



CUSTOMER STORY

Combating COVID-19 with the help of data and machine learning





“With the strong data foundation provided by Azure Databricks, we were able to develop digital solutions through the Azure Innovation Program that effectively helps us to address the challenges brought about by the COVID-19 pandemic.”

ALAN PRITCHARD

Director, EMR and ICT Services, Austin Health

Combating COVID-19 with the help of data and Machine Learning

Austin Health uses Azure Databricks to deliver novel patient portals to support the full COVID-19 patient lifecycle

For Austin Health, which is a tertiary and quaternary health service in Melbourne, Australia, the COVID-19 battle ushered in a new set of challenges that they have never encountered before.

Victoria's largest provider of training for specialist physicians and surgeons had to relook at their healthcare delivery models to be able to better care for patients, with or without the COVID-19 pandemic. Austin Health had originally engaged Arden Street Labs to design and develop an Azure-based Innovation Program focused on enabling data science research in digital health. When COVID-19 hit, they immediately refocused efforts on developing a series of novel COVID-19 digital solutions, some within days. By tapping on the potential of data with support from Azure Databricks, Austin Health developed data solutions that empowered patient recovery at home, managed hospital risk and enabled frontline health workers to focus on helping more severely ill patients.

INDUSTRY

Healthcare

SOLUTION

Patient-centric healthcare

TECHNICAL USE CASE

- Data ingest and ETL
- Machine Learning



100,000+

PATIENTS, STAFF AND VISITORS
SCREENED FOR COVID-19



OVER 20,000
PATIENTS USING COVID CARE
REMOTELY

Struggles in gathering structured data securely to enable patient communication

As the COVID-19 pandemic rages on, Austin Health has been facing stress in the healthcare system due to the need to protect the safety of patients and staff while ensuring timely care is provided.

“The sudden change in demand for services, combined with the need to keep hospital staff, regular “non-COVID” patients and people potentially infected with COVID-19 physically separated from each other lead to unique challenges.

We required a very rapid re-design of how we communicate with patients and how we gather information from them without bringing large numbers of people together at the hospital,” said Alan Pritchard, Director, EMR and ICT Services, Austin Health.

To mitigate this, care delivery, especially for non-critical conditions, was shifted out of the acute hospital setting into the community. This gave rise to the challenge of democratizing data in a structured and quantifiable manner to support the delivery of insights to patients and staff remotely so that high patient volumes in the hospital could be minimized.

Hence, Austin Health needed a unified data analytics platform that allows for structured data and analytics programs to be developed and integrated with the hospital’s data environment. By doing so, it would aid in the development of novel digital health solutions to empower patient recovery at home, manage hospital risk and help frontline health workers to focus on helping the more severely ill patients.



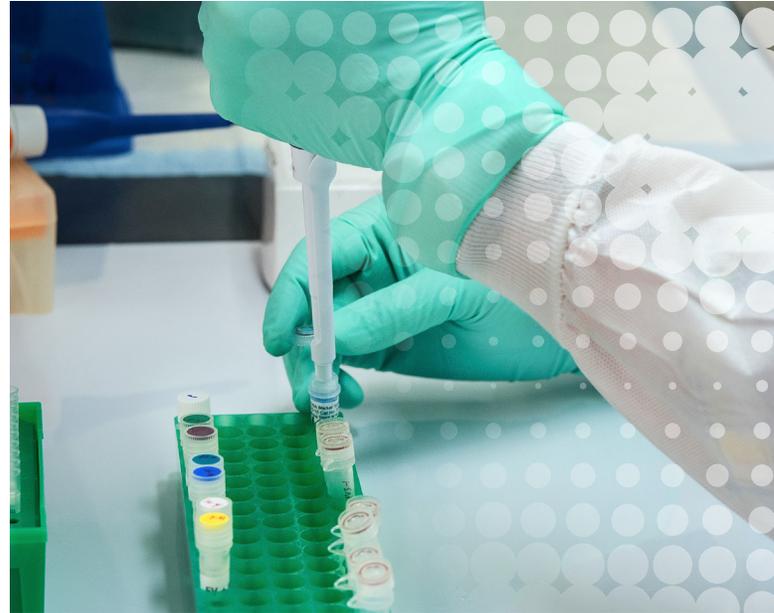
Unifying data to build ML models for enhanced patient communications

Leveraging Azure Databricks as one of the foundation features for both the AI Labs and Operational Pipelines, Arden Street Labs, working with Austin Health clinical and IT teams, brought to life the Azure Innovation Hub Program. This program aims to facilitate the rapid deployment of models, pipelines and code to production for better patient communications and wellbeing.

