Data-Driven Insights into Against-Medical-Advice Discharges Using Large-Scale Healthcare Data (Extended Abstract)

Mohammed Quazi[1], Puneet Bansal[2], Suzy Walter[1], Shea Engle[3], Jennifer Mewshaw[1], Muhammad Ahmad Nadeem[2], Abdul Rafeh Awan[4], Abu Baker Sheikh[5], Amir Sohail[6]

[1]School of Nursing, West Virginia University, Morgantown, WV, USA
[2]Digestive Diseases and Surgery Institute, Cleveland Clinic, Cleveland, OH, USA
[3]School of Medicine, West Virginia University, Morgantown, WV, USA
[4]Department of Medicine, Nishtar Medical University, Multan, Pakistan
[5]Department of Internal Medicine, University of New Mexico, Albuquerque, NM, USA
[6]London School of Hygiene and Tropical Medicine, London, UK
mmquazi@hsc.wvu.edu

Abstract

Discharges against medical advice (AMA) represent a persistent challenge for healthcare systems, contributing to increased emergency department (ED) revisits and hospital readmissions, higher mortality, and avoidable healthcare expenditures. From an operations and decision-making perspective, understanding the drivers and trends of AMA discharges is critical for improving resource allocation and patient outcomes (Gaur et al. 2024, Southern, Nahvi, and Arnsten 2012). This study leverages large-scale national ED data to provide a comprehensive, data-driven analysis of AMA discharges across the United States.

We utilized the Nationwide Emergency Department Sample (NEDS) to analyze approximately 717 million adult ED visits from 2016 to 2022. Patient demographics, clinical conditions, insurance status, and hospital characteristics were examined. Inflation-adjusted ED charges were calculated, and weighted regression models and Mann-Kendall trend tests were used to evaluate temporal patterns, disparities, and economic impact.

Across the study period, we identified over 13.2 million AMA discharges, substantially exceeding the number of in-ED deaths which was 1.3 million. AMA discharges were disproportionately concentrated among socioeconomically vulnerable populations, including Medicaid beneficiaries and patients experiencing homelessness. Significant temporal variation was observed, with AMA rates declining sharply during early 2020 and peaking in 2021, reflecting shifts in healthcare utilization during the COVID-19 pandemic. Costs associated with ED visits increased over time, highlighting the growing economic burden.

Subgroup analyses revealed markedly higher prevalence of substance use disorders, serious mental illness, and suicidal ideation among patients discharged AMA. Discharge AMA was more prevalent among the homeless population compared with non-homeless patients (3.28% vs. 1.83%). These findings underscore the intersection of behavioral health, structural inequities, and care discontinuity.

This study demonstrates the value of large-scale healthcare data and analytical modeling in identifying high-risk populations and system-level inefficiencies. The results provide a foundation for developing predictive and prescriptive analytics tools to support real-time clinical decision-making, targeted interventions, and cost reduction strategies. Integrating such data-driven approaches into healthcare operations may improve patient retention, enhance equity, and optimize resource utilization.

References

Gaur A, Gilham E, Machin L, Warriner D. 2024. Discharge Against Medical Advice: The Causes, Consequences and Possible Corrective Measures. *British Journal of Hospital Medicine*. 85(8):1-14. doi:10.12968/hmed.2024.0231

Southern WN, Nahvi S, Arnsten JH. 2012. Increased Risk of Mortality and Readmission among Patients Discharged Against Medical Advice. American Journal of Medicine. 125(6):594-602. doi:10.1016/j.amjmed.2011.12.017