

A Study on Transformation and Utilization of Common Data Model for Data Analysis of CDA-Based External Referral Document

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Background

The proliferation of the health information exchange (HIE) system has led to an increasing number of standard clinical document architecture (CDA) based health record in practice, but has not been fully utilized in research. If an extensive number of outside CDA documents can be constructed into a common data model (CDM), various observational research by utilizing the CDA data may be possible. This study aimed at developing CDMtoCDM conversion rules and showing its feasibility in various data domains.

Methods

CDA document collection and parsing

- Collected a total of 21,580 CDA-based outside referral documents accumulated in the healthcare information exchange system of Seoul National University Bundang Hospital (SNUBH)
- Identified CDA version updates
- Developed CDA parsers for different versions of CDA documents

CDA to CDM

- Defined a conversion rule for mapping CDA elements/attributes to CDM tables
- Identified values that require manual code mapping
- Defined and created a SOURCE_TO_CONCEPT_MAP table
- Created the details of ETL to store the parsed CDA data into CDM tables
- Developed CDAtocDM conversion algorithm

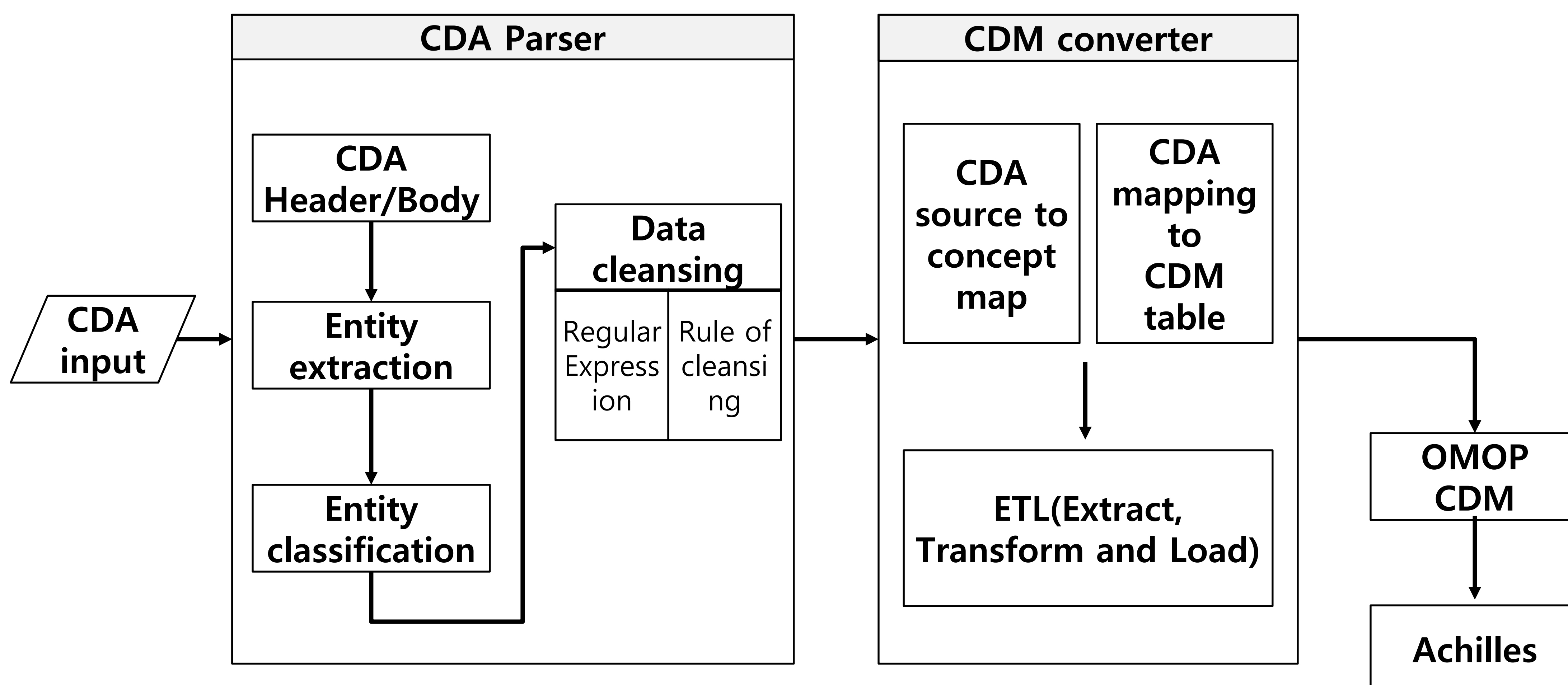


Figure 1. CDAtocDM conversion process

Results

- The total conversion rate of CDAtocDM was 97.7%
- Low mapping rate for measurement and procedure codes due to missing code and free text value
- Low conversion rate for measurements due to missing value of lab test results
- Validated CDAtocDM conversion with Achilles Heel
- Fixed Achilles heel errors to improve data quality and correct logical data error

