

1. Sources

Bisphenols are a group of dozens of organic compounds that have been used as building blocks in the production of polycarbonate plastics, epoxy resins and other products since the 1960s. The variety of products include water bottles, sports equipment, medical devices, household electronics, thermal paper receipts, and food and beverage cans.

Among the bisphenols, bisphenol A (BPA) has attracted the most attention. The consumption of BPA and related products is widespread and estimated to continue to grow in the foreseeable future, driven mainly by increasing demand for polycarbonates and other plastics.



2. Why is it relevant?

The Global Chemicals Outlook II has identified BPA in products as an issue with emerging evidence indicating risks to human health and the environment. Available governmental assessments show that:



BPA may cause multiple adverse effects on human health, particularly on infants and young children, including effects on their reproductive system (for females), spatial memory and learning functions, and developing mammary glands.



In the European Union, BPA has been recognized as a Substance of Very High Concern under the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) due to its reproductive toxicity and endocrine-disrupting properties in the environment and for humans.



BPA is highly toxic to aquatic organisms, with adverse effects related to development identified at very low levels.



BPA is not persistent in the environment and biota, and thus has limited long-range transport potential and low bioaccumulation potential in wildlife and humans.

However, it may be transported hundreds of kilometres in rivers due to its degradation half-life of about 4.5 days in water and soil.

Polymers containing bisphenols are commonly used in many everyday products across the globe. The degradation of these polymers is a major mechanism responsible for bisphenol releases from products.



The primary source of exposure to BPA for most people is through food and beverages, by migration from containers.



Studies have also shown that small amounts of BPA may remain in polycarbonates, epoxy resins and other plastics as impurities that can be released during their use and disposal (including recycling), causing environmental and human exposures.

Furthermore, marine plastic debris, including polycarbonate, may be another source and transport mechanism for nearshore BPA.

3. Existing instruments and actions



Significant progress has been made in addressing child-exposure to BPA around the globe, in particular by removing BPA from baby bottles through bans in some countries and voluntarily action by manufacturers and retailers in others.

Some countries have addressed additional sources such as food packaging, containers and utensils, and toys, through legal bans, voluntary industry phase-out and legally binding migration limits.

A number of countries and regions have legally banned the use of BPA in cosmetics. To a lesser extent, legal bans have been introduced for the use of BPA in thermal paper and all food packaging, containers and utensils, complemented by voluntary industry standards.

While these actions address “upstream” BPA uses, guideline values have also been developed for “downstream” levels of BPA in different environmental media.



4. Challenges and opportunities



While progress is being made, substantial gaps remain in addressing BPA exposure, as indicated by an estimated increase of BPA intake by adults around the world.

Low-dose effects and different subgroups’ susceptibility or vulnerability also needs to be considered.

The use of BPA analogues such as BPS and BPF has increased as replacements for BPA where it is being phased out, while recent studies have also pointed out that these chemicals may cause similar adverse effects as BPA does, though with different potencies.

Action needs to be scaled up to address all relevant exposure sources, taking into account possible challenges and uncertainties related to disposal and recycling of thermal paper and plastics.

The health risks of low-dose exposure that consider sensitive and vulnerable populations (e.g. patients, pregnant women and children) need to be determined and inform existing and future instruments and actions.

Further studies need to be conducted and actions taken to determine and manage the health risks of BPA analogues in light of existing scientific evidence of potential adverse effects. Such studies should be complemented by regular biomonitoring, so as to avoid regrettable substitutions to BPA.

