



Amsterdam UMC
University Medical Centers

PFAS in healthcare; what is it and what are the risks?

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Nice to meet you!



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University of Amsterdam, Amsterdam, The Netherlands
Climate Research Institute



European Society of Anaesthesiology
Chair, Sustainability Committee



Dutch Society for Anaesthesiology
Chair, Sustainability Working Group



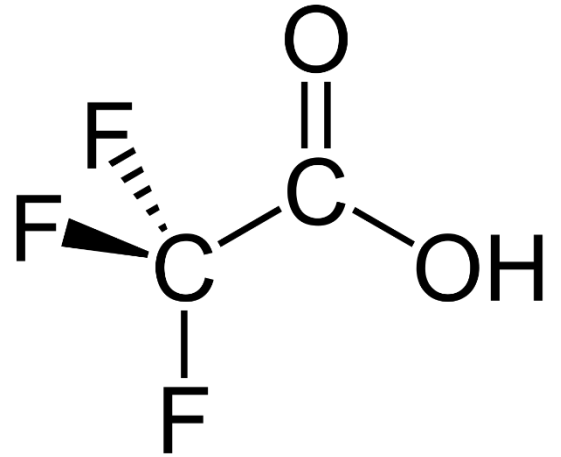
Dutch Ministry for Health, Welfare and Sports
Work Package leader Anaesthetic gases, Sino-Dutch Green Hospital Project
Member, Expert Group PFAS in Healthcare





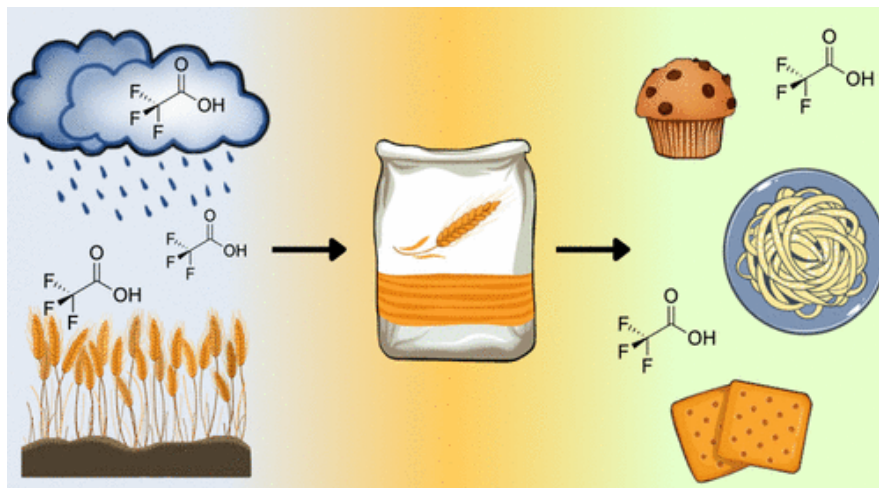
What are PFAS

- Poly- and perfluoroalkyl substances (-CF₃ or -CF₂-)
- “Forever chemicals” (TFA)
- Persistence, bioaccumulation, toxicity





