

# REVEALING BISPHENOL EXPOSURE IN CZECHIA: disparities across decades and significant determinants

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## Practical Strategies for Minimizing Exposure to Bisphenols

- 1 Avoid plastics labeled as #3  and #7 .
- 2 Throw away your reusable plastic bottle!
- 3 Keep in mind, a "BPA free" label only indicates the absence of BPA, not necessarily the absence of BPS or BPF.
- 4 Consume less canned food and drinks.
- 5 Choose cosmetics in glass containers.
- 6 If you're still smoking, it's time to give up.

## Bisphenols: WHAT are they?

BPA, BPS, BPF are **organic synthetic compounds - plasticizers**. Nowadays, **BPA** has become **one of the highest volume chemicals** produced worldwide.

## Bisphenols: WHERE are they?

BPA is widely used in a range of consumer products such as:

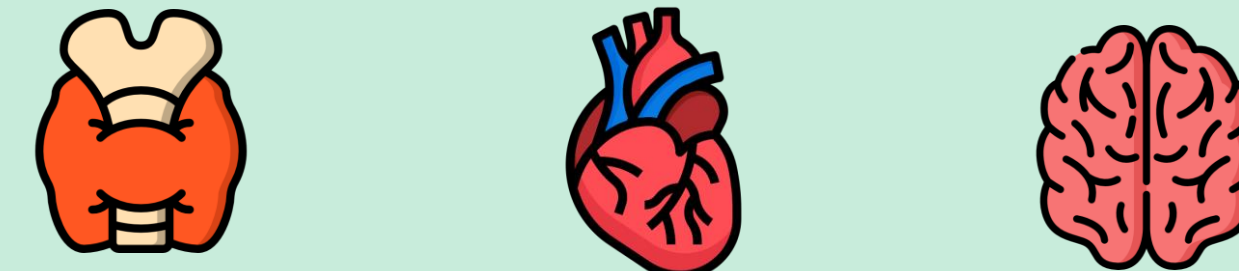
- plastic containers,
- food packaging,
- plastic water bottles,
- cans lined with epoxy resin,
- thermal paper,
- car and home interiors.

Since the 2010s manufacturers have **started replacing BPA with analogs such as BPS and BPF**

## Bisphenols: WHY are they alarming?

BPA is classified as an **endocrine-disrupting chemical** that mimics estrogen and thus, alters the functions of the endocrine system causing endocrine disorders.

Endocrine, cardiovascular, neural disorders.



**BPA detection frequency ~90%**

## Bisphenols: HOW are they regulated?

BPA use was **banned** in 2011

BPA concentration **<0.02%** in 2020

TDI **0.2 ng/kg/day** in 2023

## Data: participants and determinants

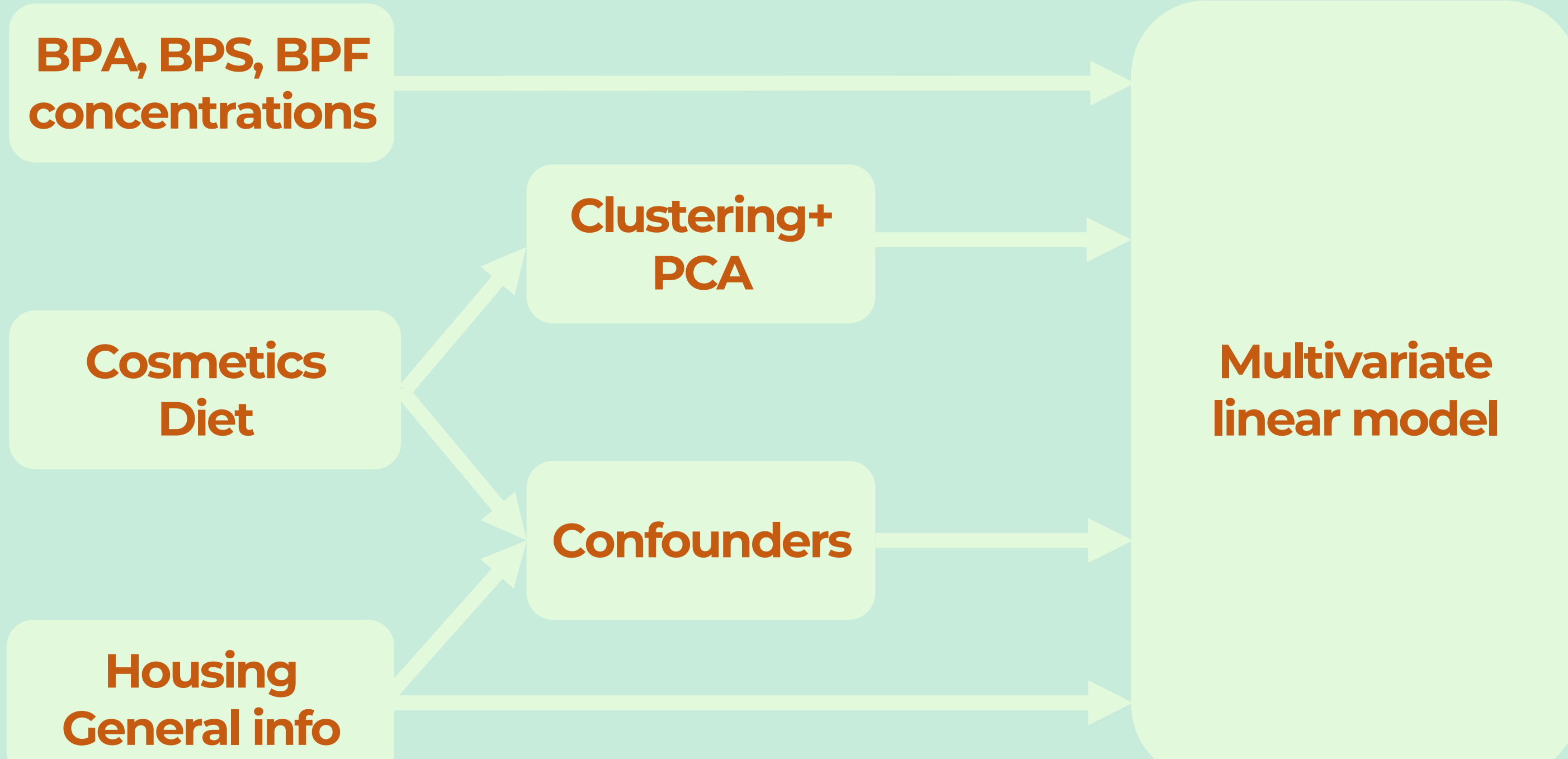
116 + 118 DEMOCOPHES<sup>11-12</sup> mother-child pairs  
 527 CELSPAC SCHOOL CHILDREN<sup>19-20</sup>  
 305 CELSPAC YOUNG ADULTS<sup>19-20</sup>

