

Climate Health WA Inquiry

About your submission

Are you responding on behalf of an organisation or group?

No

Yes

If yes, please identify the organisation:

Your contact details

The following information will not be published without your permission but enables the Inquiry to contact you about your submission if required.

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Publication of submissions

Submissions will be published with the name of the submitter unless otherwise indicated below. Do you consent to be identified in the published submission?

Yes, I / my organisation agree to be identified

No, I / my organisation request to remain anonymous

Terms of Reference

You are encouraged to address at least ONE of the Terms of Reference as listed below. Please select which item/s you will address:

1. Establish current knowledge on the implications of climate change for health in Western Australia (WA) and recommend a framework for evaluating future implications.

2. Identify and recommend a program of work to manage the implications of climate change for health in WA, which will protect the public from the harmful health impacts of climate change.

3. Identify and recommend a program of work to manage the implications of climate change for health in WA, which will strengthen the preparedness and

resilience of communities and health services against extreme weather events, with a focus on the most vulnerable in the community.

- 4. Identify and recommend a program of work to manage the implications of climate change for health in WA, which will reduce the contribution of WA health services to climate change and other detrimental impacts.
- 5. Identify and recommend a program of work to manage the implications of climate change for health in WA, which will enable WA Health services to implement change, including energy efficiency, to a more sustainable model.
- 6. Evaluate the likely benefits (health and wellbeing, social and economic) arising from climate change mitigation strategies, with a focus on WA health services.
- 7. Define the role of the Department of Health in leading public policy on climate change and health.
- 8. Recommend the Terms of Reference, scope and preferred methods for undertaking a climate change vulnerability assessment for the health sector.
- 9. Recommend the Terms of Reference, scope and preferred methods for developing a Climate Change Adaptation Plan for the health sector.

Submissions response field

Please type your response to the item(s) selected above into the field below. Alternatively you may provide your submission as a separate attachment (suggested maximum 5 pages).

Plastic has revolutionised modern human life,¹ however, it is estimated that there are now >5 trillion pieces of plastic litter and debris, weighing 268,940 tons afloat at sea.² Plastic debris enters the marine and urban environments from continental rivers, industrial and urban effluents, compost, landfill, and oil and gas mining.^{3,4} Microplastics result from the UV breakdown of larger plastic fragments, and can be found as fibres and fragments less than 5mm in size.⁵

Consumption of microplastics can cause adverse health impacts, such as intestinal damage, alteration to fertility, metabolic abnormalities and act as carriers for both heavy metals and pathogenic bacteria.³ In mice, consumed microplastic accumulated in the liver, kidney and gut cells, causing widespread biochemical disturbances and neurotoxic effects.⁶ Furthermore, in-vitro studies indicate that microplastic may interact with the immune system, triggering inflammatory reactions and oxidative stress in humans.^{7, 8, 9}

We may be inadvertently consuming microplastic particles through contaminated seafood, salt, water and potentially many other products processed and packed in plastic. A single pilot study, examining human faecal samples from Europe, detected microplastics in all eight samples examined.¹⁰ The lack of literature surrounding presence in food and consumption by humans requires urgent examination.

Edith Cowan University is currently conducting a pilot study to determine whether microplastics are also present in the Western Australian food supply, the extent of contamination, and associations with dietary intake. The project will form links with

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UWA, Curtin University and industry. Dependent on the research findings, we will work with the agricultural, food manufacturing and water treatment sectors to optimise practices, and further examine potential risks to public health. Ultimately, this research hopes to inform public health practice and policy to ensure a healthier food supply for all Australians.

Recommendations for WA DoH

As the data from the project may be controversial in nature, and potentially alarming from a public health nutrition perspective, communications will be carefully managed with consultation with WA Health Department and other key stakeholders.

In consultation with WA DOH and other key stakeholders to determine and implement appropriate actions /recommendations to minimise and management plastics in the food supply and food environment.

References

1. Anbumani S, Kakkar P. Ecotoxicological effects of microplastics on biota: a review. *Environ Sci Pollut Res Int.* 2018;25(15):14373-96.
2. Eriksen M, Lebreton LC, Carson HS, et al. Plastic Pollution in the World's Oceans: More than 5 Trillion Plastic Pieces Weighing over 250,000 Tons Afloat at Sea. *PLoS One.* 2014;9(12):e111913.
3. Barboza LGA, Dick Vethaak A, Lavorante B, Lundebye AK, Guilhermino L. Marine microplastic debris: An emerging issue for food security, food safety and human health. *Mar Pollut Bull.* 2018;133:336-48.
4. Hurley RR, Nizzetto L. Fate and occurrence of micro(nano)plastics in soils: Knowledge gaps and possible risks. *Current Opinion in Environmental Science & Health.* 2018;1:6-11.
5. Duis K, Coors A. Microplastics in the aquatic and terrestrial environment: sources (with a specific focus on personal care products), fate and effects. *Environmental Sciences Europe.* 2016;28(1):2.
6. Deng Y, Zhang Y, Lemos B, Ren H. Tissue accumulation of microplastics in mice and biomarker responses suggest widespread health risks of exposure. *Sci Rep.* 2017;7:46687.
7. Lusher A. Microplastics in the Marine Environment: Distribution, Interactions and Effects. In: Bergmann M, Gutow L, Klages M, editors.

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Please type your response to the item(s) selected above into the field below. Alternatively you may provide your submission as a separate attachment (suggested maximum 5 pages).

8. Marine Anthropogenic Litter. Cham: Springer International Publishing; 2015. p. 245-307.
8. Wright SL, Kelly FJ. Plastic and Human Health: A Micro Issue? Environ Sci Technol. 2017;51(12):6634-47.
9. Schirinzi GF, Pérez-Pomeda I, Sanchís J, Rossini C, Farré M, Barceló D. Cytotoxic effects of commonly used nanomaterials and microplastics on cerebral and epithelial human cells. Environmental research. 2017;159:579-87.
10. Liebmann B, Koppel S, Königshofer P, Bucsis T, Reiberger T, Schwabl P. Assessment of microplastic concentrations in human stool: Final results of a prospective study. Microplastics; 28-31 October Ascona, Switzerland 2018.

Please complete this sheet and submit with any attachments to: Climate Health WA Inquiry