



Plastics and human health – making the invisible visible

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Abstract

Plastic, 99% of which is made from fossil fuels, is the signature material of our age and one that has yielded multiple benefits to civil society. However, there are significant costs to planetary health and human health across the plastic life cycle. Most obvious is the visible plastic pollution that reaches every corner of the planet, in particular the ocean, and yet we have not yet been able to stop the pollution. The Minderoo Foundation seeks to solve intractable problems and the Plastics Initiative's goal is to eliminate the harmful effects of plastic on people and the planet, with a current focus on the Global Plastics Treaty. The Plastics and Human Health program puts human health centre-fold by undertaking extensive literature reviews and supporting keystone research thereby 'making the invisible visible.' We examine the less obvious, namely, the toxic chemicals that are released during plastics' production, use and disposal, which are detected in many different types of human biospecimens. These chemicals harm multiple aspects of human health across our lifespan from the unborn fetus, at birth as well as in children and adults, with particular impacts on the poor and vulnerable in both the Global North and South. In addition to chemical leakage, although we know that micro- and nanoplastics are shed during production, use and disposal, we know far less about their direct impacts on human health, largely due to lack of reliable measurement techniques. We therefore established the Minderoo Centre - Plastics & Human Health with a purpose-built plastic contamination-controlled laboratory to develop techniques to examine, for example, post-mortem human brain. With plastic production set to treble by 2060, harms will also increase and we call for reduced production, better regulation, extended producer responsibility and both social and environmental justice.

Biography

Sarah Dunlop is Professor Emeritus (University of Western Australia) with experimental and clinical research interests in recovery from chemical and physical injury to the developing and adult brain. In 2020, she joined the Minderoo Foundation, a philanthropic organisation seeking effective, scalable solutions to the biggest problems confronting humanity. She established and leads the Plastics & Human Health Research Program within the Plastics Initiative, whose vision is to eliminate the harmful effects of plastic on people and the planet. The team's strategy is to synthesise published evidence on the impact of plastic exposure on human health across the plastic life cycle of production use and disposal. We also seek new evidence by developing keystone infrastructure to measure plastic and plastic chemicals in human biospecimens; and by supporting critical research on plastic exposure and its impacts on, for example, neurodevelopmental disorders and neurodegenerative disease, and on whether reduced exposure improves human health. However, evidence is not enough, and we therefore bring the science on human health impacts to strengthen chemical regulation and as well as to chemically redesign plastic which has become so much a part of our lives – literally.