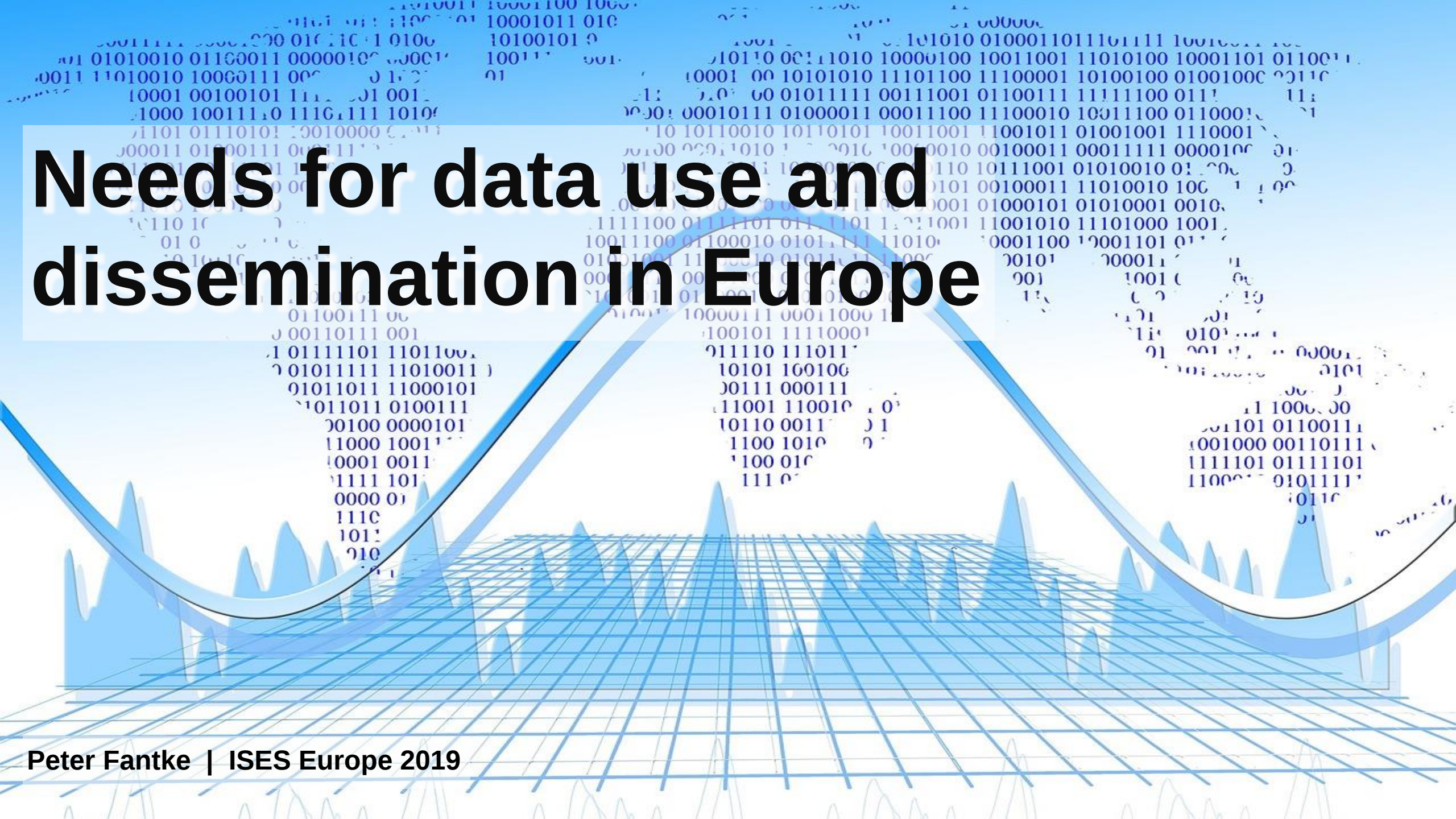


Needs for data use and dissemination in Europe

The background of the slide is a light blue gradient. It features a large, stylized blue curve that starts on the left, rises to a peak in the center, and then descends on the right. Below this curve is a grid of blue lines that recede into the distance, creating a sense of depth. Scattered throughout the background are various strings of binary code (0s and 1s) in a darker blue color.

