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CDC PUBLIC HEALTH GRAND ROUNDS

PFAS and Protecting Your Health

Event ID: 4207262

November 19, 2019
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Today’s Speakers and Contributors

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Acknowledgments

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Michelle Walker  Chris Reh  Wilma Lopez  Behetrin Mohammed
Brenda Holmes  Cristina Cope  Jamie Velasquez  Mina Zadeh
Upcoming Programs of Interest

January 21, 2020
Public Health Grand Rounds
Pathogen Genomics

February 18, 2020
Public Health Grand Rounds
Measles
PFAS and Protecting Your Health

Event ID: 4207262

November 19, 2019
Outline

➢ What are PFAS?
➢ History of Use
➢ Initial Investigations
➢ Federal Response
What are PFAS?

➢ Stands for per- and polyfluoroalkyl Substances
➢ Carbon chain surrounded by fluorine atoms and acid group
➢ Many different PFAS species (>5,000)
   ● Pefluorocarboxylic acids (e.g., PFOA)
   ● Perfluorosulfonates (e.g., PFOS)
➢ Repel water and oil
➢ Act as surfactants and dispersants
➢ Persist in environment and in people’s bodies
Sources of PFAS Exposure

- Drinking contaminated water
- Eating fish caught from water contaminated by PFAS
- Accidentally swallowing contaminated soil or dust
- Eating food that was packaged in material that contains PFAS
- Using some consumer products

Babies born to exposed mothers can be exposed during pregnancy and while breastfeeding.

- Nursing mothers should continue to breastfeed.
History of PFAS Exposure and Health Studies

1930s-1950s
PFAS are first synthesized. Production for use in nonstick coatings and stain- and water-resistant products begins.

1968
Evidence of PFAS in human serum first observed

1980s
Preliminary PFAS toxicity studies in rodents suggest possibility of health effects.

1999
PFAS detected in >98% of serum samples collected from the general U.S. population

2006
Eight major PFAS manufacturers begin to phase out PFOA and related compounds
Initial Investigations – Public Drinking Water Testing

- **2013-2015**: EPA measures PFAS in municipal water supplies via the UCMR3
- **65 of about 4,600 systems tested have PFAS above EPA health advisory level**
  - Health advisory level in parts per trillion (PPT) = 70
- **Many drinking water supplies were not tested**
Initial Investigations – Public Drinking Water Testing

- **Community water systems (CWS)**
  - n~51,000
- **CWS sampled during UCMR 3**
  - n~4,800
  - Detected below 70 ppt
    - # Systems: 129
    - # of People Served (% Population): 10 million (3%)
  - Detected at or above 70 ppt
    - # Systems: 129
    - # of People Served (% Population): 6 million (2%)
  - Not sampled
    - Private wells
    - No data
    - CWS
    - No data
    - 0-13-15 million households
    - Not detected
    - # Systems: 4,600
    - # of People Served (% Population): 225 million (67-71%)
    - 47,000

**PPT:** parts per trillion
Since 1999, NHANES has measured blood PFAS in the U.S. population

Most people have PFAS in their blood, especially PFOS and PFOA

As use of some PFAS has declined, blood PFAS levels have gone down
Between 1999–2014, Blood PFOA and PFOS Levels Declined

Blood Levels of the Most Common PFAS in People in the United States from 2000-2014

* Average = geometric mean

Point source of PFOA contamination

PFOA-Affected Water Districts
The legal settlement (2005):

- Filtration of water in affected districts
- “C8 Science Panel” created to evaluate links of PFOA to disease
- “C8 Health Project” to monitor PFOA and other PFAS exposure and clinical effects (laboratory tests)
2005-2006: C8 Science Panel

- Epidemiological study of around 69,000 people living near DuPont Washington Works plant in West Virginia
- Gathered information through interviews, questionnaires, and blood sampling
- Assessed “probable links” between exposure to PFOA and health effects
- Focus groups and townhall meetings
- An extraordinary amount of logistics

Probable link: given the available scientific evidence, it is more likely than not that a connection exists between PFOA exposure and a particular human disease.
Probable Links Between PFOA Exposure and Health Effects

- High cholesterol
- Ulcerative colitis
- Thyroid disease
- Testicular cancer
- Kidney cancer
- Pregnancy-induced hypertension
Federal Response

January 2009
EPA’s Office of Water established provisional health advisories to assess potential risk from short-term exposure via drinking water.

