

Does What You Wear Affect the Air You Breathe?

A pilot study finds airborne microplastic levels rise when people wear polyester instead of cotton — with personal exposure exceeding typical indoor background levels.

Pilot Study

The takeaway: Researchers at the University of Memphis measured airborne microplastic particles in the breathing zone of participants as they went about daytime activities wearing either a cotton or a polyester T-shirt, and compared results to overnight bedroom air. The clothing someone wore was directly linked to how many microplastic particles they were exposed to, with polyester T-shirts associated with the highest personal exposure levels measured in the study.

42%

Higher airborne microplastic exposure wearing polyester vs. cotton

15

Microplastic particles inhaled per minute on average

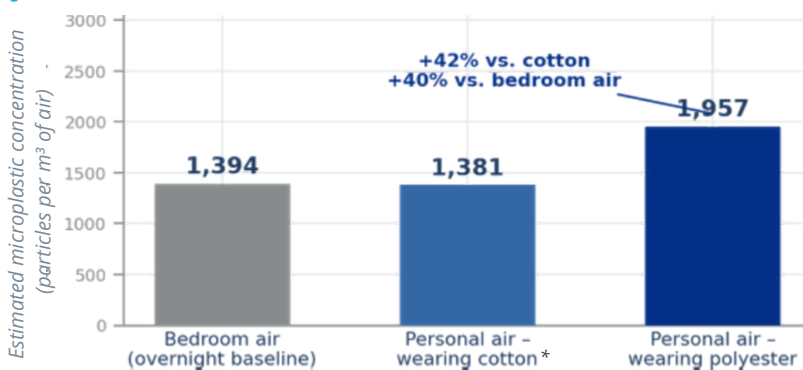
67–77%

Of particles detected were smaller than 300µm, small enough to be inhaled deeply

>99%

Of identified particles were PET, the polymer used to make polyester

WHAT THE DATA SHOWS



*Microplastics detected in cotton samples are the result of environmental exposure and textile production processes, rather than the natural cotton fiber itself.

METHODOLOGY

- **10 participants** completed paired 12-hour personal air sampling (once in a 100% cotton T-shirt, once in a polyester T-shirt) during active daytime hours.
- A parallel **12-hour bedroom air sample** was collected overnight for each participant as an indoor baseline.
- Personal samplers were worn on the chest/arm using an Ultrasonic Personal Air Sampler (UPAS v2.1).
- Filters were analyzed with **micro-Fourier-transform infrared spectroscopy (µ-FTIR)** to count particles and identify polymer type and size.
- Field blanks and duplicate samples were included throughout for quality control.

WHY IT MATTERS

This pilot study adds new evidence to the discussion around airborne microplastic exposure by examining the role of clothing materials. Because personal exposure while wearing polyester exceeded that while wearing cotton apparel, the findings suggest that fabric composition may be a relevant factor influencing everyday exposure to airborne microplastic particles.

This is an early-stage pilot study intended to inform future research. Findings are indicative of a potential exposure pathway and should be interpreted with appropriate caution pending larger, peer-reviewed studies.

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Source: "Microplastic Particles in Personal and Indoor Air," University of Memphis (2026)