General info    Diet    Housing    Cosmetics

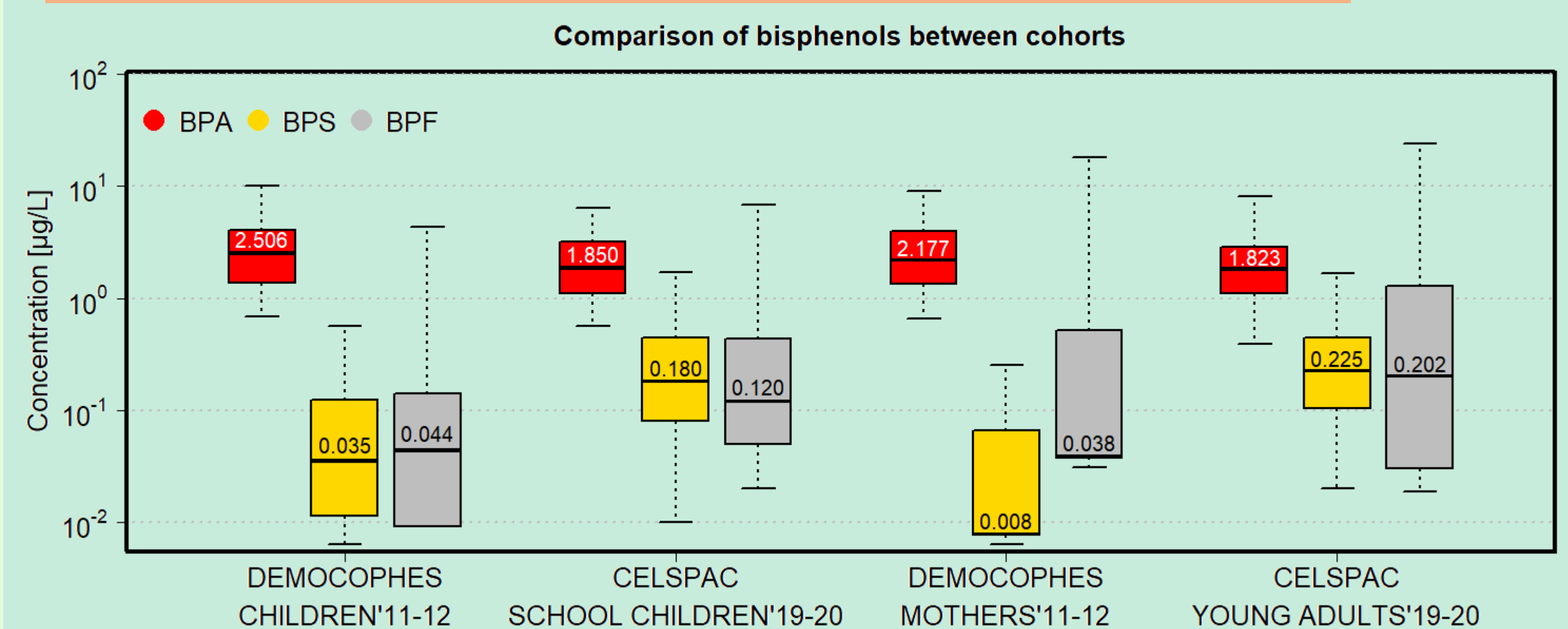
 Potential sources of exposure?





We measured **BPA, BPS and BPF in urine** of 1,066 individuals born in the Czech Republic, and attempted to **estimate associations between the concentrations and questionnaire data** that could reflect potential sources of exposure.

## Data: statistical analysis



## Results



Increasing frequency of consumption/use twice will:	BPS	BPF	<input type="checkbox"/> Soda, Cola <input type="checkbox"/> Syrup <input type="checkbox"/> Bottled drinks <input type="checkbox"/> Coffee <input type="checkbox"/> Tea <input type="checkbox"/> Make-up cosmetics <input type="checkbox"/> Skin cosmetics <input type="checkbox"/> Body cosmetics
	 	1.037 times	
 	1.065 times		

## Conclusion

- Our analysis reveals **lower BPA levels but higher BPS and BPF levels in the CELSPAC 2019-2020 cohort** compared to the DEMOCOPHES 2011-2012 cohort.
- This may suggest that **regulations limiting BPA usage are successful** in lowering exposure levels.
- Comparable **regulations are required for BPS and BPF** due to their health effects similar to those of BPA.
- Cosmetics and beverages** were identified as **predictors of BPS and BPF exposure** in young adults and school children.
- The findings suggest that the **use of makeup cosmetics significantly contributes to BPS concentration** among female young adults in Czechia.