



# MANAGEMENT OF PHARMACEUTICAL HOUSEHOLD WASTE

Guidance for efficient management of unused and expired  
medicine

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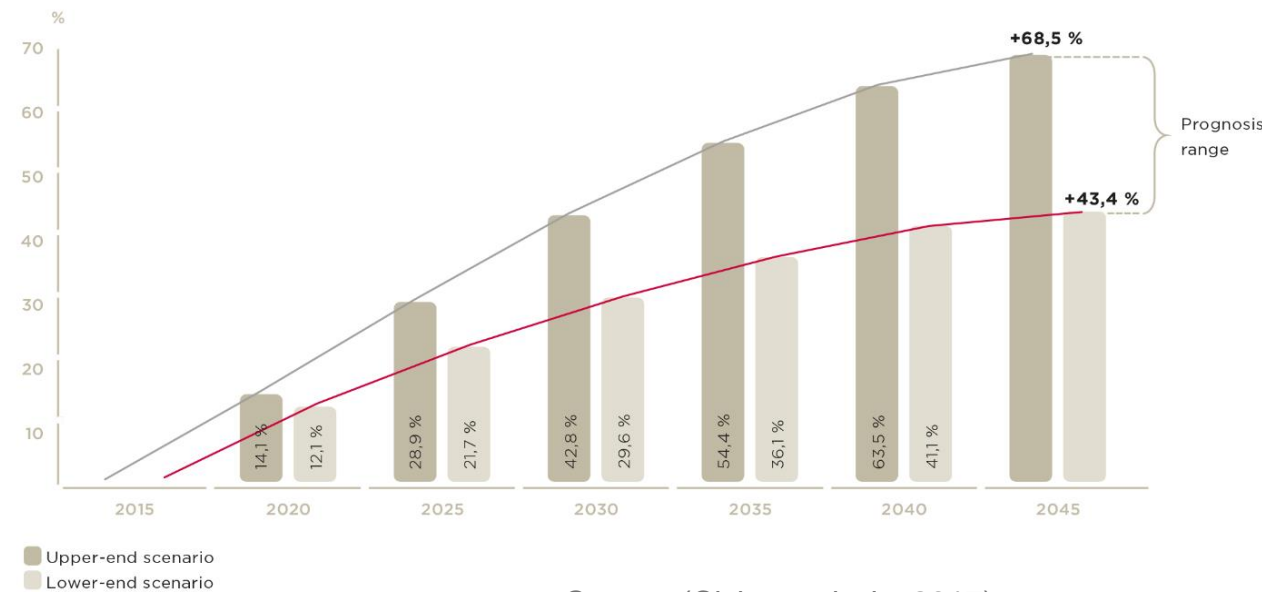
# Pharmaceuticals consumption has increased and is projected to increase further

Per capita drugs consumption 2000 and 2015, OECD average  
[Defined daily dose, per 1 000 people per day]

	2000	2015	
Antihypertensive drugs	184.6	317.0	<b>+172%</b>
Cholesterol lowering drugs	28.1	100.7	<b>+359%</b>
Antidiabetic drugs	34.5	66.5	<b>+193%</b>
Antidepressant drugs	30.7	60.3	<b>+196%</b>

Source: OECD (2018) *Health at a Glance 2017*

Growth prognosis for the consumption of prescription drugs for human use

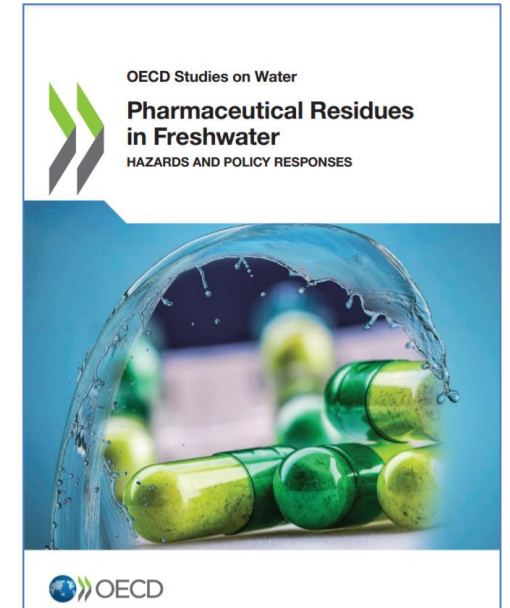


Source: (Civity analysis, 2017)



