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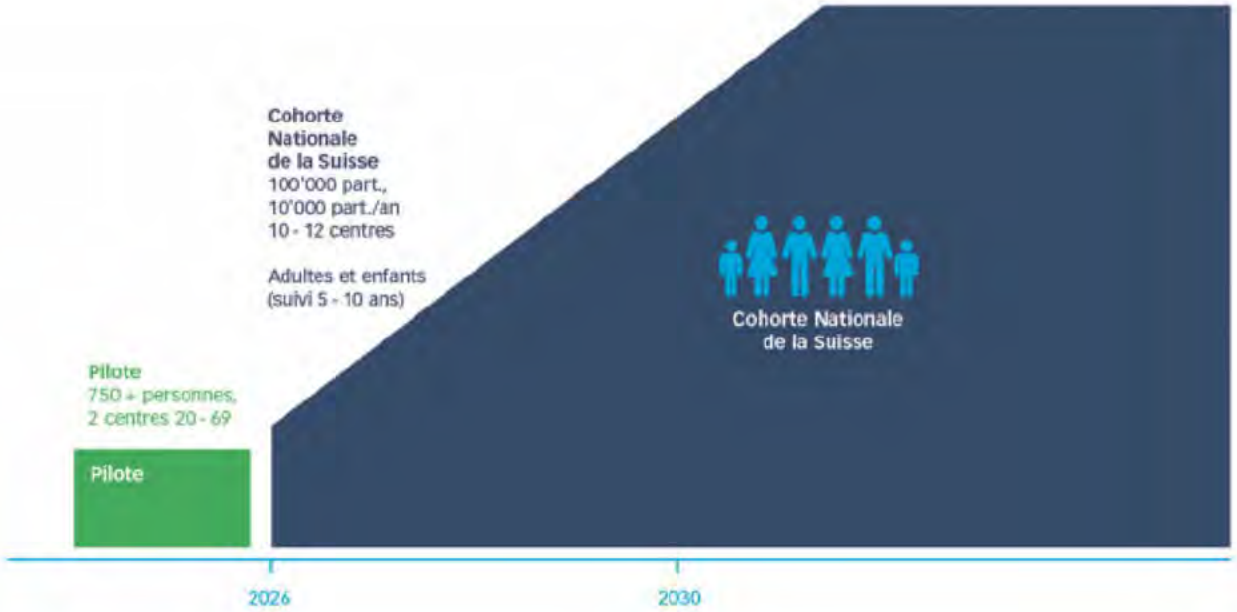
Pilot phase of the Swiss Health Study SHeS

Results of human biomonitoring (HBM)

Swiss Health Study (SHeS)

Objectives of the national cohort with follow-up



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Étude suisse sur la santé

Soutenu par l'Office fédéral
de la santé publique (OFSP)

Swiss Health Study (SHeS)

Objectives of the national cohort with follow-up

RESEARCH ARTICLE

Towards a Swiss health study with human biomonitoring: Learnings from the pilot phase about participation and design

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Swiss Health Study (SHeS)

Concept of the pilot phase

Online questionnaires
for everyone aged 20 to 69 living in Switzerland

Questionnaires, health examinations, biological samples
up to 1000 people (500 per centre) by invitation2 study centres: Lausanne and Bern

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Levels of per- and polyfluoroalkyl substances PFAS

measured in blood serum samples

Levels of PFAS

measured in blood serum samples

Substances with detection rates >50%

Substance	Acronym	CAS-Nr.	Detection rate* *[%]*	Median *[ng/mL]*	P95 *[ng/mL]*
Perfluorooctanoic acid	PFOA	335-67-1	100	1,3	3,2
Perfluorononanoic acid	PFNA	375-95-1	100	0,4	0,9
Perfluorodecanoic acid	PFDA	335-76-2	91	0,2	0,7
Perfluorundecanoic acid	PFUnDA	2058-94-8	51	0,1	0,3
Perfluorohexane sulphonic acid	PFHxS	355-46-4	100	1,2	2,5
Perfluoroheptane sulphonic acid	PFHpS	375-92-8	88	0,2	0,5
Perfluorooctane sulphonic acid *(linear + branched)*	PFOS sum	n.a.	100	6,1	18,8

**Limit of quantification: 0.1 ng/mL*

PFOA

Perfluorooctanoic acid

Serum PFOA concentrations [ng/ml] in the SHeS pilot study group (n=778)

Comparison with limits set by the UBA
(German Federal Environmental Agency)

HBM-I: Warning level

HBM-II : Threshold value for potential effects on human health

PFOS

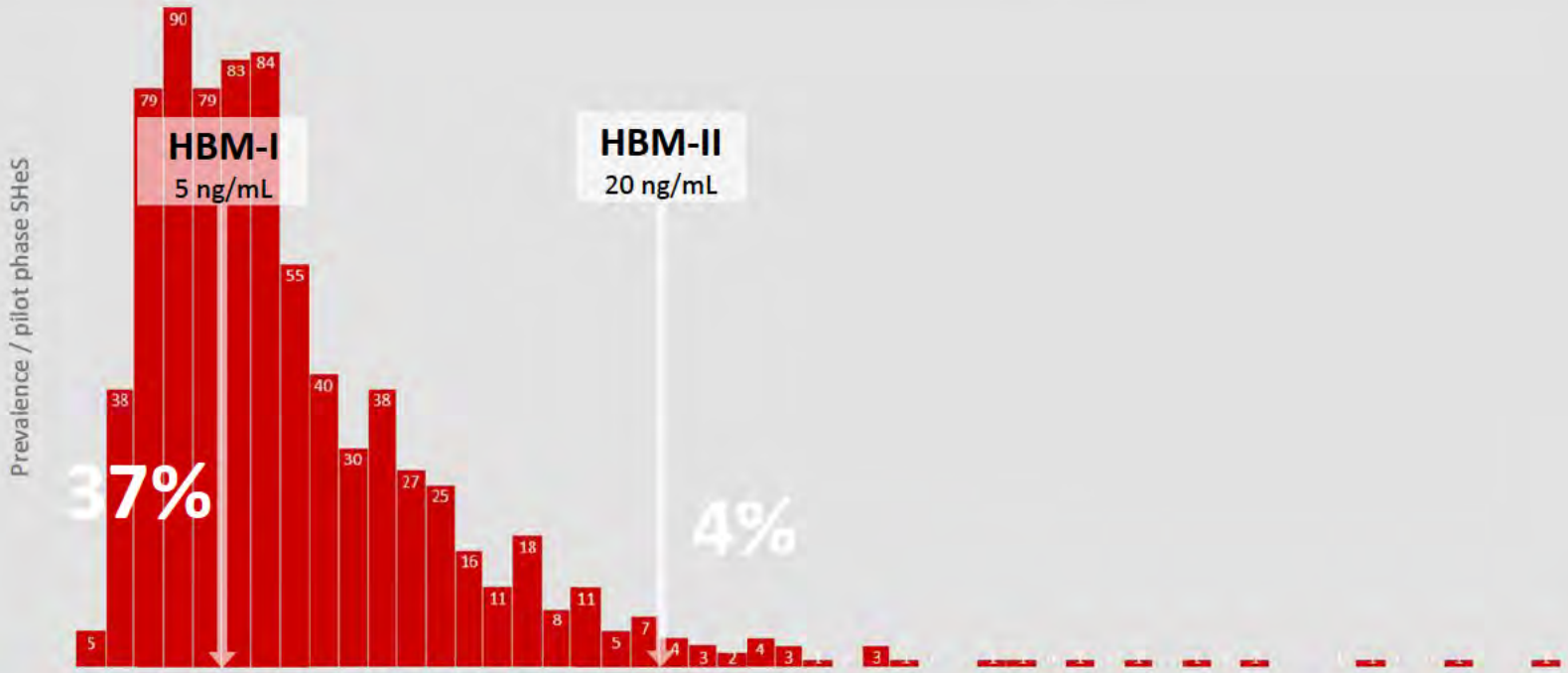
Perfluorooctane sulfonic acid

Serum PFOS concentrations [ng/ml] in the SHeS pilot study group (n=778)

Comparison with limits set by the UBA
(German Federal Environmental Agency)

