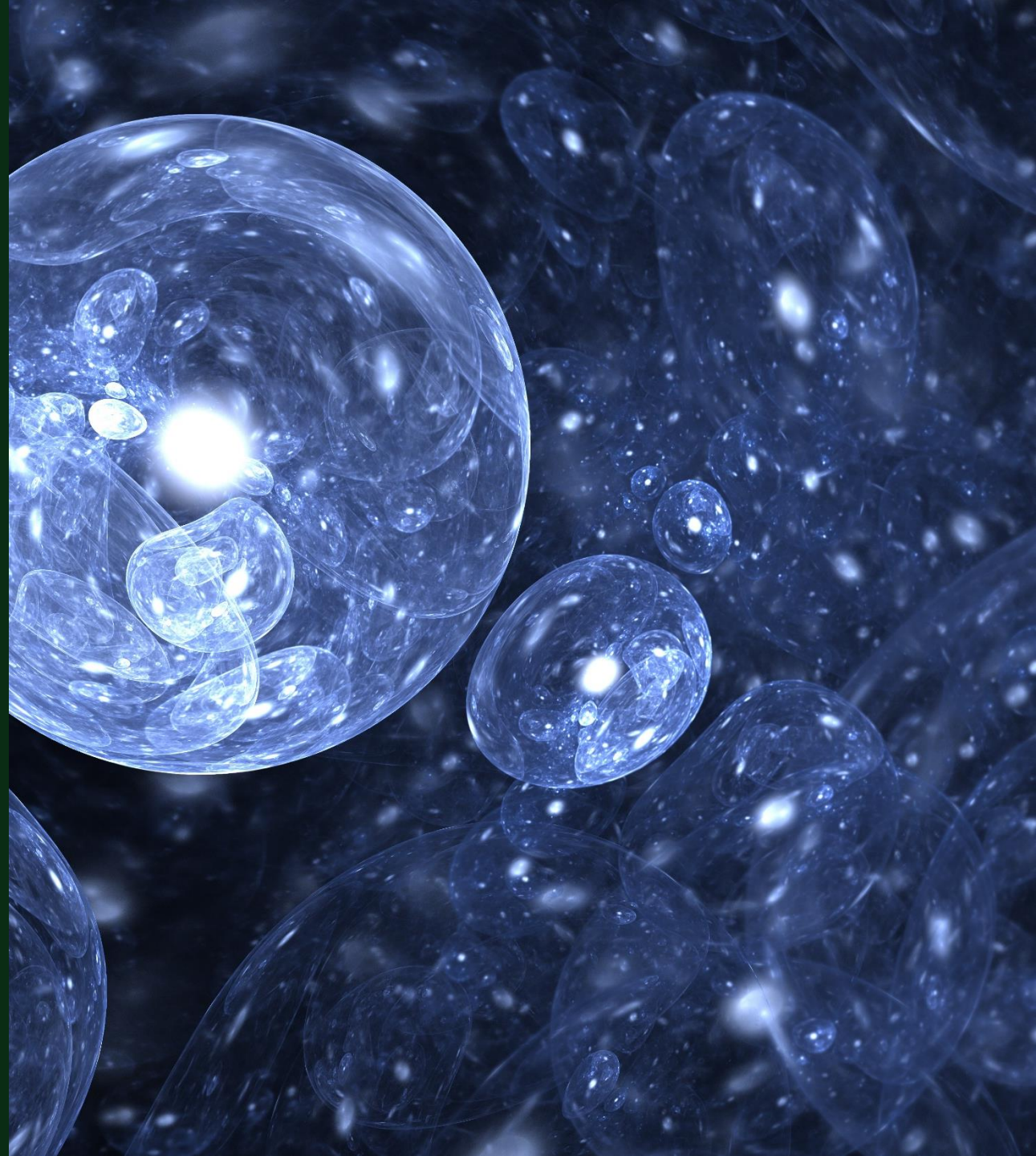
ERM

ERM WEBINAR SERIES: FAST FLUORINATED FACTS

PFAS in the News

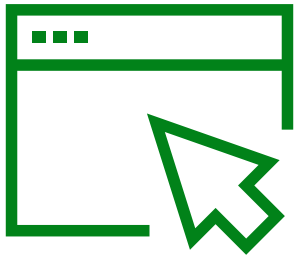
JUNE 4TH, 2025



Sustainability is our business

Welcome Participants

Your **lines have been muted** to ensure our presenters are not distracted by background noise