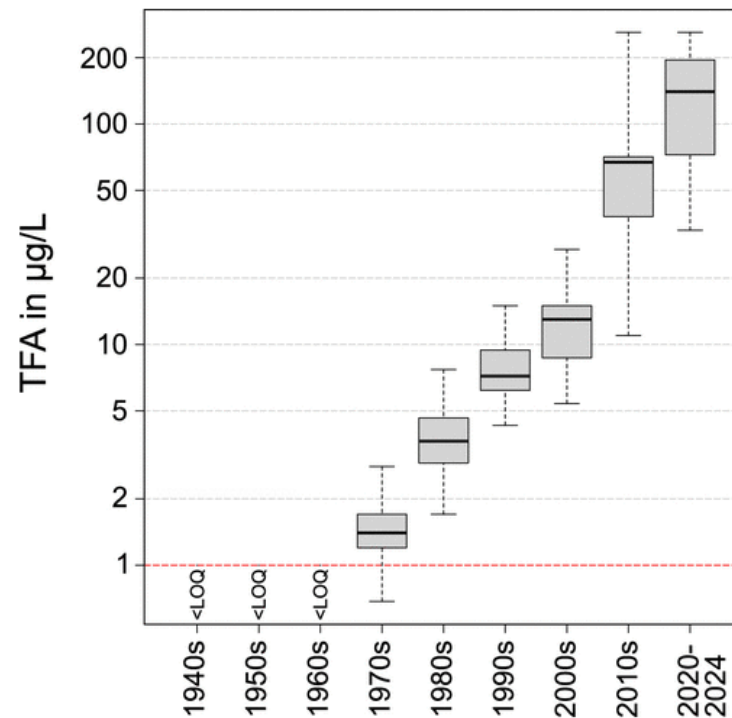
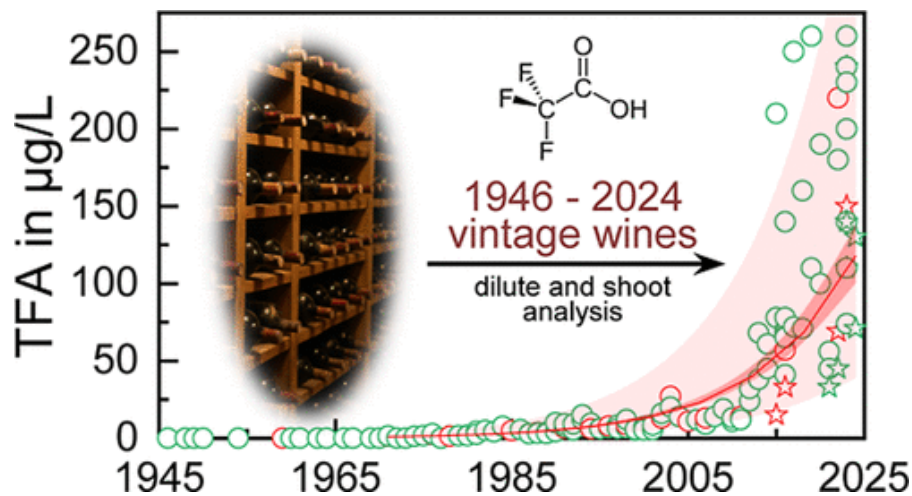
Routes of TFA intake for humans (solids)



Wheat, corn, rice, oats, beans,
potato, sugar, beef, chicken, tofu,
tomatoes, bananas, apples, oranges,
mangoes, carrots,....

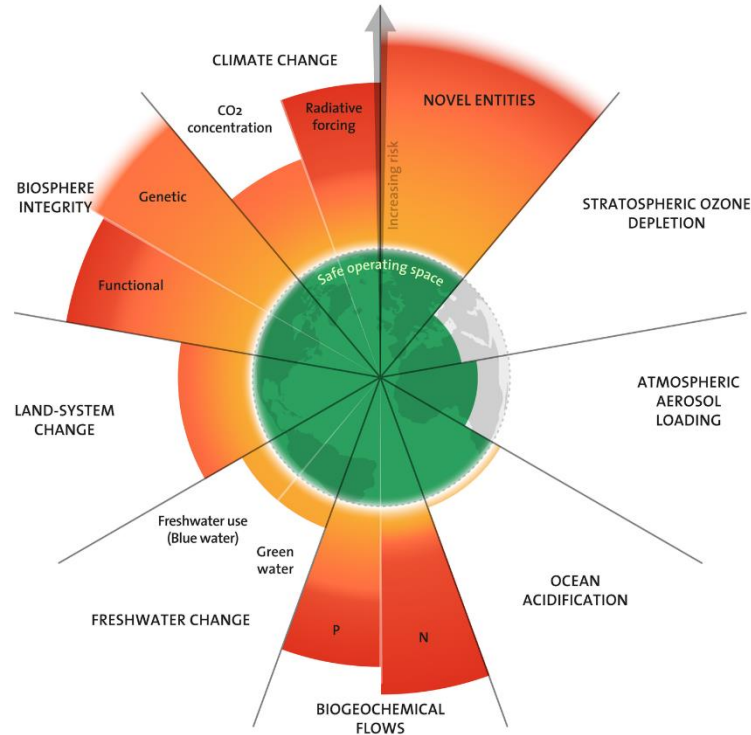


Routes of TFA intake for humans (liquids)





