Big Data Is Great, But Small Data Is Just As Powerful

You hear the term "big data" everywhere these days. It's driving decisions at the heaviest hitters in nearly every industry. Retailers like Warby Parker have used vast amounts of consumer data to strategically expand their brick and mortar locations. In an age where retail is suffering, they're thriving because they've analyzed exactly where a store will attract customers.

Deep Data vs. Small Data

Athletes like skier Lindsey Vonn are benefitting from big data, too—virtual reality goggles built with medical data from other ACL repair patients helped her get back on the mountain after a knee injury.

It's even impacting farming. Cargill, one of the world's largest agricultural companies, is backing facial recognition software for use on dairy farms. By tracking and analyzing the comfort level, happiness, and productivity of hundreds of thousands of dairy cows, they hope to increase milk production.

But that's not really what we do in the benefits industry. We're not crunching the numbers on millions of dairy cows, knee injuries, or consumers. Our data sets are focused on thousands of members enrolled in an employer's healthcare plan. Or just hundreds participating in a weight loss challenge. So "big data" doesn't quite capture how we're changing the benefits strategies of self-insured employers.

Instead, we're calling it "small data." Some have referred to it as, "deep data," also a great way to describe what we do in benefits analytics. Instead of casting a wide net to find general trends, we're looking at the individual behaviors, engagement, and real-world utilization of a few thousand members.

Learn more about the Artemis Platform at:

artemishealth.com

The trends we find might not hold true for the population as a whole, but they are immediately actionable and useful to employers, consultants, and brokers. For example, we might find that one of the employer's health plan options boasts an 8% re-admittance rate to the hospital after cardiac surgery, while nationwide the rate is closer to 18%. The benefit teams could look at other outcomes for that plan's network and develop a Centers of Excellence relationship with the hospital group as a result.

Our findings are ours alone, and they're influenced by a number of small factors like the industry in which our members work, their lifestyles, benefit plan design, geography/demographics, and more. And that's a good thing. Here are three examples of how Artemis Health is using "small data" to drive benefits decision making.
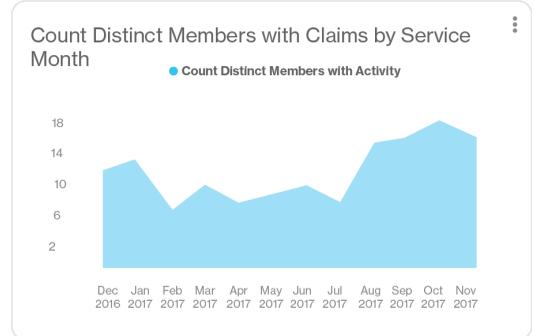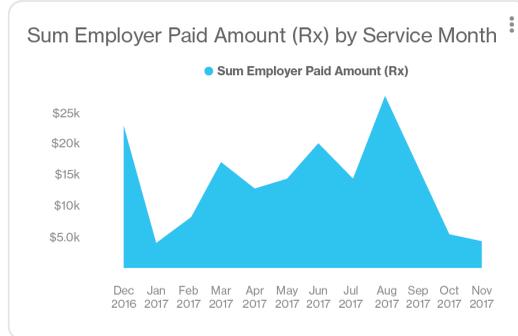
#1: The Case of the NSAID-Antacid Drug Substitution

One of the many ways pharmaceutical companies are innovating is by combining two drugs into one pill. These "combination drugs" are convenient for patients and allow drug makers to apply for new patents, a win-win in their eyes. But it's definitely not a win for payers. These drugs can be more expensive than over-the-counter options or tablets that can be prescribed and taken separately.

Let's look at an example. Artemis Chief Clinical Officer Rance Hutchings helped a client identify combination drugs in their prescription claims data. This analysis focused on two name-brand NSAID-Antiacid combinations. NSAIDs are common pain medications (it stands for "non-steroidal anti-inflammation drugs"); ibuprofen and aspirin both fall into this category. Antacids treat heartburn and acid reflux, and many are taken daily.
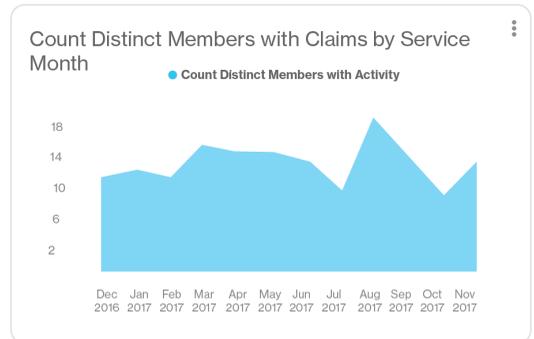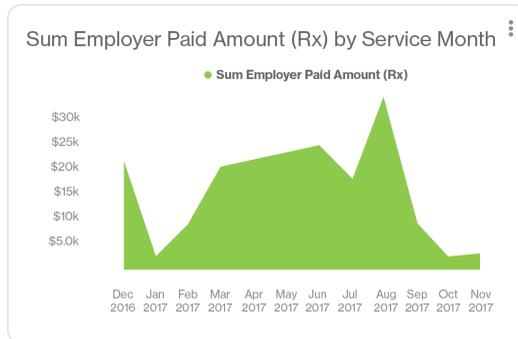
Let's look at the first drug:

Total Employer Paid Amount	Sum Employer Paid Amount (Rx) by Service Month	Count Distinct Members with Claims by Service Month
$173,019		

Over a 1-year period, the employer paid $173,019 for this combination. That's for a maximum of 18 members taking the drug. Through formulary adjustments, this client could change their coverage so these members are taking generic omeprazole and naproxen for an estimated savings of $75,000 per year.

The second drug tells a similar story:

Total Employer Paid Amount	Sum Employer Paid Amount (Rx) by Service Month	Count Distinct Members with Claims by Service Month
$190,764		

Over $190,000 per year is spent on this drug, and it's being prescribed to under 20 members. By switching to separate tablets of ibuprofen and famotidine, the employer could save approximately $40,000 per year without affecting patient outcomes.

This definitely isn't big data—we're talking about Rx claims for less than 50 people. But our analysis makes a significant difference in the client's prescription spending while still offering the quality care members need.
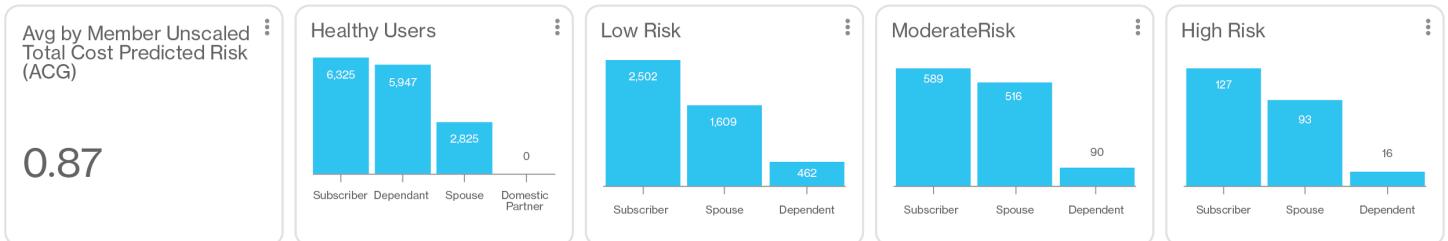
A risk score of 1.0 means that an individual's healthcare spending is equal to the expected mean for the population as a whole. A risk score of .87 means that this employer is spending only 87% of the expected costs, so their population is healthier than average.

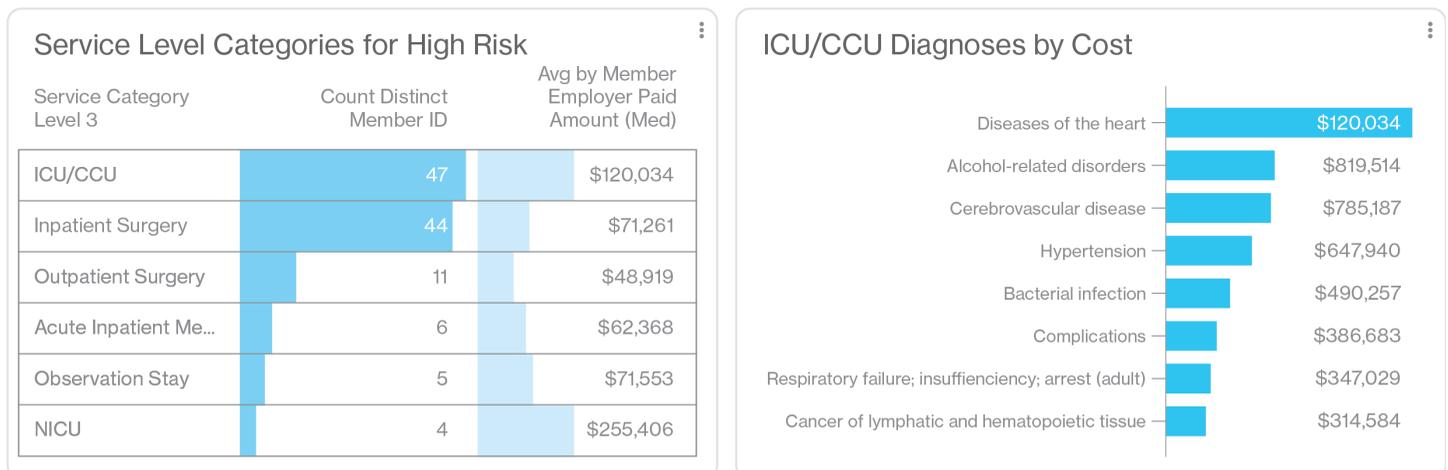# #2: The Case of the Risk Scores and Benchmarking Data Analysis