Attendees are encouraged to **participate by using the chat/Q&A** via the chat box function – select "All Panelists and Attendees" or only "All Panelists"

A link to the **recording of this session & slides** will be provided in our follow-up email sent next week

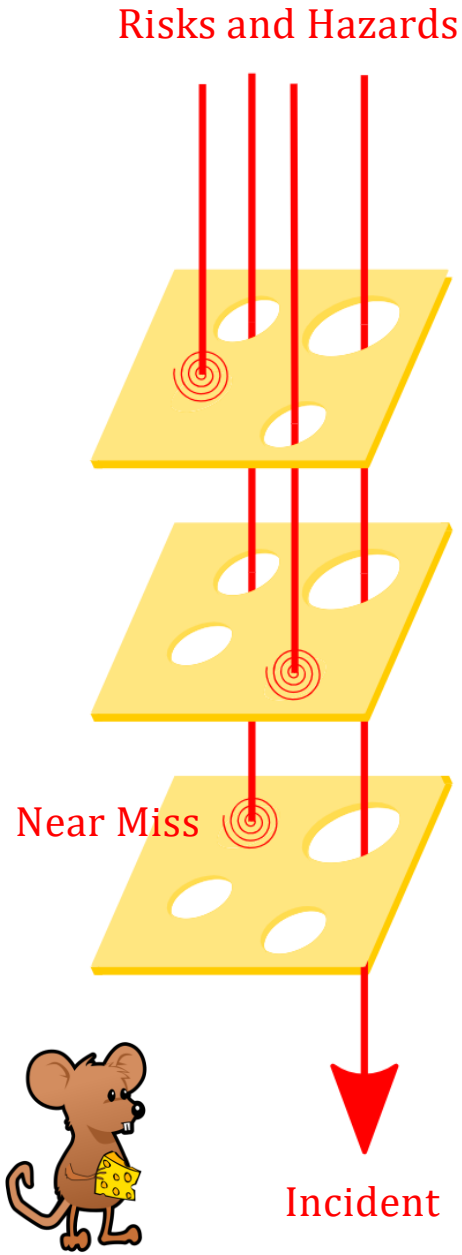
Swiss Cheese and Safety

Risk management can resemble a pack of sliced Swiss cheese:

- Each layer of cheese has randomly placed and sized holes.
- These holes represent hazards and risks we may encounter. Under less-than-ideal circumstances these holes can align and that's when accidents or near-misses occur.
- Each slice of cheese represents a layer of safety measures to prevent hazards from passing through the holes exposing us to harm and danger.
- Mitigation measures and safety programs are not always perfect, especially when the human element enters the picture – *We make mistakes, take unnecessary risks, and fail to observe hazards.*

Safety needs overlapping slices of cheese to prevent troublesome Swiss cheese holes aligning:

- Assess hazards → Training → H&S Planning → Communicate hazard and control strategies → Implement controls → Active hazard assessment → Management of change → Sharing
- Stop or Pause Work Authority is one of the most important slices of cheese – *Stopping work can be the difference between someone going home hurt or healthy at the end of the day!*



