CHE Collaborative for Health & Environment

Webinar Highlights

Chemicals in Plastics: Human health costs

Plastics are a source of endocrine-disrupting chemicals, commonly known as EDCs. Studies across the globe have documented widespread exposure to EDCs used in plastic materials, and their contribution to infertility and non-communicable diseases including obesity, type 2 diabetes, cardiovascular disease, and some cancers.

In this webinar, **Dr. Leonardo Trasande** discussed a recent study that sought to estimate the attributable disease burden and costs due to chemical exposures from plastics. The study used data from the U.S. National Institutes of Health Environmental influences on Child Health Outcomes (ECHO) Program from 1998 to 2022.

Featured Speaker: Leonardo Trasande, MD, MPP, Director of the Division of Environmental Pediatrics and Vice Chair for Research in the Department of Pediatrics at NYU School of Medicine, speaking April 18, 2024.

This fact sheet has been created by CHE based on information presented in an EDC Strategies Partnership webinar. Selected quotes in bold are from the webinar speaker(s). For the full set of resources provided by the webinar presenters, see the webinar page, where you'll also find associated slides and resources.

The Problem

Negotiations are currently underway for a global plastics treaty. A core goal of the treaty needs to be to protect health. In order to do that, the health harms and costs from plastic chemicals must be understood and taken into consideration.

Health impacts from EDCS have been well-documented. Plastics are a crucial source of many EDCs, including bisphenols (polycarbonate plastics, aluminum can linings), phthalates (food packaging), per- and polyfluoroalkyl substances (PFAS, nonstick cooking and fluoropolymer plastics), brominated flame retardants (additives to reduced flammability), and dioxins (byproducts of plastic incineration). Dr. Trasande highlighted these chemicals' associations with some of the following health outcomes:

Flame Retardants: Thyroid hormone disruption, which affects early brain development

Phthalates: Disruption to the expression of genes for lipid and carbohydrate metabolism, preterm birth, cardiovascular mortality

Bisphenols: Obesity, diabetes, cardiovascular mortality

PFAS: Reduced birthweight, obesity, diabetes

Dioxins: Cancer

Previous studies have estimated the disease burdens and costs associated with these chemicals. This study quantified how much of these burdens and costs are attributable to the use of these chemicals in plastics. For instance, the study found that 97.5% of BPA exposure – and therefore disease burden and costs – is due to BPA use with plastics.

Key findings:

The study found the following plastic-related costs of illness in the United States in 2018:

- PBDE-47 (flame retardant) – $159 billion
- DEHP and other phthalates – $66.7 billion
- BPA (bisphenol-A) – $1.02 billion
- PFAS – $22.4 billion
- Total – $249 billion

These are annual, accumulating costs that could be avoided with reduced exposures.

Dr. Trasande also compared these costs to those in Europe. The results show that public policy has real impacts on health. In the U.S., where policies previously mandated that most upholstered furniture be treated with flame retardants, the costs and health impacts of flame retardants are much higher than in Europe. In contrast, The U.S. EPA's Food Quality Protection Act resulted in reduced childhood exposures to harmful pesticides, resulting in lower costs from pesticide exposures.

Recommendations

Dr. Trasande stressed that the most important change we can make is reducing plastic production.

"We need to reduce plastic production; that's our only way to reduce the cost."

Moving forward with this knowledge, we need a global plastics treaty that:

- Reduces plastic production
- Recognizes hazards posed by recycling and use of bioplastics – these present similar health risks
- Uses hazard rather than risk to evaluate and remove endocrine disrupting chemicals from plastic – we need to follow the precautionary principle
- Expands biomonitoring globally
- Establishes an independent scientific body to evaluate hazards of endocrine disrupting chemicals

To Find Out More

- Watch the April 18, 2024 webinar: Chemicals in Plastics: Human health costs
- Read the presentation slides: Plastics, Endocrine Disrupting Chemicals, and Health
- Read the study: Chemicals Used in Plastic Materials: An Estimate of the Attributable Disease Burden and Costs in the United States

About the Speaker

Leonardo Trasande, MD, MPP is an internationally renowned leader in children's environmental health. His research focuses on identifying the role of environmental exposures in childhood obesity and cardiovascular risks, and documenting the economic costs for policy makers of failing to prevent diseases of environmental origin in children proactively. He holds appointments in the Wagner School of Public Service and NYU's College of Global Public Health. He is perhaps best known for a series of studies published in Lancet Diabetes and Endocrinology and the Journal of Clinical Endocrinology and Metabolism that document disease costs due to endocrine disrupting chemicals in the U.S. and Europe of $340 billion and €163 billion annually, respectively. Dr. Trasande leads one of 35 centers across the country as part of the National Institute of Health's Environmental Influences on Child Health Outcomes program. After receiving his bachelor, medical, and public policy degrees from Harvard, he completed the Boston Combined Residency in Pediatrics and a legislative fellowship in the Office of Senator Hillary Rodham Clinton.