I am a modeller, but ...



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Hazard/Risk Assessment

EXPLORING REACH AS A POTENTIAL DATA SOURCE FOR CHARACTERIZING ECOTOXICITY IN LIFE CYCLE ASSESSMENT

NIENKE MÜLLER,[†] DICK DE ZWART,[‡] MICHAEL HAUSCHILD,[†] GAËL KUJO,[§] and PETER FANTKE^{*†}



Journal of Environmental Management 181 (2016) 374–384

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Journal of Environmental Management

journal homepage: www.elsevier.com/locate/jenvman



Review

Improving plant bioaccumulation science through consistent reporting of experimental data

Peter Fantke^{a,*}, Jon A. Arnot^{b,c}, William J. Doucette^d



Indoor Air 2016; 26: 836–856
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INDOOR AIR
doi:10.1111/ina.12268

Review

Indoor inhalation intake fractions of fine particulate matter: review of influencing factors

N. Hodas^{1,2}, M. Loh³, H.-M. Shin⁴,
D. Li⁵, D. Bennett⁴, T. E. McKone^{6,7},
O. Jolliet⁵, C. J. Weschler^{8,9},
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P. Fantke¹¹

Critical Review

pubs.acs.org/est

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A Review of Measured Bioaccumulation Data on Terrestrial Plants for Organic Chemicals: Metrics, Variability, and the Need for Standardized Measurement Protocols

William J. Doucette,^{a,*} Chubashini Shunthirasingham,^b Erik M. Dettenmaier,^c Rosemary T. Zaleski,^d Peter Fantke,^e and Jon A. Arnot^{f,g,h}



ACS AuthorChoice

Article

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Characterizing Aggregated Exposure to Primary Particulate Matter: Recommended Intake Fractions for Indoor and Outdoor Sources

Peter Fantke,^{*,†} Olivier Jolliet,[‡] Joshua S. Apte,[§] Natasha Hodas,^{||} John Evans,^{⊥,#} Charles J. Weschler,^{▽,○} Katerina S. Stylianou,[‡] Matti Jantunen,[◆] and Thomas E. McKone^{¶,∞}



