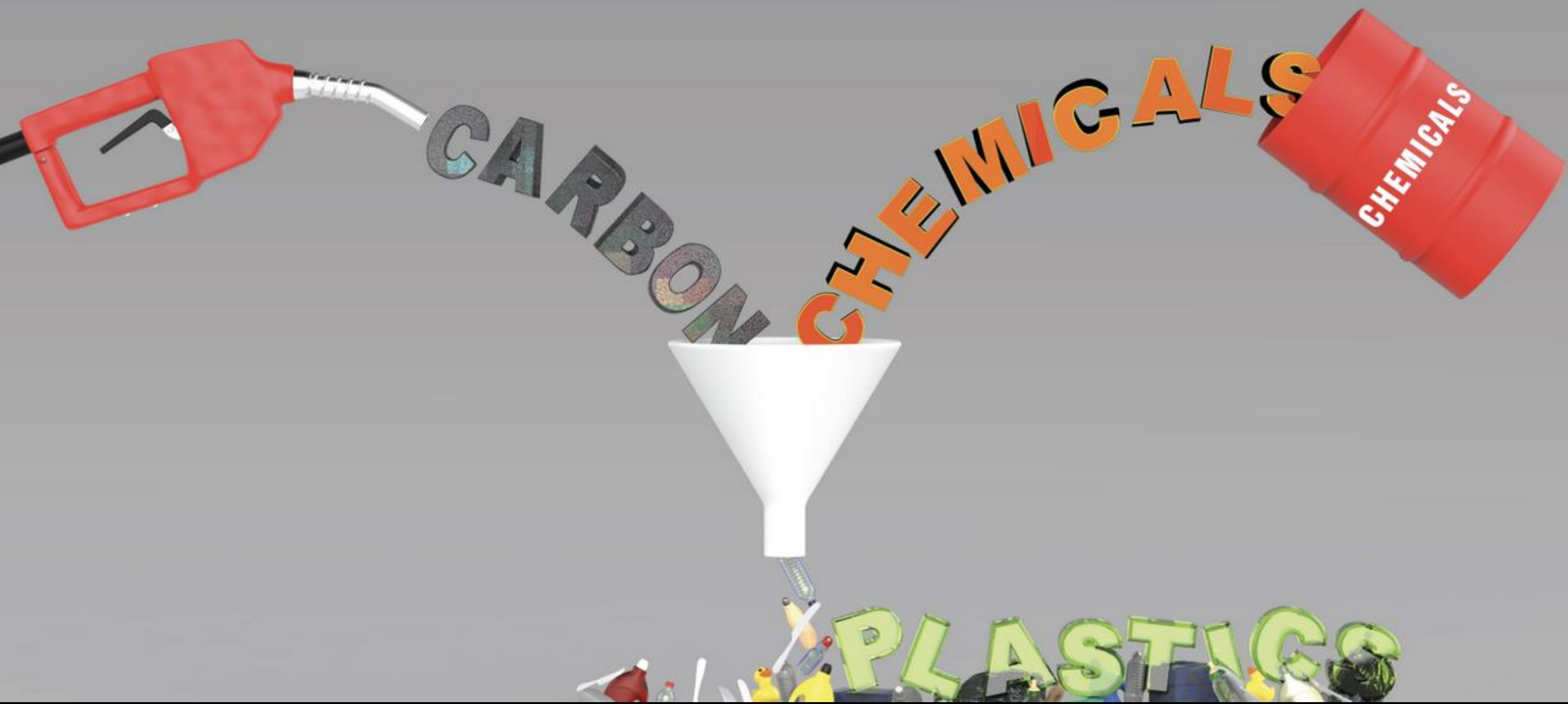




# Plastics

Therese Karlsson  
Science and Technical advisor IPEN



How are chemicals in plastics classified?