Agenda/ Contents

1 ASSOCIATIONS BETWEEN PFAS AND HEALTH EFFECTS

2 CANADA PFAS RISK ASSESSMENT AND RISK MANAGEMENT PLAN

3 PFAS BACKGROUND – WHY DOES IT MATTER

Speakers

Mark Lafranconi

Principal Technical Consultant,
Toxicologist

Jeremy Hatt

Managing Consultant,
Scientist

Chris Wenczel

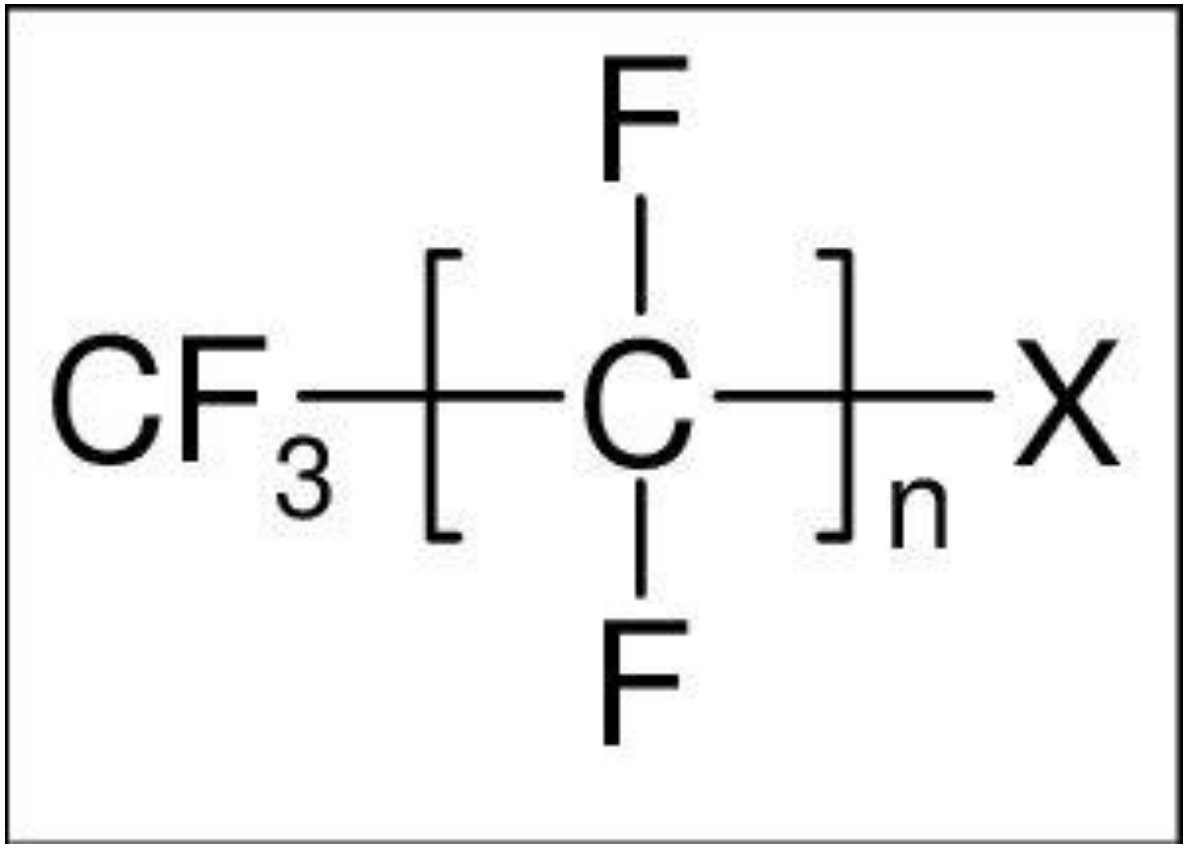
Technical Director, Geologist

ASSOCIATIONS BETWEEN PFAS AND HEALTH EFFECTS

Mark Lafranconi, PhD, DABT

PFAS and Health Effects

How to evaluate?



