The ROI of Smarter Care:

Using Population Health Analytics to Demonstrate Value and Impact

Table of Contents

Executive Summary

Health care organizations face mounting pressure to deliver improved patient outcomes while managing escalating costs. In this complex environment, demonstrating improved patient outcomes and the value of care has become essential.

The Johns Hopkins ACG® System provides organizations with tools to understand population risk, reduce unnecessary utilization and improve patient outcomes across diverse patient groups. This e-guide explores how the same analytical capabilities that drive clinical improvement also enable organizations to quantify financial return on investment with rigor and precision. Health care organizations, from health plans to integrated delivery systems, have leveraged the ACG System to translate data insights into measurable financial returns. Although these strategies can be complex, the ACG System makes them much simpler.

Why ROI Matters in Health Care

Health care organizations operate within a variety of payment models, including fee-for-service, value-based payment, bundled arrangements, capitated risk agreements and outcomes-focused contracts. In these environments, demonstrating clear return on investment has become essential. Without structured measurement, organizations lack visibility into which interventions merit continued investment. Rigorous measurement ensures resources are directed toward approaches that genuinely deliver value.

For organizations operating under capitation or shared-savings arrangements, clear measurement of avoided costs directly protects financial margins.

For providers seeking value-based contracts, evidence of outcomes improvement strengthens competitive positioning.

When organizations understand not just whether an intervention works — but why and for whom — they can refine implementation, target populations more precisely and allocate limited resources toward highest-value activities to improve population health.

The appropriate ROI methodology choice depends on organizational capabilities, data availability, population size and the level of rigor required for decision-making. Most organizations begin with simpler methodologies and progress toward more sophisticated approaches.

Measuring ROI Using the ACG System: Core Methodologies

Overview:

How the ACG System Supports ROI Calculation

The ACG System provides tools that enable robust ROI measurement through its classification algorithms, risk stratification capabilities and segmentation models.

Across the industry, organizations typically use three primary methodologies to quantify impact.

Methodology 1:

Case-Mix Adjusted Comparison Group Analysis

This methodology leverages the ACG System's classification capabilities to create comparison groups without formal propensity score matching. Using the ACG System outputs, organizations can easily divide populations into clinically homogeneous subgroups — such as those with similar diagnoses, risks and impactability levels — and compare utilization between intervention and non-intervention subgroups to calculate the average intervention effect. This approach balances rigor with feasibility and works well when sample sizes support stratified analysis and when ACG segmentation adequately controls for differences between groups.

Key Insights:

Patients in Patient Need Group (PNG) 10 with admission risk scores of 0.5–0.7 who received CCM had 0.20 fewer admissions per year, generating $2,200 in net savings per patient.

COMPLEX CARE MANAGEMENT (CCM) INTERVENTION HAD

0.20 fewer admissions

ESTIMATED TOTAL SAVINGS:
approximately

$22 million

POPULATION OVERVIEW: 10,000 patients

Methodology 2:

Relative Utilization Rate Analysis Using Population Benchmarks

This approach compares observed utilization against expected utilization using ACG System risk adjustment models. The ACG System uses diagnosis codes and demographic data to calculate expected utilization that is adjusted to risk profile. Organizations can also express results as utilization rates per 1,000 member-months or member-years, enabling straightforward comparison across organizations of different sizes and aggregation across multiple sites or time periods. Avoided cost is calculated by multiplying the difference between observed and expected utilization by population size and cost per unit of utilization. This methodology does not require a control group and can be applied when intervention and non-intervention cohorts are not directly comparable or when true controls are unavailable.

Key Insights:

For 10,000 members, expected admissions were 4,000 annually (0.4 per member); after an enhanced primary care access program was implemented, actual admissions were 3,500 (0.35 per member).

4,000
EXPECTED INPATIENT ADMISSIONS ANNUALLY

3,500
ACTUAL INPATIENT ADMISSIONS ANNUALLY

ESTIMATED TOTAL SAVINGS:
approximately
$3.25 million

POPULATION OVERVIEW: 10,000 patients

Methodology 3:

Propensity Score Matching and Comparative Analysis

One of the most rigorous approaches to ROI measurement uses propensity score matching to construct comparable control groups — pairing individuals who received an intervention with clinically similar individuals who did not. This methodology addresses the core challenge in intervention evaluation: attributing observed changes to the intervention itself rather than to pre-existing differences between populations. Organizations then compare utilization patterns between matched cohorts over a defined measurement period (typically less than 18 months), calculating avoided utilization attributable to the intervention and converting avoided utilization to dollar savings appropriate to the population and setting. This is the most rigorous approach to ROI calculations and typically requires analytical sophistication and larger populations.

