

Medication-induced delirium: A quantitative analysis of the WHO pharmacovigilance database

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Introduction

Medication is considered both a predisposing and a precipitating factor for delirium, yet limited specific prescribing guidance is available.

The aim of this study was to quantitatively analyse the association between delirium and prescribed medication adverse events (ADEs) in patients of all ages reported in the WHO pharmacovigilance database (Vigibase).

Methods

Listed ADEs for all patients with delirium were extracted from the WHO pharmacovigilance database (VigiBase (1968-2023)). Proportional Reporting Ratio (PRR) and Odds Ratio (OR) to identify drugs with increased risk of causing delirium were calculated using a disproportionality analysis. Values of OR025 and PRR025 (lower end of the OR and PRR 95 % credibility interval) > 1 were considered statistically significant. Analysis was conducted using JupyterLab (Version 4.0.7), running Python with the Modin/Ray pandas data analysis library.

Results

A total of 207,222 individual patient reports were retrieved with 4,221 drugs reported as “suspect” for delirium associated ADEs. 682 (16.2 %) of which were statistically significant across both measures [PRR and OR]. Of all individual patient reports, 113,953 (55.0 %) were categorised as serious; 40,062 (19.3 %) led to hospitalization and 15,517 (7.5 %) to death or were life-threatening. The drugs most frequently reported as “suspect” was the covid-19 vaccine (n = 12,827 (4.5 %)), followed by pimavanserin (n = 9,533 (3.4 %)) and carbidopa:levodopa (n = 5,922 (2.1 %)). Of the delirium-associated symptoms, “hallucination” (n = 122,441 (43.3 %)) was reported most frequently, followed by “delirium” (n = 48,768 (17.2 %)) and “encephalopathy” (n = 36,330 (12.8 %)). (Figures 1-5)

Conclusion

The results of this study provide valuable insights into the frequency and distribution of delirium-associated ADEs, identify active substances, drug classes, and combinations with potentially triggering effects, and highlight the critical importance of these factors in pharmacovigilance and clinical decision-making.

