

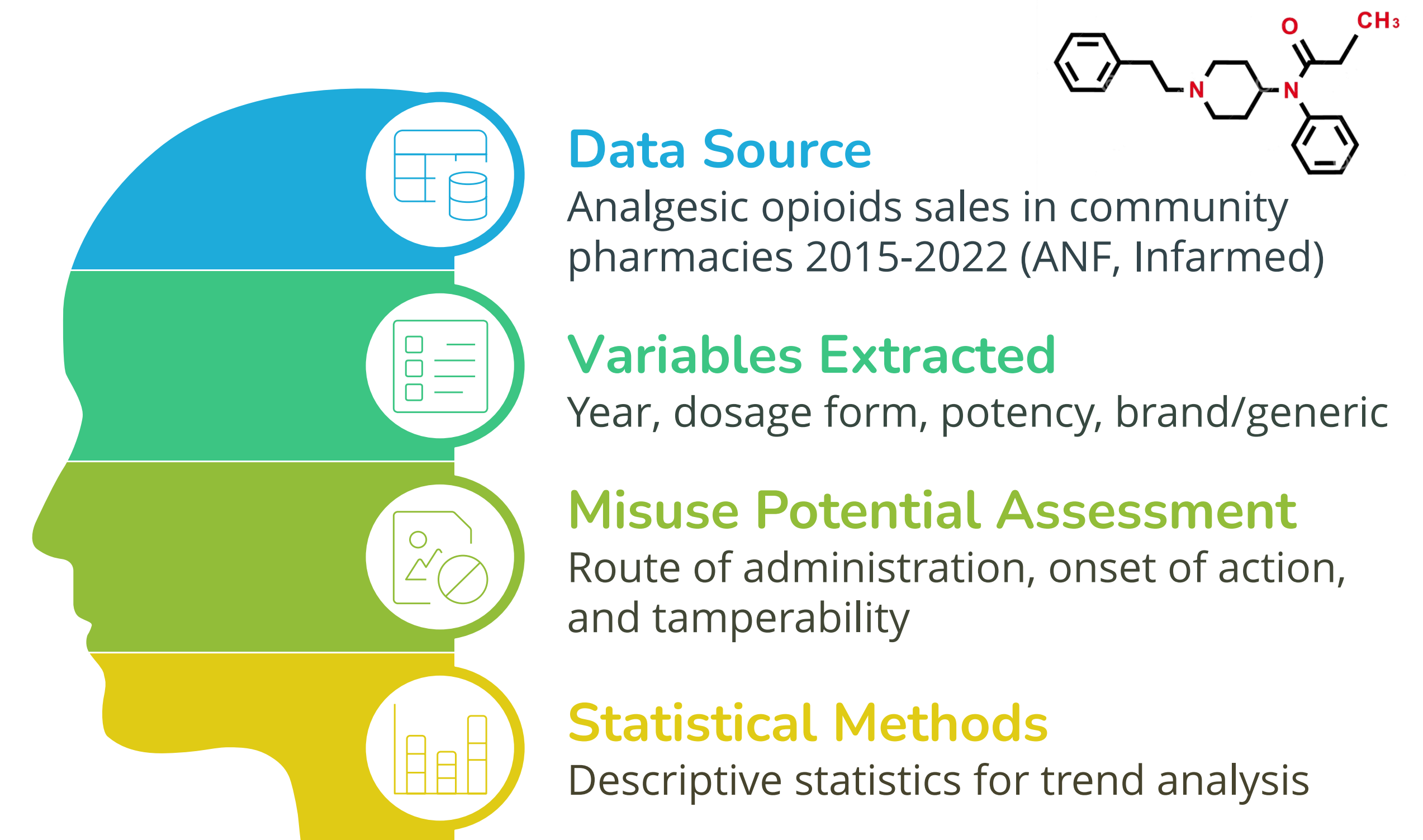
Introduction

- Fentanyl, a synthetic opioid 50–100× more potent than morphine, is widely prescribed for severe pain, especially in oncology settings and perioperative care, but is also highly susceptible to misuse, dependence, and fatal overdose, particularly in fast-acting formulations [1].
- While Portugal has largely restricted use to medical settings, recent trends show increasing outpatient consumption, raising concerns about diversion, non-medical use [2], and the absence of abuse-deterrent formulations (ADFs).

Aims

- Characterize the pharmaceutical landscape of fentanyl in Portugal, with particular attention to dosage form distribution, consumption trends, and formulation-related abuse potential.
- By identifying current gaps in abuse deterrence, this research seeks to inform future strategies for safer opioid prescribing, surveillance, and pharmaceutical innovation in the Portuguese context.

