

# UnitedHealth Premium Statistical tests



Additional UnitedHealth Premium® methodology documents are located on [unitedhealthpremium.uhc.com](https://unitedhealthpremium.uhc.com).

## 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 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 one 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 two 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 two 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 member. UnitedHealthcare does not practice medicine nor provide health care services. Physicians are solely responsible for medical judgments and treatments.

A Premium Care Physician designation does not guarantee the quality or the outcome of any health care services members receive. The fact that a physician does not have a Premium Care Physician designation does not mean the physician does not 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 in 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 designation because that physician has not been evaluated. This occurs when a physician does not practice in a specialty or market that is evaluated by Premium, or the physician's evaluation is in process. This also occurs when there are not enough measures, patients, and or episodes attributed to the physician for evaluation. This is not an indicator of the total number of patients treated by the physician, or the number of procedures performed by the physician.

**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. Members are encouraged to discuss designations with a physician before choosing them or consult with their current physician(s) for advice on selecting other physicians.**

**As with all programs that evaluate performance based on evaluation of a sample, there is a risk of error.**

There is a risk of error in the claims data used and in the way patient care is attributed to physicians. UnitedHealth Premium uses statistical testing to compare a physician's performance to benchmarks. 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. Physicians have the opportunity to review the data and evaluation results and may submit requests for changes and or corrections.

**The information contained in this document is subject to change.**

**Learn more**

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