Polypharmacy, Aging, and Medication Waste in Europe :

Call for action

Executive Summary

Medication waste has become a critical and largely underestimated challenge for European healthcare systems, with profound environmental, economic, and clinical implications. The issue directly contradicts healthcare's mission to promote health and sustainability. Research published in The Lancet Planetary Health shows that healthcare accounts for 5.2% of Europe's total greenhouse gas emissions—248 million tonnes of CO_2 annually—of which pharmaceutical supply chains are responsible for 71%. A significant share of these emissions is linked to medication waste.

Although comprehensive EU-wide figures are scarce, the estimated annual value of unused medicines in the European Union amounts to approximately **€2.8 billion.** National studies illustrate the magnitude of the problem:

£300 million

in wasted medicines annually in primary care in England.

€1 billion

worth of unused medicines every year in Greece.

17,600 tonnes

of expired medicines disposed by households annually in six EU nations.

Belgium, Austria, Spain, and other EU countries report similarly concerning levels of unused or discarded pharmaceuticals.

Implications

1. **Environmental:** Pharmaceutical residues are now ubiquitous in European water bodies, including drinking water supplies. Their persistence in the environment contributes to risks for aquatic ecosystems, the spread of antimicrobial resistance, and potential long-term effects on human health.

2. **Economic:** Wasted medicines represent billions in lost resources that could otherwise support care delivery. Additional costs arise from environmental clean-up and take-back programs.

3. **Care Quality & Patient Safety:** Medication waste reflects poor adherence, overprescribing, or fragmented care. It is a symptom of inefficiencies that undermine patient health outcomes and increase preventable hospitalizations.

4. **Supply Chain Paradox:** Europe simultaneously faces medicine shortages and large-scale waste, underscoring structural inefficiencies in pharmaceutical management.

Key Drivers

1. **Medication Non-Adherence:** Up to 50% of medicines for chronic conditions are not taken as prescribed, leading to unnecessary stockpiling and waste.

2. **Polypharmacy and Prescription Changes:** Particularly in aging populations, frequent treatment adjustments and deprescribing generate leftover medicines.

Key Drivers

3 **Patient Mortality:** Medicines often go unused when patients die, especially in end-of-life care.

4 **Weak Medication Management Systems:** Manual inventory and dispensing processes in hospitals are prone to errors, oversupply, and expirations.

Solutions

Two major strategies are highlighted:

Automated Dose Dispensing (ADD):

- Prepares patient medications in individualized unit-dose or multi-dose pouches.
- Enhances adherence, reduces confusion, and minimizes oversupply by aligning dispensing cycles (e.g., 14 days) with current treatment needs.
- Smart dispensers can provide real-time adherence data to pharmacists, enabling timely interventions.
- Proven to reduce medication returns by up to 90% in pilot studies, improve safety, and cut unnecessary prescriptions.

Automation and Digitalization of Hospital Medication Management:

- Tools such as inventory robots, unit dose distribution systems, automated dispensing cabinets, and traceability platforms reduce errors, optimize stock, and prevent expirations.
- EU-wide implementation could save an estimated €574 million annually in medication waste.
- Requires an estimated investment of €2.9 billion across EU hospitals.

Policy Recommendations

To address the systemic challenge of medication waste, FEAM proposes:

1. Integration into EU Legislation:
Incorporate specific provisions on minimizing medication waste into the final Critical Medicines Act and Pharma Package, including ADD systems, real-time adherence monitoring, and medication management automation in acute care settings.

2. Regulatory and Funding Support at Member State Level:

- Adapt national regulations to enable ADD implementation.
- Dedicate funding mechanisms to scale up both community- and hospital-based solutions.

3. EU-Level Dedicated Investment Programme:

- Establish a €3 billion programme under the next Multiannual Financial Framework (2028–2035).
- Focus on interoperable IT systems, e-prescribing, stock monitoring, and automation in hospitals.
- Complement existing EU4Health and Critical Medicines initiatives.

CONCLUSION

Medication waste in Europe is a silent crisis with measurable costs to the environment, public health, and healthcare budgets. Tackling it requires a shift from passive collection schemes toward proactive strategies that integrate smart technologies, automation, and adherence support. By adopting these policy recommendations, the EU can simultaneously reduce waste, improve patient outcomes, strengthen supply resilience, and advance its broader sustainability agenda.