August 2009
EPA’s Office of Water established provisional health advisories to assess potential risk from short-term exposure via drinking water.

February 2010
EPA issued a Health Advisory of 70 ppt for PFOA and PFOS, individually or combined.

May 2012
EPA required all community water systems serving >10,000 customers to monitor for PFCs twice in a 12-month period during 2013-2015.

August 2015
ATSDR released draft Toxicological Profile for perfluoroalkyls.

August 2017
PFOA, PFOS, PFNA, and PFHxS joined ATSDR’s Substance Priority List.

April 2018 - present
NCEH and ATSDR continue to investigate the relationship between PFAS and human health and provide resources to communities.

May 2016
EPA issued Lifetime Health Advisory of 70 ppt for PFOA and PFOS, individually or combined.

March 2018
CDC/ATSDR receives funding to conduct PFAS exposure assessments and a multisite health study.

PFNA: Perfluorononanoic acid
PFHxS: Perfluorohexanesulfonic acid
PFC: perfluorinated chemicals
➢ ATSDR has conducted or supported work at more than 40 sites

ATSDR: Agency for Toxic Substances and Disease Registry
Federal Response: Support to Communities

- CDC/ATSDR PFAS Exposure Assessments
- CDC/ATSDR Multisite Health Study
- 20+ ongoing CDC/ATSDR PFAS projects
PFAS Public Health Challenges

➢ Growing community concern, as more communities found to have been exposed
➢ Need more health information
➢ Need to expand environmental and biological sampling methods
➢ Understanding health effects of exposure to mixtures of PFAS
➢ New compounds being created and used
➢ Water treatment methods need to be developed and evaluated
➢ Clinical interpretation of PFAS test results
Human Health Effects of PFAS—The Intersection of Research Findings and Community Concerns

Alan Ducatman MD, MS
Professor Emeritus
West Virginia University
Scope of the C8 Health Project

- 69,030 adults and children enrolled
- Extensive health survey with validation for 18 health outcomes
- 10 PFAS; >50 clinical laboratory tests
- Secure data base
- Website with summary health communications
- Banked serum
## Selected Health Outcomes of Concern Identified by the C8 Study

<table>
<thead>
<tr>
<th>Topic</th>
<th>Example</th>
<th>Evidence Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altered lipid handling</td>
<td>Cholesterol</td>
<td>Strong, Near Certain</td>
</tr>
<tr>
<td>Liver functions</td>
<td>ALT (aka SGPT)</td>
<td>Strong, Near Certain</td>
</tr>
<tr>
<td>Uric acid handling</td>
<td>Uric acid</td>
<td>Strong, Near Certain</td>
</tr>
<tr>
<td>PIH</td>
<td>BP in Pregnancy</td>
<td>More likely than not</td>
</tr>
</tbody>
</table>

PIH: Pregnancy Induced Hypertension
Higher PFOA exposure, as measured by blood levels, was associated with elevated total cholesterol

Dose-response relationship suggests cause and effect
# Similar Health Effect Findings in other PFAS-exposed Populations

<table>
<thead>
<tr>
<th>Outcome topic (number of studies)</th>
<th>Population Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cholesterol (&gt;15)</td>
<td>Avon Longitudinal, Canadian Health Measures, Henan China, and Childhood populations</td>
</tr>
<tr>
<td>Liver Functions (&gt;5)</td>
<td>C8 China, NHANES, Uppsala Sweden, Childhood populations</td>
</tr>
<tr>
<td>Uric Acid (&gt;5)</td>
<td>C8 China, NHANES, Chemical Workers (Italy), and Childhood Populations</td>
</tr>
<tr>
<td>PIH (3)</td>
<td>Shanghai, China; Swedish Selma</td>
</tr>
</tbody>
</table>

**PIH:** pregnancy induced hypertension  
**NHANES:** National Health and Nutrition Examination Study
Evidence of Diminished Immune Responses to Vaccines

➢ PFOA and PFOS
  ● Are presumed to be immune hazards to humans
  ● Suppress antigen-specific antibody responses in
    ❑ Experimental models: high level of evidence (National Toxicology Program, NTP)
    ❑ Humans: moderate level of evidence (NTP)

➢ Example: diminished antibody responses to tetanus and diphtheria vaccines in 5- to 7-year olds
## Other Health Outcomes of Concern: Reproductive and Developmental

