

## OHDSI in Africa and Partnerships with European Institutions

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### Background

Africa, the second most populous continent, faces significant health challenges from a high burden of infectious diseases, maternal health issues, and rising incidence of non-communicable diseases. African governments are striving to establish efficient systems for sharing health data and promoting interoperability among various repositories<sup>1</sup> as health data are increasingly migrating to electronic data capture. The OHDSI framework for data standardization and collaboration through a federated approach, as well as the extensive suite of programs for quality checks, visualization and rigorous analysis of observational data can accelerate efforts of African entities to strengthen health information systems and analyze large health data sets, both within and across African countries, to generate evidence for improving health systems and patient care, in a manner that is privacy protecting, transparent in methodology, and economical through use of open-source tools. The successful EHDEN program, utilizing the OMOP CDM and OHDSI suite of tools, is an inspiring model for generating evidence on a continental scale to improve healthcare systems and patient care, through its demonstrable impact on clinical practices, policies, and regulatory decisions, and serves as an aspirational model for the African continent.

### Methods

Objectives for the OHDSI Africa Chapter in 2023 were to (1) grow membership to >25 members (2) craft compelling value proposition statements and other communication materials to increase awareness of OHDSI among African researchers, health data custodians, and government officials, (3) develop a pipeline from one or more regional data sources into OMOP, (4) identify and pursue funding to support Chapter members' activities, and (5) present OHDSI at conferences focused on African health. In 2024, those objectives will be deepened in the following ways. Firstly, we communicate about OHDSI virtual events and network studies so that members have greater awareness of opportunities to participate in global network community activities. Secondly, members will apply for healthcare database access from their country's governments and other data custodians, to implement specific instances of the OMOP CDM and identify new vocabulary needed to accurately represent African data from clinical visits and population health surveys. Thirdly, we will build relationships with Africa CDC and data science programs such as DSI-Africa, Africa Open Science Platform and VODAN.<sup>4</sup> All these will build support for training and development of African data scientists using OHDSI.

## Results

The OHDSI Africa Chapter was established in October 2021; by February 2023, the Chapter had >120 members from 15 African, 8 European, and 11 other countries including the UK and US. Africa Chapter members have participated in two Data Science in Africa Networking Events sponsored by the University of Cape Town and the NIH Fogarty International. Chapter members set up a meeting with the Africa CDC, US CDC and USAID to provide an overview of OHDSI, which was received favorably by Africa CDC participants and generated interest to pursue further collaboration. The Africa Chapter hosted guest speakers from the INSPIRE network, Digital Square (CEO Dr. Bilal Mateen), an organization committed to strengthening country efforts to develop digital health infrastructure in low- and middle-income countries, and VODAN (Prof. Mirjam van Reisen, Leiden University and Yohannes Samson, VODAN Ethiopia), a network of data centers in Africa initially focused on Covid-19 but which has now expanded to other health indications.<sup>2</sup> At Chapter meetings, we engage in knowledge transfer about experiences with the OMOP CDM and vocabulary and the availability of synthetic datasets, providing members who are new to OHDSI an opportunity to become familiar with OHDSI tools.

African institutions in Rwanda, Kenya, Malawi, Tanzania, and South Africa have created OMOP versions of local health data. The Rwanda Biomedical Center, in collaboration with Ghent University and EdenceHealth in Belgium with funding from the International Development Research Centre of Canada, established the LAISDAR project,<sup>3,4</sup> which conducted OMOP ETLs of 3.6 million unique subjects from EMRs at 15 Rwandan hospitals throughout the country originally captured using OpenMRS and OpenClinic. Data quality and scope were evaluated with ACHILLES and ARES. The African Population Health Research Center (APHRC) in Kenya established the Implementation Network for Sharing Population Information from Research Entities (<https://aphrc.org/inspire/>) to harmonize data to the OMOP CDM and perform quality checks, visualization, meta-data labeling, and data analysis with the OHDSI tool stack. Feasibility of this pipeline was demonstrated by transforming data from the Health and Demographic Surveillance System at locations in Kenya, Tanzania and South Africa.<sup>5</sup> APHRC recently was awarded funding from The Wellcome Trust for a program “Data Science Without Borders” involving a partnership among African research institutions, European data science experts, the Committee on Data for Science and Technology (CODATA), Africa CDC and the OHDSI Africa Chapter. Members are pursuing funding to train African scientists in OHDSI methodology. Despite these few examples of funding for OHDSI projects in Africa, there remains a large need for funding to strengthen technological and human capacity for computing infrastructure, training to conduct large-scale data analytics, financial support to carry out OMOP ETLs of African healthcare data, and travel stipends for African scientists to attend OHDSI and other data science conferences.

## Conclusion

Awareness of OHDSI is growing in Africa with several African institutions successfully implementing the OMOP CDM and OHDSI tool stack. Other OHDSI Africa Chapter members are poised to do OMOP implementations at their institutions but lack the necessary funding. Despite the availability of vast amounts of data from previous health programs, population surveys and registries in Africa, these datasets remain siloed in different organizations and captured in varying formats and terminologies.<sup>6</sup> OHDSI offers an opportunity to leverage open source and publicly available infrastructure available in Africa to make these data FAIR (findable, interoperable, accessible and reusable) through harmonization to the OMOP CDM and use of OHDSI tools, enabling advanced analytics for healthcare improvement. Leveraging the extensive OHDSI experience in Europe can expedite capacity building in Africa. Funding is urgently needed to empower African scientists to lead this transformative effort.

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