## Pharmaceuticals in the environment, a growing concern

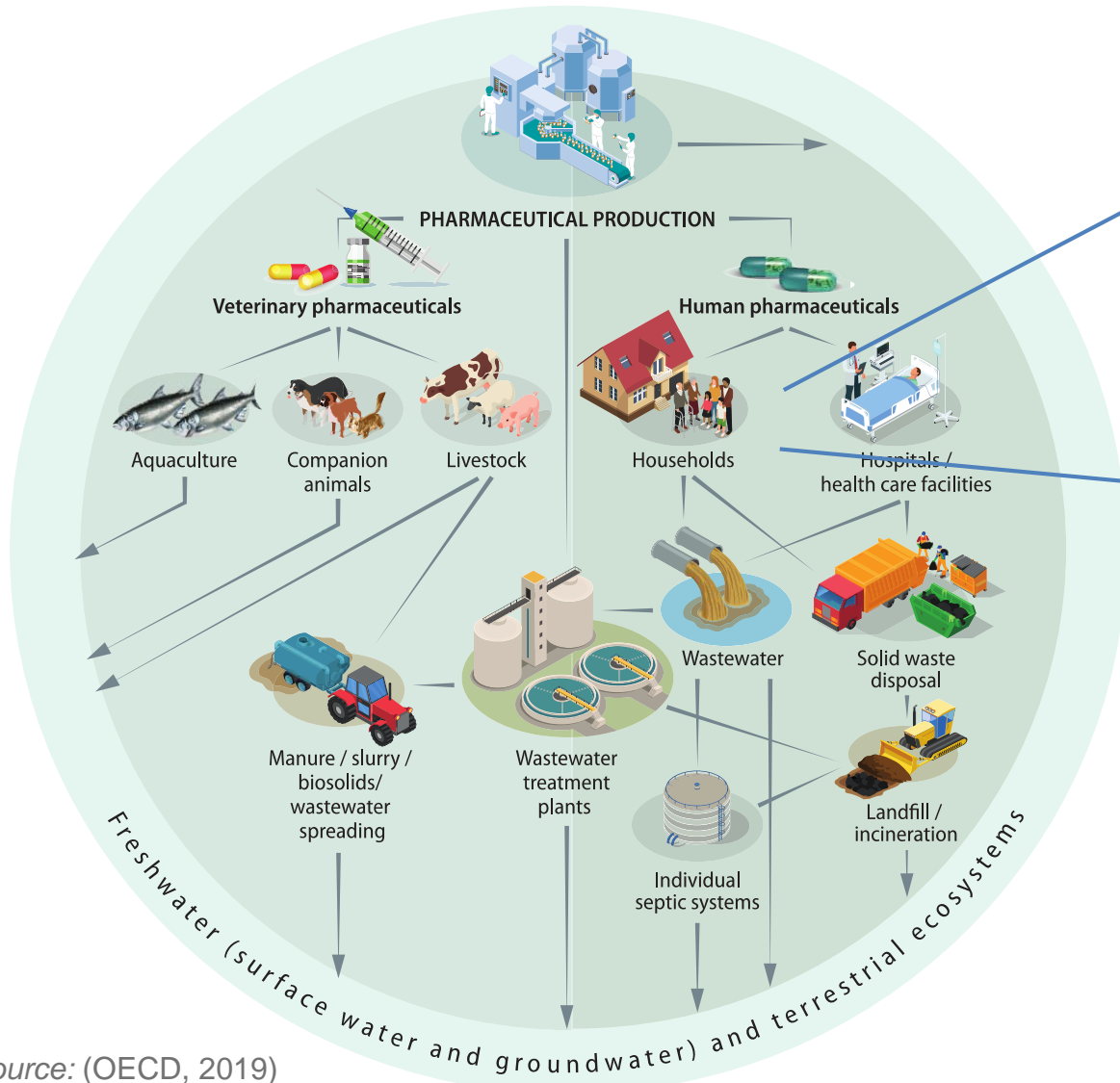
- Leakage of pharmaceuticals leads to bioaccumulation and potential negative impacts on ecosystem health
- Endocrine disruptors affecting wildlife populations and aquatic ecosystems
  - Increased mortality in aquatic species
  - Changes in physiology, behaviour or reproduction
- Humans are exposed through drinking water or ingesting residues through crops, fish, dairy or meat
- Discharge of antibiotics is linked to antimicrobial resistance



