

# The Analytics Emergency: Rapid Deployment of Real-Time Analytics, Enabled Incident Command



**In less than 16 hours, deployed integrated, real-time dashboards for monitoring all COVID-19 activity**, including patient testing and activity, care requirements, and supply utilization.



**99.8 percent relative reduction** in processing time, providing incident command the critical data required to drive informed decision making.



**Thousands of patients tested** for COVID-19.



**Integrated workforce and COVID-19 data** for more than 13,000 employees, volunteers, and contractors.

## PRODUCTS

- Health Catalyst® Data Operating System (DOS™)

## EXECUTIVE SUMMARY

The COVID-19 pandemic pushed healthcare to rely on data and analytics for decision making and illustrated the criticality of accurate, real-time data and analytics. Despite having ample patient data available for direct patient care, Albany Med's analytics platform had a two-day lag for much of the data. The organization quickly recognized that rapid access to COVID-19 analytics was essential and that it was vital for leaders to have real-time access to data for decision making during the COVID-19 crisis.

## COVID-19 RESPONSE NECESSITATED A CALL FOR REAL-TIME DATA

Before the pandemic, Albany Med had access to volumes of patient data; however, because data had to move from the operational sources to the source databases where they were aggregated into the data platform, the data ingestion process resulted in a two-day delay in visualizing the most current information via the data platform. While this data flow design met most business use cases, it was insufficient for managing the timely response necessitated by the unprecedented COVID-19 spread.

In addition to patient data, workforce data for 13,000 employees, volunteers, and contractors needed to be made purposeful. That data resided in workforce data across multiple systems, so there was no single source of truth to comprehensively track its workers. Further, there was no direct integration between the employee health system and the human resources system. Albany Med's response to COVID-19 required having specific, requisite data available in real-time to keep the workforce safe and make decisions in the moment.

Albany Med was providing care to thousands of patients seeking testing for COVID-19. Results reporting was complex and time-consuming, requiring staff to receive thousands of faxes from the lab, look up individual patient phone numbers, and attempt to contact and document patient contact. The manual processes for monitoring COVID-19 activity, patient movement, and outcomes were incredibly burdensome. Leaders at Albany Med needed access to data in real-time for decision making during the emerging COVID-19 crisis.

## COVID-19 ANALYTICS AND REAL-TIME DATA IMPROVE PANDEMIC RESPONSE

Upon presentation of Albany Med's first COVID-19 cases, formal incident command was opened. It was immediately apparent that the organization needed to embed analytics into its incident command decision making and daily operations under a new care delivery paradigm. Albany Med leveraged the Health Catalyst® Data Operating System (DOS™) platform and a robust suite of analytics applications to enable real-time access to data and improve the organizational response to the pandemic. The Albany Med data scientists developed robust COVID-19 incident command analytics in two phases.

### Two-phase development of COVID-19 incident command analytics

The first phase of developing the COVID-19 analytics focused on the effective management of patients providing answers to critical questions about patients, such as:

- Who are the patients?
- Where are the patients physically residing in the hospital?
- Do they need testing?
- If tested, are they awaiting a result?
- Do they need care?
- How will care be provided? How will follow-up occur?

The second phase of developing the COVID-19 analytics concentrated efforts on keeping the workforce safe amid continually changing guidelines, shortages of personal protective equipment, siloed systems, and insufficient testing. The primary questions for phase two included:

- Who is working within the organization?
- Which workers are sick?
- Which workers have recovered and can return to work?



### ABOUT ALBANY MED

Albany Med is northeastern New York's only academic health sciences center and is one of the largest private employers in the Capital Region.



*We needed real-time data to operationalize our 111-page incident command plan on how to reallocate resources across the Albany Med Health System. We needed immediate access to actionable data on all our resources, i.e., staff, as well as patient needs. In short, we needed to match our supply with demand.*

**Ferdinand Venditti, MD**  
**Executive Vice President for**  
**System Care Delivery and**  
**Hospital General Director**  
**Albany Medical Center**

### Real-time COVID-19 database

Using DOS, Albany Med used HL7 messaging from various systems to improve the timeliness of data, ensuring the organization could visualize changes as occurring, enabling action. A real-time database to support these needs was built that included:

- Patient information.
- Visit data (encounter type and clinical service, current location, and status changes).
- Orders (all lab order, electronic order indications and details).
- Results (raw lab results, assessment details, and other key-value information).

