Managing the impact of drugs in the European environment

A recent report raises awareness of the impact of pharmaceuticals in the environment. Experts from science, industry and the state sector have drawn up a series of proposals for actions that need to be taken at the European level to increase understanding and improve management of the risks.

The size of the pharmaceuticals market in Europe has grown and both human and veterinary medicines have the potential to harm the environment, particularly through wastewater. Despite advances in personalised medicines, ageing populations are likely to increase the consumption of medicines in the future, potentially increasing the bioaccumulation of drugs in the environment.

Two examples of pharmaceuticals adversely affecting wildlife have been well documented: ethinyl estradiol (EE2), a derivative of the hormone oestrogen, is thought to be responsible for feminising male fish. Diclofenac, which is used as an anti-inflammatory drug in cattle, has killed millions of vultures in Asia that have eaten the bodies of dead animals. However, the impact on small organisms may be less obvious and therefore not reported.

Recommendations for action from the experts include:

1. Assess the impact of drugs across the whole life-cycle, from production, through consumption to disposal. Regulatory frameworks are based largely on the impact of single drugs and need to be updated to reflect the possible impact mixtures of pharmaceuticals might have in the environment.

2. Develop greener pharmacy. Green pharmacy has been defined as “the design of pharmaceutical products and processes that eliminate or reduce the use and generation of hazardous substances along the whole life cycle”. Pharmaceutical companies should be offered incentives to adopt a green chemistry approach. Rather than imposing extra costs or penalties on non-green products, the patent period for a green drug could be extended, for example. In addition, research in the EU should be directed towards developing greener drugs that break down after use.

3. Improve waste management. In order to reduce the disposal of pharmaceuticals in household waste, schemes in which pharmacies take back unused drugs should be harmonised in the EU. Proposals for changes to the EC Directive on human medicines should include extending the risk-benefit balance to incorporate environmental risks in addition to public and patient health risks. Many drugs enter the environment through wastewater. Sewage contains drugs and by-products eliminated from the body and householders flush unused drugs down the sink. Wastewater treatment plants vary in their ability to remove pharmaceuticals depending on the type of drug and type of water treatment: modern methods, such as ultraviolet treatments or advanced oxidation processes, should be considered.

4. Ensure information on the effects of pharmaceuticals on the environment is available to guide the public and policymakers, including EU and government authorities, pharmaceutical companies, health care staff, patients and water authorities. An environmental risk classification scheme, such as is in use in Stockholm, could be extended across Europe.

Enhanced monitoring of the fate and impact of pharmaceutical products in the environment is required. In addition, the experts suggest it would be beneficial to have a European database of research projects and results.


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