<https://doi.org/10.1787/c936f42d-en>



# Sources and entry pathways



Wastewater  
treatment plants



Landfilled MSW  
(without leachate  
capture and  
treatment)



## Amount of pharmaceutical household waste

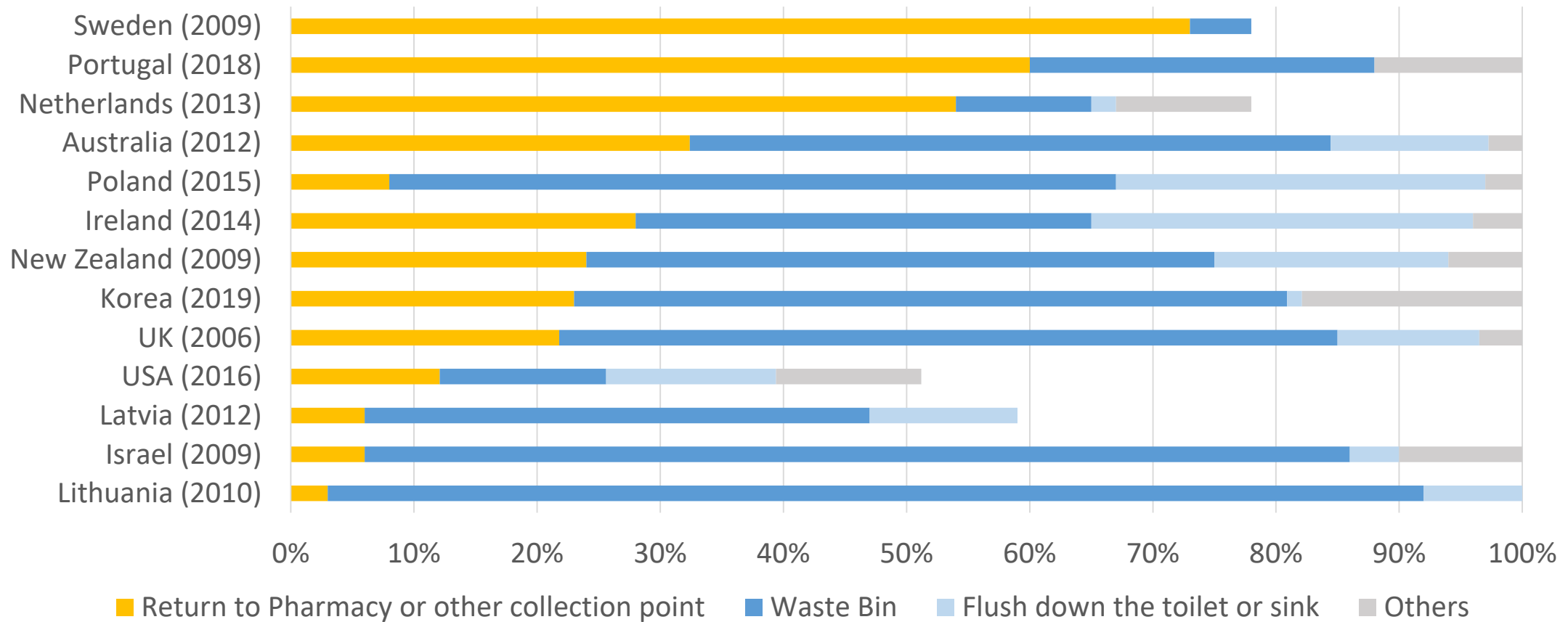
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- Estimates of amounts vary between 3% and up to 50% of prescribed drugs becoming waste
  - In US: and estimated 1/3 of prescription drugs becomes waste (Product Stewardship Institute, 2018)
  - In France, estimated 17,600 t/year ~260g per capita in 2018 (Cyclamed, 2019)
- Amounts can be substantial and ensuring proper disposal is important to reduce leakage



