

# Saint Louis University Hospital establishes a data driven culture and significantly improves clinical and financial performance.

Biome Analytics helps Saint Louis University Hospital bring O/E mortality ratio below national benchmarks.

## Challenge

Saint Louis University Hospital (SLUH) is a LEVEL 1 Time Critical Diagnosis hospital in Stroke, Trauma and STEMI. In 2018, Michael Lim, MD, director of The Center for Comprehensive Care at Saint Louis University, sought to drive superior clinical and financial performance in its cardiovascular service lines by establishing data-driven performance and making better use of data and analytics.

performance solutions for enterprise heart centers and cardiovascular teams, to surface meaningful clinical and financial opportunities and to drive achievable improvement by aligning his team around measurable performance goals.

## Understanding the problem

Biome’s first task was to dive deep into the data addressing O/E mortality, which was above both national benchmarks and scores typically realized by Biome clients. The SLUH cardiovascular unit knew there were many potential root causes impacting the scores. Was it the complexity of their patient population, care provider performance or registry data quality? Not only did Dr. Lim and his team want to understand their current state, they needed



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## > CHALLENGE

- O/E mortality benchmark and ranking for the CV service line above national averages
- Establish a data-driven culture

## > SOLUTION

- Biome Opportunity Engine™ powered by the Biome Knowledge Network™ provided comparative analysis to better understand the risks associated with PCI patient cohorts
- Biome Performance Manager™ actively monitors progress and helps the cardiovascular team sustain gains

## > RESULTS

- 41% drop in PCI & Other patient cohort to 0.85
- 178% reduction in O/E mortality rate with a score of 0.97
- O/E mortality ranking driven well below national averages

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Dr. Lim partnered with Biome Analytics, a leading provider of clinical

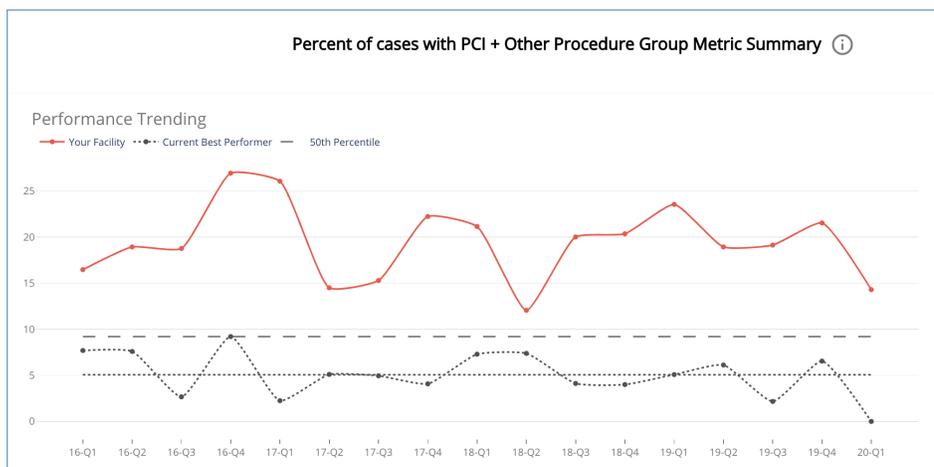


Figure 1: PCI + Other patient cohort score

to identify opportunities and methodologies to improve performance.

“Establishing a data-driven culture is not an easy thing to do,” said Dr. Lim. “No one likes to acknowledge underperforming data, performance, or outcomes, but we needed to get past the emotional response and be objective if we were to drive positive change.”

**“Biome is an important and trusted partner to our cardiovascular service line.”**

Biome deployed its cardiovascular performance applications and leveraged proprietary machine learning algorithms — the Biome Opportunity Engine™ — to analyze 36 months of client cost and clinical data and uncover the root cause performance drivers with the greatest impact on O/E mortality. The team then leveraged the Biome Knowledge Network™ — a library that connects tens of thousands of clinical and financial measures, metadata, benchmarks, transform rules, decision

trees and predictive algorithms into a proprietary ontology — and rapidly customized and configured key analytics applications that supported high-touch analytic services.

In the end, it was determined that several patient cohorts, specifically those with highly complex combination procedures performed within their admission, were significant contributors to the underperforming O/E mortality rate. In fact, analysis showed that SLUH was caring for twice the number of patients within this higher risk patient cohort than the Biome average (which skews higher risk than other national data sets), though the original classifications didn’t accurately show it (Figure 1).

### Accurately representing patient risk with registry submissions

With this new understanding in place, Dr. Lim’s team analyzed the documentation associated with registry submissions for the prior three years. The results were alarming. “We quickly realized that we had underreported the real risks in several patient

cohorts that make up a significant proportion of SLUH’s volume,” said Dr. Lim. “As a result, we re-aligned the team around new goals and objectives and implemented documentation processes and procedures to reflect the correct risks associated with the patients receiving care.”

By leveraging the Biome solution, SLUH was able to engage clinicians with insights that proved to have an immediate impact on their national rankings. As a result, clinical teams were quick to trust and adopt the data, and the subsequent opportunities and impacts. Under the leadership of Dr. Lim, the team first addressed short-term improvement opportunities. Then they focused on long-term objectives, like establishing a data-driven culture to ensure they remain aligned, were able to sustain hard-fought gains, and could adapt to emerging best practices, both developed by their teams and sourced from the Biome Knowledge Network™.