Monomers



(Ex ethylene, styrene, vinyl chloride)

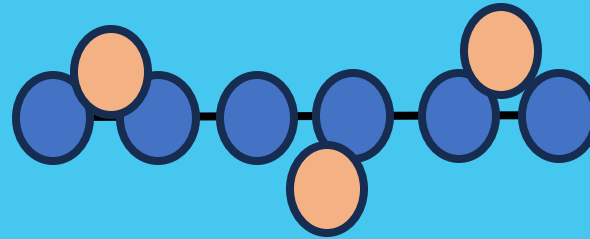
Polymers



(Ex polyethylene, polystyrene, polyvinylchloride)

How are  
chemicals in  
plastics  
classified?

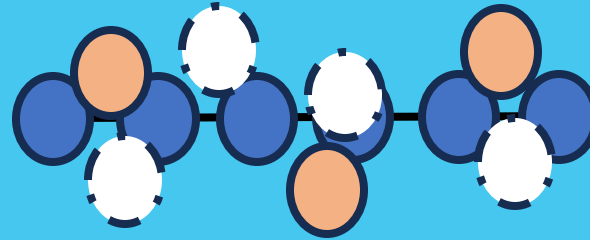
# Additives



(Ex flame retardants,  
colourants,  
UV stabilizers)

How are  
chemicals in  
plastics  
classified?

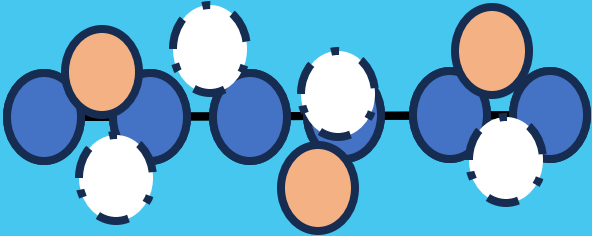
# Non- Intentionally Added Substances



(Ex degradation  
products, chemicals  
from recycled plastics)

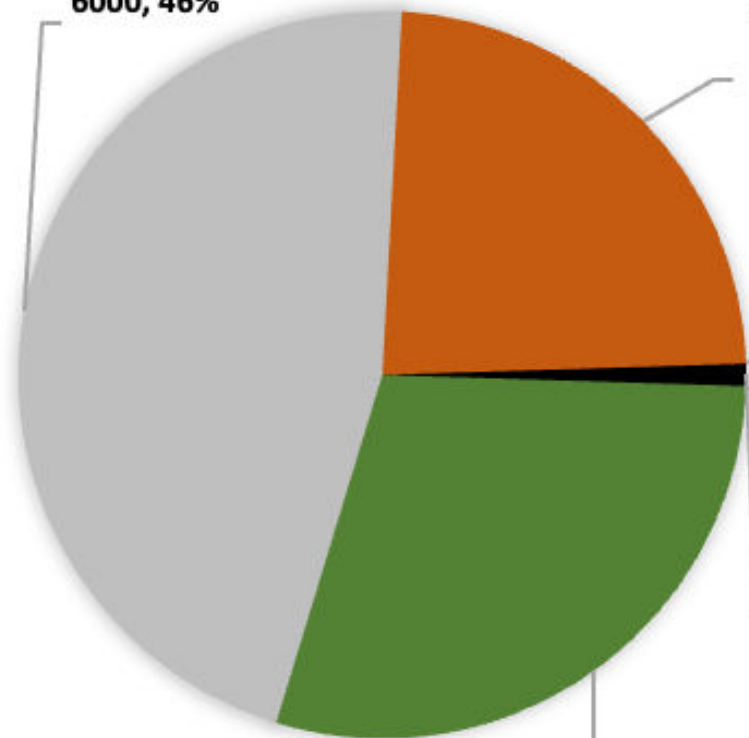
How are chemicals in plastics classified?

