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We Are Eating Far Too Much Plastic

Analysis by Dr. Joseph Mercola | November 17, 2023

STORY AT-A-GLANCE

- The world now produces 299 million tons of plastics a year, most of which ends up in oceans
- People, on average, are consuming the equivalent weight of one credit card a week from water, seafood and other sources contaminated with plastic
- Both tap and bottled water contain microplastics and bottled water may be worse
- Marine life becomes entwined in plastic bags and six-pack rings and the plastic blocks their intestinal tracts. In humans, ingested plastic is thought to produce unwanted immune responses and other health problems
- Microfibers from synthetic clothing and the practice of using sewage sludge, so-called "biosolids," as fertilizer add to plastic pollution

Editor's Note: This article is a reprint. It was originally published October 26, 2019.

Anyone who reads my newsletter is well aware of the growing environmental catastrophe of plastic pollution. Microplastics from artificial clothing fibers, microbeads found in personal care products, broken down plastics from bottles, fishing nets, plastic bags and biosolids spread on cropland are a human-created nightmare for our environment, particularly our oceans, waterways, marine and bird life.

Disturbingly, while lobbying groups are fighting to restrict plastic use across the nation, others are fighting those same restrictions. One such organization is the Plastics

Industry Association's lobbying arm, the American Progressive Bag Alliance, which backs legislation that would prevent local communities from addressing plastic pollution.

As reported by The Intercept,[1] the bill "would make it illegal for local governments to ban or restrict bags and other single-use plastic products — one of the few things shown to actually reduce plastic waste." Eleven other U.S. states have also "enacted similar so-called 'bans on bans,'" the Tennessean reports.[2]

We're Ingesting and Inhaling Surprising Amounts of Plastic

Recently, a situation that looked like it could not get worse, has indeed gotten worse. New research shows humans, not just marine life, are ingesting **microplastics** at alarming levels.

A recent study commissioned by the World Wildlife Fund and carried out by University of Newcastle, Australia, finds people, on the average, consume the equivalent weight of one credit card a week — 5 grams of plastic.[3] Primary ingestion routes are from water and seafood, according to the report.

There is even more disturbing news. While many are aware that municipal wastewater treatment systems are failing at filtering out microplastics — their filtering processes were invented long before the plastic explosion — bottled water is turning out to be no safer.

A recent study by the nonprofit journalism organization Orb Media found major bottled water brands like Evian, Aquafina, Dasani and San Pellegrino contained significant amounts of microplastics.[4] And research published in Environmental Science & Technology suggests people drinking only bottled water may receive more microplastics than those drinking tap water.[5]

Other recent research[6] suggests the average person is also inhaling 11.3 microscopic pieces of plastic each hour. According to co-author Jes Vollertsen,[7] "This is the first evidence of human exposure to microplastic through breathing indoor air."

Plastic particles identified in indoor air include synthetic fibers such as polyester, polyethylene and nylon, and nonsynthetic particles composed of protein and cellulose.[8]

How Bad Is Plastic Pollution?

Thanks to the throwaway mentality of developed nations, and even developing nations, plastic pollution is an urgent problem. It threatens fish, birds and water including in pristine areas completely free of industrialization. The world now produces **299 million** tons of plastics a year, most of which ends up in the oceans.

In fact, it is estimated that our oceans will contain more plastic than fish by weight by the year 2050.[9,10] Already, plastic exceeds plankton by a factor of 6-to-1 in some ocean waters.[11]

In a recent documentary that I wrote about, "**Hunting for Plastic**," a videotaped autopsy of a deceased sea turtle by employees of the Ocean Cleanup project showed greasy, black plastic bags and other plastic objects that had been the cause of the poor turtle's death, retrieved from its body.

Boyan Slat, a young Dutch entrepreneur, has invented an ingenious way to clean plastic debris from our oceans and organized the very encouraging Ocean Cleanup project.

One-third of the fish caught in the English Channel and 83% of U.K shrimp contain microbeads, solid plastic particles less than 1 millimeter in size that are added to cosmetics, soap, facial scrub and toothpastes and used in pharmaceutical technology. Several countries have banned the use of microbeads in personal care products,[12] but despite bans, millions of microbeads already exist in the environment and, like all plastics, will not degrade for hundreds of years.

Different Types of Plastic Pollute Our Environment

There are different kinds of plastic discarded in the environment but they are all harmful. Polycarbonate, polystyrene and polyethylene terephthalate sink to the ocean floor and

damage it. Low-density plastics like polyethylene, on the other hand, float and accumulate into massive floating islands of trash, such as the notorious 618,000 square-mile Great Pacific Garbage Patch between Hawaii and California.

