

Remediation of Faulty Septic Tanks: A Mixed Methods Approach to Environmental Risk Communication (REMARC)

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What did the research aim to address?

Domestic waste water treatment systems (DWWTSs) (e.g. septic tanks) constitute the sole means of waste water disposal for approximately 500,000 households in Ireland. While well designed, located and maintained systems can treat waste water effectively, malfunctioning or poorly designed systems can result in the discharge of untreated effluent to adjacent surface water and groundwater bodies, causing significant environmental and public health risks. This is problematic, as the EPA's annual DWWTS inspection data show that approximately half of inspected households routinely fail their inspection. Moreover, there is growing concern over the high number (500+) of unresolved advisory notices nationally, where households that failed their inspection 2 or more years ago have yet to undertake the remediation works required.

The Remediation of Faulty Septic Tanks: A Mixed Methods Approach to Environmental Risk Communication (REMARC) project investigates the barriers to DWWTS remediation through a national household survey of DWWTS users and eliciting the views of local authority officials (i.e. DWWTS inspectors and planners). This unique approach brings together both lay and expert views in the development of new policy solutions to effect the behavioural change required to foster better environmental and public health outcomes.

What did the research find?

Project findings illuminate a range of policy gaps and top-down management challenges (which remain largely underexplored to date), as well as key determinants of householder system management. At the policy/regulatory level, a lack of regulatory oversight for onsite system installation and the absence of licensing/monitoring regimes for system installers emerged as key concerns. At the local authority (i.e. top-down) level, interviews identified staff capacity issues, inspection enforcement challenges, grant restrictions and deficiencies in public engagement as key challenges

to DWWTS remediation. At the household (bottom-up) level, the survey identified that appropriate levels of system desludging were more common among system owners reporting high confidence in undertaking system maintenance actions and prior exposure to system maintenance information. Financial cost emerged as a central barrier to both routine and remedial system maintenance. Agent-based modelling (simulating future system maintenance behaviours) identified that intensified risk communication interventions and financial incentives represented the most impactful future strategies. Based on the results, the project offers an evidence-based risk communication framework that systematically outlines recommended policy measures, engagement strategies and information items.

How can the research findings be used?

The project team will now concentrate on disseminating research findings through various channels, including peer-reviewed journals and international conferences. To date, findings have been published in *Science of the Total Environment*, with several more papers in preparation. We have also engaged with the public by accepting invitations to speak on the radio and through other media channels (e.g. EPA videos/events), which will continue post project.

Plans are also under way to host an in-person knowledge-transfer event in conjunction with the UCD Earth Institute to engage with key stakeholders and relevant policymakers to communicate key recommendations and maximise impact. The project findings can be employed in a variety of policy spheres, and the team will scope and respond to public consultations and information events in relevant policy spaces as they arise (e.g. the government's review of the sustainable rural housing guidelines, the EPA's consultation on the National Inspection Plan). This can be a highly effective route to knowledge transfer and the take-up of evidence-based recommendations generated by the REMARC project to bring about environmental and health benefits.

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