LEUPHANA
UNIVERSITÄT LÜNEBURG

BIOCIDAL ACTIVE SUBSTANCES IN HOUSEHOLDS

Reasons for the need to promote a sustainable use of biocides

Biocidal active substances

= active substances with a controlling effect on any harmful organism by any means other than mere physical or mechanical action (according to Biocidal Products Regulation (EU) 528/2012 (BPR))

→ exemptions e.g. for plant protection products, human or veterinary pharmaceuticals, personal care products

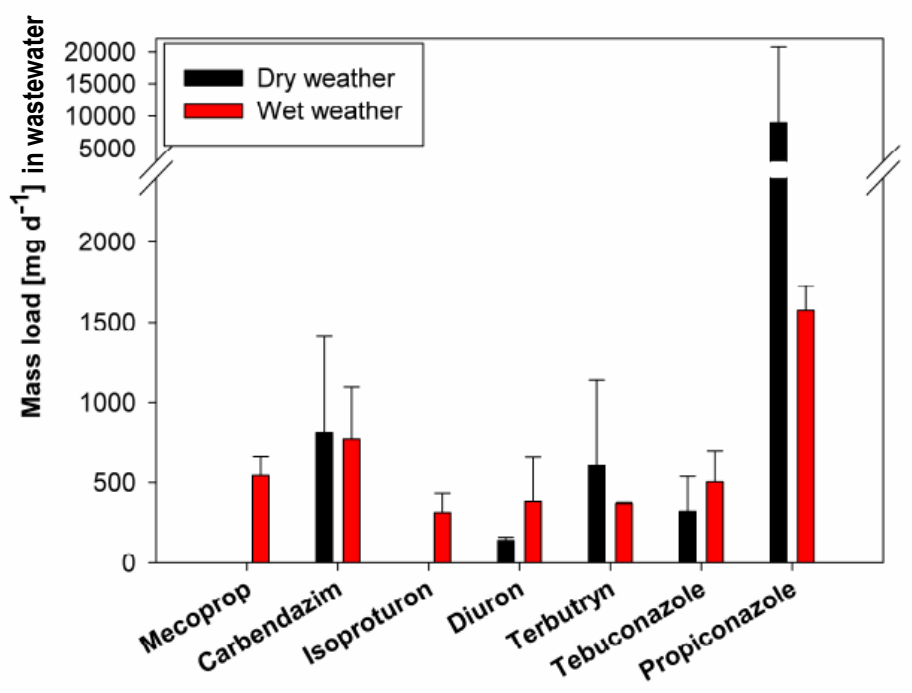
Main group 1: **Disinfectants**

Main group 2: **Preservatives**

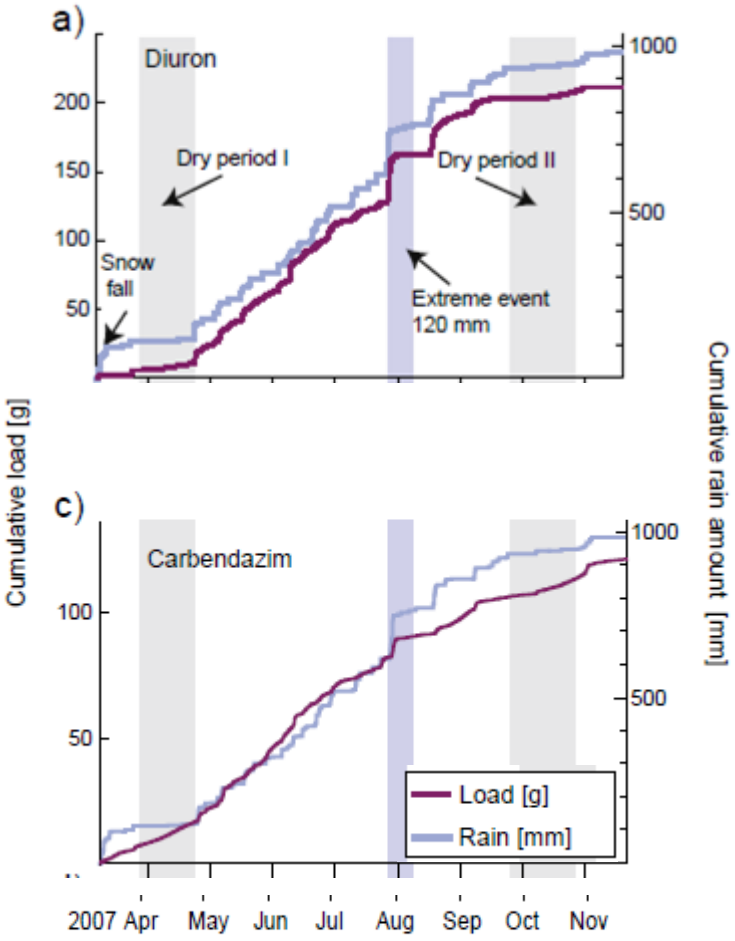
Main group 3: **Pest control**

Main group 4: **Other biocidal products**

Biocides in the environment



Bollmann et al. 2014 (amended)



Wittmer et al. 2011 (amended)

Contribution of households?

Biocides

Emissions of biocidal active substances from households can originate from several product categories:

Goals

i. to identify the **biocidal active substances** that can be found in households,

ii. to show the **product categories** they are used in and

iii. to describe the cases where biocidal active substances might enter the sewage system **without falling under the Biocidal Products Regulation**

Methods

- Interviews with standardised questionnaires (not part of this presentation)

- Barcode scans:
  - all products for the control of pests
  - all washing and cleaning products
  - certain personal care products with high release to wastewater

Study areas

Rural neighbourhood
(Main study site)

