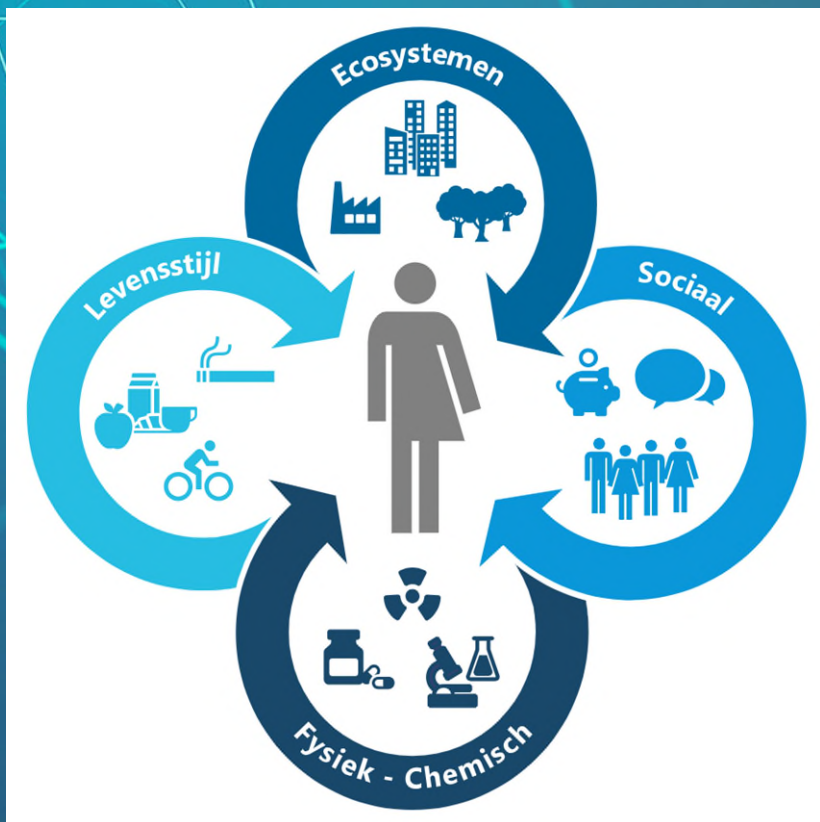


August 14, 2024, Toronto

# Exposome

Milou Dingemans



**KWR**

Bridging Science to Practice



**Utrecht  
University**



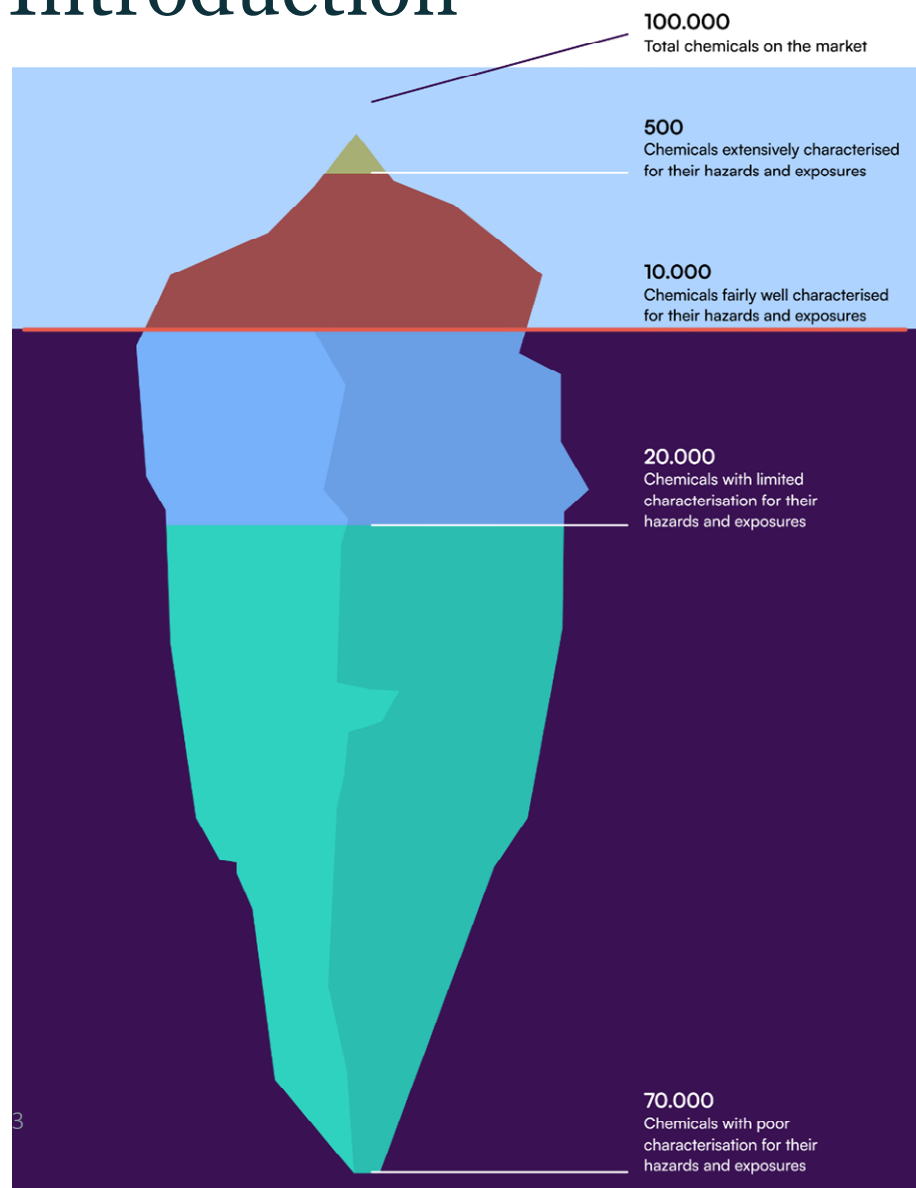
# KWR Water Research institute

- Nieuwegein, The Netherlands
- Shareholders: 10 Dutch and 1 Flemish water utilities
- +/-200 employees: +/- 150 researchers
- Covering the full water cycle

Bridging Science to Practice | KWR  
(kwrwater.nl)



# Introduction



Analogy to human genome project

“ We can’t (easily) change our genes, but if we are serious about the prevention of diseases, we need to know the modifiable part – that is, the environmental factors.”



