LAISDAR – A federated data network to support COVID-19 research in Rwanda

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Background

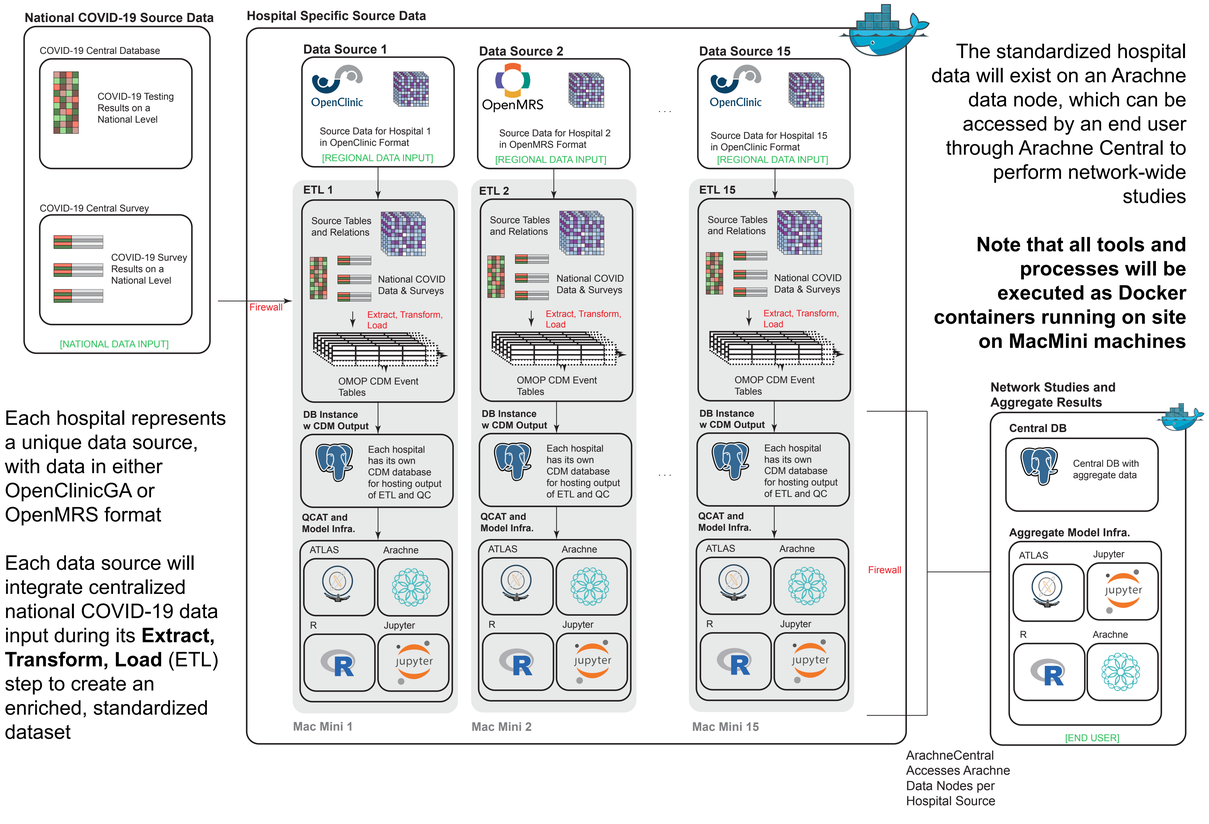
- More than 2,4 million tests have been conducted in Rwanda as of 30 August 2021, resulting in 87'131 positive cases (1083 deaths have been attributed to COVID thus far)[1]

- Because tests are only performed on high-risk groups, true case numbers are expected to be much higher

- A large and growing body of COVID-19 data exists in the country, but it is currently scattered across various hospitals and regions; **centralization and standardization is needed to fully utilize this data**

- To tackle this challenge, a consortium of Rwandan and Belgian institutions[2], led by the University of Rwanda, was assembled and has received funding from Canada's **International Development Research Centre** (IDRC)[3] as part of the Global South AI4COVID program[4]

