Big Data and AI-Driven Opioid Epidemic Research

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Abstract: The United States is experiencing an opioid epidemic. In recent years, there were more than 10 million opioid misusers aged 12 years or older annually. The opioid epidemic is worsened by the COVID-19 pandemic, leading to a historical record of 93,000 overdose deaths in 2020. In this talk, we aim to answer the following questions: 1) Can we predict opioid overdose and opioid use disorder risks of patients in the future based on EHR history for improving clinical decision support? 2) Which regions or communities have the most serious opioid problems for potential targeted interventions and optimized resource management? 3) What are the opinions of the public, the emotions of the opioid users, and the psychological effects of opioid use?

Educational Objects: Upon completion, participants should be able to:

- Describe the need for risk prediction of opioid use disorder/opioid overdose for early interventions for combating the opioid epidemic.
- Explain why temporal deep learning-based methods offer promise for the development of predictive models for opioid risks.
- Identify important features that help to understand the predictions for potential clinical decision support.
- Describe GIS driven approach for understanding geospatial patterns of opioid overdose and related resources.

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