

TOM SHERMAN
Senate District 24

State House, Room 107
(603) 271-1403

MEMORANDUM

DATE: November 1, 2020

TO: Honorable Chris Sununu, Governor
Honorable Stephen Shurtleff, Speaker of the House
Honorable Donna Soucy, President of the Senate
Honorable Paul C. Smith, House Clerk
Honorable Tammy L. Wright, Senate Clerk
Michael York, State Librarian

FROM: Senator Tom Sherman, Chairman

SUBJECT: Interim Report of the Commission to Study Environmentally-Triggered Chronic Illness
RSA 126-A:73-a (SB 85, Chapter 229:2, Laws of 2019)

Pursuant to RSA 126-A:73-a (SB 85, Chapter 229:2, Laws of 2019), please find enclosed the interim report for the Commission to Study Environmentally-Triggered Chronic Illness. This report details the progress and recommendations of the Commission thus far. Please also find included the minutes and materials from previous meetings.

If you have any questions or concerns about this report, please do not hesitate to contact me.

Sincerely,

Senator Tom Sherman
Senate District 24
Chairman
(*electronically signed*)

Enclosures: Interim Commission Report, Commission Meeting Minutes
Cc: Members of the Commission

COMMISSION TO STUDY ENVIRONMENTALLY-TRIGGERED CHRONIC ILLNESS

reestablishing the commission to study environmentally-triggered chronic illness.

INTERIM REPORT

11/1/2020

Overview:

Active Statutory Committee (2019)
SB85
Effective Date: 7/12/2019

Chapter Law: 229:2
RSA Chapter: 126-A:73-a
Final Report Due: 11/1/2024

Membership:

Representative Jeffrey Salloway – House
Representative Nancy Murphy – House
Representative Charles McMahon – House
Senator Jeb Bradley – Senate
Michael Wimsatt – NH DES
Dan Tzizik, PA – NH Medical Society
Margaret DiTulio – NH Nurse Practitioner Assoc
Representative Brian Mooney – House
Representative Gary Woods – House
Representative Bill Nelson – House
Senator Tom Sherman – Senate **(Chair)**
Dr. Kathleen Bush – DHHS
Amy Costello – IHPP
Robert Timmons – NHHA
Mindi Messmer – Community Member appt by the President of the Senate

Charges of the Commission:

- (1) Determining which entities may report confirmed cases of chronic conditions or other health-related impacts to the public health oversight program.
- (2) Recommending ways to alert public health officials regarding higher than expected rates of chronic disease or other health-related impacts which may be related to exposures of unrecognized environmental contaminants.
- (3) Recommending a method to inform citizens regarding programs designed to manage chronic disease or other environmental exposure health-related impacts.
- (4) Recommending data sources and a method to include data compiled by a public or private entity to the greatest extent possible in the development of the public health oversight program.
- (5) Defining by codes, the health status indicators to be monitored, including chronic conditions, medical conditions, and poor health outcomes.

- (6) Studying current health databases, including years available, potential for small area analysis, and privacy concerns.
- (7) Researching currently existing health data reports by agency, bureau, or organization.
- (8) Creating a model of desired data outputs and reports for chronic conditions and other health-related impacts.
- (9) Identifying the gaps between what currently exists and the model output.
- (10) Recommending the organizational structure responsible for the oversight function and mandatory reporting requirements.
- (11) Reviewing results of stages 1, 2 and 3 of the pilot study recommended by the previous commission established by 2017, 166 and identifying changes to subparagraphs (8), and further identify items in (9) and (10).
- (12) Identifying technology system changes necessary to carry out the charge of the commission.
- (13) Collaborating with the National Institutes of Health, the United States Environmental Protection Agency, and the Centers for Disease Control and Prevention to develop protocols for the department of health and human services to educate and provide guidelines for physicians and other advanced health care practitioners to identify and evaluate appropriate diagnostic screening tests to assess health effects from exposure to emerging contaminants.
- (14) Collaborating with the National Institutes of Health, the United States Environmental Protection Agency, and the Centers for Disease Control and Prevention to develop protocols for programs to streamline education and outreach to health care providers about how to implement the guidelines specified in subparagraph (13). The protocols shall include education relative to methods to reduce further exposures and to eliminate the contaminants, if effective methods are available.
- (15) Recommending legislation, as necessary, to carry out the charge of the commission.
 - (b) The commission shall solicit information from any person or entity the commission deems relevant to its study.
 - (c) The commission may, with input from a state agency or agencies, decide whether additional appropriations are necessary to complete the work of the commission. The commission may recommend additional appropriations for approval by the general court.

Meetings:

Organizational Meeting	9/17/2019
Regular Meeting	10/23/2019
Regular Meeting	11/22/2019
Regular Meeting	1/24/2020
Regular Meeting (Remote)	9/15/2020
Data Subcommittee (Remote)	10/6/2020
Regular Meeting (Remote)	10/27/2020

Overview and Progress:

In our meetings since organizing in September 2019, the Commission has heard presentations on radon, lead, PFAS, chronic disease epidemiology techniques, and data base availability in New Hampshire. NH DHHS and DES presented data sharing progress reports and Representative Salloway gave a presentation during the meeting of 1/24/2020

on the Commission, listing several possible recommended steps forward for the Commission.

Please see attached appendices for presentation material and minutes. Onset of COVID-19 resulted in suspension of our work until September 15 when we were able to meet virtually. The Commission was updated by DHHS and DES with the 3rd Progress Report for the Commission to Study Environmentally–Triggered Chronic Illness. Robust discussion followed mostly focusing on data availability and using that data for further education of providers and the public. Representatives Woods and Salloway pointed out that the House Committee on Health, Human Services and Elderly Affairs recommended that this Commission address the charge of HB 1538 was to use data to implement an education program for practitioners at all levels on environmental risk and chronic disease. Representative Salloway said this would be a great opportunity to begin to plan how data might be used to help educate and help practitioners at all levels on the need to assess environmental risk in their clinical contacts. Dr. Bush volunteered to put together a conceptual map based on the charge of the commission. See Appendix I.

As the discussion continued, Dr. Bush said she saw the charge as being about data, core surveillance, data integration, and data systems. Additionally, Dr. Bush said there are two ways of notification: first, how are public health and environmental officials alerted and how can the public alert us; and second, the education component. Dr. Bush recognized that the scope of the commission is critical, and she encouraged the commission to create the systems and processes that can be used to address the next emerging concern. Senator Sherman said the goal is to have a system that assesses and evaluates the impact of contaminants on chronic health, which in turn, could provide an educational component that would go out to the public, practitioners, and legislators alike to determine if further intervention is needed. Senator Sherman summarized that basically one approach is making sure those systems exist, and the other approach is looking at each contaminant and looking at the chronic illnesses that may be associated with it. The Commission decided to continue the Subcommittee on Data, members being Katie Bush, Mindi Messmer, Nancy Murphy, Dan Tzizik and Amy Costello. Education Subcommittee will consist of Margaret DiTulio, Representative Brian Mooney, Representative Jeff Salloway, Representative Gary Woods, Mindi Messmer and Representative Nancy Murphy.

Recommendations:

The Commission has decided to form subcommittees on education and digital data. These subcommittees will convene to further investigate their specific areas of concern. We will plan to review the progress of the subcommittees at the next full meeting after an updated review of the charge of the full Commission and how it pertains to work done to date.

Index of Appendices:

- I Minutes of SB85 Committee Meeting 9/15/2020
- II Third Progress Report on Data Sharing Between NHDHHS and NHDES
- III Second Progress Report on Data Sharing Between NHDHHS and NHDES
- IV Minutes of SB85 Committee Meeting 1/24/2020
- V Minutes of SB85 Committee Meeting 11/22/2019
- VI Minutes of SB85 Committee Meeting 10/23/2019
- VII Minutes of SB85 Organizational Committee Meeting 9/17/2019
- VIII Summary of Work Prior to Organizational Meeting for SB 85

APPENDIX I:

Minutes of SB85 Committee Meeting 9/15/2020

AN ACT reestablishing the commission to study environmentally-triggered chronic illness.

SB 85, Chapter 229:2, Laws of 2019

REGULAR MEETING

MEETING NOTES

September 15th, 2020

10:00 a.m.

Remote Zoom Meeting

Streaming Audio: <https://youtu.be/LX9kUZpww30>

Senator Tom Sherman opened the meeting at 9:00am and he read the Right-To-Know script.

Senator Sherman conducted a required roll call attendance.

- The following members were present:
 - Representative Jeffrey Salloway (at home, alone)
 - Representative Nancy Murphy (joined later)
 - Representative Charles McMahon (at home, alone)
 - Michael Wimsatt (in his office, alone)
 - Dan Tzizik (at home, alone)
 - Margaret DiTulio (in her office, alone)
 - Representative Brian Mooney (at home, alone)
 - Representative Gary Woods (at home, alone)
 - Representative Bill Nelson (at home, alone)
 - Senator Tom Sherman (at home, alone)
 - Dr. Kathleen Bush (in her office, colleague in the room)
 - Amy Costello (at home, alone)
 - Robert Timmons (in his office, alone)
 - Mindi Messmer (in her office, alone)

- The following member was absent:
 - Senator Jeb Bradley

Dr. Kathleen Bush (Department of Health and Human Services) and **Michael Wimsatt** (Department of Environment Services) presented a joint report.

- **Dr. Kathleen Bush:**
 - Under SB 85, DHHS and DES are required to submit a report every 6 months. The report being presented is the third progress report submitted to the commission.

- Due to the ongoing COVID-19 pandemic, the report is brief; however, it does include many of the ongoing projects that DHHS and DES are undertaking. In the last 6 months, certain projects have been delayed as staff have been handling COVID-19-related work.
- Page 3 of the report provides updates and a summary of the ongoing work being done. Despite the pandemic, DHHS has been able to work remotely with partners and collaborators still. Some project work includes:
 - Continuing to work with Dartmouth on efforts pertaining to PFAS-related materials.
 - Amending a contract to work with the Dartmouth Cancer Registry.
 - The governor appropriated some funds from the Drinking Water and Groundwater Trust Fund, which are being used to enhance state work related to environmental and childhood related cancers.
 - This work includes a literature review of environmentally related childhood cancers; an analysis of radiological monitoring data; an effort to convene a conference with experts of childhood cancers; and a reanalysis of some childhood data in both NH and nationally, which includes information gathering from families affected by cancer, so that DHHS can better understand their needs and inform better program planning.
- DES and DHHS applied to two collaborate grants:
 - ATSDR (Apple Tree) grant, which focused on:
 - 1) hazardous waste site investigations at priority sites and working with communities on outreach and communication; and
 - 2) the safe siting of childcare facilities and trying to incorporate environmental health criteria into the siting of those facilities.
 - An environmental health capacity building grant, which focused on:
 - Integrating data from the Public Health Laboratory (in DHHS) and DES to build a Well Water Dashboard, which can be used to target outreach and education across the state about well water quality.
- The biomonitoring trace project is near completion as DHHS continues to analyze the data collected. Within the next few weeks or months, the final participant report is expected. Dr. Bush said she hoped that the data would be easily accessible on the Wisdom Data Portal; however, that would take additional months to put together.
- **Mindi Messmer** said she was happy to see the application for the well water grant approved. She asked when it was awarded and how much was provided by that grant.
 - **Dr. Bush** said that the project date was September 1st. There were two components of that grant: a) a focus on data integration, and b) a focus on outreach and integration. Only \$50,000 was awarded in total, and it was only for component a. This award is only for one year, but it can be renewed for up to 5 years.

- **Senator Sherman** asked if that was the letter that he worked with Dr. John Ali on.
 - **Dr. Bush** said yes. Dr. Ali is part of the Apple Tree Grant and the new NCEH grant related to water quality.
- **Mindi Messmer** asked about the funds allocated to the other two grants from the CDC for the comprehensive cancer control program, which includes the cancer registry and the Apple Tree grant.
 - **Dr. Bush** said she didn't have an exact number for the Apple Tree grant, but she believed it was \$400,000 to support the project. In terms of the comprehensive cancer control program, the CDC reduced the funding awarded to DHHS for FY '21. She said there have been conversations about the impact of those reductions on maintaining a strong cancer registry and other ongoing activities. She said she would reach out to the cancer program about the cuts they are experiencing.
- **Mindi Messmer** followed up by asking how much the DWGTF allocated for pediatric cancer.
 - **Dr. Bush** said that she believed the governor appropriated \$500,000, but that appropriation expires at the end of the fiscal year.
- **Senator Sherman** said he is vice-chair of the DWGTF and that that commission strongly supported those appropriations. He asked Dr. Bush if the cancer registry had lost an oncologist due to the funding reductions over the last 5 years.
 - **Dr. Bush** said she couldn't speak to the staffing at the registry, but she could ask them about the impact they are experiencing.
- **Senator Sherman** said his concern is that this is not the first funding reduction for the registry. He said there is a point at which the utility and ability of the registry to provide DHHS meaningful information is undermined by a lack of funding. He said that maybe Dr. Bush could get back to the commission, especially as Commissioner Shibinette is putting together funding requests for DHHS' budget. He stated that of all the tools in public health, the cancer registry is one of the most important; and there is a threshold that needs to be met in order to keep the registry robust enough to answer cancer cluster inquiries.
 - **Dr. Bush** said she couldn't agree more and she will take these questions back to the cancer program. She also agreed that there needed to be an aligning of the priorities from her division, the DHHS Commissioner, and the legislature.
- **Senator Sherman** followed up by saying there is a lot of support among the legislators on this commission to support the registry.
- **Michael Wimsatt:**
 - In the report, the specific contributions from DES are summarized on page 5.
 - The first topic discussed in the report is the distribution of filter pitchers to vulnerable populations.
 - This project was also funded in part by the DWGTF.

- The basis of the project is to provide filter pitchers to treat drinking water for pregnant mothers and mothers of young infants who may be exposed to arsenic contamination.
- This was done in concert with the Women, Infants, and Children Nutrition program (WIC).
- Due to the pandemic, DES had to go back and amend their contract; however, by September, they planned on rolling this project out through a series of remote communications and mailings.
- A main focus of the program is to ensure that women and their families are educated on the hazards of water contaminated with arsenic and the side effects of it.
- It is believed this program will lead to good education and a larger program that will ensure the most vulnerable populations (pregnant women and young mothers) are getting clean and safe drinking water.
- Hopefully, at the next meeting, DES could update the commission on how the project was working.
- The second topic discussed in the report related to the statewide private well sampling initiative.
 - Again, this program was funded with money from DWGTF.
 - This project is virtually completed. 500 drinking water samples have been taken or planned to be taken from randomly selected homes from across the state.
 - This is the first time there has ever been a statewide evaluation and assessment of drinking quality.
 - The data collection has been a little hampered by the pandemic. In most cases, a lot of sampling was done prior to the pandemic. Additionally, sampling could be taken from outside taps in homes where there was no in-home treatment. Unfortunately, there were about 20 homes out of the selection that had in-home treatment, which meant that DES had to go into the homes. This approach is being evaluated and there are decisions being made whether it should be curtailed at this point.
 - An exciting aspect is that this program is happening alongside the biomonitoring trace study. So, for every single home of the trace study, DES is able to combine a blood sampling of the family members with the drinking water sample.
- **Senator Sherman** said that is an amazing opportunity because many on the commission have been looking for a long time at the impact of contaminants on blood sampling and on residents.
- **Mindi Messmer** said she noticed there was a 16 parts per billion lead maximum in private wells, and she wondered if those pitchers would handle lead in addition to arsenic. She also said that she knew SB 247 talked about the need for drinking water in schools and if there were any updates on that.
 - **Mike Wimsatt** said that as it pertained to the first question, he wasn't certain about the pitchers' ability to filter for lead. He said he would circle back to the commission when he knew. He said

that in terms of drinking water for schools, he wasn't sure if there was a current effort to do that, but he would check with the Drinking and Groundwater Bureau. As far of safe level of lead, it was his understanding that there has never been a safe determination of lead. It has been a general consensus from the toxicology community that no detection of lead is where you want to be.

- **Dr. Bush** added that she believed that SB 247 related to testing of schools and daycares, and she thought that if they were found to have higher than 15, then they were mandated to remediate. She said that anyone greater than 1 was eligible for the 50% remediation refund. She stated that the goal is to get any level of lead out of the water, particularly in schools and daycares, where the most high-risk populations are exposed.
 - **Senator Sherman** asked Dr. Bush if she knew who had the responsibility to follow up on that issue.
 - **Dr. Bush** said that falls on DES and the Water Division. She said that Cindy Klevens and her team are working on following up with schools and remediation.
 - **Senator Sherman** asked if Mike could check in with Cindy to answer Mindi's questions.
 - **Mike Wimsatt** stated he would.
- **Senator Sherman** asked about the collaborative grant, and if it had happened, except for the education component.
 - **Dr. Bush** said that was correct and that DHHS was only awarded component a of the collaborative grant. She said even though DHHS was only awarded component A, it does help set the foundation for ongoing and future work. Right now, there are several pilot programs happening in DES and DHHS that are fulfilling the mission of this commission. Meanwhile, in the background, both departments are working on IT solutions that continue to support their work and data integration. Dr. Bush stated that DHHS will eventually have a new Enterprise-wide Business Intelligence Unit (EBI) where data will be stored. DES has their own similar database (One Stop), which continues to undergo improvements. She concluded that project by project, they are trying to optimize these data integrations and flows.
- **Senator Sherman** said that the original commission did find that there was a lot of opportunity for improvement when it came to data and communication. Senator Sherman asked if one of the goals was to allow some degree of integration to happen automatically between the data in DHHS and DES.
 - **Dr. Bush** responded yes, but the trick is to get data in one department to communicate with one another, which is challenging enough. She said that actual automatization of data sets will not happen soon; however, the opioid crisis and COVID-19 dashboards have shown that DHHS are creating new infrastructure systems. She also said that the Wisdom Data portal is undergoing a huge transition, so after those transitions are

completed, it might be helpful to have that team testify before the commission.

- **Senator Sherman** wondered if Amy Costello had experience with external systems at UNH.
 - **Amy Costello** replied that she didn't know if they have anything that is unique to UNH, which isn't incorporated into EBI. She said that over the past year in collaboration with DHHS, many of the major data sets related to public health like claims have been incorporated into the EBI. Amy asked Dr. Bush if the cancer registry was included into that system.
 - **Dr. Bush** said she wasn't exactly sure what was or was not included in the system, but she knew it was on the list of what needed to get in.
 - **Amy Costello** followed-up by saying that maybe they could bring forward a status report of the development of that.
- **Representative Jeffrey Salloway** said that one charge of the commission is use data to make recommendations. Recently, the House HHS Committee recommended no further action be taken on HB 1528 (or 1538), but instead recommended its charges be given to this commission. The charge of that bill was to use data to implement an education program for practitioners at all levels on environmental risk and chronic disease. Representative Salloway said this would be a great opportunity to begin to plan how data might be used to help educate and help practitioners at all levels on the need to assess environmental risk in their clinical contacts.
 - **Senator Sherman** said that was a great point. He also said that while this commission is not quite ready for it, it does put in on the radar as the chronic disease and exposure databases by DHHS and DES are created and matured. These databases will help the commission and others to start thinking about these things (like PFAS exposure) and whether they are significant or not.
- **Dr. Bush** said a subgroup consisting of herself, Mindi Messmer, and Amy Costello met separately back in January to get to the point of surveillance and data and what if there is a community concern. She stated that they reviewed the state cancer concern investigation protocol, and they thought about adapting that into a larger and broader environmental health concern investigative protocol. She said this is essential because how can a practitioner or a concerned community member transmit these concerns on things, such as water quality, to DHHS and/or DES. She said this might be useful to bring up at a future meeting.
 - **Senator Sherman** stated that subcommittee can still exist since all the members are still on the commission. He also said that Dr. Bush's comments fit perfectly with what Representative Salloway said about educating and creating tools for practitioners.
- **Representative Woods** said that the thrust of HB 1538 was relative to PFAS. Currently, the PFAS Commission is putting together a report, which is looking into integrating the education component. Representative Woods said there are two parts to education: 1) is making the medical community in a broad sense aware of the problem, and 2) once they are aware, what protocol parameters can they institute. Representative Woods said that if we wait until we have data to provide protocols, it prolongs the process and could led to confusion.

- **Senator Sherman** responded that that was a great point. Senator Sherman said that the other tool out there, which is used by Ben Chan, is that all practitioners statewide get bulletins on a routine basis from DHHS. Similar to what Representative Woods said, those could be used as educational tools to update practitioners.
- **Representative Woods** replied that the NH Medical Society and other stakeholders have been discussing how to deal with the educational piece already.
- **Representative Bill Nelson** asked if any water from bottled water or soda was tested for any of these contaminants.
 - **Mike Wimsatt** responded that with respect to bottled water, it is regulated by DHHS. There has been a history of PFAS not currently being tested for those products.
 - **Senator Sherman** said that he thought Representative Cushing had a bill that would require companies that commercially provided bottled water for consumption by humans to have testing done. Senator Sherman asked Dr. Bush if that was correct.
 - **Dr. Bush** replied she would circle back with an answer because she wasn't certain.
 - **Mindi Messmer** asked Mike Wimsatt if it was correct that water that was bottled in the state of NH had to comply with the MCLs. She said she thought that all water originating from NH had to comply with the MCLs.
 - **Mike Wimsatt** responded he didn't think that was entirely true. He said that public drinking water is more regulated and controlled in terms of quality, but bottled products are an issue that is being looked at. On the issue of PFAS, he said that DES took samples from bottled waters, and DES did reach out to one bottled water company that had a concerning level of PFAS. Since being contacted, that plant has come offline and has begun treatment to deal with PFAS effectively. Mike concluded that this is an area that the public should be concerned about because some of us rely on bottled water as our main drinking source.
 - **Senator Sherman** clarified that this should apply to not just PFAS, but all contaminants.
- **Representative Nelson** followed-up and asked about soda, and where that water came from and if it was tested.
 - **Mike Wimsatt** responded that in a general sense that is even less regulated than bottled water. He said that a lot of water bubblers and manufacturers use filtration fairly regularly to control the composition of water for consistency purposes. He said that right now there is no regulatory program for DES to govern soda, and he asked Dr. Bush if DHHS was involved in that.
 - **Dr. Bush** said she will bring this question up with the Food Protection Bureau.
 - **Representative Salloway** remarked that he went out to the Budweiser plant in Merrimack and asked them whether their water could pass a contamination test from a variety of sources, including PFAS. He said that they were assured that their water went through a 17-stage filtration

process. Representative Salloway said he is sure that many breweries, particularly petit breweries, are using groundwater, so the real question is how much checking and filtration are they using. He wondered if Dr. Bush could take that question to her discussion.

- **Senator Sherman** said that Anheuser-Busch was drawing off the Mississippi River for their water source, and that he hoped they went through 17 different stages.
- **Dr. Bush** wanted to clarify the question. She asked if it was what are the standards for water used for bottled water, soda, and beer made in New Hampshire as well as what about those same products sold in NH.
- **Mike Wimsatt** said that one of the reasons they are so concerned about drinking water is that it is a significant exposure pathway. It is assumed that people drink between 3 or 4 liters of water, and he was hoping that in the case of microbrew and soda that that is not occurring in most people.
 - **Senator Sherman** said he has some patients who may be able to do that, but that is a great point.
 - **Mindi Messmer** said that while that is true, potential contamination could be additive because people can drink water, beer, and other things over the course of a day.
- **Senator Sherman** asked if that bottled water study was publicly available.
 - **Mike Wimsatt** replied that it was published in real time and it goes back about 3 or 4 years ago.
- **Senator Sherman** asked Mike Wimsatt to send that to his legislative aide so it could be distributed to the commission members.
- **Senator Sherman** said the interim report is due November 1st. He anticipated that the commission's work would continue to be disrupted by COVID, so the capability for monthly meetings might not be realistic. Senator Sherman proposed creating subcommittees to get more work done in-between meetings of the entire commission. Senator Sherman said there are several areas to move forward on; for instance, the educational piece as it relates to PFAS. Senator Sherman added that he is the vice-chair of the 5G Commission, and they are looking at the human impact of 5G. Senator Sherman said many people are concerned about 5G's impact on environmental and human health. Senator Sherman said that in the interim report he plans to include today's report and the reports from the meetings since last November. Senator Sherman inquired where the commission would like us to go in terms of general and specific topics (e.g., radon, lead, practitioner education, intercommunication in and between departments).
 - **Representative Woods** replied that this commission should be attentive to 5G, but not necessarily active. Representative Woods said it is really dependent upon how the report is fabricated and who picks up on the elements of that report independently.
 - **Senator Sherman** asked Representative Woods if the commission should be thinking of this as a contaminant and about chronic disease monitoring. Senator Sherman said that like so many things, the impacts are shown over the course of many years.

- **Representative Woods** said that he has been in communication with the Medical Society, and that in CA and MA, they are formulating state legislation to address this issue. Representative Woods concluded that this commission as a whole can pick up the ball if it is dropped by the other.
 - **Senator Sherman** said it might make sense to see if 5G fits in as a model of a new contaminate and then continue to monitor its impact on chronic disease.
- **Margaret DiTulio** said as a clinician she believed some part of the work of this commission should be to educate clinicians. She said she is privileged to be on this commission representing the Nursing Practitioners Association because she receives information her colleagues don't. She said she has already integrated questioning and education around these issues with her own primary care patients. She expressed her willingness to work on a subcommittee related to the educational piece. She concluded that she refers patients all the time to get their water tested through DHHS.
- **Mindi Messmer** said that the public education and awareness should happen too because that will inform clinicians on these issues.
- **Dan Tzizik** said he supported the suggestion of creating subcommittees. He said one topic that is important to him is the use of animal waste on fields, particularly in the Seacoast region where there's a confluence of five different rivers into an estuary, and the potential impact waste runoff has on populations. He said he wasn't sure whether this has been looked at in NH or elsewhere.
 - **Senator Sherman** said that there was PFAS contamination in East Kingston from human waste that was spread over fields.
 - **Mike Wimsatt** stated that was correct, but the East Kingston Bogwell site managed a lot of waste, but not for agricultural application, and that its practices were in violation of its permit. He said that DES has been looking at other land application sites and has identified impacts on groundwater quality from those sites. A major concern is that a variety of commercial products and commercial facilities have used PFAS compounds, which ends up as a component of sludge in wastewater facilities. There has been some experience and knowledge, primarily in other states like Maine, where biosolids or wastewater treatment sludges have been used on diary feed crops for diary cattle. In Maine, there was an instance where milk had been impacted by PFAS contamination in a somewhat dramatic way. He concluded that it is unknown the impact of animal manure unless there has been some way that an animal's feed has been introduced to a contaminant.
 - **Senator Sherman** said that when he lived in rural Virginia, he owned a feed spreader. Senator Sherman stated that the major risk of animal waste is infectious manure in water, which can cause things like chronic diarrhea.
 - **Representative Salloway** said there are experiences from other parts of the country, for example in Chesapeake Bay, where nitrate runoff came from chicken farms, which caused a bloom of bugs that toxified the Bay with a neurotoxin. As a result, fishermen were affected by that toxin.

Representative Salloway said that could happen to the Great Bay and it might be helpful to keep an eye on it, but there is no data available.

- **Dr. Bush** volunteered to put together a conceptual map based on the charge of the commission. Dr. Bush said she saw the charge as being about data, core surveillance, data integration, and data systems. Additionally, Dr. Bush said there are two ways of notification: first, how are public health and environmental officials alerted and how can the public alert us; and second, the education component. Dr. Bush recognized that the scope of the commission is huge and she encouraged the commission to create the systems and processes that can be used to address the next emerging concern. Dr. Bush said that biomonitoring study and DES well water report will help build the systems.
- **Senator Sherman** agreed with Dr. Bush that the commission could really end up deep in the weeds on each contaminate. Senator Sherman said the goal is to have a system that assesses and evaluates the impact of contaminants on chronic health, which in turn, could provide an educational component that would go out to the public, practitioners, and legislators alike to determine if further intervention is needed. Senator Sherman summarized that basically one approach is making sure those systems exist, and the other approach is looking at each contaminant and looking at the chronic illness associated with it.
- **Senator Sherman** said that Mike Wimsatt, Dr. Bush, and himself could work together on generating the interim report; however, he wanted to make sure the whole commission had an opportunity to express their feedback.
- **Dr. Bush** said she thought the subcommittee with her, Amy Costello, and Mindi Messmer relating to creating an environmental health protocol had relevance still.
- **Mike Wimsatt** added that even though the final report isn't due until 2024 that date will approach fast. He said the charge of the commission is much broader and it pertains to systems and how to ensure that the two departments are communicating and sharing effectively. Additionally, it is about how those systems work together and collect as much information as possible and making sure that information is available to all the parties that need it.
- **Amy Costello** stated that back in January, the commission did go through the bill and identified the charges that needed to be done. She said that to Mike's point, there are a lot of charges, but many of them are clustered neatly together in activities that have already been identified.
- **Senator Sherman** said he would like to have a draft interim report by the end of October, which the commission can discuss and finalize. Senator Sherman thanked Dr. Bush for offering to pull together a framework for the report. Senator Sherman set a deadline of October 15th for any submissions to him, which he will compile into the interim report due November 1st. Senator Sherman hoped to vote on the interim report at the next meeting, and he said it would hopefully give the commission guidance on where to move forward. So far, Senator Sherman said some of the ideas that have come forward have to be to create two subcommittees: an education subcommittee and to continue the work of the digital data subcommittee. Senator Sherman said that none of these subcommittees are exclusive, but they just couldn't have a quorum on them. Senator Sherman concluded that if anyone would like an additional subcommittee to let him know. He said a lot of work had been done on the

chronic disease side, but it could be possible to establish a subcommittee on the contaminate side and systems standpoint.

- **Mike Wimsatt** asked Senator Sherman a parliamentary question on the formation of subcommittees and whether they needed to be publicly noticed or not.
- **Senator Sherman** said that was correct, that any subcommittee meeting must be noticed and publicly accessible. Senator Sherman said he was not thinking those subcommittees would meet before the November 1st deadline, but he was just floating this idea moving forward due to the constraint of meeting online. Senator Sherman asked all the commission members to send their proposals by October 15 to his legislative aide, Aaron.

The next meeting was set for Tuesday, October 27th at 10am. A data subcommittee meeting was set for Tuesday, October 6th at 11am.

Interest in the education subcommittee consisted of Dan Tzizik, Margaret DiTulio, Representative Brian Mooney, Representative Jeff Salloway, Representative Gary Woods, Mindi Messmer and Representative Nancy Murphy. A meeting date was left pending until later, but it was seen as a future task for the commission, which would be placed into the interim report.

Mindi Messmer asked if the interim report would recommend some policy.

Senator Sherman said he didn't think the commission had gotten to that point yet; however, the interim report could include policy suggestions.

Representative Jeffrey Salloway motioned to accept the minutes from the January 2020 meeting. The motion was seconded by Representative Brian Mooney. A roll call vote was taken on accepting the minutes: 11 were in favor, 2 abstained, and 2 were absent.

- Yes: Representative Jeffrey Salloway, Representative Charles McMahan, Michael Wimsatt, Representative Brian Mooney, Representative Gary Woods, Representative Bill Nelson, Senator Tom Sherman, Dr. Kate Bush, Amy Costello, Robert Timmons, Mindi Messmer
- No: None
- Absent: Senator Jeb Bradley, Margaret DiTulio,
- Abstain: Representative Nancy Murphy, Dan Tzizik

Representative Jeff Salloway motioned to conclude the meeting. Amy Costello seconded that motion. All were in favor with one member absent (Margaret DiTulio).

