Pharmaceutical waste in the environment: a neglected threat

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The first alerts of antibiotics in the environment triggering antimicrobial resistance (AMR) date to the 1940s, and the current environmental impact of pharmaceutical waste goes far beyond AMR. Increased levels of pharmaceutical waste in surface water may be toxic for the environment and cause health-related problems. However, the global environmental risks and health hazards caused by pharmaceutical waste in the soil, surface water and groundwater are neglected by many policy-makers in health systems. Pharmaceutical waste comes from manufacturing plants, e.g. by-products of manufacturing processes, or rejected batches; healthcare facilities, e.g. expired products; and households, e. g. unused or expired medicines. An excess of waste is triggered by poor stock management and irrational use. Pharmaceutical waste requires specific, safe processing, but inadequate disposal is common. Many resourcelimited countries lack (adequate) regulation on safe disposal, and/or the infrastructure to conduct it correctly, e.g. semi-industrial Abstract incinerators. During conflicts and natural disasters, challenges are aggravated by poor donation practices: unsolicited pharmaceuticals with past or near expiry dates reach countries that cannot use them nor implement safe elimination. Furthermore, environmental toxicity data are lacking for 88% of medicines, and (public) data on pharmaceutical environmental concentrations is not available in most countries. Global health researchers should engage in multidisciplinary projects, linking-up with environmental health and pharmacy experts, to describe the causes and extent of pharmaceutical waste by regions; to test the effectiveness, safety and feasibility of contextadapted disposal methods; and to guide policymakers to minimize pharmaceutical pollution, and related harm to public health and the environment.

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