HBM-I: Warning level

HBM-II : Threshold value for potential effects on human health



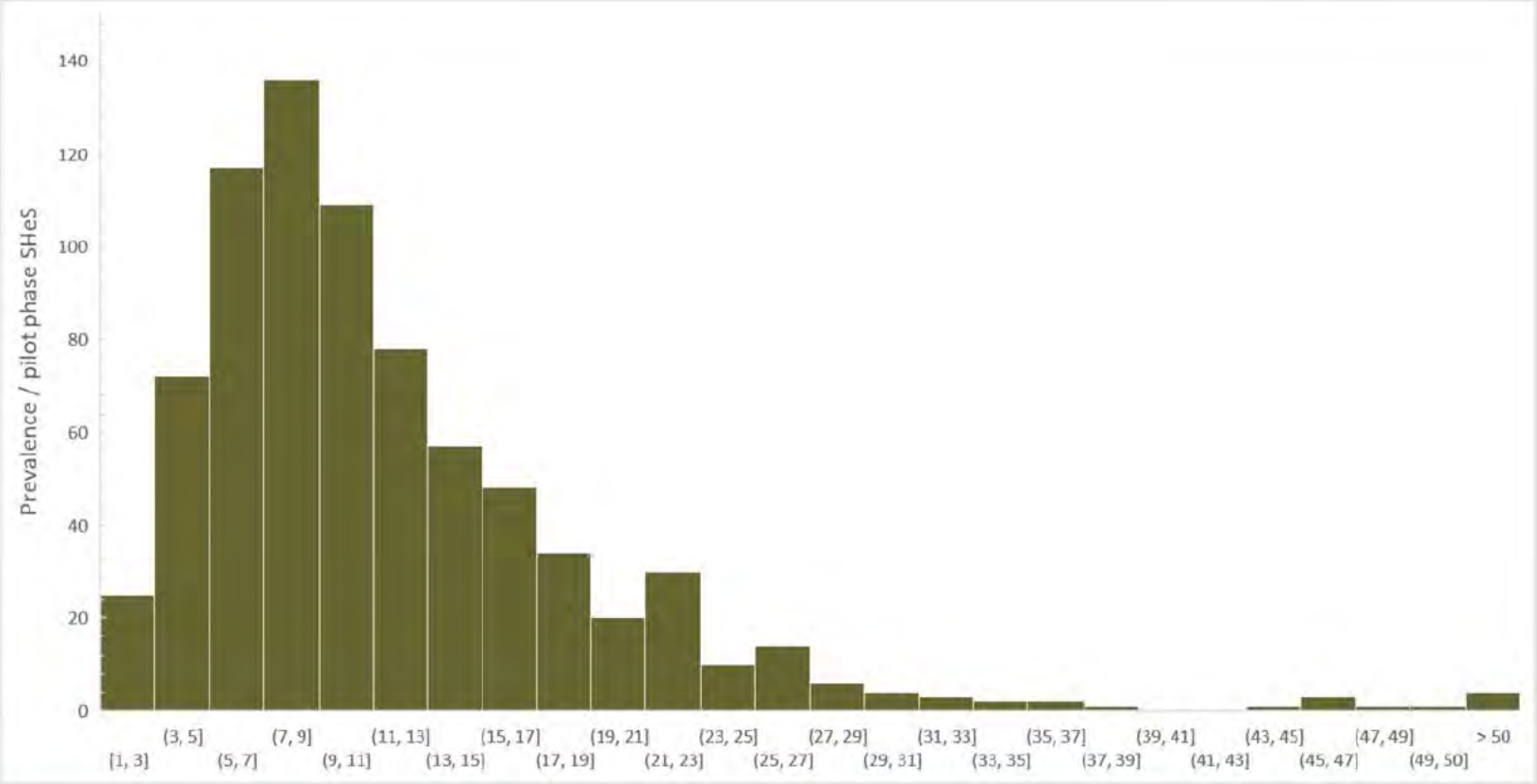
Initial investigations

Correlating data and questionnaires

Levels of PFAS in blood serum samples

by demographics

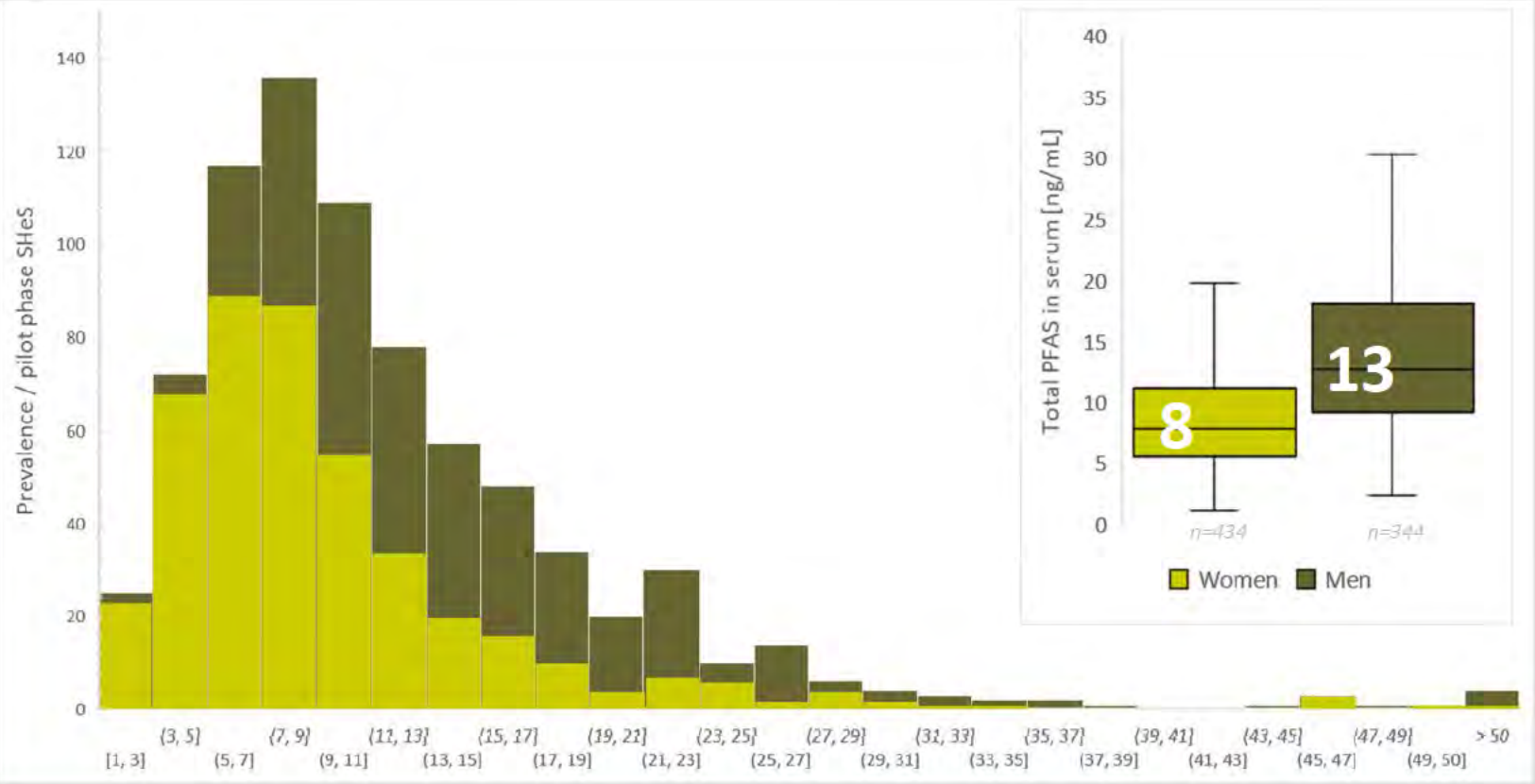
Total PFAS concentrations [ng/ml] in the SHeS pilot study group (n=778)



Levels of PFAS in blood serum samples

by demographics

Total PFAS concentrations [ng/ml] in the SHeS pilot study group (n=778)

