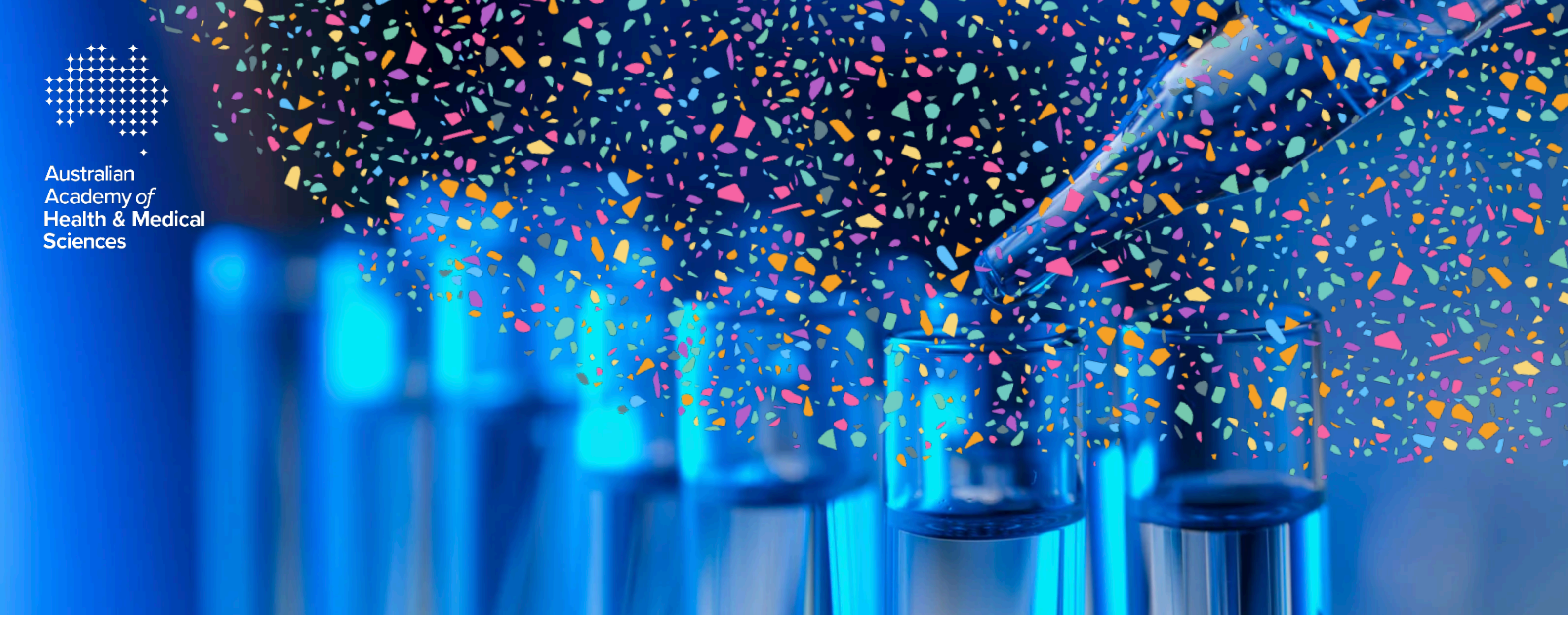

8 April 2026

POLICY STATEMENT

ESTABLISHMENT OF A NATIONAL HUMAN BIOMONITORING PROGRAM

This updated policy statement on the establishment of a national human biomonitoring program from the Australian Academy of Health and Medical Sciences expands on our 2025 policy statement. It integrates evidence from the Academy's evidence brief on microplastics, forever chemicals and other contaminants to update two key recommendations made in our December 2024 submission to the Senate Inquiry into Per- and Polyfluoroalkyl substances (PFAS):[1,2]

Recommendation 1: Commit to establishing a national human biomonitoring (HBM) program that initially focuses on PFAS and other contaminants that can be measured accurately and reliably, with the capacity to expand to additional contaminants (such as micro- and nanoplastics) as measurement techniques and analytical methods mature.

Recommendation 2: Immediately establish an interim program that monitors pregnant women's levels of contaminants.

Policy context and rationale

Australians are exposed to tens of thousands of different contaminants such as per- and polyfluoroalkyl substances (PFAS) and other endocrine disrupting chemicals (EDCs), and micro- and nanoplastics (MNPs). There is currently insufficient evidence to say for certain that any level of exposure to MNPs, PFAS and other contaminants is safe – though this does not mean no safe level exists.[2]

