



PFOA Blood Testing and Exposure Assessment • Summary of Results

Blood Testing Goals



- Make sure no additional actions were needed to prevent continued exposure
- Better understand how people in the Bennington community were exposed to PFOA
- Provide community members with their PFOA blood level and how it compares to background levels in the U.S. population

Blood Testing Eligibility

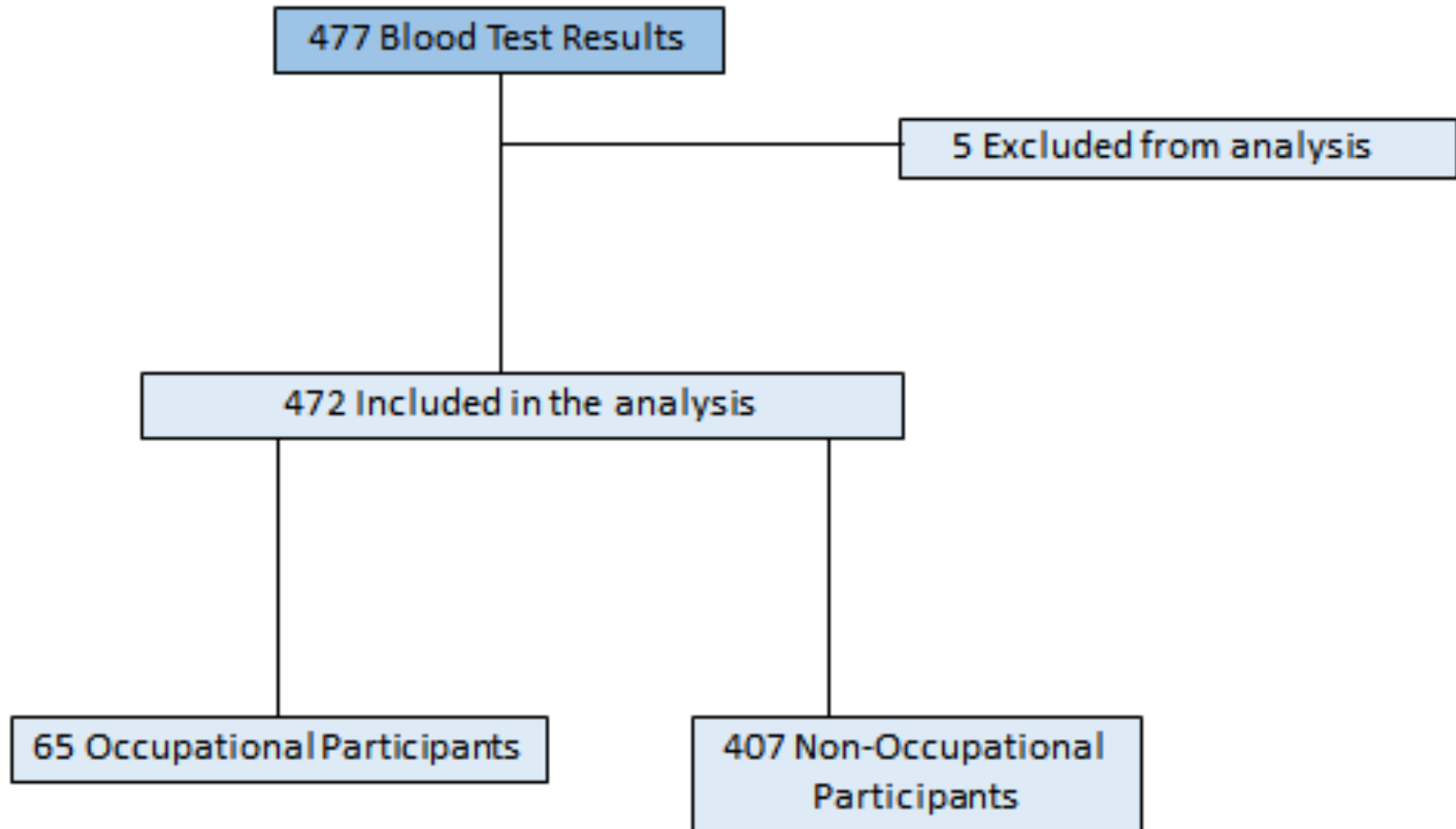


Who was eligible?

