Workers' Comp

Understanding Predictive Analytics For Workers' Compensation Data Analysis

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As technology evolves, several key ideas continue to permeate our conversations. One of the most exciting topics in 2018 is the application of predictive analytics in insurance and claims handling in particular. Unlike many of the broader terms in the industry (i.e. artificial intelligence, big data and InsureTech), predictive analytics has specific and practical workflow applications today and continues to be an industry game changer.

> **Predictive Analytics is a practice that analyzes historical facts in order to predict with a certain level of certainty either future events or outcomes.**

To understand this concept better, let's take a look at one of America's favorite sporting events: the NFL's Big Game. Whether you watched the Big Game for the commercials, the halftime show or the game itself, you likely had your own prediction about who was going to win. In 2018, more than 100 million people tuned in to the game between the Philadelphia Eagles and the New England Patriots. Many predicted that the Patriots were going to win. Vegas had the odds at 70+% likelihood that the Patriots would end victorious. However, the popular predictions turned out to be false with the Eagles winning 41 to 33 against the Patriots. How can we explain this prediction error?

The Error of Human-Calculated Predictions

We make predictions in every aspect of our lives from the trivial to the large. What is the true cooking time for a Hot Pocket? When is the best time to sell my home? What is the best way to handle a workers' compensation claim? However, when humans make predictions, there is often a larger margin of error than when we use data-driven computer models. Although we may evaluate similar elements that a model would, such as the performance of both teams over the past season, the strength of their defensive teams and talent of their

quarterback, human bias ultimately skews our predictions. Seemingly small factors, such as preference for a player or the influence of our friends in the case of the big game, can influence even the most carefully crafted human prediction. Additionally, there may be factors that are not even part of our consideration set, such as a locker room pep talk, that have an impact on the outcome.

> **Predictive analytics utilizes a wide range of techniques, but a major approach is to analyze historical facts to predict with a level of certainty future events or outcomes.**

Unsurprisingly, predictive models are more accurate than human guesses. The margin of error for these models typically ranges based on a scale of likelihood, i.e. probability, whereas human predictions can have margins of errors that are significantly skewed by our own bias. These models can process a large amount of data without bias and look for patterns that you or I may have missed. To clarify, predictive analytics does not tell us what *will* happen, but rather what ***may*** happen and with what level of certainty.

How does predictive analytics differ from the broader terms of machine learning and artificial intelligence?

Machine learning and artificial intelligence have been a part of our industry for some time. These concepts, though incredibly important, are often big-picture and somewhat difficult to apply to everyday scenarios. Predictive analytics, on the other hand, has a powerful application to our workflows today and workers' compensation in the future. However, the three terms do have a connection. Machine learning is defined as giving computers the ability to learn without being explicitly programmed and artificial intelligence is the display of this learning. Predictive analytics uses machine learning to process the data and build hypotheses of what could happen based on historical data. Unlike machine learning and artificial intelligence, which require high-level techniques to utilize, predictive analytics provides us robust insights in a practical and applicable way. As previously mentioned, predictive analytics works in quite the same way that humans build their own predictions, but creates these predictions in a much more accurate way based on a dataset that incorporates known outcomes. While humans are limited by their own experiences and biases, computers are able to pull a much larger range of data and analyze it objectively.

How does this relate to workers' compensation and claims management?

Predictive analytics provides the ability and power to manage claims more accurately. We can use information from years of past claims to build models that will predict what may happen next in a particular claim. The models relate similar data points to the current claim and provide an adjuster insight into what may happen over the lifecycle of that claim.

> **The ability to compile immense amounts of data into actionable insights is crucial to the managing of risk.**

Based on the claimant's demographics (e.g. age, gender, co-morbidities) as well as medical activities and injury (e.g. prescriptions filled, treatment, fractures versus sprains), the model is able to provide an overall risk score.

This score indicates the potential for future risk based on the data analyzed from the historical claims. Once the adjuster receives the risk score, he can choose from various recommended interventions that are considered appropriate for the claim based on clinical expertise. Instead of waiting until a claimant is already at a point of high risk, predictive analytics can help facilitate early and proactive intervention to keep their recovery on track. This has the potential to improve many aspects of the claims process, but most importantly the patient's recovery. Knowing which claims are at higher risk allows adjusters to apply the appropriate level of management and oversight to the claim and ultimately keep the injured worker on the best path to recovery.

But if these models are supposed to tell us what will happen, why didn't the Patriots win?

Predictive analytics is a very robust and powerful tool. Yet, it may seem that even these models don't always get it right. To a degree, this is true. Remember, predictive analytics tells us not what *will* happen, but rather what *may* happen and with a given level of certainty. The results from predictive analytics can alert you to elements that you may have otherwise missed and give you the opportunity to change the predicted outcome. The Patriots didn't win, but was this because the models were wrong? Not necessarily. Similar to how an adjuster is alerted to the risk in a claim, the Eagles were aware of the predictions favoring the Patriots. With this knowledge and the knowledge of their competitor, they were able to develop and deploy strategies that subsequently changed the game's outcome (e.g. going for a 2-point conversion instead of the standard extra point or converting on fourth down by taking risks they may not have otherwise). The same is true for the function of predictive analytics in the claims process. The adjuster is able to take different steps than he may have if he were simply going off his own understanding of past claims.

> **The immense amount of data in the models gives the adjuster better insight into the claim and intervention can prevent the predicted outcome from occurring, just as the Eagles' actions prevented their predicted fate.**

Predictive analytics is changing the claims landscape and allowing adjusters to focus on the injured worker's recovery, instead of on the difficult task of predicting with limited data points. In the past, the adjuster could only reflect upon what had already occurred; with predictive analytics, adjusters can and will be able to utilize their experience plus new analytics insights to take a more proactive approach and ensure the best recovery for their injured workers.

Curious what other trends we see developing in 2018? Read Brian Allen's article about predictions for the upcoming year.

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