APPENDIX II:

Third Progress Report on Data Sharing Between NHDHHS and NHDES

**3rd Progress Report for the Commission to Study Environmentally –
Triggered Chronic Illness
SB 85 (2019)**

Submitted by:

**New Hampshire Department of Health and Human Services Division of
Public Health Services
&
New Hampshire Department of Environmental Services**

September 2020

Introduction

This is the third report related to Senate Bill SB 85 (2019), which directs the New Hampshire Department of Environmental Services (DES) and the New Hampshire Department of Health and Human Services (DHHS) to improve coordination and collaboration as it relates to environmental health, with a specific focus on data sharing.

Due to the ongoing COVID-19 Pandemic, this report includes a brief summary from both NH DHHS and NH DES.

Background

Senate Bill SB 85 (2019) re-established a legislative commission to study environmentally triggered chronic illness. The objectives of SB85 build on previous work related to House Bill HB 511 (2017) and HB 1356 (2018). The work of this Commission is focused on conducting environmental health surveillance and improving coordination and collaboration between DES and DHHS in order to allocate resources efficiently to reduce exposure to environmental contaminants and prevent disease.

The SB 85 Statement of Intent reads as follows: “The general court recognizes that nearly half of adults in the United States have at least one chronic health condition and chronic diseases are responsible for increased health care costs. Seventy percent of health care costs in the United States are for chronic diseases. Some chronic diseases are known or thought to be associated with environmental causes. According to the Centers for Disease Control, the state of New Hampshire has the highest rates of people with bladder, breast, esophageal, and pediatric cancer in the country. In addition, a double pediatric cancer cluster was identified in the seacoast of New Hampshire in 2014. Therefore, the general court hereby establishes the commission to study environmentally-triggered chronic illness.”

HB 511 (2017) established a legislative commission to study environmentally-triggered chronic illness.

HB 1356 (2018), charged DES and DHHS to develop and implement a method by which the departments share certain health outcome and environmental data. The HB 1356 Preliminary Report submitted in August 2018 includes more information on the status of the activities listed below and is attached in the Appendix.

Specifically, the departments were requested to:

- Update a memorandum of agreement related to data sharing;
- Sign a joint standard operating procedure on how data layers can be shared between the two departments to identify linkages between environmental contaminants and health outcomes;
- Hold a presentation on the departments' ongoing, joint efforts under the Centers for Disease Control and Prevention environmental public health tracking cooperative agreement; and
- Compile a report describing and estimating the cost to perform a 2-way pilot project between the departments on arsenic in drinking water, where both health effects and environmental data exist.

Updates from NH Department of Health and Human Services (NH DHHS)

- Due to the COVID-19 pandemic, most DPHS staff have been working remotely. We have been able to maintain cross-program collaboration via tools that have been provided to us by the agency, such as Zoom, Jabber, and VPN access;
- We are continuing to participate in a Dartmouth led effort to develop PFAS materials specific to NH, and we will review draft documents as they become available;
- The amendment for Dartmouth Cancer Registry Contract is underway to include funding from the NH Drinking Water and Groundwater Trust Fund to enhance the State's work related to environmental and childhood-related cancers. This funding will cover a literature review for environmentally-related childhood cancers, analysis of radiological monitoring data, convening of experts in childhood cancer, re-analysis of childhood cancer data in NH and nationally, and information gathering from families of children affected by cancer to better understand their unmet needs to inform the health department in future program planning;
- The CDC has reduced the funding awarded to NH DHHS for SFY21 for the Comprehensive Cancer Control Program and subsequently we are having discussions about the impact these reductions will have on the capacity of the Cancer Registry at Dartmouth to continue to provide high quality cancer data to researchers and public health professionals;

- NH DES and DHHS were awarded the ATSDR APPLETREE Grant, which has two components:
 - 1. Conducting site-investigations at hazardous waste sites and other locations to eliminate human exposure with community education and outreach; and
 - 2. Supporting the Choose Safe Places for Early Care and Education Program focused on the safe sighting of childcare facilities; and
- NH DES and DHHS applied for a collaborative grant from CDC's National Center for Environmental Health focused on building environmental health capacity and leveraging well water quality data to drive action and policy.

Biomonitoring NH TrACE Project:

The 2019 NH Tracking and Assessment of Chemical Exposures (TrACE) Study led by the NH Biomonitoring Program (BiomonitoringNH), within DPHS, is a statewide public health surveillance study looking at many different metals, pesticides, per- and polyfluoroalkyl substances (PFAS), and other chemicals in NH residents. BiomonitoringNH tested approximately 350 NH residents (6 years and older) as well as the water from their homes. BiomonitoringNH worked with the NH Department of Environmental Services (DES) and the NH Environmental Public Health Tracking Program (EPHT) to collect and test these samples. This type of statewide surveillance study ensures that comprehensive data are collected for: (1) residential history, (2) exposure history, (3) environmental data, and (4) clinical data that allows for more in-depth analysis of potential associations.

Approximately 50 chemicals were tested in human blood and urine, 270 chemicals were tested in private well water, and 90 chemicals were tested in public water. This represents a vast amount of data. The EPHT Program, which also sits within DPHS, is responsible for the joint analysis of this data and routinely accesses shared project folders on both the I Drive and secure project folders on the secure DHHS server. Summary reports will be shared with all TrACE Study participants. The summary reports 4 and supporting information will also be shared publicly through several channels including the NH Health WISDOM Data Portal and Conference Presentations.

Creation and dissemination of the Participant Summary Report was delayed due to COVID-19 response activities within the Public Health Lab. However, the Biomonitoring NH Team plans to complete the reports and send them to participants within the next few months. Once finalized, the reports will eventually be made available on the WISDOM Data Portal.

Updates from NH Department of Environmental Services (NH DES)

Distribution of Filter Pitchers to Vulnerable Populations:

DES, in cooperation with DHHS and the state's network of Women, Infant, and Children (WIC) clinics, has hired a contractor with funding from the NH Drinking Water and Groundwater Trust fund to implement a project which will provide filter pitchers to an estimated 524 low-income pregnant women using private wells with elevated arsenic, and to provide follow-up support to program participants. The project is designed to (1)

establish a sustained practice among those families of using filter pitchers and replacing filter cartridges as needed, (2) generate valuable information regarding the effectiveness of this approach to reducing exposure to contaminated drinking water and (3) reinforce a public information initiative regarding the use of certain verified filter pitchers as an affordable means of treating drinking water from private wells, particularly for pregnant women. In addition, the project will seek to educate participants about the importance of continued well water testing. The DES-DHHS Project Advisory Committee has worked with the contractor to develop materials and protocols for the project. Roll-out was delayed due to the closure of WIC clinics to in-person services. The contract has been modified and additional funding provided to roll-out the project (begin enrolling participants) in September 2020 (two months later than initially planned) virtually through phone contact and mailing of water test kits to participants.

Statewide Private Well Sampling Initiative

The Statewide Private Well Sampling Initiative is a NHDES project funded by the New Hampshire Drinking Water & Groundwater Trust Fund to provide homeowners with information about the quality of their drinking water, and when necessary, steps that can be taken to improve water quality. The project involves sampling of nearly 500 randomly selected private drinking water wells and analysis of those samples for over 250 chemicals. It is the first statewide assessment of bacteria, nitrate, lead, fluoride, manganese, arsenic, radionuclides, and salt to be conducted in the state. The battery of tests also includes several emerging contaminants, including perchlorate, 1,4-dioxane, PFAS, and pesticides and their breakdown products. Most of the sampling and analysis have been completed to date, but the COVID-19 pandemic has delayed collection of some remaining samples. More information is available about the study at the following link:
https://www4.des.state.nh.us/nh-dwg-trust/?page_id=998

NHDES and DHHS partnered to leverage the impact of this study by including nearly 100 homes that were also randomly selected to participate in DHHS's TrACE biomonitoring study (see above). This collaboration will provide information about the relationship between chemicals measured in drinking water and in the bodies of the study participants.

Recommendations

We look forward to continuing to engage in this work as we further refine our data sharing practices and find innovative ways to use data in order to drive decision making, while also recognizing the limitations of the data and resources available to support this work. In collaboration with the Commission, we will explore further opportunities to improve data sharing and analysis of environmental exposure and health outcome data.

References Used in this Report

NH DES OneStop Data Portal: <https://www.des.nh.gov/onestop/>
 NH Environmental Public Health Tracking Program: <https://www.nh.gov/epht/> NH Health WISDOM Data Portal: <https://wisdom.dhhs.nh.gov/wisdom/#main> BiomonitoringNH Program: <https://tinyurl.com/BiomonitoringNH>
 2019 NH TrACE Study: <https://tinyurl.com/2019TrACEStudy>

APPENDIX III:

Second Progress Report on Data Sharing Between NHDHHS and NHDES



STATE OF NEW HAIVIPSHIRE
DEPARTMENT OF HEALTH AND HUMAN SERVICES
DIVISION OF PUBLIC HEALTH SERVICES
BUREAU OF PUBLIC HEALTH PROTECTION

Lori A. Shabinette
Commissioner

Lisa M. Morris
Director

29 HAZEN DRIVE, CONCORD, NH 03301
603-271-4524 1-800-852-3345 Ext. 4524
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www.dhhs.nh.gov

March 1, 2020

Senator Thomas Sherman, Chair
Commission to Study Environmentally-triggered Chronic Illness
New Hampshire State House
Room 107
107 North Main Street
Concord, NH 03301

Re: ***Progress Report on Data Sharing between the New Hampshire Departments of Health and Human Services (DHHS) and Environmental Services (DES) (RSA 126-A:76, 111) Chapter 229:5***

Dear Senator Sherman:

As required by SB 85 (2019), an act reestablishing the commission to study Environmentally-triggered chronic illness, please find attached a second progress report for 2019-2020 that represents the joint work of DHHS and DES on data sharing practices and a summary of recent collaborative projects between the departments as required under paragraph I.

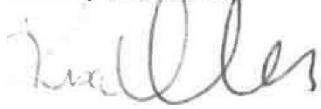
The following documents are enclosed:

- SB 85 DHHS/DES Progress Report (data sharing and collaborative projects)
March 1, 2020

Department staff are available to present the report to the Commission to Study Environmentally-triggered Chronic Illness during its next meeting scheduled for March 27, 2020. Please let us know if you have any questions.

Respectfully Submitted,

Respectfully Submitted,



Lisa Morris, Director
Department of Health and Human Services
Division of Public Health Services



Mike Wimsatt, Director
NH Dept. of Environmental Services
Waste Management Division

cc: Members of the Commission on Environmentally-triggered chronic illness
Representative Stephen Shurtleff, Speaker of the House of Representatives
Senator Donna Soucy, Senate President
Mr. Michael York, State Librarian

The Department of Health and Human Services' Mission is to join communities and families in providing opportunities for citizens to achieve health and independence.

2nd Progress Report for SB85

Submitted by:

New Hampshire Department of Health and Human Services
Division of Public Health Services

New Hampshire Department of Environmental Services

March 2020

Introduction

This is the second report related to Senate Bill (SB) 85 (2019), which directs the New Hampshire (NH) Department of Environmental Services (DES) and the Department of Health and Human Services (DHHS) to improve coordination and collaboration as it relates to environmental health, with a specific focus on data sharing.

This Report includes a summary of background information, an update on data sharing practices between the two agencies, a review of current collaborations, and recommendations for future work.

Background

Senate Bill (SB) 85 (2019), re-established a legislative commission to study environmentally-triggered chronic illness. The objectives of SB85 build on previous work related to House Bill (HB) 511 (2017) and HB 1356 (2018). The work of this Commission is focused on conducting environmental health surveillance and

improving coordination and collaboration between DES and DHHS in order to allocate resources efficiently to reduce exposure to environmental contaminants and prevent disease.

The SB 85 Statement of Intent reads as follows: "The general court recognizes that nearly half of adults in the United States have at least one chronic health condition and chronic diseases are responsible for increased health care costs. Seventy percent of health care costs in the United States are for chronic diseases. Some chronic diseases are known or thought to be associated with environmental causes. According to the Centers for Disease Control, the state of New Hampshire has the highest rates of people with bladder, breast, esophageal, and pediatric cancer in the country. In addition, a double pediatric cancer cluster was identified in the seacoast of New Hampshire in 2014. Therefore, the general court hereby establishes the commission to study environmentally-triggered chronic illness."

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Specifically, the departments were tasked to:

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- Hold a presentation on the departments' ongoing, joint efforts under the Centers for Disease
- Control and Prevention environmental public health tracking cooperative agreement; and
- Compile a report describing and estimating the cost to perform a 2-way pilot project between the departments on arsenic in drinking water, where both health effects and environmental data exist.

Conceptual Diagram: Current Data Sharing Practices Across DHHS DPHS and DES

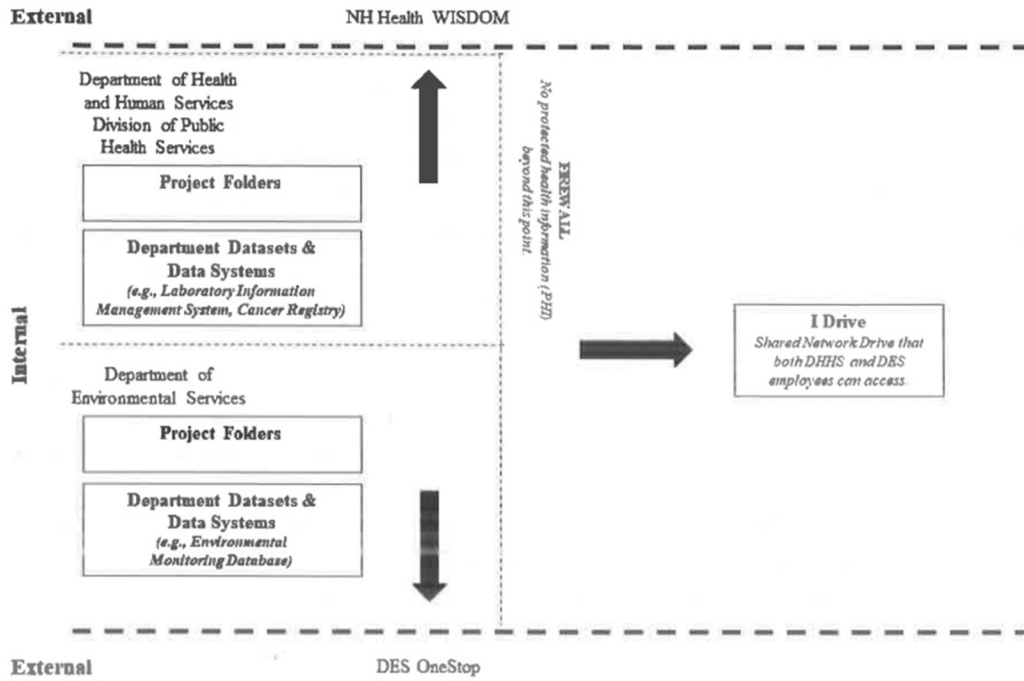


Figure 1.

2019 NH TrACE Study Analyte List

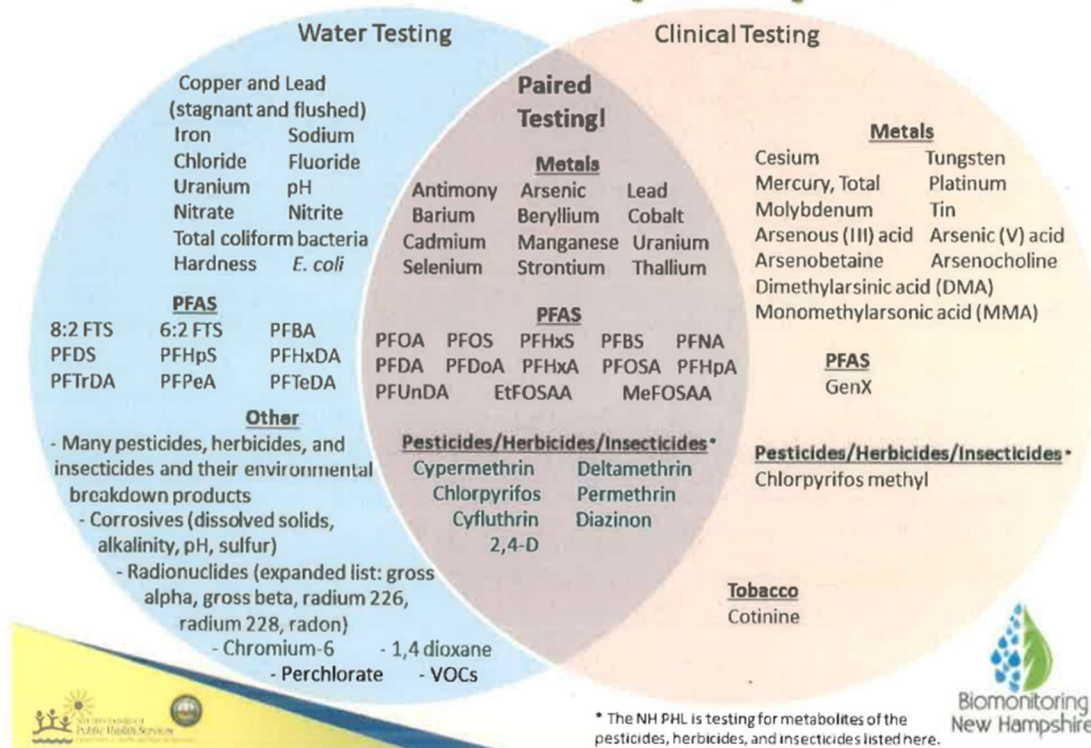


Figure 2.

Recommendations

We look forward to continuing to engage in this work as we further refine our data sharing practices and find innovative ways to use data in order to drive decision making, while also recognizing the limitations of the data and resources available to support this work. In collaboration with the Commission, we will explore further opportunities to improve data sharing and analysis of environmental exposure and health outcome data.

References Used in this Report

NH DES OneStop Data Portal: <https://www.des.nh.gov/onestop/>

NH Environmental Public Health Tracking Program: <https://www.nh.gov/epht/>

NH Health WISDOM Data Portal: <https://wisdom.dhhs.nh.gov/wisdom/#main>

BiomonitoringNH Program: <https://tinyurl.com/BiomonitoringNH>

2019 NH TrACE study: <https://tinyurl.com/2019TrACEStudy>

APPENDIX IV:

Minutes of SB85 Committee Meeting 1/24/2020

Minutes for SB 85 Commission

Attending: Robert Timmons, Margaret DiTulio, Rep Jeffrey Salloway, Rep Bill Nelson, Rep Gary Woods, Mindi Messmer, Amy Costello, Katie Bush, Mike Wimsatt

1) Call to Order at 10:15

2) Approval of minutes from 11/22/19

Motion to approve by Gary Woods, second by Mike Wimsatt, all in favor

3) Development of a paradigm for creating a final report: Rep Jeffrey Salloway

- a. Rep Salloway introduced himself as a retired professor from UNH; Chair of Health Management and Policy; as Rep, Committee of Health Human Services and Aging; training in social medicine, interested in environment health;
- b. Overview of his remarks:
 - i. What does the Commission know?
 - ii. How does the Commission know it?
 - iii. What does the Commission not know?
 - iv. What does the Commission have to do to know what the Commission does not know?

Copy of remarks provided by Rep Salloway; notes from Commission meeting discussion in italics:

I. Introduction

- A. Developing a paradigm for an interim report.
 1. Not content oriented
 2. Process oriented
 - a. How do we craft an overview, a set of general principles which guides policy regarding environmental risk and chronic disease?

II. Overarching question

- A. Quoting Rumsfeld: What do we know? What do we not know?
 1. A useful paradigm for guiding action.
 2. Review with examples.

III. When we know what we know.

- A. If we have science-based findings on risk factors and we are confident of these findings, we can design programs and implement them to reduce

risk and thus prevent disease outcomes.

B. Example before this commission: Arsenic on ground water and bladder cancer.

1. We know that arsenic is present in NH groundwater and that organic arsenic is associated with elevated risk of bladder cancer.

C. Thus, given that we know what we know our programs for environmental risk

reduction must include

1. Surveys of wells to assess the presence of arsenic.
2. Recommendation for amelioration of arsenic in wells which are found to contain above-allowable levels of arsenic.
3. Public awareness campaigns to alert users of well-water to the and to recommend testing.
4. Systems for water testing which are
 - a. affordable
 - b. accessible
5. Systems may be offered by the state or private testers
 - a. This may require
 - i. State subsidy
 - ii. Legislation to guarantee that wells are tested

periodically

A. At the time of a home sale

B. Periodically

D. This is how we create a system when we know what we know.

1. We can do!
 - a. But that is expensive and intensive and we are not structured to do it. And we will annoy!
2. We can legislate to demand that others do it!
 - a. Mandate arsenic evaluation for every real estate transaction.
 - i. This is not hard to do, but it will annoy.
3. We can recommend that it be done, e.g. home inspections.
 - a. This is not always effective.

IV. A more recent example: Do we know what we know?

A. Perfluorides in water — PFOAs and PFOSs

B. Until recently, we knew that water throughout the state had traces of PFOAs and

PFOSs. That we knew.

C. What we did not know at the time was what the health outcomes were.

1. Dr. Ben Chan, state epidemiologist, testified before our Committee on Health, Human Services and Aging, that we ought not to act on

PFOAs

and PFOSs for several reasons:

- a. This would be a costly endeavor
- b. We did not know what the health outcomes were or were not
- c. We knew that we did not know

D. That seems to have changed.

1. Over the summer I was privileged to observe two scientific papers

- a. International conference at Northeastern University
- b. Paper presentation at Georgetown University
- 2. These papers relied on a meta-analysis of multiple studies and were able to document the health outcomes of exposure to PFOAs and PFOSs.
- 3. These ground-breaking papers moved us from ‘what we know that we don’t know’ toward ‘what we know that we now know’. These papers were written by Mindi Messmer!
- E. If we now return to our arsenic experience, we must consider whether we must create programs for environmental risk reduction to include:
 - 1. Surveys of wells to assess the presence of PFOAs and PFOSs.

Senator Sherman asked if the paradigm shifts if the environmental risk is created by polluters. Arsenic is natural to the granite state; but PFAS was introduced by companies.

- 2. Recommendation for amelioration of chemical in wells which are found to contain above-allowable levels.
- 3. Public awareness campaigns to alert users of well-water and to recommend testing.
- 4. Systems for water testing which are
 - a. affordable
 - b. accessible
- 5. Systems may be offered by the state or private testers
 - a. This may require
 - i. State subsidy
 - ii. Legislation to guarantee that wells are tested periodically
 - A. At the time of a home sale
 - B. Periodically

Mindi Messmer reminded the commission that legislation around mandatory testing has been tried and defeated. Mindi Messmer highlighted the example of property owners in Greenland that did not know about super fund site.

- F. We create a system when we know what we know.
- G. If we now know what we did not know, what is our responsibility in places such as Merrimack?

V. We must now consider how we must act when we know that we don’t know.

- A. If there is a potential risk factor, but we don’t know the health outcomes, what shall we do? “I know what I don’t know”
- Lots of examples:
 - a. Legalizing marijuana, vaping
 - a. Microwave radiation
 - i. From cell phone use, from towers

- ii. Swimming in a sea of microwave radiation
- b. Fluoridation of water
- c. Glyphosphates
- d. Agricultural pesticides
- e. Prescription drugs (e.g. thalidomide)
- f. Effect of immunization using mercury-based preservatives

Senator Sherman commented that the immunization research was bad research. The researcher has lost his license. The research resulted in deaths of children that cannot be vaccinated. We are the only states in the nation that does not have an immunization registry which is a critical tool in the event of an outbreak.

Comment from Jonathan Alli: Emerging evidence that PFAS may be associated with antibody responses which may affect efficacy of immunizations (ongoing study with silent spring)

- B. The fact is that new technologies — even old ones — may have health outcomes which we do not know.
 - 1. Some may suspect — but we do not know.
 - 2. A troubling example: Biliary carcinomas in Exeter [Dr. Sherman]
 - a. Shall we act and if so, how?
 - b. Examine data? Conduct research?
 - c. Our DHHS is not funded nor resourced to do research.

Senator Sherman shared his experience from a meeting of staff at Exeter Hospital and oncologists from Boston... their comment was that it is striking how much cholangiocarcinoma and pancreatic cancer are seen in Exeter.

But when Dr Sherman asked DHHS to do the analysis of cancer cases... there was not a statistically significant difference between this area and the state rate. Mindi Messmer asked if the local rate was compared to national or other regional rates.

Dr Bush shared the DHHS cancer protocol which indicates that local cancer rates are compared to regional rates, state age-adjusted rates, and national age-adjusted rates.

This type of investigation could be done by State; Tom Sherman has included resources in previous pieces of legislation. Those bills died, but there is legislation for a State Health Improvement Plan.

Surveillance of list of conditions of NIEHS currently

- C. What is our responsibility and what is our plan of action?
 - 1. Persistent review of scientific literature.
 - 2. Having information readily available for the public — i.e, we don't know.
 - 3. Creating a watch-list. Journal scans. Is this enough?
 - 4. Continuous presence at CDC, including cost of travel.

VI. Then there are the things we don't know we don't know.

- A. Why don't we know?
 - 1. Sometimes there are actors who don't want us to know.
 - a. Bottled water?
 - 2. Sometimes things are unknowable.
 - a. Very difficult to assess time duration of exposures, quantity of exposure, outcomes, when outcomes can be quite diverse, e.g. neoplastic disease.
- B. Can we create and maintain oversight for every possible exposure?

VII. What shall we recommend?

- A. Intervention when we know what we know.
- B. Surveillance when we know that we don't know.
 - Surveillance is looking at our own data and surveying for hot spots
- C. Vigilance when don't know what we don't know.
 - Vigilance includes reviewing literature and learning at professional conferences

Mindi Messmer asked if vigilance includes precautionary principle. Rep Salloway defined precautionary protections as... before we have all of the data, when we have enough data to know that we know we should be protecting.

Rep Nelsen asked about how often houses are bought/sold with appropriate testing of wells; Rep Salloway suggested that this would be great research project.

Mike Wimsatt provided an update that the drinking water quality study is almost done. 540 wells distributed statewide... large panel of pesticides, manganese, etc. In tandem, DPHS testing urine and blood (TRACE study 200 households, 2/3 on private wells); many homes/wells can be matched survey results to well results. Senator Sherman requested that Mike Wimsatt bring those results to this Commission.

- D. Agility when our paradigm shifts from don't know to know.

4) Discussion of the future direction of the Commission: Senator Sherman

Senator Sherman suggested that the Commission review charge of the commission. Excerpt from the legislation below (notes about Commission meeting discussion in italics):

The commission's study shall include, but not be limited to:

- (1) Determining which entities may report confirmed cases of chronic conditions or other health-related impacts to the public health oversight program.

In SB 511 commission, we learned what data sources are available and what outcomes are of interest... is there a mechanism for entities to report. There are some conditions that are “reportable” but there could be recommendations to make additional conditions reportable.

Discussion around feasibility of “any” entity reporting confirmed cases of additional chronic conditions or other health-related impacts to DPHS. There are thousands of chronic conditions, which ones would be reportable.

Audacious goal: all conditions reported by all providers to DPHS in real time.

There is a list of reportable conditions.

EPHT tracks 12 measures. There could be more, and should DPHS add to this list, and this Commission could recommend resources.

APCD could be used in conjunction with Corrections and hospital data to detect

Many municipalities have local health officers for reporting other health findings. Some diseases are “reportable” and are required to be reported to DPHS.

DPHS Chronic Disease Surveillance program is the entity reporting about public health.

Senator Sherman suggested that Mindi, Katie and Amy will work on concept for Commission that ties together surveillance, vigilance... data sources, etc. This charge and the resulting concept paper are also related to #4, 5, 6, 7, 8, 9, 10, 11 and... there is material from SB 511 that relates to this.

- (2) Recommending ways to alert public health officials regarding higher than expected rates of chronic disease or other health-related impacts which may be related to exposures of unrecognized environmental contaminants.
- (3) Recommending a method to inform citizens regarding programs designed to manage chronic disease or other environmental exposure health-related impacts.
- (4) Recommending data sources and a method to include data compiled by a public or private entity to the greatest extent possible in the development of the public health oversight program.
- (5) Defining by codes, the health status indicators to be monitored, including chronic conditions, medical conditions, and poor health outcomes.

- (6) Studying current health databases, including years available, potential for small area analysis, and privacy concerns.
- (7) Researching currently existing health data reports by agency, bureau, or organization.
- (8) Creating a model of desired data outputs and reports for chronic conditions and other health-related impacts.
- (9) Identifying the gaps between what currently exists and the model output.
- (10) Recommending the organizational structure responsible for the oversight function and mandatory reporting requirements.
- (11) Reviewing results of stages 1, 2 and 3 of the pilot study recommended by the previous commission established by 2017, 166 and identifying changes to subparagraphs (8), and further identify items in (9) and (10).
- (12) Identifying technology system changes necessary to carry out the charge of the commission.
- (13) Collaborating with the National Institutes of Health, the United States Environmental Protection Agency, and the Centers for Disease Control and Prevention to develop protocols for the department of health and human services to educate and provide guidelines for physicians and other advanced health care practitioners to identify and evaluate appropriate diagnostic screening tests to assess health effects from exposure to emerging contaminants.
- (14) Collaborating with the National Institutes of Health, the United States Environmental Protection Agency, and the Centers for Disease Control and Prevention to develop protocols for programs to streamline education and outreach to health care providers about how to implement the guidelines specified in subparagraph. The protocols shall

include education relative to methods to reduce further exposures and to eliminate the contaminants, if effective methods are available.

(15) Recommending legislation, as necessary, to carry out the charge of the commission.

(a) The commission shall solicit information from any person or entity the commission deems relevant to its study.

(b) The commission may, with input from a state agency or agencies, decide whether additional appropriations are necessary to complete the work of the commission. The commission may recommend additional appropriations for approval by the general court.

5) Next meeting: March 27 at 10am NH DES Room A

6) Adjourned at 12:02.

APPENDIX V:

Minutes of SB85 Committee Meeting 11/22/2019

SB85 Environmentally-Triggered Disease Commission Meeting – 11/22/19

Sen. Tom Sherman Called to order at 10:03AM

Attendees: Margaret DiTulio, Bill Nelson, Tom Sherman, Kathleen Bush, Robert Timmons, Gary Woods, Amy Costello

Moved to approve minutes from last meeting by Margaret DiTulio

Second Nancy Murphy

All in favor, no opposed

Sen. Sherman - Apology to Jeff Salloway - should have been today move discussion on radon to March -

Rep. Salloway to present in January

After his presentation we discuss where Commission to go

MOU update from DES and DHHS

Recalibrate and think about where we are going next year

January meeting - Salloway, Costello, and discussion of where we are going

Notes taking for today is Mindi Messmer

T. Sherman wants to move the notes taking around responsibility.

Presentations

Whitney Hammond - NH Health Lives

Chronic disease and prevention screening

Appreciates the opportunity to share what is done at the Health Dept

Chronic disease Epidemiology techniques

Key strategies

Section Structure and Funding

In 2014 4 FTEs on team

Now 20 FTEs and 3 chronic disease epis

About 6M per year in funding

\$3M for cancer largest chunk of funding

lots of grants funnel together

9% from State General funds and rest from Federal grants

Focus on primary prevention -healthy nutrition, not smoking

Secondary Prevention - onset of symptoms by catching it at earliest stage

e.g. breast cancer screening - free screening for people who can't afford it;

Tertiary prevention-

diagnosis - minimize negative effects, i.e. diabetes - self management education

- 1- measurement of people with chronic disease - using data, measure risk factors.
- 2- improve environmental factors - improving social determinants of health, water bottle filling stations, in school filters do not filter for everything - monitoring and upkeep and provide replacement filters - will provide us with info on what the filters address.
- 3- health systems to make changes really targeting - federal systems QIP increase use of preventative services, eg. look at who is getting breast cancer screenings - popup reminders to improve service delivery.
- 4- work at connections between clinical and community based to prevent chronic disease, fund consultants to go to school to look at school health to promote health give funding to implement things into curriculum.