Evaluation of health effects is challenging

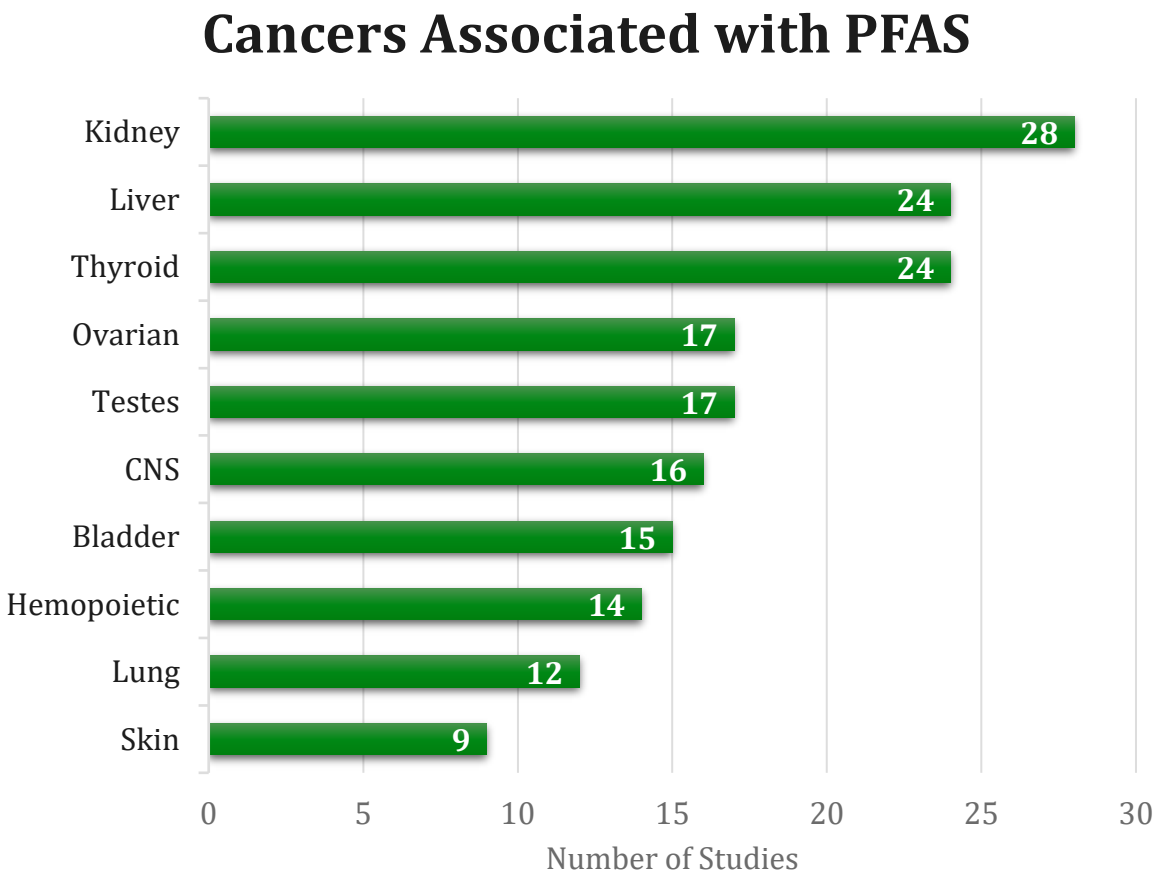
- Thousands of molecules (EPA ~ 15,000)
- Only a fraction examined for hazards
- Environmental exposures occur as mixtures
- Routes of exposure vary
  - Oral (drinking water, food)
  - Dermal
  - Inhalation

Epidemiology studies most common

- Directly applicable to human heath effects
- Can utilizes a variety of data sources
- Can focus on specialized populations

PFAS and Cancer

Epidemiology Studies **128**



Included studies

- General population
- Workplace
- Special populations
- Case-controlled
- Cohort

Excluded studies

- Case reports
- Self-reported data
- Biomarker reports

Li *et al, 2025*

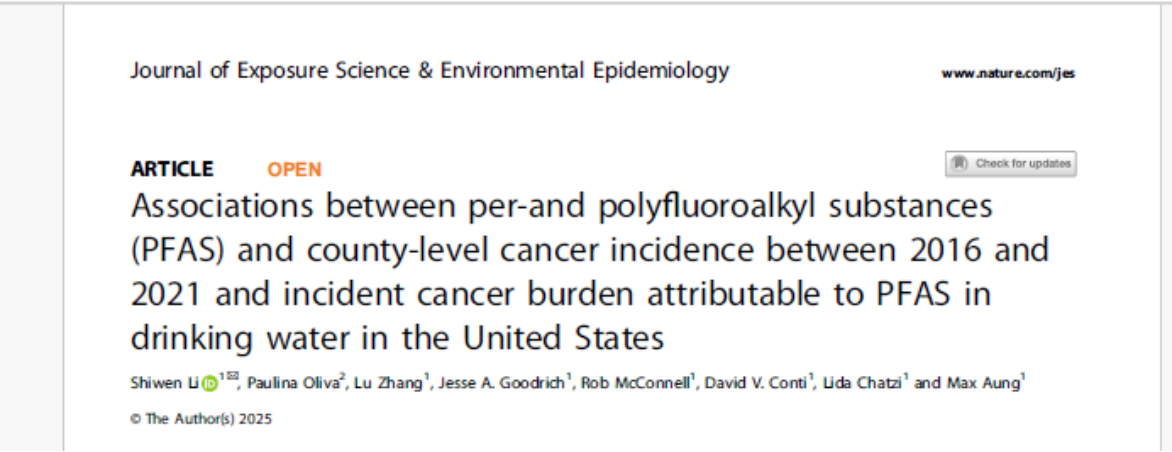
Association of drinking water PFAS and cancer incidence

