Dashboards to Support Nigeria COVID-19 Serosurveillance Study

In the fall of 2020, Ciheb conducted the first phase of a COVID-19 population-based serosurveillance study (COVID-19 Household Seroprevalance Survey) in the Nigerian states of Enugu, Nasarawa, and Gombe to assess the prevalence of COVID-19 in the country.

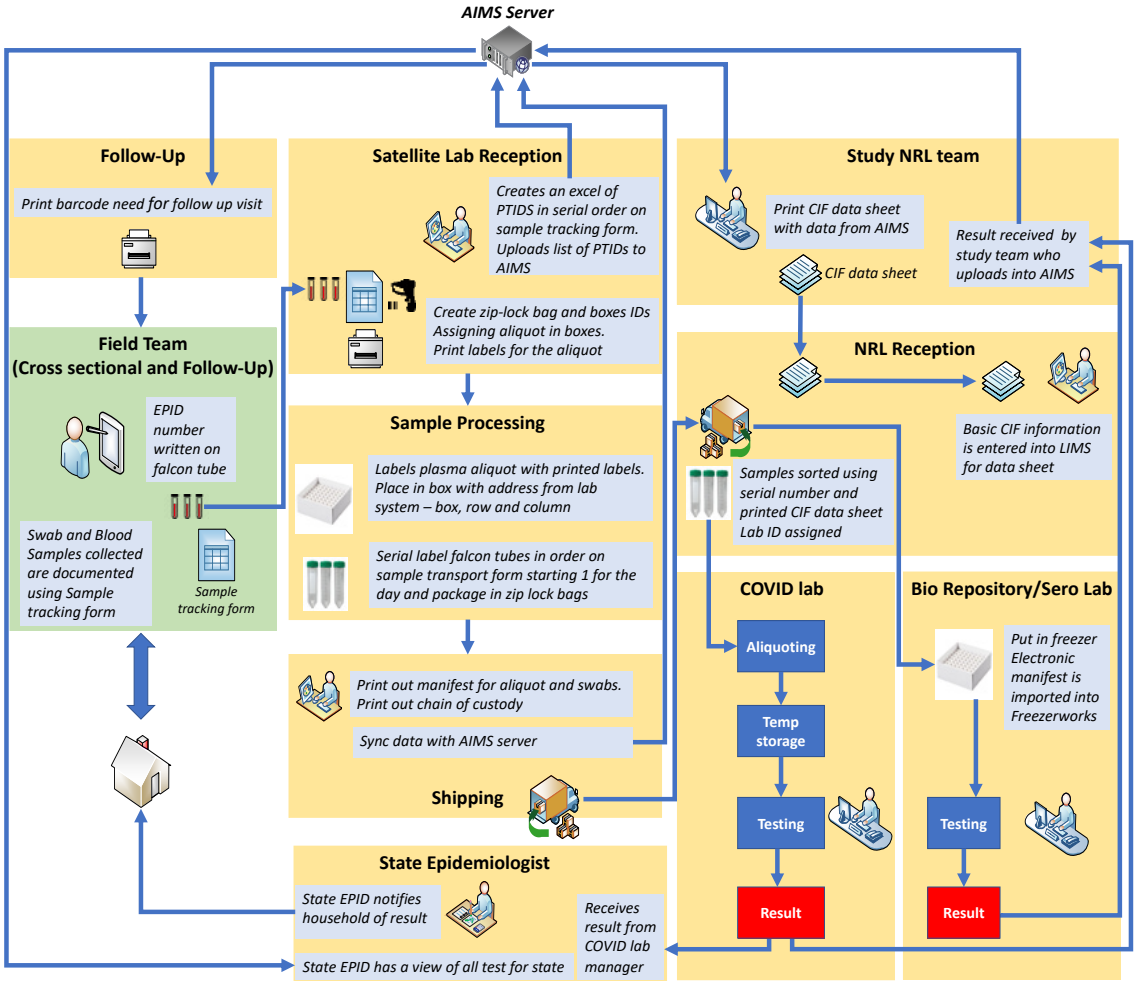
Ciheb created a data collection tool for the serosurveillance study known as the Computer-Assisted Personal Interview (CAPI). Within CAPI, there were multiple software solutions to help coordinate and synthesize data including a CAPI Mobile Application, Lab Systems Application, and Lab Dashboard.

CAPI IN SUMMARY

- Software solutions for data include **CAPI Mobile Application**, **Lab Systems Application**, and **Lab Dashboard**
- Built using **CSPro**, **.NET Core**, **Microsoft SQL Server database**
- Supported one of the largest population-based HIV/AIDS household surveys ever conducted

The procedures for the survey included:

1. Community mobilizers traveled to different areas to sensitize the public. This was followed by mapping out randomly selected households to survey.
2. The data collection survey team comprised of one team lead, two testers, and one driver and tracker. Serologic blood samples were collected to test antibody levels and nasal swabs to test current infection rates. Participants received a questionnaire and were also offered free malaria testing.
3. State epidemiologists disseminated COVID-19 positive tests, and the survey team followed up with households where at least one positive participant was found.
4. The survey team conducted participant quarantine and household testing and sometimes provided malaria drugs.



