

## What is ATHLETE about?



"Better understanding and preventing health damage from multiple environmental agents and their mixtures, from the earliest parts of the life course onward"

- ✓ Developing exposome tools, data and a prospective exposome cohort
- ✓ Providing new longitudinal **evidence** linking the exposome to health and biological pathways during the first 2 decades of life
- ✓ Implementing interventions
- ✓ Translating knowledge









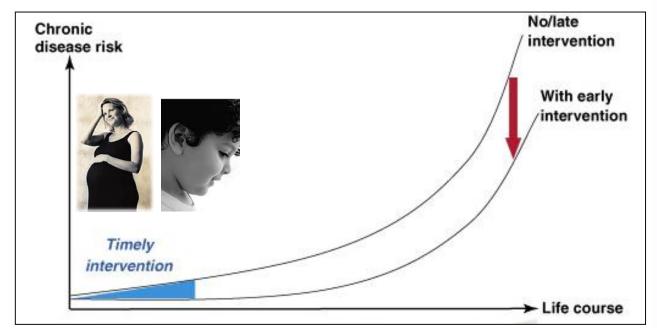




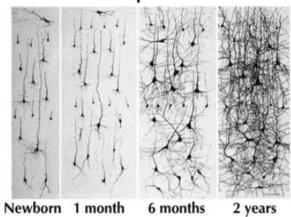
## Why is this important?

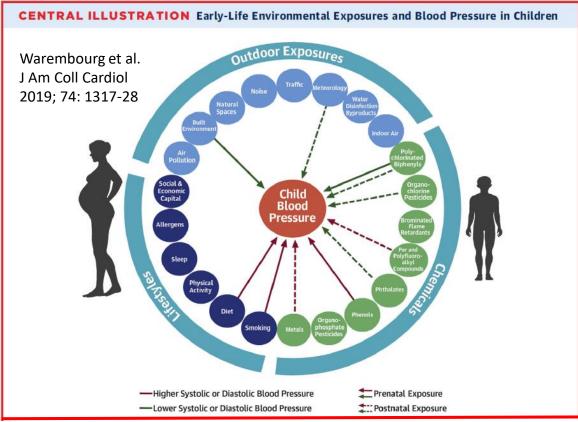
**EARLY LIFE as a key target period** for solid, costeffective preventive actions and policies related to multiple adverse environmental exposures

- ✓ Vulnerable periods of rapid organ development
- Chronic diseases have part of their origin in early life
- ✓ Lifetime influence
- Effective prevention



### **Brain Development Over Time**





## How will ATHLETE reach that goal?

#### **Exposome Data and Analysis Tools**

#### **Data infrastructure**

ATHLETE EXPOSOME COHORT

FAIR

Harmonisation

New cohort follow-up data

#### **Exposure science tools**

High throughput targeted biomonitoring

Untargeted HR-MS screening

App and wearables

GIS, remote sensing

Source-exposure tools

#### Exposome data analysis toolbox

Agnostic data mining, longitudinal effects Combined exposure effects

Causal structures

Cross-omics

Software, tutorials, courses, E-learning

#### **Longitudinal Exposome Evidence**

#### **External Exposome**



DRIVERS AND SOURCES

Urban, built, traffic Natural spaces

Food, consumer products

Social deprivation

Climate

**Personal Exposome** 

Chemical

**Physical** 

Behavioural / lifestyle

Social / psychosocial





**Biological** pathways



Metabolomics Metagenomics

**Epigenetics** 

Ageing / stress

Adverse outcome pathways

#### (Pre) Clinical end-points

0-18 YEARS

Brain

Cardiometabolic Respiratory







#### **Exposome Knowledge Translation Tools**

#### Interventions

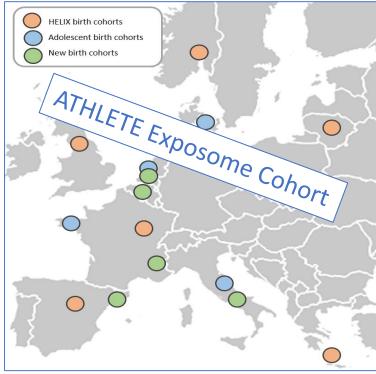
Urban exposome Chemical exposome Intervention priorities Guide for decision makers

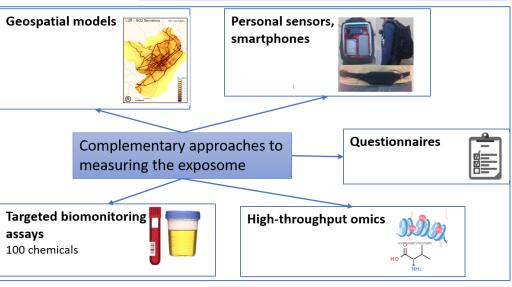
#### Impact assessment

Health impact Economic cost Cost-benefit of interventions Uncertainty analysis Toolkit