Design and Methods

- Cancer incidence from SEER database
- Drinking water PFAS concentrations from UCMR3 (2013-2015) and UCMR5 (2023-2024)
- Converted to binary score –
  - 0 (undetected)
  - 1 (detected)
- Adjusted for socioeconomic factors and air quality
- Limited adjustments for obesity, and smoking
- Calculated Incidence Rate Ratios (IRR)

Results

- Associations with digestive, respiratory, endocrine cancer incidence (IRRs 1.11-1.75)
- Estimated 4,626-6,864 cancer cases attributed to PFAS in drinking water



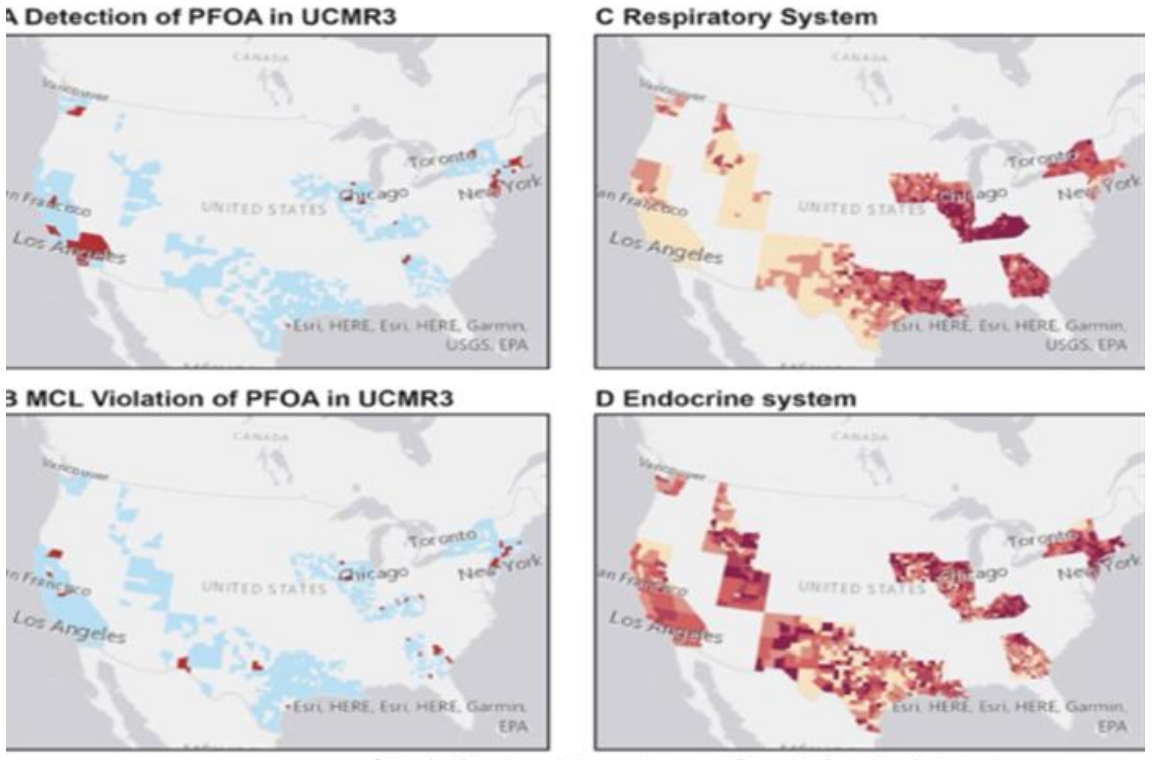
Journal of Exposure Science & Environmental Epidemiology www.nature.com/jes

