

# THE ACG<sup>®</sup> SYSTEM'S EMERGENCY DEPARTMENT CLASSIFICATION:

YOUR GUIDE TO REDUCE COSTS  
AND IMPROVE HEALTH OUTCOMES



## *Introduction*

The Johns Hopkins ACG® System is relied on by health systems, health plans, accountable care organizations, health care analytics companies and others across the globe for population health analytics and strategy. In this guide, we'll be looking at specific ways the ACG System's unique Emergency Department (ED) classification feature can reveal potential cost savings and improve health outcomes. We'll also show you several real-world examples of how companies have used the ACG System to achieve concrete results.

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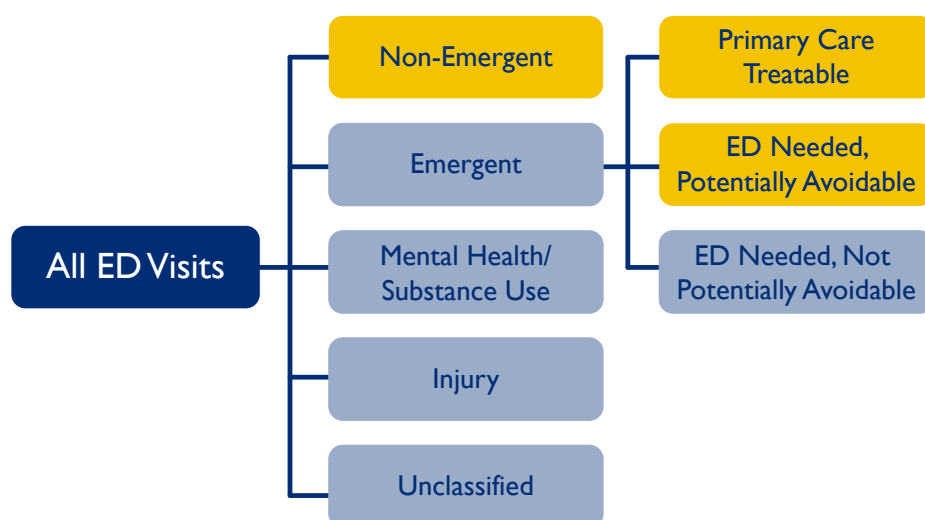
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# Part I: Revealing Health Care Savings

Emergency departments are an essential link in the health care system; however, ED visits for non-urgent conditions strain limited health care resources, incur unnecessary health care costs and contribute to suboptimal care coordination. Fortunately, with the help of the ACG System, users can identify and address potentially avoidable ED visits, ultimately streamlining access to health services for patients while revealing potential savings.

## How the ACG System Works

The ACG System uses a custom algorithm developed by researchers at the Johns Hopkins Center for Population Health IT ([CPHIT](#)). In collaboration with a team of experienced clinicians and health services researchers, the CPHIT team reviewed and assigned diagnostic codes and billing patterns that occur in ED visit records. The ACG System's mappings are updated quarterly as new codes are released, generating a comprehensive algorithm that classifies 99% of ED visits in a typical population.



## How the ACG System's ED Features are Used by Customers

The ACG System's proprietary ED classification algorithm is used by customers around the world to understand patterns of care, identify patients who may benefit from additional services, and quantify and monitor cost savings. Typical applications include:

- » Understanding ED utilization patterns within a population
- » Identifying patients with frequent, avoidable ED use
- » Monitoring ED visit rates by PCP group assignment, using the ACG System's casemix adjustment values
- » Tracking and trending interventions to reduce ED use
- » Quantifying expected savings from diversion to urgent care or PCP offices

## Johns Hopkins HealthCare (JHHC)

This new classification system was tested on a [national dataset](#) using real-world data from Johns Hopkins Medicare, Medicaid and employer populations. Results indicated that just over **33% of ED visits occurred for diagnoses that are non-urgent**. In addition, **28% of ED visits could have been prevented through primary care**. Digging even deeper into the data, researchers found that nearly **20% of patients with a non-emergent ED visit had not seen a primary care physician in the past year**, revealing an unmet health care need. All of this information can help providers find ways to streamline access to health care services. Beyond improving patient access to health care services, reducing the number of non-emergent ED visits can also lead to major cost savings—for JHHC in this case, an estimated \$3.8 million.