Intermediate neighbourhood

Urban neighbourhood

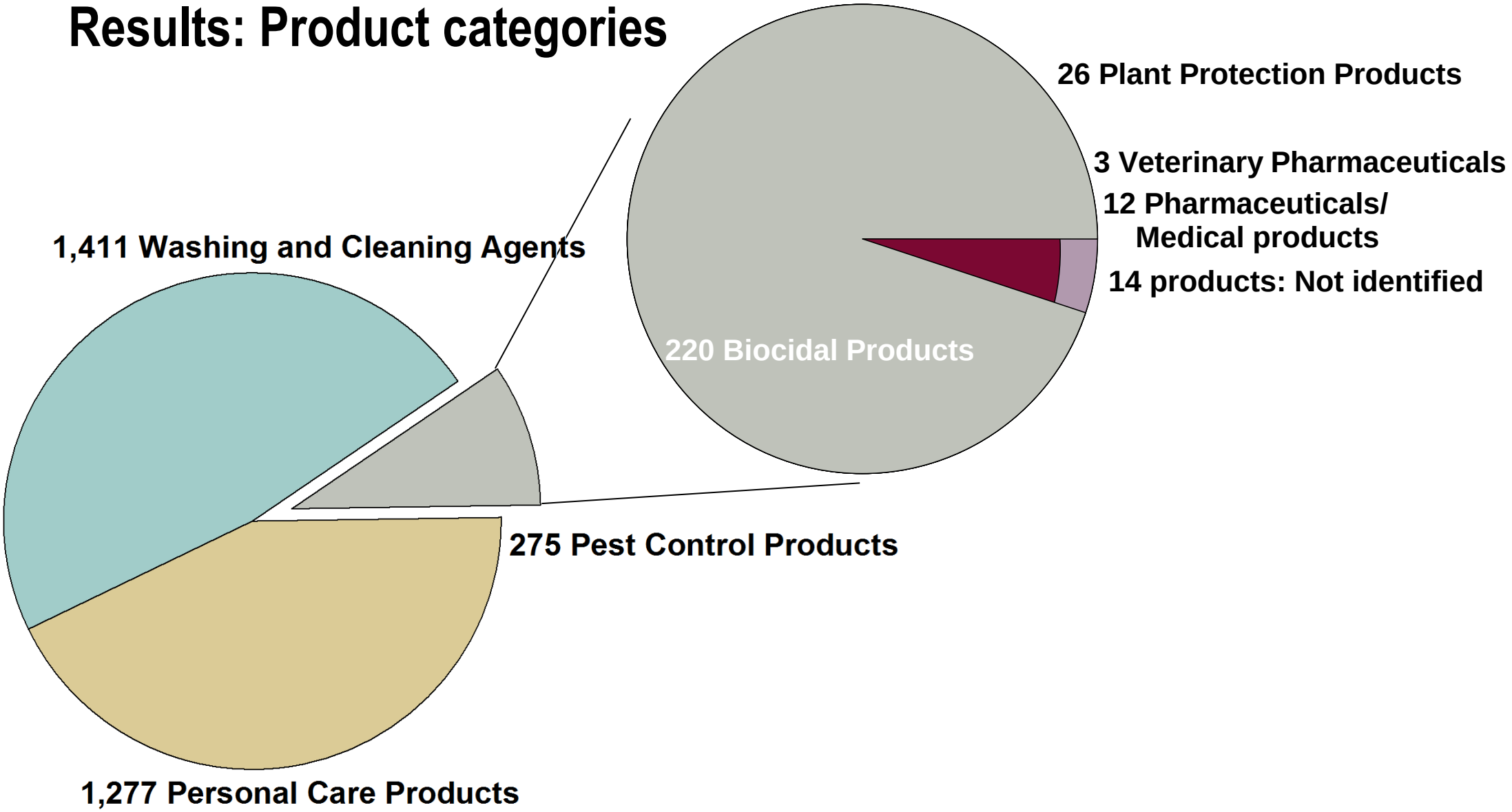
Results

- Scan of almost 3,000 products
- Retrieved:
  - Names of 96 % of the scanned products
  - Ingredients of 93 % of the scanned products
- 214 biocidal active substances detected that were at least identified under the old Biocidal Products Directive 98/8/EC
- Results only include information regarding 79 active substances currently under review or approved active substances

