Development of Medical Imaging Data Standardization for Imaging-based Observational Research: OMOP CDM Extension

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Development of Medical Imaging Data Standardization for Imaging-Based Observational Research: OMOP Common Data Model Extension

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918 Accesses  Explore all metrics
Medical Imaging

- Advancement in equipment, data storage, artificial intelligence and machine learning further pushes greater use of medical images in clinical and research settings.

Figure 5.24. CT, MRI and PET exams, 2021 (or nearest year)

1. Data exclude privately funded exams. 2. Data exclude exams outside hospital. 3. Data include only exams outside hospital. 4. Data exclude exams on public patients.

PubMed results of “Medical Imaging Machine Learning”

(as of March 2024)
DICOM

DICOM is a ubiquitous international standard to transmit, store, retrieve, print, process and display medical imaging information.

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<th>Value</th>
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Study Aims

• Combine imaging data with clinical data in a standardized model
• Enable detailed phenotype definition with imaging features
• Expand OMOP CDM usage for imaging research
MI-CDM tables (a case study)

Person

Visit Occurrence

Procedure Occurrence

Image Occurrence

Image Feature

Measurement

Image’s DICOM attributes:
- modality, acquired dates, study UID,
- series UID, local path, DICOMweb URI,
- gross anatomic site

Image’s acquisition parameters and imaging findings:
- slice thickness, kVp, a solid nodule,
- specific anatomical site, algorithm information
Seamless Integration with OHDSI Tools

Welcome to ATLAS.
ATLAS is an open source application developed as a part of OHDSI intended to provide a unified interface to patient level data and analytics.

Documentation
The ATLAS user guide can be found here.

Getting Started
- Define a New Cohort
  - Begin performing research by defining the group of people you intend to study
- Search the Vocabulary
  - Search the different ontologies used to describe patient level data around the world

Release Notes
ATLAS Version 2.13.0 Release Notes
WebAPI Version 2.13.0 DEV Release Notes

This latest release contains 24 feature enhancements and issue resolutions:
- Cannot pick up a concept from vocabulary for some cohort attributes
- Cannot find a concept by its id or code
- Admin cannot assign protected tag to entity
- JobServiceIT test fails
- Hydra v0.3 update
- Azure Synapse Analytics Dedicated dialect support
- Snowflake dialect support
- Refresh user names during scheduled user import
- PHOEBE 2.0 Implementation for WebAPI
- Add description fields for all study asset types
- Support removal of non-description fields
Summary & Next steps

- OMOP CDM Medical Imaging extension creates a standardized multimodal dataset with clinical and imaging data to conduct outcome research.

Next steps

- Vocabulary integration of DICOM and RadLex (Radiology Lexicon) terminology to OMOP CDM vocabulary

- Reference implementation