OHDSI India Digital Health CoE and National Registry Pilots

Dr.SwethaKiranmayi Jakkuva (Real-World Data Research Coordinator at GVW Technologies), Parthiban Sulur (VP- Innovation & Growth at GVW Technologies), Louis Hendricks (Founder & Initiator of GVW Technologies), Dr. Vikram Patil (Dy Dean, Research (Clinical) , JSS AHER), Dr. (Prof) Anurag Agrawal (Head*, Koita Center for Digital Health at Ashoka (KCDH-A);* Dean*, BioSciences and Health Research, Trivedi School of Biosciences, Ashoka University*), Dr. Rintu Kutum (Group leader, Augmented Health Systems; Faculty Fellow, *Department of Computer Science*; *Koita Centre for Digital Health at Ashoka (KCDH-A)*; *Mphasis AI & Applied Tech Lab at Ashoka*; *Trivedi School of Biosciences*, Ashoka University)

Background

India's healthcare system is undergoing a digital transformation driven by national initiatives like the Ayushman Bharat Digital Mission (ABDM) which aims to create a unified, interoperable health data infrastructure. Like many countries in the early stages of healthcare digitization, India is actively learning to adopt and scale techniques for harmonizing clinical data across institutions enabling real-world evidence (RWE) generation and supporting inclusive scalable research. While national programs like the ABDM have laid the foundation for a unified digital health infrastructure, much of the clinical data still resides in fragmented systems. The growing demand for interoperability, consistent terminologies, and longitudinal data access is driven not only by policy goals but also by the rising interest in applying AI and machine learning to improve care delivery and outcomes.

Recognizing these needs, OHDSI India has launched two key initiatives to accelerate progress:

- **The OHDSI Powered Digital Health Center of Excellence (CoE)** - India's health data landscape and growing demand for real-world evidence call for a centralized and standards-driven approach. The CoE was created to unify efforts in data harmonization, interoperability, and capacity-building aligned with ABDM's national priorities.
- **Development of disease-specific registries** that are both research-ready and clinically usable - High-burden diseases like cardiovascular conditions suffer from a lack of structured, interoperable data needed for longitudinal tracking and clinical insights. These registries help physicians and health systems consistently capture, organize, and analyze patient data supporting care delivery.

Methods

The development of the OHDSI India Digital Health Center of Excellence (CoE) and its flagship cardiovascular disease (CVD) Patient Registry followed a reproducible, standards-driven methodology grounded in open science principles. The approach integrates data modeling, terminology mapping, and stakeholder collaboration to ensure inclusiveness, scalability, and alignment with national digital health priorities.

The **OHDSI Powered Digital Health Center of Excellence (CoE)** employs a reproducible, standards-driven methodology to unlock large-scale health data for real-world data (RWD) generation and real-world evidence (RWE) research in India.

To establish a collaborative hub that drives digital health transformation, the CoE follows a multi-pronged methodology by fostering innovation through open science and standardized data practices; builds capacity via certified training programs; and engages experts and stakeholders across clinical, technical,

and academic domains to ensure inclusive implementation. By aligning with the Ayushman Bharat Digital Mission (ABDM), the CoE integrates the OMOP Common Data Model (CDM) with the FHIR ecosystem to ensure semantic interoperability across Indian health systems.

Cardiovascular diseases (CVDs) account for nearly 28% of all deaths in India, making them a national health priority. JSS Academy of Higher Education and Research (JSS AHER), Mysuru, was selected as the initial pilot site for the CVD registry based on its consistently high cardiovascular patient volume and its readiness to support structured digital data collection—making it an ideal setting to initiate scalable registry implementation.

The registry is designed to be both **ABDM-compliant** and **OMOP CDM-compatible**, enabling structured, interoperable data capture. The registry will be extended to additional hospitals to support multi-site harmonization and scalable real-world evidence generation.

The CVD registry is built on a reproducible workflow and modular software architecture that supports:

- **Secure access** via VPN and HTTPS load balancing for performance and data protection
- **Centralized patient registry (PR) database** with scheduled tasks managed by dedicated schedulers
- **Standardized cohort selection** using clinical criteria to ensure representativeness
- **Support for relational databases and REST APIs**, enabling integration with third-party applications

The registry fields were designed in alignment with the mandatory requirements of OMOP CDM tables, ensuring OMOP compatibility from the outset, and efforts are underway to automate the conversion pipeline enabling seamless research and real-world evidence generation.

Results

The OHDSI Powered Digital Health Center of Excellence (CoE) has successfully established momentum in India's digital health ecosystem by fostering dialogue between the OMOP CDM and HL7 FHIR communities. Through active outreach, the CoE has connected with experts working on ABDM interoperability and created a dedicated OMOP–FHIR workgroup that continues to grow across clinical, technical, and academic domains.

The CoE has also laid the groundwork for demonstrating how data standardization and open science can inform scalable, policy-aligned digital health solutions. These efforts have catalyzed interest among hospitals, government bodies, and researchers, creating a shared vision for interoperable infrastructure built on open frameworks.

As a flagship initiative of the CoE, the cardiovascular disease (CVD) Patient Registry is currently in its development phase and has been piloted at JSS Academy of Higher Education and Research (JSS AHER), Mysuru. The site was prioritized for its consistent CVD patient volume and digital readiness. All registry data fields have been defined in close consultation with physicians to ensure clinical relevance and usability. The registry supports structured data capture across demographics, diagnostics, risks, and outcomes. While Phase 1 focuses on OMOP CDM design and clinical harmonization, ABDM compliance (Phase 2.0) is actively underway, with plans to incorporate FHIR structuring for seamless integration and multi-site expansion**.**

Conclusion

This report outlines the early-stage efforts to foster collaboration between the OHDSI India and FHIR India workgroups. The aim is to create a harmonized and scalable approach to clinical data standardization, analysis, and interoperability in the Indian healthcare context.

Through the integration of OHDSI's analytical and vocabulary frameworks with FHIR's interoperable data structures, we envision building robust pipelines that support evidence generation from real-world data, particularly in underrepresented healthcare settings.

We encourage the OHDSI community to take away the importance of regional customization and cross-standard collaboration to enable inclusive, reproducible, and scalable research. Community members are invited to contribute with technical insights, data stewardship, and policy alignment strategies that can further this initiative.

This effort also opens avenues for long-term regional capacity building, alignment with global health informatics standards, and the creation of open, collaborative learning systems tailored for India and similar resource-limited settings.

References

https://www.ohdsi-india.org/home