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Building a database
for predictive analytics

Predictive analytics is a process that many workers compensation insurers are using to control claims costs and improve efficiency in claims administration. Furthermore, medical care inflation is frequently cited as a major cost driver behind high and escalating workers' compensation claim costs. As a result, this increased focus on reining in medical costs requires underlying data challenges to be addressed to perform predictive analytics.

Data Sources
A database for predictive analytics may contain data from three general sources:

1) Claim records from the insurance carrier's or TPA's claims system, containing payment and reserving data for indemnity and medical benefits and expenses.

2) Claim notes maintained in the claim system to record the information received and decisions made by the adjustor.

3) Medical transactional records from the insurance carrier, TPA, or medical management vendor, containing detailed medical diagnosis and procedural data about the claim.

At Milliman, we have extensive experience in working with numerous workers' compensation clients on these three types of data in a coordinated fashion. We see three primary challenges with respect to this data: **completeness, consistency, and comparability**.

Completeness
Data capture processes often change. The capture of detailed workers' compensation medical and indemnity experiences are often on different and non-integrated platforms. Detailed medical bill information is typically retained by a vendor that the payor uses to review medical service charges and services. Changes in the data-capture systems can create breaks and discontinuities in the capture of detailed medical bill information data. Data from multiple data systems may need to be merged to compile the *complete*

medical history. This is often the case when physician, clinic, hospital, and pharmaceutical services are captured on different data systems. If a relationship with a vendor has terminated, there may be issues of ownership of the data and there likely will be costs imposed on access to the data.

Consistency
Medical management practices differ across states and are constantly changing. Changes to statutes and regulations alter the manner in which payers can manage medical care. Rules concerning the authorization of medical care are significantly different across states and frequently change over time within a state. There are substantial differences in the use of treatment guidelines across states and within states over time. Over the past several years, the use of provider networks has become more specialized, with many payers having multiple networks that individually serve specific types of injured workers. As a result, a data management process must be rigorous enough to ensure a *consistent* interpretation of these changing practices.

Comparability
Critical data elements are constantly changing. Changes to the reporting of medical services affect the *comparability* of data over time. The Current Procedure Terminology system is frequently reviewed and revised by the AMA. Changes in the capture of diagnostic information present challenges, including the reporting of multiple diagnoses for a single claim and changes in the manner that particular injuries are classified over time. New formulary is constantly being added to the National Drug Codes list. The ICD-9 is being replaced by ICD-10.

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The Answer

Milliman is an international consulting firm that has provided services in the areas of actuarial analyses, underwriting and operational management, benchmarking, and claims consulting for more than 50 years. As such, we have accumulated a wealth of data and information from performing claims consulting and actuarial services for a variety of workers' compensation insurance entities. We have extensive experience building large, multi-dimensional claims and medical databases that clients and Milliman have used for predictive analytics, and have developed proprietary models as solutions to effectively manage workers' compensation claims and control exposures.

Milliman is among the world's largest independent actuarial and consulting firms. Founded in Seattle in 1947 as Milliman & Robertson, the company currently has 54 offices in key locations worldwide. Milliman employs over 2,500 people. The firm has consulting practices in healthcare, employee benefits, property & casualty insurance, life insurance, and financial services. Milliman serves the full spectrum of business, financial, government, union, education, and nonprofit organizations. For further information, visit milliman.com.

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