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The State of Predictive Analytics in U.S. Health Care

By the Society of Actuaries

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If there is one word that has taken on new meaning for health care in the new era of accountable care, it is this one: Risk.

Risk has traditionally, in health care, corresponded to a doctor's or institution's chance for malpractice. But now, as providers and payers take on new responsibilities in the areas of patient experience, clinical outcomes, population health management, and financial accountability, "risk" takes on a multitude of new meanings and roles in the business of health care.

With the expansion of risk, the ability to predict needs and outcomes is more important than ever. Imagine, for instance, a physician being able to predict whether a patient is more or less likely to comply with their medication regimen based on various



demographic factors. Or, imagine a health system being able to project which of its patients are most at risk for high-impact events like infections and readmissions—and taking the steps to proactively manage those patients to avoid these events.

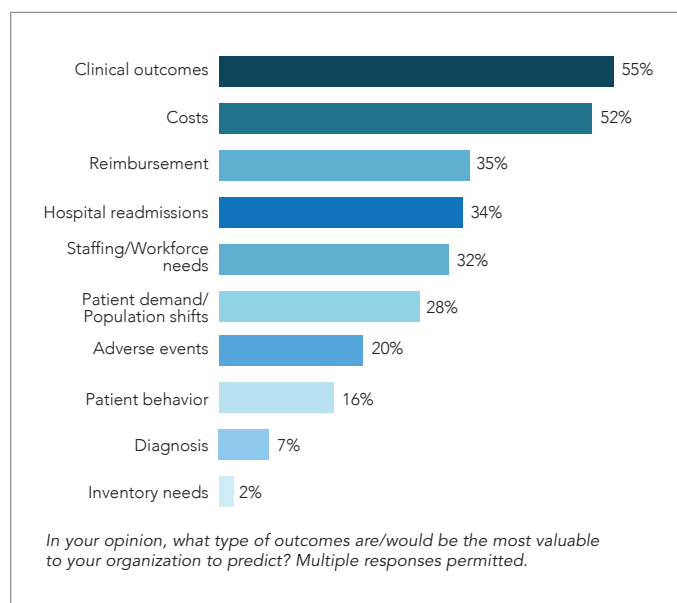
Decision making like this can be possible through the use of predictive analytics—the ability to mine data in order to forecast probabilities and trends, and ultimately, manage risk. Indeed, predictive analytics has the potential to radically change health care, and the way decisions are made at the bedside and in the corner office.

How are U.S. health care organizations leveraging predictive analytics right now? Are they using them at all? What are the barriers to integrating predictive analytics within a health care organization? This survey of 388 health care executives answers those questions and more.

THE OPPORTUNITIES—AND THE BARRIERS

The opportunity for using predictive analytics to make better decisions in health care is high and expansive, according to surveyed health care executives. Direct clinical and financial outcomes are the most valuable data to predict, with clinical outcomes leading (55 percent) and costs—whether per patient, per episode of care, or through another lens—coming in a close second (52 percent). Less critical, but still considered valuable, are the following predictors from data: reimbursement (35 percent), hospital readmissions (34 percent), staffing and workforce needs (32 percent), and patient demand and population shifts (28 percent). (Figure 1)

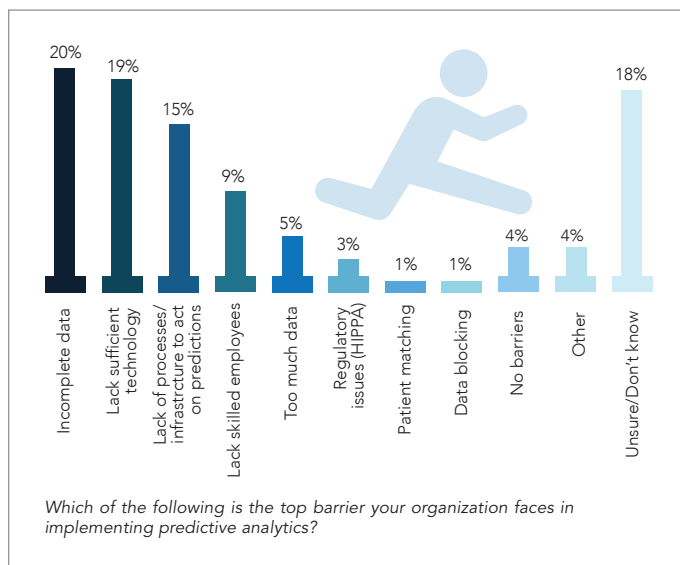
Figure 1
The Most Valuable Data to Predict



There are notable differences between payers and providers. Payers are more than twice as likely as the survey average to choose patient behavior and diagnosis as valuable outcomes to predict. They also place far less emphasis on staffing and workforce needs, with only 8 percent identifying this as a valuable outcome to predict vs. 31 percent of providers.

Where there are opportunities, there are also challenges. When asked to identify their organization's biggest obstacle to implementing predictive analytics at their organizations, health care executives cited incomplete data (20 percent) and insufficient technology (19 percent). These are not unexpected, as the industry's slow acceptance of technology compared with other industries has caused a lack of structured, organized data—both of which are key to leveraging predictive analytics. Interestingly, almost as many health care executives don't know the top obstacle their organization faces, uncovering an absence of strategy or urgency around using predictive analytics. (Figure 2)

Figure 2
A Health Care Organization's Biggest Obstacle Is . . .