PFAS and the planetary boundaries





PFAS causes health problems

Cancer

- Testicular
- Kidney
- Breast

Unborn life

- Low birth weight
- Breast development disorders
- Reduced response to vaccinations

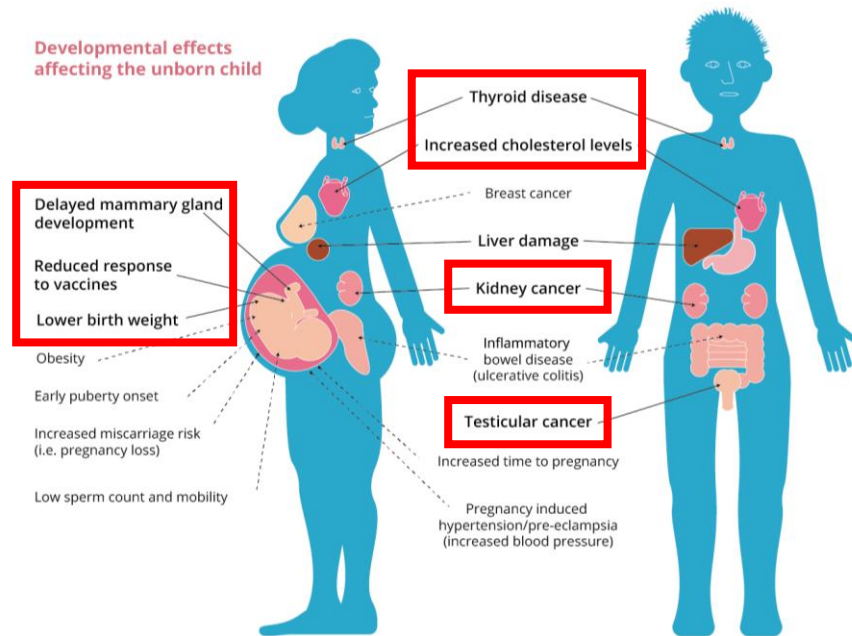
Other

Reduced fertility, obesity, lower sperm count, inflammatory bowel disease...

— High certainty

- - - Lower certainty

Developmental effects
affecting the unborn child





Industry and waste management are the bad guys, right?

NOS Nieuws • Dinsdag 7 oktober 2025, 21:22

Fabrikant Sabc moet PFAS-lozing in Westerschelde terugdringen

Plasticfabrikant Sabc in Bergen op Zoom moet de lozingen van een PFAS-stof in de Westerschelde beperken. De rechtbank Oost-Brabant oordeelt dat het bedrijf in 2025 en 2026 niet meer dan 2,75 kilo PFBS (perfluorbutaansulfonzuur) per jaar in het afvalwater mag lozen. De fabrikant had bezwaar gemaakt tegen de norm, maar dat bezwaar is verworpen.

Eerder werd duidelijk dat de fabriek grote hoeveelheden (51 kilo per jaar) loosde van de stof die als vlamvertrager wordt toegevoegd aan kunststof producten. De provincie Noord-Brabant wilde dat beperken en legde daarom een strenge norm op.

