

How predictive analytics can tackle the opioid crisis

Every day in the U.S., there are about 650,000 opioid prescriptions dispensed, 3,900 people who begin abusing opioids, and 78 deaths from opioid-related overdoses. There are states where the number of yearly opioid prescriptions outnumbers the population. As the abuse of prescription painkillers increases so too has the use of heroin, filling our newspapers and news feeds with tragedies and announcements of loved ones lost. If you are not personally affected by the epidemic, it is practically a guarantee that you know someone who is. But despite the seemingly dire situation, there may be good news – from an unlikely source – on the horizon.

“Knowledge is power,” though cliché, accurately describes what it will take to cure the opioid epidemic. In a typical day, Americans attend millions of doctors’ appointments, resulting in hundreds of thousands of prescriptions. All of this information must be collected and routed through insurers (public and private alike). The result is a treasure trove of information – aptly referred to as “big data” – that allows us to pick up on trends and find patterns within enormous data sets. The huge amount of data could be used to detect areas where opioid abuse is likely occurring. Unfortunately, so far we’ve lacked the technology to effectively separate the signal from the noise. That is, until now.

In Michigan, we have built a Proof of Concept for an addiction-identification tool that analyzes Medicaid claims for signs of opioid abuse both at the prescriber and beneficiary level. The solution combines the Medicaid administrative data with pharmacy and clinical datasets. In statistics, an outlier is a data point that is distant from the rest of the data set. By sorting and analyzing health information datasets in Medicaid claims, we are able to

identify outliers that may be indicative of addictive behavior. Some of the key data elements that are analyzed are individuals that visit numerous pharmacies and prescribers, early prescription refills, prior non-opioid substance abuse/dependence diagnoses, mental health-related diagnoses, and demographic information.

The data sources are curated using the IBM BigInsights solution from the Michigan's Operational Data Store (ODS) platform that is a rich repository of structured data content along with the mostly unstructured clinical data from external entities such as hospitals, labs, and clinics. Leveraging Michigan's private cloud and implementing various logistic regression models, the data is analyzed to get a holistic view of the patients, providers, and the interactions among them leading to the identification of outliers. Applying these models within the Michigan Medicaid Management Information System's (MMIS) ClaimsSure, which determines whether a bill has been improperly filed, allows for the real-time prediction and flagging of medical claims for further manual review by the state's case management team.

This predictive analysis could ideally prevent an addiction before it begins – and hold irresponsible prescribers accountable.

Of course, opioid addiction is not exclusive to the Medicaid population. Segmentation of health data between hundreds of insurers and providers that may operate in just one state – let alone the entire nation – makes addressing the epidemic an even more daunting task.

But 78 deaths a day is unacceptable. We can't treat daunting as a synonym for impossible.

Big data analytics might just be the proactive piece of the puzzle we've been missing – and the potential for this realistic type of fortune telling could not come at a more

exciting time for the healthcare industry. After being introduced more than a year and a half ago, the 21st Century Cures Act received wide bipartisan support in Congress and was signed into law by President Obama. Not only will this legislation invest billions in medical research, it will give \$1 billion to the states to help in the fight against opioid addiction and improve access to recovery programs.

This is the furthest-reaching piece of health care legislation since the Affordable Care Act, and it has the potential to be even more impactful for the millions of Americans affected by the opioid epidemic. With this legislation's huge investment into medical research, we see doors flung open towards solutions for many of this country's biggest health problems.

So after years of trying to solve the epidemic reactively in courtrooms, jail cells, and rehab centers, it's time for a change. The technology is proven and through the 21st Century Cures Act the federal government has signaled its commitment to help. Now it's up to state and local governments to embrace a technological solution to a very human problem.

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Sharif Hussein, Senior Vice President of Health and Human Services with CNSI, brings 40 years of experience to the role. He is responsible for directing and managing diverse healthcare initiatives and multiple state businesses across the organization. Hussein has implemented and directs the operations of the Community Health Automated Medicaid Processing System (CHAMPS) advanced Medicaid Management Information System (MMIS) for the State of Michigan and the MMIS for the Utah Department of Health. In a partnership between the Michigan Department of Health and Human Services and the State of Illinois, he is leading the development,

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