CASE STUDY:
PFAS in textile consumer items used by children and adolescents

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Motivation

- **PFAS are widely used** in many everyday textile items
- **Children and adolescents may be at greater risk** of exposure and adverse effects
- Consumers seeking to avoid PFAS-containing products often have **little guidance to inform purchasing decisions**

What we set out to accomplish

- Identify **which types of everyday textile products** for children and adolescents are most likely to contain PFAS
- Identify **types and levels of PFAS** in these products
- Evaluate whether **product information** can help consumers select products without PFAS
  - Stain-resistance or water-resistance
  - "Green" assurances and certifications

Table Discussion ~ 10 minutes

Please discuss the following:

- How would you approach this study?
- What tests would you run?
- What results would you anticipate?

Report Back

- What tests did you think you would run?
- What did you do differently and why?

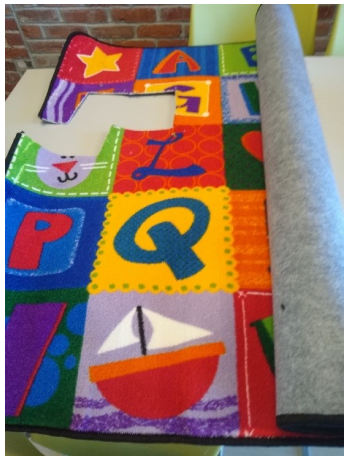
CASE STUDY

How did we approach our study?

What tests did we run?

8 product types

Product category
Rugs
Upholstery
Bed / crib sheets
Mattress / crib mattress protectors
Pillow protectors
Clothing, including school uniforms
Menstrual underwear
Miscellaneous infant products



Product label categories

	• Stain-resistant or waterproof with trademark (e.g., Scotchgard)
	• Stain-resistant or waterproof • No trademark treatment indicated
	• Stain-resistant or waterproof • Non-toxic or “green” language or certification (e.g., Oeko-Tex)
	• Not stain-resistant or waterproof • Non-toxic or “green” language or certification
	• Not stain-resistant or waterproof • No non-toxic or “green” language

KM Rodgers et al. *ES&T.* 2022

Tests we decided to run

93 items

Total fluorine

- Combust sample, measure total fluorine released
- Used to screen products for PFAS

61 items

Targeted PFAS testing

- Extract sample in solvent
- Measure 36 specific PFAS compounds

30 items

Total Oxidizable Precursor analysis

- Extract sample in solvent + strong oxidation
- Measure additional PFAS present as precursors

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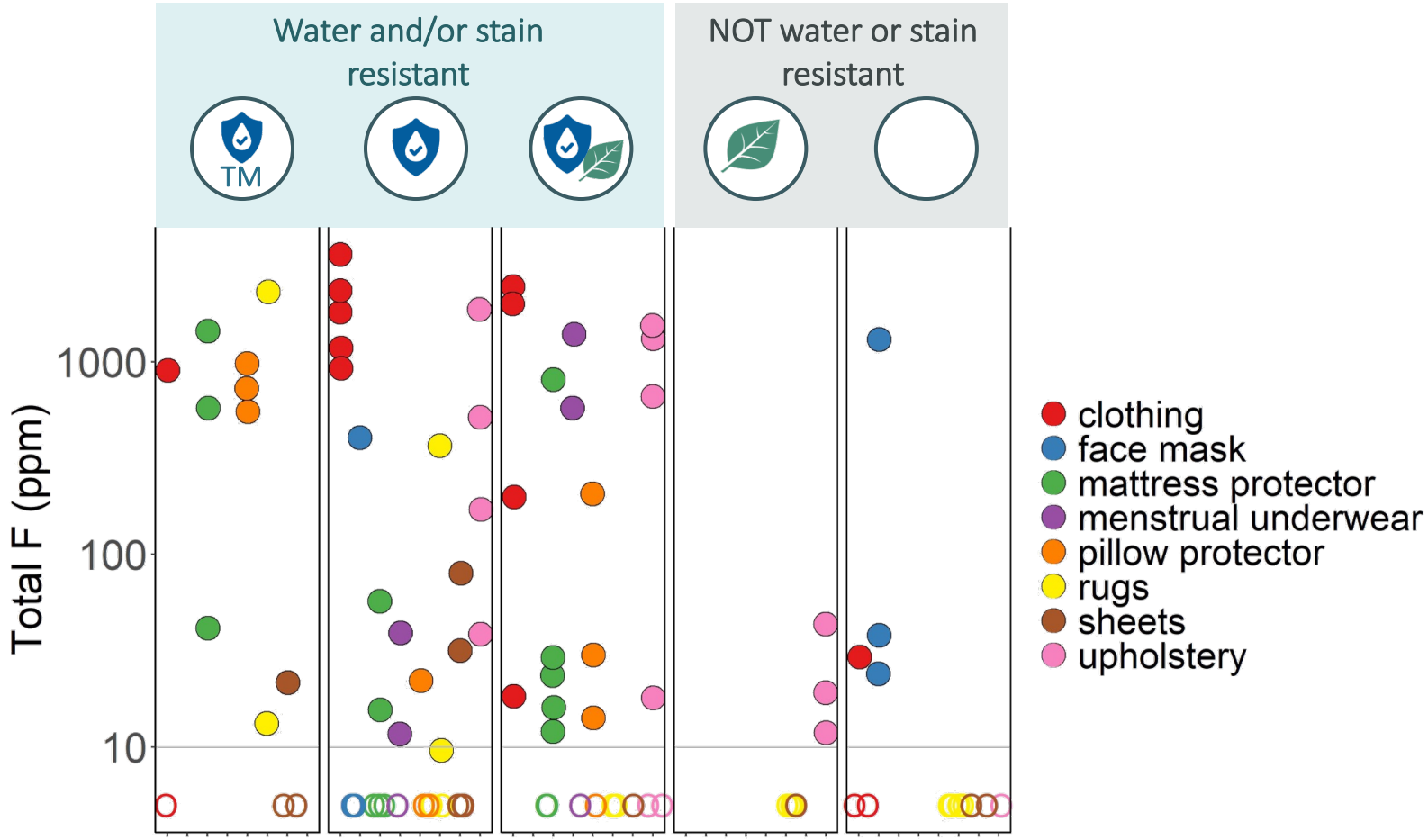
Report Back

- What results would you anticipate?
- What challenges would you anticipate?

CASE STUDY

What were our key findings?

Total F was more often detected in water- and stain-resistant items, regardless of "green" assurances



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Extractable PFAS were only detected in stain-resistant and waterproof products

		#	PFHxA	PFBA	PFOA	PFBS
Water and/or stain resistant		*13*	**38%**	**38%**	**23%**	**38%**
		*19*	**26%**	**11%**	**11%**	0%
		*16*	**19%**	**6%**	**12%**	0%
NOT water or stain resistant		*4*	0%	0%	0%	0%
		*3*	0%	0%	0%	0%

KM Rodgers et al. *ES&T.* 2022

Take-home messages

- Presence of extractable PFAS only in water- or stain-resistant items consistent with intentional use
- Vast majority of total F could not be accounted for by extractable F, consistent with presence of polymers
- Detection of PFAS in items with green certifications is not necessarily unexpected
- Info on product labels provides some clues about presence of PFAS but still difficult for consumers to avoid

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