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Solutions

CAPI Mobile Application: Ciheb developed this app using CSPro. On this mobile app, team leads collect and upload questionnaire data onto tablets, which get synced to the server. Testers can also collect lab data onto tablets, which get synced to the server.

Lab Systems Application: Ciheb developed this app using .NET Core and the Microsoft SQL Server database. Data of samples are converted into aliquots, stored, and results sent to teams. Samples with barcodes are tracked from receipt of sample to storage at lab.

Real Time Dashboards: Ciheb also developed the dashboards using .NET Core and the Microsoft SQL Server database. A mapping and listing dashboard included a GIS map of all the households included in the survey. CSPro file processors running in the background reads the files sent to the central server and stores the content to the database. Follow-up file generation procedures are also running in the background. A survey dashboard includes the COVID-19 response rate, malaria positivity rate, and age disaggregation. Results are linked to participant ID, so participants with COVID-positive tests can be notified.

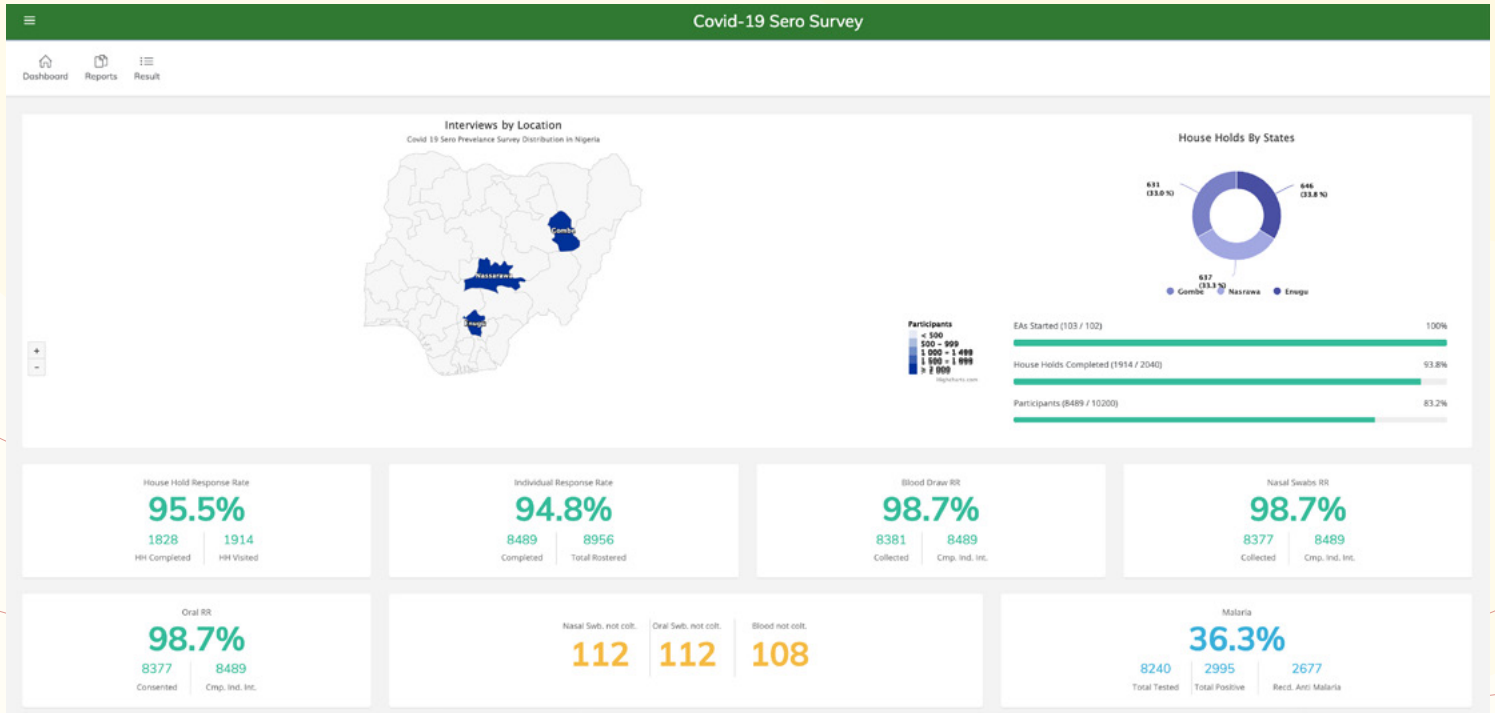
Impact

The Ciheb development team followed an agile software development approach, whereby the team added enhancements, fixed bugs, and addressed user requests as they arose on an ongoing basis. The team ran into issues linking some samples, but that was addressed with system updates. Ciheb staff also improved manual data collection to semi-automatic collection.

Progress was measured through daily reports with monitoring trackers. Each of the three states had its own plan. The development team used a sprint list and daily check-in meeting as well.

One of the key lessons from the development of these applications and dashboards is that in order to achieve success in projects on a short timeline, stakeholder engagement is essential.

The CAPI application was developed to have a modular structure, which is primarily controlled by dictionaries, so it is possible for to scale and modify it to suit other country programs if needed elsewhere.



Dashboard showing the monitoring dashboard CAPI feeds data into

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