<table>
<thead>
<tr>
<th>Topic</th>
<th>Example</th>
<th>Evidence Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transplacental transport</td>
<td>PFAS in Newborn</td>
<td>Strong/Certain</td>
</tr>
<tr>
<td>Breastfeeding</td>
<td>PFAS in Infant</td>
<td>Strong/Certain</td>
</tr>
<tr>
<td>Breastfeeding</td>
<td>Duration</td>
<td>More likely than not</td>
</tr>
<tr>
<td>Topic</td>
<td>Example</td>
<td>Evidence Basis</td>
</tr>
<tr>
<td>------------------------------</td>
<td>------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Fecundity</td>
<td>Time to pregnancy</td>
<td>Hot research topic</td>
</tr>
<tr>
<td>Sperm</td>
<td>Shape, motility</td>
<td>Hot research topic</td>
</tr>
<tr>
<td>Neurodevelopment</td>
<td>Performance testing</td>
<td>Hard research topic</td>
</tr>
<tr>
<td>Congenital defects</td>
<td>Brain development</td>
<td>Research topic</td>
</tr>
<tr>
<td></td>
<td>Midline clefts (e.g., cleft palate)</td>
<td></td>
</tr>
</tbody>
</table>

Fecundity: a woman’s ability to have children
## Health Outcomes of Concern: Endocrine Disruption

<table>
<thead>
<tr>
<th>Topic</th>
<th>Example</th>
<th>Evidence Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thyroid disruption</td>
<td>Protein binding</td>
<td>Strong, importance debated</td>
</tr>
<tr>
<td>Sterol hormones</td>
<td>Sex steroids</td>
<td>More likely than not</td>
</tr>
<tr>
<td></td>
<td>Androgens (e.g., testosterone)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Estrogens (e.g., estradiol)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Corticosteroids</td>
<td></td>
</tr>
<tr>
<td>Insulin resistance</td>
<td>Diabetes</td>
<td>Research topic</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Research topic</td>
</tr>
</tbody>
</table>
## Do PFAS Cause Cancer?

<table>
<thead>
<tr>
<th>Cancer type</th>
<th>Example</th>
<th>Evidence Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Testicular</td>
<td>Seminoma</td>
<td>More likely than not</td>
</tr>
<tr>
<td>Kidney</td>
<td>Renal Cell Carcinoma</td>
<td>More likely than not</td>
</tr>
<tr>
<td>Other urogenital</td>
<td>Prostate, Bladder</td>
<td>Research topic</td>
</tr>
<tr>
<td>Others</td>
<td>Liver, Pancreas</td>
<td>Research topic</td>
</tr>
</tbody>
</table>
Other Health Outcomes of Research Interest

➢ Bone and joint health
  ● Recent literature example: osteoporosis

➢ Obesity
  ● Following exposure in utero or early in life

➢ Hypertension

➢ Microvascular disease
  ● Sites include brain, kidney

➢ Kidney disease

➢ Immune-mediated
  ● Includes ulcerative colitis, asthma, allergy

Certainty and Concern Are Not Always Aligned

- Understandably, cancer, birth defects, and reproduction are frequent topics of community questions; this research is harder to do.

- What scientists may consider a cautious answer about exposures, outcomes, knowledge gaps, and barriers to good research, can also be heard by listeners as dismissive.

- Answers about what we do and do not know have to be framed carefully.
Priority 1. First Reduce the Exposure

- When a contaminated water supply is identified as the primary source in an affected community, this is a public health priority in that community. Options are a source of clean, uncontaminated water, or a means to filter the contaminated water.
Priority 2: Reduce the Impact of Past Exposures

This leads to questions about **MEDICAL MONITORING**, defined as **case-finding** in order to refer individuals for further evaluation and, as appropriate, treatment.

**Can Include:**
- Testing for early biologic effect, and
- an assessment of exposure using models of exposure or actual biological specimens (for example, blood or urine), when appropriate
CDC/ATSDR Guidance: When is Medical Monitoring Helpful?

- **Target community, exposure > threshold**
  - measured or modeled

- **Reasonable association: exposure → adverse outcomes**

- **Monitoring brings a net benefit**
  - Earlier detection
  - Treatment or intervention possible, can prevent or mitigate disease
  - Detection and treatment or intervention has more benefits than harm
  - Does not duplicate other testing
Advantages of Community Level Medical Monitoring

- Participant access to testing, including serum PFAS
- Summary report-back function
- Access to expertise
- Economies of scale
- Quality improvement
- Proven participation, appreciation
Positive Community Response to Medical Monitoring

Combined “excellent” or “good” responses (percent) from C8 Health Project Participant Survey

- Public awareness: 88.0%
- Ease of providing blood sample: 94.4%
- Recalled receiving results: 97.5%
- Overall experience: 91.8%

Importance to health of family:
- Very important: 84.4%
- Moderately important: 14.1%

One Reality of Community Level Monitoring: 
In Absence of Resources, Long Delays
What Is Reasonable for Affected Individuals in Communities?

