



Mamadou Diao Diallo

Digital Health & Interoperability Engineer

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⇒ [Github](#), [Linkedin](#), [ORCID](#)

Skills

Digital Health Platforms

DHIS2 (Server, Tracker, App Development, Maps / GIS thematic layers, Predictors & validation rules, DataStore, Data Integration);

OpenMRS (deployment and setup - Java + MySQL + Tomcat);

OpenLMIS (deployment, configuration, and stock reporting workflows);

ODK (Form development and deployment)

KoboCollect and CommCare (API integration for data extraction)

Surveillance & Early Warning

Event-based surveillance (EBS/CEBS) design and DHIS2 Tracker configuration;

Early warning systems, alert detection and signal prioritization;

One Health / multisectoral surveillance (human, animal, environmental and security signals);

Profile

Digital Health and Interoperability Engineer with **10+ years of experience** designing and deploying health information systems across Africa, holding a Master's degree in Artificial Intelligence for Public Health and postgraduate training in Health Information Systems Engineering (Aix-Marseille Université).

Specialized in **One Health event-based surveillance (EBS)** and in **interoperability architecture** — OpenFn, HL7 FHIR, OpenHIE, REST APIs — connecting EMR, laboratory, logistics and surveillance systems to DHIS2 for Ministries of Health, with proven expertise across DHIS2, OpenMRS and OpenLMIS. Works across the full delivery cycle, from **requirements engineering and functional specification through functional validation, User Acceptance Testing and national rollout**, and applies machine learning and predictive analytics to disease surveillance and early warning, including the integration of climate and environmental data into national surveillance platforms.

Experienced in leading national rollouts, data governance frameworks and multi-stakeholder technical workshops, having trained over 300 health professionals and supported Ministry of Health programs across West, Central and East Africa.

Country experience: Guinea, Senegal, Burundi, Madagascar, Niger, Côte d'Ivoire, Burkina Faso, Sierra Leone. **Remote programme support:** Mali, Kenya, Tanzania, Mozambique.

Employment History

Senior Interoperability Engineer - Madiro (Consultant), Madagascar

From June 2026 — September 2026

Design and implementation of interoperability workflows connecting national health information systems for epidemic surveillance and vaccination reporting in Madagascar.

- Developed OpenFn integration pipelines automating data flows from DHIS2 Vaccination to DHIS2 MPOX, CommCare to DHIS2 Surveillance, and KoboCollect to DHIS2 Surveillance, reducing manual data entry and improving reporting timeliness.

Data governance standards, metadata dictionaries and validation rules;

Africa CDC / WHO surveillance guidelines

Interoperability & Data Exchange

OpenFn (Design, development and QA of interoperability workflows and adaptors);

OpenMRS/OpenLMIS-DHIS2 data exchange architecture;

Data modeling, data dictionary/metadata harmonization and semantic mapping;

FHIR, HL7 and OpenHIE architectural principles;

interoperability middleware (HAPI FHIR, OpenHIM exploration); REST APIs

Data Engineering & Databases

ETL/ELT pipeline development (Python, SQL);

MySQL, PostgreSQL, MS SQL Server

Data Analysis, ML & Visualization

Python (Data Analysis, Machine Learning, Model Evaluation, Bayesian hyperparameter optimisation, walk-forward temporal validation, threshold calibration, SHAP explainability, Visualization);

Power BI (dashboard design, DAX, data modeling);

charting libraries (Billboard.js, C3.js, Chart.js, Google Charts, Highcharts);

QGIS;

Data analysis and evaluation for decision-making

- Applied health data interoperability best practices to ensure reliable, scalable data exchanges across heterogeneous source systems.
- Ran functional testing, integration testing and **User Acceptance Testing** with in-country teams prior to production deployment, documenting test scenarios, results and acceptance criteria.
- Produced technical documentation and testing frameworks to support system maintainability and knowledge transfer to in-country teams.