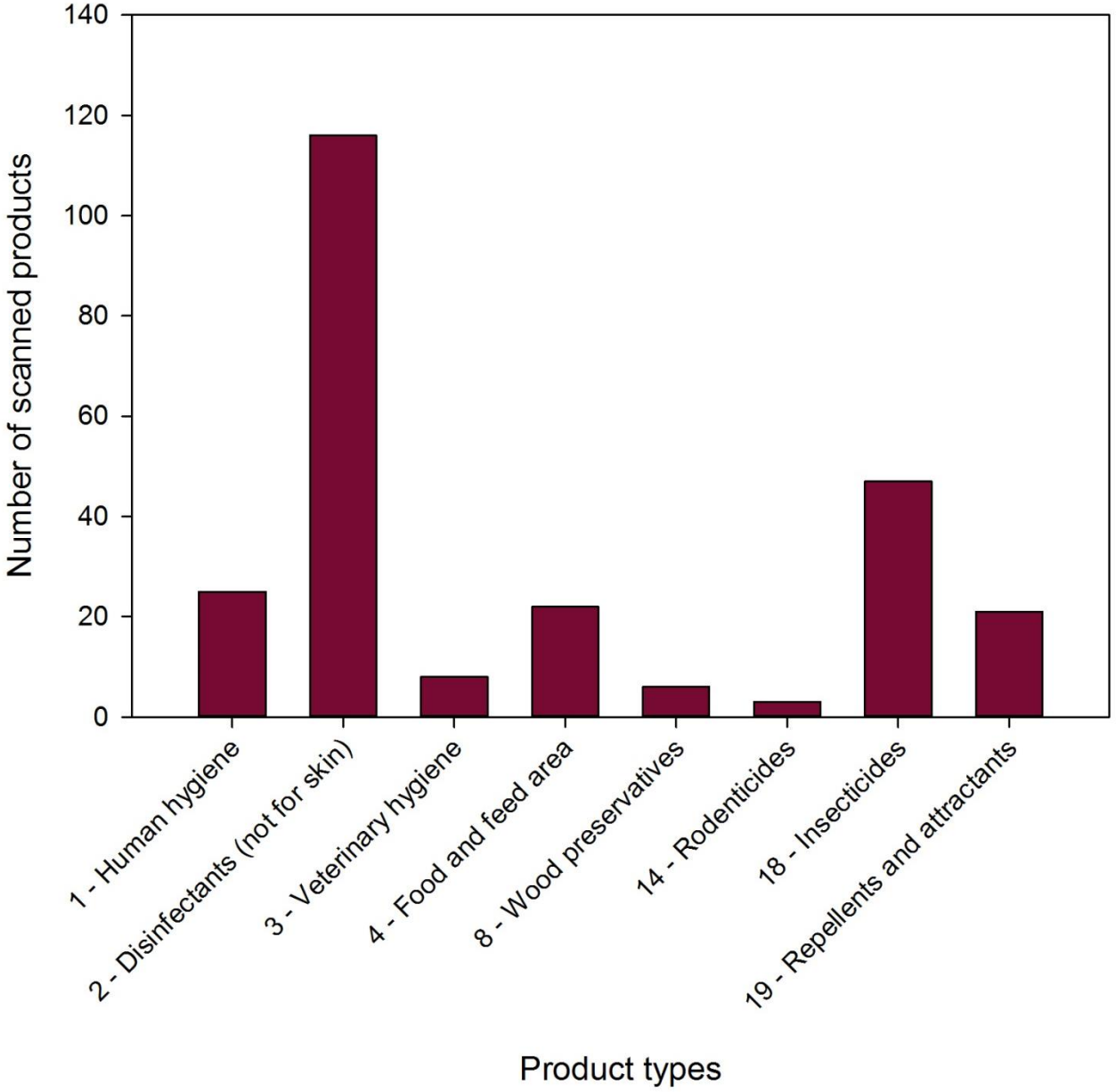
Results

- Households with biocidal active substances: 100%
- Households with biocidal products: 75%
- Average number of biocidal products per household: 1.7
- 9 product types present in the households