Variability of Pesticide Dissipation Half-Lives in Plants

Peter Fantke^{*}

Department of Management

Ronnie Juraske

Institute of Environmental E



ACS AuthorChoice

Article

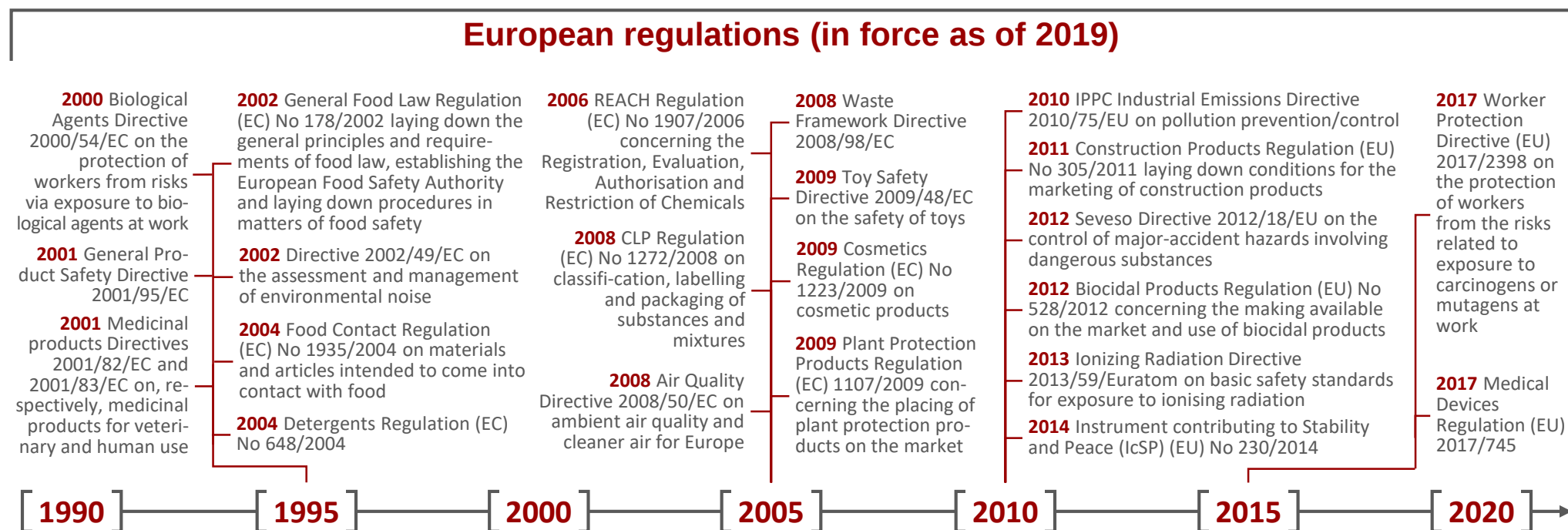
pubs.acs.org/est

[Terms of Use](#)

Estimating Half-Lives for Pesticide Dissipation from Plants

Peter Fantke,^{*,†} Brenda W. Gillespie,[‡] Ronnie Juraske,^{§,#} and Olivier Jolliet^{||,⊥}

Why do we have data problems?



Challenge 1: different **regulations** come with different data requirements

Fantke et al., JESEE, *submitted*

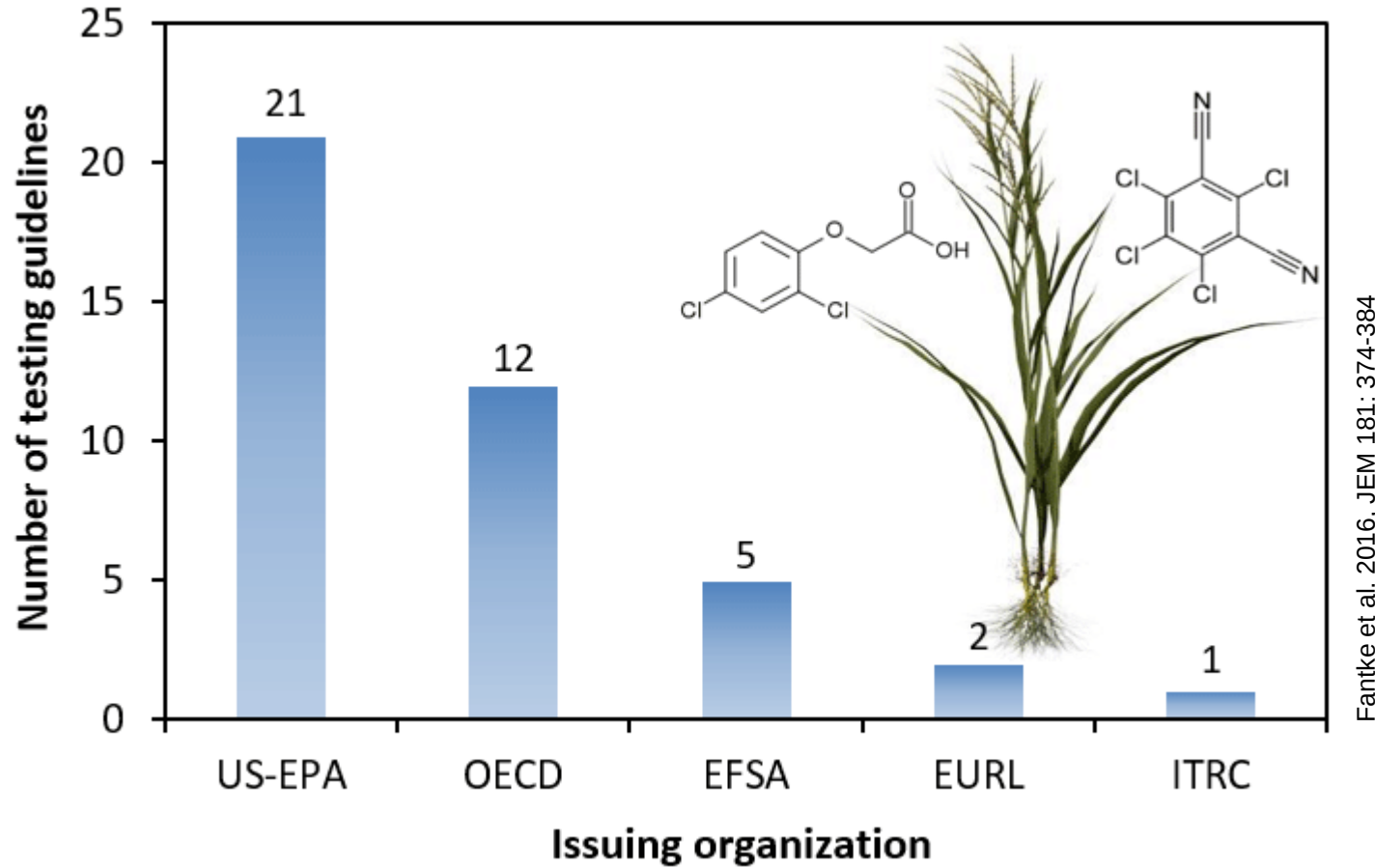
Why do we have data problems?