Event-Based Surveillance (EBS) & Digital Health Systems - PReSeS-AOC, World Bank (Consultant), Guinea

From November 2025 — Today

- Supporting the national rollout of Event-Based and Community-Based Surveillance (EBS/CEBS) aligned with Africa CDC and WHO One Health guidance.
- Designed and configured the national EBS Tracker in DHIS2 under a **One Health** approach, covering the four national signal streams - **human health, animal health, environmental, and security/safety events** - with dedicated signal forms, verification and triage workflows, and risk-based escalation to national level.
- Coordinated multisectoral stakeholders (human health, veterinary services, environment) around shared signal definitions, verification responsibilities and reporting timelines.
- Development of data governance standards, metadata dictionaries, validation rules, and organizational workflows.
- Development of analytical dashboards and performance monitoring indicators.
- Identification of needs and best practices for future AI-driven alert prioritization.

Associate Researcher in Artificial Intelligence for Public Health — ANSS, Guinea

From February — June 2026

- Developed and validated a machine learning epidemic alert prediction system (LightGBM, AUC-ROC = 0.902) detecting 58.6% of true alerts seven days in advance across 19 priority diseases and 38 health districts.
- Built an end-to-end data pipeline integrating DHIS2, NASA POWER climate data, and demographic data covering eight years of surveillance data (348,612 observations, 46 engineered features).
- Integrated SHAP explainability as a core operational component of the dashboard, enabling district health agents to interpret each predicted alert at the district-disease-week level.
- Developed a multi-page web-based dashboard prototype and a DHIS2 native application for national-level operational deployment at ANSS Guinea.
- Published as open-access thesis (CC-BY 4.0): doi.org/10.5281/zenodo.21624986

Software Development

PHP, JavaScript, Python, Dart, Java; React, Flutter, HTML5, CSS3;

Drupal (module development, site building, theming)

DevOps & Infrastructure

Git, Docker, CI/CD, TDD, Lando, Pantheon;

Linux server administration (Ubuntu, CLI, permissions, networking)

Requirements & Validation

User requirements gathering and functional specification; test case design; functional, integration and User Acceptance Testing (UAT); defect triage and acceptance sign-off; SOP and user guide development

Project Management & Collaboration

Requirements analysis, technical documentation, user training;

Jira, Trello, Asana, Slack; MS Office Suite

Languages

French - Native

English - Fluent

Principal Interoperability Engineer - Madiro (Consultant), Burundi

From January — March 2026

- Design and implementation of interoperability workflows connecting SIDAInfo (HIV EMR), IBIPIMO (Laboratory Information System), and DHIS2 for national health reporting in Burundi.
- Developed OpenFn integration pipelines to automate HIV reporting and laboratory exchanges (viral load requests and results), reducing manual data entry and improving data quality.
- Implemented CI/CD pipelines with automated unit and integration tests, ensuring reliable deployments on OpenFn Lightning.
- Led the full design–test–validation cycle: gathered and documented functional requirements with SIDAInfo, IBIPIMO and DHIS2 stakeholders, translated them into functional specifications and test cases, and ran **User Acceptance Testing (UAT)** sessions with Ministry and partner users, logging and resolving defects through to formal sign-off before production release.
- Collaborated with the OpenFn technical team to develop custom adaptors and apply health data interoperability best practices.
- Produced comprehensive technical documentation and testing frameworks to support system maintainability and knowledge transfer.

Digital Health Systems Specialist - JSI Research & Training Institute, Inc., Remote

May 2021 — February 2025

- Co-created DHIS2 app automating malaria bulletins, reducing reporting delays by 95% for health programs.
- Led development of the Android-based Malaria RDQA tool, adopted in 5 West African countries; trained 60+ professionals, improving surveillance and data quality. Recognized as a Top 3 app at the 2022 DHIS2 Annual Conference.
- Developed DHIS2 analytics package for real-time malaria data reviews, enabling faster decision-making.
- Maintained JSI's DHIS2 platforms, ensuring reliable data systems across projects.
- Improved TB DIAH (hub.tbdiah.org): contributed to data dashboards for 32 USAID TB priority countries, improving access to TB intervention data and supporting policy decisions.
- Contributed to USAID MOMENTUM-2C KM Platform: integrated collaboration and knowledge management tools to promote resource sharing and data-driven decision-making.
- Led development of SCDataUse portal (scdatause.org): Drupal-based M&E dashboards for Kenya, Tanzania, and Mozambique; integrated DHIS2 data to enhance health program monitoring and supply chain performance.
- Designed DMPA-SC Access Collaborative dashboard: supporting family planning programs across 21 countries, enabling real-time supply chain analytics.

