# RACGP submission to

# *Inquiry into the impact of microplastics and other toxins on human health*

March 2026

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## Introduction

The Royal Australian College of General Practitioners (RACGP) welcomes the opportunity to provide a submission to the Senate Community Affairs References Committee on the impact of microplastics and other toxins on human health.

The RACGP is Australia's largest professional general practice organisation, representing over 50,000 members working in or toward a specialty career in general practice, including four out of five general practitioners (GPs) in rural Australia.

The RACGP sets and maintains the standards for high-quality general practice care in Australia and advocates on behalf of the general practice discipline and our patients. As a national peak body, our core commitment is to support GPs and their broader healthcare team to address the primary healthcare needs of the Australian population.

The RACGP's mission is to improve the health and wellbeing of all people in Australia by supporting GPs, general practice registrars and medical students through its principal activities of education, training and research and by assessing doctors' skills and knowledge, supplying ongoing professional development activities, developing resources and guidelines, helping GPs with issues that affect their practice, and developing standards that general practices use to ensure high-quality healthcare.

## Executive Summary

A growing body of scientific research shows that the impact of microplastics, nanoplastics and plastic- associated chemicals pose a serious and growing risk to human health. The Lancet Countdown (2025)[1] found that plastic chemicals were detected in nearly all humans and that endocrine disruption pathways were established. Plastic pollution and the emissions through the lifecycle of plastics are damaging the lives and wellbeing of populations and the magnitude of this damage is yet to be fully researched and understood. [2]

Plastic production, including oil and gas extraction, contribute to the health effects of global warming, air pollution-induced respiratory disease and hazardous chemicals associated with cancers and other diseases.[2] Global plastic production exceeds 400 million tonnes annually and is projected to increase substantially in coming decades. Plastics contain more than 13,000 chemicals, including multiple classes of substances of high concern due to toxicity, persistence, bioaccumulation, and ability to migrate into humans.[3,4]

Microplastics are able to enter the human body through ingestion, inhalation and skin contact, including via contaminated food and water, airborne fibres, cosmetics, textiles and skin contact with plastic-containing products.[6,7] Studies have confirmed the presence of micro-and nanoplastics in blood, lungs, liver, kidneys, heart, brain, spleen, colon, testes, ovarian fluid, placenta, breast and infant stool.[4]

While still in the early stages of research, with the demand for plastics set to double by 2050[2], there is a strong need for this to be built upon by further population research, better public education and national product standards. The RACGP believes that there is currently sufficient evidence to warrant serious concern and further research.

## The impact of microplastics, toxins and forever chemicals on reproductive health:

Plastic- associated chemicals are detected in nearly all people, including pregnant women and newborns[3,6]. It is thought that these substances are associated with declining fertility, hormonal disorders and reproductive dysfunction.

There is emerging evidence that microplastics represent a risk to foetal development. A 2023 systematic review[20] reported evidence that microplastics can translocate from the maternal circulation to the foetus, indicating that the placenta may not constitute a complete barrier to these particles[i]. This raises concern that developing organs and systems could be exposed during critical windows of foetal growth, with potential implications for developmental outcomes. A 2025 systematic review[ii] of developmental and reproductive toxicity highlights that microplastics can induce

inflammation, oxidative stress, and endocrine disruption.

Animal models show effects on foetal growth, placental structure, and offspring development although further research is needed to improve the quality of this data. A 2025 systematic review on pregnancy and early childhood exposure highlights that microplastics are detectable in maternal and neonatal samples in increasing rates and at key developmental stages[iii]. The implication of this is that even low level exposures may have important impacts[20]. Epidemiological evidence links plastic-related exposures to miscarriage, preterm birth, stillbirth, reduced sperm quality, and declining fertility across populations.

**Early life development and long-term health**

The first 1,000 days of life represent a critical window of vulnerability. Exposure to micro- and nanoplastics and plastic-associated chemicals during early development disrupts endocrine, immune, metabolic and neurodevelopmental pathways[1]. These disruptions are linked to increased risks of obesity, diabetes, cardiovascular disease, immune dysfunction, and impaired cognitive outcomes later in life[3].

**Reproductive and Hormonal Health**

Microplastics and associated chemicals act as endocrine disruptors, interfering with hormonal signalling[17]. Systematic human and animal evidence suggests that exposure is suspected to adversely affect reproductive health, including sperm quality, ovarian follicle function, hormone levels and fecundity. Two human observational studies and numerous animal studies support these associations, with evidence graded as moderate to high quality for reproductive outcomes.

Recent studies also report detection of plastic particles in ovarian follicular fluid, raising concern for direct impacts on female fertility.[17] Microplastics have also been detected in placenta and cord blood, with this trend appearing to increase over time[1].

Studies have shown microplastics to be detected in testes and reproductive issues in men, and animal studies show impaired sperm quality and endocrine disruption, but further human investigation is required to prove the link[1].