Parameter	Reported in experimental testing study					
	a	b	c	d	e	f
Study location(s)	✓ ¹	✓ ¹	✓ ¹	✓ ¹	✓ ¹	✓ ¹
Study year(s)		✓		✓		
Study characteristics	✓		✓	✓		
Application rate	✓	✓	✓	✓	✓	✓
Application date (or days after planting)		✓				
Application duration					✓	
Application type	✓ ²	✓ ²	✓ ²	✓ ²		✓ ²
Treated component			✓			
Formulation	✓	✓	✓	✓		✓
Substance purity	✓		✓			✓
Relative air humidity	✓	✓				
Rain rate	✓ ³	✓				
Wind speed		✓				
Air temperature	✓	✓				
Binomial plant name (including variety)	✓	✓	✓	✓	✓ ⁴	✓
Plant growth period		✓		✓		
Plant stage	✓			✓		✓
Planting density	✓	✓				
Sampled component	✓	✓	✓	✓	✓	✓
Sampled mass	✓	✓	✓	✓	✓	✓
Sampling date(s)/time(s)	✓	✓	✓	✓	✓	✓
Sampling specifics	✓		✓	✓	✓	✓
Residue analysis setup	✓ ⁵	✓	✓	✓ ⁵	✓	✓ ⁵
Analysis temperature(s)	✓	✓	✓	✓		✓
Solvents used	✓	✓	✓	✓	✓	✓
Fate processes studied			✓	✓	✓	
Kinetic models used	✓					✓

