Using variable selection and machine learning approaches to predict mortality outcome
By: Stacy Zhang, PhD

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In many studies we face the challenge to deal with a large number of variables to predict a clinical outcome. To reduce the high-dimensional information and select the most important variables that predict the outcome, we can use variable selection methods or machine learning approaches, depending on the research purpose and data structure. In this seminar, I'll present two of our recent studies that have used these methods. In one study, we used the Agency for Healthcare Research and Quality's database on social determinants of health and linked it with cardiovascular disease mortality data at the county level from 2009 to 2018. We applied the penalized generalized estimating equations to select the most important social determinants that predict county-level CVD mortality. In the other study, we used inpatient hospitalization data from the 2016-2019 National Inpatient Sample, and developed four machine learning models, including logistic regression, random forest, light gradient boosting, and extreme gradient boosting models, to predict the risk of in-hospital mortality based on a selection of variables including patient characteristics, comorbidities, procedures and hospital-related factors.

Stacy Zhang, PhD

Dr. Zhang is an associate professor in the Division of Health Services Research at NYU Long Island School of Medicine, with expertise in population health management, health policy and economics, health systems research, and comparative effectiveness research. Her research focuses on understanding and addressing health disparities in chronic diseases, including hypertension, cardiovascular disease, type 2 diabetes, and stroke, by investigating barriers to accessing medical care and healthy food, studying multilevel social determinants of health that affect health outcomes, and advancing knowledge in minority health and rural patient care.

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