# JOHNS HOPKINS ACG® SYSTEM:

## A Standardized Approach to Understanding Patient Populations by Region or PCP Group

The Johns Hopkins ACG System is an internationally recognized and validated population health analytic suite used by health systems, payors, health ministries, and provider groups. Across the US and 6 continents, health care organizations use the ACG System to understand their population's health care needs, track patterns of disease, accurately predict outcomes, compare and optimize provider performance, and drive clinical innovation through targeted workflows and programs.

The ACG System supports robust comparisons of populations, clinic and provider performance, and casemix adjusted predicted utilization. Our concurrent and prospective models allow organizations to standardize program measurement and evaluation across different populations, and establish risk-based targets for population subsets and provider groups. Through use of these tools, organizations can allocate resources more efficiently, identify outliers, and improve performance, while improving patient health.

**This document demonstrates how the Johns Hopkins ACG System can be used to illuminate key patient characteristics across populations, compare populations to a national reference on a casemix adjusted basis, and understand risk-adjusted outcomes across patient groups.**
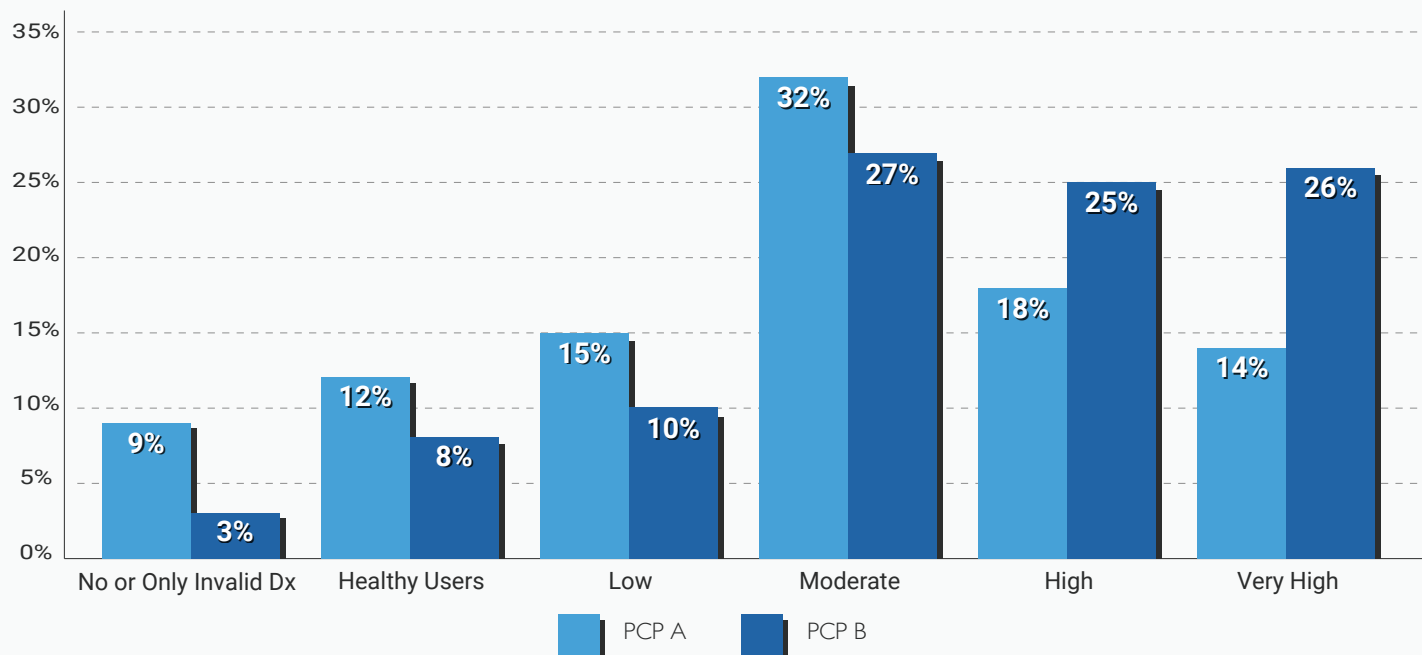
## COMPARING DISEASE BURDEN AND HEALTH CARE NEEDS