Health Plan Type	Non-Emergent Visits/1000	Estimated Savings for 5% Reduction in Non-Emergent ED Visits	
		No. of Avoided Non-Emergent ED Visits	Est. ED Visits Cost Savings (\$)
Commercial	56	142	\$176,506
Medicare	30	30	\$34,440
Medicaid	171	3,011	\$3,456,628

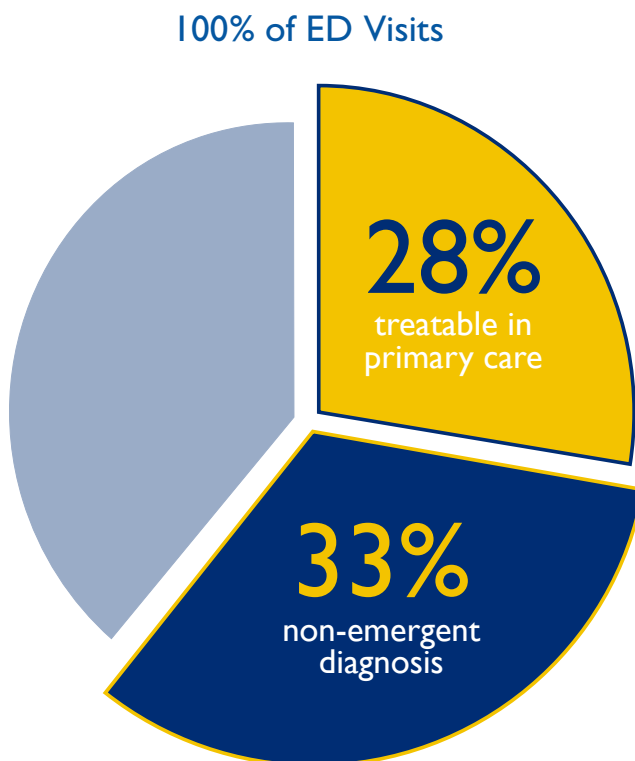
### KEY TAKEAWAY .....



*Ultimately, the ACG System can help highlight specific, measurable instances of health care overutilization, giving providers, health plans and other organizations the information they need to prevent costly ED visits and thereby reduce overall health care costs.*

## Part II: Reducing Avoidable ED Visits

The ACG System can reveal specific trends in ED visits for a certain population, specifically, patients who visited for non-emergent care or primary care (PCP) treatable conditions. By drilling down into this data, ACG System users can understand root causes of ED use and segment patients into groups depending on their unique health care needs. With this information in hand, System users can develop an effective strategy to reduce ED use and associated health care costs.