Chronic Disease Epidemiology

BRFSS - phone based survey - health dept conducts, personal questions answered for 20 mins

cell and land lines - adults 18+ risk factors and health outcomes, i.e. smoking, BMI, screened for cancer

Youth Risk Behavioral Survey - use of indoor tanning beds – banned, how many sugar beverages daily

Cancer registry - merge death rates
incidence of breast cancer and stage

Hospital discharge data - e.g. asthma, ED visits

All payer claims data - commercial Medicare and Medicaid data, cost of false positives for breast cancer screening, prevalence and incidence of disease

700 pharmacists - see if they are using cooperative agreements

Importance to look at multiple indicators not a single one to make sure you are not misinformed

e.g. Hypertension rates - really high compared to rest of the state
enable someone to monitor BP at home - could be well controlled and then it wouldn't make sense to do self-monitoring. Ground truth in community to see what the data may be showing.

For example, Age-adjusted rates of breast cancer is higher than Coos County. Without looking at risk factors you can't compare county rates.

SIR - accounts for gender and age rates

Chronic disease epidemiology has made a lot of progress in recent years but there's more to go that we need to develop to make disease-based prevention decisions.

Amy Costello - question - this commission is grappling with the small numbers issue
SIR - 1.5 would the department react?

Tom Sherman - pancreatic cancer - compare to a control group - data from NH as a control - have to make a decision on reference population. Usually use the rest of the state as the comparison population. Best that we have for looking for a signal.

Dartmouth - bought residential history data - now looking at whether that database is helpful in determining chronic disease.

DHHS doesn't have access to EMRs. They have to gain funding.

Link databases - Senate Bill - to connect the dots to bridge the databases

MA - all payers claims database - their laws are different to be able to use the database to connect - opioid death surveillance.

Whitney – to provide Commission with a summary of what needs to be done structurally to provide information.

EMR privacy data - history of it to provide to the commission

Mike Wimsatt - remarking on how much information in a survey would be helpful to determine and identify risk factors.

Beverly Drouin - Health Homes and Environment oversee the lead, climate resilience, health officer liaison, and radon

Gail Coppins - health advisor healthy children

Only 24% of children under 12 are tested annually yet we have 3,402 kids with lead levels >5 ug/dL.

62% of NH Housing residential lead paint, leaded gasoline

In NH most of exposure is lead paint dust

High risk pre-1978 homes

Claremont 84% with housing stock >1978

test the tap water for lead in the homes when there is a child with a blood level of 7.5.

BLL 3-7.4 they are educated on ways to prevent exposure. Living spaces are lead testing by inspectors, never attributed to high lead in drinking water. Lead in unit - then landlord is required to address the lead hazard. Lead dust on floor that is similar to the amount of sugar that sticks to your finger. Lead was used as a sweetener in wine for centuries!

Children under 6 years of age do not have a blood brain barrier so it is more neurotoxic in adults in impacts heavy metal only trace amounts in children - lead is stealth under the radar don't see the impact until the children are older. 1,2,3 YO at high level exposures you can't tell. ESL, ADHD, lead outcomes show up later in life. Heavy metal dust sits on surfaces where children play and crawl. Lead acts like calcium in the child's brain - gums up the neurotransmitter synapses. Lead kills synapses body sees it like calcium.

Cincinnati lead study - Dr. Kim Cecil - prenatal and early childhood longitudinal study of lead positing of children.

University of Cincinnati - video
show video link:

www.pbs.pbslearningmedia.org/resource/nvpw-sci-leadexposure/wgbh-nova-poinoned-water-the-health-impacts-of-lead-exposure/#.WUrNsNKGPb0

Economic impacts to the system from lead exposure. 41% of the children in Rochester NY were high lead BLL, 100% of them were in special education programs

Most of the lead in NH is from lead paint - friction surfaces, 1/3 of them report renovations in the last 6 months contact hazard with lead paint removal. EPA lead paint removal procedures.

Update on SB247- only 51% of age 2 are tested as of 2018

T. Sherman - individual homeowners are not subject to lead hazard removal landlords are subject to the rules.

Amy Costello - rate is going down but we still have prevalence.

Testing was venous before and the new testing finger sticking will provide better testing rates - in office testing

T. Sherman - provide wish list - for improved lead testing -when schools have the compliance rate for testing goes up.

Next meeting Friday January 24 at 10 to 12pm
Take off February?
March 27.

Amy and Jeff and ideas and legislative tracker -issues on environmental issues
Data on school and housing stock age in NH? Schools? - old pipes, old homes

Pediatrician training?

APPENDIX VI:

Minutes of SB85 Committee Meeting 10/23/2019

**Meeting Minutes
Environmentally Triggered Disease Commission
October 23, 2019**

Senator Tom Sherman called meeting to order at approximately 10AM

First order of business – quorum of more than 7 present

Minutes of previous meeting – J. Salloway moves to approve, second M.Messmer – unanimous in favor

Clerk – no one offered so M. Messmer volunteered for temporary clerk. G. Woods nominates,

Sen. Sherman – seconded. Unanimous vote for Mindi Messmer for clerk

Present:

Sen. Tom Sherman

Rep Charles McMahan

Rep Gary Woods

Katheleen Bush, PhD

Mike Wimsatt, NHDES

Rep. Jeff Salloway, PhD

Amy Costello, UNH

M. Messmer

Rep. Nancy Murphy

Commission to hear presentations on radon exposure in NH. Sen. Sherman was asked to create a commission in a meeting in his office. Preferred this Commission possibly will look at radon exposure.

Presentations by:

Owen David - Radon Specialist, Health Homes Radon Program

Lance Bouscher - American Lung Association

Owen David first presenter.

The radon work has been dormant in NH since 2011.

- will send us the slides DHHS

Radon - water and air in your home is radioactively unstable and naturally occurring

1.4 pico curies/L average inside your home

No odor, no taste no color

Tied to lung cancer - inhalation

- breakdown w/polonium on dust particles

- stomach cancer - ingestion

other cancers being studied

known issue for quite sometime

Two testing procedures, short term and long term - 48 hours and 90 days
 Measures gamma radiation - decay products of gamma radiation- radon emits alpha particle that is the DNA disruptor that causes cancer - inhaled in lungs - real risk to health.
 EPA 4pCi/L -is action limit - based on technology limitation.
 Remediate in homes by sub slab depressurization

Construction changes - radon resistant new construction
 policy changes - new building code
 10,000 :1 transfer water to air
 private wells issue – not fully understood or known the depth of the problem.

Messmer asked Mike Wimsatt- How many public water systems are above 2,000 Pi/L? M. Wimsatt will provide answers to the commission.

Jeff Salloway - RR of exposure – M. Messmer provided answers- 4Pi/L - RR exposure above 4 from USEPA (2003), based on an assumed average equilibrium fraction of 40% between radon and its decay products and an indoor occupancy of 70%, the estimated risks from lifetime exposure at the 4 pCi/L action level are: 2.3% (all), 4.1% (ES), and 0.73% (NS).

NJ every radon test give state \$10 so state can take data
 NJ has strictest laws on construction and school testing

Radon in schools
 19 NH schools were tested
 Amy Costello - number of schools that declined testing? Owen said didn't find too many perhaps policy focus on school testing and mitigation?

Average was above 4 PiC/L- Owen went to science classes to educate children as education opportunity

Year of construction - Amy Clark and Marjorie Shumaker at NHDHHS – newer schools with HVAC systems not as much a problem.

SEAU 48 short term test kits

Children - work higher rate of inspiration and closer to the ground – focus on health impact on children may be important.
 10-20 year latency for lung cancer

Cancer registry - occupation and residential risk
 Bill Field Iowa professor - radon risk
 As smoking rates go down - will expect higher rates of lung cancer from other environmental triggers

Lance - Lung Association
 10% of deaths directly radon-related

Charles McMahon- disclosure about the issue in NH

Is this the right commission to address this a: yes – consensus of commission

McMahon -Title 5 for septic in MA
Fire fighters - in MA CO and fire and egress
What is critical answer on what is needed?

Sen Sherman - January meeting will be dedicated to radon issue in radon awareness month. Owen and Lance will bring back - policy and legislative proposals for us to address the issue.

Construction codes on homes and schools?
Schools testing program and possible policy changes?

Lance Boucher - 207-624-0325 lance.boucher@lung.org
Owen David - Radon Program - 603-271-4052 owen.david@dhhs.ng.gov

Katie Bush-
Community Health Tracking program
Community Health outlooks

Nick Shonka - new EPHTS NHDHHS scientist
Lead there has been an increase in testing kids under 2 upward trajectory - discuss at next meeting?

Amy Costello Comment that EHPTS work is amazing. Have come so far in 2 years since this Commission started. Supported by M. Messmer.

Next meeting -
November 22, 2019-
1-Salloway - full page of thoughts,
2- Discussion on charge and brain storming
3- Cancer discussion from NHDHHS

M. Messmer suggested future meetings presentation from Amy Costello on UNH work on costs with conditions. On NIEHS summary outcomes.

Meeting adjourned at 12:02 PM.

APPENDIX VII:

Minutes of SB85 Organizational Committee Meeting 9/17/2019

SB 85, Chapter 229:2, Laws of 2019

AN ACT reestablishing the commission to study environmentally-triggered chronic illness.

Organizational Meeting Report

TO: Members of the Commission

FROM: Senator Jeb Bradley

RE: **Organizational Meeting Minutes**

MEETING DATE: September 9th, 2019 10:00 a.m. SH RM 103

Members of the Commission Present: Sen. Sherman, Rep. Nancy Murphy, Rep. McMahon, Rep. Nelson, Rep. Woods, Former Rep. Mindi Messmer, Robert Timmons NHHA, Margaret DiTulio NH Nurse Practitioners Association, Michael Wimsatt NH DES

- Senator Sherman was elected to Chair the Commission
- Former representative Messmer reviewed past findings of the previous commission. (SB 85 reauthorized this commission).
- Mindi Messmer also summarized various pieces of legislation related to environmentally triggered chronic illness. These pieces of legislation included HB-1582, SB-247, SB-309 and HB-661.
- There was a general discussion about the health impact of environmentally triggered illnesses and the cost of responding to the threats
- Kathleen Bush of DHHS summarized the September 10th report on environmentally triggered illness.
- The meeting adjourned with next session on October 23.

APPENDIX VIII:

SUMMARY OF WORK PRIOR TO ORGANIZATIONAL MEETING FOR SB 85

THE COMMISSION TO STUDY ENVIROMENTALLY- TRIGGERED CHRONIC ILLNESS

SB 85, CHAPTER 229:2, Laws of 2019

Sen. Tom Sherman
Tom.Sherman@leg.state.nh.us

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<http://www.gencourt.state.nh.us/statstudcomm/committees/1348/reports.html>

Report on Data Sharing between the New Hampshire Departments of Health and Human
Services (DHHS) and Environmental Services (DES) (RSA 126-A:76, III) Chapter 229:5, Laws of
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**AN ACT reestablishing the commission to study environmentally-triggered chronic illness.
SB 85, Chapter 229:2, Laws of 2019**

ORGANIZATIONAL MEETING

AGENDA

September 17, 2019

1:00 p.m.

State House 103

-
1. Welcome and introductions of Commission members
– **Senator Sherman**
 2. Elect a Chairperson
 3. Elect a Clerk to prepare minutes
 4. Review statutory mission of commission
 5. Review of what was done in the last commission
 6. Joint DPHS DES report
 7. Goals of the commission
 8. Next steps
 - a. Agenda for next meeting
 - b. Date for next meeting
 9. Adjournment

CHAPTER 229
SB 85 - FINAL VERSION

03/27/2019 1204s
5Jun2019... 2035h

2019 SESSION

19-0426
01/10

SENATE BILL 85

AN ACT reestablishing the commission to study environmentally-triggered chronic illness.

SPONSORS: Sen. Sherman, Dist 24; Sen. Fuller Clark, Dist 21; Rep. Murphy, Hills. 21; Rep. Salloway, Straf. 5

COMMITTEE: Health and Human Services

ANALYSIS

This bill reestablishes the commission to study environmentally-triggered chronic illness.

Explanation: Matter added to current law appears in bold italics.
Matter removed from current law appears ~~[in brackets and struckthrough.]~~
Matter which is either (a) all new or (b) repealed and reenacted appears in regular type.
03/27/2019 1204s
5Jun2019... 2035h 19-0426
01/10

STATE OF NEW HAMPSHIRE

In the Year of Our Lord Two Thousand Nineteen

AN ACT reestablishing the commission to study environmentally-triggered chronic illness.

Be it Enacted by the Senate and House of Representatives in General Court convened:

229:1 Statement of Intent. The general court recognizes that nearly half of adults in the United States have at least one chronic health condition and chronic diseases are responsible for increased health care costs. Seventy percent of health care costs in the United States are for chronic diseases. Some chronic diseases are known or thought to be associated with environmental causes. According to the Centers for Disease Control, the state of New Hampshire has the highest rates of people with bladder, breast, esophageal, and pediatric cancer in the country. In addition, a double pediatric cancer cluster was identified in the seacoast of New Hampshire in 2014. Therefore, the general court hereby establishes the commission to study environmentally-triggered chronic illness.

229:2 New Section; Commission to Study Environmentally-Triggered Chronic Illness Reestablished. Amend RSA 126-A by inserting after section 73 the following new section:

126-A:73-a Commission to Study Environmentally-Triggered Chronic Illness Reestablished.

I. There is established a commission to study environmentally-triggered chronic illness.

II.(a) The members of the commission shall be as follows:

- (1) Five members of the house of representatives, 3 of whom shall be appointed by the speaker of the house of representatives and 2 of whom shall be appointed by the house minority leader.
- (2) Two members of the senate, one of whom shall be a member of the minority party, appointed by the president of the senate.
- (3) The program manager of the environmental public health tracking program, department of health and human services, or designee.
- (4) The commissioner of the department of environmental services, or designee.
- (5) The director of the university of New Hampshire institute for health policy and practice, or designee.
- (6) The director of Boston University public health policy and practice, or designee.
- (7) A representative from the New Hampshire Medical Society, appointed by the society.
- (8) The chair of the board of trustees of the New Hampshire Hospital Association, or designee.
- (9) An advanced practice registered nurse, appointed by the New Hampshire Nurse Practitioner Association.
- (10) Two community members with backgrounds in environmental science and/ or public health, one of whom shall be appointed by the president of the senate and one of whom shall be appointed by the speaker of the house of representatives.

(b) Legislative members of the commission shall receive mileage at the legislative rate when attending to the duties of the commission.

III.(a) The commission's study shall include, but not be limited to:

- (1) Determining which entities may report confirmed cases of chronic conditions or other health-related impacts to the public health oversight program.
- (2) Recommending ways to alert public health officials regarding higher than expected rates of chronic disease or other health-related impacts which may be related to exposures of unrecognized environmental contaminants.
- (3) Recommending a method to inform citizens regarding programs designed to manage chronic disease or other environmental exposure health-related impacts.
- (4) Recommending data sources and a method to include data compiled by a public or private entity to the greatest extent possible in the development of the public health oversight program.
- (5) Defining by codes, the health status indicators to be monitored, including chronic conditions, medical conditions, and poor health outcomes.
- (6) Studying current health databases, including years available, potential for small area analysis, and privacy concerns.
- (7) Researching currently existing health data reports by agency, bureau, or organization.
- (8) Creating a model of desired data outputs and reports for chronic conditions and other health-related impacts.
- (9) Identifying the gaps between what currently exists and the model output.
- (10) Recommending the organizational structure responsible for the oversight function and mandatory reporting requirements.
- (11) Reviewing results of stages 1, 2 and 3 of the pilot study recommended by the previous commission established by 2017, 166 and identifying changes to subparagraphs (8), and further identify items in (9) and (10).
- (12) Identifying technology system changes necessary to carry out the charge of the commission.

(13) Collaborating with the National Institutes of Health, the United States Environmental Protection Agency, and the Centers for Disease Control and Prevention to develop protocols for the department of health and human services to educate and provide guidelines for physicians and other advanced health care practitioners to identify and evaluate appropriate diagnostic screening tests to assess health effects from exposure to emerging contaminants.

(14) Collaborating with the National Institutes of Health, the United States Environmental Protection Agency, and the Centers for Disease Control and Prevention to develop protocols for programs to streamline education and outreach to health care providers about how to implement the guidelines specified in subparagraph (13). The protocols shall include education relative to methods to reduce further exposures and to eliminate the contaminants, if effective methods are available.

(15) Recommending legislation, as necessary, to carry out the charge of the commission.

(b) The commission shall solicit information from any person or entity the commission deems relevant to its study.

(c) The commission may, with input from a state agency or agencies, decide whether additional appropriations are necessary to complete the work of the commission. The commission may recommend additional appropriations for approval by the general court.

IV. The members of the commission shall elect a chairperson from among the members. The first meeting of the commission shall be called by the first-named house member. The first meeting of the commission shall be held within 45 days of the effective date of this section. Seven members of the commission shall constitute a quorum.

V. The commission may form subcommittees or appoint technical committees composed of commission members and non-voting nonmembers to advance the goals of this section.

VI. The commission shall submit interim reports on November 1 of each year beginning November 1, 2020 containing its findings and any recommendations for proposed legislation and a final report on or before November 1, 2024 to the speaker of the house of representatives, the president of the senate, the house clerk, the senate clerk, the governor, and the state library.

229:3 Membership of Commission to Study Environmentally-Triggered Chronic Illness. To the extent possible, the initial membership of the commission to study environmentally-triggered chronic illness reestablished in section 2 of this act shall remain the same as the commission established in former RSA 126-A:73.

229:4 Data Sharing Between the Department of Environmental Services and the Department of Health and Human Services; Reference Deletion. Amend RSA 126-A:76, I(d) to read as follows:

(d) Make a presentation to the commission to study environmentally-triggered chronic illness~~[-established in RSA 126-A:73,]~~ regarding the departments' use of the standard operating procedure developed under subparagraph (b) to compare data, analyze community impacts, and communicate the results to the community.

229:5 Data Sharing Between the Department of Environmental Services and the Department of Health and Human Services; Reference Deletion. Amend RSA 126-A:76, III to read as follows:

III. On or before September 1, ~~[2018]~~ **2019, and at a minimum every 6 months thereafter**, the commissioners of the department of environmental services and the department of health and human services shall submit a report regarding the data sharing practices required under paragraph I to the speaker of the house of representatives, the senate president, the state library, and the commission to study environmentally-triggered chronic illness~~[-established in RSA 126-A:73,]~~. The report shall include ~~[a description and estimate of the cost to perform a]~~ **results of the 2-way pilot project** between the departments on arsenic in drinking water, where both health effects and environmental data exist.

229:6 Repeal. RSA 126-A:73-a, relative to the commission to study environmentally-triggered chronic illness, is repealed.

229:7 Contingency. If SB 85 and HB 736 of the 2019 regular legislative session both become law, HB 736 shall not take effect.

229:8 Effective Date.

I. Section 6 of this act shall take effect November 1, 2024.

II. The remainder of this act shall take effect upon its passage.

Approved: July 12, 2019

Effective Date:

I. Section 6 shall take effect November 1, 2024.

II. Remainder shall take effect July 12, 2019.

The Final Report of the Commission to Study Environmentally-Triggered Chronic Illness RSA 126-A:73 (HB 511, Chapter 166:2, Laws of 2017) can be accessed via the archived commission's website at:

<http://www.gencourt.state.nh.us/statstudcomm/committees/1348/reports.html>

Subsequent documents pertaining to the commission's work can also be accessed on the website. The following pages from the range of pg.7—pg.89 constitute the contents of their final report.



State of New Hampshire

GENERAL COURT

CONCORD

MEMORANDUM

DATE: November 1, 2018

TO: Honorable Chris Sununu, Governor
Honorable Gene Chandler, Speaker of the House
Honorable Chuck W. Morse, President of the Senate
Honorable Paul C. Smith, House Clerk
Honorable Tammy L. Wright, Senate Clerk
Michael York, State Librarian

FROM: Representative Mark Pearson, Chairman

SUBJECT: Final Report of the Commission to Study Environmentally-Triggered Chronic Illness
RSA 126-A:73 (HB 511, Chapter 166:2, Laws of 2017)

Pursuant to RSA 126-A:73 (HB 511, Chapter 166:2, Laws of 2017), enclosed please find the Final Report of the Commission to Study Environmentally-Triggered Chronic Illness.

If you have any questions or comments regarding this report, please do not hesitate to contact me.

I would like to thank those members of the commission who were instrumental in this study. I would also like to acknowledge all those who testified before the commission and assisted the commission in our study.

Enclosures

cc: Members of the Commission

FINAL REPORT

Commission Study Environmentally-Triggered Chronic Illness RSA 126-A:73 (HB 511, Chapter 166:2, Laws of 2017) November 1, 2018

Commission Membership:

House Member appointed by the Speaker House	Mark Pearson
Member appointed by the Speaker House	Bill Ohm
Member appointed by the Speaker House	Joseph Guthrie
Member appointed by the Minority Leader House	Mindi Messmer
Member appointed by the Minority Leader	Jeffrey Salloway
Senate Member appointed by the Senate	Martha Fuller
President Senate Member appointed by the	Clark Daniel
Senate President NH Department of Health and	Innis Lisa Morris
Human Services UNH Institute for Health Policy	Amy Costello
and Practice NH Medical Society	Thomas Sherman
NH Hospital Association	Thomas Wold
NH Nurse Practitioner Association	Julie Bosak

Process and Procedures:

The committee organized on Thursday, September 6th and elected Representative Mark Pearson as Chair. The Chair appointed Representative Jeffrey Salloway as commission clerk.

The committee met thirteen times throughout the study period, and issued an interim report on November 1, 2017. The minutes and interim report are attached. Minutes, documents reviewed by the commission, the interim report and this final report are also available on the Commission's webpage at: <http://www.gencourt.state.nh.us/statstudcomm/details.aspx?id=1348&rbl=1&txtkeyword=chronic>

Documents Reviewed:

- DHHS Public Health Laboratories handout
- NH DPHS Biomonitoring Program handout
- NH State Cancer Registry handout
- Stensgaard, Anna-Sofie, et al., "Virtual globes and geospatial health: the potential of new tools in the management and control of vector-borne diseases," *Geospatial Health* 3 (2), pp 127-147.
- Health Transformation in New Hampshire: April 2016 Powerpoint
- Memorandum of Agreement between DHHS and DES re: Cooperation in the area of Environmental Public Health Tracking (July 1, 2017 – June 30, 2022)
- Empowering the Granite State: State Health System Innovation Plan Model Design Proposal, January 2016
- DPHS Data Release Guidelines, July 16, 2016
- Kaffenberger, Benjamin H., et al., "The effect of climate change on skin disease in North America," *Journal of American Academic Dermatology* vol. 76 (1), 2016, pp 140-147.
- NH Health WISDOM powerpoint, October 20, 2017, Dr. Kathleen Bush
- C8 Settlement science panel PFOA probable health link report summary
- Lead Poisoning Prevention, Executive Summary, DPHS
- Health Effects of PFAS, ATSDR
- PFAS Clinician Fact Sheet

- Woodward, Robert S., et al., “Optimum Investments in Project Evaluations: When Are Cost Effectiveness Analyses Cost-Effective,” *The Journal of Medical Systems* vol. 20 (6), 1996, pp 385-393.
- NTP Monograph on Health Effects of Low-Level Lead, Executive Summary, table 1.1 and 1.2
- Washington County, WI Community Profile
- New Bedford, MA Community Profile
- Brooklyn District 14, NY Community Profile
- NHDPHS: Female Breast Cancer Incidence Rates by State, 2014
- NH Health WISDOM: Bladder Cancer Incidence
- Elevated Bladder Cancer in Northern New England – Drinking Water and Arsenic: USGS
- Bruce Stanton, Ph.D., Dartmouth Toxic Metals Superfund Research Program, Testimony on HB 1592 (2018)
- Jamee Hood and Sonya Lunder, “Cancer-Causing Arsenic Contaminates Tap Water for 70 Million Americans,” EWG, September 20, 2017
- Proposed Metrics for Environmental Health Community Profiles: Dr. Kathleen Bush

Findings and Recommendations:

The Commission’s findings and recommendations are divided into the following sections:

- Health and Environmental Database Inventory (charges 1, 6, 7)
- Health Indicator Inventory (charge 5)
- Communications (charges 2, 3, 11, 12)
- Synthesis/Analysis (charges 4, 8, 9, 10)

Health and Environmental Database Inventory

Relevant Charges:

- (1) Determining which entities may report confirmed cases of chronic conditions or other health-related impacts to the public health oversight program.
- (6) Studying current health databases, including years available, potential for small area analysis, and privacy concerns.
- (7) Researching currently existing health data reports by agency, bureau, or organization.

After its investigation the commission found that the following data sources held promise as elements for potential future integration in a system of environmental/public health data surveillance. It should be noted, however, that each data set has its own unique limitations and presents only a partial picture.

The NH Comprehensive Health Data Information System (CHIS)

The Insurance Department requires that health insurance carriers and third party administrators (TPAs) operating in NH to submit their claims data to the Department. The data has been collected from 2005 to present, and is created when providers submit a claim for reimbursement from an insurance company.

Types of care reflected in claims include:

- Inpatient
- Outpatient
- Prescription
- Dental
- Mental Health Counseling
- Substance Abuse Counseling

NH Health WISDOM

NH Health WISDOM is an interactive system assembled by the Department of Health and Human Services, Division of Public Health Services, in order to aggregate public health data and produce customized analysis. Data in WISDOM is organized around The New Hampshire State Health Improvement Plan (NH SHIP) and the NH Environmental Public Health Tracking (EPHT) surveillance data on environmental hazards, exposures, and associated health effects. Users may access data using interactive dashboards. Data in WISDOM is compiled from the following sources:

- Behavioral Risk Factor Surveillance Survey 2005-2016
- NH Hospital Discharge Data (In-State) 2000-2009; 2012-2016
- NH Hospital Discharge Data (Out-of-State) 2000-2009; 2012-2016
- Birth Conditions 2003-2010
- Air Quality (PM 2.5 and Ozone) 1999-2014
- National Survey on Drug Use and Health (NSDUH) 2003-2015
- NH Population (Claritas) 2005-2017
- Occupational Health Data (years vary based on dataset)
- PFC blood test results 2015-2016 (varies based on location)
- NH State Cancer Registry 2000-2015 maintained through the Geisel School of Medicine at Dartmouth-Hitchcock Medical Center
- NH Vital Records (Birth/Death Certificates) 2000-2016
- Pediatric Nutrition Surveillance System (PedNSS) 2007-2013
- Third Grade Survey 2009, 2014
- Youth Risk Behavior Surveillance System 2007-2017

LIMS system, DHHS Division of Public Health, Public Health Laboratories

The LIMS system is the internal data system of DHHS's Public Health Laboratories, which is used to store data accumulated in the course of a miscellany of programs. The Public Health Laboratories have been involved in testing for water quality in conjunction with DES's MTBE investigations, arsenic and uranium in conjunction with DHHS's Biomonitoring Program, and DHHS's lead poisoning surveillance.

For details on the release of data held by DHHS to the general public and to public health researchers, consult the Division of Public Health Services

The Environmental Monitoring Database

The Department of Environmental Services Environmental Monitoring Database holds data collected through permitting, investigation and monitoring activities of the divisions of air resources, water resources and waste management. Data is collected through permitting activities and data monitoring required by state law, rules, and relevant federal statutes such as the Clean Air and Clean Water Acts.

The public facing portal to the Environmental Monitoring Database is the website OneStop, maintained by the Department.

Health Indicator Inventory

Relevant Charge:

- (5) Defining by codes, the health status indicators to be monitored, including chronic conditions, medical conditions, and poor health outcomes.

To conduct surveillance of standard chronic disease conditions, the Commission suggests using the chronic disease indicators (CDI) from the Centers for Disease Control and Prevention (CDC), the Council of State and Territorial Epidemiologists (CSTE), and the National Association of Chronic Disease Directors (NACDD). The CDI are a set of surveillance indicators developed by experts in the field for public health surveillance. For more information visit the CDC Chronic Disease Indicators website.

The Chronic Disease Indicators draw on several federal databases including, but not limited to: Behavioral Risk Factor Surveillance System (BRFSS), State Cancer Registries, the American Community Survey (ACS), National Vital Statistics System (NVSS), Youth Risk Behavior Surveillance System (YRBS), Pregnancy Risk Assessment Monitoring System (PRAMS), Alcohol Epidemiologic Data System, National Survey of Children’s Health, Centers for Medicare and Medicaid Services Chronic Condition Warehouse, National Immunization Survey, and others. This list of indicators may be refined in the future.

Summary of Chronic Disease Indicators by Indicator Group (2013)

Indicator Group	Total Number of Indicators	Individual measures
Alcohol	10	14
Arthritis	5	8
Asthma	6	12
Cancer	10	20
Cardiovascular Disease	11	18
Chronic Kidney Disease	3	4
Chronic Obstructive Pulmonary Disease	8	13
Diabetes	13	20
Disability	1	1
Immunization	1	1
Mental Health	3	3
Nutrition, Physical Activity, and Weight	22	38
Older adults	4	5
Oral health	5	9
Overarching Conditions	8	16
Reproductive Health	3	3
School Health	0	0
Tobacco	11	16
Total	124	201

To conduct surveillance of standard neurologic conditions, the Commission suggests using the following standard case definitions (adapted from St. Germaine-Smith et al., 2012 Recommendations for optimal ICD codes to study neurologic conditions. Neurology (79)).

As stated in the review article, “To ensure the accurate interpretation of population-based studies with use of administrative health data (i.e., hospital discharge data), the accuracy of case definitions for neurologic conditions needs to be taken into consideration.” Other conditions that may be of interest are difficult to

define due to too few validation studies. Examples of these rare conditions include cerebral palsy, Huntington disease, hydrocephalus, muscular dystrophy, spina bifida.

Summary of Neurologic Conditions Indicators by Category
(Adapted from St. Germaine-Smith et al., 2012)

Disease Outcome	Relevant ICD-9 or ICD-b0 Code
Epilepsy	ICD-9: 345; ICD-10: G40 – 41
Motor neuron disease	ICD-9: 335, 335.2; ICD-10 G12.2
Multiple sclerosis	ICD-9: 340; ICD-10: G35
Parkinson disease	ICD-9: 332; ICD-10: G20 (limited validation)

This list of indicators may be refined in the future.

Communication

Relevant Charges:

(3) Recommending a method to inform citizens regarding programs designed to manage chronic disease or other environmental exposure health-related impacts.

(11) Collaborating with the National Institutes of Health, the United States Environmental Protection Agency, and the Centers for Disease Control and Prevention to develop protocols for the department of health and human services to educate and provide guidelines for physicians and other advanced health care practitioners to identify and evaluate appropriate diagnostic screening tests to assess health effects from exposure to emerging contaminants.

(12) Collaborating with the National Institutes of Health, the United States Environmental Protection Agency, and the Centers for Disease Control and Prevention to develop protocols for programs to streamline education and outreach to health care providers about how to implement the guidelines specified in subparagraph (11). The protocols shall include education relative to methods to reduce further exposures and to eliminate the contaminants, if effective methods are available.

