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How effective is OMOP CDM Conversion for Claims Data?

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Abstract

While conducting the OMOP CDM conversion for claims data sources, there are certain key use cases which are not covered as some of the fields or metrics are missing in the CDM data model (especially the ones requiring claim plan or practitioner/ provider details). There is a need to identify such use cases and add fields, metrics or tables in the existing CDM data model that can help to implement use cases that were not supported earlier.

Introduction

Based on our experience of executing the OMOP conversion for claims data sources, we have observed that there is a significant loss of information and there are certain commercial use cases the OMOP is not able to support. The OMOP model can be modified to accommodate for the information loss and to cover missed use cases.

Information Loss

While conducting the conversion for claims data sources, some information is lost due to the force fitting of data into OMOP. Certain columns of claims data sources cannot be accommodated in OMOP, resulting in information loss. Mainly:

- OMOP does not capture Practitioner ID information
- OMOP does not store Physician ID
- OMOP does not have the ability to capture the Approval Status flag
- The Patient Activity Table in source data has information about all claims and retail claims, but OMOP cannot accommodate both claims in an Enrollment Table as there is no specific column to separate them
- A claim in the Procedure/Diagnosis Table can be MX or HX (medical or hospital); OMOP does not capture this information
- OMOP does not capture the information from Medicare Part D table, which includes the deductible date, copay date, etc. for a patient. These dates specify if Medicare patients are expected to pay any money out of their pockets (deductible fees)
- OMOP lacks information such as group number (key to track what the prescription was)
- OMOP does not capture the RX number (encrypted RX script number)
- OMOP cannot capture institutional claim details (admit type, source of admission, etc.)
- OMOP cannot capture COB (coordination of benefits) information
- A Payer Table accommodates payment information from medical claims; OMOP does not capture pharmacy claims information, as it is more granular and cannot be accommodated like the medical claims payer information

Key Use Cases OMOP CDM Data Model does not cover

Due to the above-mentioned information loss, there are certain key use cases that OMOP cannot support:

- Differentiating claims in CDM model, e.g., retail, MX/HX
- Capturing how many days in a year the patient spent in each phase, i.e., copay, deductible, gap or catastrophic
- Capturing plan details: OMOP has a generic Payer Plan Period Table because of which primary and secondary plan IDs cannot be differentiated, nor the payment paid by the secondary payer
- Relating a visit to the plan type
- Getting claim status: There are no columns to identify if a claim has been reversed, rejected or approved, information that is valuable in commercial applications
- Identifying drugs that are dispensed in pharmacy vs. mail order: There is no column that can help differentiate if a prescription was given over email or in a pharmacy, this information can be used to find the percentage of patients who use mail order as compared to pharmacy
- Capturing e-prescription numbers (e RX): Physicians punch an eRX number in their system; patients go to the pharmacy and share this number; the pharmacy is able to give patients their medication by referring to this number. A DRX flag can specify if a claim is generated through an e-prescription, which is not captured in OMOP
- Segregating different type of providers based on rendering, referring or billing

Suggestions to Update the Current Model

- Update the Provider Table to:
 - Add Practitioner and Physician IDs
 - Capture the type of provider, e.g., rendering, referring or billing
- Currently, claims information is captured in the Visit Occurrence Table; for each claim, a Visit ID is generated. To capture any claims-specific details, following updates should be made to the Visit Table:
 - Add a column to capture Approval Status flag, i.e., if a claim has been approved, rejected or reversed
 - Add a column to capture the type of claim — if it is an MX or HX claim
- Update Cost Tables to capture the number of days a patient spends in each phase: copay, deductible, gap, catastrophic, etc.
- Update the Drug, Procedure and Condition Tables to capture group number and e-prescription number
- Add columns to capture plan details in the Payer Plan Period to differentiate primary and secondary plan IDs and accommodate granular information from pharmacy claims
- Update the Drug Exposure Table to add a column to specify if the drug is dispensed via pharmacy or email

Conclusion

We have significant experience in implementing the OMOP CDM conversion for claims data sources and we are in the process of leveraging this experience to design an OMOP++ model that will result in minimal information loss and would cover a majority of business use case.