NOS Nieuws • Dinsdag 24 maart, 23:48

Afvalverwerker uit Weert ziet af van omstreden PFAS-lozingsvergunning



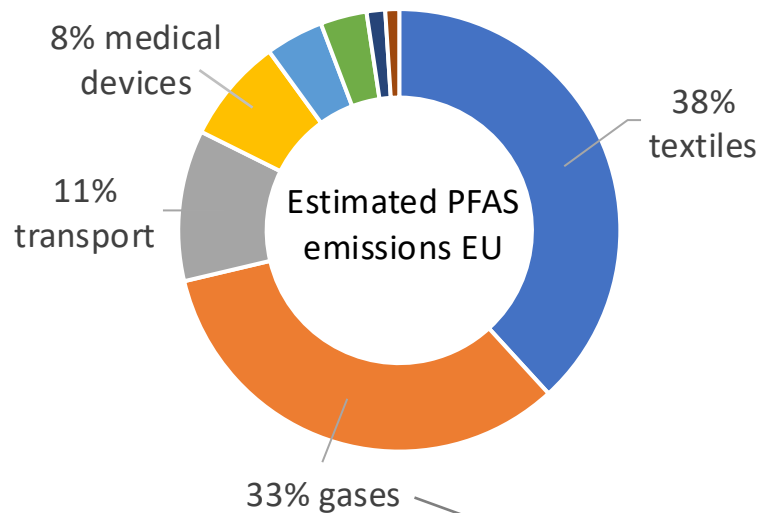
Tobias van der Valk
redacteur

Afvalverwerker CFS uit Weert trekt de aanvraag van een omstreden PFAS-lozingsvergunning voorlopig in. Ook zal het bedrijf, dat onderdeel is van Renewi, extra filters plaatsen om de lozing van PFAS verder terug te dringen. Dat staat in een brief [↗](#) die door gedeputeerde Michael Theuns is verstuurd aan de Gedeputeerde Staten in Limburg.

Over de vergunning waren al jaren ernstige zorgen bij controlerende instanties en drinkwaterbedrijven. Zij waarschuwden ervoor dat de vergunning, die CFS toestond om jaarlijks 5 kilo PFAS te lozen, in de praktijk een vrijbrief zou betekenen voor PFAS-lozingen. Ook waren er serieuze twijfels over de betrouwbaarheid van gegevens die het bedrijf had aangeleverd, zo bleek uit berichtgeving door de NOS en *Nieuwsuur*.



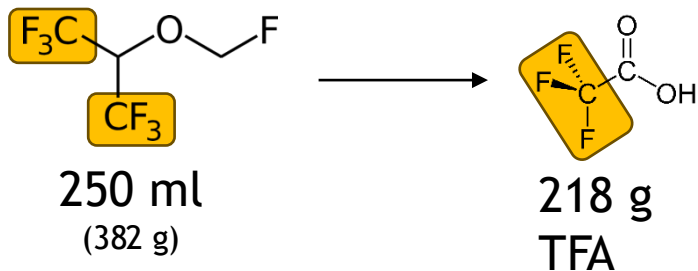
Healthcare itself is a major emitter!



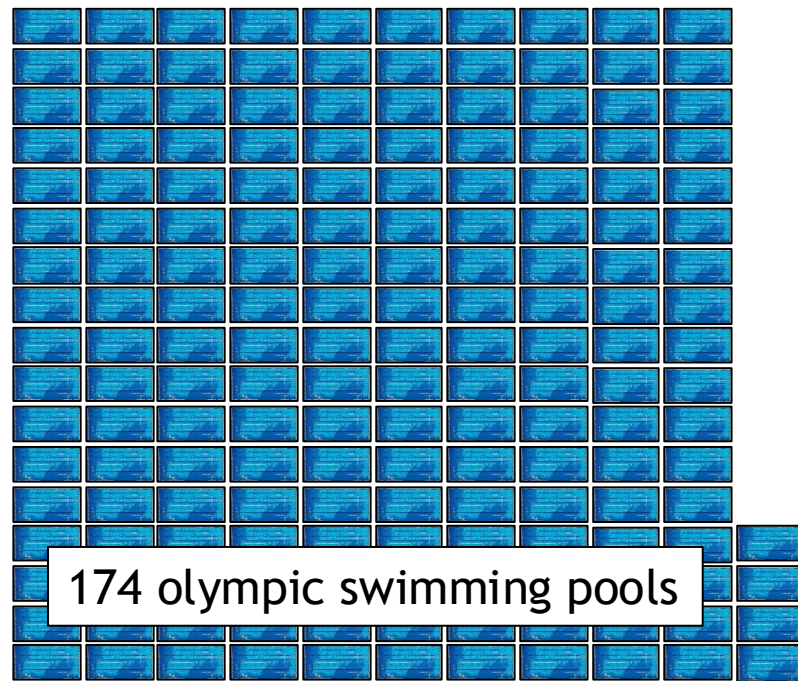
~19% of this are anaesthetic gases!



