

Addressing Medication Waste and Drug Disposal in Europe: The Clinical Pharmacist's Contribution to Global Environmental Sustainability - Results from the DISPOSAL Study

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Background and importance

Improper disposal of unused or expired medicines is a global concern, as it contaminates water systems and landfills and contributes to antimicrobial resistance. Numerous reports highlight the scale of pharmaceutical waste and link it, among other factors, to medication non-adherence. However, limited evidence exists on how healthcare professionals—particularly clinical pharmacists—can support interventions to reduce waste, improve adherence, and promote safe disposal.

Aim and objectives

This study aimed to investigate real-world practices across Europe related to the management and disposal of unused or expired household medicines. The objective was to identify areas in which clinical pharmacists can contribute to reducing medication waste, fostering proper disposal practices, and minimising environmental impacts.

Materials and methods

Stemming from the IHI ENKORE Project, this European online expert survey assessed national legislation, awareness campaigns, and disposal practices for unused household medicines. The survey examined the volume of pharmaceutical waste generated, as well as economic aspects, including costs and financial responsibilities for disposal. Data from 35 European countries were analysed to identify cross-country differences and define priority areas where clinical pharmacists can play a significant role.

Results

In most countries, neither medication packaging nor public campaigns provided patients with detailed information on how to manage unused medicines safely and in an environmentally responsible manner, leaving pharmacists as one of the few accessible sources of guidance for patients.

Most national collection systems for unused drugs involved pharmacists - obligatory collection in pharmacies was reported in 16 countries, while voluntary schemes operated in 8 (Figure 1), positioning community and clinical pharmacists as central actors in organised medicine take-back systems.

In real-world settings, the most common disposal practice was returning unused medicines to community pharmacies (23 countries), highlighting the role of pharmacists in facilitating safe disposal. However, in 7 countries, the most common method was discarding them in household waste (Figure 2). Consequently, a substantial proportion of unused medicines were disposed of improperly, leading to environmental pollution and underscoring the need to further empower and integrate pharmacists in patient education and disposal pathways.

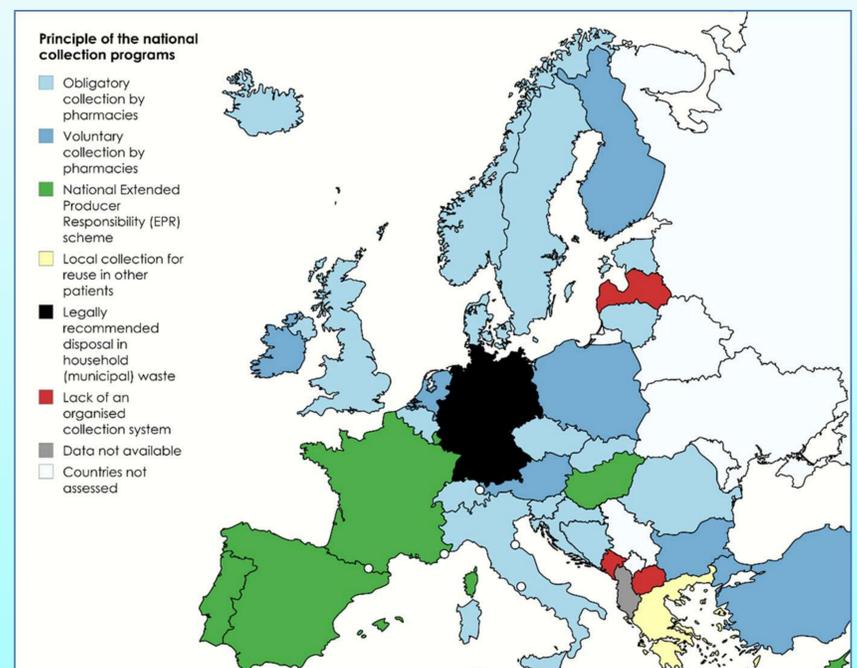


Figure 1. Principles of national collection systems of unused or expired household medicines

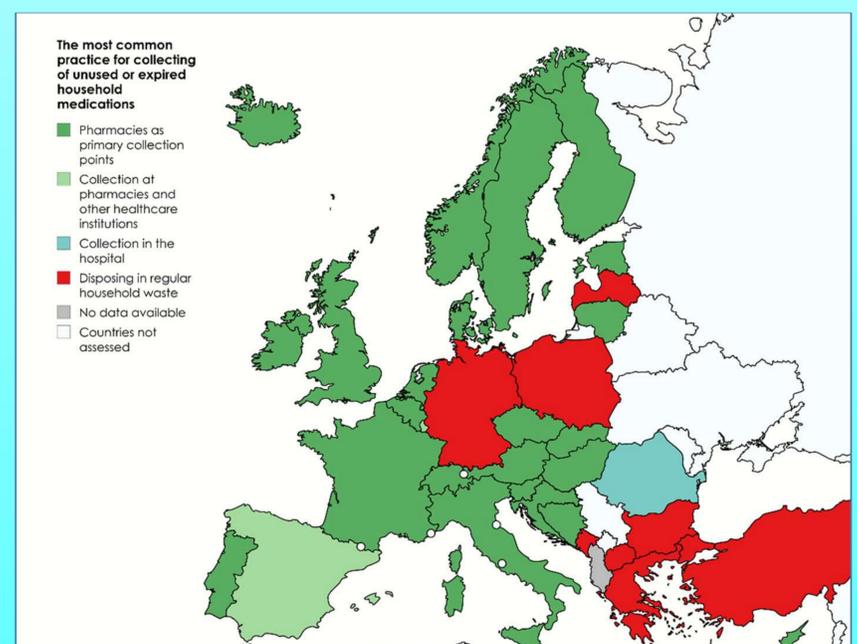


Figure 2. The most common disposal practices of unused or expired household medicines

Conclusions and relevance

Unused and expired medicines remain a persistent and costly problem with serious implications for health systems and the environment. With their expertise in medication management, clinical pharmacists are well positioned to address this challenge by counselling patients on proper use, adherence, and—where appropriate—safe disposal of unused medicines. Their more frequent involvement can help reduce pharmaceutical waste, limit environmental harm, and strengthen healthcare sustainability. This provides a strong incentive to broaden the scope and availability of clinical pharmacy services across Europe.

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Reducing Medication Waste



ENKORE Project



European call for action