BEATING THE ODDS:

Meharry Medical College Accelerates Research & Transforms Patient Care with Data Science.

MEHARRY®
MEDICAL COLLEGE

Meharry Medical College
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This is the story of how a small, private, historically black college/university (HBCU) health sciences center surpassed elite schools to launch a data science institute and drive predictive insights for underserved patients in fewer than 24 months.

THE CHALLENGE

In 2015, Meharry Medical College President and CEO James E.K. Hildreth Sr., Ph.D., M.D., approached Amy M. Andrade, his senior advisor of technology and innovation, with a big challenge: Launch a data science institute from the ground up—no additional head count, no miracle angel-funding.

Located in Nashville, Tennessee, Meharry Medical College is an academic health sciences center that comprises schools of medicine, dentistry and graduate studies, and exists to improve the health and health care of minority and underserved communities. To execute on that mission, Meharry Medical College offers excellent educational and training programs in the health sciences and conducts research that fosters the elimination of health disparities.

Dr. Hildreth's vision was to expand those research capabilities and, in doing so, to drive down costs and improve the level of care for Meharry's underserved and minority patient populations.

At the time, Meharry's data maturity was in an early phase. While they had a wealth of data—approximately 4 million records from 209,000 patients over 10 years— that data was living in more than six separate systems, leaving researchers with no efficient way to access or analyze it. In order to conduct research, their teams had to comb through the data manually, slowing data-driven discoveries by two to three years.

THE SOLUTION

Amy M. Andrade finds a data science partner and disruption in the details.

In 2016, Andrade partnered with Clearsense. Initially attracted to the Clearsense platform's ability to quickly ingest, clean, organize, govern and analyze a large data ecosystem, she soon discovered that the transformative power of the platform was in its ability to do so with any kind of structured or unstructured data at real-time speeds. It was in this critical detail that Andrade's story found its transformational pivot.

If the Data Science Institute at Meharry Medical College could harness unlimited sources and types of data, they could transform the way research teams view patient populations and discover predictive insights. Traditional research limits teams to a clinical view of a patient, using data such as medical records and payer and pharmacy data. Using Clearsense, Meharry researchers could expand that view to 360 degrees, adding environmental, socioeconomic and behavioral factors that contribute to more than 80 percent of a patient's overall wellness.

In 2017, Meharry Medical College and the Clearsense team added public health data, social determinant data, environmental and neighborhood data, and even social media data to their ecosystem within 21 days. With this comprehensive picture of what triggers risk and what causes chronic disease, Andrade found what she needed to begin building the 64-step algorithm and six predictive models she uses today to identify trends, predict outcomes and start shrinking the gap in health disparities for underserved populations.

THE OUTCOMES

Today, the Meharry Data Science Institute, powered by Clearsense, is quickly bringing Dr. Hildreth's vision to life. Since launching the institute in September 2018, Amy M. Andrade and her team have redefined the curriculum for future medical professionals, discovered critical relationships in their data, and begun to improve health care for underserved patient populations.

Attracting talent. Preparing for the future of evidence-based medicine.

Targeting the 2020-21 school year, students at Meharry Medical College will graduate with a certificate in data science. This new addition to the curriculum is a bold differentiator for the academic program and raises the profile of health care professionals graduating into the workforce right now.

Faster research. Powerful discoveries.

The research teams at Meharry are shaving years off their timelines. Discovering powerful insights in hours, not months, they are fast-tracking grant applications in days, not years. By identifying relationships across a much more complete picture of the population, Meharry's teams are uncovering questions that go much deeper than clinical information and have the potential to lay the groundwork for preventive social programs.

Using Clearsense Discover, one of our researchers was able to translate his bench research work to a clinical phenotype. This accelerated his research by eliminating the need for mouse models, thus saving two years of research time.

Multi-dimensional view of patients. Predictive insights for underserved populations.

With a 360-degree view of the environmental, socioeconomic and behavioral factors that impact patient health, Meharry can use trend information to identify at-risk patients and proactively improve their care. For example, Meharry has developed predictive models to identify both patients at risk for and patients who have undetected Type II diabetes and hypertension.

> " Most standard protocols use a majority Caucasian patient set, which does little to drive proactive care of high-risk, underserved populations. This more complete data ecosystem provides a much more complete picture of the factors that impact patient health, giving our medical community more insight into predicting risk, delivering proactive care, and driving down the cost of indigent care. "

WHAT'S NEXT

With their data science institute fully operational, Amy M. Andrade and her team have turned their sights to what's next: realizing the promise of the community care model. Andrade and her team are making the Meharry data ecosystem accessible to other health care systems, further developing advanced algorithms, and bringing the future of community care to life today.

Meharry by the numbers:

- Data maturity acceleration Phase 1 to Phase 4
- Meharry Data Science Institute, powered by Clearsense, launched within 23 months
- Data ecosystem of 4 million records from 209,000 patients over 10 years:
  » + 35,000 social determinants
  » + Twitter, Instagram, Facebook, local media feeds' social media
  » + National public health data
  » + 100,000 environmental/local data (air quality, crime, violence, poverty, housing, access to food)
- 64-step algorithm
- Predictive models for six chronic diseases (Type II diabetes, hypertension, obesity, stroke, congestive heart failure, peripheral vascular disease)

Data Sources:

- Ambulatory Electronic Medical Records (EMR)
- Dental EMR
- Hospital EMR
- HIV/AIDS Wellness EMR
- Collegiate Electronic Resource Planning (ERP)
- Social Determinants of Health (SDOH)
- Public Data Sources providing information pursuant to social determinants of health, social media, environmental and other public data sets as surveys

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