PFAS emissions from anaesthetic gases



EU Drinking
water limit
(0.5 µg/L) (NL: 2.2 µg/L)





An everyday choice for anaesthesiologists

Use gases

- PFAS
- Potent greenhouse gases
- Ozone layer depletion
- Occupational exposure



Use IV medication

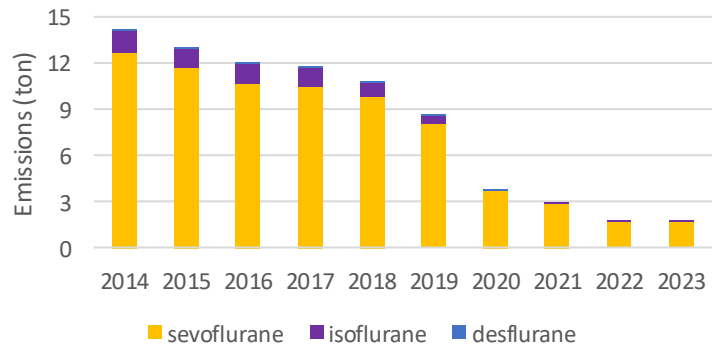
- No PFAS
- Low carbon
- No ozone layer depletion
- No occupational exposure



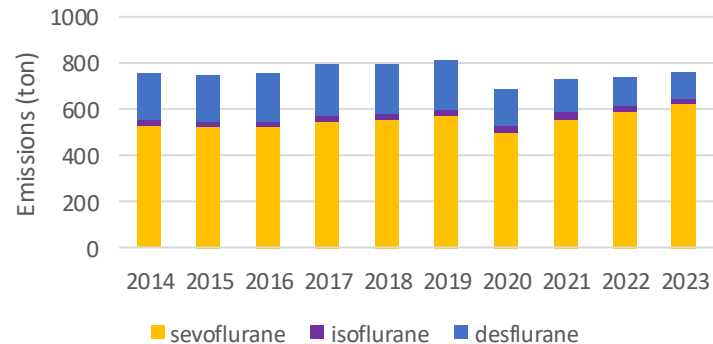
**“Great I-V” campaign:
IV when possible, gas when necessary**



Results: anaesthetic gas emissions 2014-2023



2023: ~1000 kg TFA



2023: ~430.000 kg TFA



Next steps: Sino-Dutch Green Hospital Project



35,000 hospitals
117,000
anaesthesiologists



Next steps: scoping other products

“Health(ier) without PFAS”

Amsterdam UMC as a 'living lab' to develop a comprehensive method for identifying PFAS in:

- (1) Medication
- (2) Laboratory chemicals and devices
- (3) Medical devices

Our goals:

A) Develop a PFAS identification tool for medical consumables

B) Scoping and impact of PFAS emissions

C) Phase out of non-essential uses of PFAS



Guido Berends PhD



Early results

Over **8,4 million** registered PFAS structures globally*



2,100+ medications authorized in NL that contain PFAS...

.... 727 through Active Pharmaceutical Ingredients (API)

.... 185 through excipients

.... 1,341 through packaging



Next steps: influencing policy





Take home messages

1. PFAS (TFA) in the environment harms human health
2. Healthcare itself is a major emitter
3. Bottom-up approaches have implemented viable PFAS-free alternatives
4. System change through: policy, knowledge and innovation





PFAS phase-out from healthcare



We welcome further dialogue and collaboration



nieksw



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