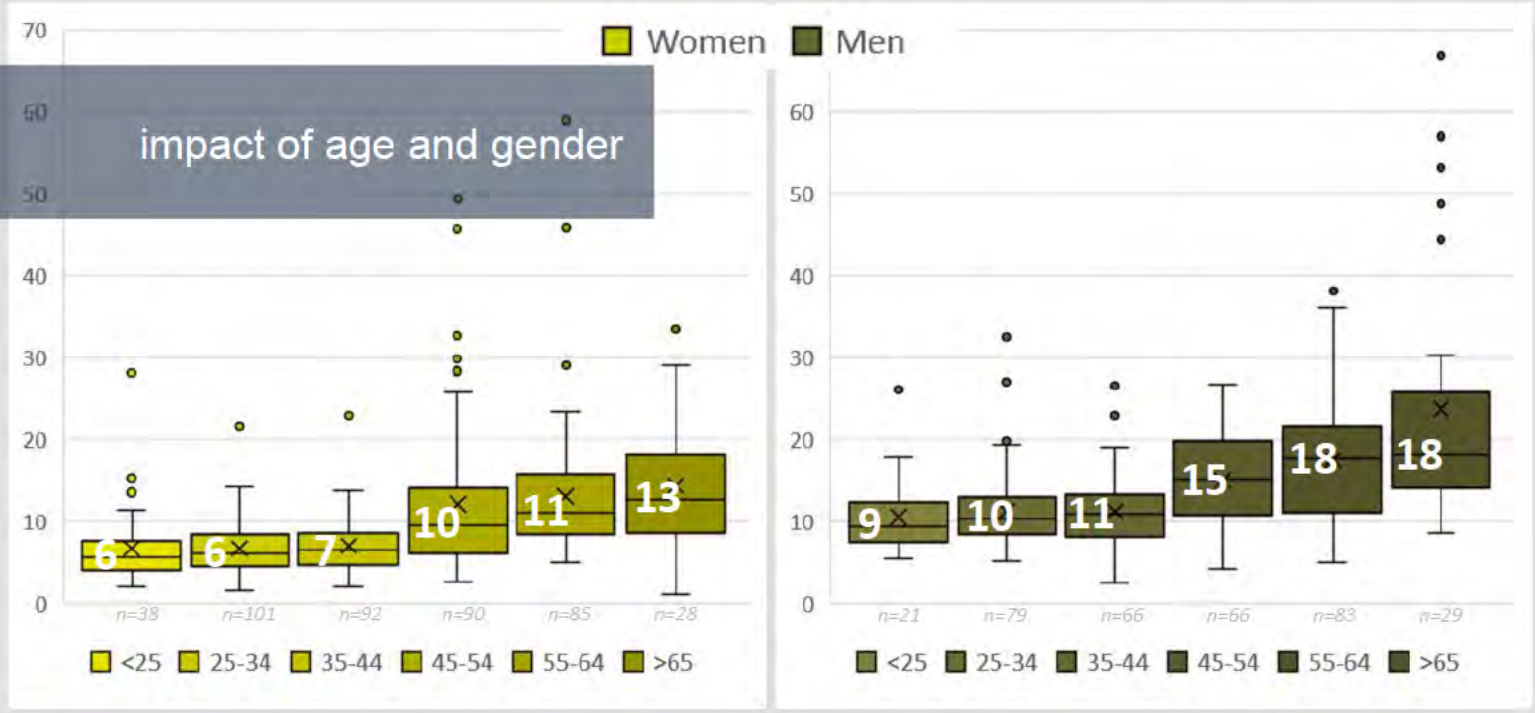


Levels of PFAS in blood serum samples

by demographics

Total PFAS concentrations [ng/ml] in the SHeS pilot study group (n=778)

impact of age and gender



Levels of PFAS

potential sources of exposure

Online questionnaires
for everyone aged 20 to 69 living in Switzerland

How often do you eat the following foods?
e.g. fish, seafood and fish products, etc.

How often do you eat hot meals from disposable packages?
e.g. McDonalds, Migros Take-Away, kebab stand, supermarket, etc.

Do you use waterproofing sprays?
e.g. for shoes, jackets, etc.

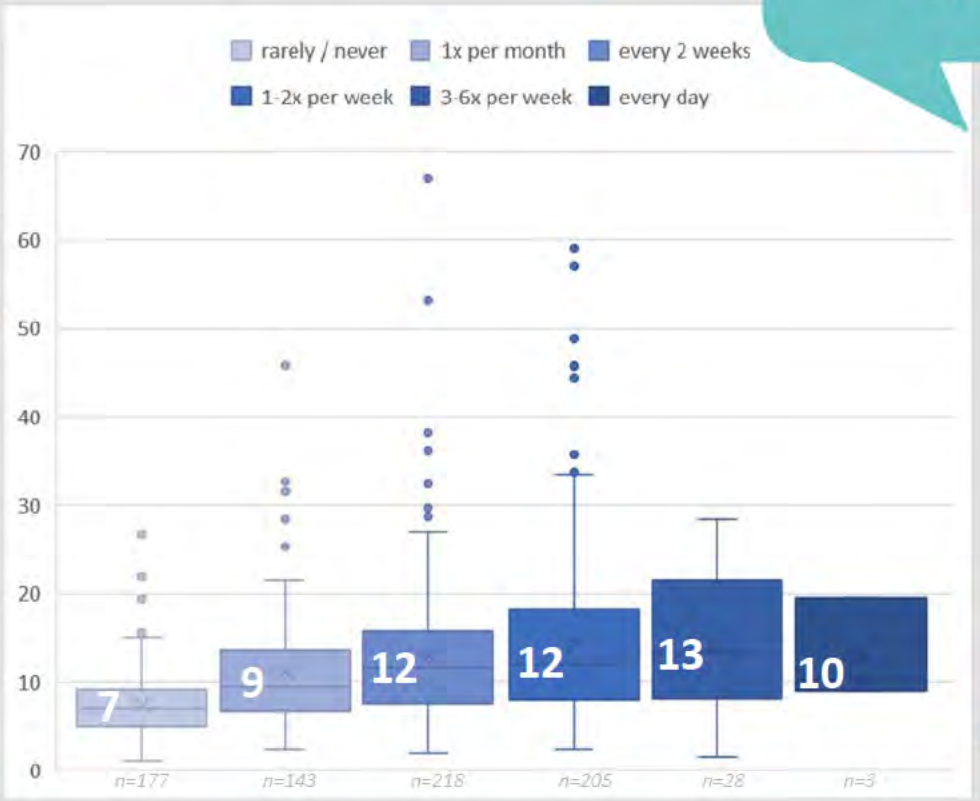
Do you wax your skis/snowboard yourself?

Current occupation and main activities?

Levels of PFAS in blood serum samples

potential sources of exposure

Frequency of **fish, seafood and fish products** consumption



Total PFAS concentrations [ng/ml] in the SHeS pilot study group (n=778)

Levels of PFAS in blood serum samples

potential sources of exposure

Do you use waterproofing sprays?

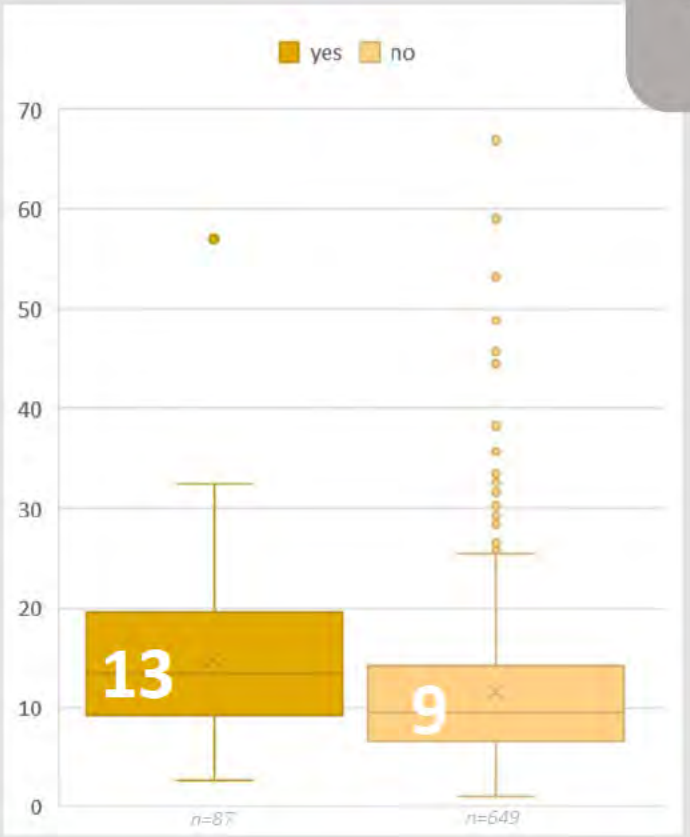
e.g. for shoes, jackets, etc.

Total PFAS concentrations [ng/ml] in the SHeS pilot study group (n=778)

Levels of PFAS in blood serum samples

potential sources of exposure

Do you wax your skis/snowboard yourself?