A physician’s perspective:

The CDC/ATSDR criteria for communities can also provide reasonable guidance to people and their providers, so long as:

➢ The exposure is documented
➢ The approach is simple, acceptable in the community, and has a net benefit for earlier diagnosis and then preventing or mitigating disease
What Is Reasonable for Affected Individuals in Communities?

➢ **Clinical Evaluation** *(in my view meeting recommended criteria for helping and being acceptable)*

- Body mass index (BMI) measurement and managing obesity as needed
- Clinician or self-administered testicular examination
- Home blood pressure monitoring to augment measurements during pregnancy
- Fertility and reproductive concerns- discussion
What Is Reasonable for Affected Individuals in Communities?

- **Laboratory Testing** (in addition to serum PFAS)
  - lipid panel (cholesterol, LDL, HDL, triglycerides)
  - liver function tests such as ALT, AST, GGT
  - thyroid stimulating hormone (TSH)
    - especially during pregnancy
  - uric acid and creatinine
  - urinalysis
Health Communications About PFAS Testing

➢ Needs to be done thoughtfully.
➢ Those affected by contaminated water may not agree that they are “better off without testing”.
➢ Barriers should be stated honestly; it has been hard and costly to get individual testing of PFAS exposure.

Other than money and time investment, there is in my view no downside to the individual obtaining PFAS lab data.
Some health effects of PFAS exposure are well documented, others the subject of ongoing investigation, and our knowledge is based on only a few of the many possible PFAS contaminants.

Reduction of exposure and reducing the effects of past exposure are overarching principles of public health response.

Medical monitoring according to established public health guidance is beneficial to populations in exposed communities and can reasonably inform choices for individuals.
How Michigan Is Taking Action on PFAS

Steve Sliver
Executive Director
Michigan PFAS Action Response Team
Michigan Department of Environment, Great Lakes, and Energy
Objectives

➢ Highlight Michigan’s proactive approach to PFAS contamination

➢ Provide an overview of PFAS contamination in Michigan and actions to identify and reduce exposures

➢ Highlight state-level opportunities for protecting public health

**PFAS RESPONSE**

**TAKING ACTION, PROTECTING MICHIGAN**
PFAS Emerge in MI

- 2012 Wurtsmith Air Force Base “Do Not Eat” fish advisory
- 2013 Surface water survey
- 2017 Camp Grayling sample data
- 2017 North Kent County sample data
Michigan PFAS Action Response Team (MPART)

- Unique multiagency approach
  - includes environment, agriculture, transportation, and health

- Advisory body

- Leads coordination and cooperation at all levels of government

- Enables a comprehensive approach to identify and reduce exposures to PFAS contamination
Sites Being Investigated

- Prioritized investigations based on known or suspected sources, potential for exposure
- Protect drinking water
- Other investigations underway
Surface Water Investigations

- Survey of surface water and fish
- Foam
- Wastewater
Public Health Advisories

Fish and Deer consumption
9 – 300 ppb PFOS

Surface water foam
Michigan PFAS Standards

Drinking water
✓ 70 ppt PFOA/PFOS lifetime health advisory recommendation
✓ Maximum contaminant levels (MCLs)

Surface water quality
✓ 12 ppt PFOS (11 ppt if DW source)
✓ 12,000 ppt PFOA (420 ppt if DW source)

Groundwater cleanup
✓ 70 ppt PFOA/PFOS
✓ GSI per surface water quality standards

DW: drinking water
PPT: parts per trillion
GSI: groundwater surface water interface
Public Water Supply Testing

➢ **Phase I - 2018**
  ● All community water supplies (1,114)
  ● All NTNCWS schools and daycares (619)
  ● All tribal systems (17)
  ● Informs additional testing of other supplies

➢ **Phase II - 2019**
  ● Non-community water supplies (750 total)
    ❑ 237 children’s camps
    ❑ 162 medical care facilities