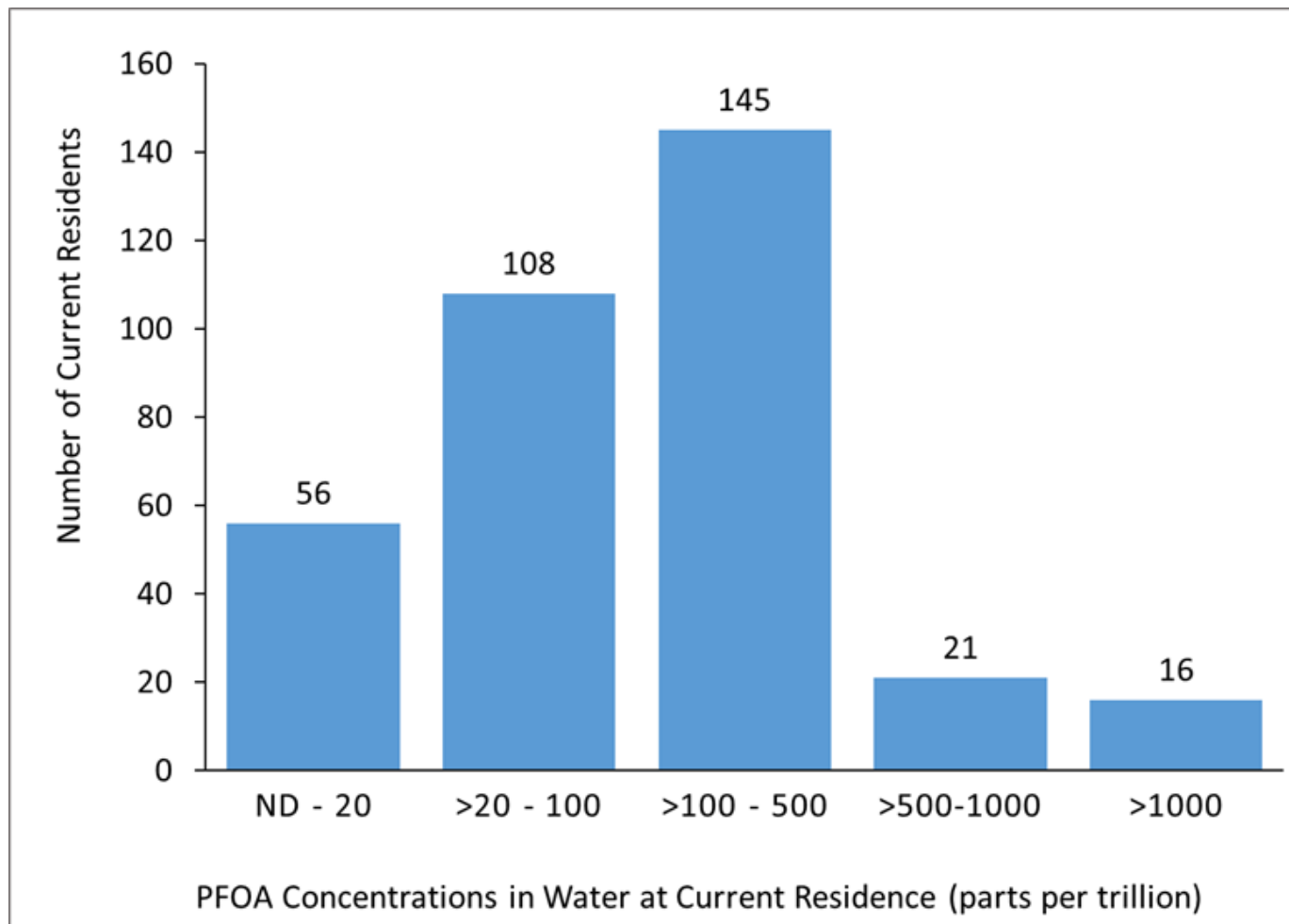
Anyone who –

- had their well water tested by DEC -or-
- lived in one of those homes in past 8 years
- lives, lived, works or worked at Chemfab