## Household disposal practices vary, depending on the availability and public awareness of collection systems

- A significant share is flushed, in particular liquids and creams





# Measures for minimising impacts of unused pharmaceuticals

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## 1) Waste prevention

- Disease prevention, dimensioning of packaging
- Marketplaces of close-to-expiry-date medicines or re-dispensing
  - Pharmaswap (NL): trading platform for unused/undamaged drugs, redistributed >190 packages
  - NL study underway to assess feasibility of re-dispensing unused drugs

## 2) Proper collection and treatment of unavoidable waste

- What is proper collection and disposal depends on the national context. Separate collection can be useful to mitigate the following risks:
  - lower risk of abuse or accidents by third parties
  - Lower risk of UEM being flushed and contaminating waterways (in particular liquids)
  - Avoiding leakage via solid waste (in particular, where state-of-the-art waste incineration is not widespread)



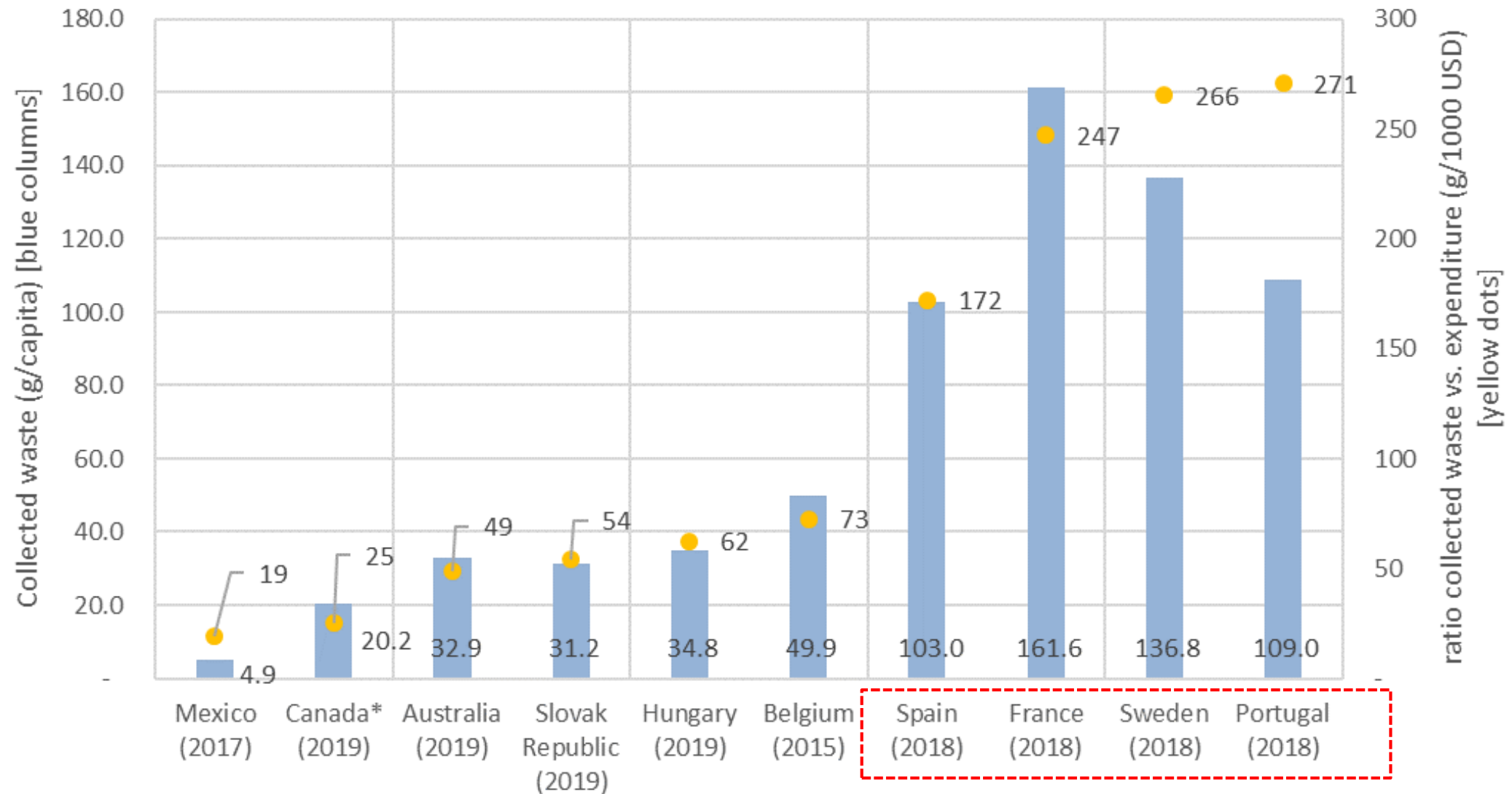
## Different approaches for collecting unused medicine