The commission gathered information relative to current practices, that the public concerns associated with those charges have been clearly communicated to the Departments, but that the further development of information and training protocols should be deferred until the synthesis of environmental and health data envisioned in the three stage process recommended by the commission takes place.

Synthesis/Analysis of Data

Relevant Charges:

(2) Recommending ways to alert public health officials regarding higher than expected rates of chronic disease or other health-related impacts which may be related to exposures of unrecognized environmental contaminants.

(4) Recommending data sources and a method to include data compiled by a public or private entity to the greatest extent possible in the development of the public health oversight program.

- (8) Creating a model of desired data outputs and reports for chronic conditions and other health-related impacts.
- (9) Identifying the gaps between what currently exists and the model output.
- (10) Recommending the organizational structure responsible for the oversight function and mandatory reporting requirements.

HB 1356 (2018), sponsored by the commission chair and co-sponsored by all the legislative members of the commission, was signed into law by Governor Sununu on June 25th, 2018. The bill required the Department of Environmental Services and the Department of Health and Human Services to develop and implement a method by which the departments share certain health outcome and environmental data. Specifically, the departments are tasked to:

- Update a memorandum of agreement on cooperation regarding data sharing
- Sign a joint standard operating procedure on how data layers can be shared between the 2 departments to identify linkages between environmental contaminants and health outcomes
- Hold a presentation on the departments' ongoing, joint efforts under the Centers for Disease Control and Prevention environmental public health tracking cooperative agreement.
- Compile a report describing and estimating the cost to perform a 2-way pilot project between the departments on arsenic in drinking water, where both health effects and environmental data exist (see attached report).

In its August 31st report, the Division of Public Health Services noted that due to the absence of key staff, the interagency team could not currently complete the work on the pilot proposal.

Recommendations

The following three stage process, beginning with the completion of the planned pilot, is recommended by the commission.

Stage One

Conduct the pilot, including mapping areas with high arsenic levels (already available), along with review of related cancers (bladder) within those areas, to assess possible associations. This study will demonstrate the “how to” of assessing linkages. Components would include selection of appropriate data sources, mapping, epidemiologist analysis, and a write-up of methods and findings (with potential to publish in a public health journal). The DPHS and DES will collaborate and as feasible do as much of the work as possible with existing resources and also advise of any additional resources that may be needed to complete work on the study. The time frame to complete the study will be within SFY 19.

Stage Two

Building off of the lessons learned from the study, DPHS and DES will work with the legislature to propose an expanded review of environmental contaminant and health data sets – perhaps up to 10 top contaminants and/or disease focus areas. A cost/benefit discussion will be included in the proposal, as well as resource, methodology and funding required (via a fiscal note) to support the expansion. It is hoped that demonstration of value in Stage One would suggest possible federal funding options to compliment state funding. DPHS and DES will partner with Dartmouth and UNH as well as federal agencies (EAP, CDC) to add academic environmental public health expertise to the design and implementation of the expansion (contingent upon funding and resources – IT and staff/contracted). Time frame for the proposal is within 6 months of completion of Stage One. Once the necessary resources

and structures are in place, the informed expansion will commence and results will be reported out to the legislature (estimated to be available by July 1, 2020).

Stage Three

Development of a comprehensive system of automated mapping and analysis, complimented by expert epidemiological investigation where there are indicators of adverse population health effects related to known environmental contaminants for a wide range of contaminants, would be proposed based on the success of Stage Two. State agencies would partner with NH academic institutions to strengthen the blend or research and surveillance in a robust ongoing and sustainable system. A cost estimate and a benefit assessment would be provided for the SFY 22/23 biennial budget.

In addition to the three step process, the commission recommends that legislation be filed for consideration in 2019 to extend the commission's work for two additional years.

Conclusion

After two years of study, the commission hopes that the information gathered in this report and the recommendations made will benefit future efforts to create integrated surveillance and response in the area of environmental health.

A serious challenge for policymakers charged with protecting the public's health is the difficulty of proving a link between exposure to an environmental contaminant and an illness. Where evidence exists of a link, scientists, courts, office holders and members of the public may disagree on the standards of proof.

To assess such links, epidemiologists have developed two main types of studies which vary in their ability to confer certainty.

First, observational studies, including ecological and case-control studies. These studies are fast, inexpensive, and permit the calculation of risk in mathematical terms. While they do not prove that exposure to a contaminant causes an illness, they can strongly suggest that a relationship of some kind exists. Courts may disagree that evidence of this kind meets a required legal standard of proof.

Longitudinal studies which follow an exposed population over time, offer higher quality evidence that exposure to a contaminant causes illness, but these studies are slow and expensive.

Policymakers in this area are therefore routinely faced with a decision; act now on uncertain evidence and risk wasting resources, or wait for definitive proof at the risk of continuing damage to public health.

Public health scientists faced with this dilemma have developed the Precautionary Principle, which states that if we have some evidence that a risk factor causes a disease and if the disease has serious consequences and if the risk factor can be mitigated at reasonable cost to society and if mitigation does not further damage society — we should act — even if we are not totally certain.

However this leaves us to ask: if there is a substantial cost to mitigation — do we have the right to intervene based on uncertain evidence and demand mitigation?

This difficult question will present itself again and again in the future. It's the commission's hope that guided by its work, future policymakers, scientists and health workers in New Hampshire will be able to address emerging issues quickly, in a coordinated and informed way.

Attachments

Attached with this report, please find:

- The minority report of commission member Representative Mindi Messmer
- Appendix A: Meeting Minutes
- Appendix B: HB 1356 Preliminary Report

MINORITY REPORT OF REPRESENTATIVE MINDI MESSMER**Commission Study Environmentally-Triggered Chronic Illness
RSA 126-A:73 (HB 511, Chapter 166:2, Laws of 2017)
November 1, 2018****Commission Charge and Study Purpose:**

The commission's study was charged with (but not limited to):

- (1) Determining which entities may report confirmed cases of chronic conditions or other health-related impacts to the public health oversight program.
- (2) Recommending ways to alert public health officials regarding higher than expected rates of chronic disease or other health-related impacts which may be related to exposures of unrecognized environmental contaminants.
- (3) Recommending a method to inform citizens regarding programs designed to manage chronic disease or other environmental exposure health-related impacts.
- (4) Recommending data sources and a method to include data compiled by a public or private entity to the greatest extent possible in the development of the public health oversight program.
- (5) Defining by codes, the health status indicators to be monitored, including chronic conditions, medical conditions, and poor health outcomes.
- (6) Studying current health databases, including years available, potential for small area analysis, and privacy concerns.
- (7) Researching currently existing health data reports by agency, bureau, or organization.
- (8) Creating a model of desired data outputs and reports for chronic conditions and other health-related impacts.
- (9) Identifying the gaps between what currently exists and the model output.
- (10) Recommending the organizational structure responsible for the oversight function and mandatory reporting requirements.
- (11) Collaborating with the National Institutes of Health, the United States Environmental Protection Agency, and the Centers for Disease Control and Prevention to develop protocols for the department of health and human services to educate and provide guidelines for physicians and other advanced health care practitioners to identify and evaluate appropriate diagnostic screening tests to assess health effects from exposure to emerging contaminants.
- (12) Collaborating with the National Institutes of Health, the United States Environmental Protection Agency, and the Centers for Disease Control and Prevention to develop protocols for programs to streamline education and outreach to health care providers about how to implement the guidelines specified in subparagraph (11). The protocols shall include education relative to methods to reduce further exposures and to eliminate the contaminants, if effective methods are available.

Commission Membership:

House Member appointed by the Speaker House	Mark Pearson
Member appointed by the Speaker House	Bill Ohm
Member appointed by the Speaker House	Joseph Guthrie
Member appointed by the Minority Leader House	Mindi Messmer
Member appointed by the Minority Leader Senate	Jeffrey Salloway
Member appointed by the Senate President	Martha Fuller
Senate Member appointed by the Senate	Clark Daniel
President NH Department of Health and Human Services UNH Institute for Health Policy and Practice NH Medical Society	Innis Lisa Morris
NH Hospital Association	Amy Costello
NH Nurse Practitioner Association	Thomas Sherman
	Thomas Wold
	Julie Bosak

Executive Summary:

The HB51 I Commission was formed with the overall goal of reducing exposures in our environment that may trigger cancer and chronic disease in New Hampshire. According to the Centers for Disease Control (CDC), New Hampshire has the highest incidence rates of breast, bladder, esophageal (<https://itis.cdc.gov/Cancer/USCS/DataViz.html>), and pediatric cancers (<https://www.cdc.gov/minwr/volumes/67/wrimm6725a2.htm#flown>) of all US states. In addition, a double pediatric cancer cluster was identified in a 5-town area of the seacoast in 2016 (<https://www.dhhs.nh.gov/vlphs/hscimicancerfrms-investigation.htm>).

The importance and breadth of public health environmental threats:

"More broadly, the Global Burden of Disease Study has estimated that 9 million deaths per year can be attributed to environmental or occupational factors such as air pollution or unsafe water, sanitation, and hand washing. This represents three times more deaths than those caused by AIDS, tuberculosis, and malaria together, and 15 times more than the deaths caused by all wars. Environmental exposures are important for non fatal illness throughout the life course, with significant impacts on birth outcomes, pediatric asthma, cardiovascular health, and other diseases."

"Many of the solutions to environmental challenges require expertise across multiple disciplines. As such, environmental health is inherently interdisciplinary, and there are natural and sustained connections to most branches of public health... Water is a key resource that requires sustained public health attention. By documenting the connections between drinking water exposures and poor health outcomes, we provide information and data to inform both prevention and intervention strategies. The lack of control of lead in drinking water in Flint, Michigan, and the lack of attention to the aging infrastructure in many cities, represents an intertwined environmental and public health failure."

Sandro Galea, MD, DrPH
Dean and Robert A Knox Professor, and
Jonathan Levy, ScD
Professor, Environmental Health, Boston
University School of Public Health

The work of the commission is to determine how to establish a data framework that would enable health and environmental officials to monitor areas of increased disease and illness that threaten public health in proactively before they become clusters. The model the commission is developing is meant to inform

where areas of concern exist and where financial resources should be spent if these gaps are problematic. The goal is to communicate findings to the public and make concrete recommendations on how the state

and citizens can reduce exposure to environmental agents that are thought to trigger chronic illness and cancer and improve outcomes.

The charge of this Commission requires an inter-agency approach between the Department of Health and Human Services (DHHS) and the Department of Environmental Services (DES). This stumbling block to the charge of the Commission was identified early on and members sponsored enabling legislation that was signed into law in 2018 to compel the agencies to share data in order to accomplish the goals of the commission.

Introduction:

The seacoast pediatric cancer cluster consists of statistically significant higher than expected rates of rhabdomyosarcoma (RMS) and pleuropulmonary blastoma (PPB) (Department of Health and Human Services Pediatric Cancer Cluster Investigation. February 2016), as well as, almost 3 times the expected rate of brain and central nervous system cancers in children in the same 5-town area. The double pediatric cancer cluster was reported to the New Hampshire Cancer Registry by Rye resident and HB511 Commission member Representative Mindi Messmer in March 2014. While the pediatric cancers have several inherited or genetic conditions that could predispose individuals to RMS and PPB, it is thought that environmental factors may trigger onset.

The Commission discussed several environmental factors that may be contributing to cancer and chronic disease in New Hampshire from a variety of natural, industrial, and defense-related sources. According to the New Hampshire Department of Environmental Services, approximately 150 unlined landfills and 20 Superfund Sites exist in New Hampshire which are possible and proven environmental concerns. Drinking water, groundwater, surface water, soil and air contamination has been identified related to these and other sources of environmental pollution. PFAs contamination of drinking water supplies has been identified in Amherst (TC1), Rochester (Lydall), Brentwood (County Fire Training Area) and adjacent to unlined landfills across the state. Four of the largest drinking water supply wells on the seacoast have been shut down due to environmental contamination. Approximately 14.7 square miles of drinking water aquifer in the Merrimack/Bedford/Litchfield area is impacted from an airborne release by Saint Gobain and an approximate total of 64 square miles is potentially impacted. Residents across the state are currently drinking water from private and municipal sources with levels of arsenic and PFAs chemicals, at a minimum, above what other states would allow. Other releases of contaminants in private and public drinking water supplies have been identified across the state.

With the high rates of cancer in New Hampshire and **the** fact that **the** pediatric cancer cluster was identified by private citizens, highlight the fact that the need to proactively address ways to reduce and prevent cancer and chronic illness.

The charge of this Commission requires an inter-agency approach between the Department of Health and Human Services (DHHS) and the Department of Environmental Services (DES). This stumbling block to the charge of the Commission was identified early on and members sponsored enabling legislation that was signed into law in 2018 to compel the agencies to share data in order to accomplish the goals of the commission.

Process and Procedures:

The committee organized on Thursday, September 6, 2017 and elected Representative Mark Pearson as Chair. The Chair appointed Representative Jeffrey Salloway as commission clerk.

The committee met twelve times throughout the study period, and issued an interim report on November 1, 2017. The minutes and interim report are attached. Minutes, documents reviewed by the commission, the interim report and this final report are also available on the Commission's webpage at:

<http://www.c4encourtstate.nh.us/statstudeommidetails.aspx?id=-1348&rb1=1&txtkeyword=chronic>

The commission heard presentations from the New Hampshire Department of Health and Human Services, commission members, the Department of Environmental Services, the New Hampshire Insurance Department, and academic professionals.

With the Charge of the Commission in mind, the commission organized its work into 1) developing a database of relevant reference information reviewed; 2) developing an inventory of relevant health indicators, 2) developing an environmental and health data inventory. The following sections provide a summary of the Commission work.

Documents Reviewed:

Documents reviewed during the Commission charge are summarized below (see <http://www.uncourt.state.nh.us/statstudcommcommittees/1348/>):

- DHHS Public Health Laboratories handout
- NH DPHS Biomonitoring Program handout
- NH State Cancer Registry handout
- NIEHS Chronic Conditions and Toxin/Agents, handout
- Stensgaard, Anna-Sofie, et al., "Virtual globes and geospatial health: the potential of new tools in the management and control of vector-borne diseases," *Geospatial Health* 3 (2), pp 127-147.
- Health Transformation in New Hampshire: April 2016 Powerpoint
- Memorandum of Agreement between DHHS and DES re: Cooperation in the area of Environmental Public Health Tracking (July 1, 2017 —June 30, 2022)
- Empowering the Granite State: State Health System Innovation Plan Model Design Proposal, January 2016
- DPHS Data Release Guidelines, July 16, 2016
- Kaffenberger, Benjamin H., et al., "The effect of climate change on skin disease in North America," *Journal of American Academic Dermatology* vol. 76 (1), 2016, pp 140-147.
- NH Health WISDOM Powerpoint, October 20, 2017, Dr, Kathleen Bush
- C8 Settlement science panel PFOA probable health link report summary
- Lead Poisoning Prevention, Executive Summary, DPHS
- Health Effects of PFAS, ATSDR
- PFAS Clinician Fact Sheet
- Woodward, Robert S., et al., "Optimum Investments in Project Evaluations: When Are Cost Effectiveness Analyses Cost-Effective," *The Journal of Medical Systems* vol. 20 (6), 1996, pp 385-393.
- NTP Monograph on Health Effects of Low-Level Lead, Executive Summary, table 1.1 and 1.2
- Washington County, WI Community Profile
- New Bedford, MA Community Profile
- Brooklyn District 14, NY Community Profile
- NHDPHS: Female Breast Cancer Incidence Rates by State, 2014
- NH Health WISDOM: Bladder Cancer Incidence
- Elevated Bladder Cancer in Northern New England — Drinking Water and Arsenic: USGS
- Bruce Stanton, Ph.D., Dartmouth Toxic Metals Superfund Research Program, Testimony on HB 1592 (2018)
- Jainee Hood and Sonya Lunder, "Cancer-Causing Arsenic Contaminates Tap Water for 70 Million Americans," EWG, September 20, 2017
- Proposed Metrics for Environmental Health Community Profiles: Dr. Kathleen Bush
- Building Environmental Health and Chronic Disease Capacity, DHHS

Health Indicator Inventory

The Commission was tasked to define by codes, the health status indicators to be monitored, including chronic conditions, medical conditions, and poor health outcomes related to environmental exposures. In order to understand what information exists regarding environmental exposures that are likely to trigger public health impacts that should be included in the framework of the monitoring system, the Commission identified available information regarding known common diseases and conditions that may be linked to environmental exposures.

Diseases and conditions strongly linked to environmental exposures and associated environmental toxins recognized by NIEHS are summarized on Table 1 (see <https://www.niehs.nih.gov/health/topics/index.cfm>).

Table 1. NIEHS Summary of Disease or Condition and Environmental Toxin

Disease or Condition	Subtype Diagnosis	Environmental Toxin(s)
Asthma	Asthma	Air pollution, ozone, fine particulates, allergens
Autism	n/a	Air pollution,
Autoimmune diseases (i.e., Lupus)	Diabetes Lupus Multiple sclerosis Rheumatoid Arthritis Celiac disease	Solvents Smoking Silica Mercury
Cancer	Breast cancer Endometrium Kidney Colon Lung Esophagus	Acrylamide (fried food) Aristolochic acids (herbals) Tobacco Obesity Pesticides Solvents Silica Dioxins PAHs Arsenic Beryllium
Lung disease	COPD	Tobacco Allergens Air pollution Asbestos
Obesity (Obesogens)		Tobacco Tributyltin Pesticides PCBs Phthalates Flame retardants
Parkinson's disease		Pesticides DDT
Reproductive Health		Lead Mercury


The NIEHS lists chemicals or factors in the environment to which humans are exposed that may cause adverse health effects (see <https://www.niehs.nih.gov/health/topics/agents/index.cfm>).

The Commission reviewed additional studies that determined probable links between exposure to PFAS and pregnancy-induced hypertension/pre-eclampsia, liver damage, increases in serum lipids, decreased antibody response, asthma, lower birth weight, thyroid disease, ulcerative colitis, decreased fertility, testicular and kidney cancer (<https://www.atsdr.cdc.gov/toxprofiles/tp200.pdf> and C8Sciencepanel.org). More recent studies suggest connections with breast cancer (Ghisari M, et al., 2017 and Bonefeld-Jorgensen EC, et al., 2014).

The Commission also heard about the biomonitoring program currently underway consisting of collaboration between the NHDES and NHDHHS to assess the relationship between arsenic levels in drinking water and public health outcomes such as bladder and lung cancer. The program was implemented since New Hampshire has the highest levels of bladder cancer in the country. House Bill 1592 was passed into law in 2018 and will result in NHDES proposing a more stringent drinking water standard for arsenic by January 1, 2019 intended to reduce levels of exposure to arsenic in drinking water to prevent bladder, kidney, and lung cancer.

To conduct surveillance of standard chronic disease conditions, the Commission suggests using the chronic disease indicators (CDI) from the Centers for Disease Control and Prevention (CDC), the Council of State and Territorial Epidemiologists (CSTE), and the National Association of Chronic Disease Directors (NACDD) and the National Institute of Environmental Health Sciences (NIEHS). The CDI are a set of surveillance indicators developed by experts in the field for public health surveillance and are summarized on Table 2. The Chronic Disease Indicators draw on several federal databases including, but not limited to: Behavioral Risk Factor Surveillance System (BRFSS), State Cancer Registries, the American Community Survey (ACS), National Vital Statistics System (NVSS), Youth Risk Behavior Surveillance System (YRBS), Pregnancy Risk Assessment Monitoring System (PRAMS), Alcohol Epidemiologic Data System, National Survey of Children's Health, Centers for Medicare and Medicaid Services Chronic Condition Warehouse, National Immunization Survey, and others. For more information visit the CDC Chronic Disease Indicators website: <https://www.cdc.gov/cdi/index.html>.

Table 2. Summary of Chronic Disease Indicators by Indicator Group (2013)

 Indicator Group	Total Number of Indicators	Individual measures
Alcohol	10	14
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Asthma	6	12
Cancer'	10	20
Cardiovascular Disease	11	18
Chronic Kidney Disease	3	4
Chronic Obstructive Pulmonary Disease	8	13
Diabetes	13	20
Disability		
Immunization		
Mental Health	3	3
Nutrition, Physical Activity, and Weight	22	38
Older adults	4	5
Oral health	5	9
Overarching Conditions	8	16
Reproductive Health	3	3
School Health		
Tobacco	11	16
Total	124	201

This list of indicators may be refined in the future as the work of the Commission continues to evolve.

To conduct surveillance of standard neurologic conditions, the Commission suggests using the following standard case definitions (adapted from St. Germaine-Smith et al., 2012 Recommendations for optimal ICD codes to study neurologic conditions. *Neurology* (79)) shown on Table 3.

As stated in the review article, "To ensure the accurate interpretation of population-based studies with use of administrative health data (i.e., hospital discharge data), the accuracy of case definitions for neurologic conditions needs to be taken into consideration." Other conditions that may be of interest are difficult to define due to too few validation studies. Examples of these rare conditions include cerebral palsy, Huntington disease, hydrocephalus, muscular dystrophy, spina bifida.

Table 3. Summary of Neurologic Conditions Indicators by Category (Adapted from St. Germaine-Smith et al., 2012)

Disease Outcome	Relevant ICD-9 or ICD-10 Code
Epilepsy	ICD-9: 345; ICD-10: G40 — 41
Motor neuron disease (incl. ALS)	ICD-9: 335, 335.2; ICD-10 G12.2
Multiple sclerosis	ICD-9: 340; ICD-10: G35
Parkinson disease	ICD-9: 332; ICD-10: G20 (limited validation)

Existing Data Framework and Data Gaps:

The following sections of this report present a summary of the Commission's work to define the framework necessary to achieve the goals of creating a monitoring system for environmentally triggered disease in New Hampshire. The Commission's findings relating to available data sources in the state are divided into the following sections:

- Health and Environmental Database Inventory (charges 1, 6, 7)
- Communications (charges 2, 3, 11, 12)

NH Health and Environmental Database Inventory

The Commission focused on determining what data is already collected in the state that is relevant to the overall goal of creating a public health environmentally triggered disease monitoring system. The Commission investigated which entities report confirmed cases of chronic conditions or other health-related impacts. The Commission studied current health databases, including years available, potential for small area analysis, and privacy concerns and researched currently existing health data reports by agency, bureau, or organization.

After its investigation the commission found that the following data sources held promise as elements for potential future integration in a system of environmental/public health data surveillance.

For details on the release of data held by DHHS to the general public and to public health researchers, consult the Division of Public Health Services.

The NH Cancer Registry

The New Hampshire State Cancer Registry (NHSCR) is a statewide, population-based cancer surveillance program that collects incidence data on all cancer cases diagnosed or treated in the State of New Hampshire. Since its inception in 1985, the NHSCR has contracted with the Geisel School of Medicine at Dartmouth by the DHHS Division of Public Health Services and the Health Statistics and Data Management Section.

In mid-1984, mortality statistics for the State of New Hampshire as provided by the National Cancer Institute showed that our population had experienced about 100 more cancer deaths than the national average each year during the period 1950-1979. This information led to the formation of a Coalition Against Cancer, established with the help of the New Hampshire Division of Public Health Services and the American Cancer Society, N.H. Division, Inc. Through the efforts of the Coalition and the passage of the Chronic Disease Prevention and Control Act, cancer was established as a reportable disease in New Hampshire. A contract between the Division of Public Health Services and Dartmouth College to establish and operate a statewide cancer registry was then approved by the Governor and Council. The NHSCR collects incidence data on all cancer cases diagnosed or treated in New Hampshire. As required by the NH Administrative Rules, the NHSCR currently collects data from hospital registrars in the larger hospitals in NH. Hospitals with fewer than 105 cases per year who generally do not have their own cancer registry are assisted by the NHSCR staff, helping these hospitals with some of their reporting duties. The NHSCR also receives case report from physician practices, free standing radiation oncology centers, pathology laboratories and other sources. In addition, the NHSCR receives case reports for NH residents who are diagnosed outside the state, based on interstate data exchange agreements. The NHSCR has an innovative, two-phase reporting system. The initial rapid report provides basic aspects of case identification and is submitted within 45 days of diagnosis. A definitive case report is transmitted within 180 days from the date of diagnosis, and includes more detailed information, such as treatment and staging information. Timely reporting is essential for registry activities.

The Cancer Registry data set is limited in the following ways:

- The stripping of direct personal identifiers prevents directly linking the data with other data sets.
- The reporting on small area incidence is restricted in order to protect privacy but may be possible. The Environmental Public Health Tracking program is investigating the potential future ability to utilize small area analysis. Strict policies and procedures have been developed to maintain confidentiality in disclosure of data.

The NH Comprehensive Health Data Information System (CHIS)

The New Hampshire Comprehensive Health Care Information System (CHIS) was created by NH state statute to make health care data "available as a resource for insurers, employers, providers, purchasers of health care, and state agencies to continuously review health care utilization, expenditures, and performance in New Hampshire and to enhance the ability of New Hampshire consumers and employers to make informed and cost-effective health care choices." The statute also required that the New Hampshire Insurance Department (NHID) and the NH Department of Health and Human Services (NH DHHS) partner on the project. The same legislation that created the CHIS also enacted statutes that mandated that health insurance carriers submit their encrypted health care claims data and Health Employer Data and Information Set (HEDIS) data to the state.

NH DHHS, Office of Medicaid Business and Policy, after a competitive bid process, contracted with Milliman in June 2012 to assume maintenance of the CHIS."

Through Health insurance carriers and third-party administrators (TPAs) operating in NH are required to submit their claims data to the NH Insurance Department. By contract the data is collected by Milliman in accordance with:

- RSA 420-G:11: Portability, Availability, and Renewability of Health Coverage
- Rules Chapter Ins 4000: Uniform Reporting System for Health Care Claims Data Set

The data has been collected from 2005 to present, and is created when providers submit a claim for reimbursement from an insurance company. Types of care reflected in claims include:

- Inpatient

- Outpatient
- Prescription
- Dental
- Mental Health Counseling
- Substance Abuse Counseling

RSA 420-G:1 1-a creates the NH Comprehensive Health Data Information System (CHIS) through a Memorandum of Understanding (MOU) between the Insurance Department and the DHHS, while also stipulating what data can be released:

"To the extent allowed by HIPAA, the data shall be available as a resource for insurers, employers, providers, purchasers of health care, and state agencies to continuously review health care utilization, expenditures, and performance in New Hampshire and to enhance the ability of New Hampshire consumers and employers to make informed and cost-effective health care choices. In presenting data for public access, comparative considerations shall be made regarding geography, demographics, general economic factors, and institutional size. Notwithstanding HIPAA or any other provision of law, the comprehensive health care information system shall not include or disclose any data that contains direct personal identifiers. For the purposes of this section, "direct personal identifiers" include information relating to an individual that contains primary or obvious identifiers, such as the individual's name, street address, e-mail address, telephone number, and social security number."

While the information in the CHIS dataset has been stripped of direct personal identifiers, it does include basic information in the enrollment record such as gender, date of birth and zip code.

DHHS oversees the release of CHIS data for research purposes in accordance with:

- RSA 91-A:10: Procedure for Release of Personal information for Research Purposes
- Rules Chapter He-W 950: Comprehensive Health Care Information System Procedures for the Release of Claims Data Sets for Public and Research Purposes

The CHIS data set is limited in the following ways:

- Only DHHS can link the CHIS data to other data sets since it is stripped of direct personal identifiers.
- The reporting on Small area incidence is restricted in order to protect privacy.
- Claims data is limited to care provided to the privately insured population and does not include care provided through the Veteran's Administration, or to the privately insured living in NH but working and receiving insurance from carriers licensed out-of-state, or the uninsured.
- Contract terms require NH Medicaid managed care organizations to submit to CHIS.
- NH Medicare is also incorporated into CHIS format.

NH Health WISDOM

NH Health WISDOM is an interactive system assembled by the Department of Health and Human Services, Division of Public Health Services, in order to aggregate public health data and produce customized analysis. Data in WISDOM is organized around The New Hampshire State Health Improvement Plan (NH SHIP) and the NH Environmental Public Health Tracking (EPHT) surveillance data on environmental hazards, exposures, and associated health effects. Users may access data using interactive dashboards. Data in WISDOM is compiled from the following sources:

- Behavioral Risk Factor Surveillance Survey 2005-2016
- NH Hospital Discharge Data (In-State) 2000-2009; 2012-2016
- NH Hospital Discharge Data (Out-of-State) 2000-2009; 2012-2016
- Birth Conditions 2003-2010
- Air Quality (PM 2.5 and Ozone) 1999-2014

- National Survey on Drug Use and Health (NSDUH) 2003-2015
- NH Population (Claritas) 2005-2017
- Occupational Health Data (years vary based on dataset)
- PFC blood test results 2015-2016 (varies based on location)
- NH State Cancer Registry 2000-2015 maintained through the Geisel School of Medicine at Dartmouth-Hitchcock Medical Center
- NH Vital Records (Birth/Death Certificates) 2000-2016
- Pediatric Nutrition Surveillance System (PedNSS) 2007-2013
- Third Grade Survey 2009, 2014
- Youth Risk Behavior Surveillance System 2007-2017

Information in the WISDOM dataset has been stripped of direct personal identifiers, however, it does include indirect identifiers in the form of an assigned identifier number and basic information in the enrollment record such as gender, date of birth and zip code.

The WISDOM data set is limited in the following ways:

- The stripping of direct personal identifiers prevents cross-referencing its data with other data sets.
- The reporting on small area incidence is restricted in order to protect privacy.

LIMS system, DHHS Division of Public Health, Public Health Laboratories

The LIMS system is the internal data system of DHHS's Public Health Laboratories, which is used to store data accumulated in the course of a miscellany of programs. The Public Health Laboratories have been involved in testing for water quality in conjunction with DES's methyl-tert-butyl-ether (MTBE) investigations, arsenic and uranium in conjunction with DHHS's Biomonitoring Program, and DHHS's lead poisoning surveillance.

Information in the LIMS dataset has been stripped of direct personal identifiers, however, it does include indirect identifiers in the form of an assigned identifier number and basic information in the enrollment record such as address and zip code.

NH Public Health Laboratory

The Commission heard from Dr. Christine Bean about the public health laboratory operated by DHHS. The laboratory analyzes samples for biomonitoring and data are stored in an internal system. Dr. Bean indicated that this data could be incorporated into the NHWISDOM dashboard.

NH Biomonitoring Program

The Commission heard from Amanda Cosser about the biomonitoring program. The laboratory analyzes public and private water samples and the program is analyzing the connection between radon, arsenic and public health outcomes. Ms. Cosser indicated that this data could be incorporated into the NH WISDOM dashboard.

The Environmental Monitoring Database

The Department of Environmental Services Environmental Monitoring Database holds data collected through permitting, investigation and monitoring activities of the divisions of air resources, water resources and waste management. Data is collected through permitting activities and data monitoring required by state law, rules, and relevant federal statutes such as the Clean Air and Clean Water Acts.

The public facing portal to the Environmental Monitoring Database is the website OneStop, maintained by the Department.

Communication

The Commission was charged with recommending a method to inform citizens regarding programs designed to manage chronic disease or other environmental exposure health-related impacts.

Additionally, the Commission was tasked with collaborating with the National Institutes of Health, the United States Environmental Protection Agency, and the Centers for Disease Control and Prevention to develop protocols for the department of health and human services to educate and provide guidelines for physicians, health care providers and other advanced health care practitioners to identify and evaluate appropriate diagnostic screening tests to assess health effects from exposure to emerging contaminants. The Commission was also tasked with identifying ways to develop protocols for programs to streamline education and outreach to health care providers about how to implement the guidelines discussed above. The communication methods identified would also include education relative to methods to reduce further exposures and to eliminate the contaminants, if effective methods are available.

