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An Executive Roundtable on the State of Predictive Analytics in U.S. Health Care

By the Society of Actuaries

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With the expansion of risk in health care, the ability to predict needs and outcomes is more important than ever. Mining data, forecasting probabilities and trends, and ultimately managing risk, is a burgeoning area for health care through predictive analytics.

Six executives from across the country gathered in Philadelphia on Aug. 30, 2016, to share how their organizations are approaching predictive analytics through processes, employee training, department structures and more. Here are the valuable insights—and successes—they shared.

How are your organizations using predictive analytics?

Carol Haines: In our emergency department, we started identifying for clinicians the patients who are a potential readmission. When a patient visits the ED, it shows up in a real-time dashboard whether the patient was admitted within the last 30 days. This helps the clinician think about how they could possibly treat this patient differently to avoid a readmission.

Kurt Wrobel: For us, it's identifying abusers of the system. We sift through our data to find the few percent who increase the cost of care. We can remove those abusers from the network and start predicting those who will become abusers based on early behavior. In many cases we actually report them to law enforcement for fraud.

Pamela Peele: Once a patient consumes a lot of care and we realize they need care management, it is too late to impact the situation. We have a very exciting predictive model called Project Flashlight, which predicts which patients are going to need high-touch care management as they enter the UPMC Health Plan.

How do we do this? We purchase publicly available data and retrospectively analyze who consumed a lot of care. Then, we compare it to our data to run a prospective model, predicting who would consume a lot of care based on the entire population. It works beautifully. The math is still on my whiteboard; because it is such a thing of beauty, I cannot bring myself to erase it.

Jim Dunn: I spend a lot of time thinking about where hospital talent will come from in the future. Where are they now? Where will they be in five years? So we do a lot of predictive analytics around replacement of key clinical staff, turnover metrics and more. For instance, we cannot predict exactly when people are going to retire, but by flagging employees who have run their retirement and pension plan numbers three times in one year, that's a predictor for me to start looking for that position's replacement.

How are your organizations currently challenged with data?

Carol Haines: Gathering the data and being able to use it has been a challenge. Health care is in a time of mergers and acquisitions, and acquiring providers on different technology systems exposes the problem that we have too many disparate sources of data and no common definitions.

Pamela Peele: As an industry, we need more standardization. The root of the problem is that all the data we're using now was created to do something else. For instance, claims data are bills to be paid. But then we grab it and pretend to do population health management with it.

Jeffrey Driver: We too are challenged by the state of today's data. Our approach is to actually accept the world as it is with disparate data sources and look at it as a bowl of individually wrapped candies. We created a system that acts as a "shrink wrap" around all of those candies—that data—to translate the disparate sources into one language. We built this with funding from our insurance company and in conjunction with a vendor.

Paul Savage: That is a viable approach, for now. But we still don't have a national standard for health care data. When banks started to process electronic transactions, a single standard was created. Health care data is far too valuable to not treat it the same way.

Predictive analytics will better match physicians and patients in the future in the hopes of better achieving mutually desired outcomes.

What can predictive analytics accomplish?

Jeffrey Driver: What we're really jazzed about is taking decision analytics to the patient level. We have the technology and are steering it toward end-of-life care, as this is a very costly area in health care but has almost no planning or structure around it. (Research also shows there's a complete discord between the patient's thinking about prognosis and the clinician's.)

So, we are developing our proprietary system to scan and "read" the information contained in a medical record over a lifetime, as well as personal documents, to discover what that patient's values are. Then, we will compare that against the quantitative information and research available about their prognosis—generating a framework of the patient's values against what is actually possible in medicine. This will help the patient and physician make keener decisions.

Paul Savage: The end-of-life application is a valuable one, because the culture of health care right now is to provide whatever care is necessary for as long as possible to sustain life to 100 years old. That mind-set needs to change. The actuaries of Medicare recently released that by 2025, \$5.6 trillion will be needed for the cost of care. That's untenable.

Kurt Wrobel: I agree, this is a huge issue. It is where a lot of our expenditure goes.

