Biomonitoring Communication Considerations:
Reporting, data sharing, and policy initiatives

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Communicating Risk and Reporting
“Risk communication is estimating the probability of something happening and communicating that probability...people don’t think in these terms.”

- K. Viswanath, PhD, Harvard School of Public Health
Keep the following at top of mind

- Limited health effect information available
- Need to combine information on exposures, test results, toxicity levels, reference populations, and health effects to answer their questions
- Whether a health effect occurs depends upon many things: dose, frequency, route of exposure, exposure to other chemicals, personal factors

How do people process risk?
How will you communicate risk?

Part of the planning process is getting to know your audience and building trust

- Assess your population
- Professional and community partnerships for trust and expertise
- Use several types of media

Socioecological model

Credit: MA Citizens for Children
Think about the questions you would have if you were being tested

- Am I going to get sick?
- Is my family safe?
- How can I reduce my levels?
- Who will see my results?
- Who will pay for testing/fixing the problem?
You need to be explicit about what is known and what is unknown.

Before beginning the questionnaire, you must read the following five statements and then select Yes below to confirm that you understand:

1. I understand that measuring my blood PFC levels will not tell me whether I have developed, or will develop, a health problem because of the PFCs found in my blood.

2. Because PFCs are found in the blood of almost all people in the United States, I understand that my blood will most likely have PFCs found, and that if my drinking water had PFC contamination, my blood PFC level is probably higher than the average person in the United States.

3. I understand that for certain medical reasons, the hospital performing the blood draw may not be able to draw my blood.

4. I understand that I must sign all necessary consent forms before having my blood drawn and tested for PFCs.

5. NH DHHS encourages all participants to talk with their, or their child’s, health care provider before deciding to have PFC blood testing to discuss the risks and benefits of testing, and to ensure that there is no medical reason why a person should not have their blood drawn.
Reference population

- Necessary for CLIA, necessary for personal interpretation
- When should they consult a medical provider?

Credit: CDC PHIL
Plain Language

Writing so that information is:

• Easy to find
• Easy to understand
• Easy to use

Plain Writing Act of 2010

• To increase citizen access to governmental information

What should I do?

• Test your well water every 3-5 years.
  ○ **Install** a water treatment system or drink and cook with bottled water if your well water uranium levels exceed 30 micrograms per liter (30µg/L).
  ○ **Consider Installing** a water treatment system or drinking and cooking with bottled water if your well water uranium levels are 0.001-30µg/L. This is because it is not known if long-term low-level exposure will make you sick.

• Ask your supervisor if you come into contact with uranium at work. Discuss ways to protect yourself from contact.
• Wash your hands after touching soil or working at a job that involves uranium or uranium-containing products.
• Do not use products, fertilizers, or pigments that contain uranium.
Welcome to Arsenic and You

We hope this website answers your questions about arsenic. It includes comprehensive information on arsenic in food, water and other sources. Our goal is to help you lower your exposure to this toxic metal and improve your family’s long-term health.

Should you be concerned about arsenic?

Yes. While everyone is exposed to some arsenic, certain people are exposed to more arsenic on a regular basis. Find out if you might be exposed to more arsenic, and read on to learn what you can do to reduce your exposure.

Explore this website for details on arsenic in food, water and other sources, and follow the steps outlined on each page to reduce your arsenic exposure. See the Resource links for helpful tools, videos and more detailed information. The Definitions page provides explanations of arsenic-related words and terms.

Why is arsenic a problem?

You can’t see, smell, or taste arsenic. At very high levels, arsenic is poisonous and causes serious and immediate health effects. In the U.S., levels of arsenic in food and water are usually too low to cause obvious symptoms or make you sick right away.

Many people in this country are exposed to low levels of arsenic through food, water and other sources that may increase their risk of diseases like cancer, heart disease and diabetes later in life.

What can you do?