Challenge 2:
different **studies** report different sets of data

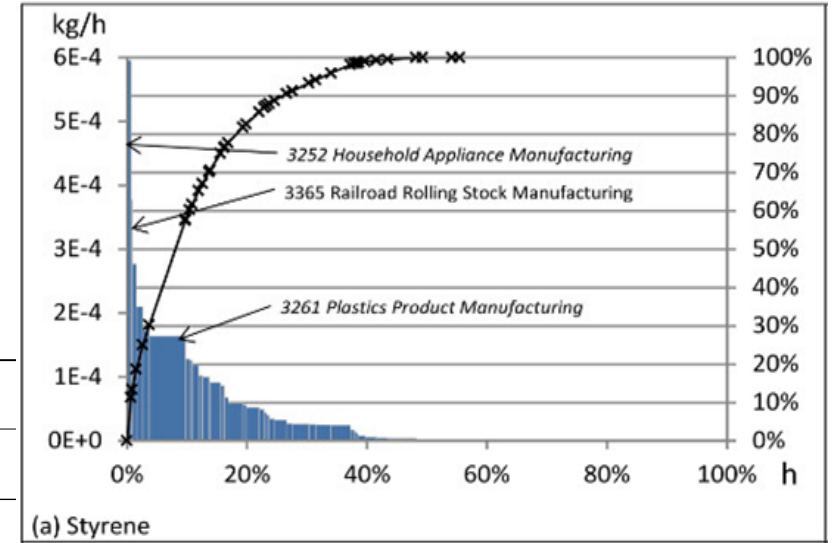
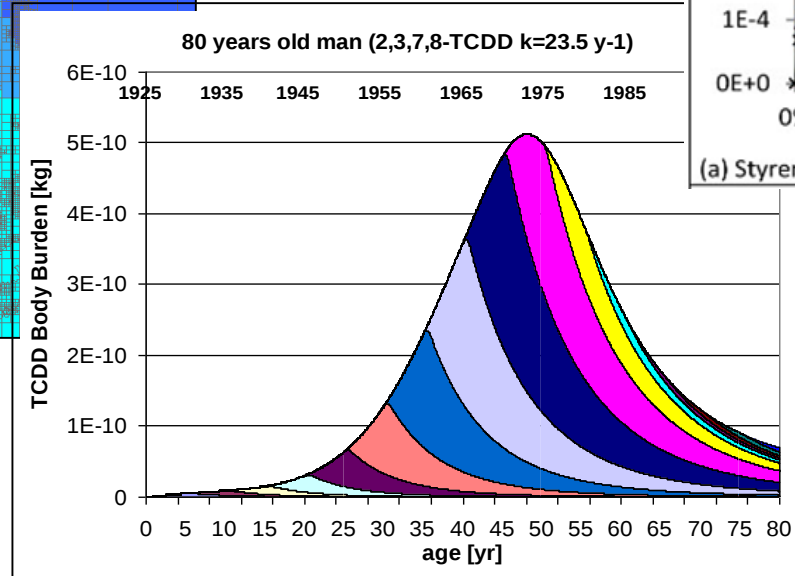
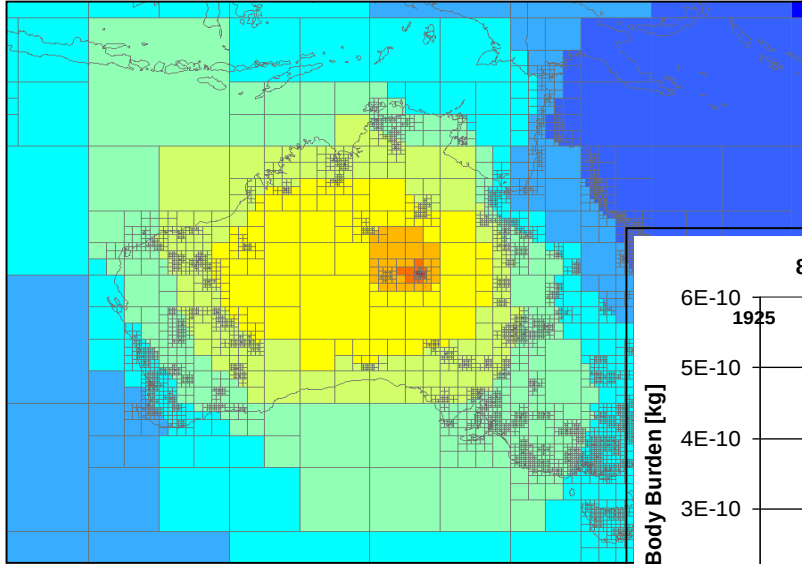
Fantke et al. 2016, JEM 181: 374-384

Why do we have data problems?



Challenge 3: different **testing guidelines** propose different reporting requirements

Why do we have data problems?



