

Exploring the Big Data Healthcare Transformation with Google Cloud

We use the Google Cloud Platform (GCP) as we seek to understand current cloud healthcare tools, how GCP meets the unique industry requirements (from data types to data privacy), and its machine learning capabilities.

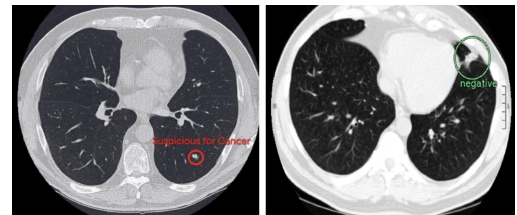
Data is transforming the healthcare industry

Two key challenges:

1. The healthcare industry uses unique data types



Fast Healthcare Interoperability Resources (FHIR)



Digital Imaging and Communications in Medicine (DICOM) - medical images

2. Technologies must meet specific requirements - especially for data de-identification



Health Insurance Portability and Accountability Act

The Google Cloud platform can help

The GCP healthcare API allows for

- user-friendly, HIPAA compliant, patient de-identification
- multiple tools to meet any machine learning requirements

Use case examples

De-identifying patient FHIR data

The Google Cloud Platform lets users de-identify patient data with just one click

Query results [SAVE RESULTS](#) [EXPLORE DATA](#)

Query complete (0.3 sec elapsed, 813 B processed)

Job information **Results** JSON Execution details

Row	patient_id	given_name	family	birth_date
1	8c8bd3f7-f84a-442f-bf0d-a49e3522e1c9	Bud153	Buckridge80	2010-05-04

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Job information **Results** JSON Execution details

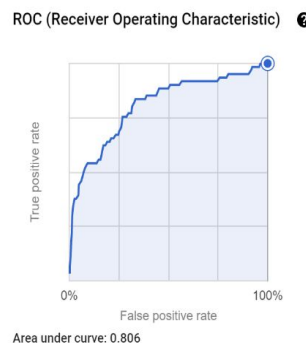
Row	patient_id	given_name	family	birth_date
1	8c8bd3f7-f84a-442f-bf0d-a49e3522e1c9			2010-05-04

Predicting probability of death due to medical reasons with BigQuery ML and AutoML

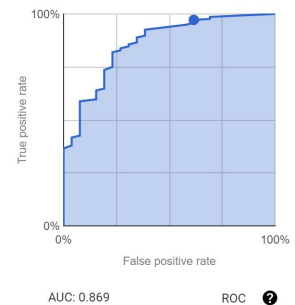
AutoML has stronger performance but has greater time and monetary costs

Both BQML and AutoML perform better than a random classifier with an AUC = 0.5

BQML: AUC = 0.806



AutoML: AUC = 0.869



Key takeaways

- Data is transforming the healthcare industry and the Google Cloud Platform has the tools to help keep up
- Unique healthcare data types and patient privacy concerns make adoption a challenge
- The Google Cloud Platform presents a user-friendly, adoptable solution benefitting both patients and healthcare providers