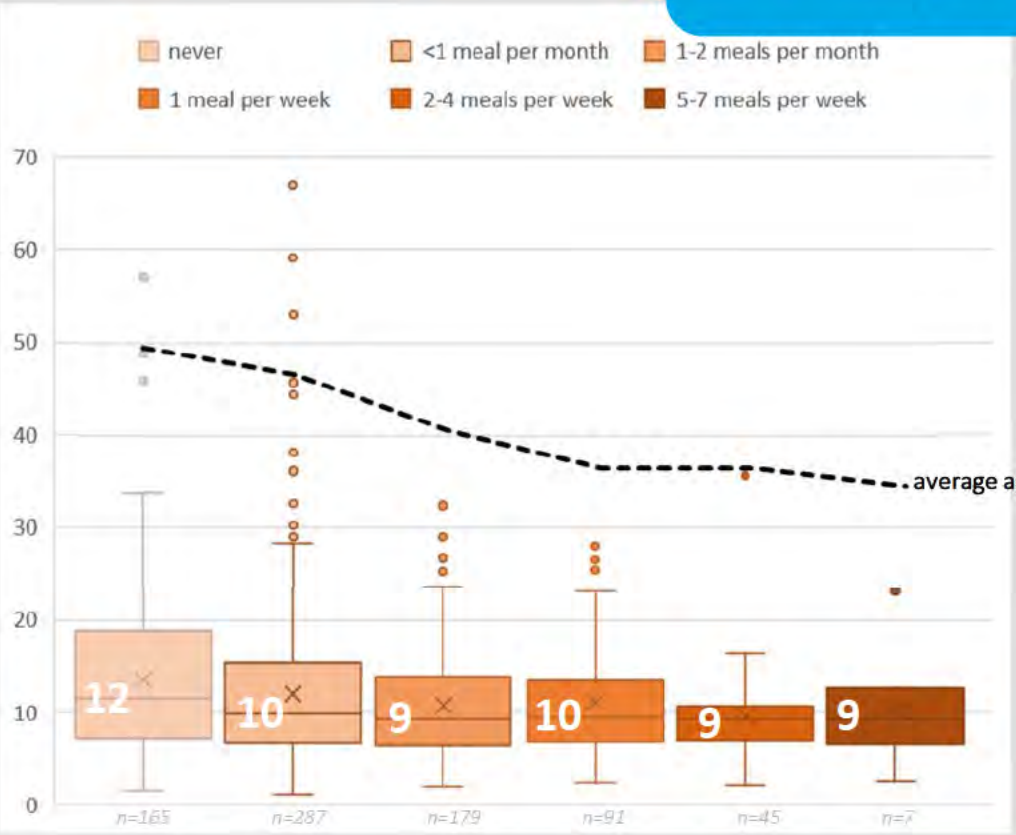


Total PFAS concentrations [ng/ml] in the SHeS pilot study group (n=778)

Levels of PFAS in blood serum samples

potential sources of exposure

How often do you eat hot meals from disposable packages?



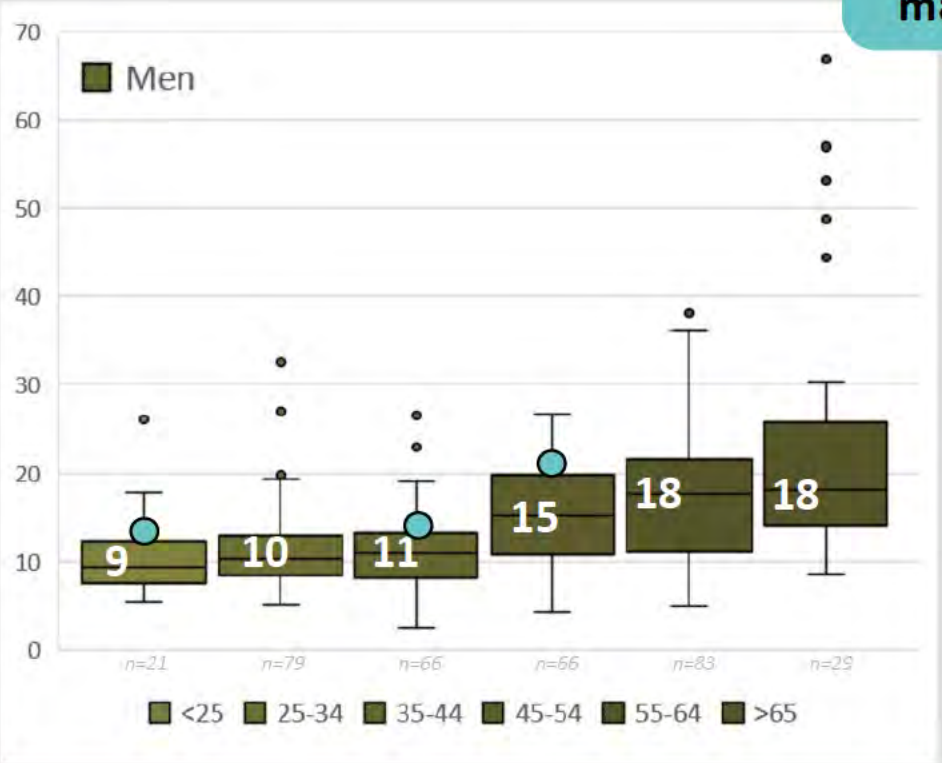
Total PFAS concentrations [ng/ml] in the SHeS pilot study group (n=778)