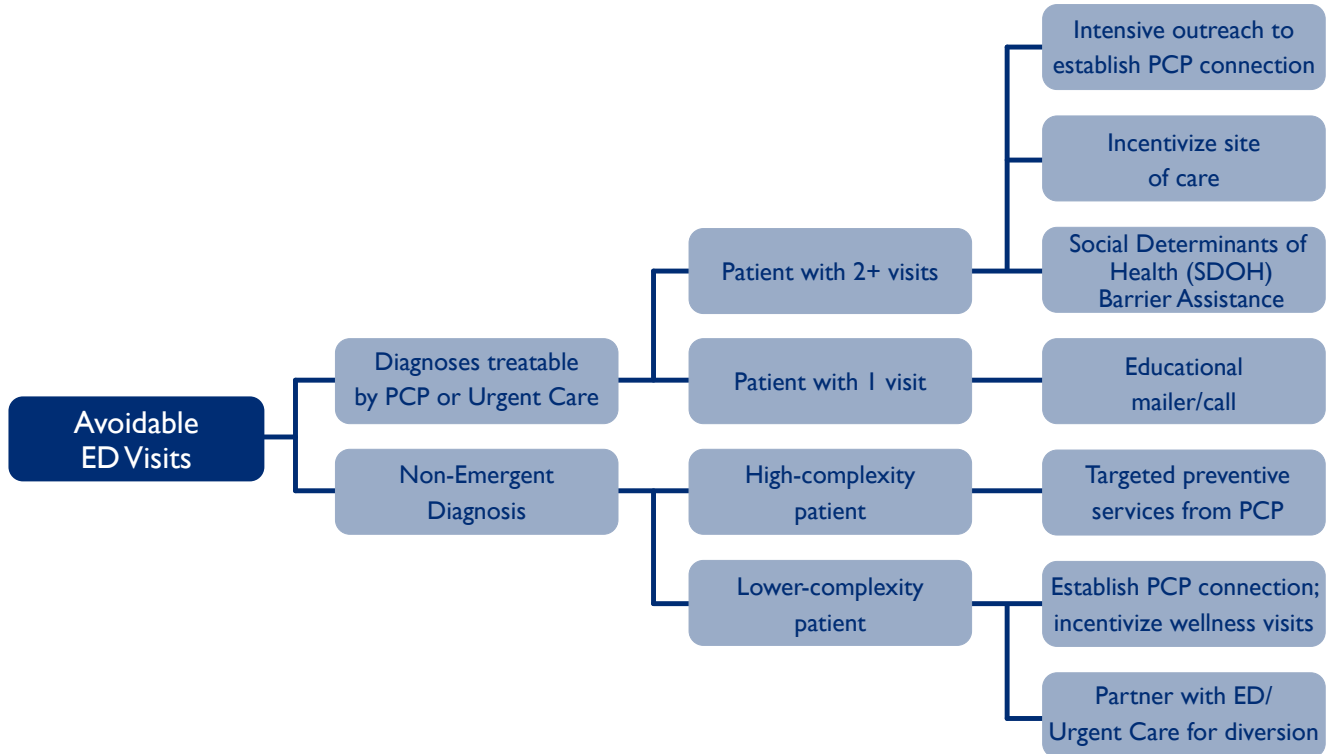


*Based on insured patients' emergency department visit data covering a 1-year period*

Following a detailed ACG-driven analysis, System users can use patient-level outputs to deploy tactics to reduce potentially-avoidable ED visits. Patients with multiple ED visits for PCP-treatable diagnoses may benefit from outreach from their PCP, or assistance locating and working with a PCP if they do not have an existing relationship. The organization may wish to assess systemic access barriers as well, such as transportation challenges, PCP office hours/appointment availability or prohibitively high co-pays for PCP visits.

Another impactable patient group are those visiting ED's for non-emergent diagnoses. ACG System users can identify and target relatively healthy patients (those with lower Resource Utilization Band (RUB) levels, for instance) with educational campaigns and incentives for PCP visits. Likewise, individuals with more complex needs, multiple chronic conditions or care coordination challenges can be directed to targeted preventive services and guidance from their PCP. The ability to tailor a specific approach maximizes impact while meeting patient-specific care needs.

The diagram below shows how the ACG System can support strategy creation and provides a tactical approach to reducing ED utilization. The ACG System helps understand patient groups and utilization patterns, facilitating a targeted approach to interventions.



