Agenda

• OHDSI News
• APAC Study Quarterly Updates Part I
  – Characterization of Health by OHDSI AP chapter to identify Temporal Effect of the Pandemic by Seng Chan You
  – Data quality of OHDSI APAC: CDM Inspection study by Chungsoo Kim
• 2022 OHDSI APAC Symposium Overview
Brief update

CHAPTER

Characterization of Health by OHDSI AP chapter to identify Temporal Effect of the Pandemic

Yonsei University College of Medicine, Korea

Seng Chan You

July 14th 2022
Presentation at OHDSI-Europe 2022

Characterization of Health by OHDSI Asia-Pacific chapter to identify Temporal Effect of the Pandemic for Diabetes Mellitus
CHAPTER-DM

PRESENTER: Seng Chan You

INTRO: Type 2 Diabetes Mellitus (T2DM) is important comorbidity among patients diagnosed with COVID-19 with high prevalence, which is also shown to increase the COVID-19 mortality risk and lead to worse severity.

By investigating the temporal change in the incidence of T2DM before and after the emergence of COVID-19, this study will provide insight on the impact of COVID-19 and reveal the resilience of healthcare system regarding T2DM across nations and times.

METHODS T2DM patient data from Australia LID and Japan claims converted to the Observational Medical Outcomes Partnership (OMOP) common data model (CDM) were adopted as our data source.

Cohort of T2DM are defined as ‘patients with new type 2 diabetes and no prior T2DM or secondary diagnosis’ according to the phenotype definition provided by the (OHDSI) community during the ‘Pneumonia’ initiative.

The trend of incidence of T2DM from 2010 to 2021 were described and compared before and under the COVID-19 pandemic using interrupted time series analysis.

The temporal effect of the pandemic may reveal the the pattern of identification and treatment given to patients with diabetes during the pandemic.

Potential temporal change in the diagnosis of Type 2 Diabetes Mellitus after COVID-19 pandemic occurrence in the Asia Pacific.

Comparison of the periods with and without COVID-19 pandemic exposure.

The counterfactual refers the predicted values had no COVID-19 occurrence, and the fitted values are estimated based on the Poisson regression model with adjusting time vector (trend).

The figures show there is a sharp decline in the incidence of T2DM in the Australia LID in 2020, whereas this trend is less evident in the Japan claims. There was no trend of T2DM incidence in 2021 in the Australia LID.

RESULTS In our preliminary result, we found the potential change in the incidence of T2DM after COVID-19 pandemic occurrence. The further investigation of CHAPTER-DM study group will more accurate and detailed information.
Characterization of Health by OHDSI Asia-Pacific chapter to identify Temporal Effect of the Pandemic for Cardiovascular Diseases (CHAPTER-CVDs)

PRESENTER: Seng Chan You

INTRO: As routinely-collected data emerges, a federated network study could provide a fuller picture of how healthcare system is resilient against the pandemic across the systems, regions, and countries.

The OHDSI Asian Pacific regional chapter has launched the Characterization of Health by OHDSI-Asia-Pacific chapter to identify Temporal Effect of the Pandemic (CHAPTER) study to describe the temporal change in incidence of diseases and healthcare pattern before and after the emergence of COVID-19.

Here, we describe the preliminary results for cardiovascular diseases (CVDs).

METHODS

The temporal change of CVDs including hypertension, acute myocardial infarction (AMI), and Heart failure (HF) from Australia LDP and Japan claims were assessed based on Observational Medical Outcomes Partnership (OMOP) common data model (CDM).

The digital phenotype definitions and the incidence rate were calculated by leveraging previous Phenotype Pedestrian project initiated by the OHDSI.

The interrupted time series analysis was used to describe the trend of incidence of three hypertension, AMI, and HF before and after the COVID-19 pandemic occurrence.