Study Participation

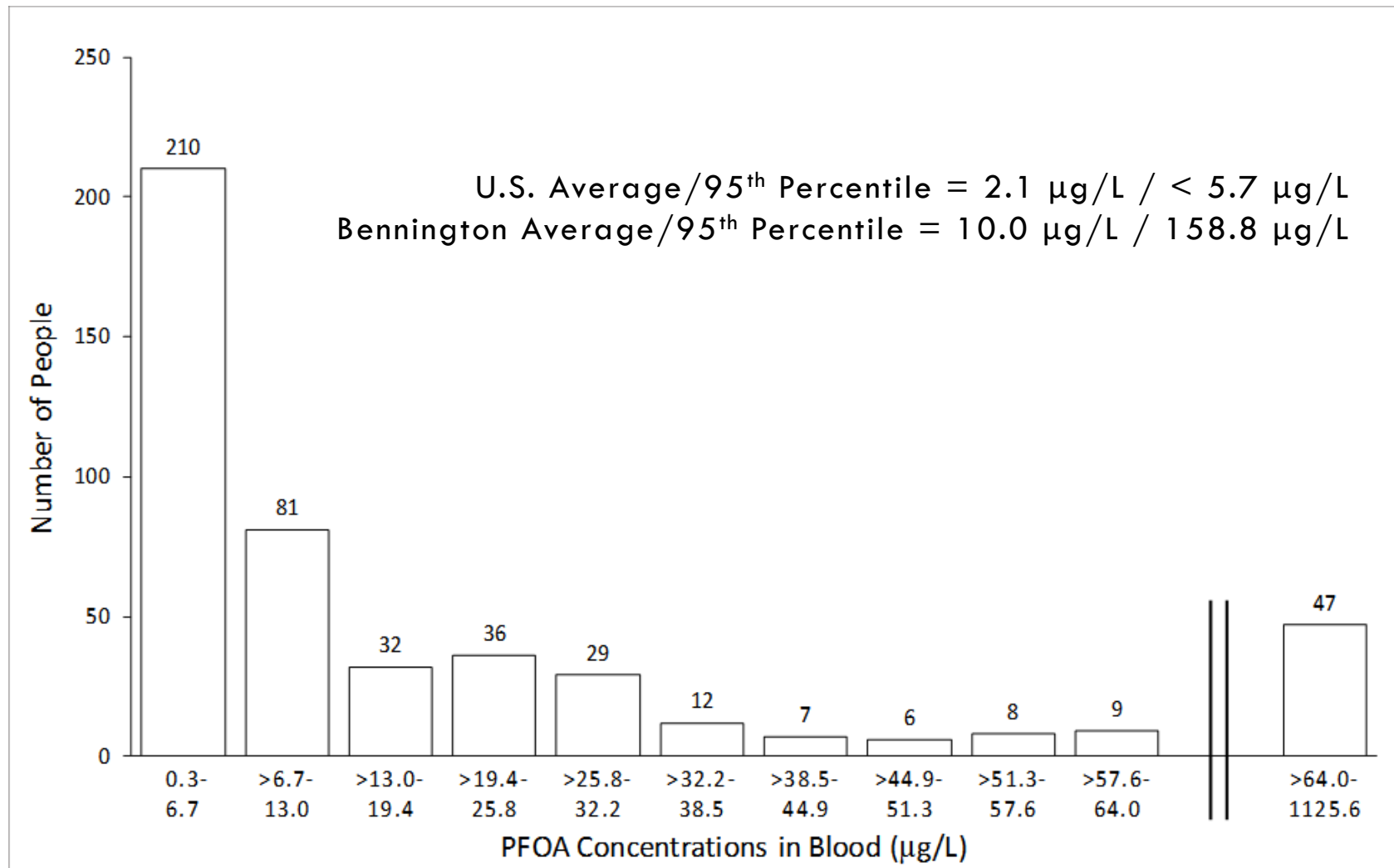


Study Results: PFOA in Water

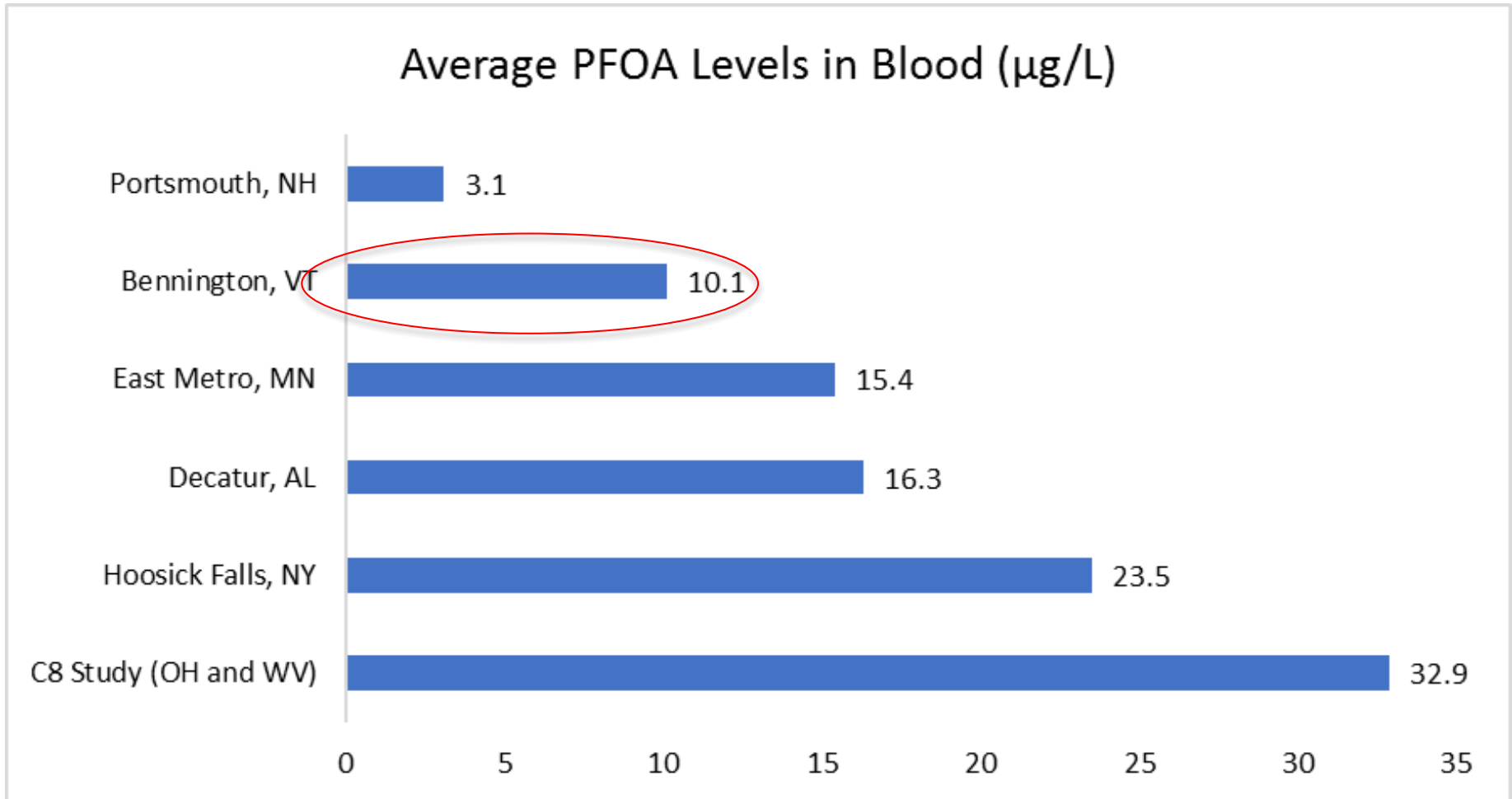


Study Results: PFOA in Blood

PFOA blood results for people tested in the Bennington Investigation



Study Results: PFOA in Blood



Study Results: Men and Women



PFOA concentrations in blood were higher among

- Men (13 $\mu\text{g}/\text{L}$) compared to Women (8.8 $\mu\text{g}/\text{L}$).
- Among women, those age 60+ had higher levels (13 $\mu\text{g}/\text{L}$), compared to women 18-59 years old (6.9 $\mu\text{g}/\text{L}$).

Study Results: Private Drinking Water



PFOA Concentrations in Water

Strongly Correlated with PFOA levels in blood.

Cumulative exposure to PFOA in Water =
PFOA concentration in water x years at residence
x average daily consumption of unfiltered water

Strongly Correlated with PFOA levels in blood.