Through its sophisticated handling of diagnosis and pharmacy data, the ACG system generates a robust set of clinical markers and groupings. These attributes are used by customers to describe a population's disease burden and expected resource use, and compare population subsets, regional patterns, and established benchmarks. The ACG System's 286 unique disease and symptom clusters incorporate acute and chronic conditions, and help to mitigate differences in coding detail and frequency between practitioners. At the individual disease level, expanded diagnostic clusters (EDCs) may be used to quantify disease prevalence within a population, compare subsets to each other and national benchmarks, and track disease trends over time.

| Diagnosis Cluster | Clinic A | Clinic B | Population Average | Age-Sex Adjusted Benchmark/1000 |
|---|---|---|---|---|
| Type 2 Diabetes/1000 | 132 | 201 | 181 | 168 |
| Hypertension/1000 | 512 | 551 | 534 | 530 |

" **To minimize variations in disease based on casemix, the software calculates expected disease rates based on age and sex and compares the actual disease rates to the expected.**

JOHNS HOPKINS
M E D I C I N E

Going beyond single disease states to whole-person needs, the ACG System aggregates patient-level groupings of overall illness burden and future need for health care services. Our six Resource Utilization Bands (RUBs) range from non-user of health care services to very high utilizer and represent anticipated health care resource use. ACG System customers commonly use RUBs to compare resource use across entities, at the sub-population level, or between provider groups. In the below example, most of PCP A's patients fall into non-user, healthy and low-moderate categories, while most of PCP B's patients are in moderate, high and very high need groups. An ACG customer would use this information to further understand diagnostic or utilization trends across provider groups and individual providers and to finely tailor clinical program planning.

### Comparing Anticipated Health Care Needs at Two Clinic Locations



## RISK-ADJUSTED MEASUREMENT AND PREDICTION

In addition to the raw measures of disease burden and health care need described above, the ACG System's concurrent risk models normalize and compare the relative performance of groups against a risk-adjusted benchmark or national average. These models compile demographic, diagnosis, and overall illness burden into weighted metrics of historic performance, accounting for local variation and area practice patterns.

These weighted measures establish a population norm of one. Measures higher than one represent a subset of higher illness and those lower than one a subset with healthier patients. Similarly, the prospective (predictive) models provide an estimate of the future risks for each subset, and a method to predict those members that are likely to experience high utilization.

In the example below, we see that PCP A has healthier patients overall, as indicated by a concurrent risk of 0.77 compared to the population mean. Predicted pharmacy costs for those patients are anticipated to be 82% of next year's average. Despite a healthier population, PCP A patients use Emergency Room services 17% more than expected given their health status, representing an opportunity for improved use of urgent clinic hours.

JOHNS HOPKINS
M E D I C I N E

Applying the tools described above, organizations can understand current and predicted health resource use across multiple provider groups or patient subsets. These metrics may be used to establish risk-adjusted utilization targets at the group, PCP or regional level. Through routine monitoring of these metrics and relevant drill-downs, organizations can understand best practices in locations with healthier populations, while allocating additional resources or support programs to sicker patient subgroups. This data-driven methodology is vital to effective management of diverse populations with varying health care needs.
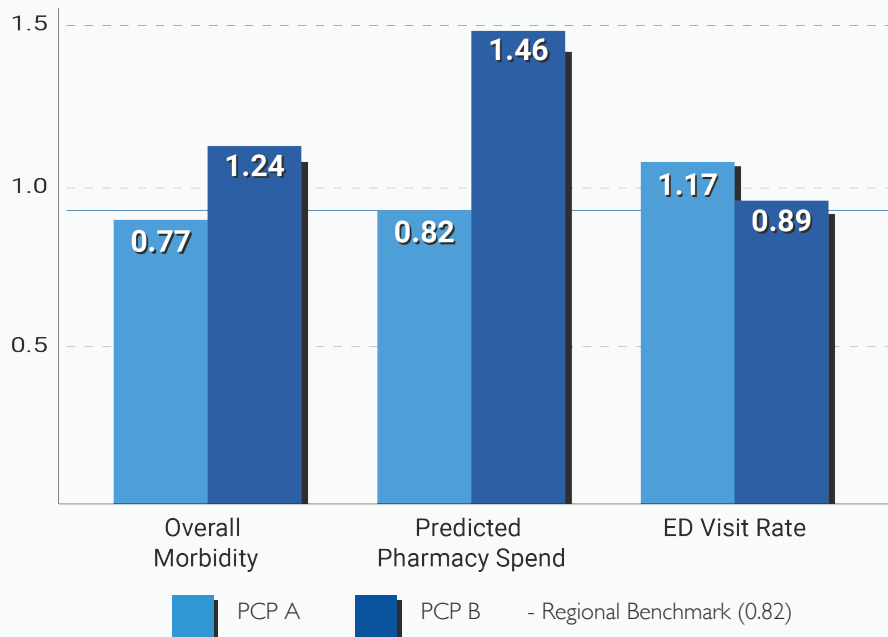


