THE CAR WASH PILOT STUDY
Just how much COULD you ingest?

A novel approach to quantify indirect ingestion of recycled water: Improving the evidence base for water guidelines

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OBJECTIVE
To measure how much water spray might be accidentally swallowed while car washing using cyanuric acid (CYA) as a “tracer” chemical.

DRIVER
Current water treatment guidelines for non-potable water are based on “guesstimates” of how much is swallowed by accident during garden watering etc. Before this work, limited actual data existed for spray exposures.

RESULTS
• Average CYA excretion from known dose test was 86.3%
• 18 of 26 participants had swallowed enough water during the 10 minute car wash test for tracer to be detectable in urine
• Ingestion ranged from below limit of detection to > 3 mL

POTENTIAL APPLICATIONS
• Generate empirical data on exposure volumes for water-using activities to replace current estimates for QMRA
• Ability to investigate and compare:
  • specific scenarios of interest
  • interventions to reduce exposure
  • proposed new applications for non-potable waters
• More certainty for regulators and industry about exposures and potential health risks.

KEY MESSAGE:
The pilot study demonstrated that small quantities of inadvertently ingested water can be measured. This approach can now be used to test a variety of recycled water exposure scenarios.

Limitations
• Ambient conditions are fairly constant in the laboratory setting
• Little variation in water pressure, spray setting
• Mainly male participants (23/26)

Implications for guidelines
Dual reticulation housing developments
• High pressure spray exposure from various activities has a very small effect on total recycled water exposure (an extra 13.1 mL /year compared to 670 mL from other water uses) so there would be little change (< 0.01 log10) in pathogen removal requirements.

Occupational exposures
• Assuming 4 hours per day using high pressure spray = 749 mL/year (5 days/week, 48 weeks/year) - maybe higher with physical exertion, greater exposure (Log10 removals may need to be higher than for dual reticulation use, or use of personal protective equipment (face mask) may be required)

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Recruit Participants

Consent, Assign Participant number and randomise

Known dose test for CYA N=12

Car wash test with CYA spiked water N=26

Urine Collection 24 hours

Urine Collection 24 hours

SPE Clean up GC/MS Analysis

Evaluation of results

Volunteers wore protective covering - only faces and hands were exposed

Domestic high pressure sprayer was used for 10 mins