



Biometrics Analytics on the NDR

The Biometric Analytics Dashboard was developed to monitor clients receiving care through the PEPFAR-funded ART program in Nigeria, by using biometric identification to reduce duplicate client records, improve data quality and service delivery. The dashboard was created on the National Data Repository (NDR) platform, which stores information on all clients enrolled in HIV/AIDS programs across Nigeria. The dashboard provides information on various indicators, including biometric coverage, processed fingerprint records, valid and invalid fingerprint records, duplicate client fingerprint records, and new unique client records.

The development of the dashboard involved analyzing the existing PBS PowerBI dashboard, designing mockups of different visualizations, and implementing the approved visualizations on the NDR dashboard. The dashboard can be used by different parties to monitor biometric records utilization during enrolment and deduplication of clients, provide a standardized list of actual unique clients under care, and encourage implementing partners to scale up biometric enrolments across all their supported facilities.

The Biometric Analytics Dashboard is expected to contribute to achieving epidemic control of HIV/AIDS in Nigeria by improving data quality and accuracy, identifying and resolving issues in the biometric identification process, and ensuring that all clients receive optimal care and support. The dashboard provides a centralized platform for monitoring and improving the ART program's effectiveness, ultimately helping to reduce the impact of HIV/AIDS in Nigeria.

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Editorial

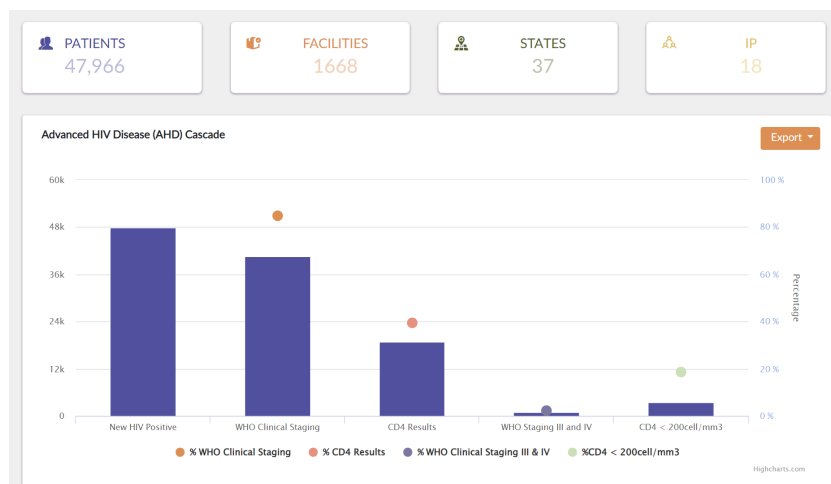
The NDR's quarterly newsletter series on Health Information Systems is a vital resource for anyone interested in healthcare data management in today's digital age. As health data is generated at an unprecedented rate, the importance of efficient and effective information management systems cannot be overstated. The NDR supports health information management, collecting, storing, and managing healthcare data for evidence-based decision-making, policy formulation, and program management.

This Newsletter series offer in-depth insights into activities related to health information systems, including data standards, data quality, interoperability, privacy, and security. It contains informative articles, projects, and activities in the field for technical and non-technical readers. Policymakers, healthcare providers, researchers, and anyone interested in the future of healthcare data management can benefit from this accessible and timely resource. Overall, the NDR's quarterly bulletin and factsheet series on Health Information Systems is an excellent resource that can help drive positive change in the healthcare industry.

AHD Analytics live on NDR

Advanced HIV disease (AHD) is defined by the World Health Organization (WHO) as a CD4 cell count of less than 200 cells/mm³ or WHO stage 3 or 4 in adults and adolescents, while all children under five years old are considered to have AHD. Although CD4 cell count testing is no longer needed to initiate treatment, it remains a crucial tool for identifying people with AHD. Children under five years are considered to have advanced disease at presentation due to an increased risk of disease progression and mortality regardless of clinical and immune conditions. However, those who have been receiving antiretroviral therapy for more than one year and who are clinically stable should not be considered to have advanced disease and should be eligible for multi-month dispensing.

It is important to track AHD data for HIV program development, improvement, policy development, strategic planning, and advocacy. To achieve this, data documented into the data capturing tools need to be updated on the EMR systems and synchronized into the NDR. AHD analytics were developed on the NDR to track AHD indicators and related opportunistic infections reported for clients. The AHD dash-



board on NDR currently displays data from 18 implementing partners, 1826 facilities and 36 states plus the Federal Capital Territory, allowing for selection by time of first positive test, facility level, sex, age groups, duration on treatment, and viral suppression. The dashboard is already in use and has been presented at several stakeholder meetings and is also used for program reporting.