Levels of PFAS in blood serum samples

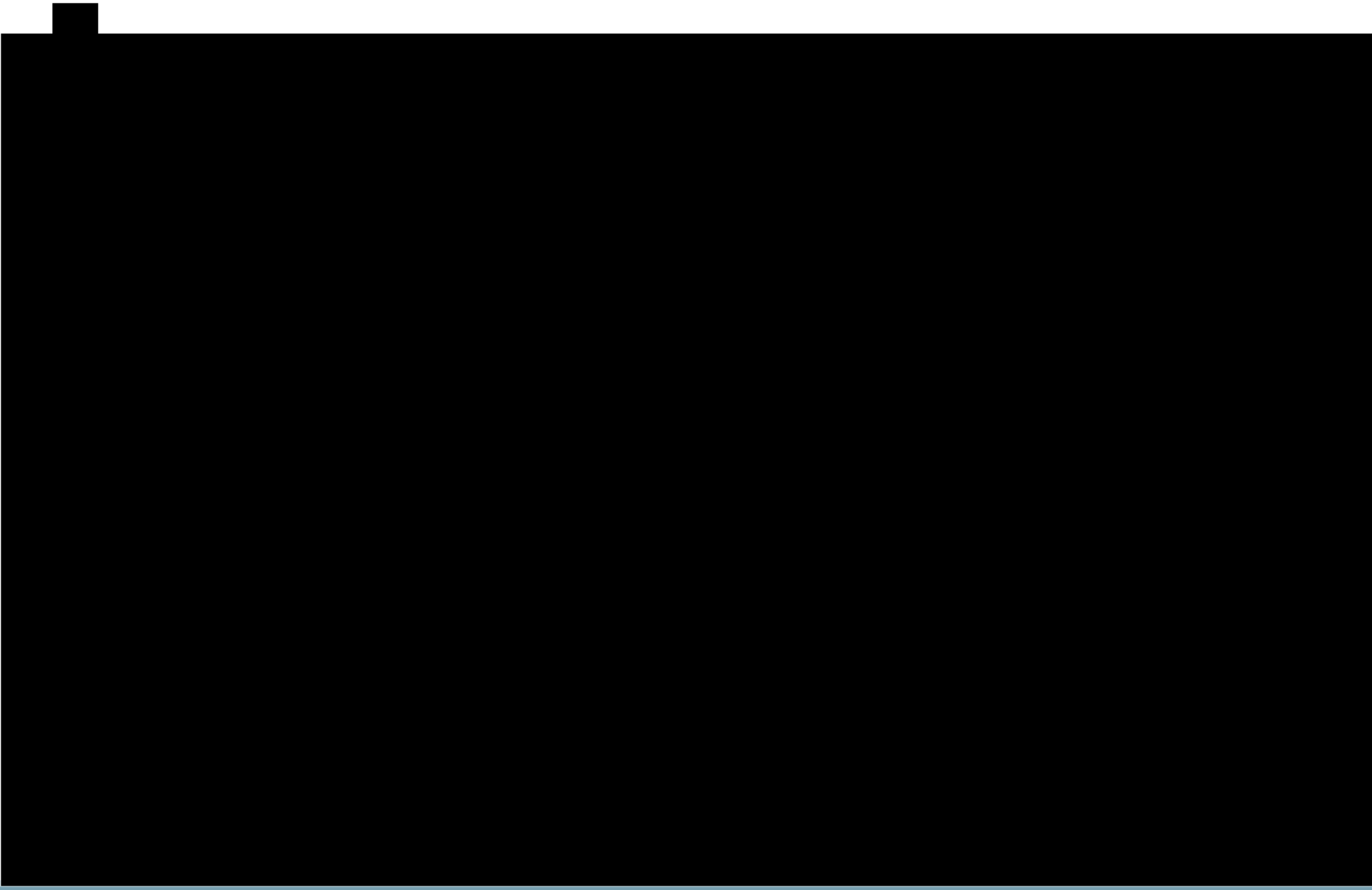
potential sources of exposure

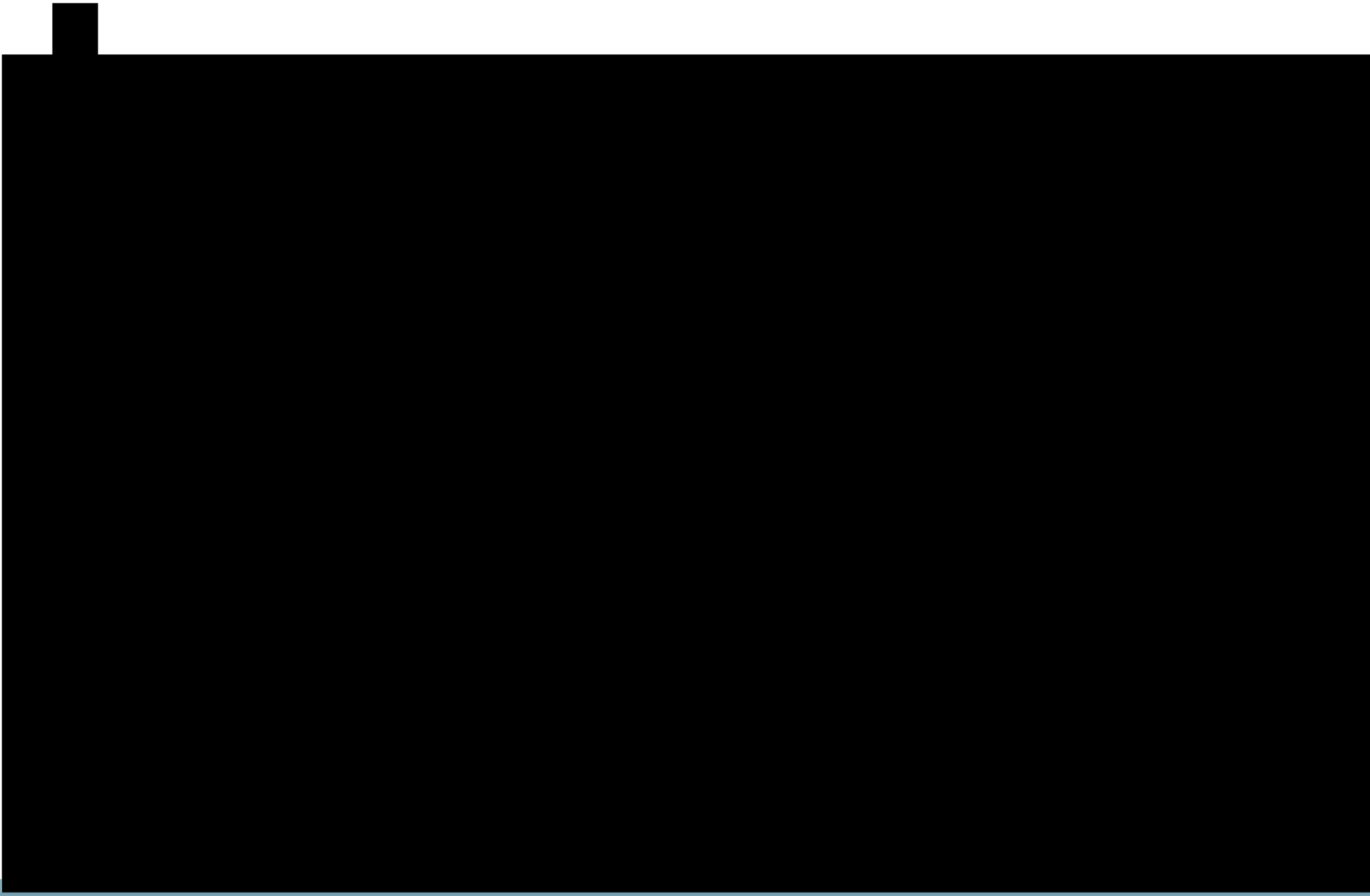
Current occupation and main activities?