➢ **Monthly monitoring**
  ● All 65 surface water systems

➢ **Quarterly monitoring**
  ● 61 systems with >10 ppt total PFAS from Phase I

NTNCWS: Non-Transient Non-Community Water System
PPT: parts per trillion
Phase I Results Show PFAS Contamination in Multiple Types of Community Settings

Statewide Public Water Supply Testing Initiative Results*

- Non-Detect Total PFAS
- < 10 ppt Total PFAS (Not ND)
- 10 – 70 ppt PFOS+PFOA (>10 ppt Total PFAS)
- > 70 ppt PFOS+PFOA

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage %</th>
<th>Non-Detect</th>
<th>&lt; 10 ppt</th>
<th>10 – 70 ppt</th>
<th>&gt; 70 ppt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Water Supplies</td>
<td>89.2%</td>
<td>7.5%</td>
<td>3.1%</td>
<td>0.1%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Schools on Wells</td>
<td>91.1%</td>
<td>4.6%</td>
<td>4.1%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Child Care / Head Start</td>
<td>88.2%</td>
<td>6.6%</td>
<td>5.3%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Tribes</td>
<td>100.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
</tbody>
</table>
Establishing State Drinking Water Standards

➢ No federal standards on the horizon

➢ Science Advisory Panel Report, December 2018
  ● 70 ppt standard for PFOA/PFAS could be too high
  ● other PFAS should be considered as well

➢ Michigan’s two-step approach to enforceable standards
  ● Science Advisory Workgroup completed June 27, 2019
  ● rulemaking underway for planned issuance in April 2020
# Health-Based Values for Drinking Water

<table>
<thead>
<tr>
<th>Specific PFAS</th>
<th>Parts Per Trillion (ppt)</th>
<th>EPA Lifetime Health Advisory</th>
</tr>
</thead>
<tbody>
<tr>
<td>PFOA</td>
<td>8</td>
<td>70 ppt combined</td>
</tr>
<tr>
<td>PFOS</td>
<td>16</td>
<td>N/A</td>
</tr>
<tr>
<td>PFHxS</td>
<td>51</td>
<td>N/A</td>
</tr>
<tr>
<td>PFNA</td>
<td>6</td>
<td>N/A</td>
</tr>
<tr>
<td>PFBS</td>
<td>420</td>
<td>N/A</td>
</tr>
<tr>
<td>GenX</td>
<td>370</td>
<td>N/A</td>
</tr>
<tr>
<td>PFHxA</td>
<td>400,000</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Michigan’s Public Health Response to PFAS

- Whole of state government response
- Source investigations and statewide drinking water surveillance
- Evidence-informed policymaking
- Public health actions to reduce PFAS exposure
PFAS Contamination: Community Perspective

Andrea Amico
Co-founder
Testing for Pease
Objectives

- Describe PFAS contamination at the former Pease Air Force Base in Portsmouth, NH
- Outline origins of Testing for Pease
- Understand the role of community action and organizing in protecting public health
- State community concerns and needs
Welcome to the Pease International Tradeport

- Large business park on the seacoast of New Hampshire
- Development of the Pease Tradeport started in 1991
- Three wells supply drinking water
- Currently home to ~ 250 businesses and still growing
  - 2 daycare centers
  - restaurants
  - healthcare and medical office buildings
  - five colleges
  - golf course
- More than 10,000 people employed on Pease daily
- Home to Portsmouth International Airport (PSM)
- Air National Guard base still active on Pease
PFAS Contamination at Pease Air Force Base in Portsmouth, NH

- 1956 to 1991 Strategic Air Command (SAC) base
- 4,365 acres of land with 3 on-site drinking water wells
- In 1991, Pease AFB closed
- In 1991, Pease became a Superfund site
- Home to the Air National Guard 157th Air Refueling Wing

A Superfund site is any land that has been contaminated by hazardous waste and identified by the EPA as a candidate for cleanup because it poses a risk to human health and/or the environment.
Origins of PFAS Contamination at Pease

➢ May 2014 – newspaper revealed that PFAS contamination was discovered in three wells supplying drinking water to the Pease International Tradeport.
➢ All three drinking water wells had detectable levels of many PFAS.
➢ One well tested over the EPA Public Health Advisory limits and was shut down immediately.
➢ Source of PFAS was aqueous film forming foam (AFFF).
  • Used to fight petroleum related fires

www.seacoastonline.com/article/20140522/NEWS/140529897
PFAS Contamination is Widespread

www.ewg.org/interactive-maps/2019_pfas_contamination/map/?_ga=2.71133200.1624294917.1568649435-997314722.1568649435
What Is Testing for Pease?