PFAS are a group of nearly 15,000 synthetic chemicals widely present in the environment – including in drinking water, food, and household products.[3,4] Known as "forever chemicals" due to their strong carbon-fluoride bonds, PFAS persist in the environment for decades and, through bioaccumulation, build up in human and animal bodies.[5,6] Human exposure to PFAS occurs through ingestion of food (e.g.. food that is contaminated, or packaged in or cooked with, PFAS-containing products), ingestion of contaminated drinking water, incidental ingestion of dust or soil, and everyday products such as non-stick cookware and food packaging. PFAS exposure also occurs via inhalation – including of everyday house dust, and in occupational settings, and infants are exposed in the uterus and through both breastfeeding and bottle-feeding. PFAS are endocrine-disrupting chemicals that interfere with hormone function. Growing concerns have emerged around the potential health impacts of PFAS bioaccumulation, with early research highlighting the need for further investigation of possible links to immune and reproductive system disruptions, childhood neurodevelopmental disorders, and increased cancer risks.[4,7–9]

MNPs are plastic particles – each with different sizes and properties – that humans are exposed to primarily through ingestion and inhalation.[10,11] Skin contact could be a third potential route, though evidence for direct skin absorption remains limited and the mechanisms are not yet well understood.[12] Everyday sources of MNPs exposure include plastic food packaging and containers (particularly if these are heated, for example in a dishwasher), household dust, water, food, and a wide array of consumer goods. MNPs can contain EDCs and other contaminants, and may act as carriers of PFAS. [13,14]

Ongoing uncertainty about the health risks of exposure to contaminants such as PFAS and MNPs is contributing to public anxiety in Australia, with communities facing higher exposure levels being more likely to experience psychological distress linked to perceived threats to their health.[15]

Confirming or quantifying the potential health risks of contaminants exposure is complex due to a series of intersecting challenges, such as:

- Methods for detecting and measuring different contaminants vary widely in maturity. While PFAS can be accurately and reliably quantified, detecting and measuring nanoplastics remains a major challenge.[16,17]
- The need to track thousands of interacting contaminants, often present at low levels. Contaminants can accumulate and act in combination, but the effects of such complex mixtures remain poorly understood.[18]
- A lack of large-scale bioaccumulation datasets of representative Australian populations that would enable the necessary longitudinal research.

Addressing these challenges requires large-scale research that will only be possible through targeted, long-term monitoring of the levels of PFAS and other chemical contaminants present across all Australian communities.

Recommendation 1: Commit to establishing a national human biomonitoring (HBM) program that initially focuses on PFAS and other contaminants that can be measured accurately and reliably, with the capacity to expand to additional contaminants (such as micro- and nanoplastics) as measurement techniques and analytical methods mature.

> It is the position of the Australian Academy of Health and Medical Sciences that the Federal Government should implement a national human biomonitoring program of contaminants such as PFAS, other EDCs, and – when possible - MNPs.
>
> This will enable researchers to investigate whether there are connections between exposure levels and health outcomes and enable policymakers to develop evidence-based approaches if needed, such as public health interventions and communication strategies.

Australia stands out among comparable nations such as Canada, the US, Germany, South Korea, and Japan for not operating a population-level human biomonitoring (HBM) program.[19,20]

To identify the extent of contaminants bioaccumulation across the population, and then investigate possible connections between exposures and health outcomes, Australia must begin tracking levels of key contaminants that co-accumulate in the human body.

Environmental monitoring of contaminants is valuable, but it is not enough. What is missing is comprehensive data on how these environmental exposures translate into bioaccumulation in the human body. Without a HBM program, we lack the critical information needed to understand the extent of contaminants bioaccumulation across Australian communities and whether there are health impacts.

Case study | National Health and Nutrition Examination Survey (US)

The US operates one of the world's most comprehensive HBM programs through the National Health and Nutrition Examination Survey (NHANES). Since 1999, NHANES has provided nationally representative data on PFAS exposure in approximately 5,000 people aged 12 and over, tracking trends and informing national health policy.[28,29] Key PFAS chemicals such as perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) have been detected in blood samples from nearly all participants.[30] NHANES data collection has been set up so that it can support regulatory decisions, risk assessment, and public health responses, with a robust design that captures high-risk groups.

Australia could benefit significantly from adopting a similarly comprehensive approach, enabling timely, evidence-based responses to chemical exposures across the population.

Implementation guidance:

- **Adopt a staged and adaptive monitoring framework:** Begin with contaminants that can be measured with high reliability (e.g. PFAS, bisphenols, phthalates), while embedding mechanisms to later incorporate additional contaminants (e.g. MNPs) as measuring techniques mature
- **Sample a randomised group of individuals annually**: This would establish population-level baseline exposure levels, making it possible to identify communities have unusually high bioaccumulation. The sample size should be identified through statistical analysis but would likely be smaller than the NHANES sample of 5,000. As research advances, individuals with significantly elevated PFAS levels could be recalled for follow-up testing, health assessments, or targeted interventions if warranted by emerging evidence.
- **Review existing Australian research efforts:** Examine studies such as the Australian National University PFAS Health Study and previous time- and scope-limited national HBM efforts (e.g. the National Health Measures Survey (2002-2003) and the Australian Human Biomonitoring Pilot Project (2020-2021)), to ensure that the HBM program builds on current knowledge and integrates insights from existing research approaches.[21,22]
- **Prioritise co-monitoring of multiple chemical contaminants:** Recognising the potential cumulative risks of chemical mixtures, HBM should include a range of

contaminants, such as PFAS, bisphenols, phthalates, flame retardants, and pesticides.