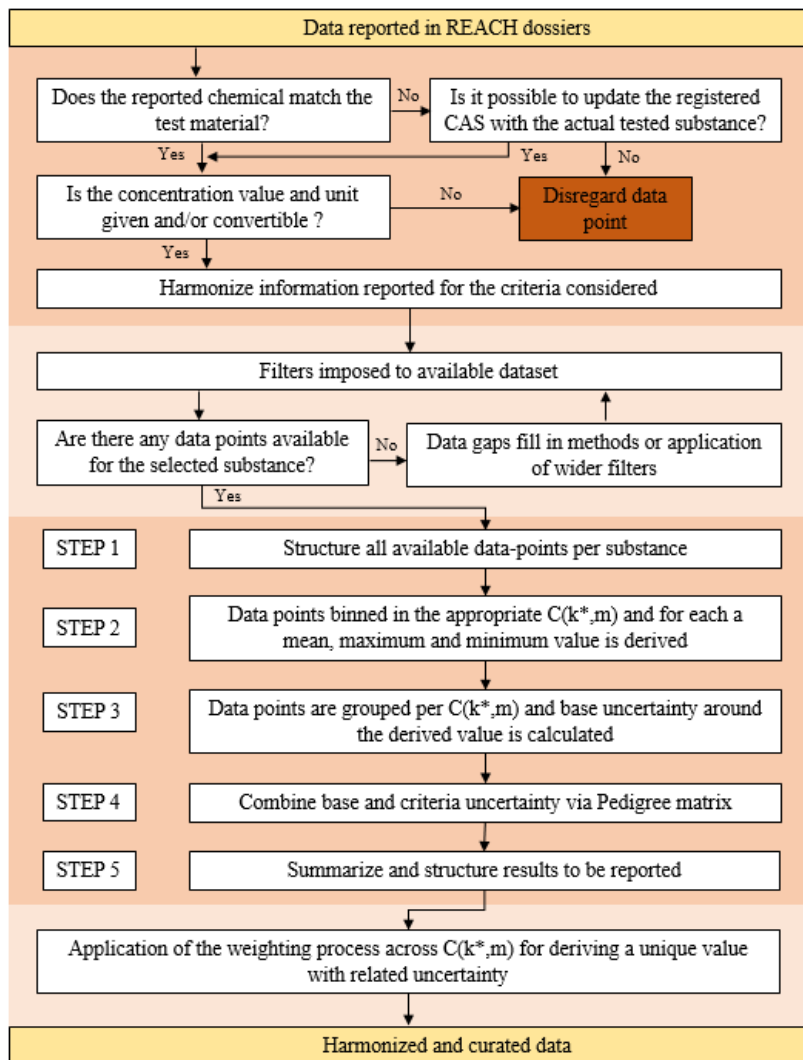
Challenge 4: different **models** use different sets of assumption and come with different level of granularity

Common questions around data use



- If $n > 1$ data point available, **which one to pick?**
- How to **average** (e.g. arithmetic vs. geometric vs. harmonic mean)
- Are the data **representative** and what is a sufficient **data quality** level?
- How to **curate data** for use in different assessments?
- What is the **granularity**, **variability** and **uncertainty** in the data?
- How can data be **accessed** (e.g. batch) and what is the correct **data format**?
- What are the **units** of the data and how are they correctly **interpreted**?
- ...

Understanding & curating of desired data needed



Pre-processing:

- Format issues, software compliance, ...

Filtering:

- Context-specific selection criteria (e.g. quality)