"Tracking Advanced HIV disease is not just about collecting data, it's about saving lives. By monitoring AHD indicators and opportunistic infections, we can improve HIV program development, policy, and strategic planning"

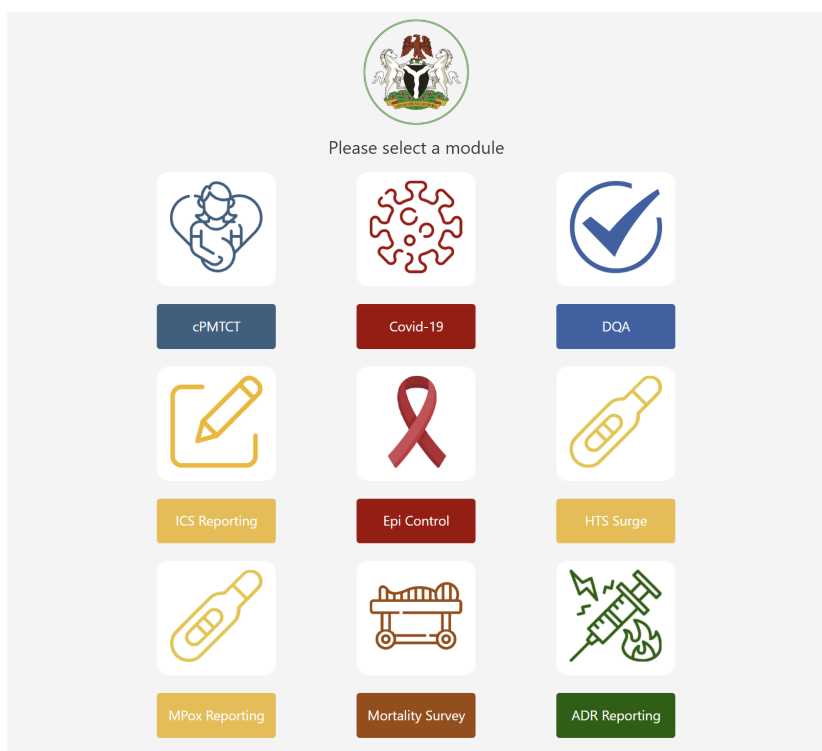
Leveraging the NDR platform to improve programs: The Continuous Quality Improvement (CQI) approach.

The National Data Repository (NDR) is a platform that supports programs by providing key stakeholders with informed decision-making tools. Quality Improvement (QI) builds on data-driven principles and relies on the performance measurement foundation of the NDR. The Nigerian Government and the CDC collaborated to appoint National and State Clinical Mentors (NCMs and SCMs) to support HIV/AIDS response in their states. A QI Coaching Program to certify NCMs and SCMs as QI coaching mentors commenced in June 2022, in partnership with PHIS3 and UCSF. A collaborative effort commenced on VL across the 19 CDC states to improve VL coverage and suppression rates using the NDR for performance monitoring. This intervention led to the development of the Quality Improvement Learning Network (QILN), which allowed all quality stakeholders to meet and improve programs. The NDR played a critical role in this feat.

Optimization of Prevention of Mother to Child Transmission (PMTCT) data on the NDR

The Prevention of Mother-to-Child Transmission (PMTCT) program in Nigeria has advanced over the years to eliminate new HIV infections among children. To track and monitor the PMTCT efforts, all PMTCT data must be documented and reported accurately. PMTCT optimization aims to ensure that Electronic Medical Records (EMRs) are updated with all the necessary data element fields for complete and correct reporting of PMTCT data elements. The PMTCT line list was reviewed to identify missing data elements, and CDC and USAID were advised to build all PMTCT reporting tools into their EMRs to prevent missing important data elements.

The NDR minimum data requirements were updated to ensure that no PMTCT data elements are missed. PMTCT visuals have been built on the NDR using the National PMTCT reference sheet, and a line list is available to make PMTCT monitoring easy for stakeholders. Data from the E-PMTCT intervention has also been linked to the NDR, giving a comprehensive picture of PMTCT achievement. However, there is still sub-optimal reporting of PMTCT data, and once PMTCT data is optimized on the EMRs and uploaded to the NDR, the achievements will be displayed on the already-built visuals, and the line list (Mothers and HEI) will contain optimal data available for use by stakeholders.



