MEDICAL NEWS
The business of healthcare

Predictive analytics

Unique form of statistics uncovers vital data to advance the future of healthcare.

By Dave Dimas, PhD

Ever wonder how Facebook knows who you should add to your "Friend" list or how Amazon delivers well-timed buying suggestions? These are some of the intriguing applications that involve the use of predictive analytics. This unique form of statistics yields measurable and oftentimes dramatic business results that can be found all around us. Predictive analytics combines existing data from a variety of sources. Using a combination of art and science, it can create models that can be used to improve future outcomes.

Predictive analytics is just beginning to emerge in the healthcare industry. As healthcare treatments advance, providers – along with drug and medical product companies – continue to look for ways to improve medical outcomes. Predictive analytics can help reduce and contain costs by coordinating and guiding medical decision making, and improve clinical trials that can influence future research.

The Importance of Predictive Analytics in Healthcare

Current practice in healthcare is often based on more traditional statistical analysis (p-value), which can lead to treating a person as a "mean" of a population. An individual's demographics, health history, comorbid conditions and genetics may cause him to react differently to a particular drug or treatment. As a result, predictive analytics applied to medical data can help develop treatments that are more in tune with the individual patient.

In addition, predictive analytics can effectively support and enhance coordinated care efforts. It considers multiple factors and looks at all of the data so it can be used more effectively in the practice of evidence-based medicine.

Transforming Data into Growth and Reducing Costs

Predictive analytics will have a big impact in the field of healthcare, especially where there are large sets of cumbersome and unconnected data. New methods being developed through predictive analytics will allow those including hospitals, medical centers and drug companies to examine this data to see how it can best guide medical decision making.

Gary Miner, PhD, a University of California, Irvine Extension instructor and leading expert in the field, points to another breakthrough in which predictive analytics is helping to adjust the in-hospital time for an individual patient: "It's allowed us to develop models that can predict when each individual patient should be released to minimize re-admissions within 30 days," he said.

Miner authored the *Handbook of Statistical Analysis and Data Mining Applications* (Academic Press, 2009) and *Practical Text Mining* (Academic Press, 2012 and is currently working on, *Healthcare Administration &*

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Miner also noted that by using predictive analytics to keep track of medical supplies and drug inventories in a clinic or hospital, the "correct need" can be maintained. This prevents having to throw away outdated drugs, a practice that has significantly contributed to increased medical overhead and costs.

A Role in Clinical Trials

Clinical trials are often performed among a similar demographic. This can be problematic when it becomes essential to learn how a drug or device will work for patients with multiple medical conditions across a wide range of demographics.

Predictive analytic models can zero in more accurately on effects of medicines that are currently being studied. This will generate better hypothesis for further drug testing, and in the long run, bring about drugs that more accurately accomplish the jobs for which they're intended.

Smarter Decisions and a Brighter Future for Healthcare

New methods of analytics are surfacing that dramatically aid in mining textual data from what a nurse observed to what a patient said (despite significant levels of variation). Results from hundreds of thousands of interactions with patients create data that hospitals, medical centers and drug companies can statistically rely upon.

Sentiment analytics takes it one step further by examining the tone of the text to uncover what might be subjective information within the data.

Supported by the Meaningful Use (MU) and Electronic Health Records (EHR) provisions of the 2009 Health Information and Technology for Economic and Clinical Health (HITECH) Act of 2009, Predictive Analytics is poised to become a key component in decision systems that will improve outcomes while reducing medical costs in the coming years.

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