

Microplastics & Health Fact sheet



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Introduction

Microplastics (MPs) are plastic particles that range in size from 1 nanometer to 5 millimeters (1); as small as a strand of DNA to as large as a standard drinking straw (2). MPs classified as “primary” are intentionally manufactured for use in consumer products (1). Those classified as “secondary” result from the chemical breakdown of larger plastic products (1). MPs are ubiquitous in the environment and are a contaminant of emerging concern due to their potential threat to human and environment health (3). Due to their small size, MPs can be ingested, inhaled, and dermally absorbed by humans and animals, and have been found in significant levels in nearly every human organ system, with concentrations increasing over time (4), warranting further research on their potential negative health impacts (2).

Exposure Sources

Humans can be exposed to microplastics in the air we breathe, the water we drink, and food we eat (2,5). Exposure sources include toothpaste containing microbeads, hot drinks in disposable to-go containers, drinks stored in plastic bottles, food that is packaged, stored, or microwaved in plastic, makeup containing glitter, lawn and agricultural fertilizers, pesticides, and from community and private drinking water supplies (2). In water, MPs are usually present in greater concentration near shores and in urban areas. The greatest source of inhalation exposure is likely through breathing household dust that contains MPs (2, 5); these can also be consumed through hand-to-mouth contact (2).

Health Risks Associated with Microplastics

Cancer Health Risks No studies have conclusively demonstrated that exposure to microplastic increases cancer risk (2, 5). There is limited evidence that MPs may be carcinogenic; however, these findings require additional investigation and validation (6). There is evidence of microplastic accumulation in and around colorectal cancer tumors, although mechanisms of how MPs might contribute to tumors have not been defined (7). There is also limited evidence that exposure to MPs could result in oxidative stress that is an important bioindicator in the formation of malignancies for those with high exposure (2).

Non-Cancer Health Risks Microplastics accumulate at higher concentrations in the brain compared to other organs and increased brain microplastic concentration is associated with dementia (4). Researchers have found that MPs can be found in arterial plaques and significantly increase risk for cardiovascular events (8). Inhalation of MPs can trigger changes in the lung and immune systems. Occupational exposures to higher doses of MPs have been linked to chronic lung inflammation, irritation and, in severe cases, development of respiratory disease (2, 5). Some weakly supported health impacts associated with exposure to MPs include disruption of immune functions and negative reproductive effects (2).

How are Microplastics regulated?

- There are no federal regulations to establish limits on MPs in the environment (2)
- The Microbead Free Water Act, 2015, prohibits manufacturing, packaging, and distribution of rinse-off cosmetics containing MPs (2).
- Iowa is one of six states with no regulations or intent to regulate MPs (2).

What can you do?

- Reduce personal use of single use plastics, including disposable cups for hot drinks and coffee pods or capsules (9, 10).
- Vacuum often to remove household dusts (9).
- Avoid highly processed foods, which contain higher concentrations of MPs (9).
- Use glass storage containers for food (9).
- Use wood cutting boards rather than plastic (9).

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