

## **A Decision Tree Analysis of Opioid and Prescription Drug Interactions Leading to Death Using the FAERS Database**

Rohit R. Dixit, Robert P. Schumaker, Michael A. Veronin  
The University of Texas at Tyler  
USA

rdixit@patriots.uttyler.edu; rschumaker@uttyler.edu; mveronin@uttyler.edu

Can unknown and possibly dangerous interactions between opioids and prescription drugs be identified? Is it possible? Our research seeks to answer these questions by applying a supervised machine learning algorithm to the FDA's Adverse Event Reporting System (FAERS). We trained a decision tree classifier to investigate heroin and prescription drug interactions with an accuracy of 84.9%. We found that heroin and buprenorphine, a commonly prescribed opioid detox drug, led to a 28.0% survival rate among patients. Heroin, buprenorphine, and quinine were even deadlier with a 24.0% survival rate. Our technique can be applied to previously unknown drug combinations to predict mortality and perhaps improve patient safety.

**Keywords:** Machine learning, FAERS, Opioids, Business intelligence.