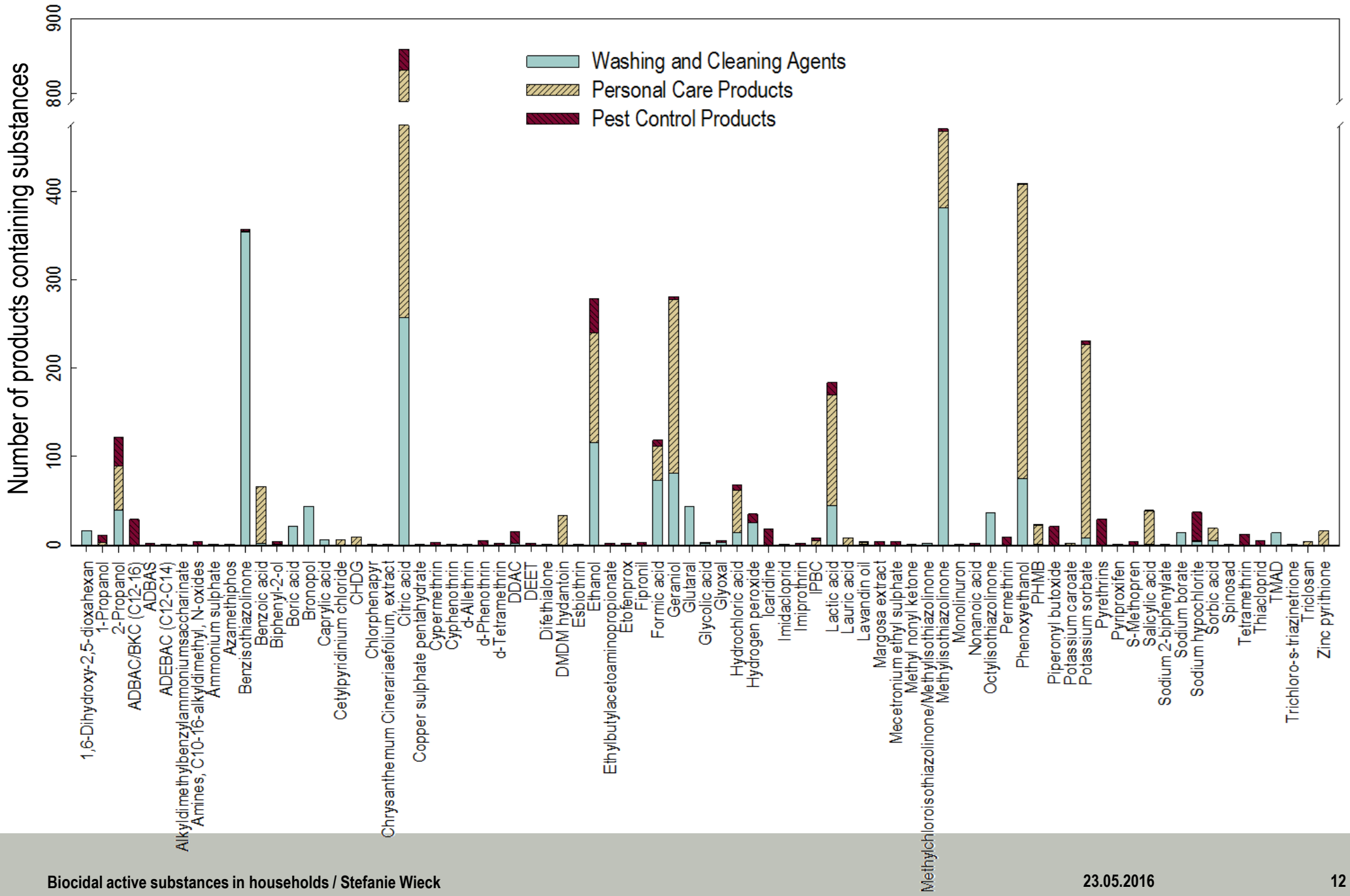
Results: Product categories



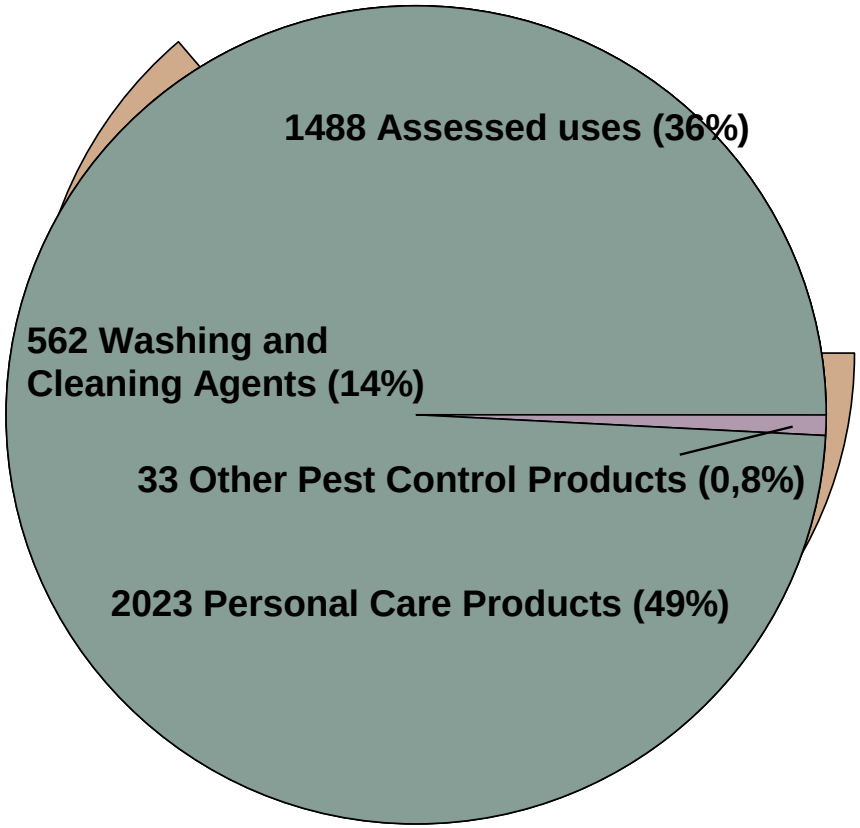
Results: Product types



Results: Substances found in the products



Results: Uses not falling under Biocidal Products Regulation



- 64 % do not fall under the risk assessment of BPR because:
  - Use in a washing and cleaning agent without being assessed as in-can-preservatives (product type 6)
  - Use in a personal care product
  - Use in another pest control product than biocidal product