The commission gathered information relative to current practices, that the public concerns associated with those charges have been clearly communicated to the Departments, but that the further development of information and training protocols should be deferred until the synthesis of environmental and health data envisioned in the three-stage process recommended by the commission takes place.

In addition, the Commission heard that there are some very real limitations on communication internally between state departments and with external data sources due to antiquated computer systems making interagency cooperation and data sharing challenging.

Findings and Conclusions:

The work of the commission is to determine how to establish a data framework that would enable health and environmental officials to monitor areas of increased disease and illness proactively before they become clusters.

Examples of recent policy advanced in New Hampshire discussed in the Commission aimed to reduce rates of chronic disease and cancer include Senate Bill 247 (lead), House Bill 1532 (arsenic), and Senate Bill 309 (PFAs). Senator Dan Feltes presented to the Commission regarding SB-247 which will reduce childhood exposure to lead in paint and water.

House Bill 1532 which will result in a more stringent standard for arsenic in drinking water was signed into law during the 2018 session. Katie Bush (DHHS) discussed the EPHT study being conducted through a federal grant to assess arsenic and bladder cancer.

Senate Bill 309 was signed into law in the 2018 legislative session which will result in a rule making proposal for a more stringent and enforceable standard for five PFAS compounds in drinking water by January 1, 2019.

A serious challenge for policymakers charged with protecting the public's health is the difficulty of proving a link between exposure to an environmental contaminant and an illness. Where evidence exists of a link, scientists, courts, office holders and members of the public may disagree on the standards of proof.

Policymakers in this area are therefore routinely faced with a decision; act now on uncertain evidence and risk wasting resources, or wait for definitive proof at the risk of continuing damage to public health.

Public health scientists faced with this dilemma have developed the Precautionary Principle, which states that if we have some evidence that a risk factor causes a disease and if the disease has serious consequences and if the risk factor can be mitigated at reasonable cost to society and if mitigation does not further damage society ---•- we should act — even if we are not totally certain.

However, this leaves us to ask: if there is a substantial cost to mitigation — do we have the right to intervene based on uncertain evidence and demand mitigation?

Professor Robert Woodward, a retired health economist from University of New Hampshire, presented to the Commission on the tension between the precautionary principle and cost effectiveness. Dr. Woodward reviewed his methodology for assessing cost-effectiveness of risk mitigations vs. the benefit of risk reduction. Assessing the cost paid by the reinsured is complex and includes assessing hospital costs, physician costs, lost days at work, and for caregiving. He compared the value of risk vs. the benefits of improving the environment. Quality adjusted life-year is a generic measure of disease burden, including both the quality and the quantity of life lived. It is used in economic evaluation to assess the value for money of medical interventions. One QALY equates to one year in perfect health. Dr. Woodward cited the need for small scale analysis; small geographical units to accomplish the Commission goal to identify and prevent environmental triggers for chronic illness.

Recommendations:

The Commission is charged with recommending **the** organizational structure responsible for the oversight function and mandatory reporting requirements. The DHHS provided the Commission with a legislative resource request to summarize staffing needs to establish a more centralized environmental health monitoring program within the DPHS. This would enable the Department to respond to emerging concerns and environmental health issues. This information is provided in Attachment C of the Majority Report.

HB 1356 (2018), sponsored by the commission chair and co-sponsored by all the legislative members of the commission, was signed into law by Governor Sununu on June 25¹¹¹, 2018. The bill required the DES and the DHHS to develop and implement a method by which the departments share certain health outcome and environmental data. Specifically, the departments are tasked to:

- Update a memorandum of agreement on cooperation regarding data sharing
- Sign a joint standard operating procedure on how data layers can be shared between the 2 departments to identify linkages between environmental contaminants and health outcomes
- Hold a presentation on the departments' ongoing, joint efforts under the Centers for Disease Control and Prevention environmental public health tracking cooperative agreement.
- Compile a report describing and estimating the cost to perform a pilot project between the departments on arsenic in drinking water, where both health effects and environmental data exist.

As recommended by Dr. Woodward and Commission members, small area analysis and interagency cooperation between environmental and public health agencies is necessary to be able to build a framework that will allow public health officials to surveil, identify, and prevent clusters of chronic illness and cancer. Challenges include reforming the relationship between DES and DHHS to achieve these goals and overcoming infrastructure interoperability between departments. The Commission recommends the following three-stage pilot study process in order to further assess data gaps and challenges to overcome.

Stage One

Conduct the pilot, including mapping areas with high arsenic levels (already available), along with review of related cancers (bladder) within those areas, to assess possible associations. This study will demonstrate the "how to" of assessing linkages. Components would include selection of appropriate data sources,

mapping, epidemiologist analysis, and a write-up of methods and findings (with potential to publish in a public health journal). The DHHS and DES will collaborate and as feasible do as much of the work as possible with existing resources and also advise of any additional resources that may be needed to complete work on the study. The time frame to complete the study will be within fiscal year 2019

Stage Two

Building off of the lessons learned from the study, DHHS and DES will work with the legislature to propose an expanded review of environmental contaminant and health data sets and contaminants and/or disease focus areas. A cost/benefit discussion will be included in the proposal, as well as resource, methodology and funding required (via a fiscal note) to support the expansion. It is hoped that demonstration of value in Stage One would suggest possible federal funding options to compliment state funding. DHHS and DES will partner with academic institutions as well as federal agencies (EAP, CDC) to add academic environmental public health expertise to the design and implementation of the expansion (contingent upon funding and resources — IT and staff/contracted). Time frame for the proposal is within 6 months of completion of Stage One. Once the necessary resources and structures are in place, the informed expansion will commence and results will be reported out to the legislature (estimated to be available by July 1, 2020).

Stage Three

Develop a comprehensive system of automated mapping and analysis, complimented by expert epidemiological investigation where there are indicators of adverse population health effects related to known environmental contaminants for a wide range of contaminants, would be proposed based on the success of Stage Two. State agencies would partner with New Hampshire academic institutions to strengthen the blend or research and surveillance in a robust ongoing and sustainable system. A cost estimate and a benefit assessment would be provided for the fiscal year 2022/2023 biennial budget.

In its August 31st report, the DHHS noted that due to the absence of key staff, the interagency team could not currently complete the work on the pilot proposal at this time.

Closing:

The Commission was charged with recommending ways to alert public health officials regarding higher than expected rates of chronic disease or other health-related impacts which may be related to exposures of unrecognized environmental contaminants.

The Commission heard that there are some very real limitations on communication internally between state departments and with external data sources due to antiquated computer systems making interagency cooperation and data sharing challenging. Updates to facilitate cross agency communication and data sharing would enhance the ability to carry out the Commission's recommended actions.

Another proposal is recommended for the next legislative session to continue the important work of this HB511 Commission.

Attached Appendices (Majority Report):

- A: Meeting Minutes
- B: HB 1356 Preliminary Report
- C: DHHS Legislative Resource Request

References:

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Appendix A:
Meeting Minutes

Commission to Study Environmentally-Triggered Chronic Illness
 Sept. 6, 2017
 Organizational Meeting
Minutes of the meeting

Meeting called to order at 10:00 a.m.

A. Introductions

RA). Kotowski - called for meeting times

Sen. Fuller-Clark — identified data assessment (charge #6) as a first step in committee deliberations.

Rep. Weber — called for testimony on existing databases

Rep. Salloway — added the issue of access to the data

Rep. Pearson — called for examination of "hot spots"

Mr. Dumond — noted that environmental hot spots are the purview of Dept. of Environmental Services.

Rep. Kotowski — recommended that each member submit a list of prioritized activities

Sen. Fuller Clark — suggested items 2,3,4,10.

Dr. Sherman — reviewed a federal grant which funded a "deep dive" into state data. A final report on that project exists.

Rep. Kotowski — asked that a copy of that report be distributed to each commission member.

Dr. Sherman — reviewed the progress — or lack of the same of that report.

Mr. Dumond — raised the issue of the variety of reports prepared by state agencies. He recommended DES inclusion.

Dr. Sherman — added the need for Dept. of Insurance to be included as well.

Rep. ——— Chair Pearson — will approach DES & insurance — called attention to objectives 6

added a need to include 7 & 8 to see where the gaps are. He added the need to look at federal data bases.

Sen. Fuller-Clark — voted the need to bring to the committee data on environmentally triggered

illness. Mr. Dumond — queried a process to identify data experts from FIBS to appear,.

Rep. Mark Pearson — Chairman

Rep. Jeffrey Salloway — Clerk

Next meeting Friday 9/15 at 10:00

a.m. Meeting adjourned at 10:45 a.m.

Respectfully submitted,

- (4 R p. Jeffrey Salloway, Clerk

Salloway

Commission to Study Environmentally-Triggered Chronic Illness

HB 511

RSA Chapter: 126-A: 73

9-15-17

Call To Order:

Chairman Rep. Mark Pearson called the meeting to order at 10:01AM.

Rep. Salloway, clerk, distributed minutes of the 9-6-17 meeting and a contact information sheet to be signed by attendees. The chairman invited new members to introduce themselves. Rep. Weber is replaced by Rep. Messner. Added to the minutes was designation of Rep. Pearson as chairman and Rep. Salloway as clerk.

Organization:

A: Rep. Pearson asked that data bases be included in minutes.

David C. Bates will create a web site to make data accessible to the commission.

B: Rep. Pearson introduced Tyler Brannon of the NH Insurance Dept.

He described the NH Comprehensive Health Data Information System. This data goes back to 2005. Most people with insurance are in this data base. There is a website with this data. This has been used to assess cost of care. DHHS controls research access to this data, This is a large, complex data set.

C. Rep. Pearson noted that those who are uninsured aren't in the data base.

D. Rep. Kotowski asked about managed care data and Medicare data. These are pending,

E. Rep. Messner asked about residency data by zip code.

F. Ms. Porter noted the categories of insured, uninsured and self-pay.

G. Dr. Sherman asked who else might be missed in this data base. Mr. Brannon noted that some are not covered in the data base. Insurance department is attempting to get data from neighboring states. Dr. Sherman asked about coding for multiple diagnoses.

- H. Rep. Salloway asked about death certificate data-not available on this data base. Up-coding, somewhat. DHHS has the data and some ability to analyze it.
- I. There is a report available on the NH Insurance Dept. web site.
- J. Dr. Sherman asked if there is a disease burden report for the state. Jo Porter identified a report from UNH which chronicles rates of chronic diseases.
- K. Ms. Levesque asked about the NH Health and Equity Report Card. Rep. Messner asked that UNH report its data to the commission.
- L. Dr. Wold asked about Medicaid data. Most recent data is two years old. Mr. Dumond will provide the Health & Equity Report Card.

Mr. Dumond introduced staff from Environmental Services.

- A: Dr. Kathleen Bush, Environmental/Public Health Tracking.** Dr. Bush reviewed data bases at DHHS. Data is found at <https://wisdom.DHHS.NH.GOV>. Dr. Sherman asked if data sets overlap. Untreated disease is not reported. The data exists but DHHS does not permit access. Ms. Porter noted that discharge data is more comprehensive than claims data. Rep. Salloway asked if DI-IHS could identify cancer spots. Dr. Bush declined. **Mr. Dumond** asked for examples - Lyme disease was described. Ms. Porter asked for release of the guidelines for access to data. Rep. Messner clarified the commission's need for data.
- B. Dr. Christine Bean, Director of Public Health Labs** Dr. Bean described the role of the public health lab. Data is in a lab information data management system. It is not accessible to outsiders. Dr. Sherman asked if data could appear in the Wisdom system, Yes!
- C. Amanda Cosser, Biomonitoring Program.** She reviewed methods, criterion and programs. Water and home arsenic and uranium are being studied. The intent is to put this data on Wisdom. Dr. Sherman asked if the lab study looked at health history. Yes! Dr. Pearson asked if water testing was available to the public. Yes! Mr. Dumond asked who funds this. CDC! Rep. Kotowski asked if CDC would publish reports. Yes!
- D. Mike Wimstat, Waste Management Division.** DES has developed at one-stop data site on environment, especially hazardous waste disposal, air emissions, Dr. Kathleen Bush Dr. Kathleen Bush petroleum water discharge, solid waste facilities. EDM is environmental monitoring data. Also automated data logs report in real time. Dr. Sherman asked if geographical data is now available. Ms. Levesque asked if organizations work together

to combine information on outcomes. DHHS restricts data. DES is willing to work on this. Mr. Dumond identified efforts at cooperative efforts. Dr. Bush added descriptions of collaborative efforts. Dr. Sherman described the Seacoast cancer cluster.

E. **Whitney Hammond, Chronic Disease Prevention**, Cancer registry is federally funded since 1986. Data is available to researchers on request. Dr. Sherman, the registry is not used proactively to look for hot spots. Rep. Messner asked about out-of-state data. It is collected. Ms. Porter observed that this is cancer incidence reporting. Dr. Wold asked if there was a list of monitored chronic diseases. Yes!

Next meeting goal will be to continue identifying sources of data. Ms. Porter noted the distinction between data and reports. She will organize speakers from UNH.

Mr. Dumond will speak on lead exposure.

We will meet again on October 6, 2017. Meeting adjourned at 10:17 am.

Commission to Study Environmentally-Triggered Chronic Illness

HB 511

RSA Chapter: 126-A: 73

10-6-17

I. Call To Order:

A: Chairman Pearson called the meeting to order at 10 am and introduced Rep. William Ohm as a replacement for Rep Kotowski. (Revise minutes. Adjourned at 12:17 PM. Spell Messmer)

II. Rep. Pearson reviewed access to the committee web site.

Rep. Pearson reviewed his conversation with Dr. Sherman. He linked this to the charge to the committee.

Next meeting 10-20-17 at 10 am. Rep. Pearson asked Mr. Bates to begin drafting an interim report. Following meeting will be Monday, Nov. 13th. Final meeting will be Friday, Dec. 8th.

III. Amy Costello - Director of Health Analytics and Informatics at the Institute for Health Policy & Practice at UNH. Ms. Costello provided a demonstration of how data is used for the accountable care project. Data is broken down by county moving to Integrated Delivery Network. Data is available for commercial insurers, Medicare and Medicaid. Uninsured are missing from the data. The data base reports diagnosis and associated treatments.

Rep. Pearson asked if there were chronic diseases we wanted to target. Dr.

Wold asked about diagnosis specificity.

Rep. Salloway asked about total disease burden per county. He recommended looking at neoplastic disease, metabolic disease and neurologic disease.

Dr. Wold noted the difficulty of identifying exposure.

Rep. Ohm asked for the definition of "hot spots."

Mr. Dumond mentioned Dartmouth's data base on arsenic in water. Rep.

Messmer spoke to the need for an initial grasp at "hot spots." Rep.

Salloway spoke to the issue of exposure.

Beverly Drowin of DHHS does lead poisoning surveillance of DHHS. She described the lead testing results.

Sen. Innis asked about half-life of lead and elevated levels in New Castle.

Rep. Ohm asked if data is broken down into census tracts. Ms. Drouin said "Yes!"

Mr. Dumond introduced Michael Wimsatt of Waste Management Division of DHHS. He reported on our ability to report on regional water quality. He recommended looking at "hot spots" for disease. But the number of potential contaminants is huge. A primary route is ground water.

IV. Committee discussed its next steps.

Sen. Innis and Rep. Salloway reviewed the choice of precautionary principle when there is no demonstrated causality.

Dr. Wold noted that we can link some risks with specific diseases. He suggested developing a list of disease outcome.

Mr. Dumond will bring Ms. Bush back to demonstrate The Wisdom System. Rep.

Salloway will invite Professor Woodward to testify.

Meeting adjourned at 12:17 pm.

Respectfully Submitted:

Rep. Jeffrey Salloway, Clerk

Commission to Study Environmentally-Triggered Chronic Illness

HB 511

RSA Chapter: 126-A: 73

10-20-17

1: Meeting was called to order at 10 am by Chairman Pearson.

A: Minutes of the meeting were distributed.

1. Ms. Costello noted corrections of her title and department.
2. Dr. Sherman noted a spelling correction Mr. Wimsatt.
3. Minutes were approved.

B: Next meetings will be Monday, November 13 and Friday, Dec. 8.

C: A chart outlining risk factors and disease outcomes was distributed. Dr. Wold voted that some toxins and outcomes are possible but not adequately documented to be included.

1. This chart will be posted on the commission website.
2. Dr. Sherman added the risk of radiation.
3. Rep. Ohm observed the need to identify dose and length of exposure as variables.
 - a. Dr. Sherman suggested an expanded Excel spreadsheet.
 - b. Ms. Costello asked for clarification of categories.
4. Dr. Sherman noted the need to age-categorize.

II: Website

A: Mr. D.C. Bates noted his efforts to add data bases to the commission website.

III: Interim Report

A: Report of progress is due Nov. 1St

1. A draft was distributed.
 - a. Ms. Costello and Dr. Sherman suggested edits. Rep. Pearson added his pithy edits.

B: An attendee (Whitney), from DHHS, asked for an edit regarding data suppression rules.

1. Rep. Pearson spoke of the need to generate data while protecting privacy.
 - a. Dr. Bush noted that such data is available publicly.
 - b. Ms. Costello asked that the data suppression rules be made available.
2. Edits were discussed and recorded by Mr. Bates for revision to the final document.

C: Rep. Messmer moved adoption of the document as amended. Seconded by Dr. Wold and passed in voice vote.

IV: Dr. Bush presented the NH Health Data Portal known as WISDOM.

A: She demonstrated the utility of WISDOM to demonstrate rates of disease incidence across the state.

1. Rep. Pearson asked if the department initiated studies.
 - a. Dr. Bush indicated that they use collected data from other sources.
2. Dr. Sherman asked if anyone is tasked with identifying hot spots. a. Dr. Bush described the lead surveillance program.

- b. Dr. Sherman asked if the data were coordinated. Dr. Bush noted limited resources. Dr. Bean described how coordinating committees struggle to bring people, agencies and data together.
3. Rep. Guthrie asked what resources are needed to advance this effort.
 - a. "Something is better than nothing," Dr. Bush, i.e., it takes time.
4. Ms. Costello asked about task force funding. There is none.
5. Rep. Salloway noted that outcomes as reported are "dirty data" and we need to be cautious in attributing outcomes to risk. a. Ms. Costello and Dr. Bush discussed the concept of attributable risk.
6. Mr. Bates noted the decline in federal funding.
7. Dr. Sherman asked if there is a way to measure the results of surveillance and intervention
 - a. Rep. Salloway issued a caveat that measuring outcome is difficult.

V: Rep. Pearson suggested agendas for future meetings.

A: Dr. Sherman asked for a witness who could describe the power and utility of statistical data.

1. Rep. Pearson offered perspective on using data from other states.

B: Dr. Sherman asked if we could build a map of the location of data sets.

1. He suggested that we reach out to other states to both gather and disseminate our results.

VI: Meeting adjourned at 11:56 am.

Respectfully Submitted:

Jeffrey Salloway, Clerk

Commission to Study Environmentally-Triggered Chronic Illness

HB 511

RSA Chapter: 126-A: 73

11-13-17

- I. Meeting was called to order at 10:06 am by Chairman Pearson.
In attendance were: Reps. Salloway, Pearson, Messmer, Ohm and Guthrie;
Sen Fuller Clark, Mr. Dumond, Ms. Cappiello and Ms. Costello.

A: Rep. Pearson reported on the overlap with the Seacoast Cancer Cluster Commission and the potential for joint session.

B: Rep. Olm has recommended that Rep Pearson visit with DHHS to discuss data needs.

1. This is an ongoing discussion.

C: Mr. Bates is out ill.

D: Next meeting is Dec. 8 and may be a joint meeting.

II. Rep. Salloway introduced Professor Robert Woodward retired health economist from UNH.

A: Dr. Woodward reviewed his methodology for assessing cost-effectiveness of risk mitigations vs. the benefit of risk reduction.

1. One problem is assessing the cost paid by the reinsured. Costs include hospital costs, physician costs and then last days at work, caregiving; it becomes quite complex.
 - a. He compared the value of risk vs. a value such as housing accessible to a beach.
 - b. He cited the need for small scale analysis; small geographical units.

B: Mr. Dumond noted the difficulty measuring the cost of lead abatement vs. increases in rent.

1. Dr. Woodward posed an alternative approach to lead: rent only to older residents.

C: Rep. Olm asked about direct and indirect costs.

1. Dr. Woodward discussed air pollution and asthma as indirect costs.

D: Rep. Pearson noted the argument of cost-effectiveness vs. compassion.

1. He asked for links to literature on cost effectiveness.
2. Dr. Woodward indicated that this literature is risk-specific. There is the potential for a map of chronic illnesses and some data on cost. He would be willing to collaborate with DHHS, Ms. Costello and Rep. Salloway.

E. Rep. Messmer asked for Dr. Woodward's publications.

F: Rep. Olm asked if there were confidence levels on predictions of cost effectiveness.

G: Rep. Messmer noted the need to generate data.

H: Rep. Salloway noted a study on air pollution and asthma. It was difficult to demonstrate a relationship. He noted the precautionary principle.

1. Dr. Woodward reviewed the tension between this precautionary principle and cost effectiveness.

Ms. Costello noted the need for analysis of attributional risk.

1. Dr. Woodward described his own work on indirect costs of air pollution in Maine.

J: Rep. Pearson thanked Dr. Woodward and threatened further contact! III.

Sen. Fuller Clark asked for a definition of chronic disease.

A: Rep. Salloway identified cancers, metabolic and neurologic disease.

1. Mr. Dumond and Dr. Bush discussed what is available as coded data.

B: Ms. Costello provided a list which Dr. Wold had offered.

1. She noted the public health tracking grant and the possible convergence with the work of the commission.
2. Dr. Bush listed the diseases she is tracking on her grant.
3. Mr. Dumond described the resource limitations on DHHS and the tracking grant.

C: Dr. Woodward advised the use of correlation coefficients rather than map points.

1. Dr. Bush agreed.

D: Rep. Olm asked about spurious correlations.

1. Dr. Woodward replied that this is an arcane art.
2. Rep. Salloway discussed the problem of multi-collinearity in data.

E: Sen. Fuller Clark questioned how the commission might move forward to identify specific threats.

F: Mr. Dumond documented the risk factors already being identified by DPHS.

IV. Meeting adjourned by 11:25 am.

Respectfully Submitted:

J.C. Salloway, Clerk

raft,

Commission to Study Environmentally-Triggered Chronic Illness
December 15, 2017
Minutes of the meeting

IN ATTENDANCE: Mike Dumond-DHHS, Pamela Levesque, Clark Friese, Tom Sherman, Rep. Mindi Messmer, Rep. J.C. Salloway, Rep Mark Pearson, Sen. Martha Fuller-Clark, Thomas Wold

- I. Call to Order
 - A. Commission was called to order at 10:10 by Chairman Pearson
 - B. Minutes for 10-20-2017 were moved.
 - 1. Dr. Sherman noted a spelling correction for Wainsatt
 - 2. Sen. Fuller-Clark asked for an attendance list
 - C. Minutes for 11/13/17 were moved
 - 1. Dr. Dumond voted a change to DPHS and not DES in III F.

- 11. Sen. Feltes appeared in testimony on the lead abatement bill
 - A. Bill has passed committee- Senate Bill 2471
 - 1. Seeks to reduce to 5 micrograms blood level.
 - 2. Mandates universal testing
 - 3. Adds water testing
 - B. This is a bipartisan bill.
 - C. Children are being poisoned.
 - 1. Every dollar invested in abatement returns \$17 on investment
 - D. Rep Pearson asked how we might increase press coverage
 - E. Leadership of both parties are in support.
 - F. Sen. Fuller-Clark called for an op-ed piece
 - 1. Rep. Pearson offered to work on this
 - A parallel improvement was the move to unleaded gasoline.
 - G. Ms. Levesque noted the role of the Nurse Practitioners Assoc.
 - H. Mr. Dumond spoke in praise of Sen. Feltes
 - 1. He noted a nationwide drop in lead levels with elimination of leaded gasoline.
 - a. He distributed a chart of lead effects.
 - 2. 700-800 children per year test between 5-10 micrograms per deciliter.
 - I. Rep. Salloway noted rental restrictions as an option.
 - a. Sen. Feltes noted the conflict with the Fair Housing Act.
 - b. Rep. Pearson suggested a warning could be implemented, i.e, avoid lead if you have children.
 - J. Dr. Sherman pointed out the need for tracking procedures for contaminated housing units.
 - 1. Dr. Sherman noted the need for warning to tenants prior to rental.
 - 2. Ms. Levesque asked about opt-out/opt-in provisions
 - 3. Sen. Feltes and Mr. Dumond both spoke of current procedures to screen for lead.

Chairman Pearson returned to the minutes of 11-13-17

- A. Mr. Dumond moved to accept with corrections, Rep. Messmer seconded.

B. Motion passed.

- IV. Asst. Commissioner of DES Clark Frieze spoke on collaboration between DES & DHHS
 - A. There is extensive sharing of data.
 - 1. DES & DHHS created a coordinated program to get public health needs regarding contaminated water —testing water/testing blood.
 - B. Rep. Pearson described the problem of identifying what is knowable and where data is accessible.
 - 1. Ms. Levesque asked how the data sharing process was put into place.
 - 2. Rep. Messmer asked what barriers exist to merging data on environmental risk and healthy outcomes. How do we make a dashboard work?
 - 3. Dr. Sherman pointed out the extreme diversity of data bases and the challenge of redirecting the complexity of these data sets.
 - a. Commission Frieze spoke of the IT challenges.
 - b. There are shortcomings in the current system.
 - C. Rep. Pearson summarized the needs of the commission.
 - 1. Dr. Sherman asked DES to consider how we might create a solution to the data needs of the commission.
 - 2. Commissioner Frieze said this was difficult and expensive and you can get it wrong!!
 - 3. Rep. Sherman asked what we have to do to accomplish this.
 - a. Commissioner Frieze suggested the need to have a consultant to map the process.
 - 4. Dr. Wold commented on what the outcomes would look like.
 - a. Dr. Katie Bush said we need to do an IT assessment.
 - 5. Rep. Messmer discussed the pilot studies on arsenic as a demonstration.
 - 6. Rep. Salloway warned that observational studies can be fraught with bias and erroneous conclusions.
 - 7. Mr. Dumond cited the lead analysis as an example of a program that works.
- V. Chairman Pearson discussed future agendas.
 - a. We will meet January 19th and February 9th.

Meeting adjourned at 12:06

Commission to Study Environmentally-Triggered
Chronic Illness
(RSA 126: A: 73)
January 19, 2018
Minutes of the meeting

IN ATTENDANCE: Kathleen Bush, Thomas Wold, Kerry Nolte, Joe Guthour, Rep. Mark Pearson, Rep. J.C. Solloway, Rep. Mindi Messmer, Michael Dumond, Rep. Bill Ohm, Tom Sherman

- _ I. Commission was called to order at 11:15 by Chairman Hon. Mark Pearson
 - a. The Chair reviewed an agenda
 - 1. He introduced Dr. Katie Bush
 - b. Next meeting will be February 9th. c, He welcomed Katie Nolte, Nurse Practitioner.
 - d. Motion to approve minutes
 - 1. Wimsatt is misspelled
 - .2. Mr. Dumond:does not celebrate a doctorate-yet.
 - 3. Minutes were moved, seconded and passed.
- II. Rep. Salloway presented on epidemiologic method.
(See.attached)
 - a. Rep. Ohm & Dr. Sherman and Rep. Messmer continued the discussion. .
 - 1. 'Rep. Messmer summarized the goals of the commission to identify the most pressing risks:to the public and recommendations.
- III: Dr. Katie Bush of DHHS •Spoke'about sources of dates from DHHS.
 - a. In particular she spoke:of the need to inform the public of risks and resources
 - b. DHHS needs to author:new reports from their data bases. They are working in this direction.
 - 1. She sees the need for community profiles.
 - c. Chairman Pearson recommended that the commission include the need for a department to continuously review data in search of unexpected health outcomes.
- IV. Meeting adjourned at 12:50

Respectfully submitted;

Jeffrey Salloway, Clerk

Epidemiology and the Search for Certainty Casual Remarks by J.C. Salloway

- I. Introduction
 - A. The speaker's credentials
 - 1. Prof. Emeritus at UNH — teaching epidemiology
 - 2. Author of four books on epidemiology
 - 3. Author of dozens of published articles
 - 4. Award for total lack of humility and no sense of humor

- U. The Problem:
 - A. Determining
 - 1. What do we know?
 - 2. How confident are we that what we think we know is true?
 - a. Philosophy of Science, cf Kaplan, Conduct of Inquiry
 - B. Jacob's error
 - 1. The torn, bloody coat of many colors — a case •
 - 2. Jacob concludes: An evil beast has killed my sort.
 - 3. Assumptions
 - a. There has been a death
 - b. We know the cause of death
 - c. The perpetrator was evil — a killer rabbit [cf. Monty Python]
 - C. Our challenges in examining causes of disease in populations
 - 1. What is our evidence?
 - a. Are there biases built into our evidence? [cf. Jacob]
 - 2. What are the suspected chains of causality?
 - a. Can we demonstrate the causal chains?
 - 3. How confident are we of
 - a. Cases — are they real?
 - 1. Are there confounders?
 - b. Causes?
 - D. The importance
 - 1. Is our standard of proof agreed upon?
 - a. Scientists vs. the courts — the case of chlordane heptachlor.
 - b. In civil suit, the plaintiffs lost. In administrative action the government banned the possible pathogen.
 - 2. If we aim to intervene to reduce cases, we need to have full confidence in what we know.

III. Types of Studies

A. Observational

1. Descriptive
 - a. Disease surveillance and surveys
 - i. Static and dynamic
 - b. Ecological
 - i. Comparing regions which are different in their exposures
2. Advantages of observational studies [retrospective or case-control studies]
 - a. Fast
 - b. Cheap
 - c. Intellectually appealing
3. Disadvantages of observational studies
 - a. There are no controls over duration of exposure, dose, time in the life cycle, migration of those exposed, etc.
4. Quantifying observational studies
 - a. Calculating risk
 - i. Attributable risk; attributable risk percentage
Logistical regressions
5. Do observational studies prove causality?
 - a. No! They are indictments but not definitive proofs.
6. Do we reach hard conclusions from observational studies?
 - a. No! '
7. Can observational studies be correct in their allegations?
 - a. Yes, they can!
8. How can we know? The power of statistics and the limits of proof.
 - a. A troubling tale of exposure and the search for truth — Sidney.

B. Longitudinal Studies

- I. Most texts include studies which follow a population over time as observational studies. In a total lapse of of reason, I suggest that they are a better than pure observational studies and not as good as interventional studies. [cohort studies]
2. In a longitudinal study [prospective or cohort studies] rather than looking at data which has been collected, we follow two cohorts forward over time.
 - a. One cohort is exposed to a risk factor, the other is not.
 - b. At the end of the study, we examine the health outcomes of the exposed and the non-exposed to look for differences.
3. Advantages
 - a. This give us a much better look at causality.