**Cardiovascular, Neurological, Respiratory and Gastrointestinal Impacts**

Direct human evidence links microplastics to cardiovascular disease. A 2024 study detected microplastics and nanoplastics in carotid artery plaque in 58.4% of patients undergoing endarterectomy, with a more than four-fold increased risk of myocardial infarction, stroke, or death over 34 months of follow-up [5,12].

Emerging evidence also suggests neurological impacts, with higher concentrations of microplastics identified in the brains of individuals with dementia compared with controls[7]. Another study reports associations between micro- and nanoplastic exposure and neurological symptoms such as fatigue, dizziness, and neuroinflammation, although causality in humans remains under investigation[7].

Respiratory effects include asthma, hypersensitivity pneumonitis, and potential increased lung cancer risk due to inhalation of fine plastic particles. Gastrointestinal effects include inflammatory bowel disease–like changes and disruption of the gut microbiota, supported by toxicological and observational evidence[7].

**Cancer, Immune and Inflammatory Disease**

Plastic-associated endocrine disruptors are linked to hormone-related cancers, immune suppression, asthma, respiratory disease, and chronic inflammatory conditions. PFAS (polyfluoroalkyl substances), are widely used, long lasting chemicals, components of which break down very slowly over time. Many PFAs have been found in the blood of people and animals worldwide, as well as in water, air, fish and soil in many locations and exposure may be linked to harmful health effects in humans and animals[16]. Exposure is also associated with impaired immune responses and reduced vaccine effectiveness[3]. Nano- and microplastics have been shown to dysregulate immune responses and promote chronic inflammation, raising concern for long-term disease risk [7].

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**Education, Public Awareness, Regulation and Standards**

Microplastics are everywhere and rising. They are now detected across ecosystems, in food and air, and environmental contamination is projected to increase substantially without intervention.

They reach people and potentially the unborn. Biological plausibility for harm is strong. Laboratory and animal studies link microplastics to inflammation, oxidative stress, endocrine disruption, and altered development—mechanisms that could affect fertility, pregnancy, and child health.

Evidence gaps limit policy and clinical action. Human epidemiology is sparse and methods vary; we need standardised measurement, exposure assessment, and longitudinal studies to determine real-world risks and guide regulation.

Public education converts concern into action—reducing single-use plastics, improving waste disposal, and supporting reuse systems—so that upstream sources of microplastics decline.

Investing in this research protects public health and informs policy. Better data will enable targeted interventions, safer product design, and evidence-based guidance for pregnant people and communities most at risk.

Public awareness of the breadth and significance of microplastic and nanoplastic exposures remains limited. Systematic analyses emphasise that education alone is insufficient to reduce exposure or mitigate risks; coordinated regulatory action, national product standards for plastics and hazardous chemical additives, and monitoring frameworks are essential to protect population health[3,6].

**Research, Monitoring and Policy Gaps**

Although the evidence base is growing, significant gaps remain. Studies vary widely in detection methods, exposure quantification, and outcome assessment, limiting causal inference in human populations [3,6]. Australia lacks comprehensive national biomonitoring, standardised methodologies, and routine surveillance of micro- and nanoplastics and plastic-associated chemicals in humans, food, water, and consumer products .National standards could limit exposure by restricting harmful additives and reducing microplastic shedding in products such as textiles, cosmetics and packaging [1].

The RACGP supports the adoption of a national standard for consumer products to reduce microplastic exposures. In particular a tightening of regulations to reduce microplastic production through reductions in upstream plastic production will have the greatest impact. This could incorporate reduction of virgin plastic use, elimination of unnecessary single use plastic products and the re-design of packaging to embrace reuse and refill. Most microplastics originate from product wear or inclusion of primary microplastics in products hence a focus on reducing production of these materials reduces environmental load and human exposure at the source.

Practical steps for consideration in this standard could include:

- Mandate extended producer responsibility so manufacturers pay for end-of-life management. This will encourage manufacturers to reduce the amount and fragility of plastics entering the environment.
- Improve collection, sorting, and recycling infrastructure to keep plastics in the economy.
- Design for recyclability (mono-materials, easy separation).
- Bans or phase-outs for specific high-risk items (microbeads, certain single-use plastics).
- Product labelling and standards to inform procurement and consumer choice.
- Taxes, subsidies, or quotas to shift markets toward low-plastic alternatives.

**Conclusion**

The available evidence strongly suggests that microplastics, nanoplastics and plastic-associated chemicals are ubiquitous, bioaccumulative, and biologically active human health hazards. Exposure would seem to begin before birth, increases across the lifespan and is associated with reproductive harm, developmental disruption, cardiovascular disease, immune dysfunction, respiratory and neurological impacts, and increased mortality. It is estimated that plastics cause in excess of US$1.5 trillion in annual health related economic losses globally[1].

While further longitudinal human studies are needed, the existing evidence justifies precautionary, population-level action. Urgent regulatory reform, national product standards, improved monitoring, and alignment with international best practice—including the Global Plastics Treaty—are required to protect current and future generations.

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