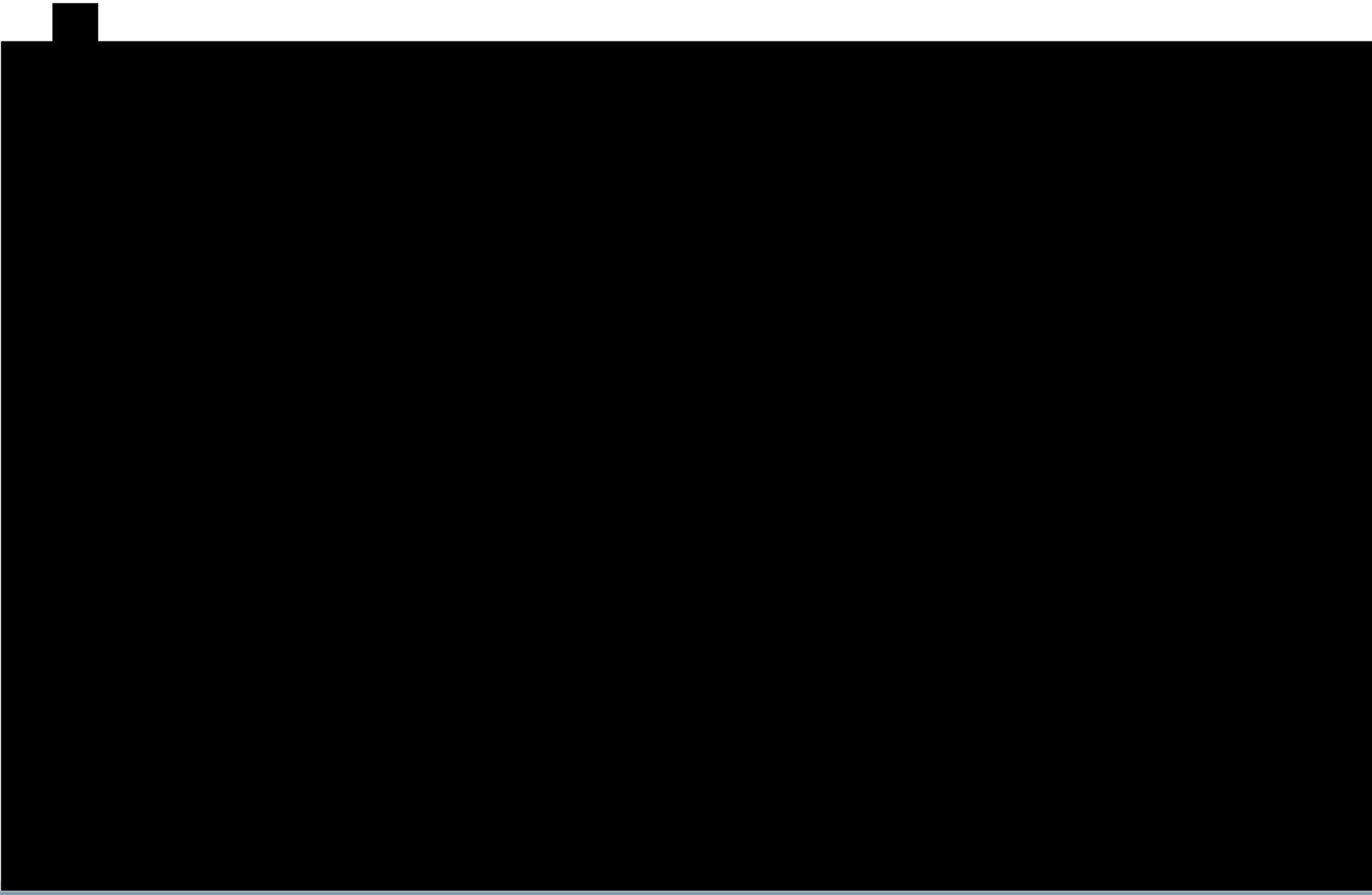
firefighter / professional or volunteer

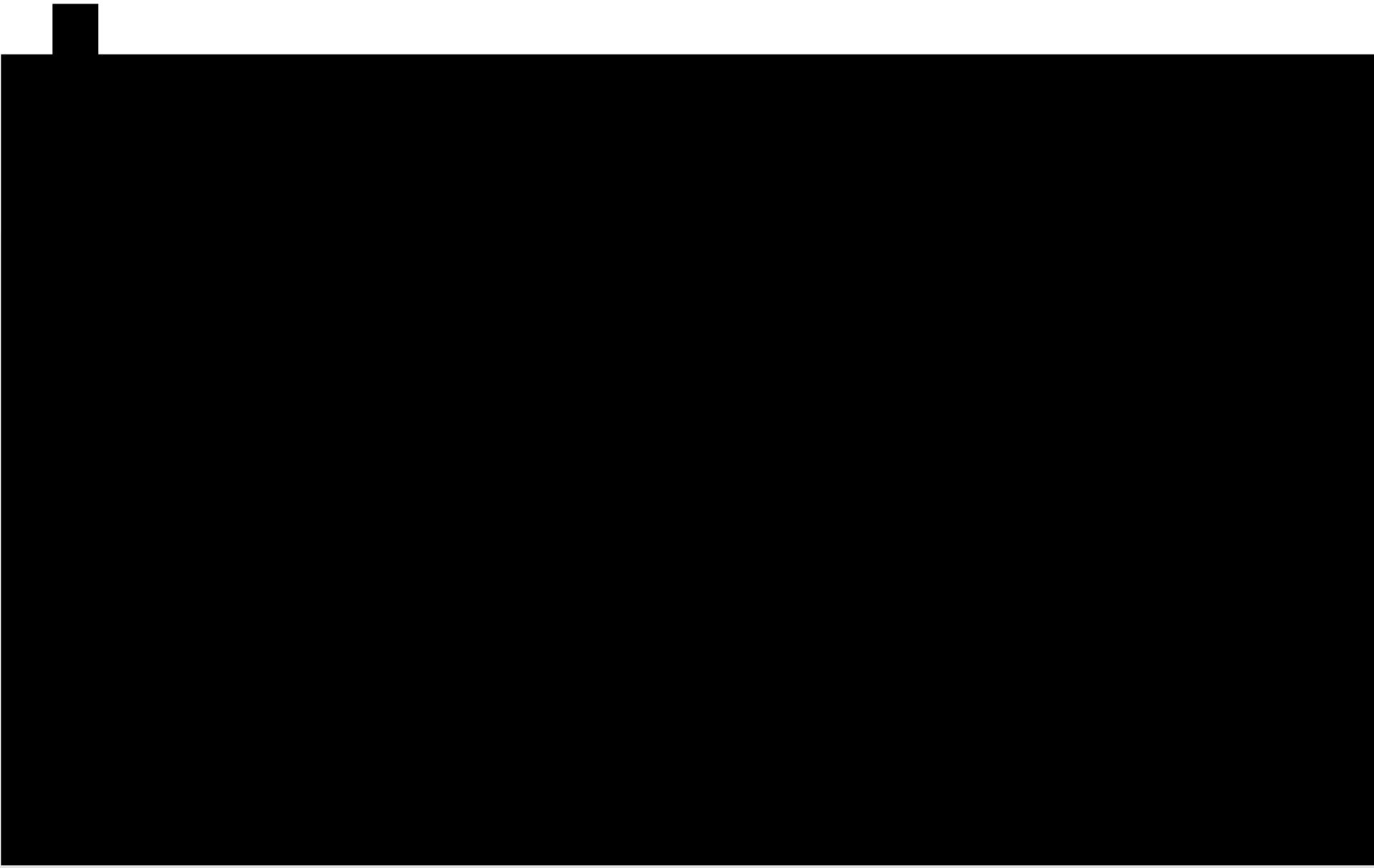


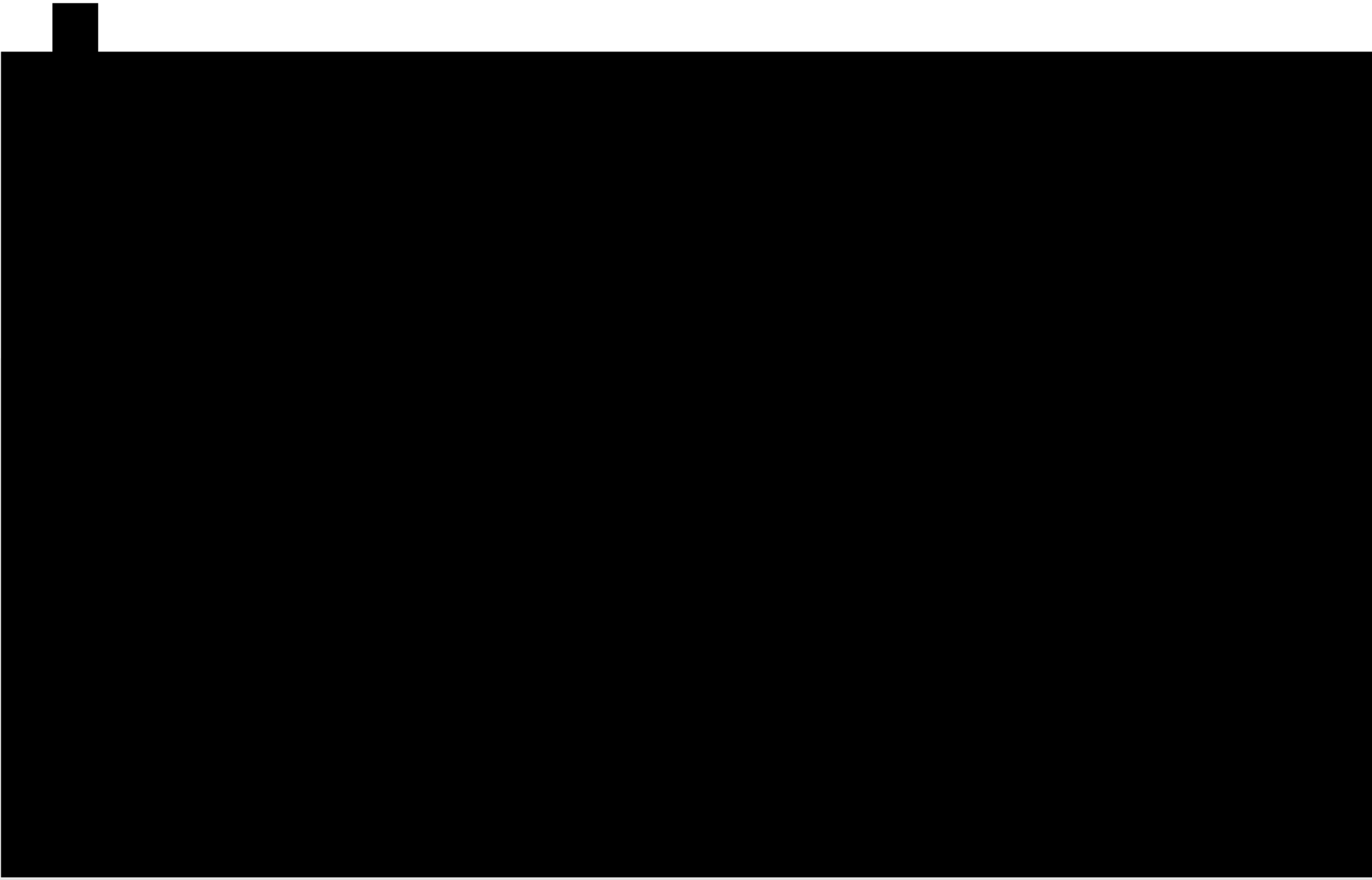
Total PFAS concentrations [ng/ml] in the SHeS pilot study group (n=778)

