A Flushing Revelation

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Recent advances in water testing have allowed for the identification of many new contaminants at extremely low concentrations. This includes not only industrial chemicals, but also pharmaceuticals and personal care products (PPCPs). The origins of PPCPs as an environmental and health issue are related to the discoveries in the 1990s of reproductive disorders in aquatic wildlife, such as fish near wastewater treatment plant effluent. There is also evidence of feminizing occurring, where male organisms develop male characteristics, such as the ability to produce eggs.

By the late 1990s, evidence had accumulated that many substances could mimic the effects of hormones like estrogen, or otherwise disrupt the functioning of the endocrine system. In animals, these effects happened at vanishingly low concentrations – micrograms per litre of water – and even down to nanograms per litre of water.

During the same period, the use of pharmaceutical products has skyrocketed: in humans, for birth control and therapeutic purposes; and livestock, for growth promotion and disease prevention.

A significant concern is that 25-90 per cent of the active ingredients of these drugs are excreted. In the case of antibiotics, widespread use has led to rising antimicrobial resistance (AMR) in bacterial pathogens. While the low concentrations of antibiotics detected in water probably do not led to resistant bacteria in surface water, it remains uncertain whether waste-water treatment facilities play a role in maintaining or promoting AMR.

For sub-therapeutic levels of drugs, and for most other emerging contaminants, there is not yet enough scientific information to be certain of possible health effects in humans.

In general, it is better environmental policy to restrict potential pollutants at the earliest possible stage. For some substances, this means not using them or at least curtailing the amounts used. However, at this point there is not enough scientific information to develop restrictive legislation and regulations, or even comprehensive, prioritized phase-out strategy, especially for endocrine-disrupting substances. Moreover, since many human-use drugs are medically important and are excreted by people, it will still be necessary to rely on wastewater and drinking water treatment to provide barriers to the presence of some pharmaceuticals in water. There is an urgent need for more science, along with a precautionary approach that encourages individuals and all sectors of society to move as far as possible toward a culture of environmental stewardship.

For more information on the dangers of PPCP contamination, and recommendations to mitigate their risks, read the Canadian Institute for Environmental Policy's report, There is no "Away": Pharmaceuticals, Personal Care products, and endocrine disrupting Substances : Emerging Contaminants Detected in Water. It can be found at www.cielap.org.