



Hazardous chemicals in products: bad for our health, bad for environment, and bad for circular economy

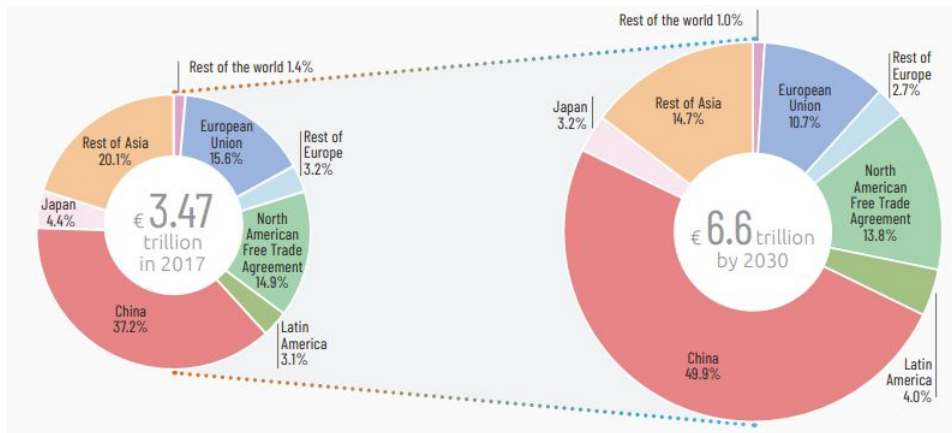
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A big picture: chemical pollution as a world-wide crisis

- UN announcement: The triple planetary crisis – climate, nature, and **pollution**
- The planetary boundary of chemicals and plastics has been crossed



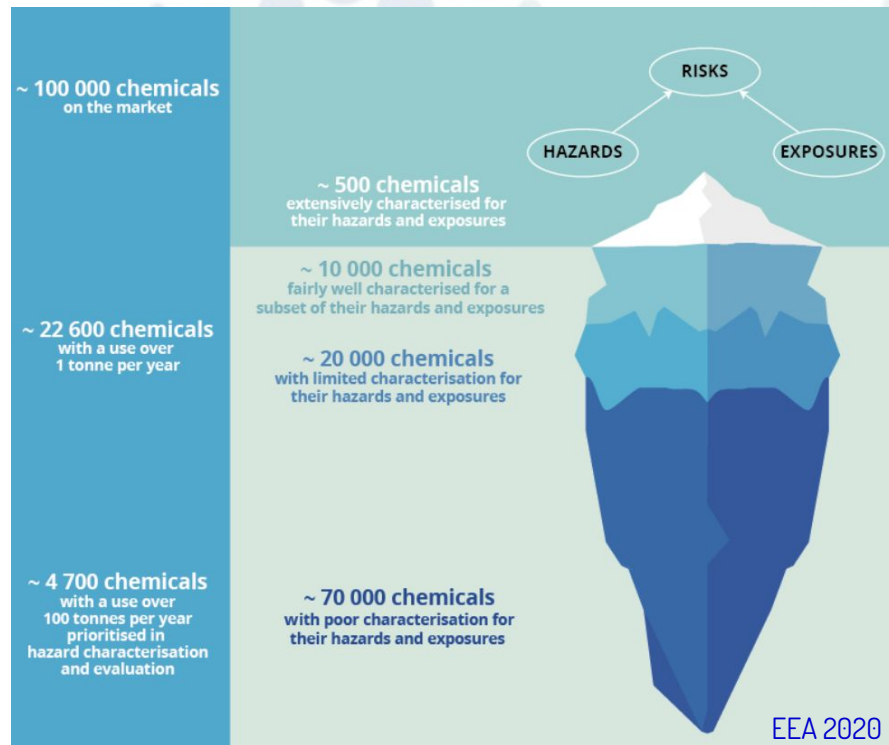
[Chemical pollution: A growing peril and potential catastrophic risk to humanity](#)

