

## Brief Overview of the CPII Statistical Methodology

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During the first four years of the Group Insurance Commission (GIC) Clinical Performance Improvement Initiative (CPII), Resolution Health Inc. (RHI) produced a score of the quality of care provided by a physician based on the percentage of times the claims submitted by the physician showed that he/she complied with clinical practice guidelines that applied to his/her patients. If the care provided by MD<sub>1</sub> was consistent with the relevant clinical practice guidelines in 40 of 50 instances, then the quality of care score for MD<sub>1</sub> in 2006 would have been  $40/50 = 0.80$ .

The GIC and RHI have been working with an expert biostatistician from the Johns Hopkins School of Public Health to refine the quality of care scoring methodology we use to reflect the statistical uncertainty of a point estimate of the quality of care delivered by any given physician.

This year, we have used a statistical model that quantifies the uncertainty around a point estimate of the quality of care delivered by a particular physician (the “physician effect”) while controlling for biases related to a) the mix of quality measures that applied to the physician’s patients (the “measure effect”); b) the behavior of a physicians’ patients, each of whom has a particular likelihood of complying with his/her physician’s recommendations (the “patient effect”); and c) the effect of the number of observations for a particular physician available in the GIC database (the “sample size effect”).

The model’s output is a probability distribution around a point estimate of the quality of care delivered by a particular physician. For example, the point estimate of 0.7 for a particular physician’s quality score is our best estimate of the likelihood that this physician will comply with relevant quality measures after controlling for the “measure effect,” the “patient effect” and the “sample size effect.” However, there is a chance that the physician’s “true” quality score is less than 0.7, and a chance that this physician’s “true” quality score is greater than 0.7. There is more than one way to take account statistically of the uncertainty around a point estimate of the quality of care delivered by a particular physician, and more than one way to use that information to place physician’s into a particular performance “tier.” In this year’s model a physician is placed in the lowest or uppermost tier only if the physician’s score has a probability of greater than 75% of being in that tier.

The model we have employed assumes that the probability that a physician complies with a particular set of quality of care measures that apply to a particular number of patients is a function of measure, patient, sample size and physician effects, the latter of which we use to quantify the physician’s performance after adjusting for the other effects. This model enables us to make adjustments for the number of observations available for a physician, and the variability among measures and patients, as opposed to calculating the simple compliance rate for each physician without adjusting for measure, patient and sample size effects.