Methodology



Results

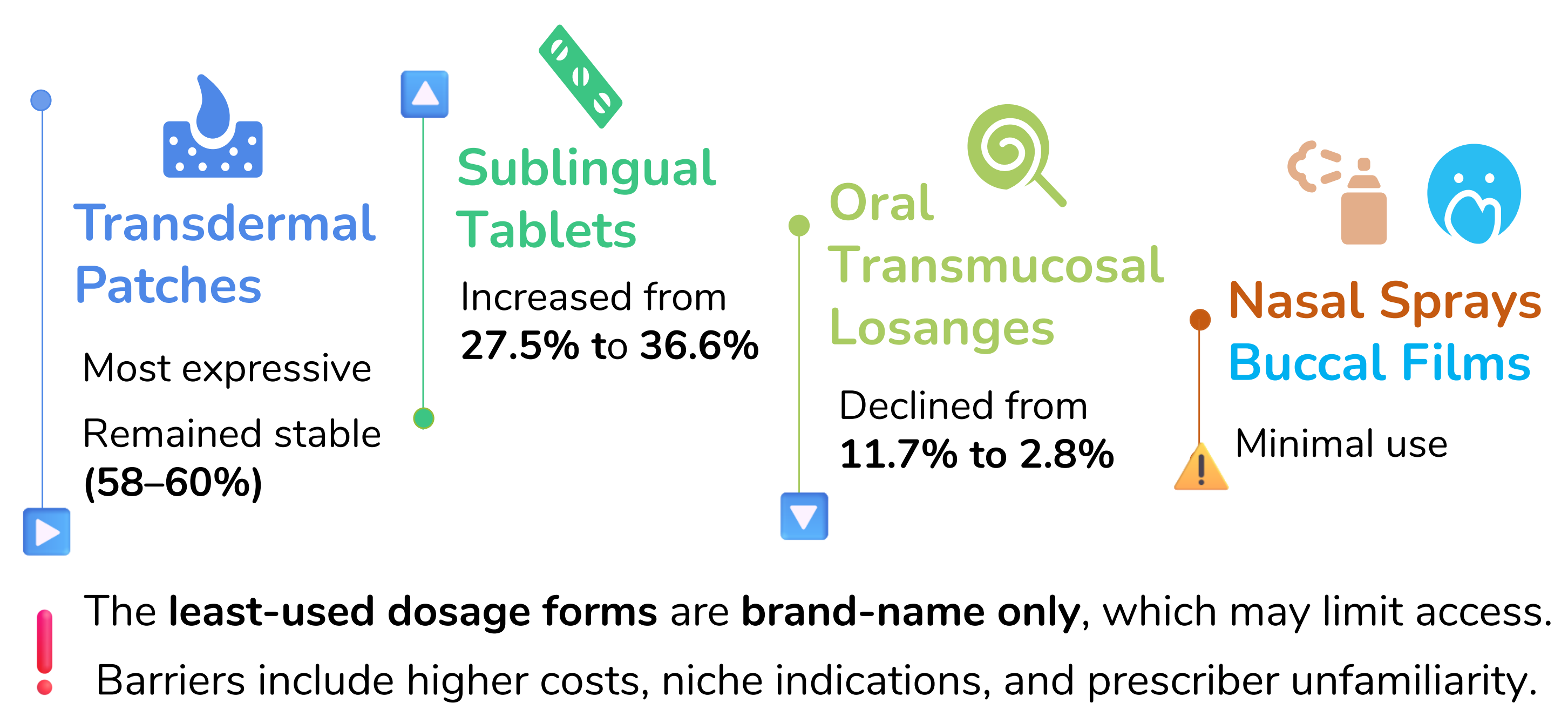