Methods



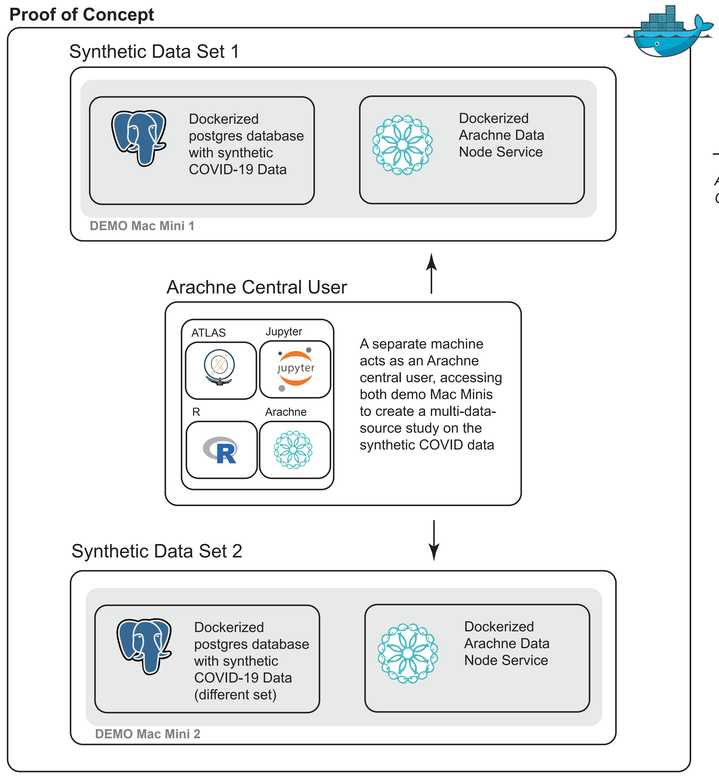
Each hospital represents a unique data source, with data in either OpenClinicGA or OpenMRS format

Each data source will integrate centralized national COVID-19 data input during its **Extract, Transform, Load** (ETL) step to create an enriched, standardized dataset

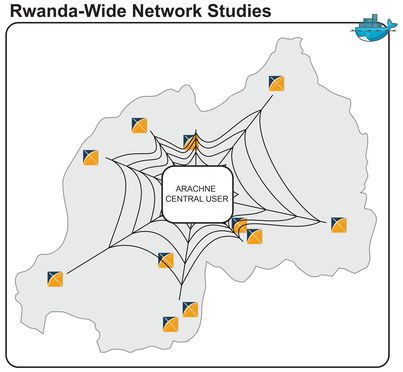
The standardized hospital data will exist on an Arachne data node, which can be accessed by an end user through Arachne Central to perform network-wide studies

Note that all tools and processes will be executed as Docker containers running on site on MacMini machines

Results



Anticipated Outcome



- The two demo machines have been configured to run the necessary dockerized processes for hosting a CDM instance with synthetically generated COVID-19 data and an Arachne Data Node

- Machines are *en route* to Rwanda, where they will be used for a network-wide training session for the data managers at the particular source locations

- Following the demonstration and training (end September 2021), the remaining Mac Minis will be configured and shipped to their respective locations to establish the national data network

- ETL development is in progress and code will be finalized and deployed at each data location

Conclusions

- First project of its kind on the African continent harmonizing COVID-19 data to the Observational Medical Outcomes Partnership (OMOP) Common Data Model (CDM)

- The design and implementation of the federated network structure may serve as a template for other nation-wide harmonization efforts, for countries both within and beyond Africa

- Selection of the OMOP CDM and utilization of Dockerized Observational Health Data Sciences and Informatics (OHDSI) tools, along with other open-source software, provides easy access to potential future partners within the project, and allows Rwanda to participate in network studies around the globe

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5. OpenMRS: open-source platform to build customized EMR system. https://openmrs.org
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7. Arachne: https://github.com/OHDSI/ArachneNodeAPI