

# UnitedHealth Premium<sup>®</sup> Statistical tests

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## Overview

UnitedHealth Premium applies statistical tests to determine if there is a statistically significant difference between the physician's performance and the benchmark. When there are enough measures attributed to evaluate effective quality care, the chi-square goodness of fit test (for statistical significance) and the phi coefficient (for effect size or absolute difference) are used to compare the physician's performance to the minimum score benchmark. When there are enough patients or episodes attributed to evaluate efficient quality care and total cost of care, the Wilcoxon rank-sum test is used to compare the physician's performance to the minimum score and target benchmarks.

### Effective quality care

The chi-square goodness of fit test is a standard statistical test used to determine whether the frequency distribution of observed events is consistent with an expected distribution. Premium uses the chi-square test because it allows the combining of observed and expected results for many measures and assesses how well the observed results fit the expected results.

Applying the chi-square test has the following advantages over a flat compliance rate criterion, such as an 80% overall compliance rate.

- The chi-square test considers some recommended interventions may be more or less difficult to accomplish. For example, patients with diabetes are likely to obtain retinal exams at a lower rate than they would obtain hemoglobin A1C blood tests. Similarly, the rate of adverse reactions to 1 class of medications might be different from the rate of adverse reactions to another medication. The expected number of compliant measures is calculated by multiplying the national compliance rate for each measure by the number of those measures attributed to the physician. This adjusts for the physician's case-mix.

- The chi-square test helps distinguish meaningful deviations from the target benchmark as compared to more random deviations. For example, using a flat 80% overall compliance benchmark would exclude physicians with a 79% compliance rate, even though the difference is small and may be due to chance. If the physician's performance is not consistent with the minimum score benchmark by a margin that is unlikely due to random factors, then the difference between the 2 results is considered statistically significant.

Both the chi-square test and the phi coefficient are used together to determine the result. Since for larger sample sizes, a statistically significant difference from the benchmark may, in some cases, have a smaller absolute difference, and the phi coefficient helps ensure the difference is meaningful as well.

### **Efficient quality care and total cost of care**

The Wilcoxon rank-sum test is a non-parametric test that transforms the data into relative ranks to test 2 groups of data for statistically significant differences. Premium uses the Wilcoxon rank-sum test because it is not bound to assumptions about the data distribution and is less sensitive to extreme values commonly found in health care cost data. Applying the Wilcoxon rank-sum test has the following advantages over parametric statistical tests (based on mean averages).

The Wilcoxon rank-sum test:

- Maintains the integrity of case-mix and risk/severity adjustment.
- Is consistent with the central limit theorem down to small sample sizes. Simulation testing showed that the Wilcoxon rank-sum z-score distributions were consistent with normality down to a sample size of 10.
- Has less need for mitigation strategies required by parametric tests to deal with skewed data and outliers.
- Is more stable over time than usual parametric techniques.

## Important notes about UnitedHealth Premium

The information from UnitedHealth Premium is not an endorsement of a particular physician or health care professional's suitability for the health care needs of any particular member. UnitedHealthcare does not practice medicine nor provide health care services. Physicians are solely responsible for medical judgments and treatments supplied. A Premium Care Physician designation does not guarantee the quality of health care services members will receive from a physician and does not guarantee the outcome of any health care services members will receive.

The fact that a physician doesn't have a Premium Care Physician designation doesn't mean the physician doesn't provide quality health care services. All physicians in the UnitedHealthcare Network have met certain minimum credentialing requirements. Regardless of whether a physician has received a Premium Care Physician designation, members have access to all physicians in the UnitedHealthcare Network as described under the member's benefit plan.

There are various reasons why a physician may not be designated as a Premium Care Physician. A physician may not receive a Premium Care designation because that physician has not been evaluated for a Premium Care designation. This occurs when a physician does not practice in a specialty that is evaluated by Premium, or when a physician's evaluation is in process. It also occurs when a physician does not have enough health plan claims data to be evaluated, but it is not an indicator of the total number of patients treated by the physician or the number of procedures performed by the physician. Rather, it reflects the statistical requirements of Premium, which includes only health plan claims associated with specific Premium measures and relevant to the physician's specialty. In some cases, there may not be enough data to complete the analytic process from a statistical standpoint.

**UnitedHealthcare informs members that designations are intended only as a guide when choosing a physician and should not be the sole factor in selecting a physician. As with all programs that evaluate performance based on analysis of a sample, there is a risk of error.** There is a risk of error in the claims data used in the evaluation, the calculations used in the evaluation, and the way Premium determined that an individual physician was responsible for the treatment of the patient's condition. **Physicians have the opportunity to review this data and submit a reconsideration request.**

UnitedHealthcare uses statistical testing to compare a physician's results to expected or normative results. There is a risk of error in statistical tests when applied to the data and a result based on statistical testing is not a guarantee of correct inference or classification. We inform members that it is important that they consider many factors and information when selecting a physician.

**We also inform our members that they may wish to discuss designations with a physician before choosing them, or confer with their current physician for advice on selecting other physicians.**

The information contained in this document is subject to change.

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