4. Disadvantages
 - a. This is much more expensive and takes much longer to do.
 - b. Subject to biases in loss of subjects, subject migration, record-keeping.
 5. Overall this is a far more powerful tool to identify causality — if we have the time and money.
- C. Interventional Studies — The Clinical Trial — the Double or Triple Blind Study
1. The gold standard.
 2. We place people randomly in experimental or control groups.
 3. The investigator and the subjects don't know which groups they are in.
 - a. Real ethical concerns!
 4. We track the progress of both groups before and after exposure.
 5. Only at the end of the trial do we identify who got the experimental intervention and who did not. This is how clinical trials are done.
 6. Are they foolproof? No!
 - a. The Breast Cancer Intervention Trial.
- IV. So How Confident Are We That We Know What We Know?
- V. Policy Implications
- A. The Precautionary Principle
 - B. Public Health Professionals have developed the Precautionary Principle
 1. If we have some evidence that a risk factor is causal for a disease and if the disease has serious consequences and if the the risk factor can be mitigated at reasonable cost to society and if mitigation does not further damage society — we should act.
 - a. Even if we are not totally certain!
 2. However, if we are not certain and if there is substantial cost to mitigation — do we have the right to intervene and demand mitigation?
 3. And so, we are Jacob, faced with the torn and bloodied coat which is our current world.

Commission to Study Environmentally-Triggered
Chronic Illness
(RSA 126: A: 73)
February 9, 2018
Minutes of the meeting

IN ATTENDANCE: Mike Dumond-DHHS, Katie Bush-DHHS, Rep Bill Ohm, Julie Bosak, Tom Sherman, Rep. Mindi Messmer, Rep. 1,C. Salloway, Rep Mark Pearson, Thomas Wold

- I. Call to Order at 10:04 by Chairman Rep Pearson.
 - A. Rep. Pearson announced that he has been able to place a bill regarding sharing of data between DHHS and DES on the House Consent Calendar.
 - 1. Today's task is to review and implement the charge to the committee.
 - 2. Minutes of 1-19-2018 were distributed and reviewed.
 - 11. Chairman Pearson began to lead the commission in review of charges to the commission.
 - A. , Rep. Messmer commented on methods of deliberation-Environmental Public Health Tracking Program.
 - 1. Rep Ohm suggested addressing broader public health topics.
 - 2. Rep Salloway commented.on the commission's need to focus on policy and procedure rather than specific risks.
 - 3. Rep Ohm and Rep Messmer and Dr. Wold discussed identifying key agencies to name as policy partners.
 - 4, Mr. Dumond outlined the relation between DES & DHHS.
 - a. The Institute for Health Policy and Practice at UNH is to be included.
 - b. Rep Messmer noted that entities at DHHS and UNH are often grant funded. Thus theynay not be permanent.
 - c. Mr. Bates noted that the Div. of Public Health Services is the overarching organization.
 - 1. State Medicaid should be included,
 - 5. Dr. Wold suggested adding NIH, CDC, National Institute of Environmental Health Services.
 - 6. Dr. Sherman added NH Dept. Of Corrections. :1/4
 - 7. Rep. Salloway asked dr. Bush to comment of the DHHS Wisdom system.
 - 8. Rep Ohm asked aboutdata available from Dartmouth.
- Rep. Salloway recommended the need fora local public health infrastructure.\
- A. Mr. Dumond described our Regional PUBlic Health Networks and state public health planning councils. We do not have to bash county public health systems.
 - 1. Rep Salloway asked if the commission ought to recommend the mandate of county public health departments. Mr. Dumond recommended an initial review of current structures.
 - a. Dr. Sherman and Mr. Dumond will cooperate in assessing what structures exist in the state.
 - B. Rep Ohm asked for a definition of higher than expected rates.
 - 1. This is an epidemiological determination.
- IV. Dr. Sherman described news media outlets.

- A. Dr. Sherman noted that a state media organization probably exists.
 - 1, Rep Salloway will contact Howard Altshiller to ask.
 - 2. Mr. Diemond described the DHHS media system.
- B. Rep Ohm asked for definitions- is there a threshold for informing citizens?
 - 1. Dr. Wold noted that information can flow up from local officials and down from the state.
 - 2. Mr. Dupont explainedthat DPHS currently does not have its own public relations person, but that the Departmentdoes have a Public Information Officer.

3. Dr. Bush suggested that health care providers were important partners in the distribution of health information.
 - 4, Dr. Sherman recalled successes and lapses in efforts to disseminate public health information,
 5. Ms. Bosak described what data flows down.
 - a. Mr. Dumond described what data flows down.
 - b. Chairman Pearson decried inflammatory announcements from the media.
 - c. Dr. Sherman and Rep Salloway discussed creation of a public health/media advisory group to assist DHHS in crafting responsible information dissemination.
 - d. Rep Messner noted the Kingston drought and fire station incident re: PFC's.
 - 1, Fire stations commonly release some fire suppressants with PFC's and thus contaminate wells.
- V. No. 4 reproduces item #1.
- VI. Dr. Wold suggested using the list of indicators used in the WISDOM database.
 - A. Dr. Sherman spoke on the example of the Seacoast cancer cluster.
 1. Mr. Dumond described DHHS privacy protections.
 2. There is a need for data use agreements which are ironclad.
 - a. Dr. Bush says data is DE identified
 - b. Amy Costello will be asked to work with Rep Messmer on this.
 - 3, Rep Salloway, Mr. Dumond, Dr. Bush and Dr. Sherman discussed privacy protections.
- VII. This is covered in items 1 & 4. To be done
- VIII. This is covered under other headings.
 - A. The gap is with environmental data. To be continued
- IX. Follow from items 8 & 9.
- X. Discussion followed on using diagnostic tests at the practitioners' level.
 - A. Dr. Sherman and Dr. Wold and Rep Messmer addressed screening tests and surveillance.
 - B. It is essential that patient surveillance data from practitioners flow up.
- XI. There needs to be a coordinated effort to train practitioners.

Next meeting will be Friday April 13th at 10am

Clerk will list tasks and agents. Mr. Bates will circulate contact information

Meeting adjourned at 12:18p.m.

Respectfully submitted,

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Commission to Study Environmentally-Triggered
Chronic Illness
(RSA 126: A: 73)
April 13, 2018
Minutes of the meeting

In Attendance: Rep. J.C. Salloway, Rep. Mindi Messmer, Julie Bosak, Rep. Mark Pearson, Rep Joe Guthrie, Tom Sherman, Mike Dumond, Thomas Wold

- I. Call to Order at 10:10 by Chairman Rep Pearson.
 - A. Rep. Pearson reported on the progress of HB 1356 mandating collaboration between DHHS & DES.
 - B. Rep. Pearson spoke to final results emphasizing the need to facilitate data flow.

- II. Homework Assignments
 - A. Rep. Pearson asked Rep. Salloway to report on Media announcements of environmental risks.
 1. Howard Altshiller of Seacoast Media Group provided information.
 2. The committee added links from DHHS & DES to the public.
 3. Rep Pearson suggested creating categorized lists for public, professionals, and environmentalists.
 - a. Dr. Sherman suggesting regionalized lists.
 4. Rep. Pearson noted the need to include Mass, Maine and Vermont TV Media.
 5. Rep. Salloway will update the distributed list as passed out by Mr. Bates.
 - a. DHHS & DES can be asked to create categorized lists. They already do this.

Salloway	Where does the decision get made as to how widely info is disseminated?
Sherman	By rule we want to protect privacy but not insult public.
Pearson	Not insult, but unnecessarily alarm. Sounds like DES/DHHS have thought of this.

6. Mr. Dumond cautioned to meet the levels of health literacy in the public.
 - a. Rep. Pearson will invite PTO's from DHHS & DES for our next meeting.

- III. Dr. Sherman reported on the committee with Dr. Bush and Mr. Dumond.
 - A. How to communicate risk and public health.
 - B. They asked what data they have.
 1. Dr. Bush had previously distributed much material.
 2. Dr. Sherman chronicled the number of contaminants that we may not know.
 - a. He described the current methods used in emerging contaminants. Their data is at the town level.
 - b. The key is how granular the data can be reported without violating privacy.
 - c. Rep. Salloway noted that we can get down to census track data but this is not equivalent to exposure time.
 - d. Data maybe misleading.
 - e. Commission could recommend review of the rules regarding privacy.

C. Claims data, cancer registry, hospital data are all available.

1. Amy Costello and Tyler Boannon have reviewed these data bases previously. Some data is missing.

- 2. Dr. Sherman believes the volume of missing data is small.
- D. Mr. Dumond noted that DHHS is updating systems.
 - 1. The committee learned a great deal from Massachusetts
- E. Dr. Sherman recommended regional coordination.
- F. Mr. Dumond suggested the limits of sharing data.
- G. Dr. Bush described national efforts at coordinating methods, software and data.
 - 1. Mr. Dumond and Dr. Bush have limited time availability to participate in the final report.
- IV. Chairman Pearson reviewed what we need to accomplish in the final report.
 - A. Rep. Messmer pointed out that these are bills in the Senate to fund a state toxicologist and risk assessment.
 - B. Dr. Sherman cautioned the absence of Dr. Bush and retirement of Mr. Dumond.
 - C. Dr. Wold added to Rep. Messmer's list of diseases to track.
 - D. Mr. Dumond noted the costs which Mass spent on similar activity.
 - 1. There is increased Federal funding.
 - E. Rep. Salloway reviewed general directions for a final report.
 - F. Rep. Messmer went arsenic and bladder cancer.
 - 1. She suggested extension of the life of this commission
 - G. Dr. Wold commented on Mass. Link of cost to clinical outcomes.
 - 1. Dr. Sherman explicated that link.
- V. Next meeting will be

Meeting adjourned at 12:00 PM.

The next meeting will be held on June

1st. Respectfully submitted,

Commission to Study Environmentally-Triggered
Chronic Illness
(RSA 126: A: 73)
June 1, 2018
Minutes of the Meeting

- I. Hearing was called to order at 10:07 with the introduction of Jay Chiles a film producer.
 - a. Minutes of the meeting from 4/13 were distributed.
 - i. Rep Pearson reported that HB 1356 was passed by both Houses and been sent to the Governor.
 - b. Dr. Bush and Jackson will attend the next meeting.
 - c. Thanks to Mike Dumond for his service
 - d. Motion to accept minutes made and seconded.
- II. Chairman Pearson has asked that Dr. Sherman's report be circulated to the commission.
 - a. House Bill 1592 re: arsenic and cancer has passed both houses and gone to the Governor. This is a successful outcome of the Commission.
 - b. Sen. Fuller-Clark suggested that the Commission send a letter to our Congressional delegation requesting that the EPA release its data on risks in NH.
- III. James Martin of DES joined us to discuss his role as Public Information Officer for DES.
 - a. Rep Salloway posed a detailed set of questions about how information gets distributed.
 - i. The NH media market is not segmented. Press releases go out to TV, radio and joint media.
 - a. Posts go to DES's webpage.
 - b. There is an email list for those who request it. And a Twitter account, these are about 6,000 hits
 - c. Chairman Pearson asked about out of state TV.
 1. Mr. Martin noted that these are minimal.
 - d. Sen Fuller-Clark asked how media are promoted.
 1. Chairman Pearson suggested an op-ed in the Union Leader to promote email & Twitter contacts
 - e. Chairman Pearson asked how to protect about panic.
 1. Mr. Martin offered examples.
 - ii. One was the St. Gobain situation in southern NH this led to a very large ground water investigation.
 - iii. Rep Messmer asked for further details.
 - iv. There has been direct communication with residents.

f. DES puts our monthly municipal eco letter. Drinking/groundwater puts out a quarterly newsletter.

- g. Rep Salloway asked about direct communication with residents. i Mr. Marting chronicled DES efforts to disseminate information. ii. Sen Fuller Clark asked if resources were adequate for Incident Command System

IV. Jake Lion, Director of Public Information for DHHS

- a. He described DHHS Incident Management Model.
 - 1. He described a blood testing management program.
 - a. Challenge is balancing public demand and program availability.
- b. Sen Fuller Clark asked about resources for the Incident Command System.
 - 1. Mr. Leon was reassuring
 - 2. Sen Fuller Clark asked what demand was.
 - 3. Mr. Dumond described continuous training needs.
- c. Rep Messmer asked if training ought to be expanded on a state level. Mr. Dumond agreed.
- d. Chairman Pearson asked how broad training is for Incident Management.
 - 1. Mr. Leon described coordination of the top levels of DHHS, DES, Homeland Security, etc.
 - 2. Mr. Dumond asked if recipients of notices respond.
 - 3. Chairman Pearson asked about how close Mr. Leon is with local reporters.

V Dr. James Chethaler, State epidemiologist for state public health lab.

- a. Rep Salloway asked for details
 - i. Dr. Chethaler described his responsibilities
- b. Rep Messmer asked for details on water tests vs. serum tests
- c. Rep Salloway asked if resources were adequate.
 - i. There are so many new chemicals-no lab could trace them all.
- d. Mr. Dumond asked about federal grant support
 - i. He asked what path of results exists. How are results reported?

VI. Commission continued with review of letter to Congressional Delegation

- a. The letter will come from legislators.
 - i. Letter was edited.

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Meeting was adjourned 11:30.

Commission to Study Environmentally-Triggered
Chronic Illness
(RSA 126: A: 73)
September 28, 2018
Minutes of the Meeting

- I. Meeting was called to order by Chairman Pearson at 10:12.
- II. The Committee reviewed minutes of the meeting of 6-1-2018.
 - A. Sen Clark asked for the list of attendees and moved inclusion of the list.
Motion passed.
 - B. Gobain is to be St. Gobain
 - C. Dr. Chithalen's title is Toxicologist.
 - D. Correct Jim Chiles to Jay Chiles.
 - E. VI, A- letter will come from legislators.
 1. That letter should be posted under documents on our website.
 - F. Sen Fuller Clark asked for distribution of revised minutes. Motion passed.
- III. Lisa Morris, Director of Public Health Services came forward.
 - A. Dr. Sai Cherala, Director of Population Health
 - B. Michelle Roberge appeared.
 - C. Lisa Morris presented her preliminary report and signed memo of agreement with DES.
 - D. She described a proposed pilot study on arsenic and uranium exposures.
- IV. Dr. Cherala reported on the progress of DPH and DES toward data sharing.
 - A. The work group established standard operating procedures. This is not yet final.
 - B. She described pilot studies proposed for arsenic and uranium.
 1. The work group is examining what data exist on exposures and outcomes.
 2. Is it possible to do this?
 - C. Rep Ohm compared the proposed pilot to the need for research on opioids. 1.
Lisa Morris replied.
 - D. Rep Salloway noted that opioid is a policy issue and arsenic/uranium is environmental.
 - E. Dr. Sherman commented that environmental risk is not going away. Federal funding will go away. We need to do long-term planning.
 1. Rep. Pearson asked if this would be embedded in the budget process.
 2. Amy Costello noted that federal funding may shift.
 3. Rep Pearson related toxic waste dumping in Leominster, Massachusetts. He recommended including cost effectiveness measures in the documents.

4. Rep Pearson and Salloway encouraged contact with Prof. Robert Woodward in Lee, NH.
5. Sen Fuller Clark asked what financial resources are in place and what is needed to do this work.

Commission to Study Environmentally-Triggered
Chronic Illness
(RSA 126: A: 73)
October 16, 2018
Minutes of the Meeting

Members present: Amy Costello; Rep. Bill Ohm; Rep. J.C. Salloway; Rep. Mark A. Pearson; Tom Sherman; Rep. Mindi Messmer; Lisa Morris; Sen. Martha Fuller Clark; Rep Joe Guthrie; Thomas Wold; Michele Roberge.

- I. The meeting was called to order by Chairman Pearson at 10:06.
 - A. Michele Roberge introduced herself
 - B. The Chairman asked for review of the amended minutes of June 1. Turned 'Legislatures' to 'legislators'. Minutes approved as amended.
 - C. Chair asked for review of minutes of September 28. Minutes were approved with amendments.
- II. Chairman Pearson reviewed an agenda
 - A. Commission can elect to include submitted documents as
 1. Part of the final report
 2. Appendices
 3. Posts on the website.
 - B. Dr. Sherman noted that extension of the work of the commission ought to proceed as a commission to include non-legislators.
 - C. The Chair asked if Rep. Salloway's testimony on epidemiologic method ought to be included.
 1. Rep. Ohm and Dr. Sherman recommended that it be referenced in the report and included in an appendix.
 - a. Rep. Messmer will write a paragraph representing the conclusions. Rep. Salloway will assist. The full document will be in an appendix. So moved by Sen. Fuller Clark and approved.
 - D. Dr. Bush's report is already included.
 - E. Dr. Sherman's sub-committee report is already included. He recommended a summary paragraph.
 1. Sen. Fuller-Clark suggested a summary of recommendations.
 2. Rep. Ohm suggested an executive summary.
 - a. Sub-Committees will meet and their work will be circulated electronically.
 3. Sen. Fuller-Clark suggested omitting the initial list of charges to the commission.
 - a. Dr. Sherman suggested including a summary of the charges in the abstract.
 - b. Mr. David Bates recommended putting the charge into the appendix.

- c. Dr. Wold suggested placing recommendations following each of the four sub-headings.
- d. Dr. Wold asked to soften verbiage on up-coding.

- e. Ms. Costello suggested omitting "while the CRIS data set" and "The CHIS data set is limited" and the full paragraphs.
 - i. Each data set has strengths and limitations.
 - ii. Dr. Bush encouraged a general statement on limitations of data sets. She noted that all data bases are limited.
 - iii. D. Sherman and Rep. Messmer agree on the need to note that there are data base limitations.

- 4. Rep. Ohm asked for an executive summary to be circulated in advance of a final meeting.
- 5. Dr. Wold, Dr. Sherman and Rep. Messmer will attend to an executive summary. Rep. Pearson will participate along with Rep. Ohm.
- 6. Commission will meet 10/30 at 10:00am.

III. Chair Pearson discussed legislation to continue the commission.

A. Dr. Bush reported that DHHS has a draft document for supportive legislations to fund health and chronic disease capacity.

- 1. Sen. Fuller Clark asked if there was a budget request yet. There is not.
- 2. Lisa Morris reviewed the status of the request.
- 3. Rep. Messmer spoke in support.
- 4. Rep. Ohm observed that support at this time goes beyond the charge to the commission.
- 5. Dr. Sherman approved the initiative and suggested the initiative for the next commission.
- 6. Sen. Fuller Clark suggested that we include a call for further resource development.
- 7. Dr. Wold approved of the need for further resources.
- 8. Rep. Guthrie asked Dr. Bush to identify where DHHS is in the process, she deferred to Lisa Morris. She placed this as an early initiative.
- 9. Dr. Chithalen, state toxicologist, clarified which federal funding was providing.
- 10. Dr. Sherman reviewed the progress we have made.

Motion to adjourn by Rep. Salloway. Second by Rep. Guthrie. Adjourned at 11:20.

Commission on Environmental Risk and Chronic Disease
Tuesday, Oct. 30, 2018
RSA 126-A:73
Minutes of the meeting

- I. Meeting was convened by Chairman Pearson at 10:08
- Chair asked for review of the minutes of 10-16-18.
 - Rep. Messmer moved approval of the minutes
 - Dr. Sherman seconded
 - Minutes were approved as distributed.
- II. Final Report
- Chair reviewed the status of the final report and distributed copies to the committee
 - Rep. Ohm moved approval of the report. Rep. Guthrie seconded.
 - Dr. Sherman requested an executive summary.
 - He added the need for a conclusion calling for extension of the commission.
 - Further he asked for inclusion of the appendices.
 - He moved an added conclusion continuing the commission.
 - Rep. Messmer called in addition for inclusion of her written additions.
 - Rep. Ohm asked for review of these Rep. Messmer additions.
 - Dr. Wold noted that additional pieces could be included on the website.
 - Rep. Guthrie asked if this chair would file continuation legislation.
 - Dr. Sherman observed that conclusions were incomplete.
 - The Chair noted that he would support this
 - Dr. Sherman moved an amendment for the commission to introduce legislation to continue the work of the commission for two years. Rep. Guthrie seconded.
 - Rep. Ohm spoke in support — passed unanimously

Motions to amend

- Rep. Messmer asked for inclusion of an executive summary
- The Chair suggested placing it on the website
- Rep. Ohm objected.
- Dr. Sherman suggested referencing materials which are on the website in the final report.
- Dr. Wold spoke in support of Dr. Sherman
- Rep. Salloway questioned if the website appears with the full authority of the commission.
- Rep. Ohm called for a limit to the scope of our work
- Ms. Costello spoke in favor.
- Clerk of the House, Paul Smith, reviewed options for inclusion of a minority report.
- Additional reports may be included as appendices.
- Dr. Sherman observed that these documents can be included on the website. Or it can be a print appendix. Or it can be a minority report.

- Rep. Ohm noted that the appendix has not been distributed.
- The Clerk observed that the website is an appropriate location for additional materials.
- Rep. Salloway asked about an executive summary
- Dr. Wold denied the need for executive summary.
- Rep. Salloway pointed out that continuation of the commission is not guaranteed.
- Dr. Sherman spoke for inclusion on the website.
- Dr. Wold and Rep. Messmer spoke on the means by which serious materials with real consequences might be included.

IV. Approval of report as amended. Approved 8-1.

- Dr. Sherman moved that any member of the commission be allowed to add to the website.
- Ms. Costello seconded
- The clerk noted that work ceases November 1.
- A minority report must be submitted by 4:30 pm on Nov. 1st.
- Chair inquired of the clerk how best to proceed.
- Dr. Wold asked for review of tactics. Dr. Sherman and Ms. Costello commented.
- Rep. Ohm noted the tight deadline.
- Ms. Bosak asked about the time deadline.
- Dr. Sherman explained his position. He called the question.

Motion passed 8-1

Rep. Messmer passed out her addendum

Dr. Sherman moved to adjourn at 11:15 a.m.

Respectfully submitted,

Rep. J.C. Salloway, Clerk

Appendix B:
HB 1356 Preliminary Report



Jeffrey A. Meyers
Commissioner

Lisa M. Morris
Director

STATE OF NEW HAMPSHIRE
DEPARTMENT OF HEALTH AND HUMAN SERVICES
DIVISION OF PUBLIC HEALTH SERVICES

29 HAZEN DRIVE, CONCORD, NH 03301
603-271-4501 1-800-852-3345 Ext. 4501
Fax: 603-271-4827 TDD Access: 1-800-735-2964
www.dhhs.nh.gov

August 31, 2018

Honorable Representative Mark Pearson, Chairman
Commission to Study Environmentally-triggered Chronic Illness
Legislative Office Building/Room 205
Concord, NH 03301

Re: HB 1356 (RSA 126-A:76, III, Chapter 296:1, Laws of 2018)
*Report on Data Sharing between the New Hampshire Departments of Health and Human Services
and Environmental Services.*

Dear Chairman Pearson:

As required by HB 1356 (RSA 126-A:76, III, Chapter 296:1, Laws of 2018), please find the attached preliminary report on data sharing practices between the Departments of Health and Human Services and Environmental Services. The following documents are enclosed:

- HB 1356-Final Version
- Preliminary Report
- Appendix C-Inventory Arsenic Data
- Memorandum of Agreement

A presentation of the report to your Commission to Study Environmentally-Triggered Chronic Illness will be held at the next regular meeting scheduled for September 28, 2018. Please let me know if you have any questions by contacting me.

Respectfully submitted,

A handwritten signature in black ink that reads "Lisa Morris".

Lisa Morris
Director

ENCLOSURES

CC: House Speaker Gene Chandler
Senate President Chuck Morse
Honorable Michael York, New Hampshire State Librarian

MEMORANDUM OF AGREEMENT
between the
DEPARTMENT OF HEALTH AND HUMAN SERVICES/DIVISION OF PUBLIC HEALTH SERVICES
and the
DEPARTMENT OF ENVIRONMENTAL SERVICES

This Memorandum of Agreement (MOA) describes the environmental health data sharing activities that have been agreed to between the Department of Health and Human Services, Division of Public Health Services (DHHS/DPHS), and the Department of Environmental Services (DES). The goal of the MOA is to build on existing state capacity and expertise in environmental health surveillance to make information-driven decisions to protect public health. Through this MOA, DHHS/DPHS and DES are able to consistently design, implement, and evaluate environmental public health actions which are supported by environmental health data and information which are scientifically valid, useful, and meaningful.

This MOA covers the period July 1, 2018, through June 30, 2022. The MOA contains the option to renew for an undetermined period of time based on agreement of the parties. This MOA replaces any other agreements that have established between DHHS/DPHS and DES for a specific program.

For the purposes of this MOA, DHHS/DPHS and DES agree to cooperate as follows:

I. Department of Health and Human Services/Division of Public Health Services

The Department of Health and Human Services/Division of Public Health Services agrees to:

1. Assist DES with project planning and implementation when appropriate.
2. Assist DES staff with access to aggregated public health data via the NH Health WISDOM Data Portal.
3. Assist DES staff with access to data within the DHHS Enterprise Data Warehouse.
4. Share technical expertise on data interpretation.

II. Department of Environmental Services

The Department of Environmental Services, agrees to:

1. Assist DHHS/DPHS with project planning and implementation when appropriate.
2. Assist DHHS/DPHS staff with access to environmental monitoring data via DES OneStop and explore opportunities for direct access to database systems as deemed appropriate by DES staff.
3. Abide by the confidentiality rules defined by DHHS/DPHS to protect the identity of all personal information within health records as outlined in 'Guidelines for Public Release of Public Health Data'.
<http://www.dhhs.nh.gov/dphs/hsdm/documents/publichealthdata.pdf>
4. Share technical expertise on data interpretation.

III. Mutual Agreements of the Parties

It is further understood and agreed between DPHS and DES:

1. The parties will maintain communication via regular meetings between program staff to ensure collaboration on work that is being conducted.
2. The parties agree to facilitate the exchange of information and appropriate data sets to support work in the field of Environmental Health.
3. That this MOA may be modified in writing at any time by mutual consent of both parties.
4. In the event that changes in either State or Federal laws or regulations occur which render the performance of the activities set forth in this MOA illegal, void, impractical or impossible, this MOA shall terminate immediately.
5. The parties will review this MOA at least once each year to determine whether it should be revised, renewed, or terminated.

IN WITNESS WHEREOF, the respective parties have hereunto set their hands on the dates indicated.

Jeffrey A. Meyers
Commissioner

Robert R. Scott
Commissioner

Preliminary HB 1356 Legislative Report

New Hampshire Department of Health and Human Services/Division of
Public Health Services and New Hampshire Department of
Environmental Services

August 30, 2018

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Introduction

The following is a preliminary report on deliverables related to House Bill (HB)1356, which directs the Department of Environmental Services (DES) and the Department of Health and Human Services (DHHS) to improve the data sharing and usability of health and environmental data.

Data are an important tool that can help build common understanding, allow for more informed decision making, and improve efficiency and effectiveness. This preliminary report includes background information on communication and engagement processes across DES and DHHS, a memorandum of agreement, an update on standard operating protocol, and arsenic-related data assets. The next report will include final standard operating protocols, description of a pilot project, and cost estimates of the pilot.

Background

HB1356 charged the DES and DHHS to establish a data sharing protocol for health and environmental information collected by each agency. Under HB 1356 (attached as Appendix A), DES and DHHS were asked to provide a report on or before September 1, 2018 to the Speaker of the House of Representatives, the Senate President, the State Library, and the commission to study environmentally-triggered chronic illness to include the following items:

- a. An updated memorandum of agreement (MOA) regarding data sharing between the DES and DHHS.
- b. A standard operating procedure on how data can be shared between the two departments to identify linkages between environmental contaminants and health outcomes.
- c. A description and estimate of the cost to perform a two-way pilot project on arsenic in drinking water, a contaminant where both health effects and environmental data exist.

This preliminary report reflects on an approach that is intended to foster the relationship and build the investment necessary to accomplish this task within both agencies and among stakeholders in order to assure that HB1356 and the larger data-sharing vision will be sustainable over time. Multiple interagency meetings have taken place in order to respond to the requests as outlined by the bill. This process ensured that careful consideration was given to the resources across both agencies while also considering the feasibility and public health importance of the environmental issues at hand.

Memorandum of Agreement

The mission of DHHS is to join communities and families in providing opportunities for citizens to achieve health and independence. Promoting and protecting health and preventing disease are key functions of DHHS through the work of the Division of Public Health Services (DPHS).

The mission of DES is to help sustain a high quality of life for all citizens by protecting and restoring the environment and public health in New Hampshire. The preservation and wise management of New

Hampshire's environment are the important goals of the DES.

Environmental health and welfare for all citizens of the state are responsibilities shared by DHHS and DES. These organizations have a long history of working together to address environmental health concerns, and have focused on the accountability of public agencies, quality and efficiency in addressing the needs of citizens, improving health outcomes, and consistency in messaging. In recent years, DES and DHHS officials have faced community concerns over higher-than-expected rates of cancer and chronic diseases and existing and emerging environmental issues. To proactively address these ongoing concerns, DHHS and DES have worked to update the existing MOA to be more inclusive of DES and DHHS programs. This will allow the agencies to collect health data and information that are scientifically valid, useful, and meaningful and, as a result, will improve consistency of design, implementation, and evaluation of environmental public health actions which are supported by environmental data.

The MOA directly aligns with the primary goals of DES and DHHS which are to protect, maintain, and improve the health of all New Hampshire citizens. Moreover, it integrates data and expertise from DES and DHHS into public health practice. The updated MOA is attached under Appendix B.

Standard Operating Procedure

An interagency team of technical staff are working to establish the standard operating procedure (SOP) for data sharing. The workgroup has been making advancements towards identifying and establishing the purpose, key principles, responsibilities, staff leads, and the processes and procedures necessary for data sharing. This process will ensure that careful consideration is given to the existing data sources, legislation, and rules surrounding privacy protections.

The process to finalize the SOP has been delayed due to vacancies/absence of key staff including bureau chiefs for the Bureau of Public Health Protection and Bureau of Public Health Statistics and Informatics. Once finalized, the interagency team will provide regular updates and a final standard operating procedure on data sharing across agencies.

Pilot Project

In recent years, DHHS and DES staff have faced community concerns over higher-than-expected rates of cancer and chronic diseases as well as other emerging and existing environmentally-related concerns. Approximately 450 substances are known or reasonably anticipated to be carcinogenic, but there are substantial practical challenges in attributing individual cancers or chronic diseases to specific chemical exposures. The existing public health data or environmental data sources and conventional statistical approaches can be labor-intensive and may not be sufficient at determining whether an increase in a health outcome (including cancer or chronic disease) are real or due to random variation. These data sets don't provide conclusive answers about causes of disease. Whether an individual develops a disease or condition depends on the type, dose, and timing of the environmental exposure, whether they have also been exposed to other toxic compounds (such as radon or tobacco), and many personal factors such as genetics, nutrition status, and overall health.

The situation in New Hampshire reflects the current state nationally and illustrates a clear need for new methods to assess and investigate cancer and chronic disease links to environmental contaminants including arsenic. To address the common underlying concern that environmental pollutants may be causing cancer or chronic diseases and to fulfill the deliverable under HB1356, DES and DHHS are proposing a pilot project between the departments on arsenic in drinking water.

The interagency team and academic researchers from Dartmouth Toxic Metals Superfund Research Program developed a pilot project between the departments on arsenic in drinking water. The team proposed evaluating current collaborations across the agencies, current data assets, limitations relating to linking health and environmental data, and the scientific feasibility and public health importance of the proposed pilot to assure resources are used wisely. At this point in time, due to absence of key staff, the interagency team could not complete the work on the pilot proposal. A subsequent report is forthcoming that will include details of the pilot.