Discussion

— Personal care products and washing and cleaning agents clearly **outnumber biocidal products** as emission sources of active substances in wastewater

— Risks might be **underestimated** because not all emission sources are considered during PEC calculation (no aggregated exposure assessment)

— Not all monitoring results of biocidal active substances can be explained by **product inventory** → emissions from building materials

Conclusions

Biocidal active substances in households

1. Households are a **possible emission source** for certain biocidal active substances in waste water

2. Risk assessments and risk mitigation measures have to consider **products from other regulatory backgrounds**

3. Too complex for existing risk assessment concepts?

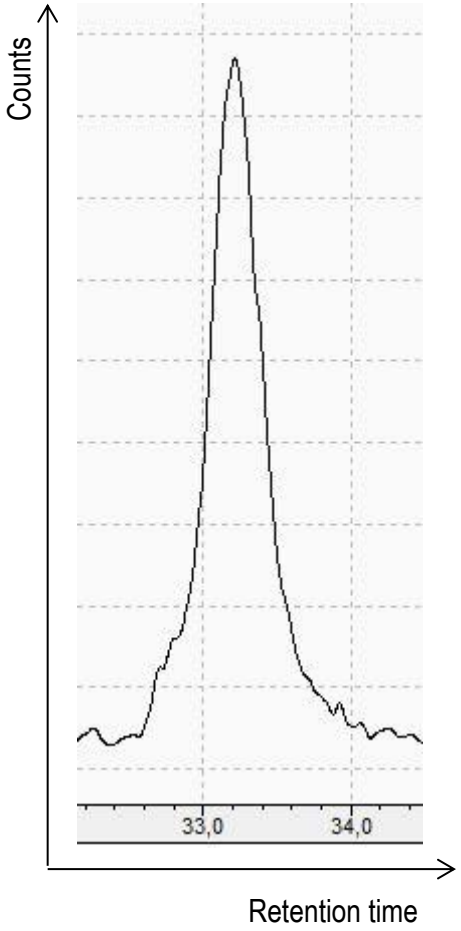
→ Sustainable use of biocides

Outlook

– Sampling of wastewater of the interviewed households in rural neighbourhood

– Analysis of 16 selected biocidal active substances

Outlook



— First preliminary results show measurable concentrations of triclosan

— Triclosan was only observed 4 times in toothpaste

— Possible other sources: pharmaceuticals, deodorant, treated articles

— Other ideas?

Acknowledgments

I would like to thank

- the participants for letting me in their houses and answering all my questions
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» https://www.dbu.de/stipendien_20014/328_db.html