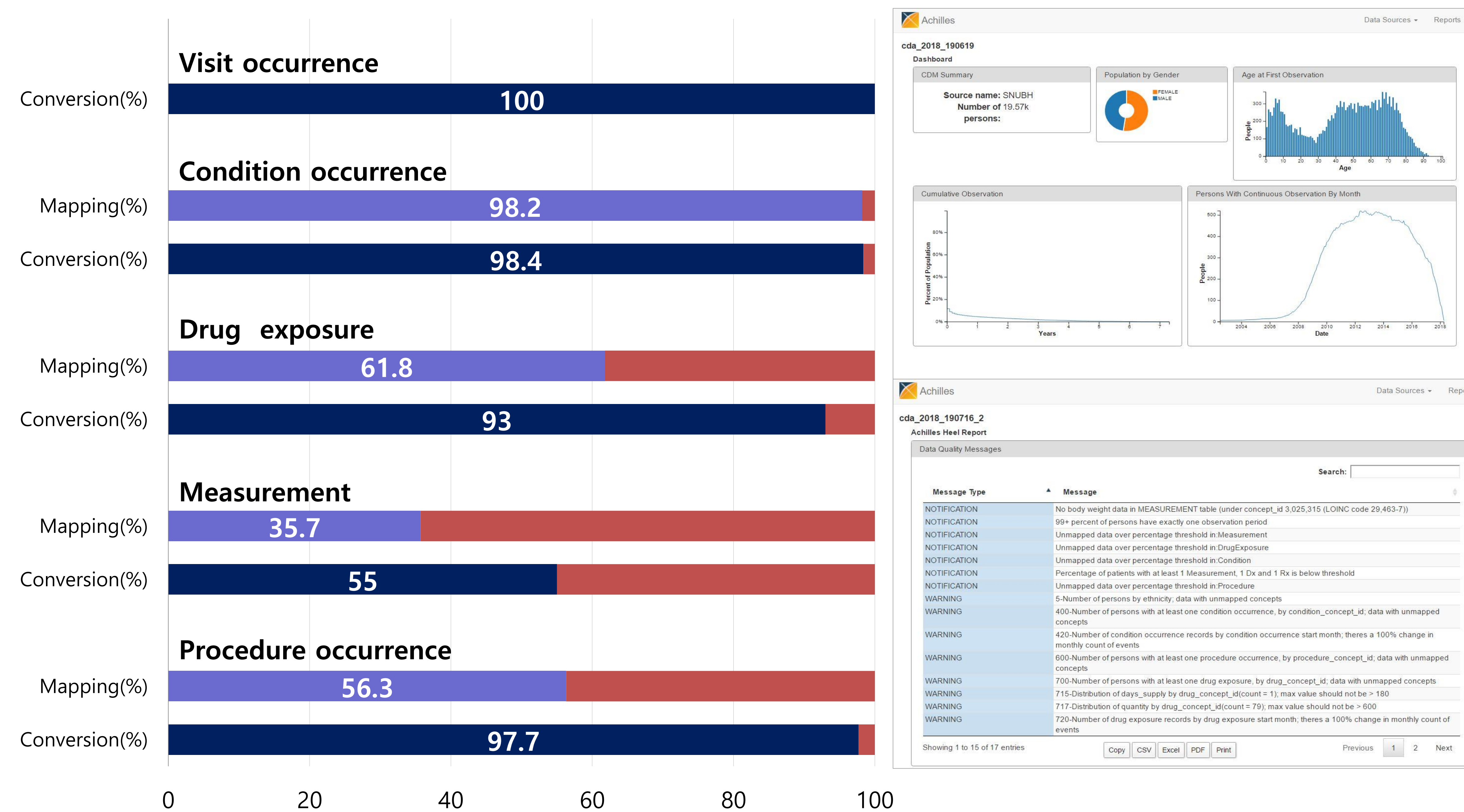


Figure 2. CDAtocDM results and the result of Achilles application

Conclusions

The present study showed a feasibility of CDAtocDM conversion to facilitate external CDA documents in observation health studies. The external documents have been found to have limitations in terminology standard mapping and data quality, requiring further studies on improving data quality.

Acknowledgement

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