

# Leveraging the Power of OMOP for an Academic Medical Research Institution

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## Abstract

*Clinical informaticists face several challenges when leveraging medical record data, including spurious data resulting from non-standard terminologies and inconsistent documentation. Common data models, such as OMOP, can improve the accuracy of data extraction but introduce other complications such as rigid conventions and additional jargon. To better serve researchers who are unfamiliar with OMOP, we have built tools to take advantage of the strengths of OMOP, while minimizing its challenges for our OMOP-naive researchers.*

## Background

There are inherent challenges in leveraging medical record data for research purposes. These challenges stem from the fact that the primary purpose of these data are to treat the immediate needs of a patient, and, at the time of data collection, the reusability of these data are not often a priority. As a result, medical record data often have inconsistent documentation, similar information recorded in spurious locations, and lack standard terminologies for many clinical data elements. However, medical record data are a powerful resource as it allows researchers to access an unprecedented number of patients for their studies. As such, clinical informaticists need to determine how best to leverage the power of medical record data while minimizing its limitations.

One way to minimize the limitations of medical record data is to leverage the Observational Medical Outcomes Partnership (OMOP) Common Data Model (CDM), which is an open community data standard, designed to standardize the structure and content of observational data and to enable efficient analyses that can produce reliable evidence<sup>1</sup>. The OMOP CDM requires conformance to a specific data structure and naming conventions, which can be a barrier for users. We have layered custom tools on top of the OMOP CDM to help make these data more accessible to our local researchers.

## Methods

The OMOP CDM serves as the foundation for our custom tools. We have extended the OMOP CDM released by the Observational Health Data Sciences and Informatics (OHDSI) community by adding extension columns to the standardized clinical data. These extension columns allow us to customize the common data model for our local research needs. The tools layered on top of the OMOP CDM include (1) Data Explorers, which are custom-built de-identified Tableau dashboards that allow users to see clinical data elements and associated record counts available in the OMOP CDM, (2) Concept Mapping tools, which helps check for errors when uploading new concepts and quickly identifies the current domain for concept lists, and (3) standard project requirements, which are common views and a corresponding Excel spreadsheet that represents the OMOP CDM in a format more intuitive to our local users that are familiar with the Epic electronic medical record system.

## Results

The OMOP CDM, data explorers, concept mapping tools, and standard project requirements improve the consistency of delivered data requests, especially when used together. The initial subjective response from our users includes that the data are easier to use and are well organized. The standard project requirements meet the needs of many data requests. We are currently gathering data to test our hypothesis that the data requests that leverage these tools will be delivered faster and will have higher customer satisfaction.

## Conclusions

Electronic medical record data can be a powerful tool for research when leveraged correctly. By layering custom tools on top of the OMOP CDM, we hope to provide standardized data in an easily accessible way to our local researchers.

**References**

1. Hallinan CM, Ward R, Hart GK, Sullivan C, Pratt N, Ng AP, Capurro D, Van Der Vegt A, Liaw ST, Daly O, Luxan BG, Bunker D, Boyle D. Seamless EMR data access: integrated governance, digital health and the OMOP-CDM. *BMJ Health Care Inform* 2024 Feb 21;31(1):e100953.