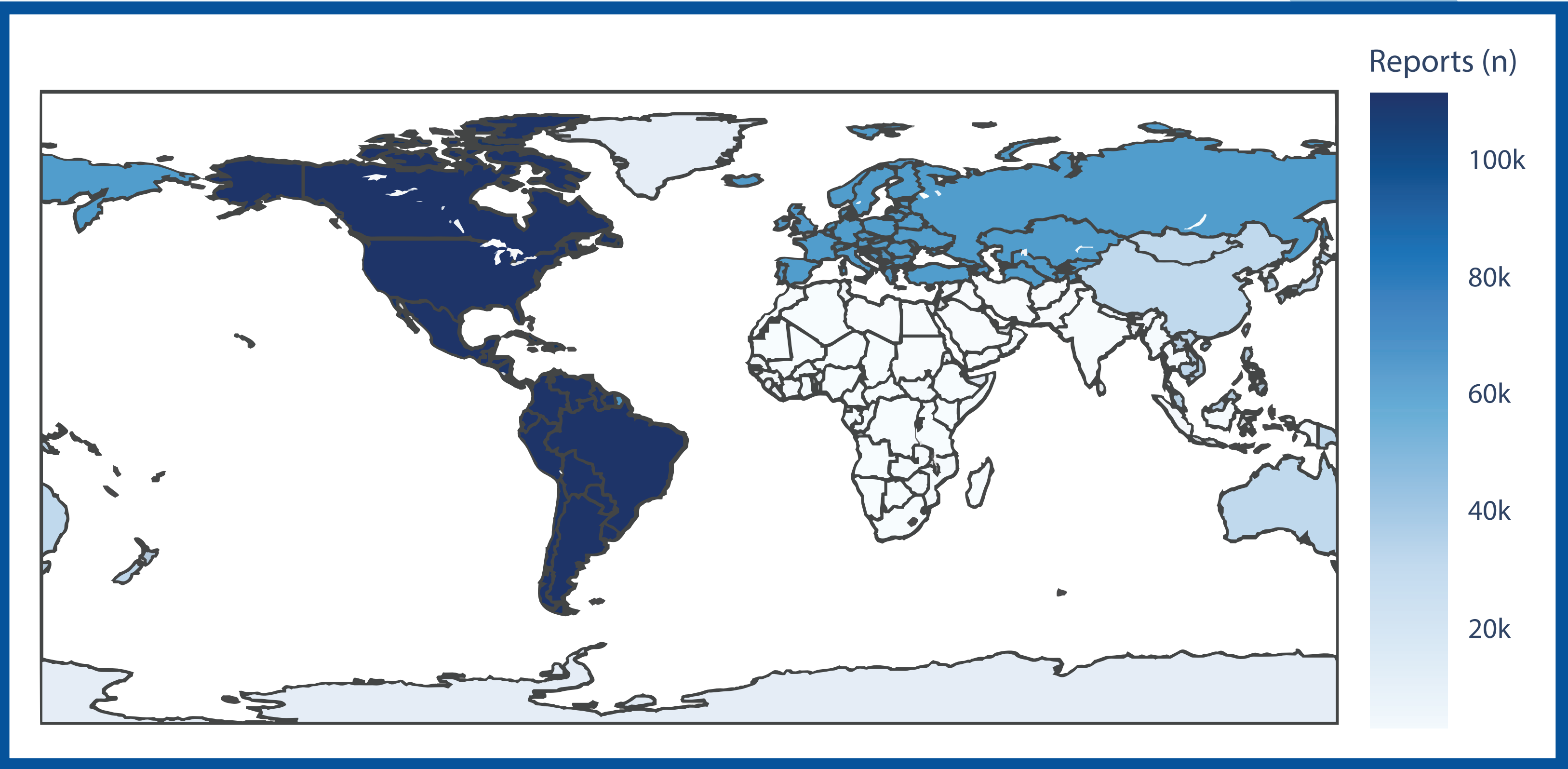


Figure 3: The number of patient reports by WHO regions

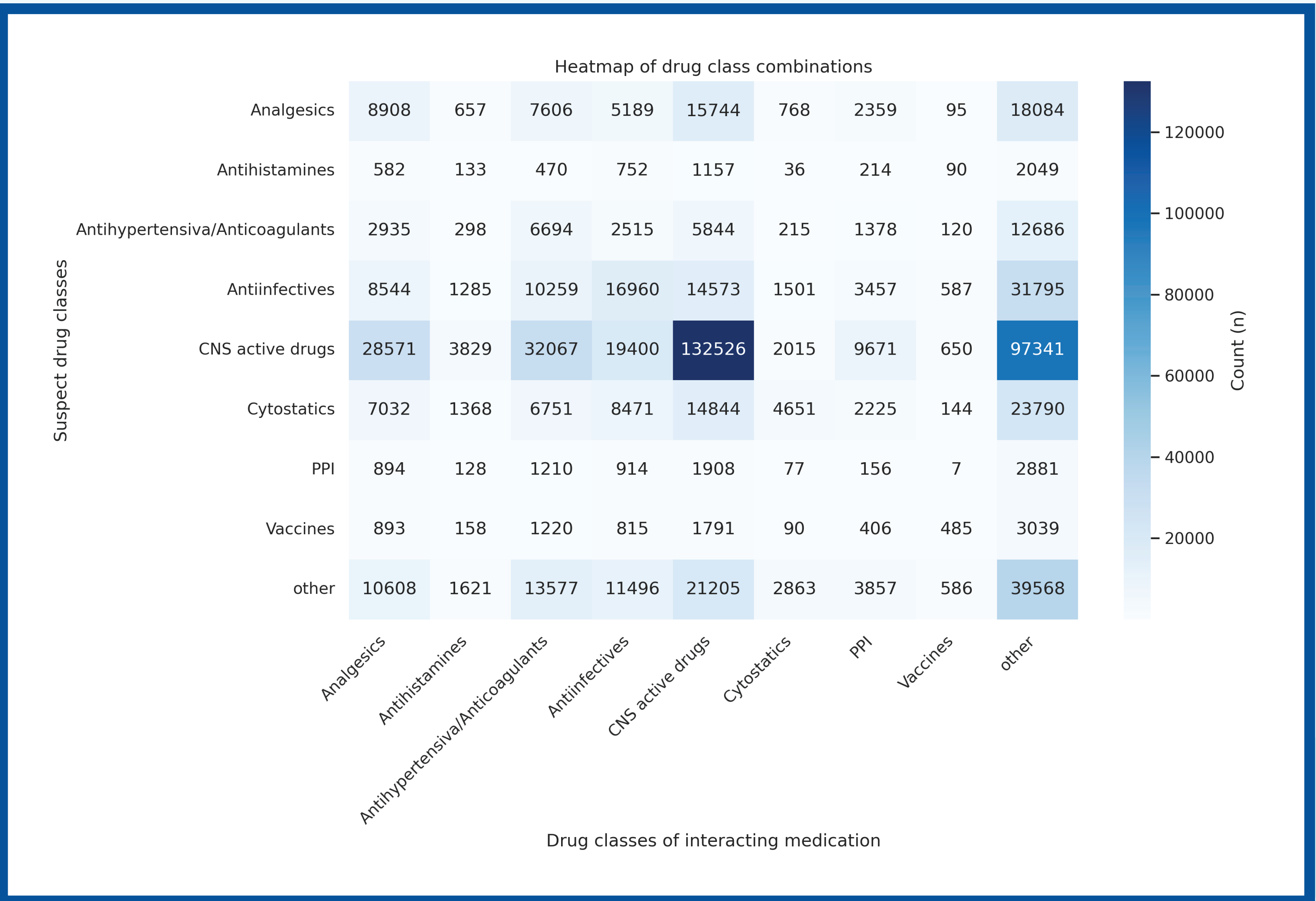


Figure 4: Frequencies of drug class combination and the associated