Azure Databricks utilizes Delta Lake to provide a robust data solution for huge data merges – from the ingestion of data from the source systems to the processing of that data and application of any AI models built. This reduces the complexity when integrating with the broader electronic medical record system for data reporting, patient contact and other outward flows of data.

Within Azure Databricks, AI Labs and experiments provided a separate ML workspace that helped to standardize data development for data scientists to evaluate new data, retrain models and rapidly evaluate new idea co-designed with the medical teams.

In addition, Azure Databricks integrated with Azure Active Directory (Azure AD) to enable the collaboration of data scientists through shared workspaces and collaborative notebooks. Additionally, it provides role-based access to dedicated and controlled Databricks workspaces, integrated with the network security controls to ensure the safety and confidentiality of patient data gathered.



By doing so, Austin Health was able to translate and deploy a proof of concept to a fully supported digital health operation that allowed it to quickly adapt amid a rapidly changing environment. In this way, frontline healthcare could dedicate their attention on caring for patients, while keeping at-home patients safe and lowering their risk of infection.

Jeff Feldman, CTO of Arden Street Labs, said that, “The nearly dozen solutions we have developed are all built and predicated on Azure Databricks as a core foundation. This has allowed us to leverage a rapid Lab to Operations deployment pattern, whilst maintaining data security and computational scalability.”

Powering 75% success rate in patient engagement through novel digital solutions

With the support of Databricks, a robust data management infrastructure was laid for the Azure Innovation Program to develop a set of digital tools that leveraged in-built clinical rules and ML-based models to digitize the COVID-19 response and reduce staff overheads, thus helping support pre-appointment compliance. They have also reduced the load on Austin Health's call center and reduce the risk of no-shows for scheduled appointments.

"These tools have been fundamental to Austin Health's ability to communicate rapidly with large numbers of people in a very dynamic and rapidly evolving environment. We are able to communicate on a broad range of complex topics with patients and visitors, give them accurate and simple advice about what they should do and provide information to clinicians about specific patients who may be at risk; and we can adjust these communication and the way data is collected and processed very rapidly in response to new guidelines or a changing situation in the hospital," said Alan Pritchard, Director, EMR and ICT Services, Austin Health.

These tools include **COVID Screen** which is a self-screening tool for the public to assess their risk of COVID-19, based upon the most current DHHS Criteria, and get advice on the next best action. On the first day that the self-assessment tool was rolled out, more than 25,000 people accessed it, and the system minimized risk for 85% of these people by informing them to stay home. The appointment portal has seen a 75-80% patient engagement success rate, which in turn has offloaded the requirements to call numerous patients.

The **COVID Clinic** is a pair of in-clinic tools called COVID ESTIMATE and COVID MATCH65 integrated with the patient's electronic medical record and used by hospital staff to assess a patient's COVID-19 risk score.