- Monomers
- Polymers
- Additives
- Non-Intentionally Added Substances



Plastics

**Chemicals used in plastics without hazard data found in regulatory databases analysed**  
6000, 46%



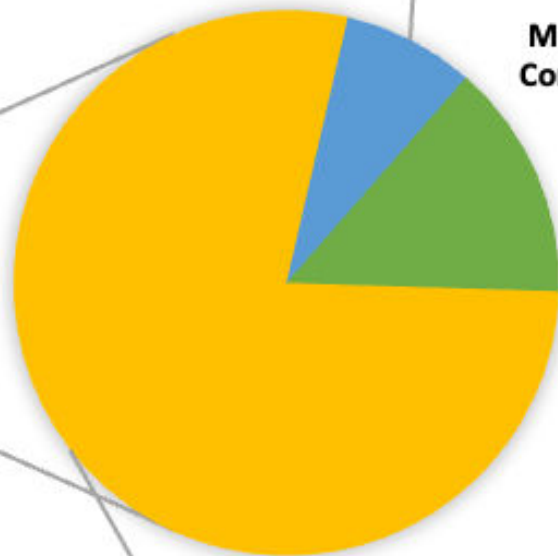
**Chemicals of potential concern used in plastics unregulated globally**  
3076, 24%

**Chemicals used in plastics regulated globally**  
128, 1%

**Chemicals of low concern used in plastics based on available hazard data**  
3800, 29%

**Montreal Protocol**  
10

**Minamata Convention**  
18



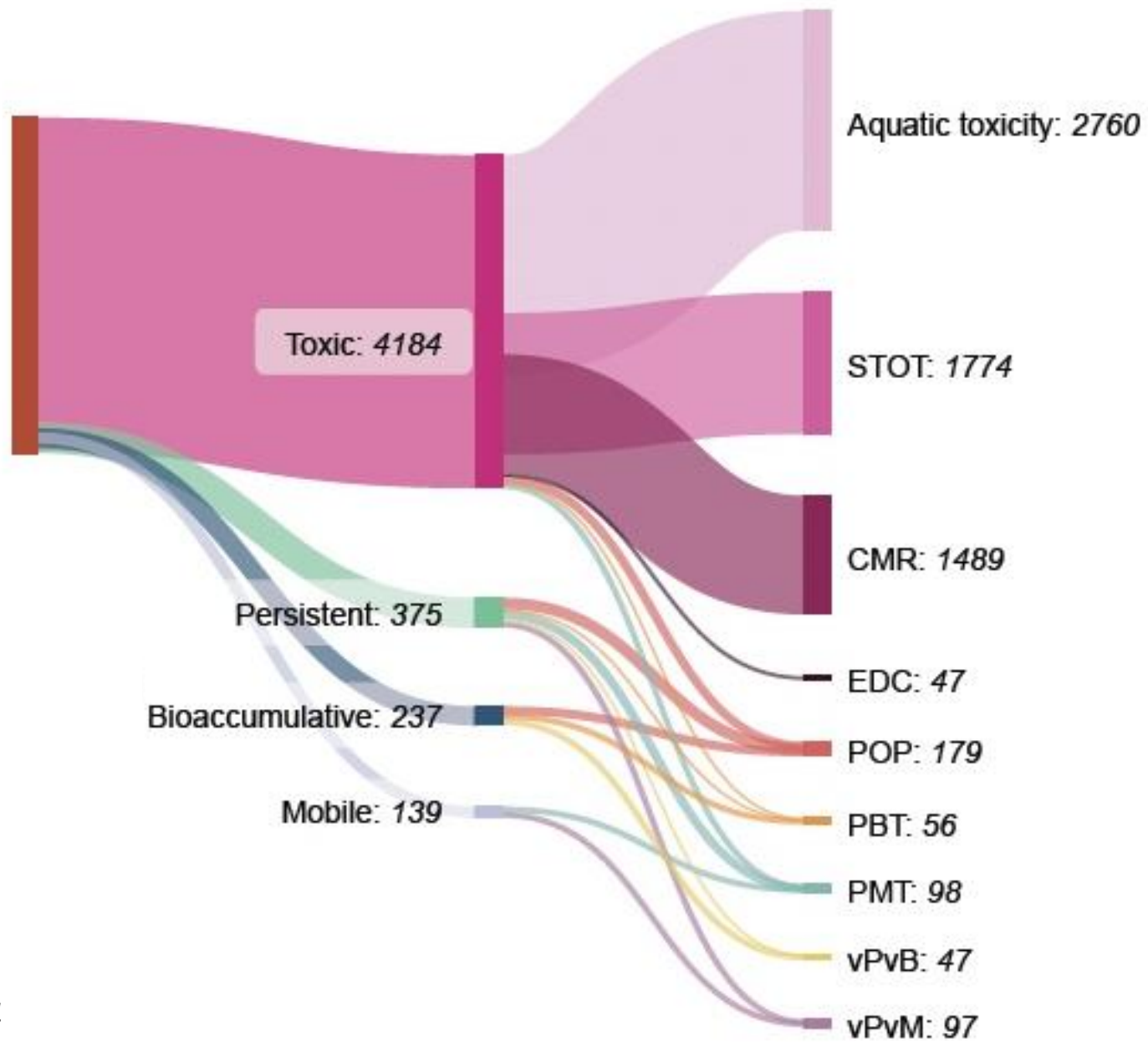
**Stockholm Convention**  
100

**GLOBAL GOVERNANCE OF PLASTICS AND ASSOCIATED CHEMICALS**

2023

SECRETARIAT OF THE BASEL, ROTTERDAM AND STOCKHOLM CONVENTIONS






Source: Wagner et al 2024


<http://dx.doi.org/10.5281/zenodo.10701706>.

# Human health impacts of exposure to plastic-associated chemicals



## Health conditions linked to chemicals associated with plastics

 Plasticizers (phthalates) and bisphenol (monomer)

 Flame retardants

### Reproductive health - adults

Polycystic ovarian syndrome  
Endometriosis  
Male sub-fertility  
Reduced sperm quality  
Delayed time to pregnancy  
Abnormal PAP smears  
Pregnancy-induced hypertension and/or pre-eclampsia

### Pregnancy outcomes - offspring

Gestational length  
Birth weight  
Delayed pubertal timing  
Genital structure (ano-genital distance)  
Pubertal onset

### Neurodevelopmental disorders

Attention deficit hyperactivity disorder (ADHD)  
Autism  
Neurobehavioural IQ  
Cognition