NDR Lite Modules

The NDR Lite

The NDR Lite app was created to improve documentation and reporting of community-level program interventions and to optimize data quality and ensure complete reporting across all programmatic areas in Nigeria. As part of this effort, a community Prevention of Mother-to-Child Transmission of HIV (cPMTCT) module was developed to coordinate the reporting of PMTCT activities carried out at the community level. The cPMTCT module has a data entry page with validation rules to ensure data quality and a data extraction table where the data entered can be downloaded by stakeholders for use and reporting. The data reported on the cPMTCT module is generated quarterly and shared with partners for reporting on DATIM.

To further optimize PMTCT efforts, the PHIS3 team was mandated to build an Electronic PMTCT (E-PMTCT) module on the NDR Lite to coordinate the reporting of PMTCT activities carried out by Primary Health Centers (PHCs) that lack the capacity for reporting on the District Health Information System (DHIS). The E-PMTCT module has a data entry page with validation rules to ensure data quality and a data extraction table where the data entered can be downloaded by stakeholders for use. The module is linked to the NDR and data is pulled from the reporting table on the module into the NDR. Healthcare workers have been trained on the use of the E-PMTCT module.

PHIS3 supported the Nigerian National Agency for the Control of AIDS (NACA) during the scale-up of the community PMTCT in several states and continues to provide technical assistance to NACA on the use of the module. The cPMTCT module has been up and running, enabling partners to monitor and report community-level PMTCT data and report to DATIM from this module for three quarters. The E-PMTCT module is expected to improve reporting of PMTCT activities carried out by PHCs that lack the capacity for reporting on the DHIS. Overall, the NDR Lite and its modules have been successful in closing the reporting gaps in the PMTCT program and ensuring complete and accurate reporting of PMTCT data.

Automated Flat Files

Automation and optimization of the process of generating and sharing flat files with implementing partners for concurrence checks between the National Data Repository and Electronic Medical Record data, with the goal of improving data quality, accuracy, and timeliness. Flat files are simple data formats used to store large amounts of data related to various treatment indicators. The implementation has automated the process of generating and sharing flat files, enabling implementing partners to generate flat files at any time for concurrence checks, improving data quality and consistency. The project has three specific objectives: to develop and implement an automated flat file generator, to train and support IPs on how to use it and conduct concurrence checks, and to monitor and evaluate its performance and impact on data quality and reporting efficiency.

The major activities include the development and testing of the automated flat file generator, training and support for IPs, and monitoring and evaluation of the application's performance and impact. The automation of the flat file generator has improved accuracy, timeliness, and ease of use, eliminating the need for manual data extraction and increasing efficiency. The application has also improved data quality by providing concurrence checks between the NDR and EMR data, streamlining the reporting process, and making it easier for stakeholders to make informed decisions about the program.

Early Warning Indicators (EWIs) on the NDR

The emergence of drug-resistant strains of HIV poses a threat to the success of antiretroviral therapy (ART) implementation. To monitor and prevent HIV drug resistance, the World Health Organization (WHO) developed a set of indicators, known as Early Warning Indicators (EWIs). EWIs are simple, standardized measures used to track the effectiveness of ART programs and detect early signs of HIV drug resistance. The WHO set of EWIs includes monitoring ART retention, viral load testing coverage, viral suppression, ARV medicine stock-out, ART adherence, and appropriate switch to second-line ART.

The implementation of EWIs does not require direct reporting from implementing partners. Instead, implementation began with mapping existing National Data Repository/Electronic Medical Records data fields with corresponding WHO EWIs. Stakeholders then discussed these mapped data points and developed a mock dashboard on Microsoft PowerBi using National Data Repository data. By implementing EWIs, healthcare providers can identify programmatic weaknesses and take corrective action before drug resistance becomes widespread. The use of EWIs is expected to result in improved patient outcomes, including increased viral load suppression and decreased morbidity and mortality associated with HIV infection.

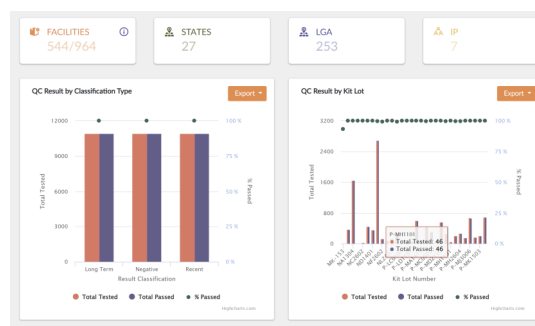
The early detection of HIV drug resistance can lead to the timely implementation of drug substitution strategies, preventing the spread of drug-resistant strains of HIV. Healthcare providers will be trained on how to use the EWI dashboard for program monitoring. Overall, EWIs will be an effective tool for monitoring the performance of ART programs and detecting early signs of HIV drug resistance.