Other Study Findings: Chemfab, Produce

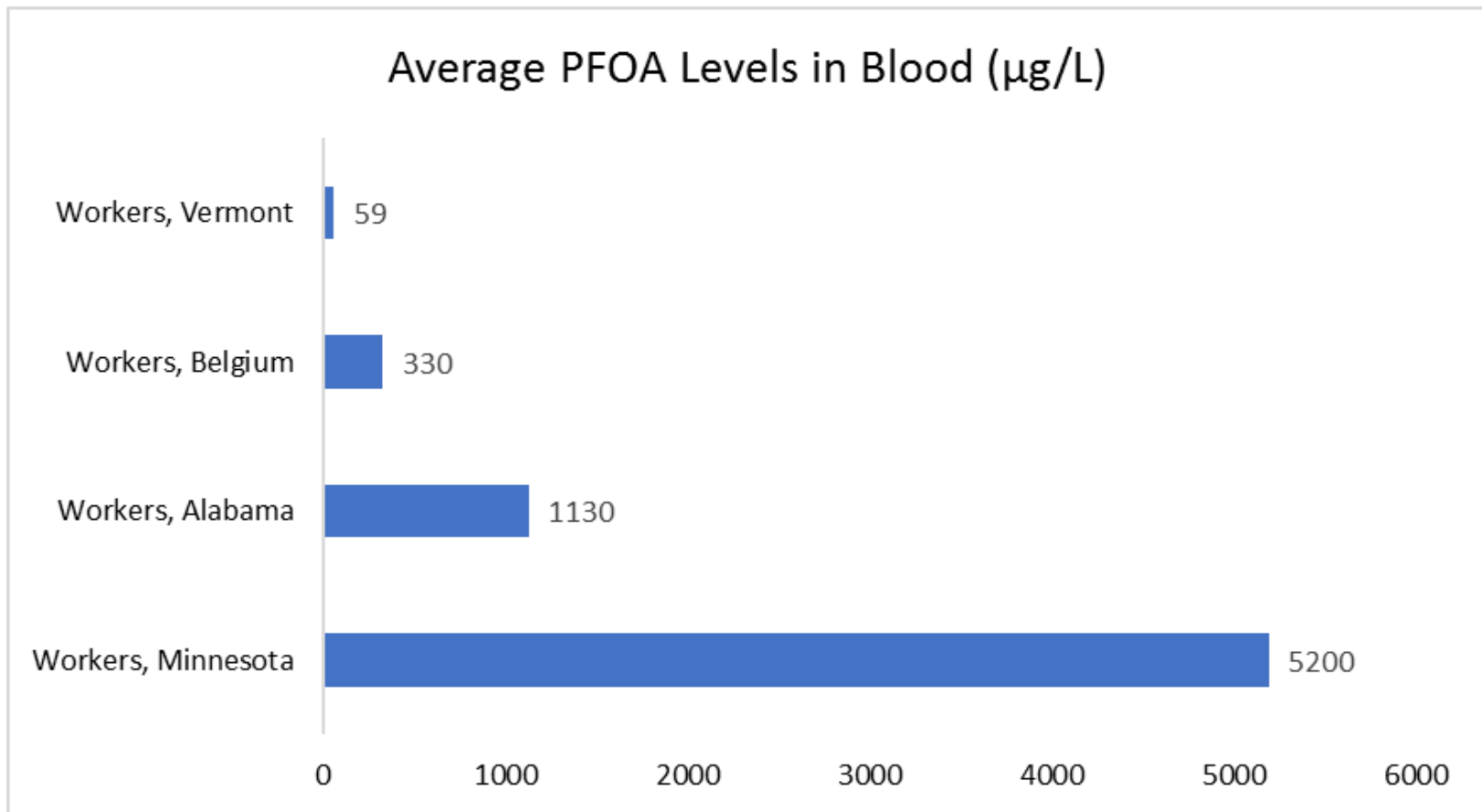
Living or working at Chemfab –

People who lived/worked at Chemfab after 2002 =
Average PFOA level in blood: 2.8 µg/L

Local fruit & vegetable consumption –

People who often ate produce grown in the area =
association went away for those with low levels of PFOA
in their well water. Consuming contaminated drinking
water was likely responsible for the original association.

Study Results: Occupational Exposure



What is Association vs. Causation?

Association (or Correlation)

Indicates there is a link or connection between two or more factors. In health (epidemiology) terms, it means there is a relationship between exposure and disease. Association:

- Suggests that the exposure *may* cause or contribute to the disease, but does *not* mean the exposure is a proven cause of the disease.
- More study is needed.

Causation

Suggests there is a true pathway that leads from exposure to disease. This is based on a strong association and other factors. Causation:

- Means that an event or condition plays a role in *causing* a disease to occur.
- Causation can only be concluded when a number of valid scientific studies have determined the same relationship between an exposure and a disease.

C8 Science Panel

www.c8sciencepanel.org



C8 Science Panel

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The Science Panel

Panel Members

C8 Probable Link Reports

C8 Science Panel Studies

C8 Study Publications

C8 Health Project

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The Science Panel Website

During 2005-2013, the C8 Science Panel carried out exposure and health studies in the Mid-Ohio Valley communities, which had been potentially affected by the releases of PFOA (or C8) emitted since the 1950s from the Washington Works plant in Parkersburg, West Virginia. They then assessed the links between C8 exposure and a number of diseases. The C8 Science Panel has completed its work and no longer exists; this website summarizes the results.