### Hormonal

Thyroid disease  
Thyroid cancer

### Respiratory disease

Asthma

### Cardiovascular disease

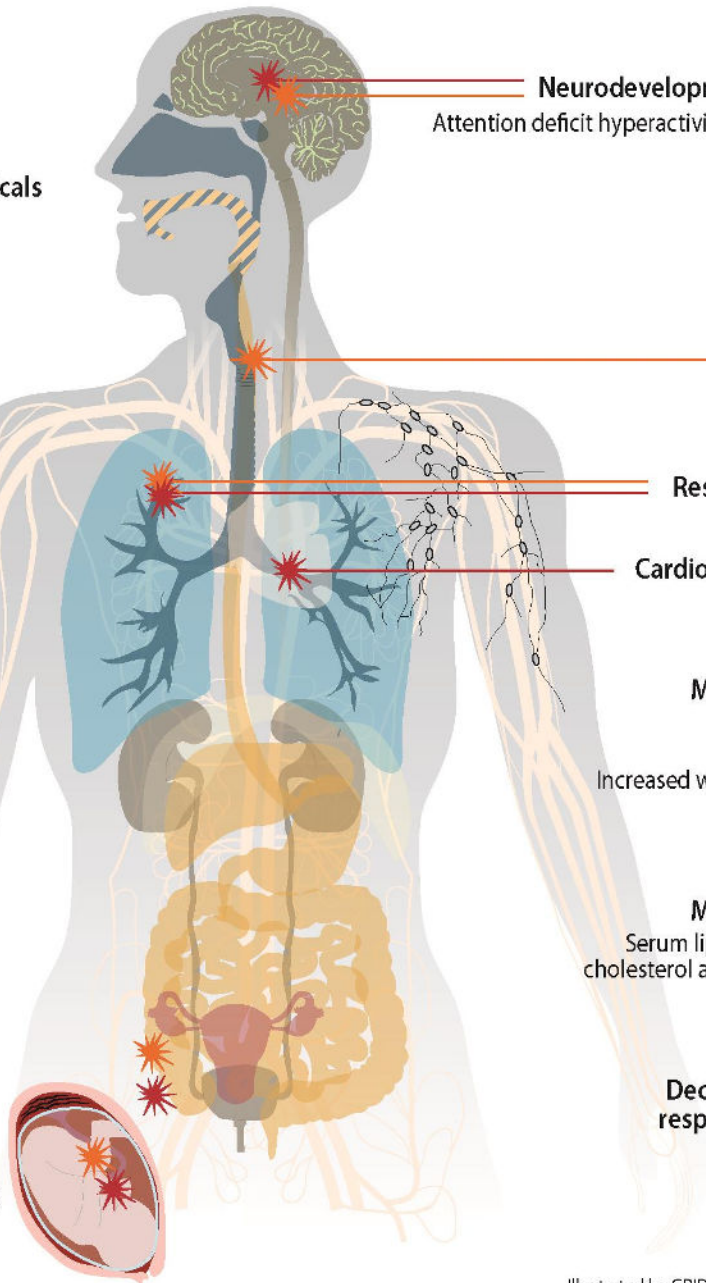
### Metabolic disease

Type 2 diabetes  
Childhood obesity  
