What risk does crop irrigation with reclaimed municipal wastewater represent with respect to the transmission of antimicrobial resistance to humans?

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Background and Aim: Climate change associated water stress in the dry southern regions of Europe, Australia and the US South West is threatening food security. In this context, irrigation of crop ground with effluent from municipal wastewater treatment plants is a practice that is become more widely adopted. Sewage effluents can contain pharmaceuticals, other micropollutants, and enteric bacteria including those that carry antibiotic resistance genes. The European Commission has recently set standards for the quality of effluents to be used in crop production with the abundance of viable *E. coli* as the only microbiological endpoint of concern. https://environment.ec.europa.eu/publications/minimum-requirements-water-reuse-guidelines_en. There is currently no provision for including risk of AMR transmission in the standards. Therefore, the key aim of the work to be done here is to provide policy makers with evidence concerning what risk this practice might represent from the perspective of AMR transmission, and options for managing transmission risk.

Objectives: In 2023 the medical research council of France (INSERM) selected a research team (the MEHTA project; managing environmental hotspots and transmission of AMR) to evaluate the sewage treatment-to-farm-to-gut risk of AMR transmission from crop production systems that are irrigated with sewage effluent. Outcomes of the project will include 1. Impact of tertiary treatment methods on water microbial and chemical quality; 2. Persistence of microbial and chemical contaminants in crop production systems; 3. Predicted no effect concentrations (PNECs) of antibiotics entrained into soils; 4. Microbiological and chemical quality of irrigated crops. 5. Impacts of consumption of irrigated crops on the resistome and mobilome of the human gut microbiome.

Implications: Results from the MEHTA project will help inform policy and practice with respect to water reuse from the perspective of AMR transmission risk.