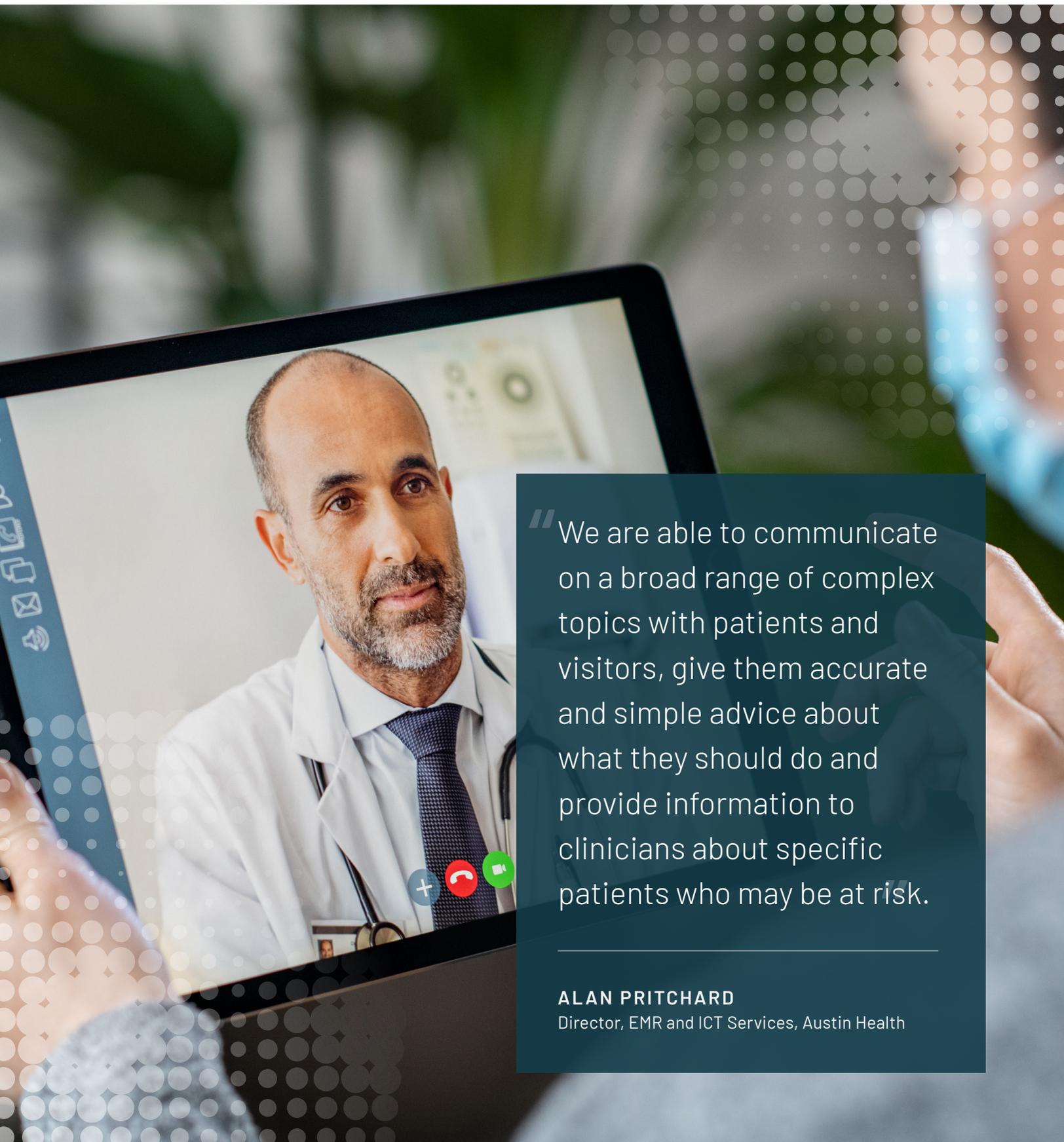
The **COVID Risk Management** is a series of apps supporting the hospital's need to manage COVID Risk for patients and visitors coming to the hospital. Over 100,000 patients and visitors have been screened using this tool.

Austin Health is also able to closely track the progress of patients in their homes without breaking quarantine or isolation and keeping patients connected to arrange urgent medical care through remote tools such as the COVID Triage, which is a solution for triaging patient assessments (used both at the COVID Clinic and during telehealth assessments).

There is also the **COVID-19 Care Monitor**, a virtual, at-home monitoring solution, which has supported nearly 20,000 patients and at-risk staff remotely.

Outside of COVID-19 applications, other departments are now starting to use the sandboxing framework, using Azure Databricks for labs, experimentation and research in the operation and production fields such as remote patient monitoring capabilities and insights to support other Austin Health patients with respiratory conditions, post procedure reviews and audits and patient lifecycle and journey insights to improve outcomes

"These solutions are examples of tools that will drive the "new normal" for healthcare," said Alan Pritchard, Director, EMR and ICT Services, Austin Health.



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About Databricks

Databricks is the data and AI company. Thousands of organizations worldwide—including Showtime, Shell, Conde Nast and Regeneron—rely on Databricks' open and unified platform for data engineering, machine learning and analytics. Databricks is venture-backed and headquartered in San Francisco with offices around the globe. Founded by the original creators of Apache Spark™, Delta Lake and MLflow, Databricks is on a mission to help data teams solve the world's toughest problems. To learn more, follow Databricks on Twitter, LinkedIn and Facebook.



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