ARTICLE OPEN

Check for updates

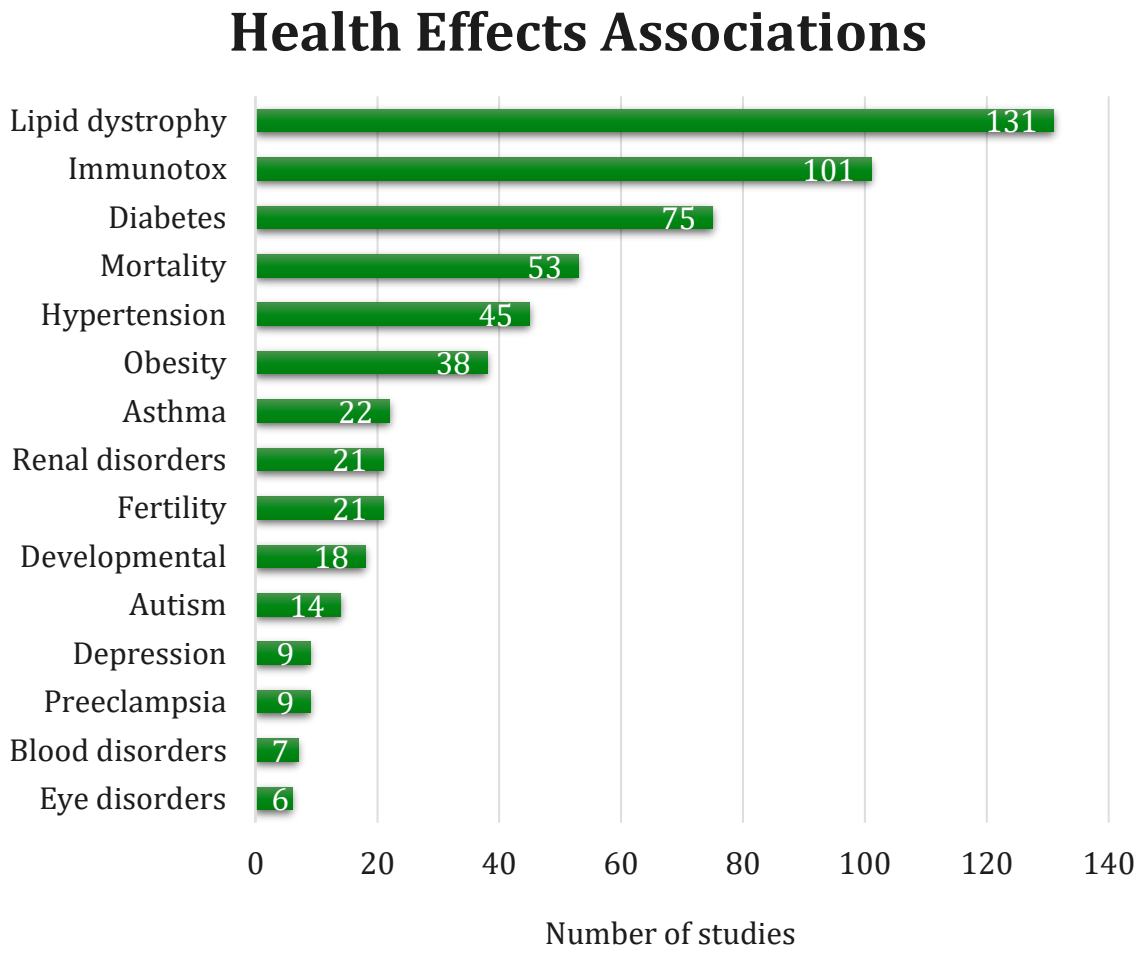
Associations between per-and polyfluoroalkyl substances (PFAS) and county-level cancer incidence between 2016 and 2021 and incident cancer burden attributable to PFAS in drinking water in the United States

Shiwen Li[1✉], Paulina Oliva[2], Lu Zhang[1], Jesse A. Goodrich[1], Rob McConnell[1], David V. Conti[1], Lida Chatzi[1] and Max Aung[1]



PFAS and Non-Cancer Health Effects

Epidemiology Studies – **442**



Wide range of health effect associations

- Associations with almost every organ system studied
- Most effects are on the fringes of detectability
- Limited information about possible mechanisms

