Chronic pain prevalence, opioid use, and primary care provider prescription patterns

JUNLIN LIN, GREG MURRAY, AUDREY P WANG

INTRODUCTION

Chronic pain prevalence and opioid use are two big concerns in the U.S.A. Few studies have employed "big data" and machine learning techniques to quantify chronic pain prevalence and describe opioids use and primary care provider prescription patterns.

METHODS

A retrospective, multi-state, cross-sectional design was used to quantify the prevalence of chronic pain in primary care in the routinely collected Medicaid benefits dataset. Data from de-identified patients covered by Medicaid in six states from 1st January 2017 to 31st December 2019 were included. Eight different artificial intelligence machine learning and deep learning classification systems were implemented to predict the presence or absence of opioids prescriptions for chronic pain.

RESULTS

The chronic pain prevalence among Medicaid patients from the 6 states was

24.1%.

On average, the percentage of total chronic pain patients who recived an opioid prescription from their primary care providers was

21.1%.
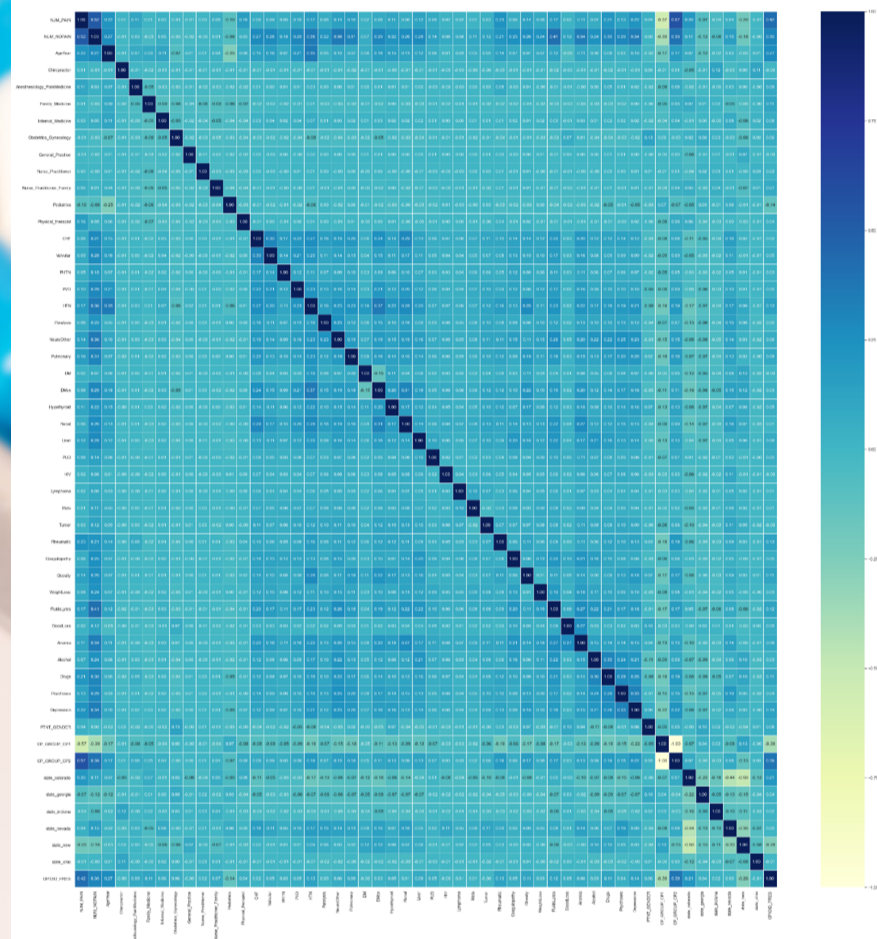
The correlation matrix heatmap revealed relationships between every two features. These features were both clinically meaningful and statistically significant.

CONCLUSION

The study summarized a proportional chronic pain prevalence of 24.1%. For machine learning, XG Boost and Random Forest classification systematics performed best, providing accuracy at 0.806 and 0.804, respectively.

AFFLIATION

Junlin Lin, the University of Sydney, Faculty of Medicine and Health, School of Medical Sciences, Discipline of Bioinformatics and Digital Health
Honnary Professor Greg Murray, the University of Sydney, Faculty of Medicine and Health, School of Dentistry
Dr Audrey P Wang, the University of Sydney, Faculty of Medicine and Health, School of Medical Sciences, Discipline of Bioinformatics and Digital Health