

CASE STUDY

Machine-Learning-Driven Engagement Campaign Drives Cardio Appointments and Revenue

Actium Health's AI approach helped Virtua Health boost revenue 130% and improve more patients' heart health.

KEY OUTCOMES



Machine learning from local data

Providing enhanced visibility into Virtua's patients, and the ability to detect care needs that would have been missed with national training data.



Data-driven outreach

Delivering relevant communications to the right patients increased the likelihood high-risk patients would book a cardio-related appointment.



Increased access and revenue

Driving high-risk patients who received the engagement messages to book more appointments — ultimately generating an estimated \$800,000 in revenue.

Traditional Methods Fail to Identify Cardio Needs

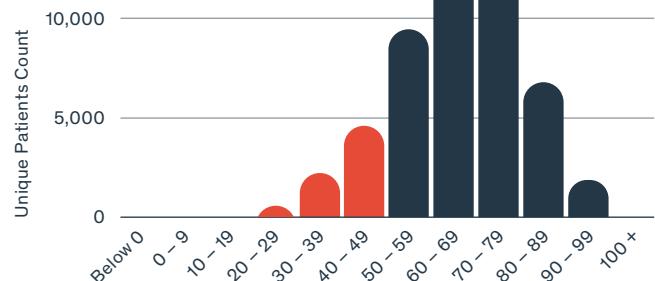
Cardiovascular diseases are the number one cause of death, yet conventional segmentation misses people who need engagement for heart services.

For instance, outreach using “age greater than 50” naturally excludes thousands of people below 50 who are also at high risk. Other filters, such as past encounters, biomarkers, or demographic lifestyle markers, compound the problem.

Healthcare needs are too complex to be represented in simple slices and data filters.

As shown to the right, filter-based approaches in cardiology (and other services) can exclude thousands of people who need services. This can significantly impact patient well-being and service line revenues.

MODEL RISK BY AGE



Thousands of patients below age 50 are at risk

AI/Machine Learning Approach

With these challenges in play, the marketing leaders at Virtua Health — an award-winning comprehensive community healthcare system comprising five hospitals and 270+ locations in South New Jersey and Philadelphia — knew that driving access demanded a far more nuanced approach.

They selected Actium for this approach because of the ability to use data science to identify patients in need and

report on the results. Also, Virtua Health had previously seen impressive results when partnering with Actium to identify and engage patients at high risk for breast cancer. Virtua Health’s breast cancer screening campaign impacted the lives of more than 1,300 patients, and the health system was optimistic that Actium could help drive similar results for cardiology patients.

How Does This Work?

Rather than manually filtering and segmenting, machine learning models observe characteristics across hundreds of thousands, or even millions of patients.

Using volumes of local health system data to train allowed the model to pick up on nuances specific to Virtua Health and the area. These nuances help identify people in need of services, and they won’t surface in with generic, national datasets or manual filters.

THE DATA IN THIS EXAMPLE WAS SPECIFIC TO VIRTUA HEALTH:

3M+
patients

13M+
admissions &
discharges

≈100M
vital signs

10M
medications

150M+
lab results

How Well Did the Method Perform?

The hype that surrounds AI is mainly when people present methods and models, but refuse to talk about performance and results. The other part of the hype is that results are often presented in a way that isn't understandable to a layperson.

To discuss model performance in a way that's relatable, we use "Highest Decile Lift." This asks, "For the people the model identified as the top 10% risk, how much more likely were they to need cardio services than the general population?" For those who wish to dig deeper into model performance, our Health AI University provides non-

technical leaders with rigorous understanding & questions to evaluate AI vendors.

The general population is the baseline "1x" lift score. Any model performing at 1x is doing no better than randomly picking people from the population.

In this case, the machine learning approach delivered a 10x lift. This means that people in the top 10% identified by the model were 1,000% more likely than the general population to need cardiovascular services within the next year.

How Did This Perform in a Campaign?

Virtua Health used the model in an email campaign with approx. 133,000 recipients.

To measure the campaign's effectiveness, we used a Randomized Control Trial (RCT) approach. This means that of the 130,000+ people in the campaign, a random 7,000 were in a holdout group. The holdout group would not receive the campaign communication during the study. Using this method will allow us to understand, given the same audience, the percent of patients that would come

in for an appointment without outreach vs those with outreach. The remaining people in the holdout group would receive the communication after it was proven effective.

We developed the communications in tandem with Virtua Health and one of their design partners. This is often the case with AI driven campaigns, where a data-oriented partner can help inform the creative process based on demographics and other factors in the target audience.

Results

35%

open rate vs industry
average 21.7%

3.3%

click rate vs industry
average 2.49%

30.3%

higher revenues from email openers
vs control group

\$800,000

Estimated revenue generated by
AI-based campaign

IMPACT ON APPOINTMENTS

25%

Greater likelihood that high-risk patients receiving the email campaign would book a cardio-related appointment.

High cardio risk patients who received the email:
16.3% booked cardio-related appointments

High cardio risk patients who did not receive the email: **13%** booked appointments

What Do These Results Mean for Patients and Virtua Health?

We've shown how Virtua Health reached people in need using AI. Without Virtua's AI-based outreach, over 4,000 of these people would not have scheduled appointments and been seen.

This is important above and beyond calls for driving volume and revenue. Among these patients are diagnoses of major illnesses. There are early warnings for preventive measures that can save lives.

Manually slicing and dicing segments of the population is no longer enough. This true personalization requires nuance AND scale that AI offers. We simply can't do this by hand.



Where Others See Patient Data, Actium Health Sees Human Potential

Learn how fast Actium Health can transform your healthcare system at: actiumhealth.com
or email sales@actiumhealth.com to request a demo.