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Experts Share How to Apply Big Data to Patient Care

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The amount of patient healthcare data is increasing more and more rapidly. In fact, research firm IDC predicts that there will be an overall increase in health data of 48% annually. With so much big data, applying it to real-world examples is key.

Weiner

Jonathan Weiner, codeveloper of the Johns Hopkins ACG System, and professor of health policy and management at the Johns Hopkins Bloomberg School of Public Health, says patient data, such as that from medical claims and pharmaceutical claims and EHRs, can combined with other information, like local demographics, to reveal patterns, trends, and associations.

"The 'garbage in, garbage out' problem occurs when data comes in at irregular intervals or isn't adequately linked to other relevant pieces of information," says Weiner. "The challenge is to structure miscellaneous data to get a useful picture of individual or community health."

The ACG team, along with the Johns Hopkins Center for Population Health IT, works directly with organizations on a case-by-case basis to determine the most useful ways to link structured and unstructured medical, geographic and social data with insurance claims, medical administrative records, and other patient data for specific needs, according to Weiner.

According to Weiner, who is also a professor of health informatics at the Johns Hopkins School of Medicine's division of health sciences informatics, healthcare organizations must have IT tools that attempt to make sense of big data. "But this is an ongoing, evolving process," he says. "Using technical

and analytic tools is only half the equation. The other half is providing organizations with ongoing support and access to the latest concepts and innovation."

For example, in the U.K., providers are using the ACG System to combine primary and secondary care data with information from location and demography in ways that have led to innovative patient care strategies that reduce costs, improve outcomes and enhance patient experience, he says.
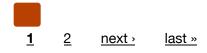
Here, Weiner, whose current research focuses on the application of EHRs and health IT for population-based applications such as performance measurement and predictive modeling/analytics, and Kumar Subramaniam, executive officer for Population Health Analytics at Johns Hopkins HealthCare Solutions, share their thoughts with *Managed Healthcare Executive (MHE)* on practical ways for healthcare executives to tap their data, as well as the specific challenges it poses for population health analytics.

MHE: Unfortunately, because of the lack of interconnectivity between systems, apparent in the EHR world as well as within MCOs; definitional differences; sloppy data accumulation; as well as a host of other issues, much of data to information in the industry is still GIGO (garbage in, garbage out). What's your perspective on remedies for this?

Weiner: The challenge that healthcare administrators face right now is how best to translate all the available patient and population health data into practical solutions that improve standards of care in the real-world care settings. The practice of slicing and dicing data occurs within an industry with incompatible and idiosyncratic data collection. As a result, the overall industry is data-rich but information-poor. The fact is that most IT vendors come with a significant investment burden, which is especially challenging for small/single providers who are being crowded out and at-risk of abandoning their practices.

Our experience shows that a little data can often go a long way. Standardization is becoming more common and easier. For example, the NQF certified HealthPartners' Total Cost of Care model provides a common means of standardizing costs across disparate data sources.

That said, the challenges related to analytics and big data are real and we plan to address at our international conference [in April 2018], which is open to all healthcare professionals for the first time this year.

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MHE: Where and how are you seeing real progress in the application of population-based data in health plans?

Weiner: Population health has become something of a buzzword, but we are seeing real progress in the application of population health management techniques.

Predictive modeling tools have become fairly standard at many established healthcare organizations. Analytic tools and predictive models are getting more sophisticated over time and data quality is getting better, as is the breadth and scope of the data being collected.

One example is how predictive models can evaluate individual patient information using medical, lab, and pharmacy data. When a provider can see a complete overview of an individual patient, based on their medical records or prescribing and fill rates, he or she has tools to make better care decisions or foster dialogue with the patient. Rather than the 'one-diagnosis-at-a-time' approach, the provider has information required to treat the patient as a whole.

Population-based data can also identify trends within specific communities. For example, we can use demographic data from a group or sub-group to predict the likely incidence of disease in the future. Population analysis tools can determine illness burdens and administrators can allocate resources more effectively. Analytics driven insights can also be used to inform capitation rates or reimbursement rates.

MHE: If there were just a couple of things you could do to improve the use of data to deliver better health or cost outcomes, what would these be?

Weiner: We need to make EHRs more interoperable than they are now. Right now, only about 10% of all EHR records are fully shared. The majority of information in an EHR is in free text and right now, the challenge is to find ways to capture the meaning from these data. We also need to develop taxonomies and frameworks to work with more sources of data on social determinants of health.

Maintaining good data and improving analytics are the first steps. But the next step is to figure out the most optimal ways to use these tools that are now available to improve health and wellbeing for both individual patients and the overall health of a patient sub-group or a community. For example, the data should give providers new ways to identify patients who are likely to require services for chronic or long-term care. Or it can inform key administrative decisions, like determining fair compensation for providers or allocate resources in the most cost-effective ways.

MHE: When you look at the proposed entrance of Jeff Bezos (Amazon), Warren Buffett (Berkshire Hathaway Inc.), and Jamie Dimon (JPMorgan) into healthcare as a disruptive force, what can they do from a data standpoint to truly be disruptive?

Subramaniam

Subramaniam: Disruption will require new models of both, healthcare delivery and health financing. Demographic shifts within the U.S. population including age, ethnicity, and increases in multimorbidity need a population health management approach. For a long time, population health management has been viewed as a derivate of public health principles.

Given the share of employer-sponsored health plans in the market, Bezos, Buffet, and Dimon could help span the care continuum to extend from and between the hospital, post-discharge care, and other informal care settings including the work place and the home. They could help introduce new ideas in improving the as-built environment in and around organizations. The changes may allow employees and their families change and sustain their health behaviors as they navigate care settings on their individual healthcare journeys.

They may introduce or influence technology that sustains or improves health behaviors. For example, AI data tools that help frontline staff engage or support patients in on-going, real-time ways.

Tools like the ACG System can provide the analytical foundation for data driven decision making across care settings and allow all healthcare funding entities, including individuals, make the right healthcare decisions.

Jonathan Weiner and Kumar Subramaniam will be speakers at the ACG System 2018 International Conference in San Antonio this month. The conference addresses the application of the latest predictive modeling tools to reduce care disparities and improve population health.