Current Collaborations

DHHS and DES have had various collaborations over the years around addressing public health concerns. The following highlights two projects in particular. The New Hampshire Public Health Laboratories (PHL), NH Biomonitoring Program (located within DHHS) has received a five year cooperative agreement from the Centers for Disease Control and Prevention to conduct two biomonitoring studies: 1) a targeted study assessing arsenic and uranium exposure from private well water and 2) a statewide surveillance study assessing exposure to a panel of metals (including arsenic and arsenic species), pesticide metabolites, per- and polyfluoroalkyl substances (PFAS), and cotinine (a nicotine metabolite). The Biomonitoring Program is about to enter Year 5, the final year of the agreement. Both projects are leveraging interdepartmental relationships and resources. The following will describe one of these efforts.

Collaboration Example: The Targeted Arsenic and Uranium Public Health Study

The Targeted Study aims to assess the relationship between arsenic and uranium in private well water and body burden by testing both household drinking (well) water and individuals' urine for those metals. The PHL worked with the Environmental Public Health Tracking (EPHT) Program to identify twenty-five (25) towns at increased risk for having arsenic above the Environmental Protection Agency's (EPA's) maximum contaminant level (MCL) in their groundwater. Modeling produced by the US Geological Survey was utilized and each data point (within a town) was given an estimate of arsenic risk. The town estimates were averaged and towns in southern and southeastern NH that had an estimated risk of arsenic above the MCL of >35% were selected for this study.

NH PHL staff worked with DES to use the OneStop Well Database for well location identification. DES has a memorandum of understanding (MOU) with the NH Department of Revenue Administration for tax parcel data. The MOU allows for sharing of tax data with NH DES which includes owner name, tax number, property information, and address. This is the most accurate way for DES to find ownership of

the well/property from OneStop information. NH DES was able to share de-identified well, line, and public parcel data with the NH Biomonitoring Program to identify well locations within the targeted towns.

The NH Biomonitoring Program worked to overlay the MOSAIC tax data with the GPS coordinates from OneStop. Wells in public water systems were removed from the study, as public water systems must treat their water to meet the EPA MCLs for all contaminants, including arsenic and uranium. Parcels that contained no wells or more than one well were also removed, as well as parcels without complete address information. The remaining addresses were run through the NH Department of Safety's E9-1-1 address locator to verify accuracy and correct any obvious errors. What remained was an inventory of property addresses with a well registered in OneStop.

These addresses were randomized and some households were selected for invitation into the study. The households were mailed recruitment postcards and letters. Those interested contacted the Biomonitoring Program and people who were at least 5 years old were enrolled, and an in-person meeting was scheduled. Informed consent/assent was given at the meeting followed by administration of the exposure survey. This survey collected demographic, occupational, and recreational information as well as a limited health history (self-reported) and food intake assessment. Participants then self-collected urine and water at their homes on a pre-determined date. Water and urine samples were packaged into a cooler, picked up by a contracted courier, and delivered to the NH PHL for testing by the Water Analysis Laboratory and the Biomonitoring Laboratory. As previously mentioned, water was tested for arsenic, uranium, and VOCs. As part of the incentive for participation in this study, water was also tested for cadmium, iron, manganese, copper (stagnant/flushed), lead (stagnant/flushed), hardness, and pH. The Biomonitoring Program also worked with the NH DES Methyl-tertiary-butyl-ether Remediation Bureau to coordinate free volatile organic compound (VOC) testing of private well water for participants who consented to this process. Water reports were mailed to the participants upon testing completion and, urine reports will be mailed at the conclusion of the study (this study is ongoing).

Throughout this process, the NH Biomonitoring Program has consulted with the Biomonitoring Technical Advisory Committee (TAC) for feedback on study design and methods. The TAC consists of members of academia, the DES Drinking Water & Ground Water Bureau, the Dartmouth Toxic Metals Superfund Research Program, the New England Poison Control Center, DHHS epidemiologists/statisticians, local town administration, health departments, and hospitals. Data collected from this study will be shared on EPHT's WISDOM health data portal as well as with members of the NH Arsenic Consortium, of which DES and DHHS work very closely together.

The NH Biomonitoring Program hopes to secure future funding from the CDC to continue this testing, as well as receive State funding to augment the program. Continuation of this program is critical for assuring the public's health in NH. First, the Biomonitoring Program hopes to evaluate how NH

addresses the environmental contaminants that were tested in the current project and to determine whether the programs in place are successful in reducing levels of these chemicals in NH residents. Second, the Biomonitoring Program is working closely with the DES to determine what new contaminants of concern are emerging and then incorporating them into the NH Public Health Laboratories' test panel. The Biomonitoring Program will reapply for federal funding through a competitive process in 2019. This competitive application is strengthened if the applying state has State funding available to enhance or expand the Biomonitoring Program.

The interagency team has presented The Targeted Arsenic and Uranium Public Health Study as one example of collaboration across agencies to collect public health data related to environmental exposures.

Arsenic Related Data: Assets and Limitations

There are numerous data sets which include measures relevant to the topic of arsenic and associated health outcomes. While many of the data sets are owned or stewarded by the DES and DHHS, some data sets belong to other agencies or organizations or are not maintained in one central location (e.g. private well water test results which are housed by DHHS and many private businesses). As organized in Appendix C, the identified arsenic-related data sets can be divided into three categories: health outcome data for conditions associated with arsenic exposure or potential exposure data, and behavioral data such as water testing, treatment, and consumption.

Appendix C provides detail about each of the identified data sets, including relevant data and indicators, the data steward, the available years and geographic granularity, and limitations and, additional notes for context. In addition to the limitations noted for the individual data sets, there are overarching limitations such as the fact that data is presented in different formats with limited or no ability to make linkages or, that the data sets are not centralized. Additionally, the inclusion of protected and identifiable health information within certain data sets restricts the sharing of data at the record level.

While a memorandum of agreement can facilitate collaboration and data sharing, in particular among State agencies, the State is limited in its regulatory authority to compel certain organizations such as private labs to share data. This poses a significant limitation on the ability to receive water test results for environmental contaminants. These limitations in addition to those noted in the table, impact the ability to produce analyses from which meaningful conclusions can be drawn. Nonetheless, improved sharing practices may help us to come closer to being able to quantify and visualize the potential association between certain environmental factors and health outcomes. Further, outlining the data assets and limitations helps us to better understand the gaps and factors that prevent more meaningful analysis. This understanding can guide efforts to improve and expand upon data collection practices and to formalize partnerships and/or develop legislation to maximize data sharing across entities.

Proposed Pilot Arsenic in Drinking Water

As mentioned in a previous section, due to the absence of key staff, this process is delayed. Additional information will be provided at a later date to include updates on next steps, a final proposed pilot project, and cost estimates.

Appendices

Table 1. Inventory of arsenic related data by type

Data Type	Data Set	Relevant Data Included in Set	Steward	Relevant Indicators	Geographic Granularity	Years Available	Limitations and Additional Notes
Health outcome: note that these health outcomes are not linked to arsenic alone, but to a number of contributing factors	NH State Cancer Registry	Cancer incidence	DPHS (HSDM)/ Dartmouth	By type/age/year/geography: case counts, incidence rates	Address-aggregated to town	1990-2015	No residential history, no exposure information (behavioral, occupational, etc.), screening data not collected, data less reliable from 1990-1994; data are good from 1995 onward To calculate rates or standardized incidence ratios, population data is needed (Claritas, US Census, etc.); statistics can be calculated based on cancer type, age at diagnosis, year of diagnosis, stage, and geography
	NH Vital Statistics	Cancer related deaths	DPHS (HSDM)	By type/age/year/geography: mortality counts, mortality rates	Address-aggregated to town	1999-2016	Inconsistent coding of cause of death; ICD coding of cause of death began in 1999 2017 data not yet available due to delays in out of state reporting To calculate rates, population data is needed
Exposure/ potential exposure: note that the presence of arsenic in water does not necessarily indicate exposure	NH Public Health Lab Well Water Quality	Well water test results	DPHS (PHL)	Private well water quality- Arsenic level	Address		There is no requirement for private well owners to test their water quality, and only a portion of those who test do so through the PHL; cannot draw conclusions about a geographic area based on results at one address (results can vary even between next door neighbors); the presence of arsenic does not necessarily mean exposure as people may obtain drinking water from another source Approximately 46% of NH residents receive water from private wells
	Private Lab Well Water Quality	Well water test results	Accredited private labs throughout NH and neighboring states	Private well water quality- Arsenic level	Address	NA- historically this data has not been shared/ made available	Same limitations as PHL well water quality results; RDL limit may vary between labs (a "no detect" reading may be based on a different minimum limit, ex. 5ppb vs 0); MCL changed in 2001 from 50 ppb to 10 ppb Private labs are not compelled to share data, DES and DPHS have not been successful in obtaining data from private labs
	DPHS Biomonitoring	Well water test results, exposure data (based on blood and urine)	DPHS (PHL)	Private well water quality- Arsenic level, arsenic exposure	Address- limited to towns targeted by study	2017	For well water quality- same limitations as PHL well water quality results; for exposure, sources other than water are not controlled for Biomonitoring study is targeted to specific towns, data is not representative of the State
	NHDES MtBE Remediation Bureau Results	Well water test results	DES	Private well water quality- Arsenic level	Georeferenced points		Same limitations as PHL and Private Lab well water quality results Program funding covers MtBE VOC related testing, but participants are given the option to pay for additional analysis (approximately 20% opt to have a test that includes arsenic), those who opt-in sign a waiver granting access to results to DES. Results from optional tests are not submitted to the EMD, but the Bureau has used the results that they receive to populate a separate database to track participation and exceedances (not all concentrations). Effective 7/1/2018, all data will be submitted to the EMD, including optional tests.
	DES Public Water System Monitoring Data	Water test results of PWSs - Arsenic	DES	PWS water quality- Arsenic level	PWS (population served), can be associated with approximate PWS service area	1994-Present	Prior to 2011, data was collected via paper- only results that exceeded 50% of the MCL were recorded electronically; MCL changed in 2001 from 50 ppb to 10 ppb; RDL may vary between labs; results are not constant (results are collected quarterly and may vary over time based on natural variation and treatment) PWS definition- a system that serves 25+ people, or 15+ service connections, for 60 or more days/year. Arsenic reporting is required for community PWSs (residential/year round), and non-transient/non-community systems (workplaces, schools, etc.) that serve the same 25+ people for at least 180 days/year. Transient systems (restaurants, motels, etc.) do not monitor for arsenic.
	USGS Arsenic Probability	Arsenic presence in groundwater	USGS	Probability of arsenic in groundwater at >1 ppb, >5 ppb, >10 ppb	Georeferenced points	2011	Data is modeled- it indicates a high probability of the presence of arsenic, based on a limited number of factors (excluding regional groundwater redox information, groundwater pH, well depth, fracture location and depth, and other groundwater chemistry measures) and on a limited number of samples, as such, it cannot be used to determine which individual wells will be at risk; presence of arsenic in groundwater does not necessarily translate to exposure Data most relevant when considering potential exposure among residents with private wells, a high probability of

							arsenic in bedrock where there is a PWS would not likely translate to exposure
	USGS	Arsenic presence in groundwater	USGS	Point in time level of arsenic in specific well locations	Georeferenced points/ well location	2006	Wells are located statewide, samples were drawn in 2006 and analyzed in 2015 (tested and proven to be sound) 3 new wells on the seacoast monitored bi-monthly from 2014-2018 for arsenic (and uranium) to show arsenic trends and seasonal variation
Behavioral Data: water source and consumption, testing, and treatment	NH BRFSS	Behavioral data around testing and consumption	DPHS (HSDM)	Drinking water source, water consumption, well water testing (ever/when), mitigation (avoidance or testing), awareness of health impacts from water contaminants, source of information/guidance about testing and treatment	Record level-aggregated to county (ability to look at Manchester and Nashua exclusive of Hillsborough County) or PHN	2014, 2017	Sample size may be too small to draw conclusions at the county level or to stratify by other factors (such as income, education, etc.), questions have not remained consistent year-to-year 2017 sub-state data will be released in the fall of 2018; 2018 data is in process of being collected, no timeline yet for data release
	NH PRAMS	Behavioral data around testing	DPHS (HSDM & MCH)	Drinking water source, well water testing (in 12 months prior to delivery), health care worker advisement on testing	State	2013-2016	Data limited to women who have recently given birth; no information about results or treatment
	Private Well Owner Survey	Behavioral data around testing, consumption, and treatment	Dartmouth Toxic Metals Superfund Research Program	Well water testing, well water treatment, concern about arsenic, water consumption, demographic data	State/regions within the State	2014	Not a representative random sample, results may not be generalizable ⁷⁹⁹¹

Acronym Key:

BRFSS: Behavioral Risk Factor Surveillance System

DES: Department of Environmental Services

DPHS: Department of Health and Human Services, Division of Public Health Services

EMD: Environmental Monitoring Database

HSDM: Bureau of Health Statistics and Data Management

MCL: Maximum Contaminant Level

MtBE: Methyl tert-butyl ether

PHL: Public Health Lab

PHN: Public Health Network

ppb: parts per billion

PRAMS: Pregnancy Risk Assessment Monitoring System

PWS: Public Water System

RDL: Reporting Detection Limit

USGS: United States Geological Survey

voc: volatile organic compound



Jeffrey A. Meyers
Commissioner

Lisa M. Morris
Director

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September 10, 2019

Honorable Jeffrey Salloway, Acting Chair
Commission to Study Environmentally-triggered Chronic Illness
Legislative Office Building/Room 205
Concord, NH 03301

Re: *Report on Data Sharing between the New Hampshire Departments of Health and Human Services (DHHS) and Environmental Services (DES)* (RSA 126-A:76, III) Chapter 229:5, Laws of 2019

Dear Representative Salloway:

As required by SB 85 (2019), an act reestablishing the commission to study Environmentally-triggered chronic illness, please find attached a report (that represents the joint work of DHHS and DES) on data sharing practices and the results of a 2-way pilot project between the departments on arsenic in drinking water which provides environmental data and examines health impacts as required under paragraph I.

The following documents are enclosed:

- SB 85 DHHS/DES progress report (data sharing and arsenic pilot project)
- Memorandum of Agreement (DHHS/DES)
- HB 1356 (2018) – preliminary report

Department staff will be presenting the report to the Commission to Study Environmentally-triggered Chronic Illness during its initial meeting scheduled for September 17, 2019. Please let us know if you have any questions.

Respectfully Submitted,

Lisa Morris, Director
NH Dept. of Health & Human Services
Division of Public Health Services

Mike Wimsatt, Director
NH Dept. of Environmental Services
Waste Management Division

**Progress Report for SB85
Building on Preliminary HB 1356 Legislative Report**

Submitted by:

New Hampshire Department of Health and Human Services
Division of Public Health Services

&

New Hampshire Department of Environmental Services

September 2019

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Introduction

This is the initial report related to Senate Bill (SB) 85 (2019), which directs the New Hampshire (NH) Department of Environmental Services (DES) and the Department of Health and Human Services (DHHS) to improve coordination and collaboration as it relates to environmental health, with a specific focus on data sharing.

This Report includes a summary of background information, the existing Memorandum of Agreement between DES and DHHS, current data sharing practices between the two agencies, the Pilot Project on arsenic and bladder cancer, current collaborations, and recommendations for future work.

Background

Senate Bill (SB) 85 (2019), re-established a legislative commission to study environmentally-triggered chronic illness. This builds on previous work related to House Bill (HB) 511 (2017) and HB 1356 (2018). This work is focused on conducting environmental health surveillance and improving coordination and collaboration between DES and DHHS in order to allocate resources efficiently to reduce exposure to environmental contaminants and prevent disease.

The SB 85 Statement of Intent reads as follows: “The general court recognizes that nearly half of adults in the United States have at least one chronic health condition and chronic diseases are responsible for increased health care costs. Seventy percent of health care costs in the United States are for chronic diseases. Some chronic diseases are known or thought to be associated with environmental causes. According to the Centers for Disease Control, the state of New Hampshire has the highest rates of people with bladder, breast, esophageal, and pediatric cancer in the country. In addition, a double pediatric cancer cluster was identified in the seacoast of New Hampshire in 2014. Therefore, the general court hereby establishes the commission to study environmentally-triggered chronic illness.”

HB 511 (2017) established a legislative commission to study environmentally-triggered chronic illness.

HB 1356 (2018), charged DES and DHHS to develop and implement a method by which the departments share certain health outcome and environmental data. The HB 1356 Preliminary Report submitted in August 2018 includes more information on the status of the activities listed below and is attached in the Appendix.

Specifically, the departments were tasked to:

- Update a memorandum of agreement related to data sharing;
- Sign a joint standard operating procedure on how data layers can be shared between the two departments to identify linkages between environmental contaminants and health outcomes;
- Hold a presentation on the departments' ongoing, joint efforts under the Centers for Disease Control and Prevention environmental public health tracking cooperative agreement; and

- Compile a report describing and estimating the cost to perform a 2-way pilot project between the departments on arsenic in drinking water, where both health effects and environmental data exist.

Memorandum of Agreement

The Memorandum of Agreement (MOA) directly aligns with the primary goals of DES and DHHS to protect, maintain, and improve the health of all New Hampshire citizens. Moreover, it supports data sharing and collaboration between the two agencies.

The MOA (signed in August 2018) focuses on environmental health data sharing activities agreed to by DES and DHHS and describes responsibilities of both agencies. Both agencies will review this MOA on an annual basis to ensure that it reflects current Department initiatives focused on data and information. The MOA is attached in the Appendix.

Data Sharing Practices

Accessing Public Health Data

State and federal regulations (e.g., HIPAA Privacy Rule) require appropriate safeguards to protect the privacy of personal health information (PHI), and sets limits and conditions on how such data are used and disclosed. Sharing health-related data must follow specific protocols such as data sharing agreements or information exchange agreements.

In order to access public health data administered by the Bureau of Public Health Statistics and Informatics (BPHSI) within DPHS DHHS, such as NH Cancer Registry Data or Vital Records Data, a formal Data Request must be submitted to the Health Statistics and Data Management (HSDM) Section (<https://www.dhhs.nh.gov/dphs/hsdm/requests.htm>).

The Data Request Process is overseen by the HSDM Section within BPHSI DPHS DHHS. The request process may include a Data Request Application, a Data Sharing Agreement, an Information Exchange Agreement, or official Institutional Review Board (IRB) Approval depending on who is requesting the data, what data format is being requested, and the purpose of the request. When summary or aggregate data are needed, such as Cancer Rates by County, the data request process is less complex. In fact, summary data is publicly available on the NH Health WISDOM Data Portal (<https://wisdom.dhhs.nh.gov/wisdom/>).

Accessing Environmental Data

Accessing data collected or administered by DES, such as air quality and hazardous waste site data, do not follow the same data request protocols because such data do not qualify as personal health information. Most DES data are publicly available on the DES OneStop Data Portal (<https://www.des.nh.gov/onestop/index.htm>). As DHHS and DES continue to work on Data and Information as a priority topic, the Data Sharing process will continue to evolve.

Separate from activities driven by SB 85 (2019), DHHS established a Business Intelligence and Analytics program. This program is part of a Department-wide initiative to increase transparency, consistency, and awareness of DHHS services for NH citizens, governing bodies, and funding sources as well as to provide an information rich environment that will guide strategic decisions to improve quality and performance. DHHS is currently organizing to implement a Department-wide Data Governance and Management Strategy to provide guidance on data access, security, maintenance, and dissemination. In addition, the Division of Public Health Services (DPHS) within DHHS is undergoing Operational Strategic Planning and identified Data and Information as a priority topic area. This work will inform future data sharing, data governance, and data stewardship policies and practices.

Summary of Datasets, Databases, and Data Systems

Many datasets, databases, and data systems exist within DES and DHHS that are relevant to environmental health.

Example datasets from DPHS include those from the: Behavioral Risk Factor Surveillance System Survey, Hospital Discharge Data, Cancer Registry, Vital Records (Births and Deaths), Childhood Lead Poisoning, and Youth Risk Behavior Surveillance System. The NH Health WISDOM Data Portal is a Business Intelligence data visualization application that integrates data from multiple sources. The NH Health WISDOM Data Portal is a public web-based clearinghouse of public health data and information touching on core topic areas and presenting over 100 data metrics. Data are available for several topic areas including, but not limited to: Asthma, Biomonitoring, Cancer, Childhood Lead Poisoning, Diabetes, Heart Disease, Oral Health, Injury, and Maternal and Child Health. The Laboratory Information Management System (LIMS) is another example of a data system, however, it is for internal data management and analysis. It allows for electronic laboratory reporting (ELR) for medical providers and also allows for submission of laboratory test results from the Public Health Laboratories (PHL). It includes data related to clinical and environmental laboratory testing done within the PHL (e.g., biomonitoring, radiation health data, well water quality).

Examples from DES include the Environmental Monitoring Database (EMD), which is a database that contains data from observations and laboratory samples for various programs within the Department. The EMD includes two types of data: manually collected samples and automated samples, the difference is that manually collected samples are typically single samples collected in the field (e.g., beach water quality data), whereas an automated sample might be collected on a continuous basis from a data logger (e.g., air quality monitor data). Data are available for several topic areas including, but not limited to: beach water quality, outdoor air quality, public water quality, well water quality, and soil and groundwater quality at hazardous waste sites.

It is important to note that residential private well water quality data resides in both DHHS and DES. Data obtained from the analysis of private well water samples submitted to the Public Health Laboratories (PHL) within DPHS DHHS and paid for by the homeowner are considered confidential unless otherwise specified by signing a waiver, which allows for the summary and release of that information.

Pilot Project: Arsenic and Bladder Cancer

There is a growing interest in using geospatial and epidemiological methods to link environmental exposures and health outcomes. A pilot project on Arsenic and Bladder Cancer was proposed as an opportunity to showcase current data sharing practices between DES and DHHS and highlight current capacity to conduct small area analysis. In reviewing results from this pilot, it is important to consider the limitations of each dataset as well as the limitations of the methods used to link environmental exposure and health outcome data.

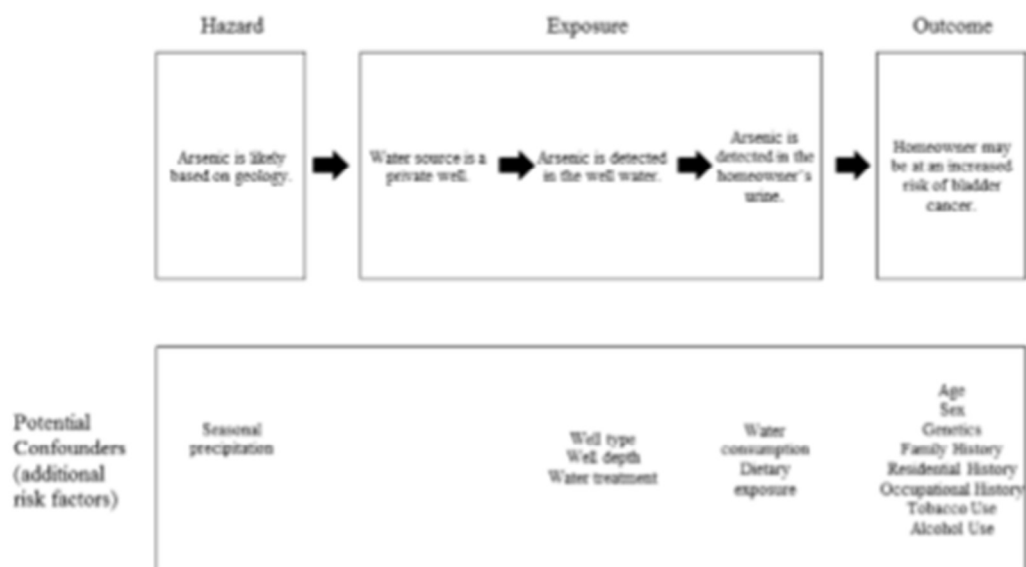
When evaluating potential environmental risks, it is helpful to classify data into three categories (Figure 1). The first is hazard data; this data represents the likelihood or probability that there is a contaminant in the environment. The second is exposure data; this data is a measure of the contaminant in the environment or human body such as the amount of arsenic in well water or the amount of arsenic in human urine. The third is outcome data; this data is related to measurable health outcomes, such as diagnosis of a specific disease.

Figure 1. A Framework for Categorizing Data



It is also helpful to consider the exposure pathways that connect environmental hazards, exposures, and health outcomes (Figure 2). The primary routes of exposure for arsenic are via ingestion and inhalation. This pilot project focuses on exposure via ingestion of contaminated drinking water, however, individual level exposure was not assessed.

Figure 2. Exposure Pathway: Connecting Arsenic in Private Well Water to Human Health



In some cases, such as with arsenic and bladder cancer, there is an established association supported by scientific evidence. In other cases, the scientific evidence may be lacking so the link is less clear, or may not exist. In addition, correlation does not equal causation. This type of study where exposure data is not available at the individual level only allows for general associations to be made. Specific study designs, such as a Cohort Study or Case-Control Study, which were not utilized in this pilot, must be used to evaluate the specific relationship between Hazards, Exposures, and Outcomes. While linking data or overlaying data is useful to explore patterns and to generate questions, more sophisticated methods must be used to draw specific conclusions about cause and effect. The Centers for Disease Control and Prevention (CDC) define 10 Essential Public Health Services that outline core functions of the public health system. Several are relevant to this type of work including: monitoring health status to identify and solve community health problems, diagnosing and investigating health problems and health hazards in the community, and conducting research to gather new insights and develop innovative solutions to health problems. However, it is important to note that DES and DHHS rely on partners such as those from academia and the federal government to conduct more complex environmental epidemiological analysis.

Arsenic exists naturally in certain granitic and metamorphic bedrock formations in NH. Nearly 50% of NH residents rely on private wells as a drinking water source. Many of these wells are drilled deep into bedrock to access groundwater. Since arsenic exists in the bedrock in many places, it can be present in the groundwater, often at unsafe levels. The maximum contaminant level (MCL) set by the Environmental Protection Agency (EPA) for arsenic in drinking water is 10 ug/L (or 10 ppb). In 2019, the New Hampshire Legislature enacted HB 261, which directs NH DES to adopt an MCL no greater than 5 ug/L (or 5ppb). Groundwater may also contain arsenic from human activities, including but not limited to agricultural runoff, contamination from wood preservatives containing arsenic, improperly disposed arsenic containing materials, or mining.

Data Sources**Arsenic Probability (United States Geological Survey, 2012)**

These data come from the United State Geological Survey (USGS). The USGS Report, *Estimated Probability of Arsenic in Groundwater from Bedrock Aquifers in New Hampshire, 2011* summarizes the probability of arsenic occurrence in groundwater at concentrations equal to or exceeding 10, 5, and 1 micrograms per liter (Ayotte et al. 2012).

This probability estimate can be used as a predictive tool to help identify potential areas at risk, however, it does not definitively identify areas of exposure. It does not mean that if you are in a high-risk area that you *will* have arsenic in your well water, nor does it mean definitively that if you are in a low-risk area that you *will not* have arsenic in your well water. However, the USGS data does indicate as the shading changes from white, to pink, to red, that the probability (or likelihood) of having arsenic in your groundwater at a concentration of 10, 5, or 1 ug/L goes up. If you live in one of these areas and have a private well, you may be at an increased risk of having arsenic present in your well water. Wells must be tested to determine Arsenic level. However, if you live in one of these areas and are on a Public Water Supply, then you are at a reduced risk because Public Water Systems monitored by DES must adhere to State and Federal drinking water standards.

Private Well Water Quality Data**(NH Public Health Laboratory and NH Department of Environmental Services, 2014-2018)**

These data come from the Water Analysis Lab within the Public Health Laboratory at DPHS DHHS as well as data shared with the MtBE Remediation Bureau within NH DES by homeowners electing to pay for additional analyses while having their wells sampled for MtBE. These data represent all samples collected from 2014 to 2018.

Not all private well water samples in the state are analyzed at the Public Health Lab. There are several private labs that conduct water testing within the State and in neighboring States. Results from these private labs are not publicly accessible nor reported to PHL and therefore are not included in this analysis. Many factors can influence whether or not well water is contaminated with arsenic. Some important factors to consider include: well design and well depth. It is also important to keep in mind that the water quality test may be done on raw water collected before treatment or finished water collected after treatment, and it is important to know the difference since people should only be drinking water post-treatment. Since many factors can influence well water quality, the public health message is to test private wells for arsenic every 1-3 years. Furthermore, it is not safe to assume that well water quality in one location will be the same as nearby locations.

Bladder Cancer Data (NH Cancer Registry, 2006-2015)

Cancer data are collected by the NH State Cancer Registry (NHSCR). The Cancer Registry is operated through a contract with Dartmouth College, with oversight from DPHS DHHS. The NHSCR is a population-based cancer surveillance program that collects incidence data on all cancers diagnosed or treated in the State of New Hampshire. In addition, the NHSCR collects incidence data for NH residents who are treated in certain out-of-state facilities. For every diagnosed case of cancer, the registry collects

detailed information about the diagnosed case, including the date of diagnosis, type of cancer, stage at diagnosis, and patient demographic information including residence at the time of diagnosis, age, race, and gender.

While there is great utility in registry data, it has certain limitations. There is often the desire to use registry data to signal or identify potential cancer-related exposures in a geographic area. Lack of information on residential history in the registry presents a challenge in assessing exposure in a specific region. The registry captures only the residence at the time of diagnosis. Because populations are mobile, this means that a case attributed to a specific geography based on the residence at time of diagnosis does not necessarily indicate lifetime or even recent exposure in the same area.

Data Analysis and Summary of Results

Part I – Hazard Data – Arsenic Probability

This section presents data on arsenic probability, the likelihood that the arsenic concentration in groundwater is greater than or equal to 10 ug/L based on the USGS Probability Map (Figure 3). The map shows data as a continuous layer across the entire state. Probability of arsenic increases as the color changes from white to pink to red. This map indicates that the probability of arsenic in groundwater (≥ 10 ug/L) is highest in the south and southeast regions of the State, however, there are pockets of high risk scattered across the State.

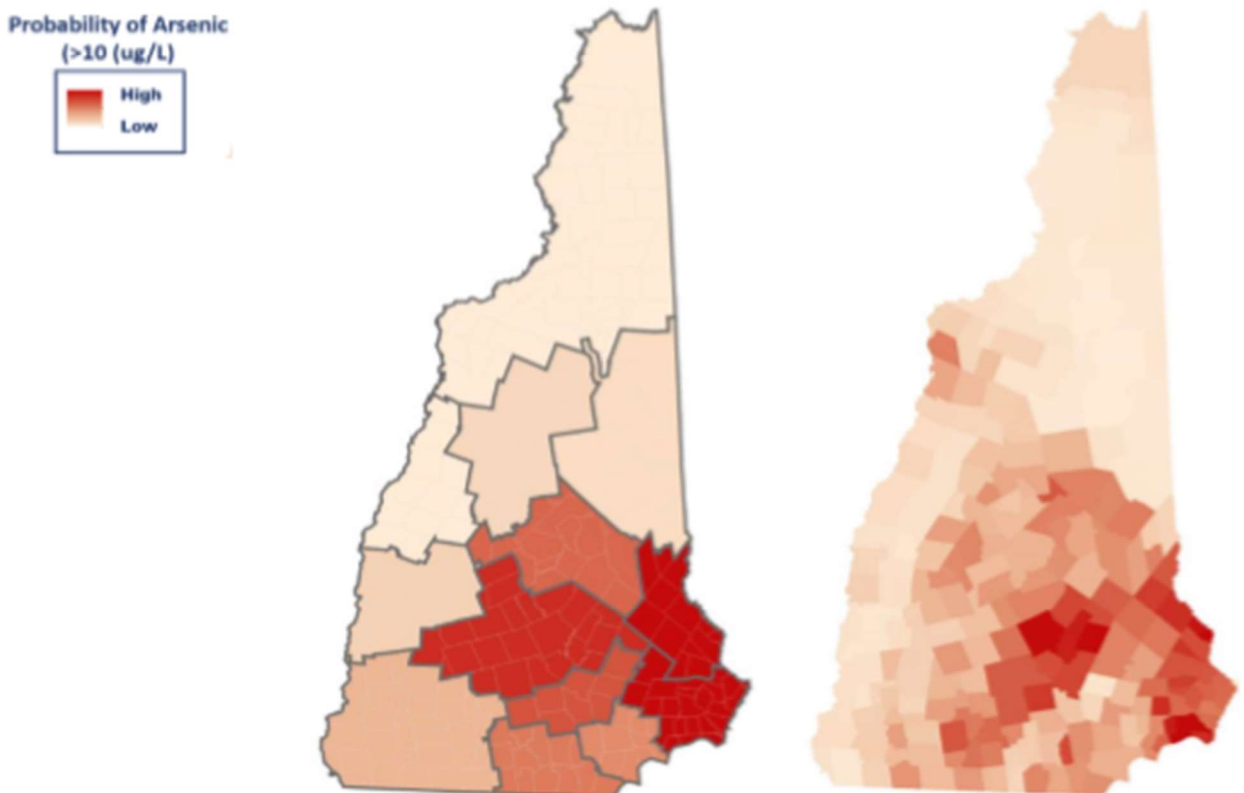
Since the goal of this pilot is to link hazard data to exposure or outcome data, it can be helpful to summarize the raster (or gridded) data by a certain geography. Arsenic probability data are summarized by Public Health Region and by town (Figure 4).