Literature

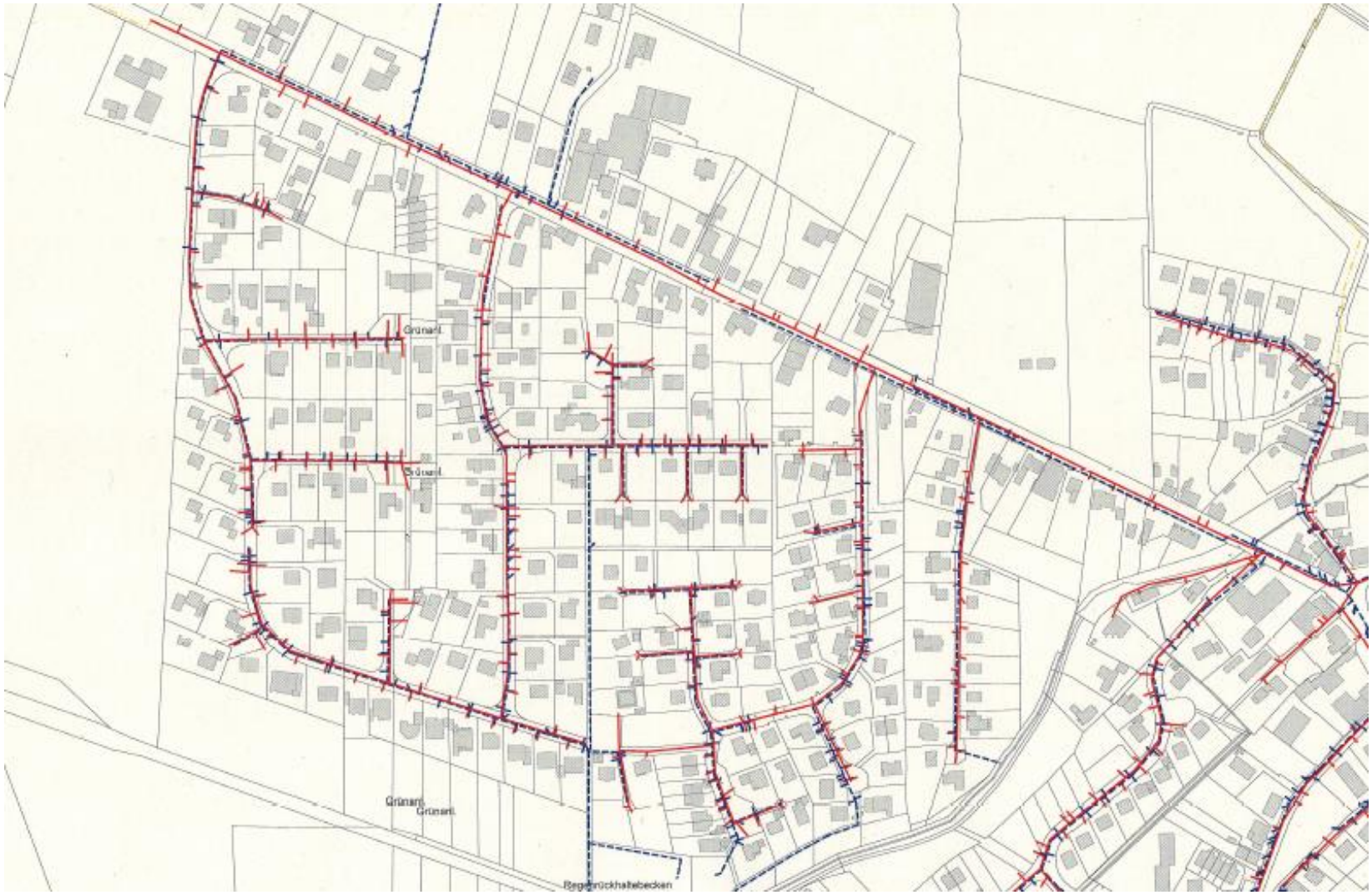
Bollmann UE, Tang C, Eriksson E, Jönsson K, Vollertsen J, Bester K. *Biocides in urban wastewater treatment plant influent at dry and wet weather: concentrations, mass flows and possible sources*. Water research 2014;60:64–74.

Wittmer IK, Scheidegger R, Bader H, Singer H, Stamm C. *Loss rates of urban biocides can exceed those of agricultural pesticides*. The Science of the total environment 2011;409(5):920–32

Product categories

- All washing and cleaning agents;
- Certain personal care product types with high release to wastewater: shampoo, body wash, bath additives, conditioner, soap, toothpaste, mouth wash, body lotion, hand cream, hair styling products, hair dye and make-up remover
- Products for the control of pests: plant protection products, disinfectants, wood preservatives, construction material preservatives, rodenticides, insecticides, repellents, embalming fluids, products against fleas and lice

Sampling site



Substances

- Analysis of 16 selected biocidal active substances:

- Benzalkonium chloride
- Benzisothiazolinone (BIT)
- Carbendazim
- Chloromethylisothiazolinone (CMIT)
- Dichlorooctylisothiazolinone (DCOIT)
- N,N-Diethyl-meta-toluamide (DEET)
- Diuron
- Icaridine
- Methylisothiazolinone (MIT)
- Octylisothiazolinone (OIT)
- Piperonyl butoxide
- Salicylic acid
- Tebuconazole
- Terbutryn
- Tetramethrin
- Triclosan