The Science Panel consisted of three epidemiologists: Tony Fletcher, David Savitz, and Kyle Steenland, who were chosen jointly by the parties to the legal settlement of a case between plaintiffs and DuPont regarding releases of C8 from the plant. The Panel, its research programme, and links to other sources of information can be found via the links on the left.

The main conclusions are in the form of Probable Link reports which summarize in each case whether the Science Panel found or did not find a link between exposure and disease. The detailed science behind the summaries in the Probable Link reports is published in articles in scientific journals. Many articles have been published and a few more are still in the process of publication. Follow the links at the left. For six disease categories, the Science Panel concluded that there was a Probable Link to C8 exposure: diagnosed high cholesterol, ulcerative colitis, thyroid disease, testicular cancer, kidney cancer, and pregnancy-induced hypertension.

Last updated January 04, 2017

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Health Effects Associated with PFOA

- ▣ Increased blood lipids, uric acid, liver enzymes
- ▣ Decreased immune response
- ▣ Pregnancy-induced hypertension
- ▣ Decreased birth weight
- ▣ Thyroid disease
- ▣ Testicular and kidney cancer



C8 Science Panel

www.c8sciencepanel.org

ATSDR

Agency for Toxic Substances and Disease Registry

Statistical Limitations of Vermont Study



- Statistical power
- Small numbers – 472 total

- The fact that no association was detected with some health outcomes in the study of the Bennington / North Bennington community does not rule out the possibility that an association exists.

