How Health Systems Can Create Value by Adopting the OMOP CDM

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Background

Health Systems are under increasing pressure to improve outcomes for their patients while also improving efficiency of resources and productivity of providers and staff. Monitoring these activities requires the synthesis of extensive amounts of data. To remain competitive, organizations require highly competent analytics teams to discover insights and inform decisions. Using the widely adopted Observational Medical Outcomes Partnership Common Data Model (OMOP CDM) for medical records improves an organization's analytic capacity in multiple ways in addition to supporting research questions[1].

The Observational Health Data Sciences and Informatics (OHDSI, pronounced "Odyssey") program is a global, multi-stakeholder, interdisciplinary community collaborating to unlock and amplify the value of health data. OHDSI accomplishes this goal via community-driven development and maintenance of the OMOP CDM, standard vocabularies, and open-source software tools covering the gamut from data ingestion to large-scale federated data analysis. The production of evidence by the OHDSI community is evident with over 340 published papers on OHDSI methods research, data standards, clinical applications, and other subjects[2]. These papers document benefits to patient care, including an increase in evidence-based knowledge about adverse events[3], risk assessment[4], clinical data quality[5], comparative effectiveness[6], quality of care[7], patient-level prediction models[8], and other outcomes-related topics[3]. However, the benefits to a health system adopting the OMOP CDM, specifically from the point of view of a financial decision maker, have not been documented in the literature. Through a survey and discussion, including a review of posts and discussions on the OHDSI forums[9,10], we have identified ten main drivers for a health system to adopt OMOP CDM.

Methods

Over several meetings of the OHDSI Health Systems Interest Group (HSIG)[11], OHDSI collaborators discussed the main reasons for their institutions to adopt and use the OMOP CDM. By surveying the HSIG members, multiple drivers were discovered as to why a health system is either in the process of or has incorporated the CDM into their patient health database options for researchers to utilize. A review of all the reasons for adoption of the CDM, revealed some overlap or duplication of an idea between the forum discussion and the HSIG survey. The HSIG compiled duplicate ideas and narrowed the list to 10 drivers of health system adoption of the OMOP CDM.

Results

The results of our study show four main areas of benefit when a health system adopts the CDM:

1. An increase in productivity among staff, providers, and researchers when utilizing the CDM for data storage, data analysis, and collaborative and internal research studies[12]
2. Increased ease of recruitment and retention of staff, providers, and researchers
3. Control of the cost and risk associated with extensible technology and data platforms, and the ability to access external expertise

4. Increased control over data privacy since standardization happens within the health system and the need to share patient-level data is reduced.

The following is an enumeration of these ideas and domains.

Top 10 reasons for using OMOP in your health system (CFO perspective)

1. Improve data analyst productivity by using a standard data model. Consistent, reproducible results, more obvious how to query; OMOP is analytics ready, logic has been predetermined by the application of business rules at time of ETL to the CDM (staff productivity)

2. Easier to train and recruit an OHDSI data analyst and researchers utilizing resources from the OHDSI community and the EHDEN Academy. (staff and researcher recruitment, retention, & productivity)

3. Reduce costly chart abstraction efforts through EMR automation for Clinical Registries (provider productivity)

4. Availability of open-source health data analysis tools: Athena, Atlas, HADES, and others. No vendor lock-in or forced obsolescence. (researcher productivity, controlling cost and risk)

5. Extensible for precision medicine efforts to combine multi-modal feature data from medical imaging, telemetry, and genomics. OMOP can support multiple different data sources as inputs (EMR's, HIE's, Claims, Registries, IOT), allowing you to combine multiple data sources for a person, enriching your data for more complete longitudinal data and research. (extensibility of an open platform allows future technology and data incorporation)

6. Keeps your data safe behind the firewall. Network studies only share aggregated results and no row level patient data. Has published de-identification practices[13]. (data privacy)

7. OHDSI allows for reproducible observation research (more competitive publications and grants, faculty recruitment, retention)

8. Ability to participate in collaborative studies. NIH All of Us, N3C, network studies. (faculty recruitment, retention, promotion)

9. Easy deployment of the OHDSI tools stack on cloud infrastructure (Amazon Web Services, Microsoft Azure, and Google Cloud Platform all support the OHDSI stack on their cloud platforms. (cost control, staff productivity)

10. Vendor ecosystem that can help you transform your data to the OMOP CDM. Consultancy firms, vendors - many professional services for ETL, infrastructure, software tools, phenotypes/research, education, etc. (cost control, staff productivity)

Conclusion

There are numerous benefits to health systems who implement the OMOP CDM. Examined together, they make a compelling case to health system C-level decision makers who are looking to increase operational and research productivity, ease recruitment, control cost and risk, and increase privacy.

References/Citations

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