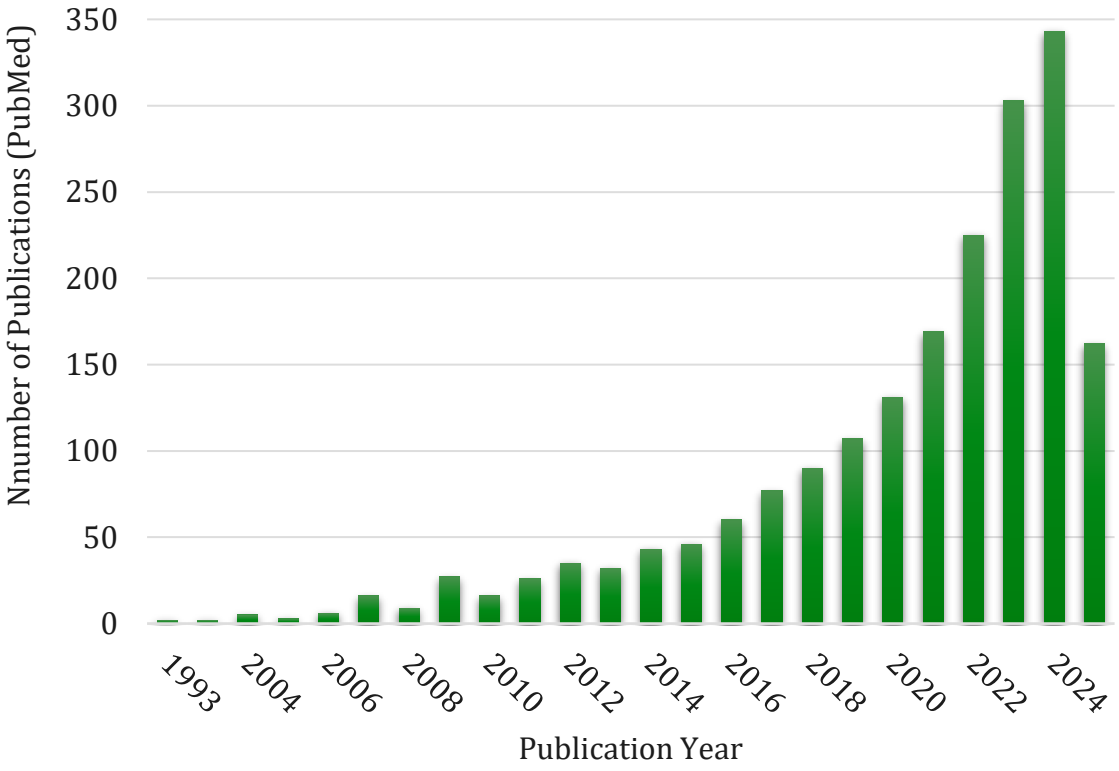
Challenges

- Characterizing exposures
- Controlling for confounding factors
- Reproducibility

PFAS PUBLICATIONS

Intense area of investigation

All PFAS Health Effects Publications



Publication rate expanding dramatically

- More than 1800 studies since 1993
- 5 – 10 Studies per week
- Most are descriptive studies

Focus is shifting to mechanistic studies

- Surrogates for endogenous substances
- Activation of nuclear receptors
- Oxidative stress
- Membrane effects

These studies are used to set regulatory limits

CANADA'S PFAS RISK ASSESSMENT AND RISK MANAGEMENT PLAN

Jeremy Hatt

Environment Canada's Risk Assessment - "State of PFAS" Report - March 2025

Environment Canada's 41-page assessment found PFAS have been widely detected across Canada in the environment and human populations, including:

- **Air & Precipitation:** Reflecting the global airborne dispersal of PFAS, they have been detected in remote locations, such as Nunavut in the high arctic, since monitoring began in 2006. PFOA and PFOS levels have declined since 2013, while short-chain PFAS (still in use) are increasing in some locations.
- **Water & Wildlife:** Surface water monitoring from 2013 to 2020 across Canada shows declining levels of PFOS and PFOA. (some of these are from phase-outs in the early 2000s) However, rising levels of shorter-chain PFAS, not yet phased-out, have been observed. Fish in the Great Lakes and Arctic biota show varying but widespread PFAS presence.
- **General Population:** The "Canadian Health Measures Survey" shows significant declines in chemicals that have seen phase-outs. However, PFOS and PFOA remain at detectable levels in the bloodstream based on tests in almost all Canadians, and at higher levels in remote Indigenous Communities, from bioaccumulation in food chains that feed tradition diets, limited clean water infrastructure, and former heavy use at remote installations like air bases.

