 2008, the commissioner shall submit a report on the results of the biomonitoring pilot program to the chairs and ranking members of the committees with jurisdiction over health and environment.

(b) Following the conclusion of the pilot program, the commissioner shall:

(1) work with the advisory panel to assess the usefulness of continuing biomonitoring among members of communities assessed during the pilot program and to identify other communities and other designated chemicals to be assessed via biomonitoring;

(2) work with the advisory panel to assess the pilot program, including but not limited to the validity and accuracy of the analytical measurements and adequacy of the guidelines and protocols;

(3) communicate the results of the pilot program to the public; and
 (4) after consideration of the findings and recommendations in clauses (1) and (2), and within the appropriations available, develop and implement a base program.

Subd. 3. Participation. (a) Participation in the biomonitoring program by providing biospecimens is voluntary and requires written, informed consent. Minors may participate in the program if a written consent is signed by the minor's parent or legal guardian. The written consent must include the information required to be provided under this subdivision to all voluntary participants.

(b) All participants shall be evaluated for the presence of the designated chemical of interest as a component of the biomonitoring process. Participants shall be provided with information and fact sheets about the program's activities and its findings. Individual participants shall, if requested, receive their complete results. Any results provided to participants shall be subject to the Department of Health Institutional Review Board protocols and guidelines. When either physiological or chemical data obtained from a participant indicate a significant known health risk, program staff experienced in communicating biomonitoring results shall consult with the individual and recommend follow-up steps, as appropriate. Program administrators shall receive training in administering the program in an ethical, culturally sensitive, participatory, and community-based manner.

Subd. 4. Program guidelines. (a) The commissioner, in consultation with the advisory panel, shall develop:

(1) protocols or program guidelines that address the science and practice of biomonitoring to be utilized and procedures for changing those protocols to incorporate new and more accurate or efficient technologies as they become available. The commissioner and the advisory panel shall be guided by protocols and guidelines developed by the Centers for Disease Control and Prevention and the National Biomonitoring Program;

(2) guidelines for ensuring the privacy of information; informed consent; follow-up counseling and support; and communicating findings to participants, communities, and the general public. The informed consent used for the program must meet the informed consent protocols developed by the National Institutes of Health;

(3) educational and outreach materials that are culturally appropriate for dissemination to program participants and communities. Priority shall be given to the development of materials specifically designed to ensure that parents are informed about all of the benefits of breastfeeding so that the program does not result in an unjustified fear of toxins in breast milk, which might inadvertently lead parents to avoid breastfeeding. The materials shall communicate relevant scientific findings; data on the accumulation of pollutants to community health; and the required responses by local, state, and other governmental entities in regulating toxicant exposures;

(4) a training program that is culturally sensitive specifically for health care providers, health educators, and other program administrators;

(5) a designation process for state and private laboratories that are qualified to analyze biospecimens and report the findings; and

(6) a method for informing affected communities and local governments representing

those communities concerning biomonitoring activities and for receiving comments from citizens concerning those activities.

(b) The commissioner may enter into contractual agreements with health clinics, community-based organizations, or experts in a particular field to perform any of the activities described under this section.

144.998 Environmental Health Tracking and Biomonitoring Advisory Panel.

Subdivision 1. **Creation.** The commissioner shall establish the Environmental Health Tracking and Biomonitoring Advisory Panel. The commissioner shall appoint, from the panel's membership, a chair. The panel shall meet as often as it deems necessary but, at a minimum, on a quarterly basis. Members of the panel shall serve without compensation but shall be reimbursed for travel and other necessary expenses incurred through performance of their duties. Members appointed by the commissioner are appointed for a three-year term and may be reappointed. Legislative appointees serve at the pleasure of the appointing authority.

Subd. 2. **Members.** (a) The commissioner shall appoint eight members, none of whom may be lobbyists registered under chapter 10A, who have backgrounds or training in designing, implementing, and interpreting health tracking and biomonitoring studies or in related fields of science, including epidemiology, biostatistics, environmental health, laboratory sciences, occupational health, industrial hygiene, toxicology, and public health, including:

(1) at least two scientists representative of each of the following:

(i) nongovernmental organizations with a focus on environmental health, environmental justice, children's health, or on specific chronic diseases; and

(ii) statewide business organizations; and

(2) at least one scientist who is a representative of the University of Minnesota.

(b) Two citizen panel members meeting the scientific qualifications in paragraph (a) shall be appointed, one by the speaker of the house and one by the senate majority leader.

(c) In addition, one representative each shall be appointed by the commissioners of the Pollution Control Agency and the Department of Agriculture, and by the commissioner of health to represent the department's Health Promotion and Chronic Disease Division.

Subd. 3. **Duties.** The advisory panel shall make recommendations to the commissioner and the legislature on:

(1) priorities for health tracking;

(2) priorities for biomonitoring that are based on sound science and practice, and that will advance the state of public health in Minnesota;

(3) specific chronic diseases to study under the environmental health tracking system;

(4) specific environmental hazard exposures to study under the environmental health tracking system, with the agreement of at least nine of the advisory panel members;

(5) specific communities and geographic areas on which to focus environmental health tracking and biomonitoring efforts;

(6) specific chemicals to study under the biomonitoring program, with the agreement of

at least nine of the advisory panel members; in making these recommendations, the panel may consider the following criteria:

- (i) the degree of potential exposure to the public or specific subgroups, including, but not limited to, occupational;
- (ii) the likelihood of a chemical being a carcinogen or toxicant based on peer-reviewed health data, the chemical structure, or the toxicology of chemically related compounds;
- (iii) the limits of laboratory detection for the chemical, including the ability to detect the chemical at low enough levels that could be expected in the general population;
- (iv) exposure or potential exposure to the public or specific subgroups;
- (v) the known or suspected health effects resulting from the same level of exposure based on peer-reviewed scientific studies;
- (vi) the need to assess the efficacy of public health actions to reduce exposure to a chemical;
- (vii) the availability of a biomonitoring analytical method with adequate accuracy, precision, sensitivity, specificity, and speed;
- (viii) the availability of adequate biospecimen samples; or
- (ix) other criteria that the panel may agree to; and
- (7) other aspects of the design, implementation, and evaluation of the environmental health tracking and biomonitoring system, including, but not limited to:
 - (i) identifying possible community partners and sources of additional public or private funding;
 - (ii) developing outreach and educational methods and materials; and
 - (iii) disseminating environmental health tracking and biomonitoring findings to the public.

Subd. 4. Liability. No member of the panel shall be held civilly or criminally liable for an act or omission by that person if the act or omission was in good faith and within the scope of the member's responsibilities under sections 144.995 to 144.998.

Information Sharing

On or before August 1, 2007, the commissioner of health, the Pollution Control Agency, and the University of Minnesota are requested to jointly develop and sign a memorandum of understanding declaring their intent to share new and existing environmental hazard, exposure, and health outcome data, within applicable data privacy laws, and to cooperate and communicate effectively to ensure sufficient clarity and understanding of the data by divisions and offices within both departments. The signed memorandum of understanding shall be reported to the chairs and ranking members of the senate and house of representatives committees having jurisdiction over judiciary, environment, and health and human services.

Effective date: July 1, 2007

This document contains Minnesota Statutes, sections 144.995 to 144.998, as these sections were adopted in Minnesota Session Laws 2007, chapter 57, article 1, sections 143 to 146. The appropriation related to these statutes is in chapter 57, article 1, section 3, subdivision 4. The paragraph about information sharing is in chapter 57, article 1, section 169.

Appendix 2 - Environmental Health Tracking and Biomonitoring Advisory Panel Roster

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