For journalists: Places to ask questions about PFAS

* denotes topics that especially need more journalism!

Essential reading:

- The Lawyer Who Became DuPont's Worst Nightmare. Nathaniel Rich, NYT, 2016
- Toxin taints CFPUA drinking water. Vaughn Hagerty, Wilmington Star-News, 2017
- Toxic: 3M knew its chemicals were harmful decades ago, but didn't tell the public, government. Deena Winter, Minnesota Reformer, 2022
- 'Toxic Gaslighting: How 3M Executives Convinced a Scientist the Forever Chemicals She Found in Human Blood Were Safe. Sharon Lerner, ProPublica, 2024.

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Policy: * denotes topics that esp. need more journalism!

- Superfund & RCRA*: There are laws besides drinking water standards under which PFAS has to be classified as "hazardous" to compel cleanup. There's lots of controversy about which ones are appropriate, and in what order to do them. This 2024 Congressional hearing has more
- DoD & EPA disposal guidance*: The guidelines could be controversial because they promote practices (including temporarily-banned incineration), that could end up leaking PFAS back into the environment
- Drinking water standards for PFAS were only set in 2024.
- Filtration/disposal: 1) Municipal water utilities will have to install expensive filtration systems to filter PFAS. The most common methods are activated carbon, ion exchange resins, or reverse osmosis. 2) After filtering out the PFAS, it needs to be destroyed, or else it will leach back out into the environment. These techniques are still being developed.
- Fraud*: It is very hard to destroy PFAS, and there are companies out there trying to persuade people that they can do it, though their tech doesn't line up with what the science says. There seem to be lots of people who don't understand the difference between "the initial PFAS went away" and "it's been mineralized to the least worrisome form, fluoride."
- Utility lawsuits*: Why would people be mad about, and possibly sue over, regulations for PFAS in drinking water? Because it's so expensive to remove the PFAS, and drinking water utilities—and the customers that pay for them—were not the people who polluted the water
- Liability*: Given the above, polluters should pay for cleanup. But who's liable? Is it the people who used PFAS-containing products and contaminated the water? Is it the manufacturers? 3M settled a lawsuit with hundreds of cities for $10 billion, but Minnesota estimated it will take $14 – $28 billion to clean up PFAS pollution in ONLY Minnesota.

Manufacturers and polluters:

- Where's the pollution?*: Check out Figure S1 in the supplementary info for this USGS study of tap water; I'm curious why OK has so many PFAS emitters but I've never read stories about OK PFAS pollution. The EPA's UCMR5 monitoring, to conclude in 2026, will give us a much better picture
- Alternatives*: finding PFAS alternatives is hard because of their unique properties. We also don't know what people are replacing PFAS with. See stories on replacing PFAS in food packaging, biking gear, and raincoats.
- PFAS phaseout: PFAS have created so much liability for 3M that it's going to stop manufacturing them by 2025. Brands are phasing them out of their products, but that's easier said than done
- Replacement manufacturers: When 3M gets out of the game, will PFAS manufacturing just shift to people who are less reputable?

Essential use: an important concept about reducing PFAS use based on what category the application falls into

- PFAS definitions*: How many PFAS there are, whether pharmaceuticals are PFAS, and whether fluoropolymers are PFAS all depends on how you define "PFAS" — and everybody has a different definition.
- Semiconductors*: Likely one application that will get carved out under essential use, since it's hard to find replacements and it's integral to manufacturing computer chips. Not enough journalism on this.
- Munitions, electric vehicles, etc.*: PFAS & fluoropolymers are used in many products. These are under-reported & we'll have to wrestle with this

Lobbying/trade groups:

- ACC (not ACS): The American Chemistry Council is the lobbying group for chemical manufacturers and leads lots of advocacy against regulating PFAS. Not to be confused with the American Chemical Society, the chemistry professional association. Example of groups ACC works with
- Questioning science: Essentially, ACC says it wants PFAS regulations to be based on science that's "right", which means it wants the exact toxicity of each PFAS compound to be defined before the EPA puts a limit on it. But it's really hard to pin down that exact toxicity (see below point) and there are thousands if not millions of PFAS. It's more conservative in terms of human health to assume they all act similarly and to set limits for all of them than it is to spend years and tons of money determining exactly what level of toxic 12,000+ different compounds are.

- Toxicology studies*: In the middle of this NYT story are a couple grafs that explain the conundrum well: When you know something has bad health effects, you can't do a randomized, controlled trial to find out *exactly* how toxic it is, so we have to cobble together a guess based on different kinds of cell data and not-well-controlled observational data from people we know have been exposed (such as the medical monitoring program for people exposed to DuPont's PFAS releases in Parkersburg, which is where some of the first public evidence that tied PFAS to disease came from)

Detection techniques:

- Targeted: A "targeted" technique like mass spectrometry looks for a specific PFAS compound, meaning that if you don't know which PFAS to look for, you won't be able to measure how much PFAS is in a sample
- Non-Targeted: New techniques allow researchers to look at mass spectrometry data and identify what PFAS are in there (some may be completely new PFAS compounds)
- Total fluorine: Some popular techniques for measuring PFAS in consumer products, e.g. PIGE, cannot tell the difference between PFAS compounds (a problem) and fluoropolymers (debatably PFAS, but less of a problem)