➢ Testing for Pease is a community action group, whose mission is to

• be a reliable resource for education and communication
• advocate for a long-term health plan on behalf of those harmed by the PFAS water contamination at the former Pease Air Force Base in Portsmouth, NH

Alayna Davis, Andrea Amico, Michelle Dalton
Community Action

Action achieved for the Pease community:

- PFAS blood tests from 2015–2018 (~ 1800 participants)
- Filtration of two of the drinking water wells (September 2016)
- Remediation of PFAS contamination (ongoing)

Air Force plant removes PFAS from Pease water
Community Action

Action achieved for the Pease community:

➢ ATSDR Feasibility Assessment completed May 2017

➢ Federal law giving DoD authority to fund Pease health study, exposure assessments, and multisite studies

➢ ATSDR Pease pilot health study started Fall 2019

Many communities have NOT experienced all of the action we have seen at Pease
PFAS Community Leaders Taking a National Platform

➢ Attended EPA’s first National PFAS Summit in DC – May 2018

➢ Met with then EPA administrator Scott Pruitt – May 2018

➢ Testified at the Senate’s first hearing on PFAS – September 2018

➢ Presented at National PFAS Conferences – 2017, 2019
PFAS Community Leaders Taking a National Platform

➢ Attended the president’s State of the Union address – February 2019

➢ Gave a TEDx talk “How an Ordinary Person Can Become an Advocate” – September 2019

➢ Executive steering committee member for ATSDR’s First PFAS Community Engagement Summit – June 2019
National PFAS Contamination Coalition

- Formed in June 2017
- Made up of community PFAS leaders all across the U.S. and Guam
- Working on common goals to enact change at the federal level
- Provide support, education, and act as a resource to others
National PFAS Contamination Coalition

- Coordinated trips to local, state, and federal meetings and hearings
- Presented and attended PFAS conferences
- Met with many elected officials, government agencies, scientists, academics, and nongovernmental organizations
Community Challenges and Concerns

➢ Why are PFAS presumed safe until proven toxic?

➢ Lack of federal health advisories, health and toxicology data for all PFAS

➢ Current EPA LHAs for PFOS and PFOA are too high and do not protect public health and sensitive populations (infants, children, already exposed populations)

➢ Multiple health effects impacting many systems in the body
Community Challenges and Concerns

- Communities should not be financially responsible for alternative water supply, remediation, filtration, blood testing
- Having few labs capable of standardized testing of water and blood causes multiple barriers to PFAS testing
- Lack of physician education and medical monitoring guidelines on PFAS
Community Challenges and Concerns

➢ **PFAS contamination has significant economic consequences:**
  - Property values decreased
  - Businesses lack the ability to attract and retain talented employees and customers
  - Chronic illness reduces employee attendance and productivity and drives up healthcare costs

➢ **Additional expenses:**
  - Medical bills
  - Bottled water
  - Home filtration systems
  - Blood and water tests
  - Community organizing
Community Challenges and Concerns

➢ Chronic illness as a result of PFAS exposure
  - loss of work, wages
  - loss of happiness
  - loss of productivity
  - loss of life
Community Challenges and Concerns

- Not seen as stakeholders
- Lack of transparency
- Inconsistent responses to contamination
- Inconsistent messaging from government agencies
- Ongoing exposure from unregulated contaminants
- Data is not made readily available to stakeholders
- Impacted communities do not have resources to engage independent technical support
- Communities, rather than polluters, bear the brunt of financial costs
Community Needs

- Classify PFAS as hazardous substance
- Treat PFAS as a class and regulate them together, not one compound at a time
- Establish MCL of 1 ppt for all PFAS
- Use non-fluorinated firefighting foam alternatives
- Do not allow the introduction of any new PFAS into production due to the large number already in the environment
- Establish medical monitoring guidelines and provide outreach to physicians
- Improve lab analytical methods to test for many PFAS in water and blood and make those more accessible, affordable nationwide

MCL: maximum contaminant level
Community Needs

- Prioritize public health when making critical regulatory decisions
- Shorten response time on taking meaningful action
- Label all products containing PFAS
- Provide funding to states to support more testing, clean up, and community response
- Value community members as critical stakeholders by including us in meetings and ask for our input on important decisions – “Nothing about us without us”
Thank You!!!

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“Never doubt that a small group of thoughtful committed citizens can change the world; indeed, it's the only thing that ever has.” ~Margaret Mead