frequency of adverse drug reactions (ADRs) relevant to delirium

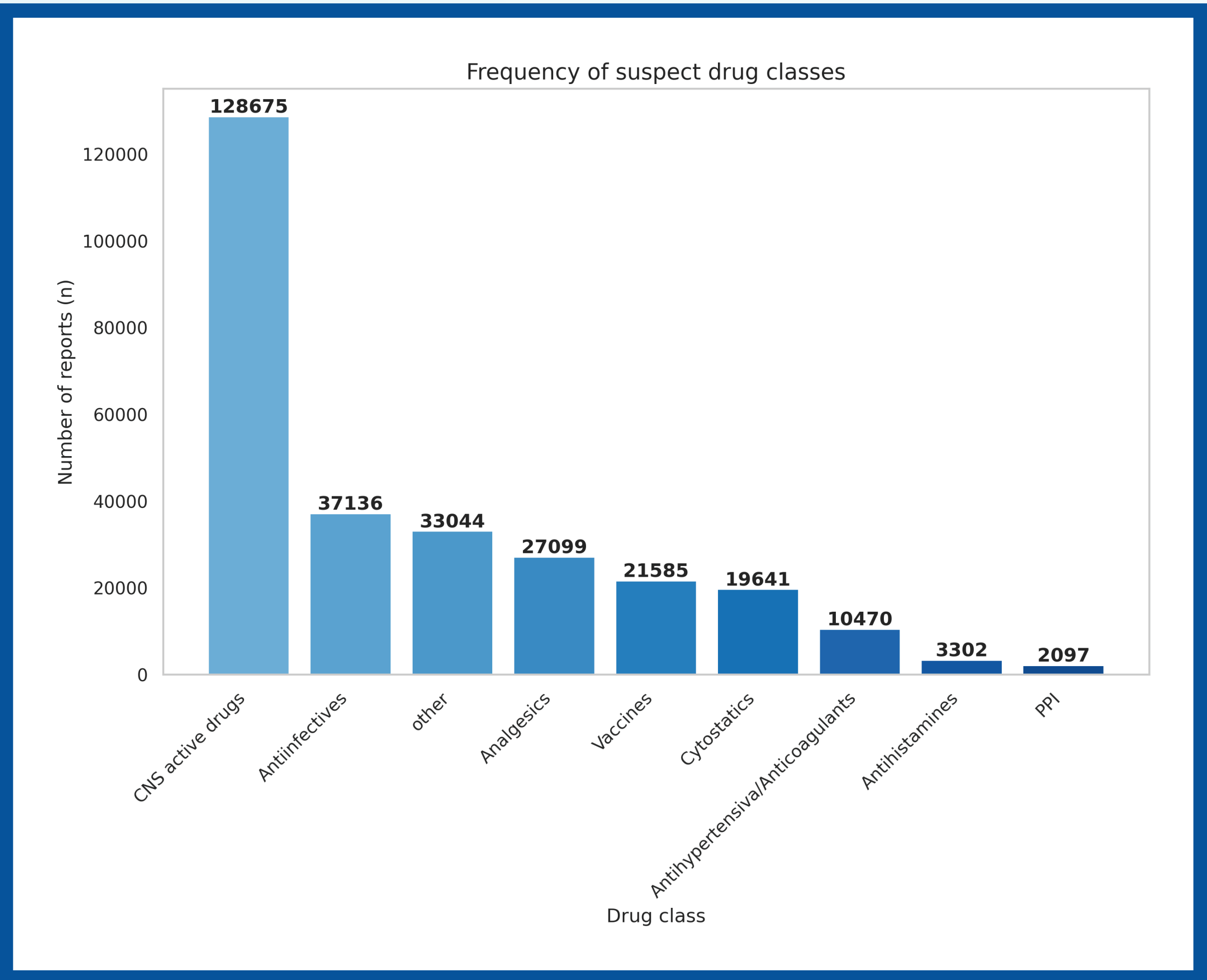


Figure 1: Frequencies of delirium-associated adverse drug reactions for all suspected medications.

