THE IDENTIFICATION OF HEALTH CONSEQUENCES ASSOCIATED WITH COUNTERFEIT MEDICINE AND ILLEGAL HEALTH PRODUCT APPLICATION USING PHARMACOVIGILANCE DATA

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BACKGROUND AND OBJECTIVES

Information on the health damages caused by counterfeit medicines and health care products is not, or only rarely found in the scientific literature. As a result, it is difficult to determine or describe to the clinical practice the extent and probability of drug related problems originated from these products and how to identify these harms in hospital setting. Our aim was to assess the active pharmaceutical ingredients affected, the extent and characteristics of health consequences related to counterfeit medications based on the accessible product alerts and pharmacovigilance data.

MATERIAL AND METHODS

In addition to the literature search, we reviewed the WHO Medical Products Alert publications in the last 20 years and collected adverse drug reactions indicating a counterfeit medicine in the WHO VigiAccess database. Furthermore, we analyzed the counterfeit medicine related adverse drug reactions in the U.S. FDA Adverse Events Reporting System (FAERS) database.

RESULTS

The top 12 most commonly involved active substances internationally were alprazolam, amoxicillin/clavulanic acid, bevacizumab, diazepam, phenobarbital, flunitrazepam, glibenclamide, heparin, insulin, levonorgestrel, sildenafil and tadalafil. Between 2003 and 2020 in the FAERS database, we identified 3868 falsified drug related adverse drug reactions, in the last 5 years average 300-500 cases, which is 0,018% of all reported adverse drug reactions. Based on the FAERS cases, we have identified less predictable adverse drug reactions as well, with PDE-5 inhibitors causing vision loss and eye bleeding, and alprazolam causing foaming mouth and suicide attempt.

Extensive literature search: Pubmed, Web of science, Scopus, Google scholar, Hungarian database (Matarka) – 2021. january 4-15. (key words: falsified/counterfeit medicine, cases, health consequences) → Reviews and case studies

Databases of counterfeit medicine cases – 2021. january 4-25. → WHO Medical Product Alerts

Publicly available international Pharmacovigilance databases – 2021. january 4-25. → WHO VigiAccess, FDA Adverse Event Reporting System (FAERS)