“Biome’s analytic platform allowed us to quickly respond to questions from all parts of our service line. We asked the same questions again, but this time we identified the patient cohorts and practice opportunities not previously visible to us. It was enlightening.” Added Lim, “More important, Biome helped us to quickly predict and assess the clinical and financial impact of performance initiatives and prioritize our investment of increasingly valuable time, capital, and resources.”

### What a difference a year makes

By aligning staff around process improvement, SLUH experienced tremendous results in just the first twelve months: 41% improvement

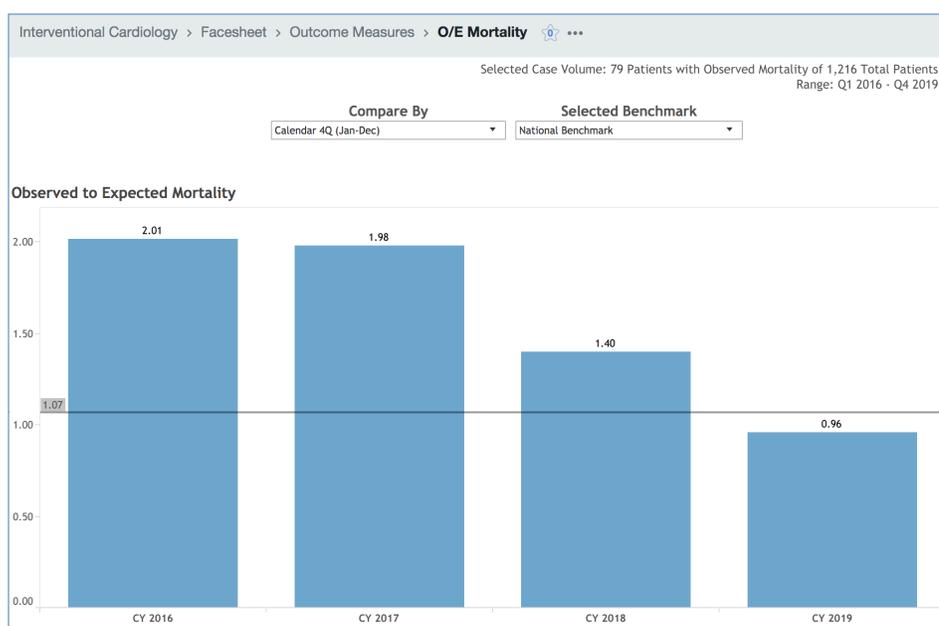


Figure 2: Observed/Expected Ratio across all cohorts

in national mortality benchmark ranking. In year two the results were even more striking as SLUH realized a 24 month drop of 178% in O/E

**“We are extremely pleased with the results, the Biome platform, and their CV expertise.”**

mortality rate with a score of 0.97, which is below the national average (Figures 2 and 3).

Using the Biome Performance Manager™, Dr. Lim can actively monitor progress against internal measures and national rankings. With Biome Analytics help, SLUH continues to maintain above-average performance.

“We are extremely pleased with the results, the Biome platform, and their CV expertise,” Lim reported. “Our return on investment is substantial, allowing us to expand our use of the analytic platform with the cardiovascular department.”

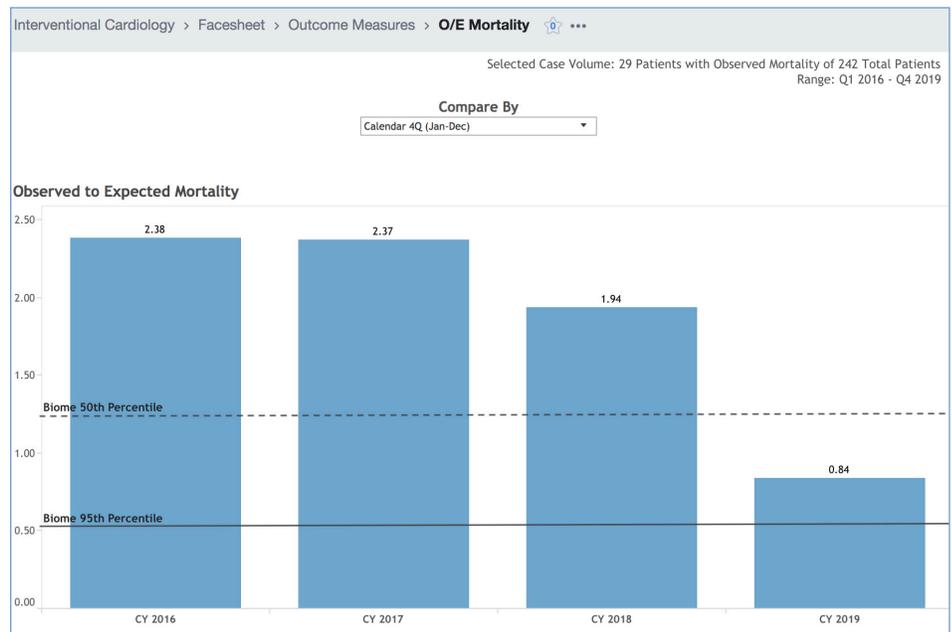


Figure 3: Observed/Expected Ratio across PCI + Other

“Biome is an important and trusted partner to our cardiovascular service line, and we look forward to leveraging their technology, personnel and expertise as we continue to drive improvements in the care of our patients,” Lim added.

### About Biome

Biome is the leading cardiovascular performance company dedicated to helping doctors and health systems deliver the best care, to the most patients, at the lowest cost. Biome partners with ambitious enterprise heart centers and cardiovascular teams looking to achieve superior clinical and financial performance.

### Biome Analytics

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