## KEY TAKEAWAY .....



*When ACG System users understand causes and trends in ED use at this granular level, they can proactively target patients with potentially-avoidable visits and deploy interventions to reduce avoidable ED use. The result? Improved PCP relationships and lower unnecessary ED visits.*

# Part III: ED Visit Performance Monitoring

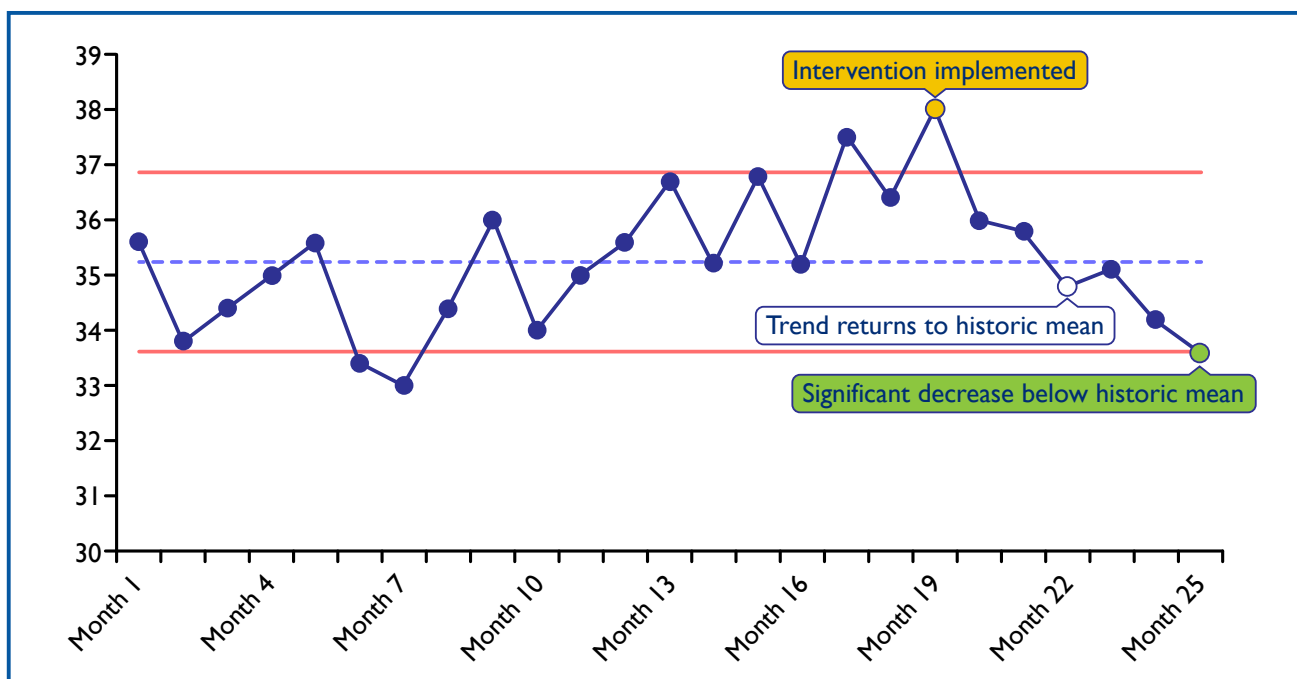
As we've discussed, the ACG System can reveal trends in ED visits across a population and be used to take action in specific segments. But, once implemented, organizations need to track performance to understand the magnitude of change, quantify savings or, if necessary, adjust their approach. Fortunately, the ACG System's granular ED visit export file supports trending and performance monitoring.

The ACG System generates a visit-level export with each ED visit classified into the categories described in the graph on page 3. By using the visit date and type fields in this export, System users can easily create trend graphs and filters to understand improvement and lingering opportunities.

## Using Control Charts to Monitor ED Visits

Let's take a look at a real-world example. The graph below shows the trend in potentially-avoidable ED visits being routinely monitored for tracking purposes in one of Johns Hopkins' populations. In this case, the tracking focused on non-emergent and primary care treatable visits, with filters available.

The leadership team became concerned about an increasing trend in avoidable ED visits starting in Month 16. The trend was identified via overall increase in ED visits/1000, with potentially-avoidable ED visits quantified as an impactable cost-driver. A suite of interventions to reduce avoidable ED visits was implemented in Month 19.