Key Insights:

In propensity-matched analysis, intervention patients had 0.15 fewer Emergency Department (ED) visits per year, equating to ~$180 in avoided annual cost per patient.

0.15
FEWER ED VISITS PER PATIENT PER YEAR

ESTIMATED TOTAL SAVINGS:
approximately
$1.8 million

POPULATION OVERVIEW: 10,000 patients

ACG System customers have demonstrated measurable ROI using these methodologies. The following case studies illustrate real-world applications and outcomes.

Real-World Case Studies: ROI in Action

Case Study 1:

Data-Driven Employer Engagement ROI from Non-Emergent ED Utilization Reduction

The Organization and Challenge

Vital Incite, a U.S.-based population health consulting company, partners with employers to reduce health care costs and improve employee health. One employer client identified rising ED utilization as a key driver of costs and a potential signal of gaps in primary care access and employee health education. The employer sought to understand emergency department utilization patterns and identify opportunities to reduce avoidable ED visits.

The ACG System Application

Using the ACG System's Emergency Department Algorithm, Vital Incite categorized each ED visit into mutually exclusive categories — from emergent conditions requiring ED care to non-emergent issues more appropriately treated in primary care — and analyzed utilization patterns. This analysis revealed that over two-thirds of ED visits were potentially preventable. Individuals without an established primary care relationship were particularly likely to use the ED unnecessarily, and a large portion of ED visits occurred during evening and weekend hours.

Based on the ACG System analysis, Vital Incite recommended a series of targeted interventions: extending onsite clinic hours to evenings and weekends, implementing an after-hours nurse call line, incentivizing primary care engagement, and launching a 24/7 telehealth service. These interventions were designed to address the specific access gaps identified through the ED utilization analysis.

Key Insights:

ACG System analysis identified 959 avoidable ED visits (611 non-emergent and 348 primary-care-treatable), representing approximately $4.0M in potentially avoidable ED costs.

611 NON-EMERGENT ED VISITS

348 PRIMARY-CARE TREATABLE VISITS

ESTIMATED TOTAL SAVINGS:
approximately
$4 million

Factoring in $650,000 in costs for clinic expansion and telehealth infrastructure, the ROI is calculated at 5.2:1, with net benefits totaling $3.4M.

POPULATION OVERVIEW: 10,000 patients

Key Lessons

By using the ACG System's ED classification to distinguish between emergent, primary-care-treatable, and non-emergent visits, Vital Incite guided the employer toward interventions targeting the root causes of avoidable utilization. Organizations that use ACG System analytics to identify not only the presence of a problem, but also the specific categories of utilization driving costs, can design interventions with measurable impact and confidently justify continued investment.

Case Study 2:

Achieving ROI in Value-Based Care Contracts with Predicted Risk Complex Care Management

The Organization and Challenge

A Southeast Management Service Organization (MSO), which manages 60,000 patients, faced a population health challenge: despite having multiple value-based care contracts and care management programs, results had plateaued. The organization had already implemented health equity initiatives, outreach and interventions, and provider incentive programs. Leadership wanted to identify which patients would genuinely benefit from intensive interventions and determine the most effective allocation of limited care management resources.

The ACG System Application

The Johns Hopkins population health analytics team analyzed the MSO's population, current resources, and intervention methodologies, recommending a refreshed algorithm to identify patients for CCM based on complexity, risk and potential impact — moving beyond utilization triggers such as ED visits or admissions. These predictive risk models were then paired with actionable clinical opportunities, prioritizing patients with the highest probability of benefit and matching them with appropriate interventions.

Intervention Design

Using ACG-derived predictive markers, the MSO implemented a targeted care management program focusing on high-risk patients across both their Medicare Advantage and ACO REACH populations. The organization concentrated care management resources on patients identified through the ACG System as high-risk, while implementing lower-intensity population health activities for broader cohorts.

Key Insights:

Using propensity score matching to compare enrolled and non-enrolled patients over 12 months, the program demonstrated reductions across multiple utilization categories:

- **Admissions**
- **ED visits**
- **Skilled nursing facility admissions**
- **Readmissions**

ESTIMATED TOTAL SAVINGS:
approximately
$3.3 million
$1.2 million in Medicare Advantage
$2.1 million in ACO REACH

With an estimated care management investment of $800,000, the first-year ROI was 3.1:1, generating $2.5 million in net benefit.

