

# Endocrine disrupting chemicals (EDCs) - the action is needed now



## What are endocrine disrupting chemicals?

An endocrine disrupting chemical is an exogenous substance or mixture that alters function(s) of the endocrine system and consequently causes adverse effects in an intact organism, or its progeny, or (sub)populations. EDCs disturb the hormonal balance of the body or initiate body processes at abnormal times in the life cycle.

They are generally effective at very low concentrations; however at high concentrations, the same EDC may trigger no or a different type of reaction. Their effects are highly dependent on the time of absorption. They are particularly harmful during critical phases of pregnancy (foetal development), infancy, early childhood and adolescence.



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## How are humans exposed to EDCs?

- EDCs reach our bodies directly via the environment (water, air, soil, dust) but also through the food, where some EDCs accumulate
- Another source of exposure is the indoor air and indoor dust, which may contain EDCs that emit from consumer products, such as food packaging, furniture, electronic devices, cosmetics and other everyday products
- Children may be exposed to EDCs already via the placenta and from their mothers' milk. This is particularly worrying as their hormone system is not fully developed, yet, and effects could be irreversible and visible only later in life

## What are the impacts of EDCs?

EDCs are linked with a wide range of adverse health effects, among others:

- impairment of the reproductive system, such as lowered sperm quality and precocious puberty of girls
- altered brain development potentially causing behavioural and cognitive disorders (e.g. Alzheimer and Parkinson's disease)
- asthma
- diabetes
- obesity
- different types of cancers, such as breast, testicular and prostate

According to scientific findings, the prevalence of health defects related to exposures to endocrine disrupters is increasing all over the world.

## Decreasing sperm concentrations

|   | 1989 | 2005 |
|---|------|------|
| Sperm concentrations among french adult men (x 10 <sup>6</sup> /ml) | 73,6 | 49,9 |

Rolland et al. 2013

## More men get testicular cancer

|         | 1973-1977<br>Incidence<br>rate | 1998-2002<br>Incidence<br>rate | Change |
|---------|--------------------------------|--------------------------------|--------|
| Sweden  | 3,1                            | 5,3                            | +70%   |
| Finland | 1,6                            | 3,7                            | +131%  |

Incidence rate: New cases per 100,000 person years.  
Chia et al. 2010

|         | Girls      | Boys       |
|---------|------------|------------|
| 1991-93 | 10,9 years | 11,9 years |
| 2006-08 | 9,9 years  | 11,6 years |

Askglæde et al. 2009; Sorensen et al. 2010  
Source: "Om varor som faror - om en hållbar kemikaliepolitik";  
Mikael Karlsson, European Environmental Bureau

## What substances are EDCs and where can we find them?

Currently, more than 200 substances with endocrine disrupting effects are known, for example:

| Chemical substance  | Uses in products  |
|---|---|
| Bisphenol A (BPA)   | Products made from plastics (baby bottles, pacifiers, teething rings, food packaging); internal coating of food cans; microwave dishes; computers, cell phones; CDs; thermal paper; recycled paper towels and toilet paper; medical devices; dental composite fillings; eyeglass lenses; adhesives, varnishes     |
| Phthalates<br>(DEHP, BBP, DBP, DINP, DIDP, DIBP, DEP, DHP, DCHP, DNOP)  | Automotive components; building materials; vinyl flooring; furniture; pool liners and garden hoses; cosmetics, perfume and nail polish; footwear, outdoor clothing and rain wear; inflatable products; medical devices; printing inks; adhesives, lacquers and varnishes; sporting goods; toys; wires and cabling |
| Nonylphenols<br>(nonylphenol, p-nonylphenol, 4-nonylphenol, branched)   | Found as residue/contaminant from production processes in textiles and clothing; food packaging; toys; flooring; disinfectants; PVC film transparencies; pesticides; wall paints  |
| Octylphenols (4-octylphenol, 4-tert-octylphenol)  | Laboratory products; textiles; tyres; agricultural products; electrical insulating material; varnishes; printing inks; water-based paints; textile auxiliaries  |
| Parabens (propylparaben; butylparaben)  | Personal care products; cosmetics; pharmaceuticals; food; tobacco; shoe polishes  |
| Benzo- phenone-3 (oxybenzone); 3-benzylidene camphor; 4-methyl-benzylidene-camphor; 4,4-Dihydroxy-benzophenon; benzophenone; ethylhexylmethoxycinnamate | Sunscreens; body lotions; creams; oils  |
| Brominated flame retardants<br>(penta-, octa- and deca-BDEs)  | Electronic equipment; plastic covers of television sets; carpets; pillows; paints; upholstery; domestic kitchen appliances; textiles  |

Some EDCs in some products are restricted or prohibited. For example BPA containing polycarbonate baby bottles is no longer permitted under EU law; the use of DEHP, BBP and DBP is restricted in toys; octa-, penta-BDE are banned for use in all applications for EU market.

But a lot of EDCs are still used in many everyday products.

# Criteria to establish if a compound is an EDC is missing in European legislation

## What politicians need to do?

- Politicians should not hesitate to implement risk reduction measures on EDCs based on the precautionary principle
- Quickly agree on EU-wide EDC criteria
- Implement measures to limit the use of and exposures from endocrine disruptors under all relevant legislation. This includes legislation on consumer mixtures (such as cosmetics) and articles (e.g. toys)
- Propose all known EDCs for inclusion on the candidate list for authorisation and promote that EDCs are treated as non-threshold substances under the REACH authorisation scheme
- Integrate endocrine disruption as classification endpoint under the classification and labelling regulation
- Financial support must be increased to promote research and development on regulatory science to assess risks from EDCs, including hazard identification and exposure assessment methods

## Our messages

- Any exposure to endocrine disruptors is unacceptable and the use of EDCs in general should be avoided as much as possible
- A quick phase out of these substances requires the agreement on criteria to identify EDCs and regulatory measures to restrict their use as much as possible. These actions must be pushed forward at policy level, now
- Consumers need to be provided with better information on the content of EDCs in everyday chemical products, such as cosmetics or packaging materials in order to make informed choices. Therefore, EDCs should be listed on product labels and their hazards be identified in understandable language



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