

The growing health hazards of microplastics in Pakistan's environment

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Dear Editor,

I am writing to highlight a critical yet overlooked public health crisis in Pakistan: the increasing prevalence of microplastics in our environment and the long-term health risks they pose. Microplastics are plastic particles smaller than 5 mm that are now present in our air, water, and soil due to the widespread use of plastics and poor waste management.¹ This environmental threat seriously affects public health, especially in developing countries like Pakistan, where rapid urbanisation and insufficient recycling facilities worsen the issue.

Microplastics enter the human body primarily through contaminated food and water ingestion, inhalation, and skin contact.² They are in plastic packages, synthetic fibre clothing, ordinary household cosmetics, facial cleansers containing microbeads, mineral water and even table salt. The COVID-19 pandemic has exacerbated this issue with the increased use and discarding of disposable face masks and personal protective equipment.¹ Studies estimate that individuals ingest between 39,000 to 52,000 microplastic particles annually, with an additional 74,000 to 121,000 inhaled through the air.^{1,2} This is alarming for a country like Pakistan, where plastic pollution is rampant. According to a report by the United Nations Development Programme (UNDP), Pakistan produces over 6.41 million tonnes of plastic annually, 70% of which is improperly disposed of.³

Recent studies have highlighted disturbing new evidence regarding the health effects of microplastics. They have been detected in stool, lungs, breast milk, and meconium, and a 2021 study confirmed their presence in human placentas, with several particles identified as originating

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from pigments used in foundations, paints, and packaging.⁴ Another study reported the ability of polystyrene nano plastics to cross the blood-brain barrier and cause neurotoxicity and potential neurodegenerative diseases.⁵ Even more concerning is a recent discovery of microplastics in the cardiac tissues of patients undergoing heart surgery, showing that these particles can infiltrate even the most enclosed and sensitive human organs.⁶

Microplastics carry harmful chemicals such as bisphenol A (BPA), phthalates, and heavy metals linked to various diseases. BPA is an endocrine disruptor and carcinogen associated with reproductive issues, developmental problems, and higher risks of metabolic disorders like diabetes and obesity. Animal studies show that microplastic exposure can lower sperm counts, reduce embryo implantation, and even cause genetic changes that affect reproduction.^{1,2}

Action is urgently needed to reduce single-use plastics and enhance waste management in Pakistan. This involves stricter regulations, promoting sustainable alternatives, and improving recycling to keep plastics out of ecosystems. Comprehensive studies are essential to evaluate microplastic contamination and its effects on vulnerable groups, including children, the elderly, and those with existing health issues.

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