Hungarian data from Ministry of Interior – 2021. january 25. → Domestic crime statistics
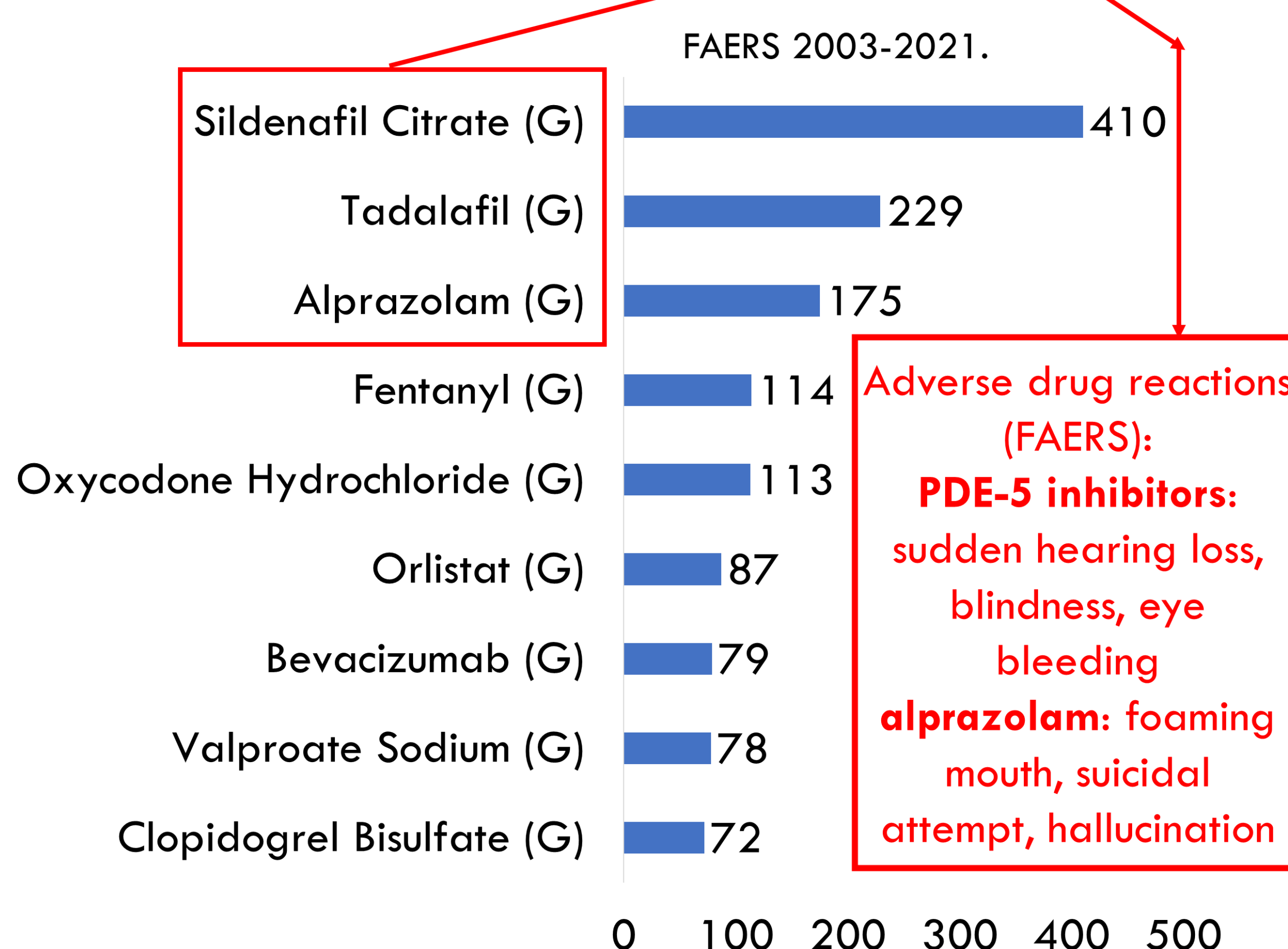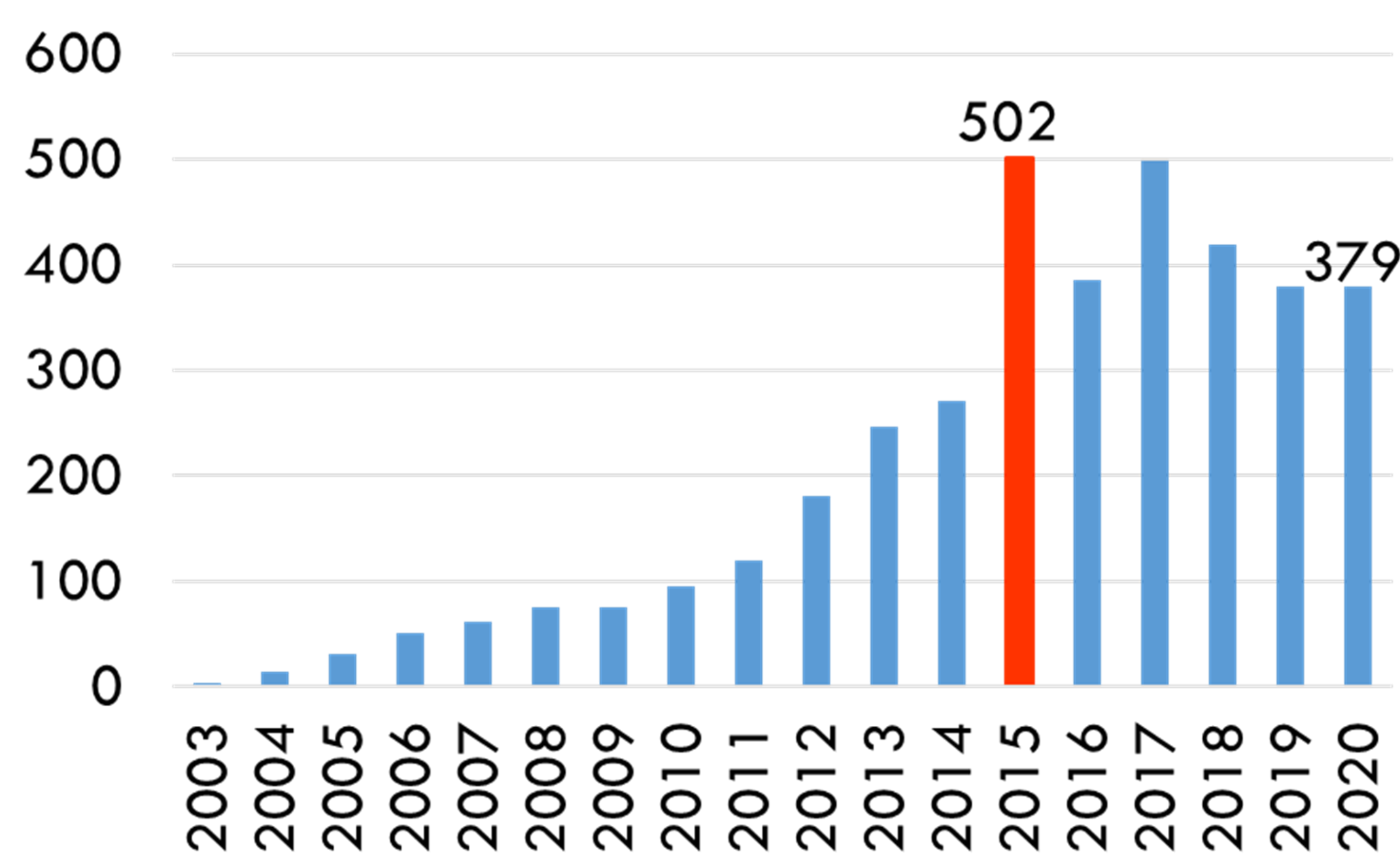
▼ Injury, poisoning and procedural complications (320)
- Counterfeit product administered (50)
- Poor quality product administered (49)
- Prescription drug used without a prescription (79)

