Researcher uses advanced analytics to identify individuals at risk of potentially inappropriate prescription opioid use

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Credit: University of Arizona

New prediction tools to help health-care providers identify patients at risk of inappropriate prescription opioid use, while allowing safe administration of legitimate pain management to those not at high-risk, are being developed by University of Arizona College of Pharmacy researcher Jenny Lo-Ciganic, PhD.

Dr. Lo-Ciganic, assistant professor of pharmacy, has been awarded a

$100,000, one-year Research Starter Grant for Health Outcomes from the Pharmaceutical Research and Manufacturers of America (PhRMA) Foundation. TheResearch Starter Award for Health Outcomes will allow her to apply advanced analytics to Medicare claims data (a 5 percent national representative sample with 3 million beneficiaries) from 2011 to 2015 to discover hidden patterns within complex health-care data. With this information, she will be able to generate precise prediction tools that can better guide health-care providers in implementing effective interventions and policies.

The advanced analytics used in this study are similar to "machine-learning approaches" used by companies such as Amazon and Netflix.

"Think of these companies that, based on your previous searches or purchases, can predict and promote items specifically for you. We are applying similar data-driven approaches to better predict inappropriate opioid use among Medicare beneficiaries," said Dr. Lo-Ciganic.

Dr. Lo-Ciganic added that traditional statistical methods have limited ability to handle missing values or complex interactions in health-care data.

"While prior studies have focused on identifying individual risk factors rather than predicting actual risk, they haven't taken into account complex interactions between opioid use and other factors such as substance use disorders, mental health disorders and frequent emergency department visits," Dr. Lo-Ciganic said. "Using advanced analytics, we can sort through massive amounts of complex data and develop tools to better predict patients who may need to be monitored or have interventions put into place."

Her study not only will identify and predict beneficiaries at risk for inappropriate prescription opioid use, it also will identify geographic

"hot-spots," or clusters, of inappropriate opioid use. The findings from this study will allow health-care providers to better allocate resources for targeted interventions and help communities develop tailored care plans for specific at-risk regions or populations.

Provided by University of Arizona