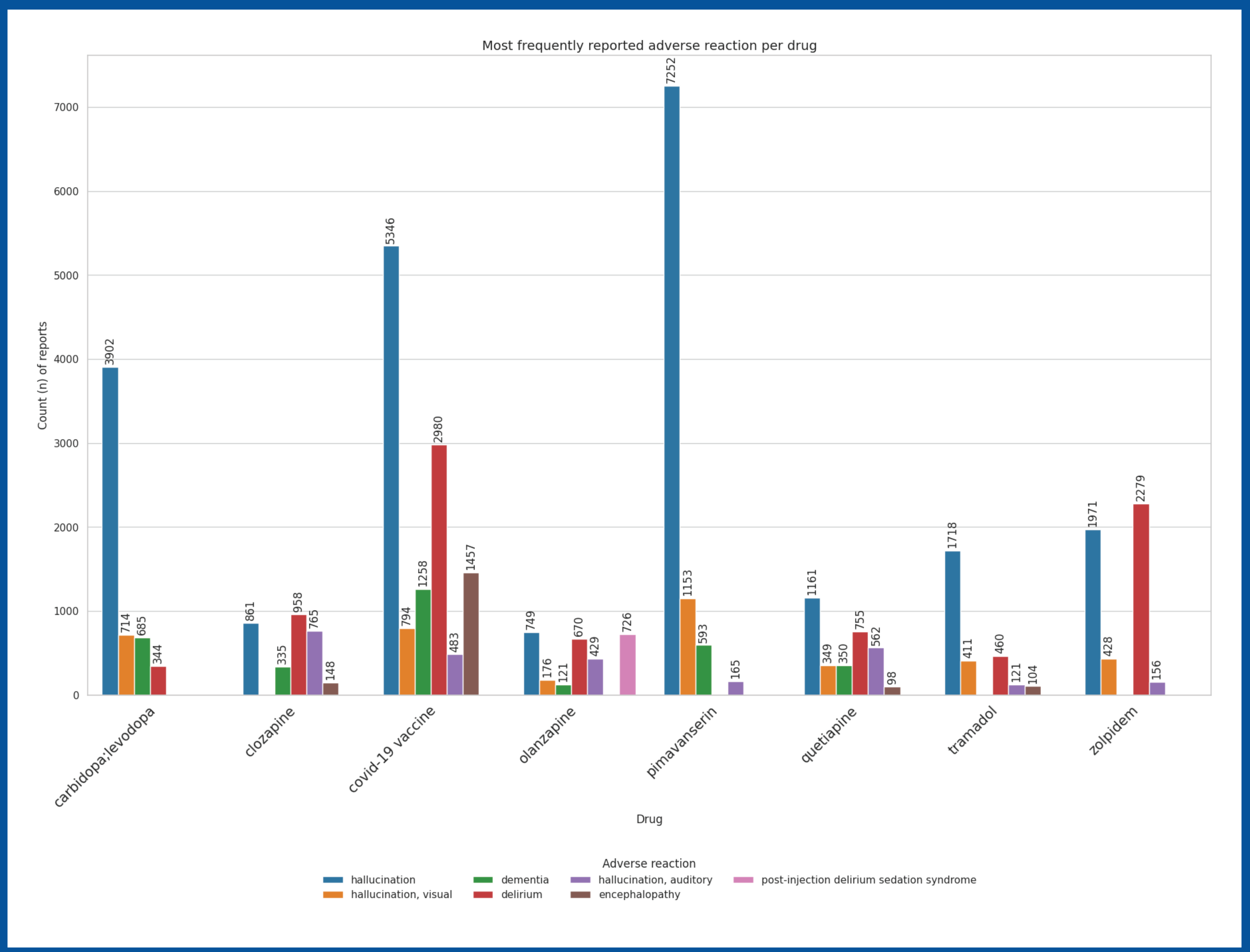


Figure 5: The most common delirium related symptom in relation to the most frequent drugs.

Figure 2: Interactive map of the frequency of drug combinations associated with delirium symptoms.

