Microplastics and the Human Body — summary

An evidence synthesis · Holistic Quality LLC

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> **Disclaimer.** This is a research synthesis of the published scientific literature. It is **not medical advice** and is **not peer-reviewed**. It summarizes the state of the evidence and cites its sources so readers can verify every claim.
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> **How this was produced.** AI-assisted literature review and drafting, then **human-verified** — every study cited was checked against its published record and reported finding. This is a selective synthesis of representative, high-quality studies, not an exhaustive systematic review.

The bottom line

Microplastic particles are **detectably present inside the human body** — reported in human stool, blood, and placenta — and estimated human intake runs to the **tens to hundreds of thousands of particles per year**. Exposure is real and measurable. **Whether that exposure harms health at current levels is not established.** No human study has demonstrated it; the hazard case rests on cell and animal models and on analogy to other particulates; and the field's own reviews and the World Health Organization converge on "unknown" or "low risk at current levels, on a limited evidence base with major gaps." The honest summary is **detected, plausibly hazardous by analogy, effect-versus-exposure margin unresolved** — not "safe," and not "proven harmful." A faithful compression of the full evidence review.

What has been detected (all small samples; none assessed health effects)

- **Stool** — microplastics in **all 8** volunteers of a prospective case series, a median of **20 particles (50–500 µm) per 10 g**, across 9 polymer types (Schwabl et al., 2019). [1]
- **Blood** — plastic particles quantified in **22 donors** at a **mean 1.6 µg/mL** (a *mass concentration*, not a particle count), PET/PE/styrene most common (Leslie et al., 2022). [2]
- **Placenta** — **12 fragments in 4 of 6** placentas, of which only **3 were confirmed as an actual polymer** (Ragusa et al., 2021). [3]

These are existence proofs of exposure, not evidence of harm — none measured a health outcome.

How much exposure

Estimated intake is **39,000–52,000 particles/year from food and drink, rising to 74,000–121,000 once inhalation is added** — but these are age/sex-stratified endpoints, cover only ~15% of caloric intake, are counts (not a toxicant dose), and are described by the authors as a **likely underestimate** (Cox et al., 2019). Water source matters: **~90,000 particles/year from bottled water vs. ~4,000 from tap.** [4] The WHO's drinking-water assessment found microplastics **do not appear to pose a health risk at current levels — while stressing this rests on limited evidence with major knowledge gaps**, and that waterborne pathogens remain the far larger priority (WHO, 2019). [5]

Why harm is not yet established

The toxicology is real but does not transfer cleanly to people: effects are shown in **mouse models and human cell lines**, with human consequences "yet unclear" (Yong et al., 2020) [6]; human health effects are "unknown" and quantifying real exposure is the unmet prerequisite (Wright & Kelly, 2017) [7]; and whether microplastics pose a substantial risk to human health remains far from settled (Vethaak & Legler, 2021) [8]. Two structural problems block a verdict: the **sub-10-µm/nanoplastic fraction most able to cross barriers is at or beyond current measurement limits** (so exposure is likely underestimated), and most toxicology uses **pristine plastic beads rather than the weathered fragments people are actually exposed to.** Until effect thresholds can be compared to measured (not modeled) human intake — the **margin-of-exposure** question — a causal human-health claim is not available.

Reasonable posture

Presence in the body is necessary but not sufficient for harm. The evidence supports **exposure reduction as cheap precaution where it is easy** (e.g., the bottled-vs-tap-water differential), paired with **honesty that a causal human-health claim is not yet available.** The full report details the evidence, the gaps, and the research that would resolve them.

How to cite

This page is the **summary brief**. The citable version of record is the **full evidence review** — please cite that:

> Robey, L. (2026). *Microplastics and the Human Body: Exposure, Translocation, and the Margin-of-Exposure Question* (full evidence review, Version 1.0). Holistic Quality LLC. doi:10.5281/zenodo.21172814 ·

https://holisticquality.io/research/microplastics-and-the-human-body-full

The full report — with the complete reference set and disclosures — is at holisticquality.io/research/microplastics-and-the-human-body-full; its version DOI (doi:10.5281/zenodo.21172814) is the citable identifier for this work (the version-independent concept DOI is doi:10.5281/zenodo.21172813).

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All citations independently verified against their published sources. Health-effect statements reflect animal/in-vitro/cell-line evidence unless a human study is named.

Disclosures

Competing interests. The author is the founder and principal of Holistic Quality LLC, the commercial publisher of this brief, which develops regulator-facing safety-data and compliance products in areas that include environmental and chemical exposure; a sibling property (the Institute for Cognitive Sovereignty) may cite this work. To mitigate this competing interest, every claim and citation was independently source-verified, the limits of the evidence are stated throughout, and the author retained sole editorial control. **Funding:** none (self-funded). **Data availability:** synthesis of published literature; no new data. **AI use:** AI-assisted review/drafting, human-verified; the named author is responsible for all content. **ORCID:** 0009-0005-6946-3569. **Peer-review status:** self-published working paper; not peer-reviewed. Full disclosures are in the full report.