

Enhancing Infectious Disease Data Integration and management through OMOP-CDM in South Korea

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Background

The Platform for Harmonizing and Accessing Data in Real-time on Infectious Disease Surveillance (PHAROS) was initiated to address challenges in data integration and management. PHAROS focuses on developing an integrated infectious disease data management system based on the OMOP-CDM in Korea, with the goal of enhancing real-time clinical information collection and improving treatment and disease management strategies.¹ To support this, data encompassing microbial test results, infectious disease consultation notes, vaccination-related information, emergency room data, and legal infectious disease reports, were utilized, aimed at improving accessibility and ensuring clear representation of information. The codes within infectious disease consultation notes, vaccination-related information, emergency room data, and legal infectious disease reports are newly mapped and integrated as CDM records. Moreover, to address challenge of identifying detailed culture information, we developed new Extract Transform Load (ETL) method that suits to specifically store data drawn from specimen culture. While this model maintains the relationship between microbial tests and drug resistance, it captures various aspects of culture information without requiring additional data tables, thus improving the comprehensiveness and utility of information from specimen culture.

Method

In this study, OMOP-CDM was utilized to include infection-related clinical data. We used CDM version 5.4 without any additional columns. Infectious disease department consultation notes are integrated into the CDM's Note domain using specific concept ids, with consultation request recorded in the observation table. Additionally, vaccination-related reports are thoroughly documented in the drug domain, with dose information recorded in the observation table for detailed tracking. Primary symptom information from the National Emergency Department Information System (NEDIS) system is integrated by mapping chief complaints to SNOMED-CT and inserting them into the condition table or the observation table if no suitable mapping exists. We also utilized patient travel history from legal communicable disease reports. Particularly, Microbial test results were stored across three tables: specimens were stored in the specimen table, cultured microorganisms and antibiotic susceptibility results were stored in the measurement table, and the type of microorganism identified were stored in the observation table. These tables were designed to be linked using connection keys, facilitating the proper extraction of necessary data for various purposes.

Result

A total of 560 codes for infection types, testing procedures, antimicrobial sensitivity, and travel history were mapped. Additionally, the National Emergency Department Information System (NEDIS) was mapped to include 1,114 codes for major symptoms and issues. A total of 2,226 codes were mapped for

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References

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