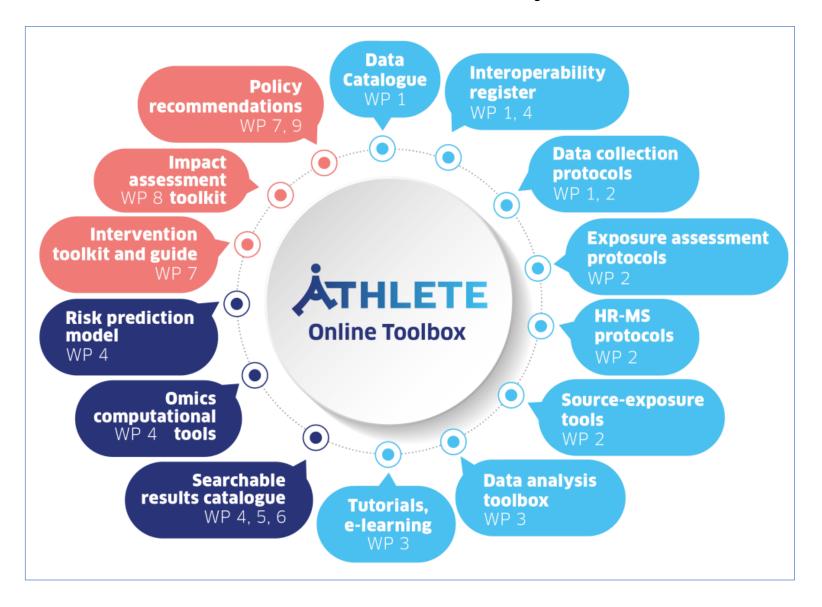
#### Dissemination, Exploitation, Visibility

Mapping policy framework Engagement of stakeholders Communication materials Policy recommendations ATHLETE online toolbox





# What will ATHLETE deliver in 5 years?

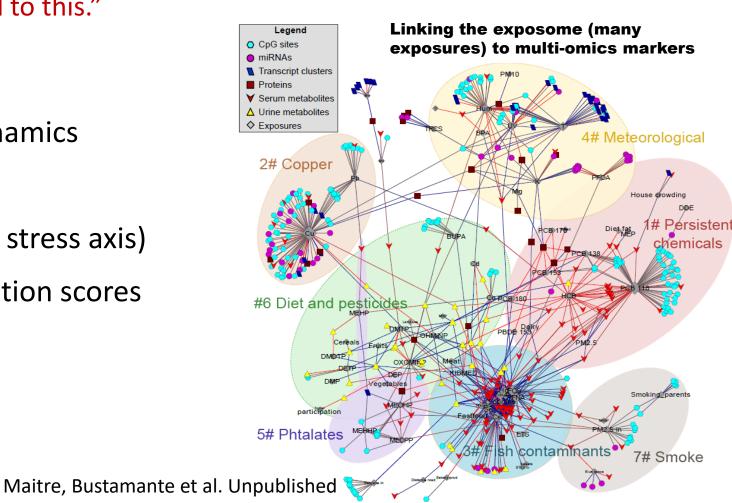


# How will ATHLETE elucidate the biological effects of the exposome?

"Integrating knowledge on biological responses and pathways related to the exposome will help to better understand the **early molecular events leading to later adverse health**, and the early part of the life course is crucial to this."

## Building on first results:

- ✓ Replication, tissue specificity, dynamics
- ✓ Microbiome-metabolome
- ✓ Composite scores/pathways (e.g. stress axis)
- ✓ Poly-environmental/omics prediction scores
- ✓ Adverse outcome pathways



## What are the critical needs for success?

> What interaction with stakeholders do you need to make your project a success?

Who?	Example
Study participants and communities/citizens	Co-production of interventions Engaging cohort participants (adolescents)
Local policy and decision makers	<ul> <li>→ practical guides to modifying personal exposomes</li> </ul>
European policy and decision- makers, international forums	Targeted events
Industry	Metabolomic profiling and smartphone APP development
Wider society	Engagement activities, social media, etc

## What interaction with other projects is needed to make the network a succes?

- **Share expertise**  $\rightarrow$  working groups
- Make tools easily accessible  $\rightarrow$  one common toolbox
- Common strategy for dissemination & stakeholder engagement





#### **Early-life Environmental Exposures** and Child Respiratory Health: The Exposome Reveals Its First Results





**Environmental Working Group** Yesterday at 9:10 PM · 6

According to a new European study, children exposed to chemicals commonly found in personal care products may be at a higher risk of suffering from lung damage later in life. Read more here:



EWG.ORG

Study: Chemicals in Cosmetics Linked to Lung Damage in Children



4 Comments 49 Shares











# 22 partners from 11 countries



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