counterfeit
- Counterfeit Product Administered
- Product Counterfeit
- Product Label Counterfeit
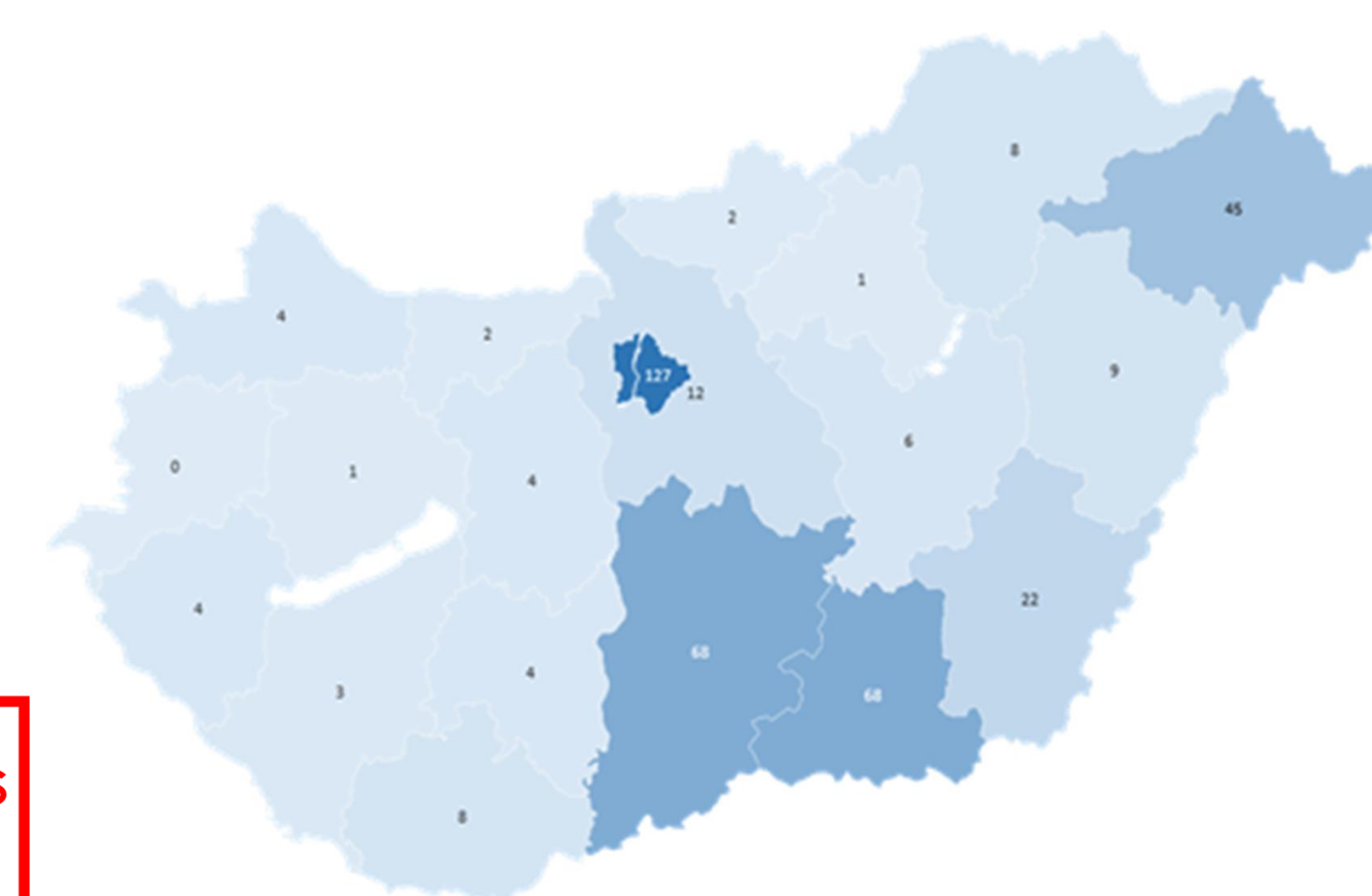- Product Packaging Counterfeit
- Suspected Counterfeit Product