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2Yonsei Institute for Innovation in Digital Healthcare, Yonsei University, Seoul, South Korea
3Research Center for Big Data Healthcare, Yonsei University, Seoul, South Korea
4Center for Healthcare Quality, Yonsei University, Seoul, South Korea
5Yonsei University College of Medicine, Seoul, South Korea

Presentation at OHDSI-Europe 2022

Potential temporal change in the diagnosis of Cardiovascular Diseases after COVID-19 pandemic occurrence in the Asia Pacific.

The temporal difference of CVDs will provide insights on the impact of COVID-19 and resilience in each healthcare system during the pandemic. We are recruiting the data partner to join this study.

https://github.com/ohdsi-studies/CHAPTER

Comparison of the periods with and without COVID-19 pandemic exposure.

The counterfactual refers the predicted values had no COVID-19 occurrence, and the fitted values are estimated based on the Poisson regression model with adjusting time vector (month).

There is a sharp decline in the incidence of hypertension, AMI, and HF in the Australia LDP in 2020, whereas this trend is less evident in the Japan claims. There was rebound in incidence of cardiovascular diseases in 2021 in the Australia LDP.

RESULTS

In our preliminary result, we found the potential change in incidence of CVDs after COVID-19 pandemic occurrence. The further investigation of CHAPTER study group will provide more scientific relevant and detailed information across the OHDSI network. The temporal difference of CVDs will provide insights on the impact of COVID-19 and resilience in each healthcare system during the pandemic. We are recruiting the data partner to join this study.
• The HIRA announced that nationwide claim data (from 2018 to April 2022) for randomly sampled 20% Korean population will be available for COVID-19 research from July 2022.

• We are requesting access to this data for CHAPTER and HKU studies.
Plan

- The study package will be prepared by July
  - Chan is working on CohortIncidence to calculate 'monthly' incidence
- The results will be presented at OHDSI symposium at Bethesda
  - October 15th
Thank You
for your time
Data quality of OHDSI APAC: CDM Inspection study

2022-07-14
APAC community call

OHDSI APAC Study Team 4
What is this study for?
- Collecting CDM Inspection reports from APAC community

Why this study is needed?
- To check the current status of CDMs, get insights from the CDMs, and improve their data quality

What is the final goal?
- Disclosure of current status of conversion, contents, and data distribution of CDMs of the OHDSI APAC community.
- To provide the basic statistics which can be used as references for future CDM conversion
Background

Implement ETL
OMOP CDM

DQ assessment
- Achilles Heels
- DQD

Pass DQ tests

No

Configure OMOP CDM in local infrastructure

Yes

Execute network research

Local infrastructure
R Studio
ATLAS

CDM Inspection report by EHDEN

Milestone for data partners
Four check levels
- Data Table counts
- Vocabulary mapping
- Performance
- Infrastructure

Figure is recreated from Maxim Moinat slides
(21/11/10, at OHDSI community call)
Study package

- Data sources: CDM databases from OHDSI APAC community
- Collecting inspection reports from each site.
- R package for automatically creating inspection reports.

- Collectibles
  - Number of record, person
  - Number of unique concepts per person
  - Source-CDM mapping ratio
  - Proportion of standard concepts in mapped codes
  - Drug mapping level (granularity)
  - Frequent concept list in each domain
  - Achilles heel result (error / notification / warnings)
  - Sample cohort generation
Study participants

China
• 1 EHR (Wonders group)

South Korea
• 20 EHRs (OHDSI Korea)
• 1 Claims

Japan
• 2 Claims (IQVIA, JNJ)

Australia
• 4 EHRs (1 JnJ, 3 OHDSI Australia)

Singapore
• 2 EHRs (OHDSI Singapore)

China
• 1 EHR (Wonders group)

South Korea
• 20 EHRs (OHDSI Korea)
• 1 Claims

Japan
• 2 Claims (IQVIA, JNJ)

Australia
• 4 EHRs (1 JnJ, 3 OHDSI Australia)

Singapore
• 2 EHRs (OHDSI Singapore)