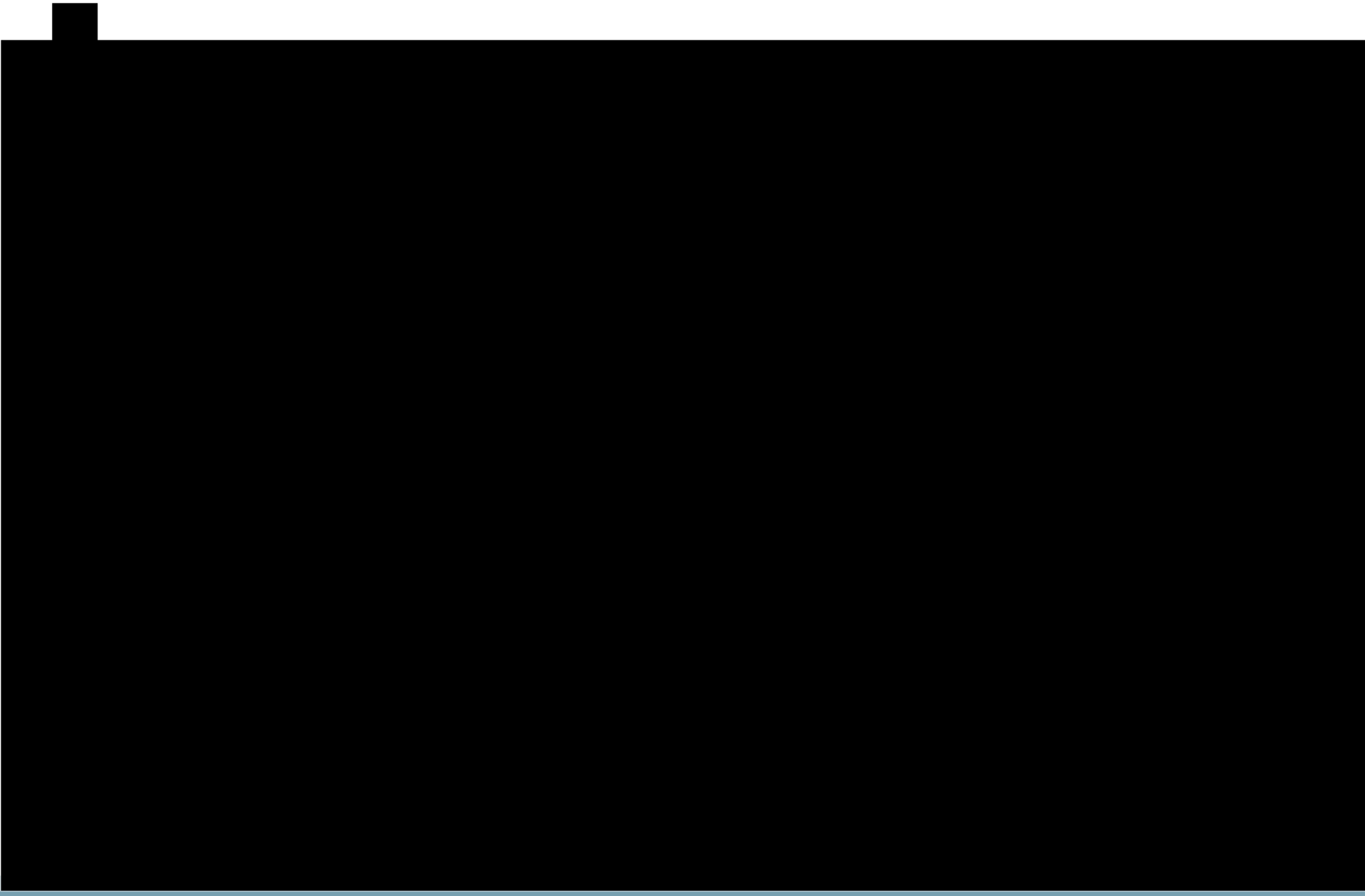












Next steps

- research into the most likely sources of exposure to PFAS for the most exposed participants
- further investigations based on questionnaire data and statistical analyses
- publication of analytical method & results (Alexandra Jaus, METAS)
- work on exposure models in the frame of PARC project

Pour en savoir plus,

www.etude-sur-la-sante.ch

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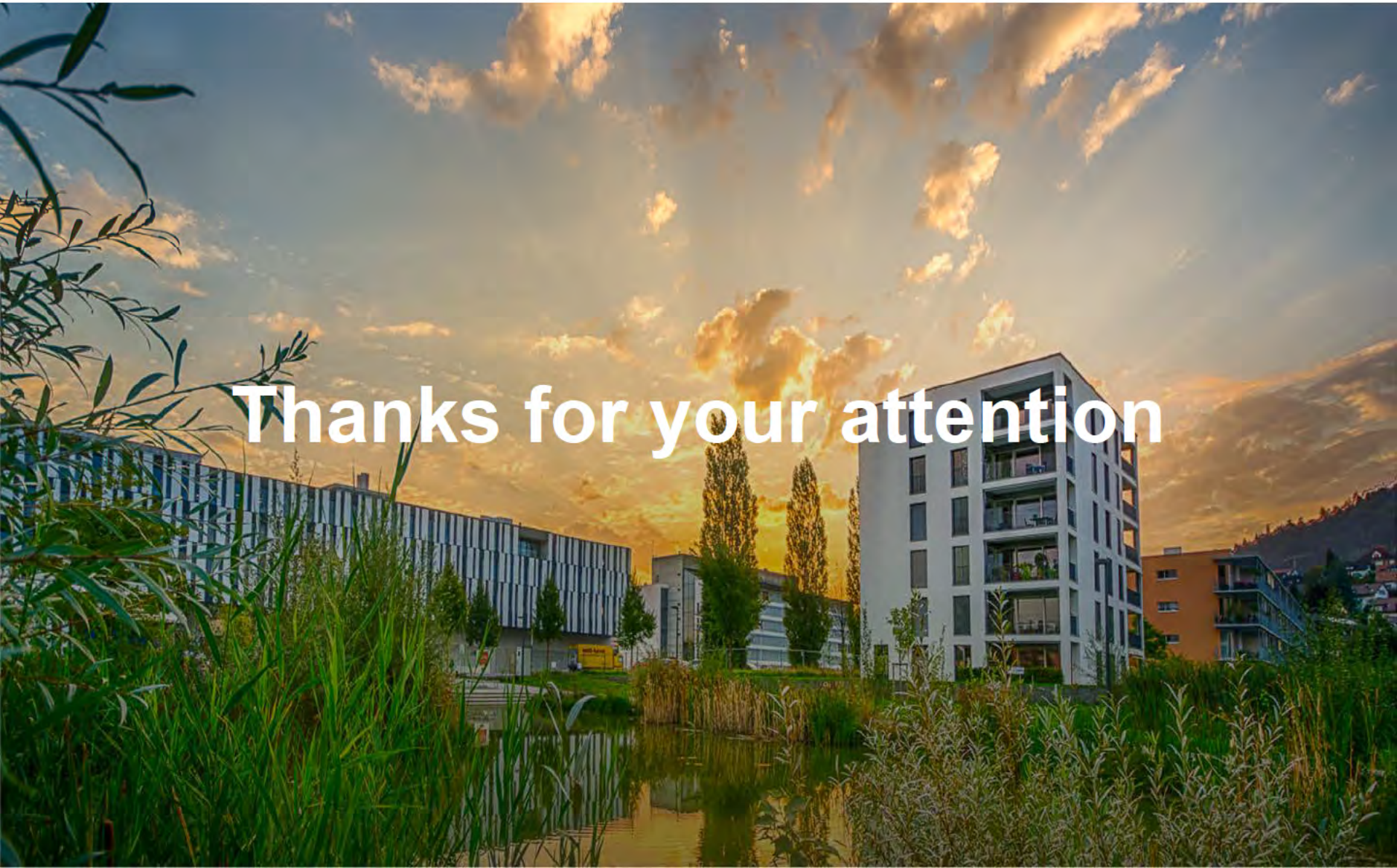
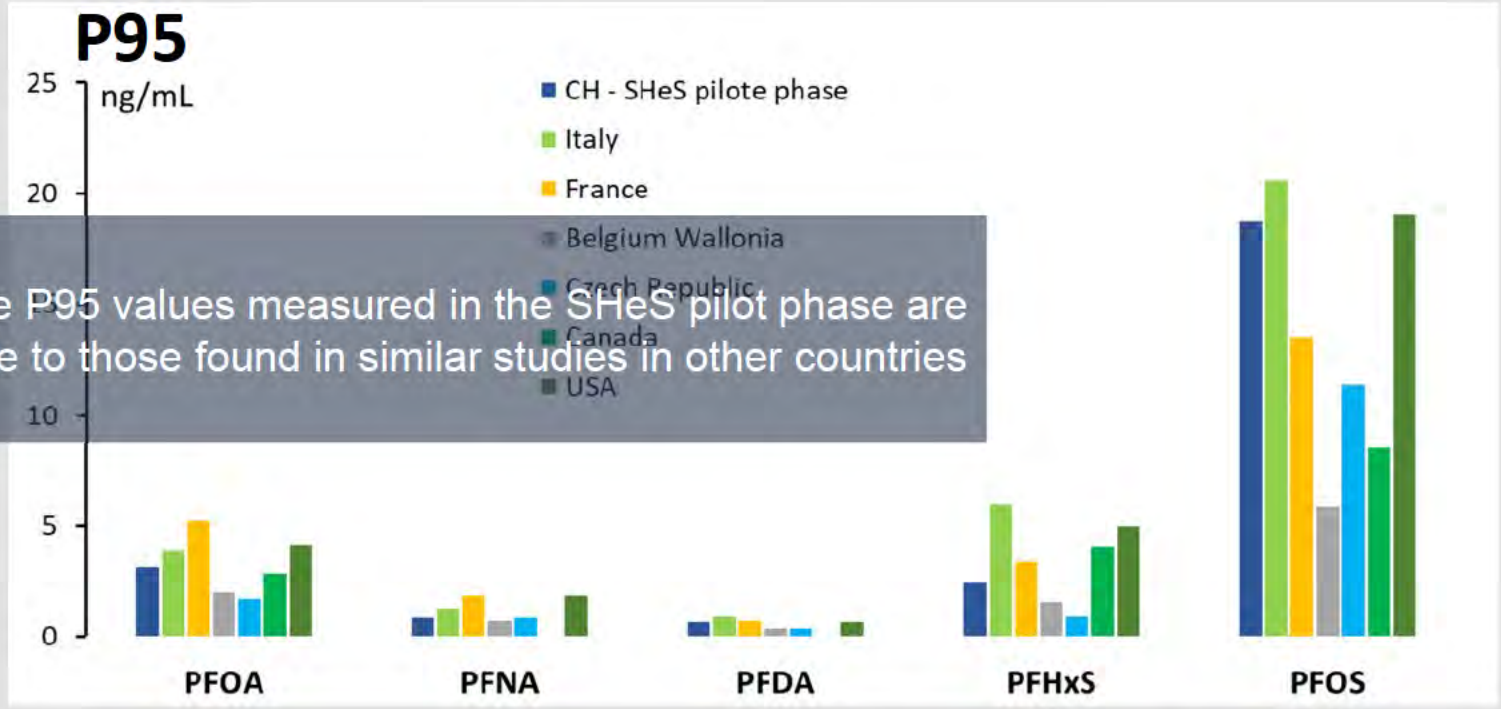