In line with international studies, Health Canada has found links to a wide range of health effects, and PFAS (excluding fluoropolymers) meet the criteria for toxic substances under the Canadian Environmental Protection Act (CEPA) requiring a precautionary approach to risk management.

Similar to the approach in the EU, Canada is progressing toward regulating PFAS as a class, rather than as individual substances. This strategy aims to prevent the substitution of banned PFAS with unregulated but similarly hazardous alternatives. This may potentially encompass a list of more than 10,000 PFAS chemicals, similar to the EU's REACH program. Canada's current proposal excludes fluoropolymers (e.g., PTFE), which are intended to be assessed separately in the future.

Environment Canada "Risk Management Approach for PFAS" - March 2025

PFAS (excluding fluoropolymers), as defined in the "State of PFAS Report," are proposed as toxic substances under the criteria of the Canadian Environmental Protection Act (CEPA). These substances are entering the environment in quantities or concentrations that have immediate or long-term harmful effects on both the environment and human health. Anticipated Federal Phase-outs of PFAS include the following:

Phase	Scope	Example of uses / products
1 (2025)	Fire Suppression Foams.	• all fire suppression foams not currently in phase-out (C8 foams in 2025-2027, C6 foams following consultation)
2 (Spring 2027)	PFAS not needed for the protection of health, safety or the environment, where alternatives are known to exist.	• cosmetics • natural health products and nonprescription drugs • food packaging materials, food additives, non-industrial food-contact products such as paper plates • paints and coatings, adhesives, sealants, and other building materials for consumers • consumer cleaning products, polishes, and waxes, including ski waxes
3 (TBA)	Uses of PFAS (excluding fluoropolymers) for which currently there may not be feasible alternatives, and requiring further evaluation.	• fluorinated gas applications, such as spray-foam insulation and refrigeration • prescription drugs (human and veterinary) and medical devices • industrial food contact materials • other industrial sectors, such as mining and petroleum • transport and military applications

www.canada.ca/en/environment-climate-change/services/evaluating-existing-substances/risk-management-approach-per-polyfluoroalkyl-substances.html

Notable is that PFAS meeting the definition of "Fluoropolymers" are not addressed within the 2025 Risk Management document. These are planned for separate assessment. Fluoropolymers in Canada remain a topic of further investigation, discussion, and regulation.

PFAS BACKGROUND - WHY DOES IT MATTER

Chris Wenczel, P.G.

PFAS Background In The Environment

- Background levels of many traditional contaminants in environmental media have been studied and used to develop clean up levels and understand the implications thereof.

  Example: *Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States, USGS Paper 1270 (Shacklette & Boerngen, 1984)*

- Industrial/commercial/city/urban residential environments are all significant contributors of PFAS to environmental media…

- PFAS are nearly inert compounds that result in accumulative persistence for decades.

- PFAS are globally pervasive in the environment, i.e., air, precipitation, soil, surface water (fresh and sea), sea spray, groundwater, food and ice.

- Our understanding of the complexity, implications and challenges of global PFAS background has evolved over the last 10 years.

Why Does PFAS Background Matter?

PFAS are a commonplace consideration in regulatory compliance, investigations & transactions.

PFAS background can present complicating factors that can be additive and drive the answers to the two questions below, now and in the future.

1. *What do I do with the results and what do they mean?*

2. *What are my potential current/future direct and indirect risks/liabilities that could be considered material and might be affected by background PFAS?*

Background PFAS in environmental media have complicating implications and present challenges that can affect critical decisions related to discovery in transactions or at existing facilities/sites, determining the need for action, forensic source attribution, allocation of responsibility, and development of remedial goal/actions and implementation.

Thank you

If further information is required, please contact Nadine Weinberg at nadine.weinberg@erm.com