Hazardous chemicals in Europe

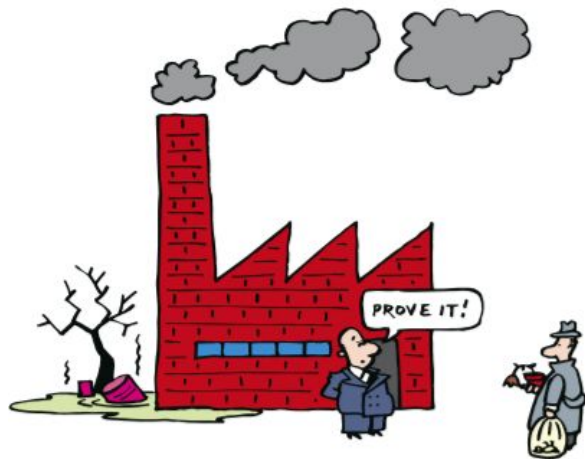
Of the **314 million tonnes of chemicals** consumed in the EU in 2018,

71 % were classified as hazardous to health

([Eurostat](#), 2020).



REGULATION OF CHEMICALS



...too little, too late

The EU in action

- 2020: The Chemicals Strategy for Sustainability to ensure protection of human health and the environment, and encourage safe & sustainable chemicals

- Consumer products in the spotlight: to **avoid the most harmful chemicals in consumer, esp. for vulnerable groups, based on their hazardous**

- Food contact materials (FCM)

- Toys and childcare articles

- Cosmetics

- Detergents



Hazardous chemicals in products



Substances of Very High Concern (SVHC)

- Carcinogenic, mutagenic, toxic for reproduction
- Persistent, bioaccumulative and toxic substances
- Very persistent and very bioaccumulative substances
- EDCs (endocrine disrupting chemicals)

Many consumer products on the market contain hazardous chemicals

(plenty of which are released to environment)

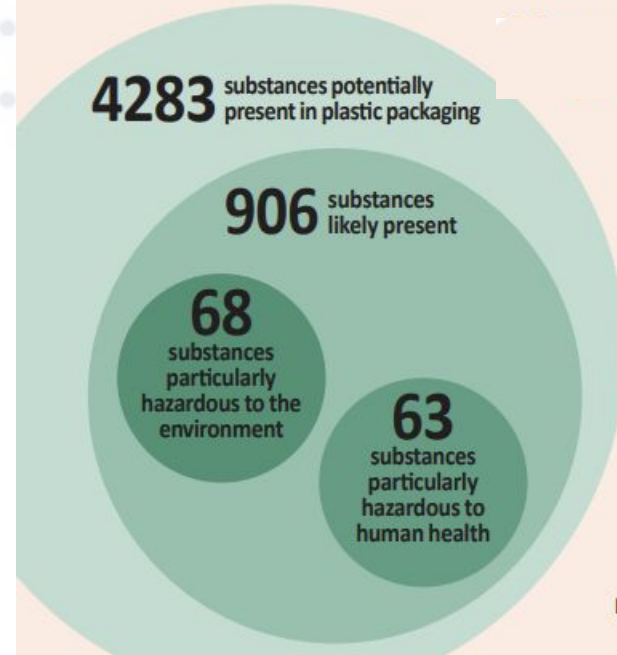
FCM are everywhere in our daily life



Hazardous chemicals in FCM

- 12,285 distinct chemicals globally
- 8,000 chemicals in Europe
- 608 prioritised for further assessment and substitution

<https://www.foodpackagingforum.org/fccdb>



FCM / Food packaging **chemicals readily migrate into the food we eat and beverages we drink**

Hazardous chemicals in FCM

Paper food packaging "not as innocent as it seems", says consumer body

A new study by consumer group BEUC underscores the need for EU-wide rules to regulate non-plastic food packaging and protect consumers from potentially harmful chemicals.