Recency Data Quality Assurance

The Recency Data Quality Assurance program aims to provide technical support to partners implementing HIV recent infection surveillance to ensure high-quality data for accurate decision-making. Data quality checks are carried out during data upload and processing on the National Data Repository (NDR) using validation rules to reduce incomplete, inconsistent, and inaccurate data.

Stakeholders hold weekly data quality review meetings to identify and correct discrepancies and low uptake, sharing best practices and implementing corrective actions. Recency Proficiency testing (PT) and quality control (QC) dashboards on the NDR showcase quality processes implemented before and during testing. Facilities that maintain good quality conditions for the Recency test kits, a con-

ducive testing/storage environment, and highly competent personnel have their monthly QC and PT rounds recorded as pass on these dashboards. The program has contributed to improved data quality on the NDR, ensuring accurate and quick decision-making processes on HIV recent infections.



Recency Lab Quality Control Dashboard on the NDR

Data management process of viral hepatitis reporting

The Nigerian Agency for the Control of AIDS (NASCP) plays a key role in managing HIV/AIDS and is now expanding to include viral hepatitis. Hepatitis C and B are major public health concerns in Nigeria and worldwide, with potentially deadly consequences. PHIS3 developed an application to support data management for viral hepatitis reporting, which was integrated into the National Data Repository (NDR) platform.

The application underwent review and is ready for deployment pending NASCP approval. The module was developed in collaboration with Data.FI, and standard operating procedures were created for intended users at all levels of government. The viral hepatitis application is currently operational on the NDR lite staging platform and will soon be fully operational for live data management.

NDR Ticketing System Optimization

The Nigeria National Data Repository (NDR) is a platform that collects anonymized patient-level data from various health facilities across Nigeria. The platform has a ticketing system that receives feedback from users concerning issues with data uploads, platform usage, and navigating the dashboard. The ticketing system had limitations that hindered its effectiveness and usage. To address this, the PHIS3 team initiated a project to optimize the ticketing system.

The intervention included analyzing the existing ticketing system, designing a new ticketing system that addressed the identified issues, and implementing the new ticketing system in stages. The optimized ticketing system has improved the user experience, increased efficiency, and resulted in higher user satisfaction levels. The PHIS3 team will continue to monitor and optimize the ticketing system to ensure it continues to meet the needs of users and researchers.

Recent Infection analytics on the NDR

The recent infection analytics has intuitive analytics for all the sentinel events that are tracked throughout the HIV care cascade, starting with HIV case finding, and diagnosis, up until exit which is death. The dashboard has been enhanced with a friendly user experience, intuitive visualization with slicing and dicing capabilities, and the ability to download visuals for easy reporting. Users can download line lists for data triangulation and identifying clients that need follow-up for HIV care continuum.

The recent infection analytics on NDR has an intuitive dashboard that is used in tracking all HIV recent infection cases, this dashboard summarizes all recent infection surveillance indicators. The Recency surveillance dashboard has an ArcGIS map that provides data in real-time, it is used in monitoring new infections by the geographical distribution of cases. Therefore, enabling users to identify where cases are coming from to quickly ramp up testing to truncate further transmission. A rapid response alert system is automated to notify all stakeholders in an LGA where 2 or more new cases are recorded within a month for rapid response.



"Validating data ensures that assessment information is complete making the objective and subjective data agree."

NDR Data Validation Module

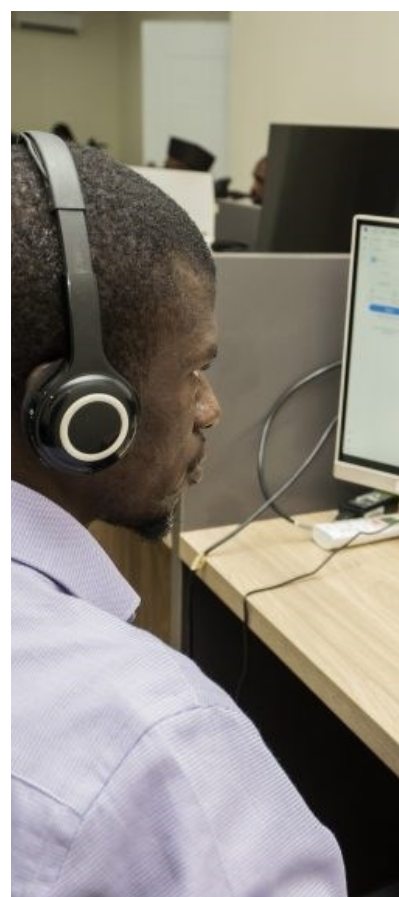
The National Data Repository (NDR) platform manages records of over two million patients, and a data validation module was proposed to improve the accuracy and quality of the data. Data validation is essential to ensure that data is accurate and representative, and it can save time and money. The GoN (NASCP) has led the development of an online module to validate ART reports on the NDR, and state M&E officers will compare populated figures on site copies of ART-MSF with what is transmitted to the NDR for concurrence.