Pamela Peele: We've learned that social determinants are incredibly important in predicting outcomes. Patients who live alone or have experienced a significant life event within the last year—situations such as these affect clinical outcomes. A very important piece of data we use in predictive modeling is the deprivation index, which captures the social resources available to patients within their ZIP code. This is free information. We find that it correlates with the topology of chronic conditions and helps us identify where additional resources need to be deployed, based on where a patient lives, to impact outcomes.

This is important because, starting next year in Pennsylvania, the insurer will be responsible for more than just formalized care. They will also be tasked with making the patient's home accessible, exterminating pests, putting in chair rails and more. A scope of services far beyond medicine.

How is your organization's culture changing to adopt data analysis and predictions?

Kurt Wrobel: We're trying to figure out how to take a system that's broken, disjointed and inflationary and make it more efficient. And we are going to, but it will take time. I believe we will see a group of incremental wins that will fuel predictive modeling, leading to more change.

Applying predictive analytics to end-of-life-care is a very costly area in health care but has almost no planning or structure around it.

Pamela Peele: As an industry, we're not even thinking about the fact that financial risk has been pushed onto providers who are not trained to handle or manage it. In an effort to manage it, clinicians are turning to data. We're not pushing it down their throats—they're coming with their plates hungry for it, because they need that information to understand where they are against their financial risk.

Jim Dunn: When departments receive data and are ready to fix a problem, sometimes the informal internal systems will not allow these changes to happen. You will need someone, or a group, to change the culture and processes that allow for change.

Carol Haines: Our organization has actually received data so well that the demand increased immediately. And we didn't have a process in place to screen for what data is being asked. Now, we ask internal stakeholders whether pulling and analyzing a certain set of data is going to add value to the organization. If you're asking for the data, is it actually changing something? Or is it just that you want to "know"? We have limited resources and need to think very seriously about where we spend them.

Jeffrey Driver: What we've done is gain acknowledgment for the usefulness of data and then marry it with design thinking. This involves bringing groups of people together to decide what the data is telling them and what are they going to do about it—but then instead of reaching for cookie-cutter solutions, engineer solutions that actually work in the culture and the place where the problem exists.

Can predictive analytics be done wrong?

Kurt Wrobel: Yes. Health care is increasingly learning to value data; the problem is when people interpret the information without enough training. Certain disciplines and professionals asked to interpret data without the background to fully understand it is very problematic.

Paul Savage: Indeed, unaided analytics is very, very dangerous. It has limited the power of predictive analytics because when you have someone using it inappropriately, it's ineffective.

Jim Dunn: There is a qualitative component to this. In health care we do well with hard data, but no different than mergers

and acquisitions, it can fail because of soft components like culture changes and communication issues.

What skills, training and professionals will propel health care in predictive modeling?

Pamela Peele: The value of analytics to an organization is the amount of influence those analytics have on decision making. So, I have two journalists in my shop whose job is to make the data consumable to the end user. I have 30 employees now, and we are growing to 50 in the next year. I credit the journalists entirely for the approval in expansion because they've properly communicated the value.

Jim Dunn: We need to look at the ability to use data in decision making as a core competency for onboarding and hiring leaders. Too many organizations are not screening leaders' backgrounds and how they understand and read data—we just leave it up to random groups of people who understand how to do it. Moving forward, these must be considered core competencies.

Kurt Wrobel: As an actuary, I value what actuaries bring to the table: professionalism and regulatory knowledge. We don't want "data pullers" in our organization. Geisinger errs on the side of training rather than recruiting in this area, so we've built a culture around rewarding those who pass actuarial exams. We emphasize the importance of the actuarial credential for analytics.

What does the future of predictive analytics look like?

Carol Haines: To me, it is pairing the right clinician with the right patient. We need to start looking at outcomes based on personalities, education and physician preferences. Some physicians are better at taking care of certain types of patients. So, the outcome that's desired by both patient and physician—not necessarily desired by society or the health plan—that's an exciting frontier.

Jeffrey Driver: The law of accelerating returns tells us that even though we are at the beginning of predictive analytics in health care, we will see faster returns as time goes on. Think about how in the 1960s we were using calculators, and today we have phones that communicate with our watches. The successes in predictive analytics will be copied and amplify across the industry, creating faster adoption. There is no doubt that predictive modeling will be woven into the future of health care. ■



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