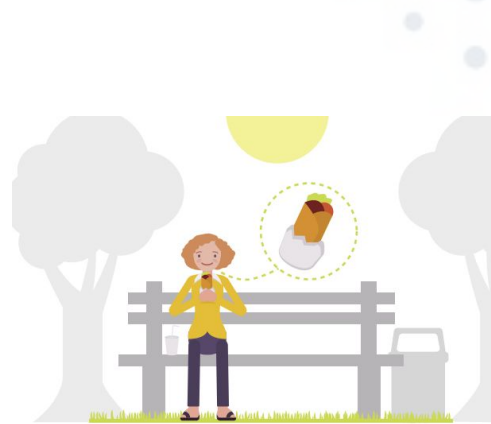


credit: Adobe Stock

<https://www.theparliamentmagazine.eu>

Reusable drinking bottles leach chemicals

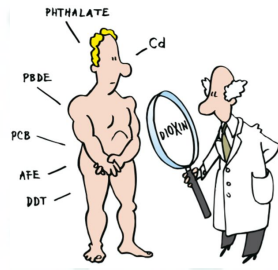
A recent test by the Norwegian Consumer Council shows that many of the reusable water bottles leach phthalates, bisphenol A, lead and other dangerous chemicals into the contents - albeit at very small amounts.



A third of **take-away food wrappings** tested across the EU contained fluorinated compounds, a group of suspected EDCs.

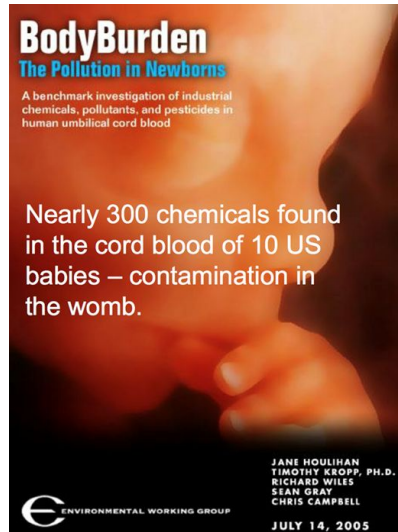
[Endocrine disruptors throughout your day](#)

Chemical pollution and the pollution in humans



Why should we worry?

- Human biomonitoring: hundreds of chemicals found in our bodies (and unborn children)
- Recently, microplastics found in human placenta and blood



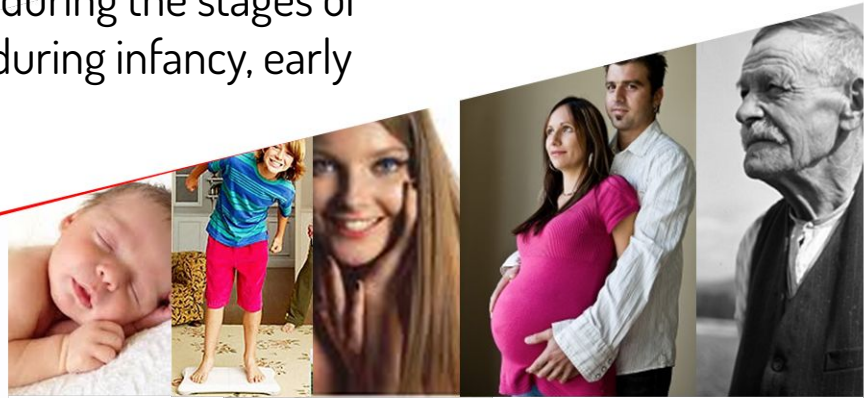
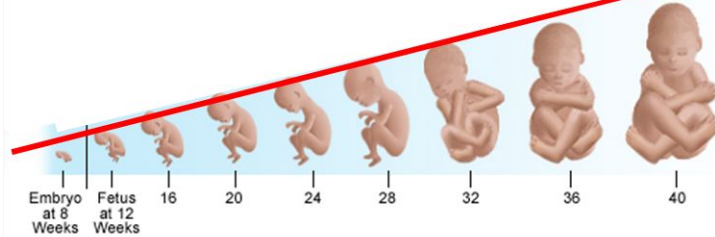
Microplastics revealed in the placentas of unborn babies