Roel Vermeulen



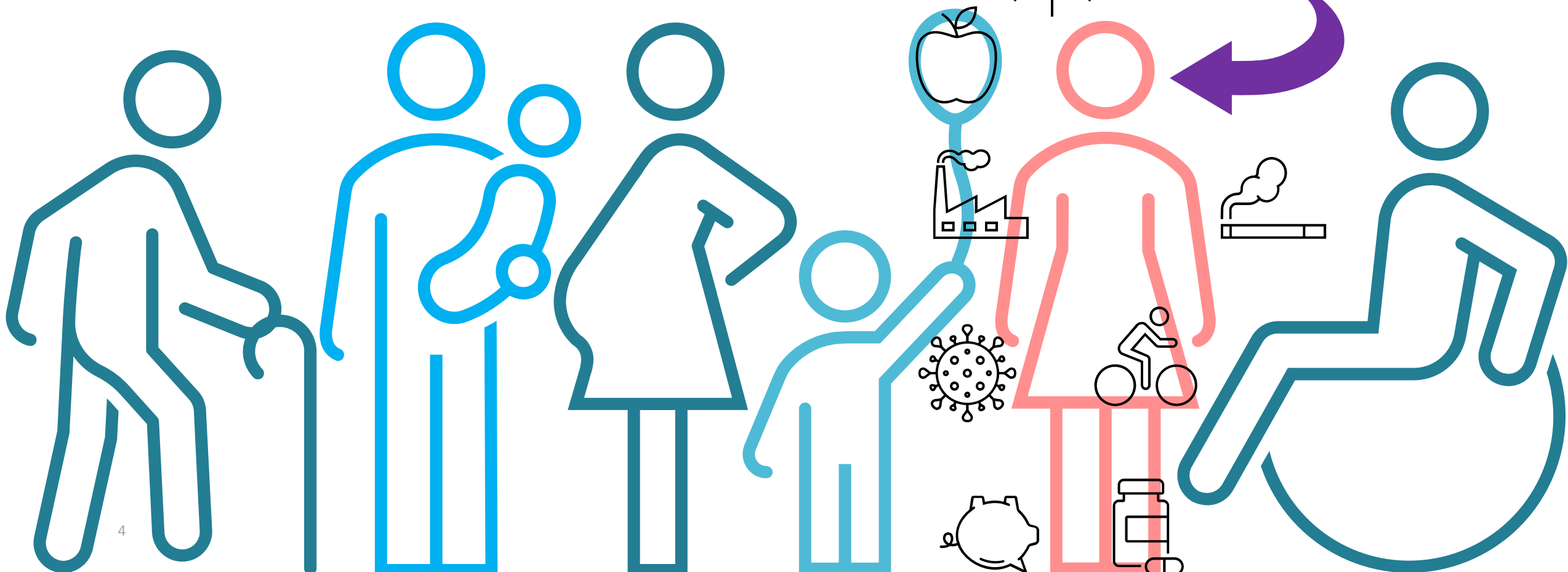
Utrecht University

Exposure Science and the Exposome - Faculty of Veterinary Medicine - Utrecht University (uu.nl)



Risk = hazard x exposure  
Exposome

KWR

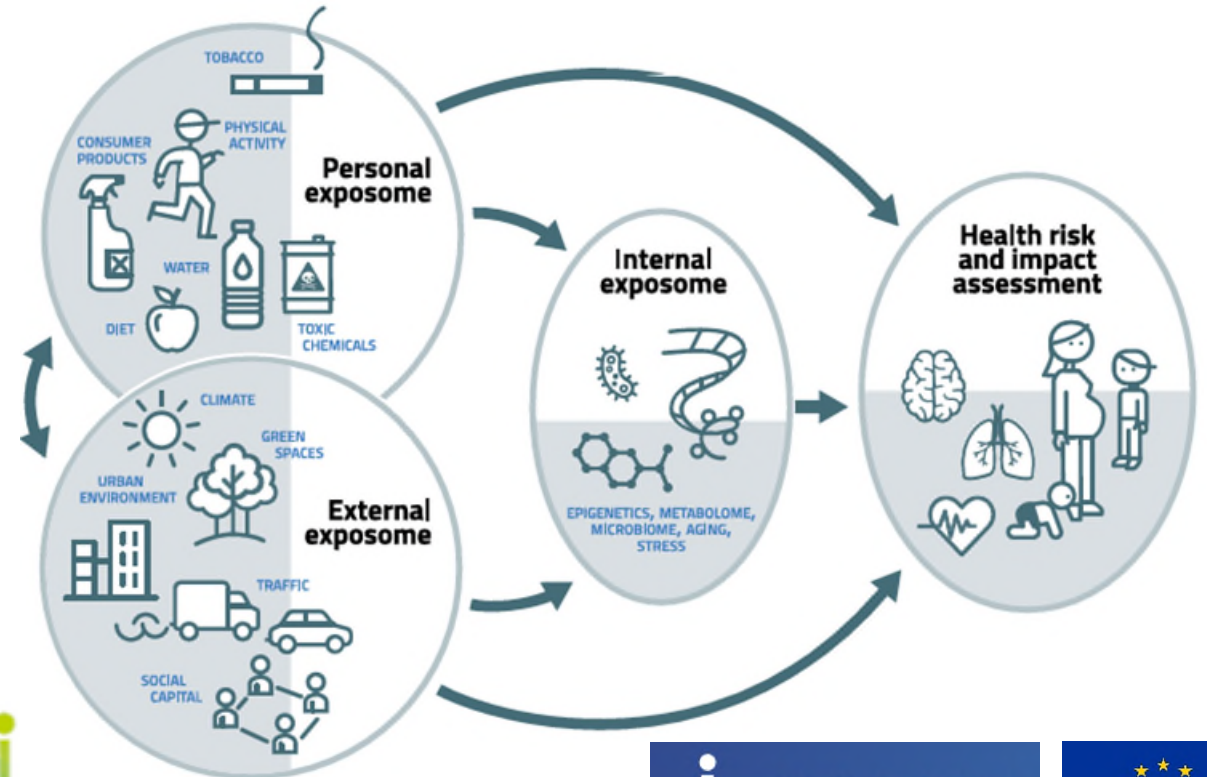


# From 'one exposure, one disease' to holistic approach

Discovering the non-genetic drivers of health and disease / lifetime exposures (environment, lifestyle, physico-chemical, social)

Basis being laid in scientific projects, with researchers organising themselves in networks

Home - The European Human Exposome Network (EHEN)



EHEN



# Exposome research domains

Inter- and transdisciplinary collaborations needed to combine different types of datasets