Vermont Study Results: Health Outcomes



- Being treated for high blood pressure
- High blood pressure during pregnancy
- High cholesterol

Information for Health Care Providers

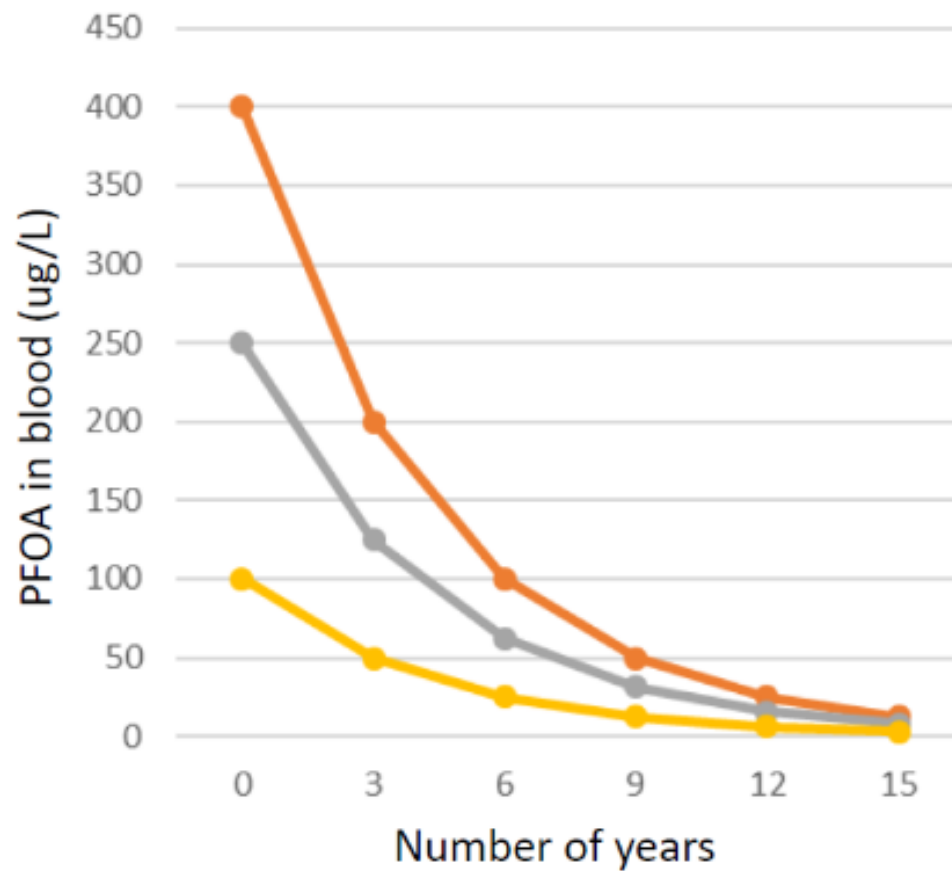


Health Department –

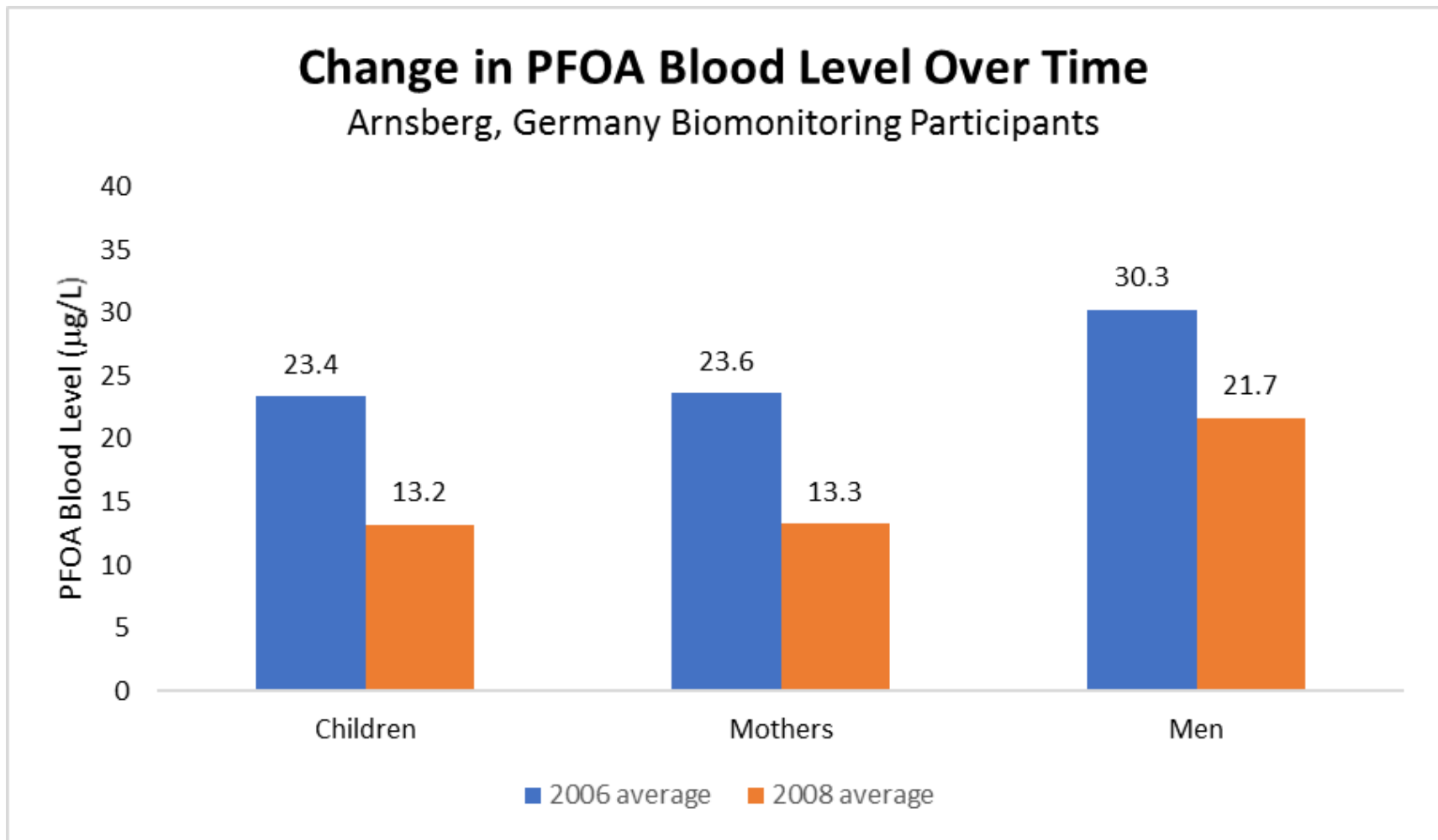
- Sent four health advisories to health care providers
 - ▣ including ATSDR information
- More information, clinical guidance and links to resources for health professionals on our website: www.healthvermont.gov/response/environmental

PFOA Half-life

Examples of half life for PFOA in blood



Half-life of PFOA – Germany



Brede et al., 2010 IJEH

Vermont Study Results: Key Points

- Primary exposure pathway confirmed: contaminated drinking water.
- Associations were found that reflect findings from larger studies.
- The blood test cannot tell if a condition you have was caused by PFOA, or if you will have an adverse health outcome in the future.
- Levels decrease by half every ~3 years.

Health Department Recommendations



- ❑ Do not use water for drinking, preparing food, cooking, brushing teeth, watering gardens or any other manner of ingestion if PFOA is > 20 ppt.
- ❑ If you have health concerns consult with your health care provider. There are actions you can take.

Future blood testing clinic planned for eligible people who have not already had their blood tested.

Thank you –
blood draw participants
Southwestern Vermont Medical Center
CDC/ATSDR
Vermont Medical Reserve Corps volunteers
Bennington College

Questions?

Environmental Health Division 800-439-8550



healthvermont.gov/response/environmental