- Digitalized the High Performing Health Care (HPHC) toolkit: moved from Excel to web-based tool; supported implementation in 8 countries.
- Conducted rapid assessment of the DMPA-SC supply chain (Senegal, 2023): Data collection, analysis and stakeholder validation to identify bottlenecks and strengthen last-mile product availability.

Global Health Projects - Consultant, Guinea - Burundi - Niger

August 2018 — April 2021

- Designed & implemented CNERS protocol submission platform (GIZ, Guinea): digitized a paper-based process, improving efficiency with real-time notifications and tracking.
- Served as DHIS2–Drupal Consultant (JSI): supported multiple DHIS2 country projects and developed digital health solutions using Drupal.
- Developed Guinea Malaria RHIS Profile (ICF/USAID–PMI): led stakeholder workshops and validation with MoH to strengthen malaria surveillance.
- Conducted Burundi HIV EMR assessment (JSI): site visits, data analysis and report supporting EMR adoption.
- Configured & deployed DHIS2 Tracker for Guinea's HIV program (with CRS & MoH), strengthening patient monitoring and introducing appointment reminders.
- Supported Niger MoH in designing the DHIS2 Roadmap 2019–2022 (system assessment, resource mapping, budgeting).
- Led the implementation of the GOFER project in Guinea, a Digital Square funded initiative supporting the integration of Guinea's Global Facility Registry into DHIS2 and trained the Ministry of Health's ICT team.

Health Information Systems Engineer - JSI Research & Training Institute, Inc., Guinea

February 2016 — March 2018

- Led national DHIS2 deployment, enabling monthly reporting from 500+ facilities, and integrated key programs (HIV, Malaria, MCH) to reduce fragmentation.
- Developed Guinea's DHIS2-based Master Facility Registry, aligned with global standards, and supported the national disease surveillance platform for early warning of emerging health threats.
- Supported OpenLMIS national configuration - supply chain workflows and MoH training - enabling standardized reporting and improved stock visibility.
- Conducted national training (200+ users) and coordinated stakeholders, positioning the project as MoH's trusted technical leader.
- Led IT infrastructure for the MoH: secure servers, internet connectivity with access control, and network device rollout across 15 districts.

IT & Systems Specialist - Advalis, Conakry

September 2014 — January 2016

- Implemented digital archiving solutions and ODK-based data collection tools with BIRT reporting dashboards for banking, logistics, and government clients.
- Delivered ArcGIS spatial analysis and mapping, and managed IT infrastructure (servers, networking, Help Desk) for secure operations.

Education

Master in Artificial Intelligence for Public Health, Aix Marseille Université, France 2025 — 2026

Master 1 in Health Information Systems Engineering, Aix Marseille Université, France 2017 — June 2018

Computer Engineering/Networks, Université Nongo Conakry, Guinea 2011 — 2015

Certificate

FHIR Intermediate Course, HL7 International

FHIR Fundamentals Course, HL7 International

Introduction to Machine Learning on AWS, Amazon Web Services

Java Programming and Software Engineering Fundamentals, Duke University

Test Driven Development, IBM

DHIS2 Server Administration, Oslo University

Publications

Diallo, M. D. (2026). AI-Augmented Epidemic Surveillance: Predicting Epidemic Alert Threshold Exceedances Using DHIS2, Climate and Demographic Data in Guinea. Aix-Marseille Université / ANSS Guinea. Zenodo: doi.org/10.5281/zenodo.21624986 HAL: hal.science/tel-05704926

References

Daniel Cothran | Digital Strategist from JSI Research & Training Institute, Inc.

Michaël Bontyes | Director of Programs and Digital Health from Madiro

Jonathan Metzger | Director, Applied Technology Center from JSI Research & Training Institute, Inc.