Health impact is unknown but scientists say particles may cause long-term damage to foetuses



Exposure: not only how much but also when matters

It is particularly critical to avoid exposure during the stages of greatest human development—in utero, during infancy, early childhood, and puberty



Over 200 synthetic chemicals have been detected in umbilical cord blood, including ingredients in consumer products, food packaging, pesticides, and chemical by-products from burning coal and flame retardants.

Chemical cocktail effects

Chemical pollution as a human health crisis

• Reproductive/endocrine

- Breast/prostate cancer
- Endometriosis
- Infertility
- Diabetes/metabolic syndrome
- Early puberty
- Obesity

• Immune/autoimmune

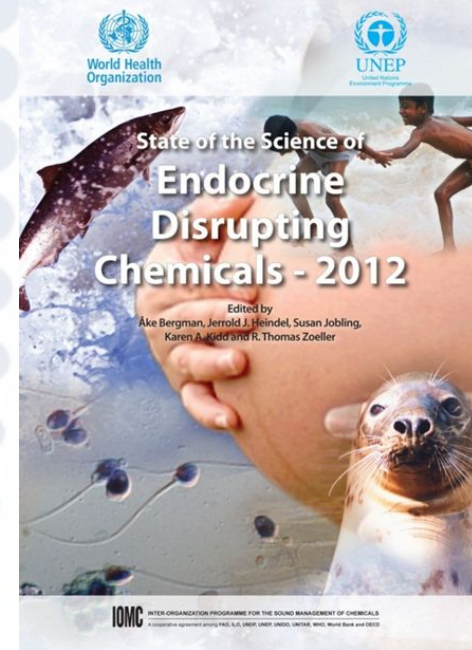
- Susceptibility to infections
- Autoimmune disease

• Cardiopulmonary

- Asthma
- Heart disease/hypertension
- Stroke

• Brain/nervous system

- Alzheimer disease
- Parkinson disease
- ADHD/learning disabilities

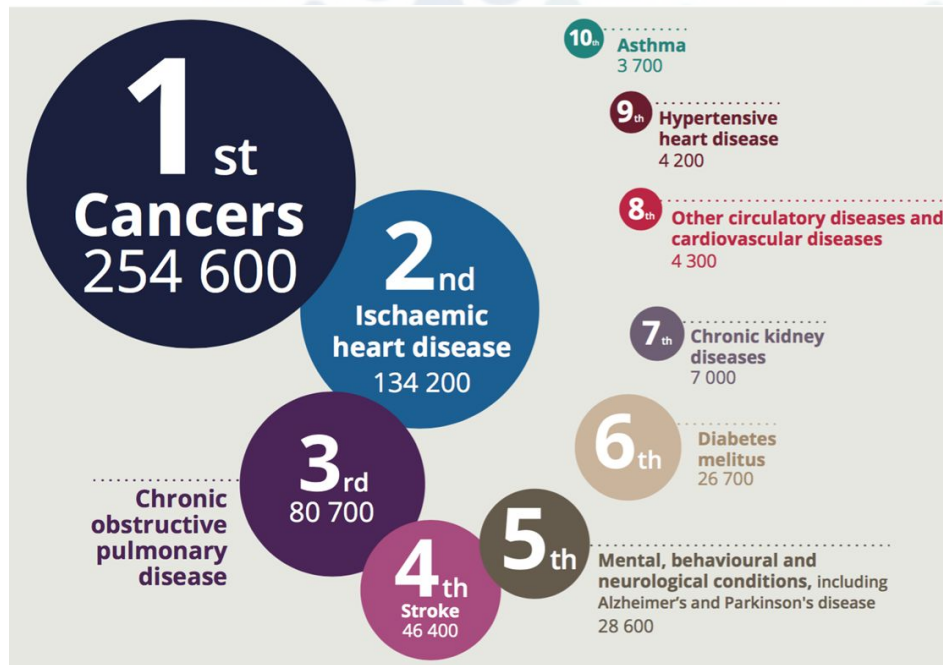
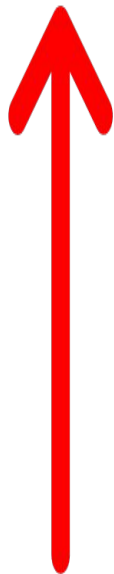