Increased waist circumference

### Metabolic disease

Serum lipid levels, e.g. total cholesterol and LDL cholesterol

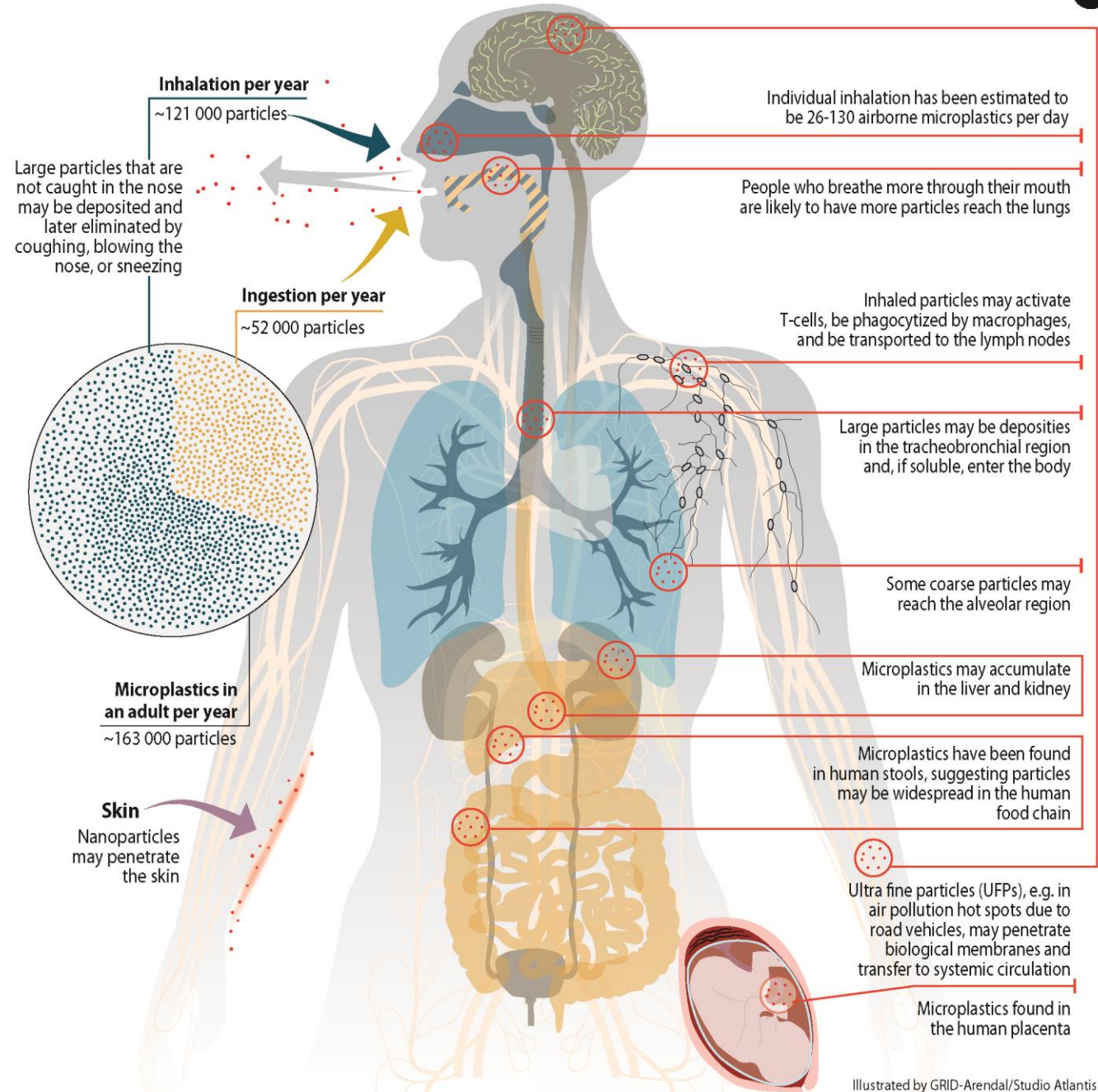
### Decreased antibody response to vaccines