Payers and providers exhibit notable differences in this question, as well. Hospitals and health systems are more likely to lack the sufficient technology (23 percent) than payers (3 percent) or medical groups/clinics and nursing homes (14 percent). Payers, on the other hand, are more likely to encounter incomplete data, with 31 percent noting this as their top obstacle, vs. the survey average of 20 percent. Payers are also less likely to face any barriers at all, with 15 percent citing no barriers vs. the survey average of 4 percent. Additionally, medical groups/clinics and nursing homes are twice as likely to lack the skilled employees needed for predictive analytics.

KEY FINDINGS

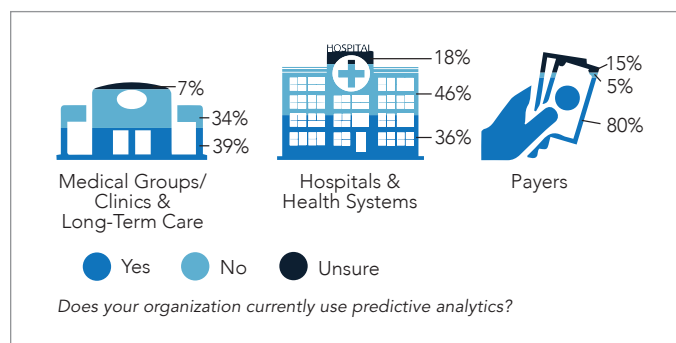
- The most valuable type of predictable data in health care is clinical outcomes, while the biggest challenge to implementing predictive analytics is incomplete data.
- 43 percent of health care organizations use predictive analytics, with hospital readmissions and costs being the most common types of data predicted.
- Predictive analytics roles are swelling in health care—every survey respondent that influences hiring decisions in their organization reported they are adding PA roles.

USING PREDICTIVE ANALYTICS

Within the U.S. health care industry—in this survey, composed of 78 percent providers, 12 percent payers and 10 percent other organizations—fewer than half are currently using predictive analytics (43 percent). Nearly the same amount (42 percent) are not using predictive analytics, and 15 percent of respondents are unsure of their organization's status. This even split represents an honest picture of an industry that has historically made business decisions differently than other industry sectors. The fact that health care is provided regardless of a patient's ability to pay for services is just one factor that makes health care business decision making unique.

When diving deeper into the data, we find disparities among the different sectors within health care. A large majority of payer organizations in this survey use predictive analytics (80 percent). That number dives to 39 percent for medical groups/clinics and nursing homes, and even further to 36 percent for hospitals and health systems. Payers arguably operate more like businesses than providers, basing many of their decisions and systems in actuarial science, like other insurance operations. This helps make sense of their much higher use. (Figure 3)

Figure 3
Health Care Organizations Using Predictive Analytics

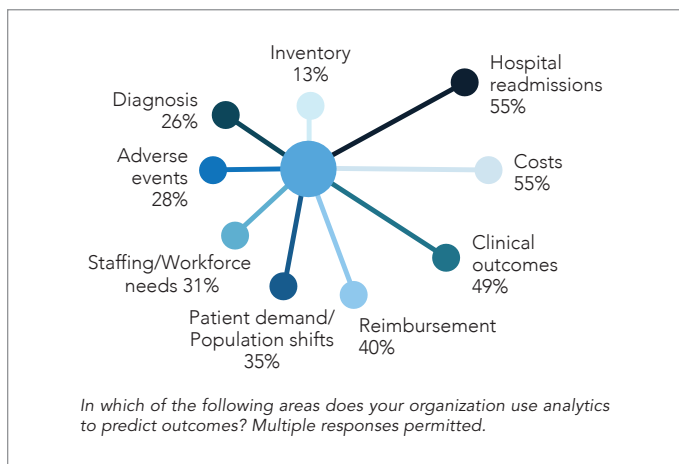




Belonging to an accountable care organization (ACO) affects whether a health care organization uses predictive analytics. Of organizations that are part of an ACO, 52 percent are using predictive analytics vs. 28 percent who are not using them. Why are ACO-related organizations more inclined to use predictive analytics? ACOs need analytics to evaluate risk, more so than the average health care organization, because ACOs tie provider reimbursements to quality metrics. The better able organizations are in predicting outcomes, the better able they are to create positive results.

What type of information is being predicted at the 42 percent of organizations that say they're using predictive analytics? The most common outcomes being predicted are hospital readmissions and costs, both reported by 55 percent of respondents. Inventory needs are the least common to be predicted, with 13 percent of respondents predicting this category. (Figure 4)

Figure 4
What's Being Predicted?