[State of the Science of EDCs
\(WHO/UNEP, 2012\)](#)

EXPOSURE TO EDCs COULD IMPAIR THE HEALTH OF OUR CHILDREN AND THEIR CHILDREN.

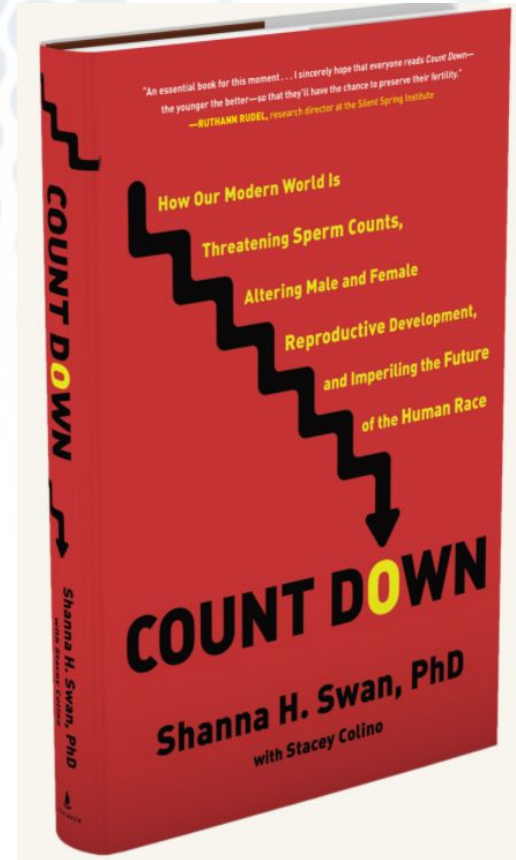
Chemical pollution as a human health crisis

- Global rates of cancers
- Reduced fertility / Infertility
- Obesity and type 2 diabetes
- Asthma
- Allergies
- Preterm birth
- Reduced foetal growth



Chemical pollution as a human health crisis

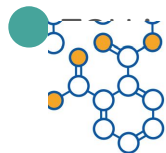
- Infertility: **From 1973 to 2011, the total sperm count of men in Western countries dropped by 59%**
- Recent [study in Denmark](#), reported that prenatal exposure to PFAS was associated with an **increased risk of children** later being hospitalized for infectious diseases (every doubling in PFOS was associated with a 23% increase in the risk of admission due to any infection)
- A strong [association](#) between **COVID-19 disease outcome** and perfluorobutanoic acid (PFBA, a small PFAS molecule): hospitalized individuals with PFBA exposure were more than five times more likely to progress to intensive care or death



[Count Down, Shanna Swan, 2021](#)

Chemical pollution as a human health crisis

- The EU of female reproductive disorders and diseases as a result of exposure to endocrine-disrupting chemicals: Europe-wide epidemiological evidence indicates that [phthalate-attributable endometriosis affects some 145,000 women](#). This costs the EU €1.25 billion per year.



*Protecting our
future fathers*
DEHP, DBP, DIBP and BBP

The use of these chemicals in products is restricted in the EU/EEA from 7 July 2020. This restriction will save approximately **2 000 boys each year** from impaired fertility in later life.