The validation exercise will take place every month from the 16th to the 21st, and validated data will be saved as the final figure for that month, while rejected values will

have additional days for corrections.

The module mirrors all currently reported indicators/data elements on the NDR in an aggregate manner, with the capability to approve or reject the correctness of the aggregated datasets. Once validated, such datasets are locked for that reporting period as the final and validated line list.

The module is currently up and running on the NDR staging server but is poised for product deployment post failed testing with NASCP field officers. The technical collaboration with PHIS3 Health informatics and the Monitoring and Evaluation arm, with direction from GoN (NASCP), supports this innovation. The expected outcomes are improved data accuracy and quality, which will aid key decision making in the public health space.



Public Health Information, Surveillance Solutions, and Systems (PHIS3)

(PHIS3) is an independent non-governmental organization devoted to designing and harnessing innovations in advanced analytics and technologies to provide reliable, accurate data to aid decision making, plan sustainable programs and develop public policies that reach and benefit underserved populations.

By consistently adapting to evolving and emerging trends in public health, information management, and research, we are able to provide quality services that are responsive to the ever-changing needs of our clientele.

Our Vision

To be a leader in the provision and management of public health information systems and solutions that are resilient and adaptable to enable efficient delivery of quality services to the populace.

Our Mission

To expand the frontiers of reliable public health information and solutions for decision making at all strata and to be the hub for high-quality, timely, and usable health information for stakeholders especially the Government of Nigeria

Moving Knowledge instead of moving people : The Extension for Communi-

In a bid to bridge the

knowledge gap of Health Care Workers (HCW) in remote / Hard-to-Reach locations, enhance the quality-of-service delivery and consequently reduce health related mortality,

the Extension for Community Healthcare Outcome (ECHO) was launched by University of New Mexico in 2003. In Nigeria, the SPICE-ECHO commenced in 2017 with the main objective of building the capacity of HCW delivering HIV services in remote areas using the model of hubs and spokes. and The West Africa Regional ECHO (WARE) was launched in 2021 in response to COVID-19 to ensure timely training of Health care workers in West Africa Region and subsequently other diseases and program areas. ECHO project has radically transformed learning in Nigeria from costly in-person sessions to accessible audio-visual learning.

To achieve the overarching objective of ECHO, the PHIS3 team in partnership with FMOH, NCDC and support from USCDC initiated a standing weekly (SPICE) and bi-weekly (WARE) didactic sessions where HCWs in health facilities in Nigeria and West African sub-region are trained on emerging and perennial health diseases. In facilitating these didactic sessions, the following approaches were adopted.

- Advocate with relevant stakeholders to ensure participation and adequate funding for ECHO.
- Coordination of curriculum development in line with standard practice to guide sessions and standardize training content.
- Development of job-aid / tools for session data analysis and reporting to ensure sustainability/continuity.
- Provide regular and timely reports on didactic sessions to stakeholders for continuous improvement
- Increase in number of facilities participation in SPICE-ECHO sessions from 223 to 390 (75% increase) between Oct. 2021 to 2nd quarter of 2023 and Increase in number of counties participation in WARE sessions from 9 to a peak of 58 countries with an average of 42 countries per session
- Increased awareness demonstrated by HCWs in their contributions during sessions.
- There is heightened interest and support from the FMOH and NCDC which assures ownership of Nigerian government
- WARE has consistently been used to train health workers in West Africa for two years.

Following COVID-19 fatigue, it has gradually and successfully incorporated several diseases such as Lassa Fever, Ebola, Monkey pox, Measles, Hypertension, substance abuse to mention a few and has been used to train HCW on NAIS-NADA portal among others. It is expected that knowledge gained from SPICE and WARE will translate to improved health outcomes as well as influence policy and practice changes.



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