## *Exposure studies*

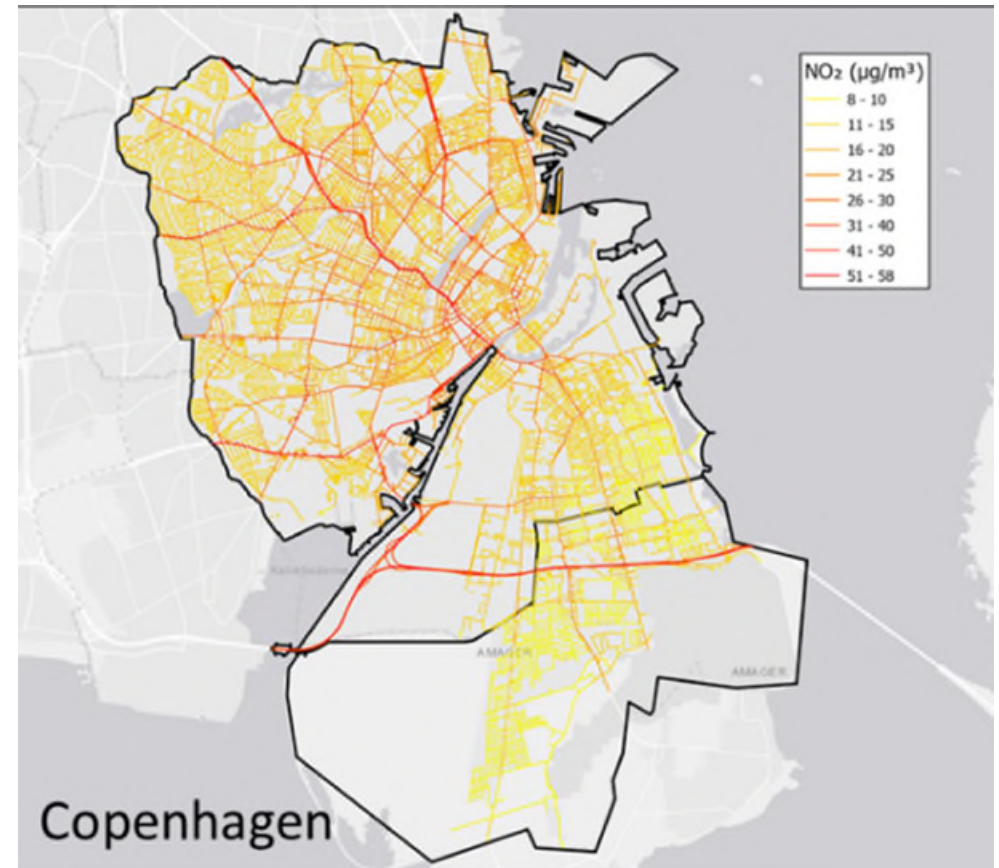
- Environmental/air/water contamination (including NTA and WBE)

## *Cohort studies*

- Biomonitoring (NTA, metabolomics, biomarkers)
- Health outcomes (clinical, epidemiology)