5 Regions
27 EHRs
3 Claims

— Planned
— Done
## Preliminary results

### Collected reports

<table>
<thead>
<tr>
<th>Sites, n (%)</th>
<th>25 (100.0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>1 (4.0)</td>
</tr>
<tr>
<td>China</td>
<td>1 (4.0)</td>
</tr>
<tr>
<td>Japan</td>
<td>2 (8.0)</td>
</tr>
<tr>
<td>Korea</td>
<td>21 (84.0)</td>
</tr>
</tbody>
</table>

### Regions, n (%)

<table>
<thead>
<tr>
<th>Data type, n (%)</th>
<th>23 (92.0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Claims</td>
<td>2 (8.0)</td>
</tr>
<tr>
<td>- EMRs</td>
<td></td>
</tr>
</tbody>
</table>

### Data type, n (%)

<table>
<thead>
<tr>
<th>CDM version, n (%)</th>
<th>25 (100.0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- 5.3</td>
<td></td>
</tr>
</tbody>
</table>

### Total Records = 36,096,359,491

- condition_occurrence: 6%
- procedure_occurrence: 16%
- measurement: 29%
- drug_exposure: 11%
- cost: 21%
- Total Records: 36,096,359,491

- care_site
- condition_era
- condition_occurrence
- cost
- death
- device_exposure
- dose_era
- drug_era
- drug_exposure
- location
- measurement
- note
- observation
- observation_period
- payer_plan_period
Preliminary results

What happened? Unique characteristics or wrong ETL?

<table>
<thead>
<tr>
<th>Sites (n = 25)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Data periods (year), Mean ± SD</td>
<td>14.6 ± 8.5</td>
</tr>
<tr>
<td>N of person</td>
<td></td>
</tr>
<tr>
<td>- Sum</td>
<td>49,154,664</td>
</tr>
<tr>
<td>- Mean</td>
<td>2,040,788</td>
</tr>
<tr>
<td>- Median</td>
<td>1,102,630</td>
</tr>
<tr>
<td>N of Records</td>
<td></td>
</tr>
<tr>
<td>- Sum</td>
<td>36,096,359,491</td>
</tr>
<tr>
<td>- Mean</td>
<td>1,516,463,775</td>
</tr>
<tr>
<td>- Median</td>
<td>547,422,589</td>
</tr>
</tbody>
</table>

Figure 2. Records proportion between domains in each database
Each institution has a different ratio of the number of records for each domain. If a specific domain is abnormally high, a quality check process could be required.
Preliminary results

Figure 3. Distribution of the records to person ratio in each domain. The records to person ratio has a specific distribution for each domain. A quality check could be needed if you have outliers compared to other databases.
Preliminary results

Drug mapping

<table>
<thead>
<tr>
<th>Class</th>
<th>Branded Drug</th>
<th>Clinical Drug</th>
<th>Quant Branded Drug</th>
<th>Marketed Product</th>
<th>Quant Clinical Drug</th>
<th>Ingredient</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>25.2</td>
<td>19.3</td>
<td>14.0</td>
<td>13.2</td>
<td>8.3</td>
<td>4.7</td>
</tr>
</tbody>
</table>

Among total drug records (n = 3,862,925,161), most of the records are mapped to the RxNorm class containing a brand name of the drug ("Branded Drug", "Quant Branded Drug", "Market Product").

Data quality (n of sites = 17)

<table>
<thead>
<tr>
<th>Achilles Heel</th>
<th>Error</th>
<th>Warning</th>
<th>Nofitication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean ± SD</td>
<td>6.5 ± 7.9</td>
<td>7.2 ± 2.8</td>
<td>18.2 ± 5.7</td>
</tr>
<tr>
<td>Median</td>
<td>2.0</td>
<td>8.0</td>
<td>20.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Error</th>
<th>N of Sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>• ERROR: 103 - Distribution of age at first observation period; min value should not be negative</td>
<td>6</td>
</tr>
<tr>
<td>• ERROR: 600-Number of persons with at least one procedure occurrence, by procedure_concept_id; n concepts in data are not in correct vocabulary</td>
<td>6</td>
</tr>
</tbody>
</table>
Preliminary results
Thank you

Chungsoo Kim

ted9219@ajou.ac.kr
2022 OHDSI APAC Symposium
Overview

November 12-13, 2022
Hosted in Taiwan by Taipei Medical University
### Agenda

**• Day 1 (November 12) – Tutorials**

– Call for participation: additional tutors and TAs needed!

