Blueair
Point of view

Blueair calls for a global agreement to stop plastic air pollution

Recent research shows that the majority of microplastics in our bodies comes from the air we breathe, not from drinking bottled water or eating fish from polluted oceans. Due to their small size, microplastics can be inhaled and may induce a wide range of diseases including respiratory and cardiovascular diseases as well as cancer. Scientists and environmental groups say that the need for more research is urgent. In 2017, the UN Environment Assembly signed a resolution to stop the flow of plastic waste into the oceans. Blueair now calls on UN member nations to sign a resolution to stop the flow of plastic waste into the air.

More than 300 million tons of plastic are produced each year. Half of that plastic becomes trash in less than a year. Out of the plastics produced, only 9% is recycled; the remaining 91% enters the air, land and water as waste. Parts end up in our lungs. And they stay in the lung tissue or enter into the blood stream as the body is not able to rid itself of the tiny plastic particles. Children, in particular, are at risk as their respiratory systems are still under development.

Microplastics: What they are and where they come from

Since 2008, plastic particles smaller than 5 mm but bigger than 0.1 um have been defined as microplastics. Particles smaller than 0.1 um are called nanoparticles. These micro-plastics can come in many sizes and shapes but are categorized as primary and secondary microplastics. Primary microplastics are plastic particles, or microbeads, produced in microscopic size for use in cosmetics, toiletries and paint. Secondary microplastics are plastic fragments from larger plastic objects. Both primary and secondary microplastics are airborne and can be inhaled by humans.

Airborne microplastics: Concentration higher in indoor air

Microplastics have been found in both indoor and outdoor air. However, the concentration of microplastics in the indoor air is higher than outdoors according to findings presented in 2018 by researchers from École Nationales des Ponts et Chausées.

Microplastics in the indoor air result from the fragmentation through friction, heat or light of plastic objects found in our homes. These include toys, furniture, floorings, food containers and plastic bags and personal care items like cosmetics, shampoo, toothpaste and scrubs. Showering with a body scrub alone may flush 100,000 microplastic beads into the wastewater system and on into the air, says the Environmental Audit Committee of the House of Commons in Britain, which banned microbead use in January 2018, following the U.S., Canada and New Zealand's lead.

The majority of microplastics found in the indoor air, however, comes from plastic fibres released from synthetic clothing and textiles used in home furnishings. These microplastic fibres tend to be longer and therefore more harmful when inhaled. Today, synthetic materials, such as acrylic, nylon, polyester, make up some 60% of global textile production. When washing these textiles, microplastic fibers are released and end up in the wastewater. A fleece jacket may release up to 250,000 microplastic fibers into the wastewater, according to a 2016 study by the Bren School of Environmental Science & Management at the University of California Santa Barbara.

Microplastics in the outdoor air come mainly from city dust filled with particles from synthetic vehicle tires, but also from plastic pellets, road markings, synthetic textiles and marine coatings.

Dust in cities and suburbs as well as rural, industrial and agricultural areas contains microplastics, worn away from plastic in the environment and wind-blown plastic waste from landfills, recycling centers, water treatment plants and outlying fields. Farmers, for instance, often use sewage sludge from water treatment facilities that contain microplastics to supplement traditional fertilizers; these end up in the atmosphere, according to research from King's College London.

Too much plastic

1. More than 300 million tons of plastic are produced each year.
2. Half of that plastic becomes trash in less than a year.
3. Plastics can take 400 years to degrade, so most of it still exists in some form.
4. Only 30% of all plastics ever produced is currently in use.
5. Only 9% of plastics are currently recycled; 91% goes to landfill or is incinerated.
6. The US recycles only 12% of plastic waste; the EU recycles 40%.
7. China's recent ban on importing plastics waste for recycling has put the sustainability burden on plastic producer countries.

Did you know?

- Plastic weighing the equivalent of one billion elephants has been made since 1950s and most is now landfill.
- There's enough plastic pollution in the oceans to cover every foot of coastline around the globe with five grocery bags of plastic trash.
- By 2050 the world's oceans are expected to contain more plastics than fish.
- The amount of plastic trash in the oceans would cover an area 34 times the size of Manhattan ankle-deep in plastic waste.

Airborne microplastics: Human health risks

The full health effects of breathing microplastics are not yet entirely understood. But research proves that the threat to human health is high. Once inhaled, these tiny particles go into the deep lungs where they may induce lesions in the respiratory systems. The smallest particles can also pass into the bloodstream and cause cardiovascular and cerebrovascular diseases, induce cancer and affect the human immune and nervous system. Microplastics found in lung tissue indicate that the body is not able to rid itself of all particles – i.e. that the microplastics are bio-persistent.

All microplastics from synthetic materials appear to cause infections when the concentration reaches a certain level. A study of factory workers who handle synthetic textiles found health effects from coughing to respiratory and cardiovascular diseases, as well as cancer, according to researchers at the Fernando Pessoa University in Portugal. Studies show that the longer the synthetic fiber, the more carcinogenic the microplastic.

Airborne microplastics may also carry other toxic pollutants found in the air, from bacteria to traffic emissions, into the bloodstream from the lungs.

Microplastic pollution: Children most at risk

Children are more active and breathe more rapidly than adults, taking in more air in relation to their body weights. This makes them more vulnerable to air pollution in general. Microplastic air pollution is no exception. Children are also more at risk as their respiratory system are still developing.

Babies and toddlers spend more time playing on the floor, where microplastics settle in the form of dust. Moreover, small children play with, and may even chew on plastic toys, putting them at a higher risk. Researchers studying Tehran's urban dust found that children may swallow as many as 3,200 plastic particles a year.

A baby's first exposure to microplastic may, however, already take place before birth as microplastics have been found in the placenta.

Call for action: Plastic free air

Blueair calls for global action to address the issue of airborne microplastics. More research is needed to better understand the impact on human health. More action is needed to reduce plastic production, consumption, disposal and pollution. More involvement is needed from a broad coalition of policy makers, plastics manufacturers, waste and wastewater management companies and other stakeholders, including scientists and consumers. More public education is needed, too.

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How to reduce airborne microplastics at home

1. Ensure good ventilation in your home - the concentration of airborne plastics is much higher in indoor air than in outdoor air.
2. Vacuum frequently to free your floor from microplastic dust that collects there.
3. Reduce or remove carpets, which trap plastic fibres and particles.
4. Choose a hardwood or ceramic tile floor. Vinyl and linoleum flooring can release microplastics into the air.
5. Avoid synthetic clothing as they shed plastic fibers, which can be inhaled.
6. Use organic, natural fabrics and textiles in home furnishings.
7. Do not buy toys made of plastic or that have plastic parts. Opt for wood or natural rubber toys instead.
8. Avoid cosmetics, soap, facial scrub and toothpastes containing microbeads.
9. Drink filtered tap water instead of water from single-use plastic bottles to reduce the amount of plastic you bring into your home.
10. Put an air purifier in the rooms where you spend most of your time. All Blueair air purifiers for home remove airborne microplastics.

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