

SETTING THE WORLD ON FHIR®

Published by HL7® International, a not-for-profit organization, Fast Healthcare Interoperability Resources (FHIR®) is a standard for exchanging healthcare information electronically

A series of case studies illuminating how HIT professionals are using HL7®FHIR® to improve and advance modern healthcare

RUSH UNIVERSITY MEDICAL CENTER

Based in Chicago, Illinois, Rush University Medical Center is an academic institution and a thriving center for clinical translational research, with physicians and scientists involved in hundreds of research projects developing and testing the effectiveness and safety of new medical devices and therapies.

AMAZON WEB SERVICES

Amazon Web Services (AWS) is the world's most comprehensive and broadly adopted cloud platform, with a dedicated focus on the healthcare and life sciences industry. Its healthcare mission is to enable access and delivery of person-centered care, drive improved outcomes at a lower cost, and accelerate the digitization and utilization of healthcare data. Millions of customers—including the fastest-growing startups, largest enterprises, and leading government agencies—are using AWS to lower costs, become more agile, and innovate faster.

Goal

To leverage public-private partnerships to advance interoperability and use of health-related data for more equitable pandemic surge response



Rush is an early adopter of Amazon HealthLake, leading Chicago metro-area hospitals in the adoption of HL7 FHIR, the new standard of health care data exchange.

— Dr. Omar Lateef, president and CEO,
Rush University System for Health

Opportunity

To use HL7® Fast Healthcare Interoperability Resources (FHIR®) resources in a centralized hub to facilitate aggregation, transformation, and analysis of clinical and public health data from multiple hospitals

Project

The Rush analytics team worked with the City of Chicago Department of Public Health to create a working reference implementation of a cloud-based analytics hub. The hub aggregates, transforms, and analyzes data from multiple hospitals related to patient admissions, discharges and transfers, electronic lab reporting, hospital capacity, and clinical care documents of patients receiving care in and across Chicago hospitals.

The hub enables a much-needed modernization of public health data infrastructure while also meeting each organization where they are at from a technology perspective. To accommodate different users, the hub has a variety of mechanisms for data submission:

- Through manual submissions into a secure file transfer protocol (FTP) portal.
- Using a protocol called direct messaging sending bundled data in a semi-automated manner.
- Using application programming interfaces (APIs) for fully automated data submissions.

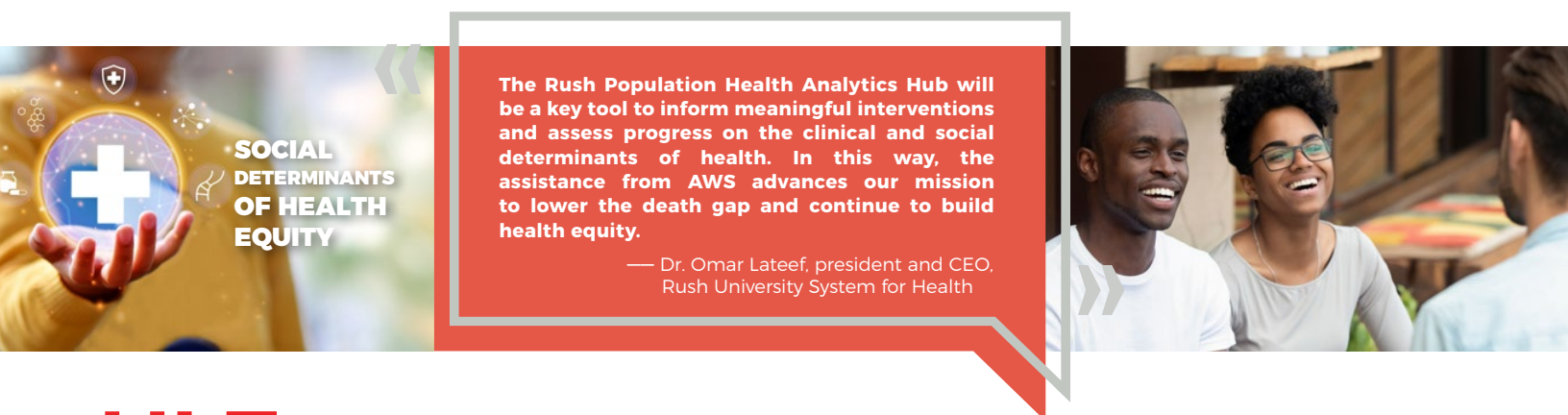
AWS supported essential aspects of Rush and the City of Chicago's response to the pandemic. With [AWS Professional Services](#), Rush developed an open source solution that leverages [serverless computing](#); it is deployable on AWS and available to other cities and states. With serverless computing, AWS handles infrastructure management tasks like capacity provisioning and patching, so Rush and partner institutions can focus on product development in response to changing conditions, like COVID-19.

The solution parses imported Continuity of Care Documents (CCD) and HL7 formatted data, converting it to FHIR Release 4 (FHIR R4) format. Once the data flows through the hub, cloud native services such as [Amazon QuickSight](#) visualize and publish near real-time dashboards to inform COVID response.

With [Amazon HealthLake](#), the solution allows AWS customers to store, transform, query, and analyze health data in minutes. Amazon HealthLake removes the heavy lifting of organizing, indexing, and structuring health care information, providing a complete view in a secure and compliant manner. The converted CCD and HL7 data then reside in an Amazon HealthLake data store. As the data flows into the solution, the Amazon HealthLake API endpoints provide participating hospital systems visibility of patient data in a secure manner that is straightforward to read and search.

Progress

AWS customers can rapidly deploy this platform in a [variety of regional settings](#) to help manage clinical and public health intervention at the state, county, and municipal levels. With legal frameworks established, the analytics hub can share data appropriately between hospitals, and state and federal agencies. As a flexible platform, users can extend the platform to meet ever-changing needs. Researchers plan to use the data to look at various trends, including health inequities such as the disproportionate impact of COVID and prevalence of other co-morbidities in communities of color.



SOCIAL DETERMINANTS OF HEALTH EQUITY

The Rush Population Health Analytics Hub will be a key tool to inform meaningful interventions and assess progress on the clinical and social determinants of health. In this way, the assistance from AWS advances our mission to lower the death gap and continue to build health equity.

— Dr. Omar Lateef, president and CEO,
Rush University System for Health

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