The analytics team used historic ED visit data, organized by the ACG System ED classification algorithm's category and month, to generate a control chart with historic mean and measures of variation. The horizontal blue line represents the historic average monthly rate of avoidable ED visits. The two red lines represent upper and lower control limits. This visualization was selected to focus attention on meaningful trends, rather than the noise of routine monthly variation.

After a few months of improving trend, in Month 25, utilization of avoidable ED visits crossed the lower control limit, indicating significant variation from the historic trend – in this case, for the better – and a meaningful reduction in potentially-avoidable visits.

## KEY TAKEAWAY .....



*The ACG System's detailed ED visit export file supports trending and intervention monitoring for performance improvement. The result? Users understand trends and if interventions are working.*

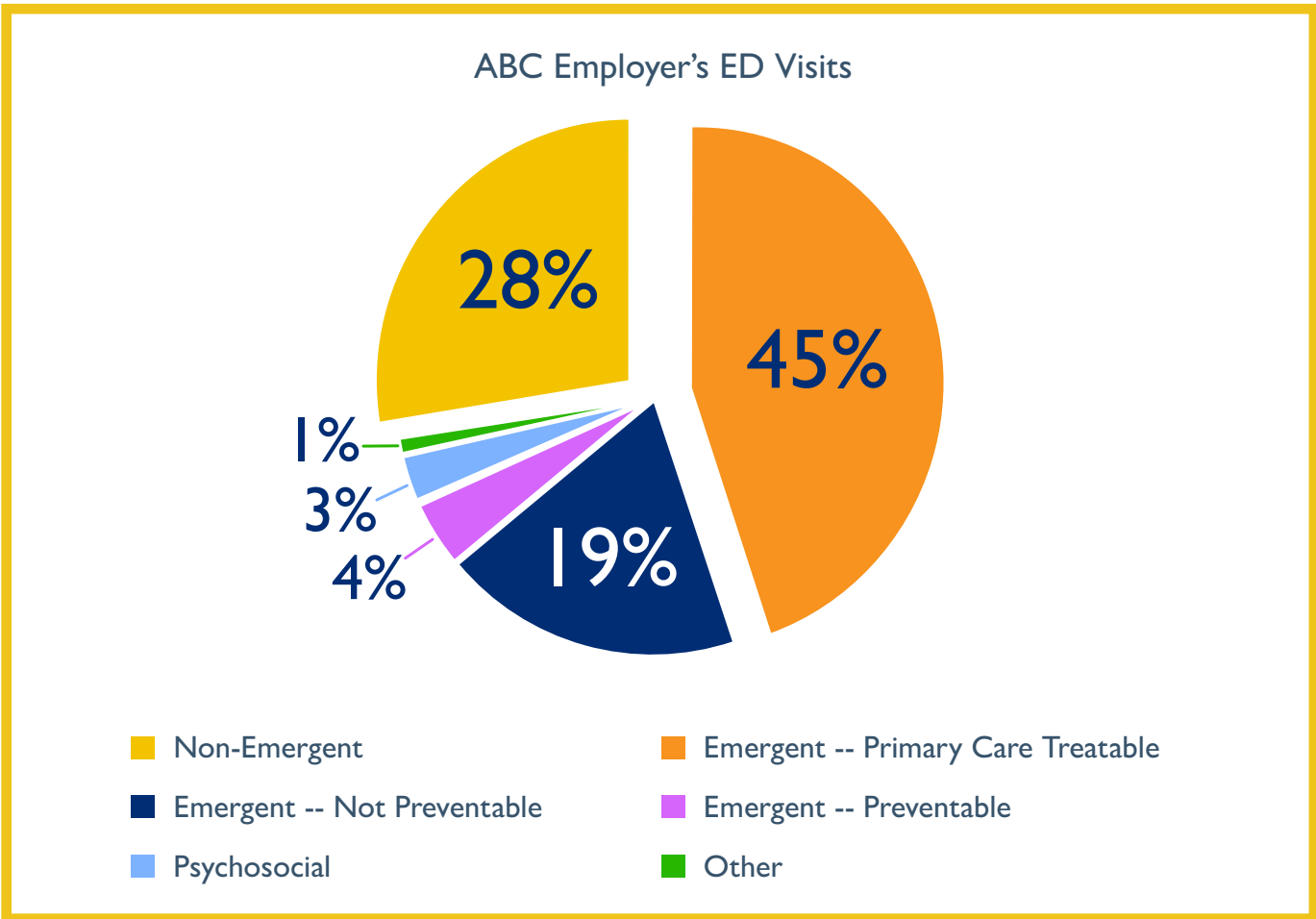


# ACGs in Action

## Vital Incite Designs and Implements Employer-Based ED Reduction Strategy

ACG System expert user [Vital Incite Population Health Solutions](#), a population health consulting company that helps employers reduce health care costs and increase employee health, recently utilized the ACG System's ED classification system to reveal a huge opportunity for cost savings with their customers. Using insights from the ACG System, Vital Incite was able to develop a comprehensive action plan for one employer to reduce avoidable ED utilization.

Vital Incite's analysis began with a review of overall trends. Among Vital Incite customers, similar to national findings, an average ED visit costs approximately \$4,300, whereas a PCP office visit averages to about \$170. To understand the magnitude of opportunity, Vital Incite first pulled overall ED categorization from the ACG System. In the case of one specific customer, who we will call "ABC Employer," 28% of ED visits within a 12-month period were for non-emergent diagnoses, and a further 45% were treatable in primary care – resulting in more than two thirds of ED visits categorized as potentially unnecessary.



