Eliciting Willingness to Pay for Precautionary Abatement of Microplastics

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What do we study?

- **What do we do?**
  - This study examines Willingness To Pay (WTP) for precautionary reductions in the potential risks from microplastic ingestion using both public and private good scenarios.

- **Why?**
  - Environment Agency interested in European Chemicals Agency proposal to restrict microplastics.
  - Costs of a restriction are estimated but not benefits.
  - Long literature on valuation under uncertainty and irreversibility but not much empirical work.

Why?

- **Why do we do it?**
  - Microplastics are irreversibly-released with potentially irreversible effects.
  - Uncertain human health effects.
  - Evidence of adverse health effects on marine life.
  - Effects ecosystem services through reduced carbon sequestration and reduced water quality.

- **Further reading:**
  - **Duis and Coors (2016):**
  - Marine organisms ingest microplastics but concentrations are lower than threshold levels. Trophic transfer and bioaccumulation are possible, but unlikely.
  - **Thompson et al (2019):**
  - “Evidence for effects in humans is still limited and there is a need for further research”
  - **Lebreton et al (2019):**
  - "Concentrations of microplastics in the environment are forecast to progressively increase as they are almost impossible to remove once dispersed within the environment and persist almost indefinitely“

How?

- **How do we do it?**
  - Stated-Preference survey to value benefits of restrictions in WTP-terms.
  - No viable market prices as an alternative approach.
  - Estimate WTP using two Contingent Valuation (CV) tasks and one Choice Experiment (CE)

- **Tasks:**
  - **CV task one:**
    - WTP for researching microplastics but no immediate effect on loss of microplastics to the environment (resolve uncertainty).
  - **CV task two:**
    - WTP to invest in improved wastewater treatment plants (WWTP) that would filter out more microplastics without understanding them further (resolve irreversibility).
  - **CE:**
    - Tradeoff cosmetic product attributes to understand value of marginal product changes.

What do we find?

- **CV task one:**
  - Median WTP: £53.30
  - Many protests against use of money purely for research
- **CV task two:**
  - Median WTP: £73.71:
  - Greater WTP indicates a premium for precautionary abatement.
- **CE:**
  - Emissions attribute: £0.038
  - Performance attribute: -£0.045
  - Consumers are willing to pay for reformulations to substitute out microplastics, but impose a penalty if there is any accompanying loss of product performance.

- **Overall:**
  - There is a substantial value in precautionary restrictions on microplastics.

- **What next?**
  - Any thoughts let me know: p.m.king@bath.ac.uk
  - Curious about how to use in further models.