



SOCIETY OF ACTUARIES

Article from:

# Health Section News

October 2002 – Issue No. 44

# Comparison of Risk Adjusters

by Bob Cumming

**W**e recently finished a research project that compares the performance of several claims-based methods for health risk assessment. Both diagnosis- and pharmacy-based methods of health risk assessment, also referred to as risk adjusters, were analyzed. This research project was sponsored by the Health Section Council. The lead researchers for this project include Bob Cumming from Milliman USA, Inc and Dave Knutson from the Park Nicollet Institute Health Research Center. The following provides some background, a brief description of the study and some high level results.

## Background

The use of claims-based health risk assessment continues to grow. The federal government has been using hospital inpatient diagnoses to adjust payments to Medicare + Choice contractors and plans to switch to an approach that uses both inpatient and outpatient diagnoses in 2004. Numerous states have implemented methods that use medical diagnosis codes to adjust payments to managed care plans for Medicaid enrollees. Employers are using diagnosis-based methods of risk assessment to analyze how employee contributions should vary by choice of provider or health plan. Health insurers are increasingly using, or are considering using, diagnosis- or pharmacy-based methods of risk

assessment for provider profiling, case management, provider payment and rating/ underwriting.

Although the use of risk adjusters is becoming much more prevalent, there is a lack of independent testing and comparison. The most recent comprehensive, independent study of risk adjusters for commercial populations is the prior study done by the Society of Actuaries in 1995.

## Purpose

The purpose of this study is to provide an independent comparison of several currently available risk adjusters. Specifically, the goals of this study include:

1. Analyzing several recently developed pharmacy-based risk adjusters.
2. Comparing the performance of pharmacy-based risk adjusters with the latest diagnosis-based risk adjusters.
3. Comparing results based on the “standard” risk weights provided with the models with results based on recalibrated risk weights developed from the data set used for this study.
4. Analyzing the change in performance of diagnosis-based risk adjusters since publication of the 1995 Society of Actuaries study.
5. Comparing alternative measures of predictive accuracy.

This study should provide useful information to payors and insurers for evaluating diagnosis and pharmacy-based risk adjusters.

## Risk Adjusters Included in Study

This study compares the performance of seven risk adjusters, including three diagnosis-based models, 3 pharmacy-based models, and one model based on both diagnosis and pharmacy data. The following models were evaluated:

(continued on page 18)



Type of Risk Adjuster	Risk Adjuster
Diagnosis	Adjusted Clinical Groups (ACGs)
Diagnosis	Chronic Illness and Disability Payment System (CDPS)
Diagnosis	Diagnostic Cost Groups (DCGs)
Pharmacy	Medicaid Rx
Pharmacy	RxGroups
Pharmacy	RxRisk
Diagnosis + Pharmacy	Episode Risk Groups (ERGs)

These risk adjusters are compared under three applications:

1. Prospective model with offered risk weights.
2. Prospective model with recalibrated risk weights.
3. Concurrent model with recalibrated risk weights.

A prospective application of a risk adjuster uses claims data from a prior period of time to project medical claim costs for a future period. A concurrent (sometimes called retrospective) application uses claims data from a period of time to project medical claim costs for that same period.

For each risk adjuster, there is a risk weight for each medical condition category. The risk weight reflects an estimate of the marginal cost for a given medical condition relative to the base cost for individuals with no medical conditions. The offered risk weights are the standard risk weights that are provided with the risk adjuster software. The recalibrated risk weights were developed as part of this study and are based on the data set used for this study.

## Results

The following provides a high level summary of the results for this study:

- For prospective applications, the pharmacy and diagnosis-based models perform at a similar level.
- For concurrent applications, the diagnosis-based models outperform the pharmacy-based models.
- The performance of the CDPS and Medicaid Rx models increase significantly when they are recalibrated for the commercial population included in this study. The performance of the other risk adjusters increases slightly when the risk weights are recalibrated.
- The performance of the diagnosis-based risk adjusters has increased significantly since the prior 1995 SOA study.
- A new measure of predictive accuracy was developed. We believe that this new measure has advantages over the existing commonly used measures.

The final report provides a thorough discussion of the results, including numerical measures for each risk adjuster under a variety of applications. 

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