For “ABC Employer,” there were a total of 611 non-emergent ED visits, with the highest number of visits occurring on Fridays and Saturdays. The analysis of the visits also showed that the majority of the visits were made by their employees, who already had access to an onsite clinic at their workplace.

**Among employees with no attributed PCP provider, 30% of ED visits were non-emergent and 44% could have been treated in primary care – representing an enormous opportunity to improve these employee’s PCP use or direct them to onsite clinic resources.**

Vital Incite used these findings to recommend a comprehensive strategy to “ABC Employer” to improve PCP use and reduce ED utilization. These specific and targeted strategies to reduce the number of unnecessary ED visits in the next year include:

- » Expanding hours of onsite clinics
- » Implementing an onsite clinic after-hours call line
- » Improving connections to primary care
- » Implementing a 24/7 telehealth service

## KEY TAKEAWAY .....



*The ACG System’s ED classification helped Vital Incite understand trends, identify impactable cost categories and develop a detailed plan to improve utilization.*

# ACGs in Action

## Discovery Health Reduces Use of ED and Increases Primary Care Use

### The Challenge

Discovery Health is a large medical scheme administrator in South Africa providing administration and managed care services to over 3 million beneficiaries. They believe primary care sits at the center of all strong health care systems and should offer the first point of contact for their members.

However, in the largely fragmented, hospital-centric, private health care system of South Africa, use of an emergency department as a first point of care before consulting a primary care provider has been a specific challenge.

Emergency department visit rates and the consequent admission rate from emergency department visits have been increasing. From 2010 to 2015, there was a 26% increase in the admission rate to hospitals via emergency departments.