Small data works best when you can compare it to larger trends and find out how your analysis compares to a larger picture. That's where benchmarking comes in. Many of our clients use wider population health data to find out how their members stack up against the norm.

A risk score is a way to determine an individual member's overall health. Each person's risk score is based on their demographics, health status, and potential healthcare utilization. For example, someone with a high risk score may have a new diabetes diagnosis, while someone with a low risk score may have seen the doctor for the occasional seasonal cold. When analyzed on a population level, risk scores can help employers assess the potential future health of their population, and even be used to predict future healthcare spend.

Avg by Member Unscaled Total Cost Predicted Risk (ACG)

0.87

Healthy Users

Subscriber	Dependant	Spouse	Domestic Partner
6,325	5,947	2,825	0

Low Risk

Subscriber	Spouse	Dependent
2,502	1,609	462

ModerateRisk

Subscriber	Spouse	Dependent
589	516	90

High Risk

| Subscriber	Spouse	Dependent
127	93	16

This population is just over 21,000 people, a relatively small data set. You can see for these members, they have an overall low risk score, which means a higher proportion of the population is classified as healthy based on their diagnoses and utilization.

Now let's look at medical claims and diagnoses for these high risk members.

Service Level Categories for High Risk

Service Category Level 3	Count Distinct Member ID	Avg by Member Employer Paid Amount (Med)
ICU/CCU	47	$120,034
Inpatient Surgery	44	$71,261
Outpatient Surgery	11	$48,919
Acute Inpatient Me...	6	$62,368
Observation Stay	5	$71,553
NICU	4	$255,406

ICU/CCU Diagnoses by Cost

Diseases of the heart	$120,034
Alcohol-related disorders	$819,514
Cerebrovascular disease	$785,187
Hypertension	$647,940
Bacterial infection	$490,257
Complications	$386,683
Respiratory failure; insuffienciency; arrest (adult)	$347,029
Cancer of lymphatic and hematopoietic tissue	$314,584

39 members who were categorized as high risk were treated in the ICU during our analysis period, which resulted in over $100,000 in costs per member. This customer's data points to "diseases of the heart" as the largest portion of ICU costs. They may take this information into consideration when adding or measuring the success of disease management programs.

This "small data" becomes actionable not just for wellness or disease management programming, but also for budgeting.