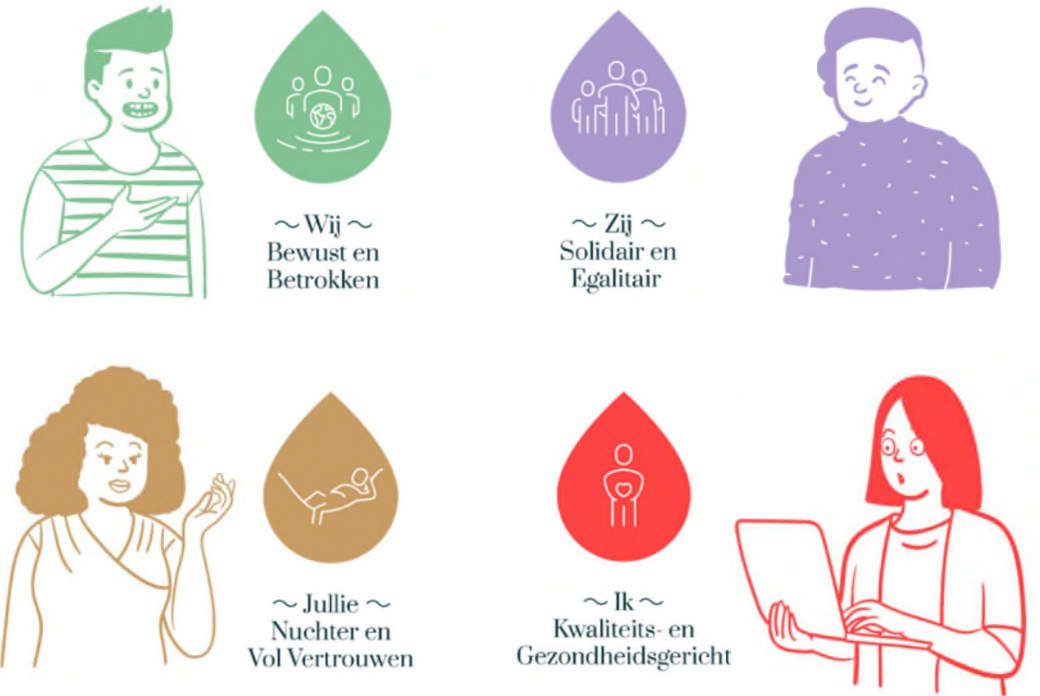
## *Sensing and data science*

- implementing new approaches (sensors, wearables, GIS, metabolomics)
- combining different data types (bioinformatics, AI)



# Exposome and the water sector

- Large BigTech invest in ‘Health’, individuals are increasingly perceiving health (also) an individual responsibility, and municipalities initiate Blue Zones
- Transparency requirement in EU DWD could increase awareness of water as environmental factor
- Opportunity to map relative contribution of drinking water and clarify health benefit of drinking (unchlorinated) tap water



*Different consumer profiles are expected to perceive and implement ‘exposome’ differently*

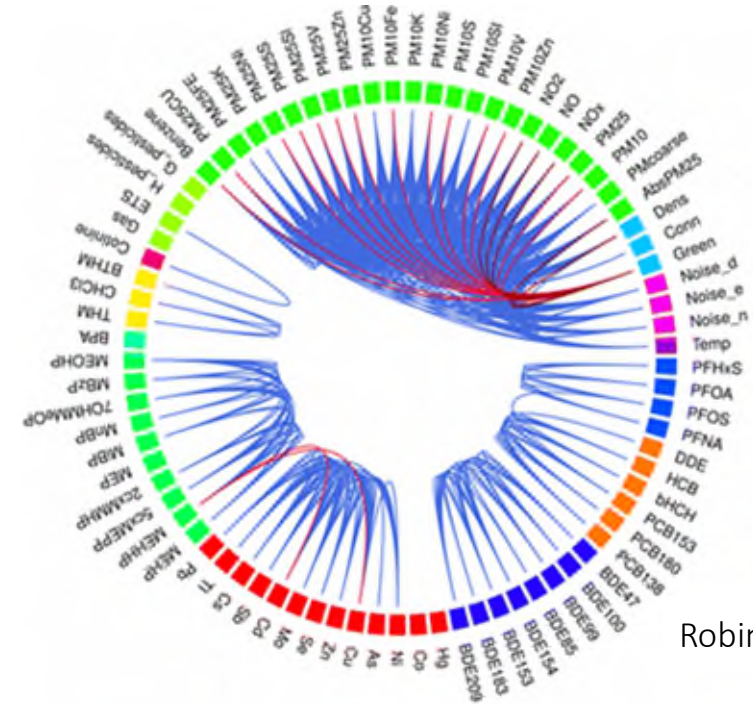
# Conclusions

Applying the exposome concept can help concentrating measures more precisely on the desired effect of reducing exposure and health risks

Individuals are increasingly aware of health and exposure (e.g. wearables) that may spark a societal demand to address the Exposome (also in a drinking water context)

Any environmental/water quality study can be placed in the context of the exposome concept

Exposome science is in a relatively early stage (water is yet underrepresented)



Robinson et al. 2015

1. [Water in the Exposome \(kwrwater.nl\)](http://kwrwater.nl)
2. [Exposome-thinking: risk perception, consumer profiles and relevant developments \(in Dutch\) \(kwrwater.nl\)](#)

[The exposome: a new paradigm for the water sector? | KWR \(kwrwater.nl\)](#)



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## Join us at our 'KWR & Friends' booth

Here, we showcase our collective research, innovative technologies, and solutions for a water-wise world, all centered around and inspired by collaboration.



kwr\_water



KWR Water Research Institute



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## BTO Collective Research Programme



Partnership  
FOR THE  
Assessment  
OF  
Risks  
FROM  
Chemicals



[eu-parc.eu](http://eu-parc.eu)