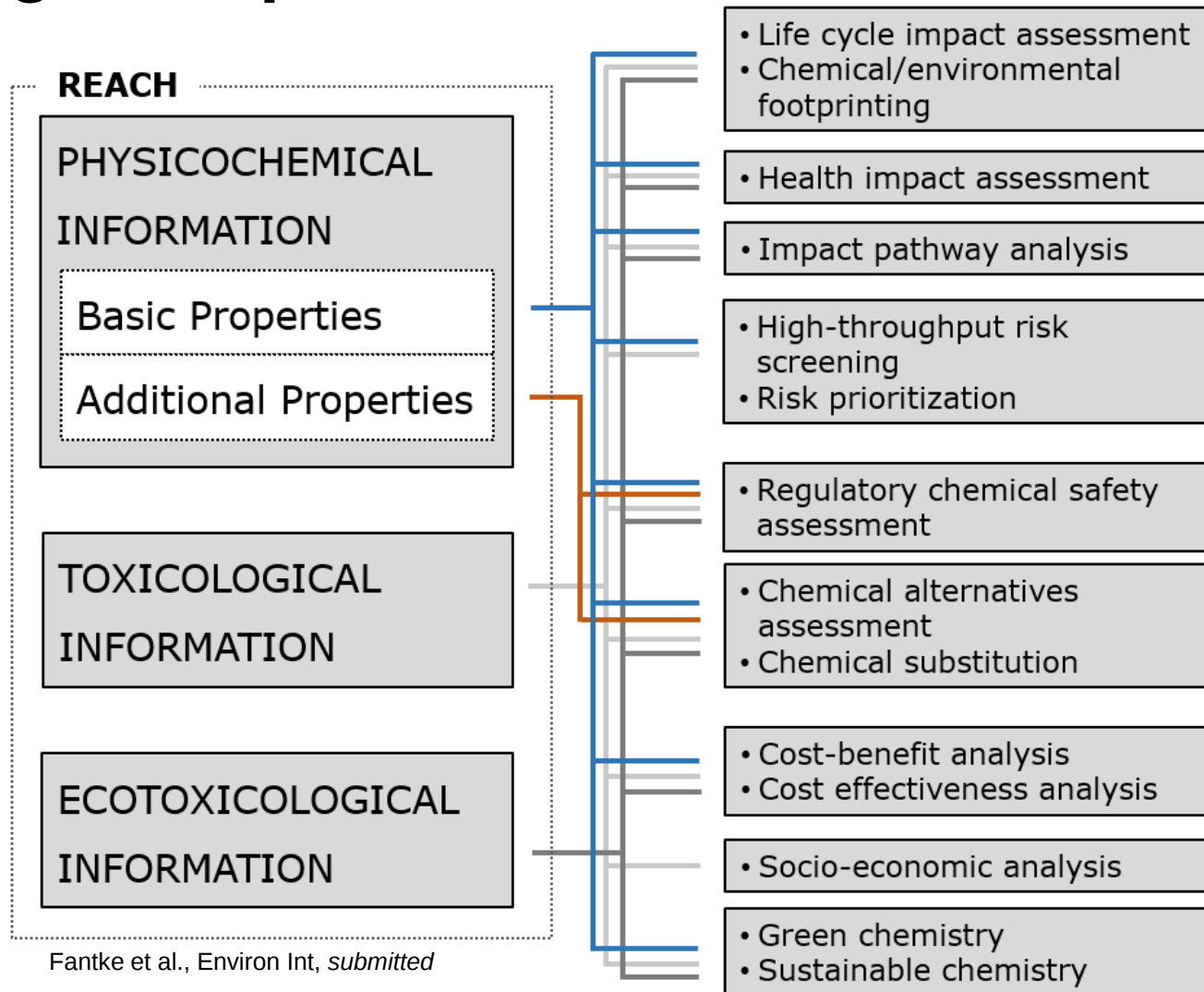
Curation:

- Terminology, units, errors, ...
- Averaging, domain of applicability, ...

Post-processing:

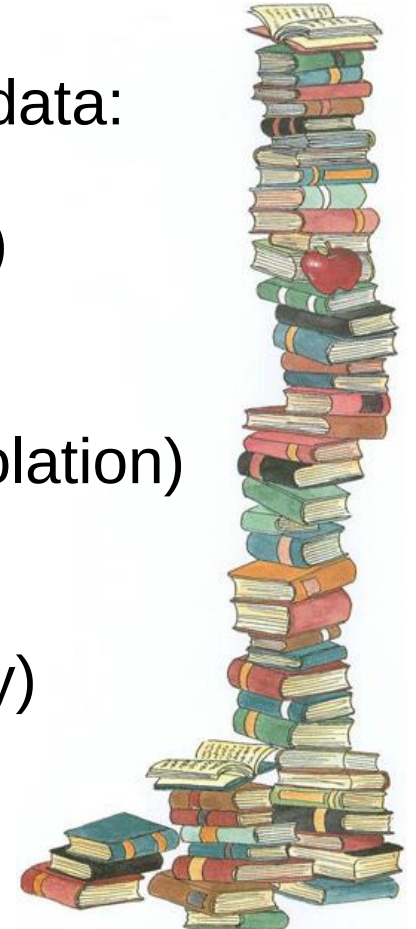
- Context-specific weighting, uncertainty
- Visualization, interpretation, communication