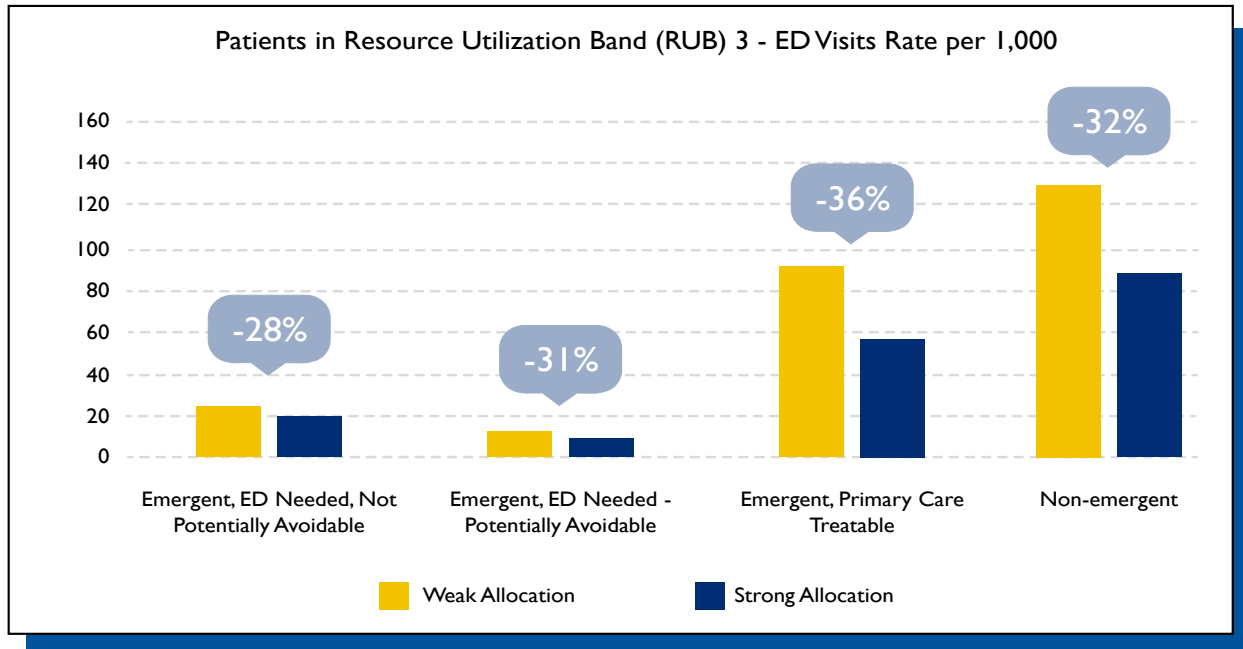
A simple model adjusting for age, gender and the presence of a chronic condition on 2010 data showed that there was a potential savings opportunity of 500 million Rand (\$33 million U.S. dollars) if better utilization of primary health care was encouraged.

### The Solution

Discovery Health wanted to find a way to improve patient access to Primary Care Providers (PCPs) to both improve health outcomes for patients and keep costs affordable by reducing unnecessary ED visits. The use of the ACG System and its ED classification system played a role in helping Discovery achieve their objective.

The team at Discovery developed a model calculating the expected admission rate for members visiting an emergency department, combining pre-existing ACG System variables with additional data points. The team then examined the nature and strength of the relationship between each member and a primary health care provider based on how much of their care they sought from the PCP, and whether a stronger relationship with a PCP impacted emergency department visits and subsequent hospitalizations.