- If you have a private well, get your water tested.
- If you eat a lot of rice or other foods that are higher in arsenic, eat them less often or vary with other types of food that are lower in arsenic.
- If you are pregnant or have infants or children in your home, be sure your family’s diet is low in arsenic as possible.
- Public water supplies are regulated by the U.S. Environmental Protection Agency.
- If you drink from a private well, it is your responsibility to make sure your well water does not contain arsenic.
- Right now there are no regulatory standards for arsenic in food.
Health Literacy

“The degree to which a person has the capacity to obtain, communicate, process, and understand basic health information and services in order to make appropriate health decisions.”

### Results Summary

<table>
<thead>
<tr>
<th>Routine Analysis</th>
<th>Water Test Value Entered</th>
<th>Drinking Water Contaminant Limit or Radon Advisory Level</th>
<th>About Your Well Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arsenic</td>
<td>0.011 mg/L</td>
<td>0.01 mg/L</td>
<td>The value entered exceeds the drinking water standard</td>
</tr>
<tr>
<td>Iron</td>
<td>0.2 mg/L</td>
<td>0.3 mg/L</td>
<td>The value entered meets the drinking water guideline</td>
</tr>
<tr>
<td>Lead Stagnant</td>
<td>0.15 mg/L</td>
<td>0.015 mg/L</td>
<td>The value entered exceeds the drinking water standard</td>
</tr>
<tr>
<td>Manganese</td>
<td>400 mg/L</td>
<td>0.05 mg/L</td>
<td>The value entered exceeds the drinking water guideline</td>
</tr>
<tr>
<td>Nitrite-N</td>
<td>2 mg/L</td>
<td>1 mg/L</td>
<td>The value entered exceeds the drinking water standard. YOUR WATER IS NOT SAFE FOR BABIES UNDER SIX MONTHS OLD TO CONSUME.</td>
</tr>
</tbody>
</table>

[https://www4.des.state.nh.us/DWITool/Welcome.aspx](https://www4.des.state.nh.us/DWITool/Welcome.aspx)
### Results Detail

<table>
<thead>
<tr>
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### Interpretation of Results:

Does my well water meet the **drinking water standard for arsenic**? No, your water does not meet federal and state drinking water standards as it contains more than 0.010 mg/L of arsenic.

### Treatment Options:

**How can I reduce the level of arsenic in my water?** In addition to arsenic, your test results show that your water also contains more than 0.1 mg/L of iron and manganese, which must be considered in the selection of a water treatment system. Install one of the following water treatment systems to reduce the level of iron, manganese, and arsenic in your water:

1. An NSF/ANSI Standard 42 certified whole house oxidizing filter system that uses chlorine or permanganate as the oxidizing agent to reduce the level of iron and manganese.

### Health Concerns:

**Can consuming water containing arsenic affect my health?** Consuming water containing more than 0.010 mg/L of arsenic is associated with an increased risk of cancer of the skin, bladder, lungs, kidneys, nasal passages, liver, or prostate as well as diseases of the nerves, lungs, heart, and immune and endocrine (hormonal) systems. Your individual health risk depends on the amount of arsenic in your water, how much of the water you drink each day, and the number of years you drink the water. To reduce your exposure to arsenic in your well water, treat the water that you use for drinking and cooking to a level less than 0.010 mg/L. You can continue to use your water for washing food and dishes, brushing your teeth, bathing, showering, and for other uses.

[https://www4.des.state.nh.us/DWITool/Welcome.aspx](https://www4.des.state.nh.us/DWITool/Welcome.aspx)
Flesh-Kincaid

• Both assess avg. sentence length and avg. syllables per word

• **Ease score:** higher score = easier to understand
  • Goal: >70

• **Grade level:** higher score = more difficult to understand
  • Goal: ≤8.0 (8th grade level)

Graphics/color blindness

• [www.usuability.gov](http://www.usuability.gov)
Apply all of these lessons to your report packages and test for understanding
Data Sharing
Things to consider:

- Data suppression guidelines
- Format
- Advertising
Sharing data with public health professionals

Things to consider:

- Do MOUs exist?
- Data suppression/granularity
- Advertising
Perfluorochemical (PFC) Blood Testing and Community Exposure

How are people exposed to PFCs?