Approach		Example country
<b>Separate collection not deemed necessary</b>	Limited environmental and health risks do not justify to collect UEM separately.	Germany
<b>Voluntary separate collection scheme</b>	Voluntary separate collection by pharmacies or pharmaceutical industry	The Netherlands, Finland
<b>Government funded separate collection scheme</b>	Funded and organised by national or local governments.	Australia
<b>Extended producer responsibility (EPR)</b>	Organisational and economic burden of collection and disposal on producers.	France, Sweden, Spain, Portugal, Belgium, Canada (BC, MB, ON, PEI)





## Countries with highest collection rates tend to have an EPR in place





## Information campaigns are key to influence disposal behaviour

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- Netherlands: **17%** were unaware that liquid medicines should not be flushed (Dutch Sustainable Pharmacy Coalition, 2020)
- Germany: **32%** of survey respondents flush **liquid** medicine leftovers at least sometimes, whereas **less than 10%** of respondents would flush **solid** unused or expired medicines. (Götz and Keil, 2007)
- E.g. #Medsdisposal campaign,
- German Umweltbundesamt: “No pharmaceuticals down the toilet or sink!”



## Complementary measures to induce behaviour change

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- Incentives for returning medication to pharmacies
  - Sweden: pharmacies offer bonus credit points to consumers for returning medicines
- Product information provision
  - EU: Mandatory disposal instructions on product packaging, patient information leaflet
- Product eco-labelling
  - Sweden: “Wise list” for doctors and prescribers, based on cost and environmental criteria
- Environmental classification schemes
  - Swedish Association of pharmaceutical industry: Environmental classification scheme of APIs. Information is accessible online for consumers and prescribers.



## Conclusions & policy implications

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1. Focus on waste prevention (improved disease prevention, dimensioning of packages and precision medicine)
2. Assess opportunities for marketplaces and re-dispensing of unused unexpired medicines
3. Separate collection can be useful to control impacts on environment and public health:
  - To reduce risk of abuse or accidents by third parties
  - To reduce risk of waste medicines being flushed (in particular liquids)
  - To avoid leakage via solid waste (where state-of-the-art household waste incineration is not widespread)
4. If separate collection is deemed necessary, EPR seems an effective tool, in line with the polluter pays principle
5. Communication campaigns are necessary to increase awareness about proper disposal routes. (product labels, sorting instructions in packaging, nudging)



# THANK YOU FOR YOUR ATTENTION!

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