Predicted Cost Ranges for Very High Risk
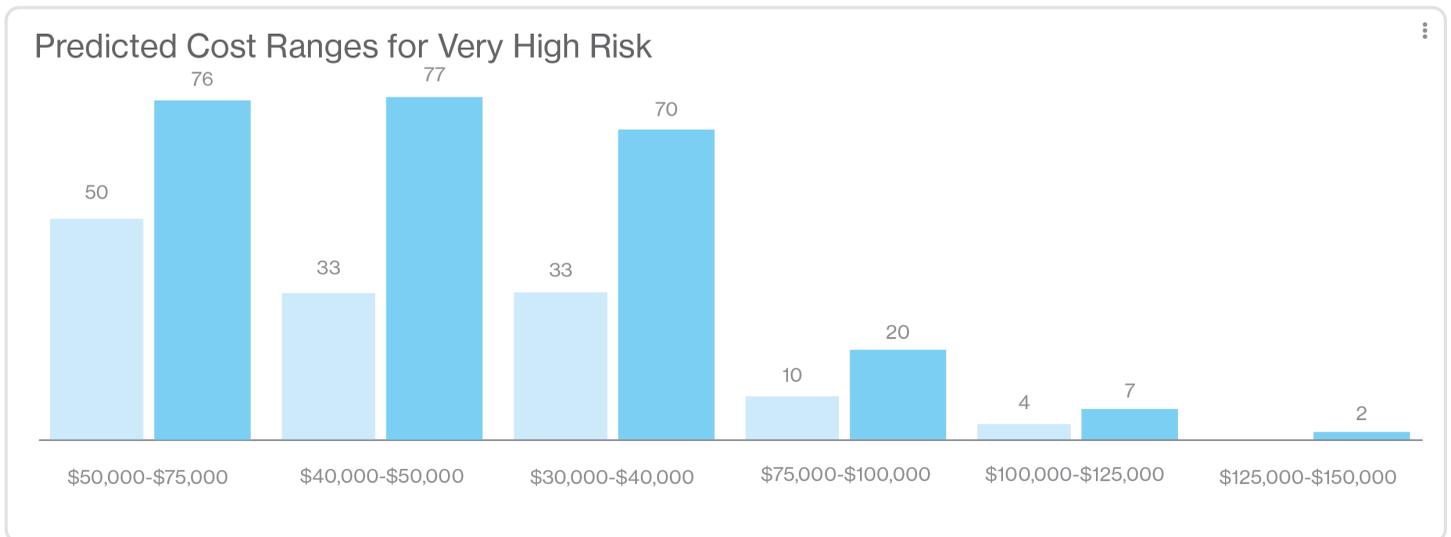
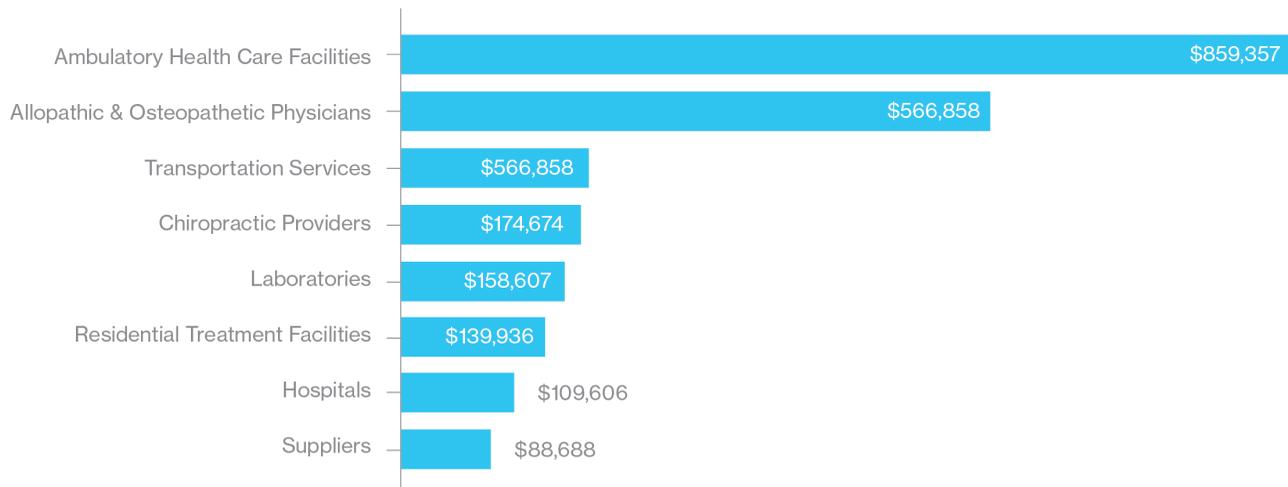A robust data warehouse tool can help benefits teams predict costs based on risk score and plan accordingly.

#3: The Case of the Out-of-Network Fraudulent Claims

Big data can reveal all kinds of trends around out-of-network healthcare spending, but can it tell one employer if their out-of-network spending was due to fraudulent claims?

The Artemis Platform makes it easy to find and track wasteful spending. In just a few clicks, we broke down medical claims data by provider type and found a surprisingly high cost for out-of-network chiropractic services. Something didn't seem right.

Sum Employer Paid Amount (Med) - Out-of-Network by Provider Specialty

Provider Specialty	Amount
Ambulatory Health Care Facilities	$859,357
Allopathic & Osteopathic Physicians	$566,858
Transportation Services	$566,858
Chiropractic Providers	$174,674
Laboratories	$158,607
Residential Treatment Facilities	$139,936
Hospitals	$109,606
Suppliers	$88,688

Next, we matched these claims to specific providers. It turned out that just two chiropractors were billing about $143,000 in claims each year, and these didn't match up to member home locations. The Artemis team provided the data to the client, who in turn worked with their carrier. Together, the carrier and the benefits team determined these claims were fraudulent.

Conclusion

In these three examples, you can see how bigger doesn't necessarily mean better when it comes to data. Small data is driving the everyday decisions that are changing the benefits industry. With small data sets, Artemis and its clients are finding wins, identifying trends, and positively impacting care.

Artemis Health makes it easy for self-insured employers to use their own benefits data to reduce spending and improve benefits for their employees. The Artemis Platform uses a series of tools (we call them "apps") to make analysis fast, easy and actionable.

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