The borders in this case follow Public Health Regions and towns, however, the borders are arbitrary when dealing with an environmental contaminant. Averaging over an area like this can sometimes be misleading as it can “wash out” or “mask” extreme high or low values. Specifically, for individuals living on a border the average value might be misleading. In comparing the region map to the town map it is clear that results will vary based on the geographic boundary of interest, and this can have serious implications for the conclusions. For example, in the Northwest corner of Grafton County, near Haverhill and Bath, the increased probability shown on the original map gets “washed out” when the data are summarized by Region, but is maintained when the data are summarized by Town. One possible solution is to move away from summarizing data over specific geographic areas, and instead analyze data over a continuous gridded surface using other spatial analysis methods such as cluster analysis or heat map analysis. There are always tradeoffs. In some cases, this type of gridded data may be more difficult for local decision makers to interpret since it may cross municipal boundaries. Though more scientifically accurate, these methods may make the results less locally relevant. Future work will need to evaluate different methods to address various community concerns. It is important to note that any method used will need to uphold data suppression and data release guidance to protect privacy.

Figure 3. Estimated Probability of Arsenic in Groundwater (≥ 10 ug/L) (USGS, 2012)



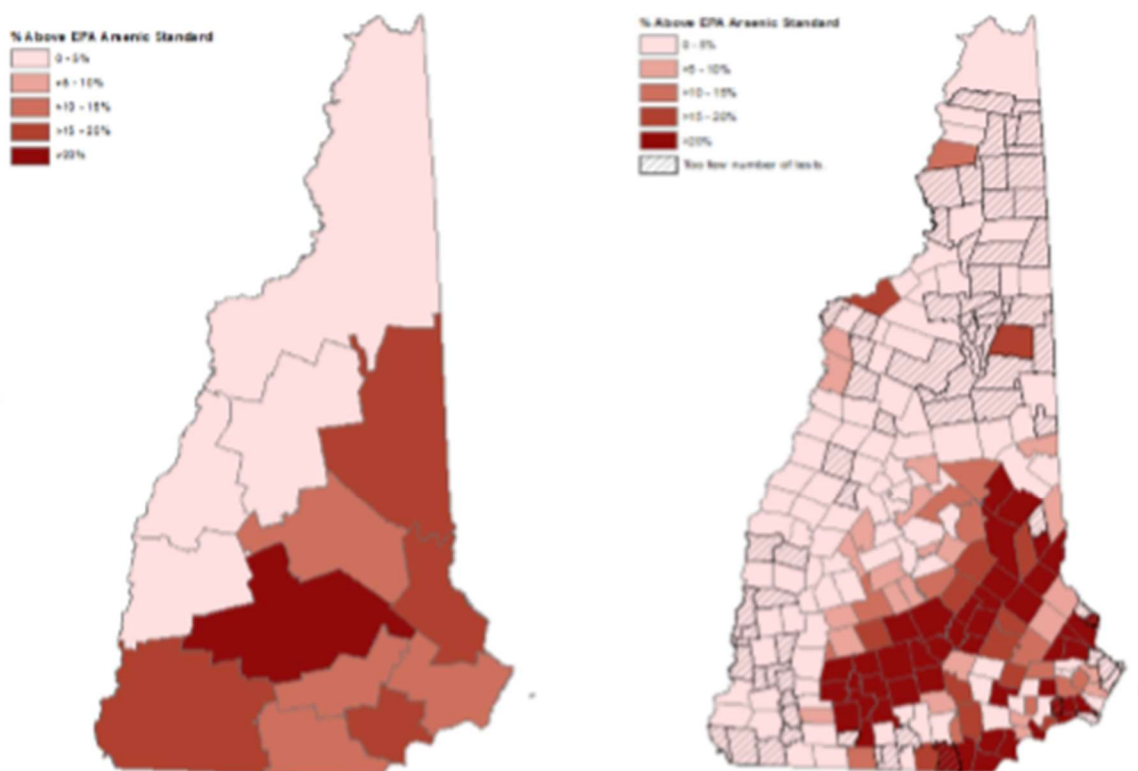
Figure 4. Estimated Probability of Arsenic in Groundwater (≥ 10 ug/L) by Public Health Region Compared to by Town (USGS, 2012)



Part II – Exposure Data – Private Well Water Quality

This section presents data on well water quality by Public Health Region and by Town. Recall that the EPA Arsenic Standard is 10 ug/L (or 10 ppb). The maps show the percent of well water tests that are above (exceed) the EPA Standard (Figure 5). These maps do not convey the proportion of residents served by private or public drinking water systems, nor does the data reflect whether a treatment system is installed in the home or whether the sample was collected pre- or post-treatment. Comparing the Region map to the Town map, it is clear that some high and low values are “washed out” or “masked” when rolled up to the region. It is extremely important to choose geographic boundaries carefully when doing this type of analysis, as it can influence the results and conclusions.

**Figure 5. Well Water Quality Data by Public Health Region Compared to by Town
(NH Public Health Laboratory, 2014-2018)**



Part III – Health Outcome Data –Bladder Cancer

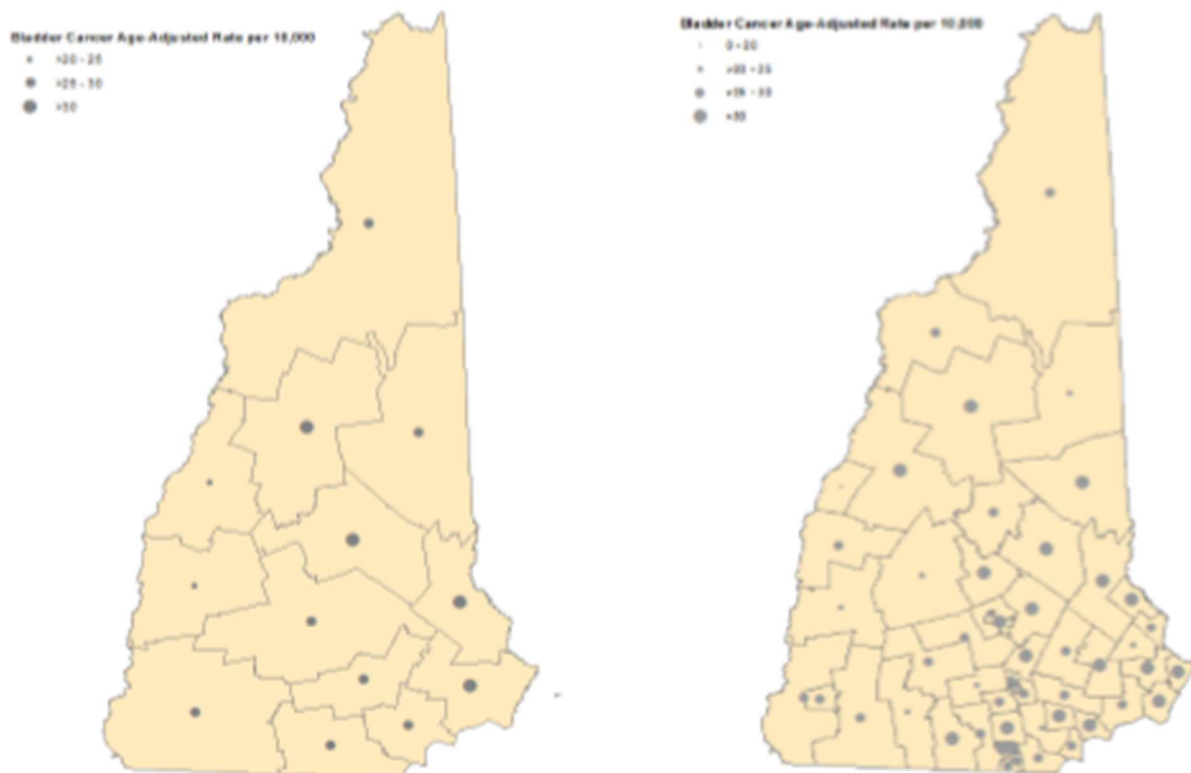
This section presents three maps of age-adjusted bladder cancer rates per 10,000 people. According to the National Cancer Institute, an estimated 40% of people across the US will develop cancer during their lifetime. Recognizing that age is a major risk factor for cancer, rates are age-adjusted to allow for comparison of rates across geographic regions since the age distribution of the population may vary. The first map depicts data for 2015 (a 1-year period) by Public Health Region (Figure 6). The second map depicts data for 2006-2015 (a 10-year period) comparing Public Health Regions to Sub-County Regions (Figure 7). The Sub-County Regions break the State up into approximately 50 distinct areas.

One takeaway is that these rates are different when comparing 1-year rates to 10-year rates. It is important to note that the confidence intervals (or uncertainty around the estimates) is much greater for the 1-year estimate compared to the 10-year estimate. Another important takeaway is that these rates vary across Public Health Regions in the State. For this reason, it can be valuable to divide the state up into smaller geographic areas. However, when we do this we must also uphold data suppression and data release guidance to protect privacy. One way to accomplish this is to group multiple years of data or combine geographic areas to ensure data reliability and maintain confidentiality. The general rule is that counts, or rates, where there are between 1 and 5 cases must be suppressed for any geography or age/sex sub-category. In this case, based on the number of bladder cancer cases it was necessary to group 10 years of data together in order to present rates at the Sub-County Region scale.

Figure 6. Age-Adjusted Bladder Cancer Rates (per 10,000) by Public Health Region (NH Cancer Registry, 2015)



Figure 7. Age-Adjusted Bladder Cancer Rates (per 10,000) by Public Health Region and by Sub-County Region (NH Cancer Registry, 2006-2015)



Summary of Findings

This Arsenic and Bladder Cancer Pilot was a valuable exercise in that it helped DES and DHHS understand current capacity and identify priorities for future work including:

- Identify data sources that are available to support this type of investigation;
- Identify additional data sources that could be incorporated into future analyses if made available in an electronically stored format;
- Identify strategies to improve data sharing across programs and agencies;
- Understand that data from multiple sources can be summarized and compared, but due to limitations of the data and methods, it is challenging to draw definitive conclusions about cause and effect;
- Highlight the tradeoffs of small geographic area analysis, in most cases several years of data will need to be combined in order to maintain reliability and protect confidentiality;
- Refocus efforts on using data to drive action and to prioritize activities in a limited resource environment such as targeted outreach and education in high-risk areas; and
- Develop standard methods for summarizing environmental exposures and relevant health outcomes.

Key Messages to Reduce Exposure from Groundwater Contaminants:

Unhealthy levels of contaminants are common in many private wells in New Hampshire. Most have no taste, smell, or color. It is important to periodically test well water quality to ensure it is safe to drink.

The following key messages are aligned with ongoing initiatives at DES and DHHS:

- **When to Test?**
The recommendation is to conduct the standard and radiological analysis every 3-5 years. Bacteria and nitrate should be tested every year. Certain conditions call for more frequent testing, such as: heavy development associated with hazardous chemicals, recent well construction or repairs, previous elevated tests, noticeable changes in taste, smell or appearance. Future testing recommendations will address volatile organic compounds (VOCs) and per- and polyfluoroalkyl substances (PFAS).
- **How to Test?**
Order a test kit from an accredited laboratory.
- **How to Treat?**
If the lab report indicates there is a contaminant above recommended action levels, steps should be taken to fix it. The NHDES Be Well Informed web tool summarizes possible treatment options for common contaminants. A water treatment professional should be consulted.

Current Collaborations

Cancer is not a single disease, but instead a group of over one hundred diseases, each with different presentations and risk factors. While there are some inherent risk factors that cannot be modified, including age, race, gender, and genetics; modifiable risk factors such as those relating to lifestyle or the environment can be addressed to reduce the burden of disease. According to the CDC, the most important risk factor for bladder cancer is smoking. Within NH DHHS, the New Hampshire Tobacco Prevention and Cessation Program (TPCP) is dedicated to the implementation of a comprehensive program designed to reduce the prevalence of tobacco use in New Hampshire. The TPCP's primary goals are to prevent NH youth from beginning to use tobacco; to eliminate exposure to secondhand smoke; to promote quitting tobacco among users; and to prioritize efforts to reach those most affected by tobacco. Another modifiable risk factor for bladder cancer is exposure to arsenic through drinking water and diet. Several programs across DES and DHHS, in partnership with Dartmouth and other stakeholders, are working to implement strategies to reduce exposure to arsenic among NH residents. The following are examples of collaborative work focused on better understanding and reducing exposure:

NH Arsenic Consortium:

The primary mission of the NH Arsenic Consortium is to help the public, primarily private well users, become aware of (1) the presence and health implications of arsenic in the food and water supply, (2) the importance of testing private wells for arsenic and other common contaminants and (3) how to take the appropriate next steps to reduce their exposure to arsenic from their food and water supply. Composed of academic and agency experts, and representatives from health and environmental agencies, non-profit organizations and local municipalities, the Consortium seeks to provide the latest information to its members and the public, coordinate outreach and other intervention efforts, and prioritize tasks to have the greatest possible impact on reducing exposure to arsenic in food and drinking water and ultimately improving public health.

The [6th NH Arsenic Consortium meeting](#) was held on March 22, 2019 at the headquarters of NH Department of Environmental Services and NH Department of Health and Human Services in Concord. Along with hearing research, outreach, and legislative updates, about 70 stakeholders from the water industry, local, state and federal government, research and education and private well owners collaborated to develop a draft "Road Map to Reduce Arsenic Exposure in NH." Still in development, the Road Map will offer routes for reducing exposure by sector, including routes specific to private well owners, government representatives, health professionals, and environmental professionals.

Distribution of Filter Pitchers to Vulnerable Populations:

DES, in cooperation with DHHS and the state's network of Women, Infant, and Children (WIC) clinics, secured funding from the NH Drinking Water and Groundwater Trust fund to contract for and implement a 5-year project which will provide filter pitchers to an estimated 524 low-income pregnant women using private wells with elevated arsenic, and to provide follow-up support to program participants. The project is designed to (1) establish a sustained practice among those families of using filter pitchers and replacing filter cartridges as needed, (2) generate valuable information regarding the

effectiveness of this approach to reducing exposure to contaminated drinking water and (3) reinforce a public information initiative regarding the use of certain verified filter pitchers as an affordable means of treating drinking water from private wells, particularly for pregnant women. In addition, the project will seek to educate participants about the importance of continued well water testing. A Request for Proposals was released, and applications were received in early September 2019. Project implementation will begin as soon as partners are in place.

Well Testing Community Events:

DES, DHHS, and Dartmouth Toxic Metals Superfund Research Program partner to host community well testing events to provide education about testing and to make it easier for well users to get their water tested. Although outreach to communities is based on probability of elevated arsenic, prevalence of private wells, and socioeconomic factors that may serve as a barrier to testing, participating communities are ultimately self-selected. Twenty-two communities have hosted the workshops since 2016, some more than once.

Targeted Arsenic and Uranium Public Health Study:

The Targeted Arsenic and Uranium study was conducted by BiomonitoringNH to look at how much arsenic and uranium is found in private wells in NH and whether these two chemicals are getting into the body. This is a targeted public health study that was specific to areas of higher exposure to arsenic and uranium. Based on the 2012 USGS Report, NH towns with an increased probability of having arsenic above the Environmental Protection Agency (EPA) maximum contaminant level (MCL) of 10 ug/L (or 10 ppb) in the groundwater were selected to recruit participants. A small comparison population on municipal (or "public") water from Concord was also involved. Invitation postcards and letters were mailed to several hundred randomly selected households in each town. Enrollment was open to all qualified residents. Qualified people were 5 years or older, lived in a selected town, and used a private well for their home (except for the comparison population). Participants spent about two hours over the course of a couple of days to (1) attend a meeting to answer survey questions and get their collection kit (2) keep a basic food log, and (3) collect a urine sample and two water samples from their home. The survey included questions about their demographics, occupational history, recreational activities, food and beverage consumption, and health. In return, participants received free arsenic and uranium testing of their urine and free water quality testing. All testing was performed by the State of New Hampshire Public Health Laboratories. A summary of results is available on the WISDOM Data Portal (<https://wisdom.dhhs.nh.gov/wisdom/>).

New Hampshire Tracking and Assessment of Chemical Exposures (TrACE) Study:

The 2019 NH Tracking and Assessment of Chemical Exposures (TrACE) Study is a statewide public health surveillance study looking at many different metals, pesticides, per- and polyfluoroalkyl substances (PFAS), and other chemicals such as tobacco smoke in NH residents. These are chemicals that individuals may come into contact with from the environment. The TrACE Study will evaluate whether these chemicals are getting into the human body. BiomonitoringNH will do this by testing blood and urine from 400 NH residents (6 years and older) as well as by testing the water from their homes. BiomonitoringNH is working with the NH Department of Environmental Services (NHDES) and the NH

Environmental Public Health Tracking Program to collect and test household water. This type of statewide surveillance study ensures that comprehensive data are collected for: (1) residential history, (2) exposure history, (3) environmental data, and (4) clinical data that allows for more in-depth analysis of potential associations.

Comprehensive Cancer Control Program (CCCP):

The CCCP is focused on promoting the use of cancer surveillance data to develop and implement the New Hampshire Comprehensive Control Plan through partnerships (<https://www.nhcancerplan.org/index.php/workgroups/93-task-forces/221-goals-objectives-strategies>). The current plan includes objectives around arsenic, tobacco use, bladder cancer, ensuring access to high quality cancer care including clinical trials, and improving the quality of life for cancer survivors. According to the National Cancer Institute, the general 10-year survival rate for people with bladder cancer is 65%. These bladder cancer survivors will need routine medical care dependent on the stage and grade of their cancer and can benefit from their provider developing a survivorship care plan. The CCCP is working in partnership with the Norris Cotton Cancer Center on improving our statewide data on cancer survivor needs, developing better systems of care for those navigating the treatment process, improving the survivorship care planning process, and increasing access to cancer survivor community programs and resources.

Recommendations

We look forward to continuing to engage in this work as we further refine our data sharing practices and find innovative ways to use data in order to drive decision making, while also recognizing the limitations of the data and resources available to support this work. In collaboration with the Commission, we will explore further opportunities to improve data sharing and analysis of environmental exposure and health outcome data.

Appendices

Memorandum of Agreement (specific to data sharing between DES and DHHS)
HB1356 Preliminary Report (August 2018)

References Used in this Report

USGS Report: Estimated Probability of Arsenic in Groundwater from Bedrock Aquifers in New Hampshire, 2011 (https://pubs.usgs.gov/sir/2012/5156/pdf/sir2012-5156_ayotte_508.pdf)
CDC 10 Essential Services of Public Health (<https://www.cdc.gov/publichealthgateway/publichealthservices/essentialhealthservices.html>)
National Cancer Institute: Cancer Stat Facts (<https://seer.cancer.gov/statfacts/html/all.html>)
Center for Disease Control and Prevention: Bladder Cancer (<https://www.cdc.gov/cancer/bladder/index.htm>)

5. [NH DHHS Community Health Outlooks, Dr. Kathleen Bush, EPHT Program Manager](#)

V. Summary of Meetings/Findings [Mindi]

Because of the coronavirus pandemic, the work of the health subcommittee was paused for a period of time and was limited in receiving necessary testimony and opportunities for group work by members. To date, the subcommittee has met once to address the 3 stated responsibilities of the data subcommittee. Meeting notes are provided in Attachment *.

October 6th to compile info for the report

Copies of correspondences are provided in Attachment *.

VI. Data Subcommittee Completed Tasks [Katie]

- **Monitoring and Surveillance [Katie]**
- **Reporting [Katie]**

The following tasks have been completed since the initiation of the data subcommittee.

The data subcommittee developed the following framework or conceptual diagram to help focus our efforts. Each charge of the Commission, as outlined in the original bill, falls into one of four topic areas.

1. Monitoring & Surveillance
2. Reporting
3. Communicating
4. Capacity Building

In addition there are two cross-cutting topics that include (a) collaborating with local, state, and federal partners, and (b) routinely monitoring and communicating results to stakeholders.

SB85: Commission to Study Environmentally-Triggered Chronic Illness

Monitoring & Surveillance	Reporting	Communicating	Capacity Building
<ul style="list-style-type: none"> • Identifying relevant programs (1) • Identifying relevant databases (1, 4, 6) • Identifying outcomes of interest (5) 	<ul style="list-style-type: none"> • Reviewing existing reports (7) • Generating new reports that summarize findings (2, 3, 8) 	<ul style="list-style-type: none"> • Getting information from concerned stakeholders (1) • Sending information to public health officials (2) • Sending information to citizens (3) • Developing materials for healthcare providers to identify health effects (13) • Streamlining outreach and education to reduce exposures (14) 	<ul style="list-style-type: none"> • Developing a surveillance program to track the outcomes of interest (4, 8, 9, 10, 11) • Identifying program and technology gaps (9, 11, 12) • Improving interoperability of data systems to support surveillance program (8, 11) • Recommending legislation to support the work of the Commission (15)
Add new text here.			
<ul style="list-style-type: none"> • Add new ideas here. 			
Collaborating with local, state, and federal partners (7, 13, 14) Routinely monitoring and communicating results to stakeholders (2)			

The subcommittee received testimony from agencies about existing programs and funding that could be made available to address concerns about the health impacts in the affected area.

1. Monitoring and Surveillance

a) Identifying relevant programs

- i. The New Hampshire Environmental Public Health Tracking Program is focused on tracking environmental health outcomes across space and time. Key topic areas include: air quality, water quality, respiratory outcomes, cardiovascular outcomes, birth outcomes, cancer, childhood lead poisoning, and climate change.

For additional information see this two-page program factsheet:

<https://www.nh.gov/epht/documents/what-is-epht-final.pdf>

- ii. In April 2020, The New Hampshire Department of Environmental Services (NHDES) and Department of Health and Human Services (DHHS) were awarded the Agency for Toxic Substances and Disease Registry (ATSDR) APPLETREE Grant. This is a 3-year award for

approximately \$400,000 per year and will fund a Program Manager and Risk Assessor within DES as well as a Health Educator within the DHHS Department of Public Health Tracking System (DPHS). The grant has two components:

1. Conducting site-investigations (e.g., health consultations and health risk assessments) at hazardous waste sites and other locations to reduce or eliminate human exposure to environmental contamination with a focus on community engagement, education, and outreach; and,
2. Supporting the Choose Safe Places for Early Care and Education Program focused on the safe siting of childcare facilities and the development of environmental health standards that may be incorporated into siting criteria.

b) Identifying relevant databases

i. *NH Health WISDOM*

NH Health WISDOM is an interactive system assembled by the Department of Health and Human Services, Division of Public Health Services, in order to aggregate public health data and produce customized analysis. Data in WISDOM is organized around The New Hampshire State Health Improvement Plan (NH SHIP) and the NH Environmental Public Health Tracking (EPHT) surveillance data on environmental hazards, exposures, and associated health effects. Users may access data using interactive dashboards. Data in WISDOM is compiled from the following sources:

- Behavioral Risk Factor Surveillance Survey 2005-2016
- NH Hospital Discharge Data (In-State) 2000-2009; 2012-2016
- NH Hospital Discharge Data (Out-of-State) 2000-2009; 2012-2016
- Birth Conditions 2003-2010
- Air Quality (PM 2.5 and Ozone) 1999-2014
- National Survey on Drug Use and Health (NSDUH) 2003-2015
- NH Population (Claritas) 2005-2017
- Occupational Health Data (years vary based on dataset)
- PFC blood test results 2015-2016 (varies based on location)
- NH State Cancer Registry 2000-2015 maintained through the Geisel School of Medicine at Dartmouth-Hitchcock Medical Center
- NH Vital Records (Birth/Death Certificates) 2000-2016
- Pediatric Nutrition Surveillance System (PedNSS) 2007-2013
- Third Grade Survey 2009, 2014
- Youth Risk Behavior Surveillance System 2007-2017

ii. *LIMS system, DHHS Division of Public Health, Public Health Laboratories*

The LIMS system is the internal data system of DHHS's Public Health Laboratories, which is used to store data accumulated in the course of a miscellany of programs. The Public Health Laboratories have been involved in testing for water quality in conjunction with DES's MTBE investigations, arsenic and uranium in conjunction with DHHS's Biomonitoring Program, and DHHS's lead poisoning surveillance. For details on the release of data held by DHHS to the general public and to public health researchers, consult the Division of Public Health Services.

iii. *The Environmental Monitoring Database*

The Department of Environmental Services Environmental Monitoring Database holds data collected through permitting, investigation and monitoring activities of the divisions of air resources, water resources and waste management. Data is collected through permitting activities and data monitoring required by state law, rules, and relevant federal statutes such as the Clean Air and Clean Water Acts. The public facing portal to the Environmental Monitoring Database is the website OneStop, maintained by the Department.

c) Identifying outcomes of interest

Diseases and conditions linked to environmental exposures and associated environmental toxins recognized by NIEHS are summarized in Table 1. See NIEHS Website for additional information:

<https://www.niehs.nih.gov/health/materials/index.cfm>.

In addition, the Agency for Toxic Substances and Disease Registry (ATSDR) recognizes the following outcomes associated with PFAS exposure: increased cholesterol, changes in liver enzymes, low birth weight, decreased vaccine response, increased risk of high blood pressure or pre-eclampsia in pregnant women, and increased risk of kidney and testicular cancer. See ATSDR Website for additional information:

<https://www.atsdr.cdc.gov/pfas/health-effects/index.html>.

Table 1. NIEHS Summary of Disease or Condition and Environmental Toxin

Disease or Condition	Subtype Diagnosis	Environmental Toxin(s)
Asthma	Asthma	Air pollution, ozone, fine particulates, allergens
Autism	n/a	Air pollution,
Autoimmune diseases (i.e., Lupus)	Diabetes Lupus Multiple sclerosis Rheumatoid Arthritis Celiac disease	Solvents Smoking Silica Mercury
Cancer	Breast cancer Endometrium Kidney Colon Lung Esophagus	Acrylamide (fried food) Arisotolochic acids (herbals) Tobacco Obesity Pesticides Solvents Silica Dioxins PAHs Arsenic Beryllium
Lung disease	COPD	Tobacco Allergens Air pollution Asbestos
Obesity (Obesogens)		Tobacco Tribuytlin Pesticides PCBs Phthalates Flame retardants
Parkinson's disease		Pesticides DDT
Reproductive Health		Lead Mercury

2. Reporting

a) Reviewing existing reports

- i. Existing reports were shared through presentations and in some cases provided as links to both NH DES and NH DHHS Websites. When the 2020 Cancer Burden Report is released, this will be something we want to review as a Commission. When the Biomonitoring TrACE Summary Report is release, this will also be something we want to review as a Commission.

b) Generating new reports that summarize findings

- i. This sub-aim is related to monitoring and surveillance above. As the Commission identifies specific exposures and outcomes of interest,

there is an opportunity to develop recommendations focused on routine surveillance and reporting. In addition, as the NH Health WISDOM Data Portal is undergoing a major upgrade and transition to a new platform, there may be an additional opportunity to develop recommendations related to what data and information are tracked and reported on the Data Portal. Lastly, as DPHS moves forward with the State Health Assessment and State Health Improvement Plan with input from the SHA/SHIP Council, there is likely opportunity to develop recommendations to inform future priorities.

3. Communicating

- a) With the establishment of the ATSDR APPLETREE Program in NH, there is an emerging opportunity to engage NHDES and NHDHHS in community engagement and outreach and education related to environmental health. We should continue to explore this opportunity. One goal of this program is to establish an environmental health concern investigation protocol that will provide an opportunity for concerned citizens and communities to engage with the Agencies through a formalized process. This program will also provide a conduit for the sharing of information back out to the public and key stakeholders such as healthcare and childcare providers.

4. Capacity Building

VII. Data Subcommittee Uncompleted Tasks [Mindi]

Capacity Building
 Communications
 Data Interoperability
 Community Feedback Loop

VIII. Data Subcommittee Recommendations [Nancy]

Community Outreach

Iterative Feed to Address Community Concerns

Data Interoperability -hear on status of EBI Enterprise Business Intelligence System(data warehouse) from DHHS DPHS Bureau of Information Services and Bureau of Public Health Statistics and Informatics

Community Feedback Loop

PFAS Provider Education

IX. Data Subcommittee Legislative Recommendations [Mindi and Nancy]
Staffing needs – Tom Sherman bill

References

ATSDR, *What are the health effects of PFAS?* <https://www.atsdr.cdc.gov/pfas/health-effects/index.html>.

Nicole W. PFOA and cancer in a highly exposed community: new findings from the C8 science panel. *Environ Health Perspect.* 2013;121(11-12):A340. doi:10.1289/ehp.121-A34

Attachment *. AMA Resolutions

The following is the entry for Resolution 901 at the Interim Meeting last fall (I-19) of the American Medical Association House of Delegates and found on page 246 of this link. The Resolution 922 referred to below is found on page 255 of this link.

<https://www.ama-assn.org/system/files/2020-01/i19-resolutions.pdf>

901. HEALTH IMPACT OF PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) CONTAMINATION IN DRINKING WATER

Reference committee hearing: see report of Reference Committee K.

HOUSE ACTION: FOLLOWING ALTERNATE RESOLUTION ADOPTED IN LIEU OF RESOLUTIONS 901 AND 922 See Policy H-135.916

Per- and Polyfluoroalkyl Substances (PFAS) and Human Health RESOLVED, That our American Medical Association: (1) support continued research on the impact of perfluoroalkyl and polyfluoroalkyl chemicals on human health; (2) support legislation and regulation seeking to address contamination, exposure, classification, and clean-up of PFAS substances; and (3) advocate for states, at minimum, to follow guidelines presented in the Environmental Protection Agency's Drinking Water Health Advisories for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS), with consideration of the appropriate use of Minimal Risk Levels (MRLs) presented in the CDC/ATSDR Toxicological Profile for PFAS.

The following link contains the full text of the two original Resolutions:

<https://www.ama-assn.org/system/files/2019-11/i19-handbook.pdf>

Resolution 901 is found on pages 399-402

Resolution 922 is found on pages 457-459