Microplastics from widely used polyvinyl chloride (PVC) absorb carcinogenic plasticizers like bisphenol A (BPA) and bisphenol S (BPS), according to research in Science of the Total Environment,[13] and BPA significantly increases the risk of breast cancer according to 2018 research in Environmental Science and Pollution Research:[14]

> *"Breast cancer is the second most common fatal cancer in women. Developing a breast cancer is a multi-factorial and hormonal-dependent process, which may be triggered by many risk factors.*
>
> *An endocrine disrupting substance known as bisphenol A (BPA), that is used greatly in the manufacture of plastic products, was suggested as a possible risk factor for developing breast cancer. BPA has a strong binding affinity to non-classical membrane estrogen receptors like estrogen-related and G protein-coupled (GPER) receptors.*
>
> *Based on animal and in vitro studies, results showed a link between BPA exposure and increased incidence of breast cancer. BPA has the ability to alter multiple molecular pathways in cells ... Thus, the aforementioned alterations cause undesired gene stimulation or repression that increase risk of developing breast cancer.*
>
> *So, restricting exposure to BPA should be considered to aid in lowering the risk of developing breast cancer."*

More Health Risks From Microplastics

Plastic pollution kills sea turtles and other marine life in several ways. They become entwined in plastic bags and six-pack rings, and ingested plastic debris blocks their intestinal tracts so they die of malnutrition. Microplastics in the ocean also develop a

biological covering of algae that smells like food to fish.[15] That means fish may be actively seeking out the microplastic mistaking if for food.

The harmful effects of microplastics on human health are also beginning to be revealed. According to 2019 research in Science of the Total Environment:[16]

> *"Humans are exposed to plastic debris via the consumption of seafood and drinking water, contact with food packaging, or inhalation of particles. The accumulation of microplastic particles in humans has potential health risks such as cytotoxicity, hypersensitivity, unwanted immune response, and acute response like hemolysis.*
>
> *We investigated the cellular responses of secondary polypropylene microplastics (PP particles) of approximately ~20 μm and 25-200 μm in different condition and size to normal cells, immune cells, blood cells, and murine immune cells by cytokine analysis, ROS assay, polarization assay and proliferation assay ...*
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> *[A] high concentration, small sized, DMSO method of PP particles stimulated the immune system and enhanced potential hypersensitivity to PP particles via an increase in the levels of cytokines and histamines."*

Microplastics in Drinking Water

As I noted earlier, wastewater treatment plants do not completely filter out microplastics. The potential of these particles for absorbing wastewater chemicals — as seen with PVC — and their small size present "unique toxicological risks for microplastics discharged" says a 2019 study in the journal Water Research X.[17]

And there is another, less recognized but huge source of microplastics in our waterways and drinking water: microfibers from synthetic clothing like fleece, acrylic and polyester. During washing, microfibers from these textiles are released, amounting to as much as 1 million tons a year.

Yet the Mermaids (Mitigation of Microplastics Impact Caused by Textile Washing Processes) project suggest special coatings and reformulated laundry detergents could minimize the toll of microfibers released during washing on the environment.[18] Research in Water Research X confirms the role microfibers play in plastic pollution, finding more microfibers in more populated areas.[19]

> *"We demonstrate through source modeling that microplastic fiber loads in influent were consistent with service area populations laundering textiles given previously published rates of microplastic generation in washing machines."*

Microplastics Also Pollute Soil

Plastic pollution is not limited to waterways. The net amount of plastics polluting land is as much as 23 times greater than that in oceans, according to research published in Science of the Total Environment.[20]

Once called "sewage sludge," — the solids left after water purification — "biosolids" are now widely used as fertilizer in the U.S. and other countries to grow crops. It should surprise no one that biosolids contain plastics, as well as PCBs, dioxins, pharmaceuticals, hormones, surfactants, heavy metals and disease-causing pathogens.

Once on the soil, weather, sun and other factors cause the plastic to fragment into microplastics. Scientists also speculate that Collembola — tiny insects in the soil — might also contribute to the problem by converting the plastic debris they consume into microplastics through their digestive processes.[21]

A British study of the coasts of six continents found sewage sludge, or so-called biosolids, contained an average of one particle of microplastic per liter.[22] Much of the plastic load comes from clothing fibers from washing machine effluent, says research, and much of it ends up in storm drains and waterways.

What Can You Do?

While microplastics are now abundant in waterways, drinking water and seafood, there are many ways you can reduce the scourge of plastic pollution by not adding to it.

- Avoid plastic bags (including for snacks and food storage)
- Avoid disposable straws (reusable straws made from stainless steel, bamboo and even glass are widely available)
- Wash synthetic clothes less frequently and when you do use a gentle cycle to reduce the number of fibers released; consider using products that catch laundry fibers in your washing machine
- Choose a nonplastic toothbrush made from bamboo or flax
- Avoid disposable plastic bottles; bring your own reusable bottle instead

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