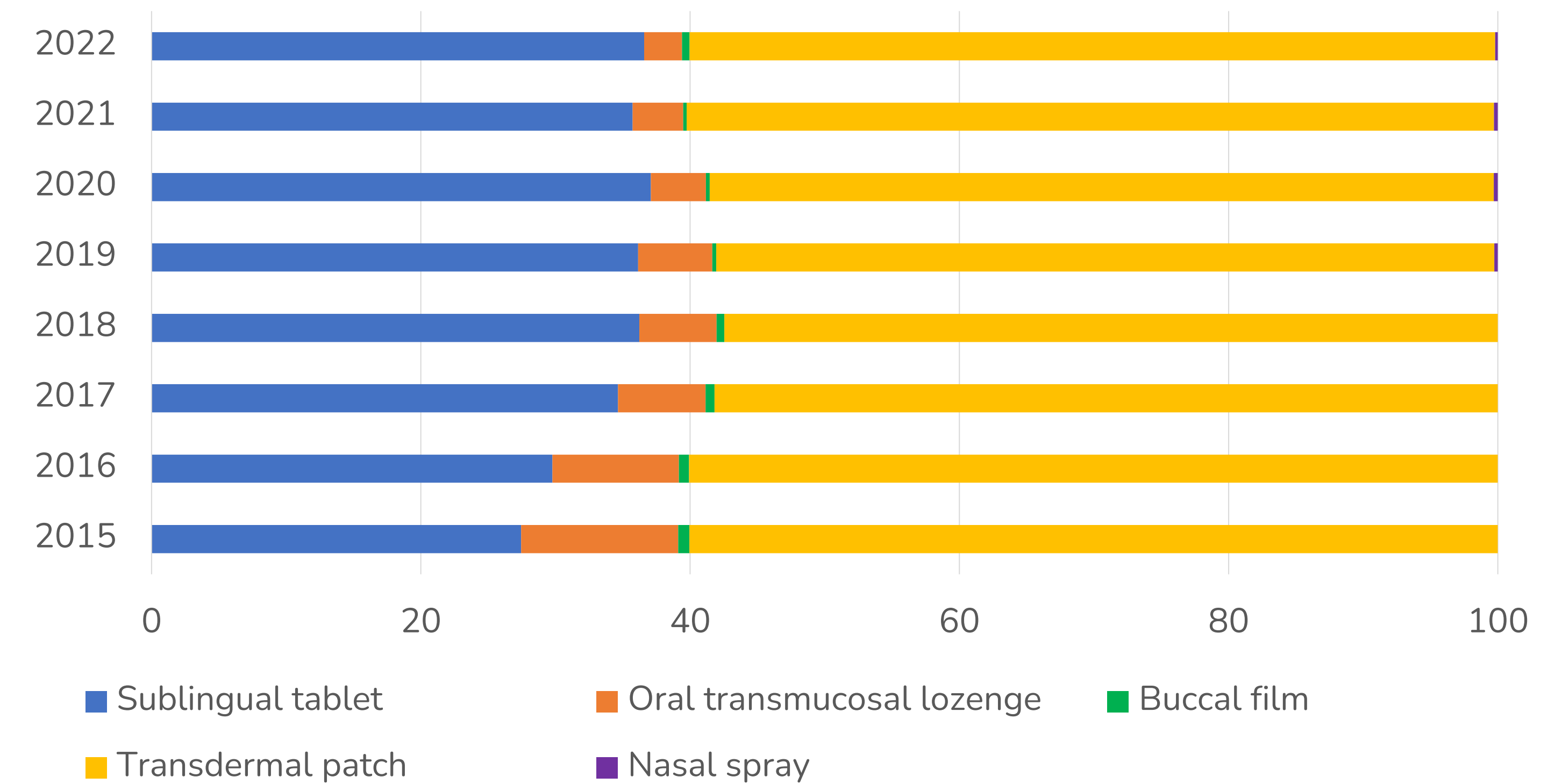
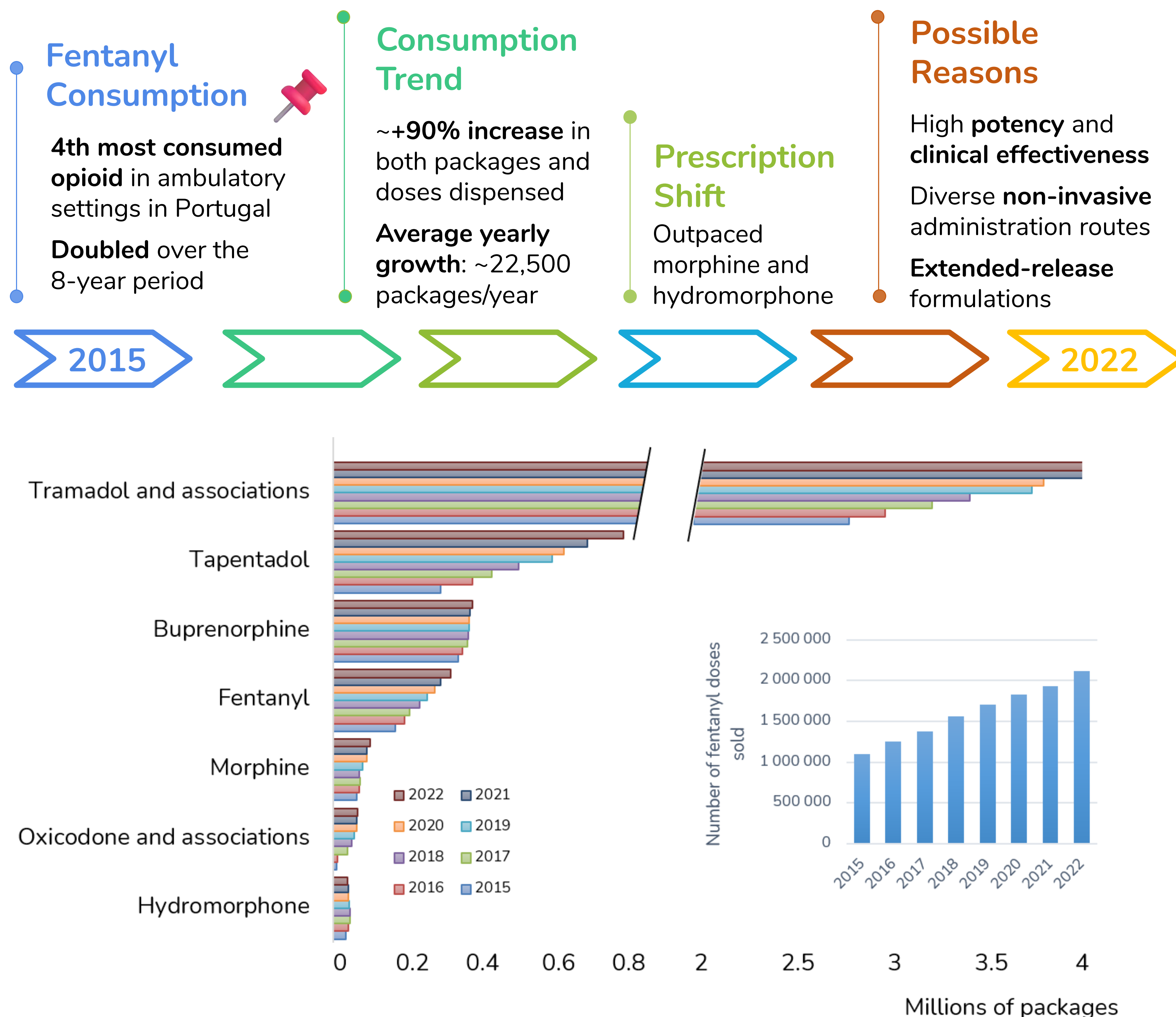