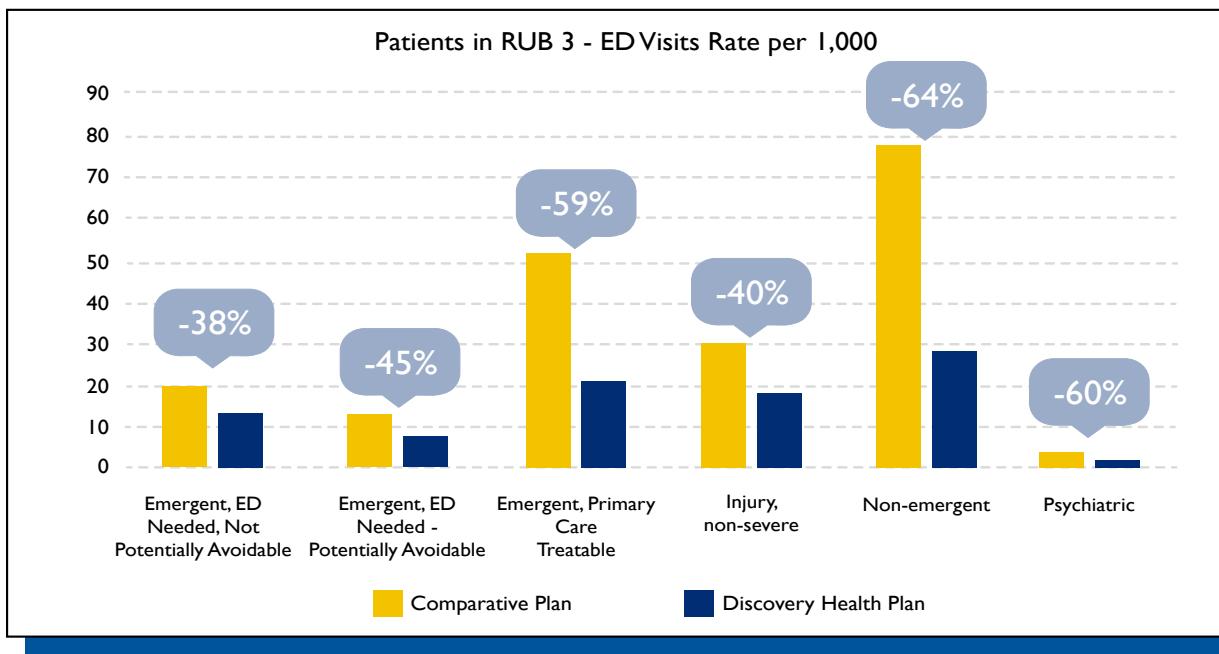
The team found that members allocated strongly to a PCP (those with a high number of PCP interactions/visits) had a lower-than-expected admission rate to the ED. In fact, there was a significantly lower amount of ED visits per 1,000 claimants for strongly allocated patients compared to weakly allocated ones.



The ED classification feature within the ACG System was used to validate the outputs of this model, to gain further insights on the reasons patients visited the emergency department and whether these visits were avoidable.

With this key finding in hand, Discovery Health launched a new benefit plan which required members to see a primary care provider first before they could “unlock” access to secondary and tertiary levels of care. This strategy dovetailed with Discovery’s philosophy that primary care sits at the center of all strong health care systems and should be the first point of contact for its members. So far, the strategy has some promising findings.

As shown in this graphic, patients in Resource Utilization Band 3 (RUB 3) - those with a moderate level of complexity - who used Discovery’s plan had a significant decrease (up to 64%) in ED visits per 1,000 claimants compared to those using a comparative plan not requiring PCP visits.



## Conclusion

Discovery Health’s innovative work combining existing ACG System variables and the new ED classification system paid off: their health care plan not only increased access to primary care for their members, but it also reduced unnecessary ED visits, maximizing health resources and keeping costs lower for everyone.

“A closer relationship with a primary health care provider leads to a reduction in emergency department visits and subsequent admissions from the emergency department, resulting in better patient outcomes and lower health care costs.

- Lizelle Steenkamp, Head of Risk Intelligence  
Discovery Limited

Read more about Discovery Health’s award-winning project [here](#).

## ACG's ED Classification - Helping You Get Results

Ultimately, the ACG System's ED classification is a powerful analytics tool that can transform your population health strategy. If you're in the early stages of evaluation, the ACG System can quantify avoidable ED visit patterns and identify patients with avoidable ED use to highlight areas for potential cost savings.

If you're ready to take action, the ACG System assists in deploying interventions to reduce unnecessary ED use. And if you've already implemented a strategy, the ACG System monitors ED trends so you can adjust your approach over time. Whatever unique challenges your organization may be facing, the ACG System's ED classification feature is ready to help you get results, every step of the way.



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### ABOUT THE ACG SYSTEM

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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 US 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.

## LEARN MORE

For more information on the ACG System, contact our team at [acginfo@jh.edu](mailto:acginfo@jh.edu) or visit [HopkinsACG.org](https://HopkinsACG.org). You can also subscribe to our blog, which features the latest developments and news, as well as tips and tricks for making the most of the ACG System's suite of analytics tools. [Click here to subscribe](#)