

Milliman

Controlling workers' compensation medical costs: A case for predictive model implementation

The client is an international retailer, with over 200,000 employees globally and annual revenue of more than \$42 billion. It spends approximately \$100 million annually on workers' compensation (WC) premium, and has an in-house self-administered claims unit. The client's average WC medical cost per claim (severity) has been increasing by approximately 8% to 9% per annum.

A solid foundation had already been established for handling claims, such as a vigorous return-to-work program, triage protocol at key facilities, strong safety and loss control programs, etc. With limited claims adjuster resources, and lots of claims and medical transactional data at hand, the client was looking for a breakthrough solution to further reduce WC medical costs.

Proposed business solution

Milliman proposed developing a set of predictive models to identify claims that would incur high medical losses in the future. The main uses would be: 1) triaging claims earlier and more effectively, and 2) identifying and predicting the medical cost drivers of claims. The model(s) would supplement the existing claims administration process, allow for accurate identification of future high-cost claims and risk drivers not readily apparent to claims adjusters, and enable early intervention with improved medical management to prevent losses from developing adversely.

Using closed claims and detailed medical transaction data and Milliman's proprietary algorithms to classify medical information (e.g., CPT/HCPCS codes, ICD-9, NDC, and revenue codes, etc.), the models predict future medical payments at the claimant level at various points in the life of a claim, ranging from Day 1 to Day 360 after the date of injury. Milliman explored a large number of multi-dimensional interactions among different factors (e.g., older divorced female with a back claim who had a recent hospital admission), and tested their statistical significance and predictive value in different models through an iterative process. Many of these factors validated claims management intuition, while others provided insight into trends that would not have been otherwise known to most adjusters.

The final models were applied to predict future medical costs on open claims as of their respective ages. The predictions as well as the predictive factors (also called "risk drivers") are presented in a

Risk Driver Report, which breaks down the predicted medical costs into the following categories:

- Claim characteristics
- Medical conditions
- Medical utilization
- Prescription drug classes

Sample Risk Driver Report

Risk Driver Category	Incremental Cost	Data Element	Estimated Future Costs
Claimant Characteristics			
Sprains/Strains of the Back	\$2,358	Category = Yes	\$2,358
Medical Conditions			
Musculoskeletal and Connective Tissue	\$447	6 Diagnoses	\$2,682
Medical Utilization			
Office Visits	\$101	34 Counts	\$3,434
Medical Paid to Date	20.5%	\$4,631 Prior Paid	\$949
Subtotal			\$4,383
Prescription Drug Classes			
Neurological Agents	\$3,688	3 Counts	\$11,064
Number of Prescriptions	\$576	1 Count	\$576
Subtotal			\$11,640
All Other			\$4,036
Grand Total			\$25,099



From predictive modeling to improved outcomes

The results for a sampling of individual open claims were used as basis for conducting a claims workshop with a multi-disciplined team of experts. The team discussed individual claims and compared model predictions versus actual results in hindsight using a Risk Driver Report.

The workshop resulted in the identification of numerous cost drivers, facilitated the recommendation of specific business actions/rules to reduce costs, led to a re-working of claims staffing structures, improved coordination with medical management providers, and supported the introduction of new data fields to collect within the claims administration process. The client intends to run these models quarterly on all open claims and has estimated expected loss savings of millions of dollars.

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