FAERS „counterfeit" ADR (2003-2020.)
All cases: 3868
All SEVERE cases: 2058   **0,018%**
All DEATH: **182**

FAERS total ADR (1995-2020.): 21 415 455

Regional distribution of criminal proceedings

Bar chart: FAERS counterfeit ADR by year 2003–2020, highlighting 502 (2015) and 379 (2020).

FAERS 2003-2021.
- Sildenafil Citrate (G) — 410
- Tadalafil (G) — 229
- Alprazolam (G) — 175
- Fentanyl (G) — 114
- Oxycodone Hydrochloride (G) — 113
- Orlistat (G) — 87
- Bevacizumab (G) — 79
- Valproate Sodium (G) — 78
- Clopidogrel Bisulfate (G) — 72

Adverse drug reactions (FAERS):
PDE-5 inhibitors: sudden hearing loss, blindness, eye bleeding
alprazolam: foaming mouth, suicidal attempt, hallucination

CONCLUSION AND RELEVANCE

Our study showed that pharmacovigilance and toxicovigilance data are suitable for the identification and detection of health damage caused by counterfeit drugs. With the national adaptation and the development of a specific prospective data collection methodology in the clinical setting, it may also be possible to identify cases in Hungary, which can be a great step towards the prevention of patients' health damage and death related to these products. We believe that clinical pharmacists should play a more definite role in the adverse drug reaction identification and toxicovigilance.