Monetised benefits are estimated to be **€ 235 million per year** while the costs are around **€ 17 million**.

Chemicals in food packaging & human health

HARMFUL CHEMICALS IN FOOD PACKAGING ARE PUTTING OUR HEALTH AT RISK

We need safe food contact materials in a toxic-free circular economy.



The chemicals used in the production, processing, preparation and packaging of food may contribute to cancer, harm reproduction and cause hormone disruption.

<https://zerowasteurope.eu/resources/library/>

[Scientific consensus statement](#) “Impacts of food contact chemicals on human health”
(March 2020)



Toxic recycling

RECYCLED CONTENT IN FOOD PACKAGING AND TOXIC CHEMICAL EXPOSURE



Adapted from: Birgit Geueke, Ksenia Groh, Jane Muncke, (2018) Food packaging and the Circular Economy: Overview of chemical safety aspect for commonly used materials, Journal of Cleaner Production, 193: 491-505 <https://doi.org/10.1016/j.jclepro.2018.05.005>

Using recycled packaging waste to create new food packaging increases the number and level of chemicals that can then migrate from the packaging into foods due to:

- contaminants in the original package
- degradation of the material during recycling
- accumulation of contaminants when materials are repeatedly recycled
- non-food grade materials that enter the recycling system

<https://unwrappedproject.org/recycled-content-in-food-packaging-toxic-chemical-exposure>

Chemicals in food packaging & circular economy

HARMFUL CHEMICALS IN FOOD PACKAGING HAMPER THE CIRCULAR ECONOMY

We need safe food contact materials to use, reuse and recycle, in order to achieve a toxic-free circular economy.



#TOXICFREEPACKAGING



Food comes into contact with many different materials during its production, processing, storage, preparation and serving. The chemicals used in the processing and packaging of our food may contribute to cancer, reproductive disorders and hormone disruption.

These chemicals are not removed from packaging in the recycling process – quite the opposite. Higher levels of chemicals and non intentionally added substances (NIAS) can still be found in recycled food packaging.

<https://zerowasteurope.eu/resources/library/>

NEWS RELEASE 17-FEB-2021

Plastic recycling results in rare metals being found in children's toys and food packaging

UNIVERSITY OF PLYMOUTH

Research News

[ScienceDaily.com/releases/2021](https://www.sciencedaily.com/releases/2021/02/)

Gerassimidou, S. et al. (2022)

[Unpacking the complexity of the PET drink bottles value chain: A chemicals perspective](#)




Recycling of PET can concentrate or introduce new chemicals to the materials which raises concerns about its safety and quality

Hazardous chemicals vs. Circular economy



The EU Chemicals Strategy for Sustainability:

- Moving to safe and sustainable-by-design chemicals and investing in finding alternatives to substances of concern is crucial for human health and the environment, **as well as an important precondition for reaching a clean circular economy.**
- In a clean circular economy it is essential to boost the production and uptake of secondary raw materials and ensure that **both primary and secondary materials and products are always safe.**
- To move towards toxic-free material cycles and clean recycling, it is **necessary to ensure that substances of concern in products and recycled materials are minimized.**



**Only by tackling
the source of
the problem we
can succeed in
achieving safe
and sustainable
food packaging**



Key messages



- ✓ Europeans are exposed to hazardous chemicals due to their presence and migration from a wide range of products (FCM / food packaging being a significant route)
- ✓ Recycling can concentrate or introduce new chemicals to the materials which raises concerns about their safety and quality
- ✓ Children and pregnant women are more sensitive to the adverse effects of chemicals, with exposure to certain hazardous chemicals associated with developmental effects.
- ✓ In Europe, exposure to hazardous chemicals is associated with chronic diseases, neurological disorders and developmental effects in unborn children
- ✓ Evidence suggests that exposure patterns to chemicals are influenced by behaviours such as consumer choices



Thank you!

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