POPULATION OVERVIEW: 60,000 patients

Key Lessons

Targeting care management resources to patients by risk and likelihood of benefit enables impact across diverse payment models and complex populations.

Case Study 3:

The ROI of Restructuring Care Access Across 3 million Members

The Organization and Challenge

Discovery Health, a major medical administrator in South Africa serving over 3 million beneficiaries, confronted a fundamental challenge. In South Africa's private health care environment, many members use the emergency department as a first point of contact. This pattern contributed to rising costs and utilization. From 2010 to 2015, ED admission rates increased 26%, leading to Discovery Health taking action to address this trend.

The ACG System Application

Discovery Health used the ACG System's care coordination segmentation model and ED classification system to understand the relationship between primary care provider engagement and ED utilization. Their analysis identified a potential savings opportunity of 500 million South African Rand ($33 million U.S. dollars) if better utilization of primary health care was encouraged across their membership.

Intervention Design

Based on the ACG System analysis, Discovery Health launched a new benefit plan requiring members to see a primary care provider first to "unlock" access to secondary and tertiary levels of care. Rather than restricting care, this gating mechanism encouraged care navigation through the appropriate first point of contact, aligning with Discovery's philosophy that primary care should sit at the center of all strong health care systems.

Key Insights:

Stronger primary care relationships reduced ED visits, especially for moderate-complexity (RUB 3) patients, with a 64% decrease. Discovery Health converted 62% of uncoordinated patients to coordinated care in one year, reducing specialist visits, admissions, readmissions and ED visits.

ED VISITS PER
1,000 members
decreased by 64%
among RUB 3 patients

ESTIMATED TOTAL SAVINGS:
approximately
$13.3 million

With estimated program investment of $2 million for care coordination infrastructure and PCP network engagement, the first-year ROI was 5.7:1, generating $11.3 million in net benefit.

POPULATION OVERVIEW: 1,000 patients

Key Lessons

Realigning care pathways and incentives through ACG System analysis can generate substantial results. The 64% reduction in ED visits among moderately complex patients represents a fundamental shift in how care is accessed and delivered.

Conclusion: The Business Case for Data-Driven Population Health

The case studies in this e-guide illustrate how rigorous ROI measurement can be achieved across diverse health care settings and intervention types. Vital Incite achieved 5.2:1 ROI through ED utilization analysis. The Southeast MSO achieved 3.1:1 ROI through predictive risk targeting. Discovery Health achieved 5.7:1 ROI through care pathway redesign. Organizations leveraging ACG System analytics to precisely target interventions toward high-need, high-impact populations generate measurable financial returns while improving clinical outcomes.

Each of these organizations moved beyond general assumptions about cost drivers to identify the specific populations, utilization patterns and clinical factors offering the greatest opportunity for improvement. This analytical clarity enabled precise, evidence-based intervention design and credible ROI measurement. In value-based care environments — where demonstrating outcomes is critical to organizational sustainability — this level of clarity distinguishes organizations that succeed from those that struggle.

The Johns Hopkins ACG System provides the analytical foundation for calculating ROI. Organizations who invest in understanding their populations through ACG segmentation and risk stratification can design interventions informed by data, measure impact with rigor, and make resource allocation decisions with confidence. The evidence is clear: measurement-driven decision-making delivers significant value.

ABOUT THE **ACG SYSTEM**

The Johns Hopkins ACG System is the world's leading population health analytics software. The system continues to evolve, providing ever-more refined tools used in the U.S. and across the globe for over 30 years, from commercial health plans and governments to health systems and large employers. The beauty of the ACG System is its ability to combine data from an array of sources to reveal powerful insights that go beyond just medical records.

By identifying risk and tracking patients over time, the ACG System can help you plan ahead and reduce health care costs — especially valuable to risk-bearing health systems and provider organizations. Most importantly, the ACG System allows you to be proactive rather than reactive when it comes to your population's unique health care needs. The system helps you combine a population-level perspective with patient-level behaviors and conditions. And because the system is incredibly flexible and responsive to new information, you can rest assured that no matter what comes next, the ACG System will continuously adapt to your health care management needs.

Discover the value and impact of the ACG System for your organization.
Contact our team today.

acginfo@jh.edu | hopkinsacg.org