- **Ensure national representativeness and statistical power:** Use a multi-stage probability sampling design, as in the US NHANES model, to ensure that findings are generalisable to the Australian population and can identify trends and risks in high exposure or vulnerable subgroups.
- **Collaborate with the health and medical research sector:** Work with the Academy and other stakeholders to design an evidence-based, implementable HBM program.[i]
- **Leverage existing national public health infrastructure:** Implement the HBM program through an established national structure – such as the Australian Centre for Disease Control – to ensure coordination, efficiency, and integration with existing health surveillance and response systems.
- **Integrate biomonitoring into national health and policy planning:** Establish formal pathways for HBM data to inform, if needed, public health policy, chemical regulation, and risk assessment processes across government departments. Where appropriate, link HBM data to administrative datasets (e.g. Medicare Benefits Schedule, Pharmaceutical Benefits Scheme, and hospitalisation records) via the Australian Institute of Health and Welfare National Health Data Hub to support analysis of potential health impacts and guide targeted interventions.[16]

Recommendation 2: Immediately establish an interim program that monitors pregnant women's levels of contaminants.

> While Australia works to establish a comprehensive HBM program, the Australian Academy of Health and Medical Sciences recommends that the Federal Government immediately implements an interim program to monitor detectable contaminants such as PFAS in pregnant women.
>
> This priority population is particularly vulnerable to the effects of endocrine-disrupting chemicals, and it is important to understand whether there are health implications for mothers and/or children.

[i] This recommendation was included in the 2025 final report of the Senate Inquiry on PFAS.[27]

Australia is the only OECD country to not survey PFAS levels in pregnant women – despite this being a relatively straightforward measure to implement. While Australia works towards establishing a national, population-wide HBM program, it should begin monitoring PFAS and other chemical contaminants in pregnant women.

Case study | Maternal-Infant Research on Environmental Chemicals (Canada)

Canada provides a strong model for interim PFAS monitoring through its Maternal-Infant Research on Environmental Chemicals (MIREC) Study, led by Health Canada since 2008.[31] This national cohort study tracks environmental chemical exposure in the same group of pregnant women and their children over time, collecting biospecimens throughout pregnancy and early childhood.[32] The program monitors over 200 substances, including PFAS, heavy metals, pesticides, flame retardants, and plasticizers.[33]

Critically, MIREC data is set up so that it can directly inform Canadian public health policy, including chemical risk assessments, drinking water guidelines, and international reporting obligations.[34]

A similar, targeted initiative in Australia could yield vital data on gestational PFAS exposure, enabling timely health research and supporting evidence-based protections for vulnerable populations, if needed.

Collecting these data would allow Australian researchers to investigate potential links between gestational and infant exposure to mixtures of endocrine-disrupting PFAS and other chemicals, and child health outcomes. It is currently not clear whether such links exist, but it is important to establish the evidence needed to inform the public and enable evidence-based policy and communication approaches if needed. Early research again suggests there is a need to explore whether such exposure could be associated with disrupted neurodevelopment, but this research can only proceed once robust, population-level exposure data are available. [9,18,23]

Implementation guidance

- Review existing Australian birth cohort studies: Examine studies such as the Barwon Infant Study and Generation Victoria to inform the design and implementation of an interim biomonitoring program for pregnant women.[24,25]

- Leverage existing antenatal testing pathways to minimise burden and cost: PFAS testing could be readily integrated into the routine gestational diabetes blood tests conducted at 24-28 weeks of pregnancy for all Australian women.[26]
- Ensure informed consent and culturally appropriate communication: Clear, evidence-informed protocols for obtaining consent and explaining the purpose of PFAS testing should emphasise that this is not diagnostic, helping to reduce unnecessary anxiety and support informed, confident participation.
- Integrate PFAS monitoring into established maternal and child health data systems: Use systems such as the National Perinatal Data Collection, to streamline data collection and enable linkage with long-term health outcomes.
- **Design a system that can be expanded to include other contaminants**, such as micro- and nanoplastics, as techniques for measuring these develop.
- Enable follow-up studies: Ensure the interim program is designed to facilitate future long-term follow up of mothers, and work with the National Health and Medical Research Council to fund this longitudinal research into potential health impacts of early-life chemical exposure. It would be valuable to include fathers in future studies to explore potential associations between paternal PFAS exposure and child health outcomes.

Authorisation

This statement was approved for publication by the Australian Academy of Health and Medical Sciences' President, and the Chair of its Policy Advice Committee on 8 April 2026.

Australian Academy of Health & Medical Sciences

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