Illustrated by GRID-Arendal/Studio Atlantis

# Human exposure to microplastic and nanoplastic particles

A



Plastics are transporting toxic chemicals in globally – even before the plastic materials becomes plastic products.

Plastics are transporting toxic chemicals into our homes with very limited controls and no transparency

The lack of transparency and traceability poisons the circular economy and exposes people to toxic chemicals throughout the full lifecycle of plastics.



## PLASTIC PELLETS FOUND ON BEACHES ALL OVER THE WORLD CONTAIN TOXIC CHEMICALS

December 2021

Lead authors:

Therese Karlsson, Ph.D.  
Sara Brosché, Ph.D.

Mona Alidoust, MSc.  
Prof. Hideshige Takada, Ph.D.



International Pellet Watch



## ARE YOUR CHILDREN'S TOYS HAZARDOUS WASTE?

HIGH LEVELS OF CHLORINATED PARAFFINS IN PLASTIC TOYS FROM TEN COUNTRIES



## A CALL TO ACTION: FREE CHILDREN FROM BPA'S TOXIC LEGACY

BPA IN PLASTIC PRODUCTS FROM BANGLADESH, BHUTAN, CHINA, INDONESIA, MALAYSIA, RUSSIA, SRI LANKA & TANZANIA THAT ARE IN CONTACT WITH FOOD OR WITH CHILDREN'S MOUTHS

February 2022



## WIDESPREAD CHEMICAL CONTAMINATION OF RECYCLED PLASTIC PELLETS GLOBALLY

December 2021

Lead authors:

Sara Brosché, Ph.D.  
Jitka Strakova, MSc.

Lee Bell, MSc,  
Therese Karlsson, Ph.D.





Plastics transport toxic chemicals into the environment, into our homes and into our bodies with limited controls and no transparency



# Ongoing negotiations for a global Plastics Treaty

In March 2022, the United Nations Environment Assembly (UNEA) approved a broad mandate to start talks on an international treaty to address the growing threats from plastic pollution.

The Plastics Treaty will be a key legally binding agreement moving the world toward a toxics-free future.

INC-4 just finished in Ottawa, INC-5 is scheduled for November in Busan



@ToxicsFree

*stoppoisonplastic.org*



for a toxics-free future