Table 1. Pharmaceutical typification of fentanyl dosage forms currently available in Portugal regarding abuse potential.

Dosage form	Route	Onset	Duration	ADF	Abuse potential
Patch	Transdermal	Slow	Long	No ¹	Low to Moderate ¹
Sublingual tablet	Sublingual	Fast	Short	No	High
Buccal film	Oromucosal	Fast	Short	No	High
Lozenge with applicator	Oromucosal	Fast	Short	No	High
Nasal spray	Intranasal	Fast	Short	No	High
Injectable solutions	Intravenous	Immediate	Short	No	Moderate ² to High ³

¹Partial deterrence – difficult to extract the drug from matrix patches; potential for misuse via extraction or reuse. ² Parenteral forms under restricted access; ³ Injectable forms – immediate bioavailability, increased risk of overdose.

- **Formulation characteristics** (route, onset, tamperability) critically impact abuse risk.

✗ No fentanyl ADFs are currently available in Portugal.

✓ Matrix transdermal patches - lower misuse risk

⚠ Still misused via extraction or reuse

- **One Health Risks**

🐾 Pet poisoning via discarded patches 🌱 Environmental residues

- **Strategies needed**

📊 Link prescription & usage data 🧑🏫 Educate on safe use, storage & disposal

📦 Require safer formulation & packaging from industry

🤝 Promote cross-sector collaboration (health + veterinary + environment)

Conclusions

- The predominance of **transdermal and sublingual forms**, both of which carry moderate-to-high abuse potential, highlights the need for continued **pharmacovigilance and prescriber education**.
- The overall rise in fentanyl use highlights its increasing role in pain therapy but also amplifies the **urgency for implementing ADFs, particularly in formulations with rapid onset**.
- A comprehensive **opioid stewardship model with One Health alignment** should be implemented.

- Gudin, J.A.; Nalamachu, S.; Leong, M.; Schatman, M. Abuse potential of fentanyl and its analogs. *Journal of Pain Research* 2020, 13, 1223–1230.
- Carmona Araújo, A. et al. Use and misuse of psychoactive medicines: a descriptive cross-sectional study in a densely populated region of Portugal. *J. Pharm. Policy Pract.* 2024, 17, 2369319.

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