### Dashboards enable contact tracing and visualization of patient activity

Albany Med quickly developed an epidemiology dashboard, enabling real-time tracking of patients with confirmed COVID-19 cases and persons under investigation (PUI) and centralized results recording. It also created a tool where infection preventionists and clinicians record contact tracing information, exposure tracking, and interventions.

Infection preventionists and clinicians can now quickly and easily visualize all patients who had a pending or positive COVID-19 test from a contact tracing and exposure tracking tool. Albany Med can efficiently visualize patient movement for all PUIs and patients who are known positive for COVID-19 for the last seven days, including movement in and out of the facility, total cases, ventilator utilization, intubation status, and final disposition. These real-time visualizations were actively used for incident command and operations management and are in continuous use now.



Before the pandemic, we were well aware of some of our limitations, such as a hybrid paper medical record, limited real-time data, and multiple disparate systems within our collective institution. We also knew how powerful data analytics had become for us, helping us understand our current state, challenges, opportunities, and guide decisions. Therefore, there was a special place at the table in incident command for our analytics team, and I believe having them a part of almost every decision and solution was the reason our organization was able to succeed with each challenge the pandemic brought with it.

**Ashley Telisky, DO, MBA, Associate Medical Director, Albany Medical Center Hospital**

### People-matching algorithm for worker contact tracing

To ensure workforce safety, Albany Med joined the different workforce systems into one consolidated list—using person-matching algorithms to match people across the systems—and matched COVID-19 test results with the right worker. Using the same people-matching algorithm, the employee health department replaced its initial paper intake form with an electronic form. The organization can visualize and monitor work locations, mask usage, and symptoms. It can also track which workers have received state-issued quarantine orders.

The organization performs contact tracing for workers and uses decision support to ensure appropriately timed reassessment of symptoms to confirm the need for continued quarantine or the eligibility to return to work. Albany Med can visualize the number of healthcare workers exposed, the number of patients and employees causing the exposures, the incidence of nosocomial infections, and healthcare worker related COVID-19 cases.

### Callback applications

To support the safe restart of elective surgeries, Albany Med developed callback applications and data entry tools for pre-admission testing, tracked antibody testing, N95 fit testing, and availability of necessary personal protective equipment.

The organization stood up a separate contact tracing callback application for first responders arriving for testing and treatment. It also created a report to identify companies that brought in patients with COVID-19 to inform them of the workplace exposure, enabling follow-up. Albany Med is also aggregating multiple data sources to track COVID-19 positive patients in congregate living facilities, such as nursing homes, treatment facilities, and correctional facilities.



*The tools built by the analytics team were invaluable to Albany Med's safety efforts. By creating organized dashboards for daily review, the team saved countless hours of merging and searching hospital records to track COVID exposures, as well as the test results of at-risk law enforcement, EMS, and fire department personnel.*

**Michael Dailey, MD, FACEP, FAEMS**  
**Chief of Prehospital & Operational**  
**Medicine, Associate Professor of**  
**Emergency Medicine**  
**Albany Medical Center**

## RESULTS

Albany Med's rapid analytics response enabled the organization to efficiently respond to the COVID-19 pandemic by providing the critical, real-time data required, improving the effectiveness of its incident command. Results include:

- **In less than 16 hours, deployed integrated dashboards for monitoring all COVID-19 activity**, including patient testing and activity, care requirements, and supply utilization.
- **99.8 percent relative reduction** in processing time, providing incident command the critical data required to drive informed decision making.
- **Thousands of patients tested** for COVID-19.
- **Integrated workforce and COVID-19 data** for more than 13,000 employees, volunteers, and contractors.



## WHAT'S NEXT

Albany Med continues to refine its visualizations and dashboard for optimum interactive application and will pursue opportunities to apply analytics to situations where real-time data can positively impact patient outcomes, increase staff safety, and improve the effectiveness of hospital operations. For example, a real-time visualization for COVID-19, various flu strain PUI, and positive patient tracking is nearly developed, ensuring the organization is ready for what might happen next. 📈

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## ABOUT HEALTH CATALYST

Health Catalyst is a leading provider of data and analytics technology and services to healthcare organizations, committed to being the catalyst for massive, measurable, data-informed healthcare improvement. Our customers leverage our cloud-based data platform—powered by data from more than 100 million patient records, and encompassing trillions of facts—as well as our analytics software and professional services expertise to make data-informed decisions and realize measurable clinical, financial, and operational improvements. We envision a future in which all healthcare decisions are data informed.

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