Differences emerged again between the industry sectors on this question. Medical groups/clinics and nursing homes were more likely than other sectors to predict adverse events (39 percent vs. the survey average of 28 percent) and staffing/workforce needs (50 percent vs. the survey average of 31 percent). Payers, interestingly, are more likely to predict clinical outcomes (57 percent vs. the survey average of 49 percent). And hospitals and health systems are more likely to predict hospital readmissions (62 percent vs. the survey average of 55 percent). While nearly half of hospitals and health systems predict costs, a much higher percentage of medical groups/clinics and nursing homes (78 percent) and payers (77 percent) do so.

THE FUTURE OF PREDICTIVE ANALYTICS

As more of the health care industry adopts predictive modeling for various aspects in business decision making, support services and staff are expected to increase accordingly. Where are these roles being housed within health care organizations? (Figure 5) We asked this of survey respondents who are in the position to influence or make hiring decisions related to predictive analytics (PA) roles in their organizations. Of those 50 survey respondents, half indicated that PA roles are increasing at their organizations in an astounding six of the seven possible categories. The most common area for growth is clinical (80 percent), followed by financial (66 percent) and operations (60 percent). (Figure 6)

Figure 5
Who's in Charge?

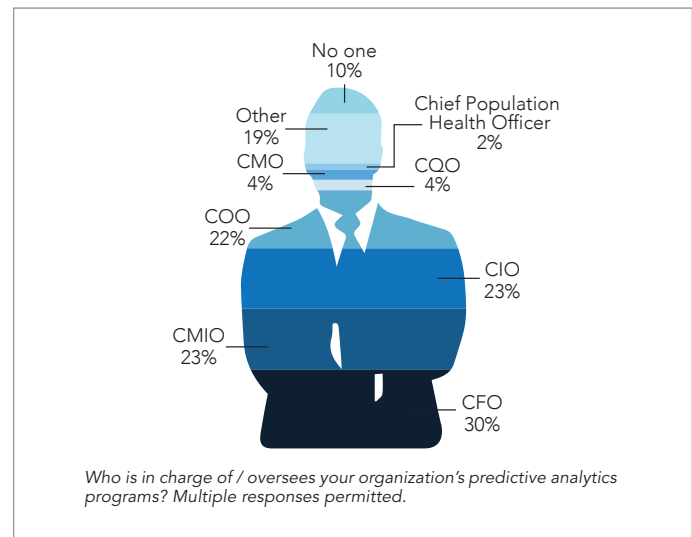
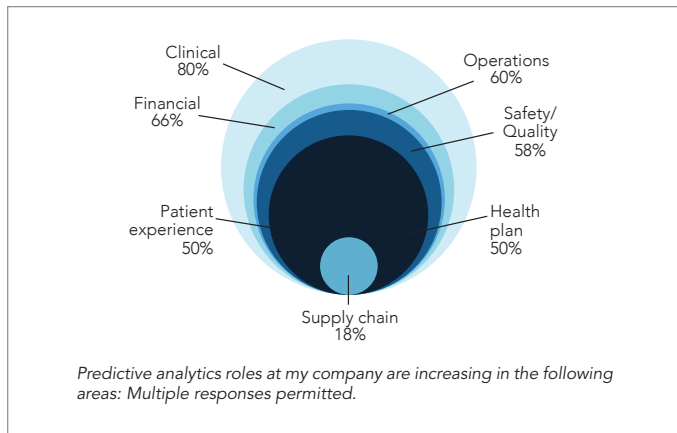
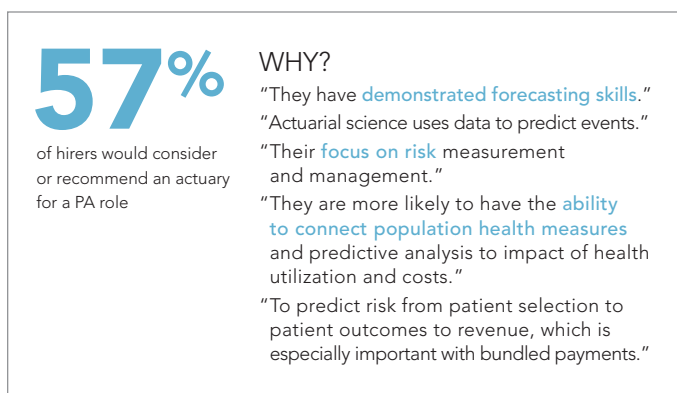


Figure 6
Roles are Swelling. Where are They Increasing?



This group of respondents also specified who might fill these PA roles. With health care organizations taking on more risk, experience with risk evaluation is a more attractive skill than ever: 57 percent said they would consider or recommend an actuary to fill a PA role. (Figure 7) While other backgrounds may be more common among today's health care workforce, actuaries are particularly positioned for success in the area of predictive analytics through their training to measure and manage implications of future events.

Figure 7
Actuaries in PA Roles



ABOUT THE SURVEY

This briefing summarizes the results of a custom research survey conducted by Modern Healthcare Custom Media on behalf of The Society of Actuaries. Invitations to participate in a web-based survey were sent via email to 20,796 health care executives in April 2016. By the closing date of April 25, 2016, 388 returns had been received for a 1.9 percent response rate. (Figure 8) As an incentive to complete the survey, respondents were offered the chance to win a \$500 gift card. ■

Figure 8
Who Took This Survey?

