OECD Water: Extra WWTP-treatment not the best solution for medical residues

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End-of-pipe upgrades of Waste Water Treatment Plants (WWTPs) are costly, energy intensive and toxic transformation products may be formed. OECD Water researchers claim that prevention early in a pharmaceutical's life cycle may deliver the most long-term and large-scale benefits.Â "However, in combination with other approaches, extra treatment at the level of WWTPs may play a role in protecting the environment", states the OECD water reportÂ Pharmaceutical Residues in Freshwater: Hazards and Policy Responses, published on 13 November.

Not so long ago the European Environment Agency (EEA) stated more investments are needed to make urban Waste Water Treatment Plants (WWTP's) fit to meet the difficult challenges posed by the impacts of climate change and the presence of antibiotics and other micro-pollutants in waste water. But when it comes to pharmaceutical discharges it appears to be just a limited part of the solution. In many countries current policy approaches to manage pharmaceutical residues in water are often reactive. According to the report such approaches are ill-adapted to emerging challenges. About 2.000 active pharmaceutical ingredients (APIs) are being administered worldwide in prescription medicines, non-prescription drugs and veterinary drugs, the residues of which are of increasing environmental concern as the number and density of humans and livestock requiring healthcare escalates. Most OECD countries have already established watch-lists and voluntary monitoring programmes for certain pharmaceuticals in surface water.Â "But the majority of APIs, metabolites and transformation products remain unmonitored and without ecotoxicity data. There are therefore a number of uncertainties associated with the environmental risk assessment of pharmaceuticals due to lack of knowledge concerning their fate in the environment and impact on ecosystems and human health, and the effects of mixtures of pharmaceuticals and other chemicals", states the report.

Advances in monitoring technologies and modelling can help close the knowledge gap and support policy responses. Real-time in-situ monitoring, passive sampling, biomonitoring, effects-based monitoring, non-target screening, hotspots monitoring, surrogate data methods, early-warning systems and holistic modelling can help identify and prioritise APIs in the environment. Country and international initiatives are crucial to improve the knowledge base and exchange of data, methodologies and technologies to address risks between countries and sectors. All stakeholders along the pharmaceutical chain have a critical role to play in the transition to more effective management of pharmaceutical pollution. OECD:Â "Voluntary participation alone will not deliver. Economic and regulatory drivers from central government are needed. Policy-makers will need to factor in financing measures for the upgrade, operating and maintenance costs of wastewater treatment plants, as well as policy transaction costs to facilitate the transition from reactive to proactive control of pharmaceutical residues in water bodies."Â The effectiveness of different solutions depends on collaboration across several policy sectors and the adoption of the life cycle approach. Taking action through pharmaceutical design, authorisation, manufacturing, prescription, over-the-counter purchases, consumer use (patients and farmers), collection and disposal and wastewater treatment. A focus on preventive options early in a pharmaceutical's life cycle may deliver the most long-term and large-scale environmental benefits.

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