PFCs are synthetic chemicals that have been widely used to make a range of household and commercial products including stain resistant furniture, carpeting, and clothing; water-repellant fabrics; and grease-resistant food packaging. Because of this widespread use, most people have been exposed to these chemicals in their everyday lives, usually through oral ingestion, and when tested, almost all people have detectable levels of PFCs in their blood. If someone’s drinking water has these chemicals, their blood levels are likely higher than the average U.S. resident.

How long do PFCs stay in the body?

Some PFCs remain in a person’s blood for a very short amount of time, whereas others can remain for years. Once exposures are removed, PFCs, such as perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS), decline naturally in a person’s blood by about half every 4-6 years; perfluorohexane sulfonic acid (PFHxS) declines by about half every 7-8 years. There is no known medical procedure to remove PFCs from your body more quickly than occurs naturally over time.

Are there health effects known to be associated with PFCs?

Some human health studies have found associations between PFC exposure and health effects and others have not, therefore conclusions cannot be made with certainty about any health effects caused by PFCs at this time. Because of this uncertainty, further research is necessary, and a variety of potential health effects in humans are currently being studied. Studies include how PFCs might affect growth and development, liver function, hormone levels, cholesterol levels, and occurrence of some types of cancers. More information can be found on the Department of Health and Human Services website.

If you have additional questions, contact the DHHS Public Inquiry Line at (603)271-9461 or at PFCtesting@dhhs.nh.gov.
Average PFC serum levels by age group, MVD

- **PFOS**: 3.6
- **PFOA**: 2.8
- **PFHxS**: 0.9

**Age group (years)**

- 0 to 19
- 20 to 39
- 40 to 59
- 60+

**Average serum concentration (micrograms/L)**

- PFOS
- PFOA
- PFHxS
Policy Initiatives
Welcome Bienvenue

New Hampshire

"Live Free or Die"

Credit: NHPR File Photo
Establishing a commission to study environmentally-triggered chronic illness
Requires the commissioner of DES to review ambient groundwater standards for arsenic
Exploring our options

- DHHS Legislative Liaison
- THE question: *How much?*
- *May v. shall* language
- Outreach
Acknowledgements

- NH PHL Water Analysis Laboratory & EPHT
- NH Department of Environmental Services (DWGW, MtBE)
- Dartmouth Toxic Metals Superfund Research Program
Resources

APHL Biomonitoring Communication Module
https://vimeo.com/258108654/cd3a5f7f6e

FEMA Public Information Officer course
https://training.fema.gov/programs/pio/g290.aspx

Harvard School of Public Health “Communicating Risk in the 21st Century”
https://www.hsph.harvard.edu/ecpe/programs/

NIH Plain Language online training
https://plainlanguage.nih.gov/CBTs/PlainLanguage/login.asp

CDC Health Literacy trainings
https://www.cdc.gov/healthliteracy/gettraining.html
Resources

CDC Everyday Words for Health Communication
https://www.cdc.gov/other/pdf/everydaywordsforpublichealthcommunication.pdf

ATSDR Communications Toolkit
https://www.atsdr.cdc.gov/communications-toolkit/c7.html

Readability software
• Flesh-Kincaid: https://support.office.com/en-us/article/Test-your-document-s-readability-85b4969e-e80a-4777-8dd3-f7fc3c8b3fd2
• Visual: https://www.usability.gov/

NIH Health Literacy training

Plain Language
https://www.plainlanguage.gov/
Resources

NH DES Be Well Informed Tool
https://www4.des.state.nh.us/DWITool/Welcome.aspx

Dartmouth Toxic Metals Superfund Research Program As information
www.ArsenicandYou.org

NH EPHT WIDSOM health data portal
https://wisdom.dhhs.nh.gov/wisdom/
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