PUBLIC HEALTH ALERT · UPDATED 2026

MICROPLASTICS & HUMAN HEALTH

~5g
estimated plastic ingested per person per week
(equivalent to a credit card)

Microplastics (MPs) are particles <5mm formed from degrading plastics. **They have been detected in virtually every human tissue examined**, including blood, lungs, liver, kidneys, placenta, breast milk, and brain. A landmark 2024 *New England Journal of Medicine* study found MPs in arterial plaque, linking them to significantly higher rates of heart attack, stroke, and death. Harvard, Stanford, and the WHO have all identified MPs as a priority public health concern.

68,000
microplastic particles inhaled daily (est.)

11,000
MPs ingested annually via seafood alone

1,300+
species — including humans — found to contain MPs

<1 µm
nanoplastics penetrate individual cells & nuclei

EXPOSURE, RESEARCH & MECHANISMS

HOW WE'RE EXPOSED

- **Ingestion:** Contaminated food, seafood, drinking water, sea salt, packaged food leaching plastic
- **Inhalation:** Airborne fibers from synthetic textiles, tire dust, industrial processes, indoor air (0.1–1.2 particles/m³)
- **Dermal:** Primarily nanoplastics (<100 nm) through skin, especially damaged skin
- **Medical:** IV bags, tubing, catheters, and surgical tools shed plastic particles
- **Placental transfer:** MPs found in placenta and meconium; fetal exposure confirmed

MECHANISMS OF HARM

- **Inflammation:** Chronic immune activation in gut, lungs & vessels
- **Oxidative stress:** DNA damage, cell death, cancer risk signal
- **Gene disruption:** Altered expression in vascular cells
- **Endocrine disruption:** BPA, phthalates, heavy metals on particle surfaces
- **Pathogen vector:** Carry antibiotic-resistant bacteria into the body
- **Gut microbiome:** Disrupts microbial diversity and gut barrier

ORGAN SYSTEMS AFFECTED

CARDIOVASCULAR
MPs in arterial plaque; elevated heart attack, stroke & death risk; vascular gene expression changes

RESPIRATORY
Lung inflammation, oxidative stress, impaired pulmonary function; colon & lung cancer signals

REPRODUCTIVE
Reduced sperm count & quality; ovarian follicle damage; altered hormones; fetal exposure via placenta

NEUROLOGICAL
MPs detected in brain tissue; vessel blockage in animal models; association with dementia risk

DIGESTIVE
Gut microbiome disruption; intestinal wall damage; chronic inflammation; cell proliferation changes

POPULATIONS, RISKS & PROTECTIVE STEPS

VULNERABLE POPULATIONS

- **Infants & children:** Hand-to-mouth behavior, higher ventilation rates, immature barriers — greatest susceptibility
- **Pregnant women:** Fetal exposure via placenta; link to preterm birth
- **CV patients:** Amplified plaque and clotting risk
- **Occupational:** Textile, manufacturing, and healthcare workers

REDUCE YOUR EXPOSURE

- Use glass or stainless water bottles; filter tap water
- Avoid heating food in plastic containers
- Choose natural-fiber clothing & furnishings
- Vary seafood intake; peel/gut shellfish
- Vacuum & ventilate frequently — reduce indoor dust
- Minimize single-use plastic food contact

KEY RESEARCH FINDINGS (EVIDENCE LEVELS)

STRONG	MPs in arterial plaque linked to 4.5x higher cardiovascular event risk (NEJM 2024); MPs found in 100% of tested human blood samples
MODERATE	Suspected harm to digestive, reproductive & respiratory systems (Environ. Sci. & Tech. 2024); associated with increased risk of dementia and early death (JAMA Insights 2025)
EMERGING	Higher MP concentrations in placentas from preterm births; 2025 mouse study shows MPs moving through brain and blocking blood vessels

Key Sources:
NEJM 2024 · JAMA Insights Oct 2025 (Harvard Chan School) · Environ. Sci. & Tech. Dec 2024 (UCSF/CalSPEC) · Frontiers in Public Health 2025 · Stanford Medicine Jan 2025 · World Economic Forum Feb 2025

Current evidence: Suspected — not yet proven causal in humans

Prepared April 2026 · For educational use