Thanks for your attention

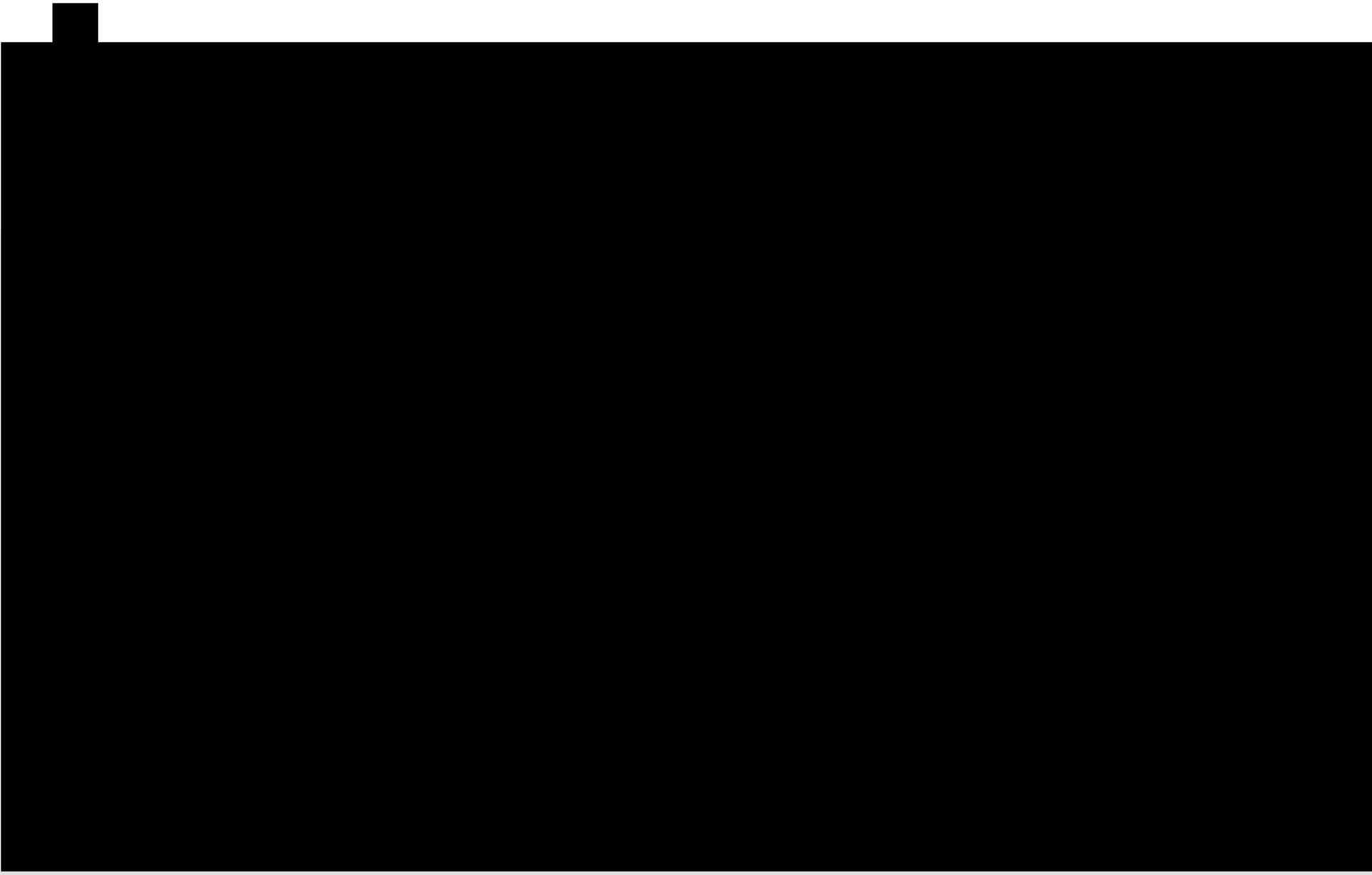
Levels of PFAS

compared to values from other countries



The P95 values measured in the SHeS pilot phase are comparable to those found in similar studies in other countries

The 95th percentile, or P95, indicates high levels of exposure (only 5% of values are at higher levels)



PFAS | WHAT YOU NEED TO KNOW

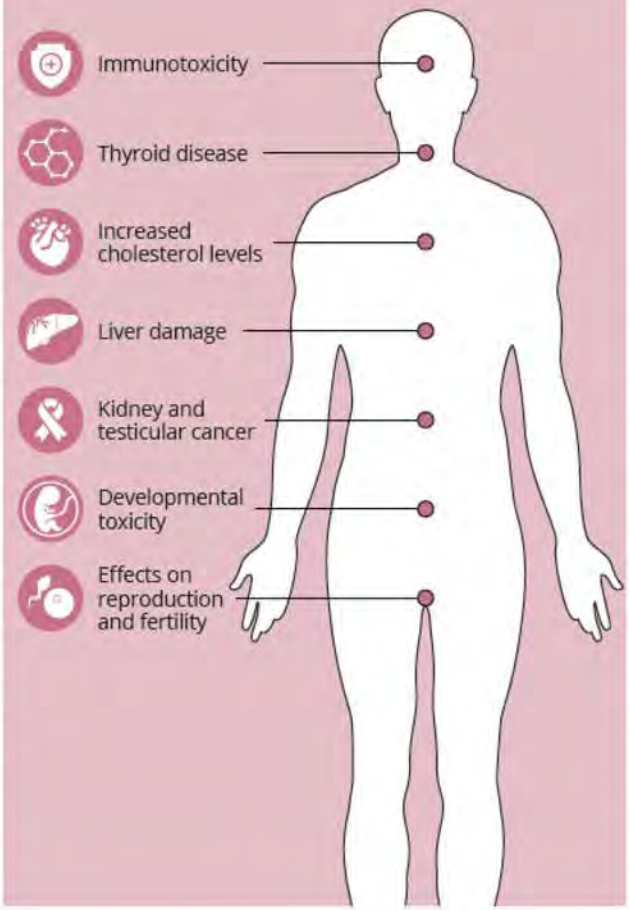
1 Possible sources of exposure

- House dust
- Occupational exposure (PFAS manufacture, firefighters, ski waxing, chromium plating...)
- Home consumer products
- Personal care products
- Breast milk
- Contaminated drinking water
- Contaminated food
- Food consumer products

2 How can PFAS enter your body?

- Via inhalation
- Via dermal absorption
- Via ingestion

3 How might PFAS affect your health?



4 How can you reduce your exposure to PFAS?

- Avoid fast-food wrapped in grease-proof papper
- Avoid fast-food sold in PFAS-containing cardboard, such as some pizza boxes
- Avoid using optional waterproofing sprays on clothing and footwear
- Ask for PFAS-free products when purchasing products that may contain PFAS. Ensure that products are free of all PFAS (and not just PFOS and PFOA)
- Check whether a particular product contains PFAS or not in online applications
- Instead of non-stick cookware, opt for ceramic, stainless steel, or cast iron

If you live in or near areas known to be contaminated with PFAS:

- **Avoid** fishing and consuming fish from these areas
- **Avoid** consuming home-grown fruits and vegetables from these areas. Ask local authorities to assess the PFAS levels to reassure yourself that it is free of PFAS
- Please **follow** the advice from authorities for water use

The EU has taken action to reduce people's exposure to PFAS. For example, PFOS, its salts and derivatives as well as PFOA, its salts and PFOA-related compounds are banned under the Regulation on Persistent Organic Pollutants. The European Food Safety Authority has defined a limit for the volume of four PFAS that may be safely consumed in food in a one-week period. EU REACH restrictions are also adopted for PFHxS en C9-C14 PFAS and will be effective in the coming years for several uses. Also, the Drinking Water Directive sets limit values for PFAS in water for human consumption. Most recently, the Chemicals Strategy for Sustainability set out a range of actions to regulate PFAS as a group, including phasing out the use of PFAS in the EU, unless their use is essential.

For further information on how the European Union is protecting citizens read the **HBM4EU PFAS Factsheet**.

Where they can be possibly found?

PFAS can be found in consumer products, such as food packaging and cookware; personal care products, such as shampoo, dental floss, nail polish and eye makeup; cleaning products, upholstery, leather, and carpets as well as home improvement products such as paints, varnishes, lubricants and sealants.

It can also be found in contaminated drinking water (close to manufacturing facilities, waste treatment facilities, firefighting and military training sites and airports) or food (fish, meat, fruit and fruit products, eggs, vegetables and vegetable products due to contaminated soil).

Source: HBM4EU