## EVALUATING PROVIDER PERFORMANCE USING RISK-ADJUSTED PROCESS AND OUTCOME METRICS

The casemix adjusted comparisons described above allow ACG System users to quantify the performance of provider practice groups and individual providers, accurately accounting for underlying illness burden. The ACG System uses this underlying calculation to quantify expected resource use given the subset's overall illness burden. The ACG System produces expected metrics in a number of key domains, including clinic visits, hospitalizations, ED visits and costs.
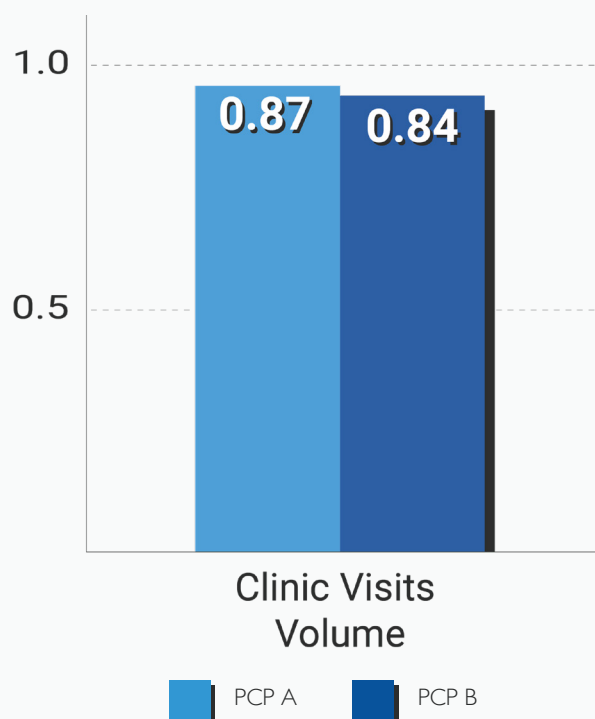


Within our prior examples we demonstrated a scenario in which PCP A has a healthier patient subset than PCP B. Using the ACG System's casemix adjusted predictions, we quantify expected utilization and cost metrics for each clinic. Despite a healthier population, PCP A's Emergency Department visits are higher than expected – suggesting an opportunity for additional performance improvement. Conversely, PCP B's sicker population uses the Emergency Department less frequently than expected. Both physicians have an opportunity to increase per-patient preventive clinic visits to reach risk-adjusted goals.

JOHNS HOPKINS
M E D I C I N E

The ratio of actual/observed visits to expected visits, or O/E ratio, is a measure of efficiency relative to an average of 1.0. Ratios greater than 1.0 indicate a performance opportunity, while ratios less than 1.0 indicate subgroups that are more efficient in their use of health care resources.

| Location | Actual ED Visits/1000 | Expected ED visits/1000 | ED O/E | Actual Clinic Visits/1000 | Expected Clinic Visits/1000 | Clinic Visit O/E |
|---|---|---|---|---|---|---|
| PCP A | 336 | 288 | 1.17 | 2644 | 3015 | 0.87 |
| PCP B | 284 | 319 | 0.89 | 2813 | 3332 | 0.84 |

## USING THE ACG SYSTEM TO UNDERSTAND POPULATIONS

The ACG System's whole-patient approach and methodological tools help provider groups, payors, and at-risk organizations understand, compare, monitor and optimize performance. Through applying analytic insights across a population, organizations can monitor performance at-a-glance while accounting for common variations in disease burden and resource need between locations. Our casemix adjustment variables will facilitate establishment of benchmarks across locations, and support accurate predictions of resource need and utilization. Organizations can rely on the well-established science of Johns Hopkins tools for accurate measurement and globally-validated methodology.

## The ACG System's Whole-Patient Approach and Methodological Tools

Understand          Compare          Optimize          Monitor

JOHNS HOPKINS
M E D I C I N E