Match data reporting to requirements

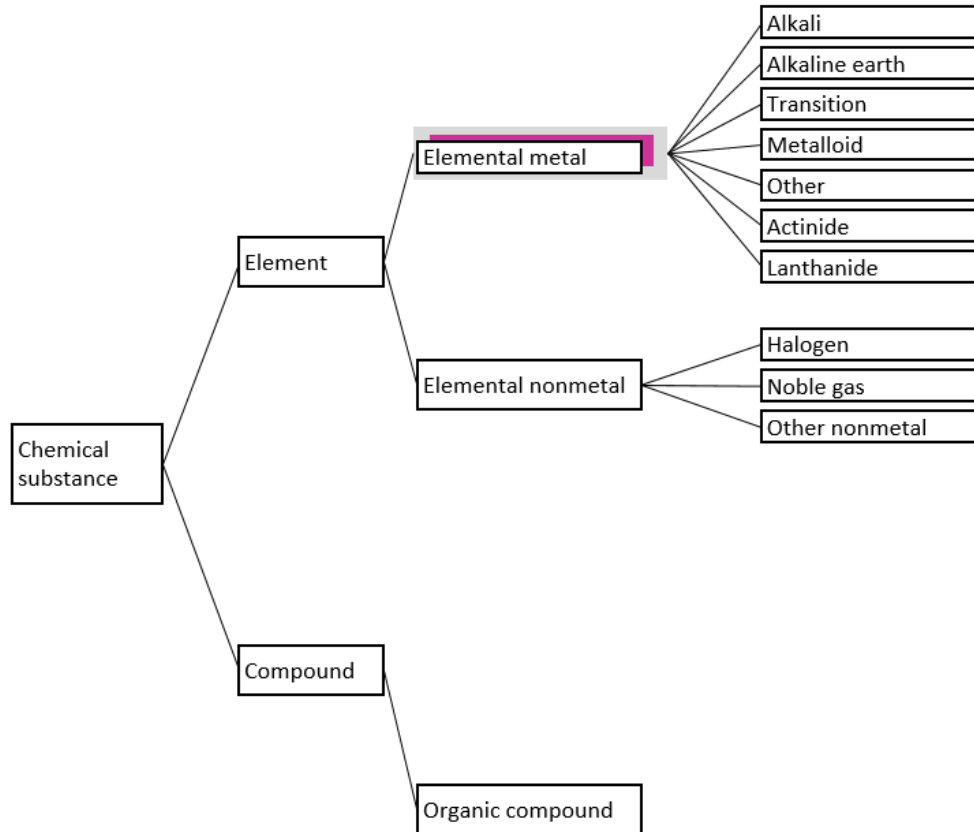


Key messages to increase data use & dissemination

- Exciting times: **plenty of available data** for exposure science, BUT most reported data **NOT readily usable** → Methods needed for data:
 - **Reporting** (harmonization & application of test protocols; evaluation)
 - **Storage** (interoperable, batch processing, meta data templates)
 - **Selection** (text mining; context conditions, e.g. screening vs. extrapolation)
 - **Curation** (automated methods, decision criteria → ‘Aurisano’ talk)
 - **Interpretation** (automated validation checks; variability & uncertainty)
 - **Communication** (visualization, different aggregations, training)
 - **Funding** (data work not sexy and hard to sell as ‘research’)



... and what about missing data?



Dermal exposure – product composition – inorganics – ...

Kirchhübel & Fantke 2019, JCP 227: 554-565