<table>
<thead>
<tr>
<th>Time</th>
<th>Schedule</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:30 – 09:00</td>
<td>Registration</td>
<td></td>
</tr>
<tr>
<td>09:00 – 12:00</td>
<td>OHDSI Intro – CDM &amp; Vocab</td>
<td>Christian + APAC</td>
</tr>
<tr>
<td>12:00 – 13:00</td>
<td>Lunch &amp; Poster Session</td>
<td></td>
</tr>
<tr>
<td>13:00 – 17:00</td>
<td>ETL &amp; DQ.</td>
<td>Phenotype Development</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ETL – Mui + APAC</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Phenotype – Patrick &amp; Marc</td>
</tr>
</tbody>
</table>
# Agenda

## Day 2 (November 13) – Conference

<table>
<thead>
<tr>
<th>Time</th>
<th>Schedule</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:00 – 08:30</td>
<td>Registration &amp; Light Breakfast</td>
<td></td>
</tr>
<tr>
<td>08:30 – 09:00</td>
<td>Taiwan and TMU Opening Remarks</td>
<td></td>
</tr>
<tr>
<td>09:00 – 09:20</td>
<td>OHDSI Opening Remarks</td>
<td>George Hripsack</td>
</tr>
<tr>
<td>09:20 – 09:40</td>
<td>Group Photo</td>
<td></td>
</tr>
<tr>
<td>09:40 – 10:00</td>
<td>Keynote – OHDSI Global Presentation</td>
<td>Patrick Ryan</td>
</tr>
<tr>
<td>10:00 – 10:20</td>
<td>OHDSI APAC Intro</td>
<td>Mui Van Zandt</td>
</tr>
<tr>
<td>10:20 – 10:30</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>10:30 – 11:30</td>
<td>Researches in OHDSI APAC</td>
<td>Study Leaders</td>
</tr>
<tr>
<td>11:30 – 11:45</td>
<td>Researches using Taiwan National Data</td>
<td></td>
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<tr>
<td>11:45 – 12:00</td>
<td>Researches using TMUCRD Data</td>
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<tr>
<td>12:00 – 13:00</td>
<td>Lunch &amp; Poster Session</td>
<td></td>
</tr>
<tr>
<td>13:00 – 14:00</td>
<td>Panel – Standardization &amp; Common Data Models</td>
<td>Christian Reich &amp; others from APAC</td>
</tr>
<tr>
<td>14:00 – 15:00</td>
<td>APAC Regional Adaption to Standardization</td>
<td>Chapter Leaders including potentially Thailand &amp; India</td>
</tr>
<tr>
<td>15:00 – 16:15</td>
<td>Poster and Networking Session</td>
<td></td>
</tr>
<tr>
<td>16:15 – 17:00</td>
<td>Closing Remarks</td>
<td></td>
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Registration

• Fees

<table>
<thead>
<tr>
<th>Registration Types</th>
<th>In-person registration fees</th>
<th>Online registration fees</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Early bird (by Oct. 6)</td>
<td>Regular (by Nov. 6)</td>
</tr>
<tr>
<td>Tutorial Workshop (Nov. 12)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic / Government</td>
<td>$70</td>
<td>$80</td>
</tr>
<tr>
<td>Industry / Corporate</td>
<td>$170</td>
<td>$180</td>
</tr>
<tr>
<td>Student / Trainee</td>
<td>$30</td>
<td>$50</td>
</tr>
<tr>
<td>Main Symposium (Nov. 13)</td>
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<td></td>
</tr>
<tr>
<td>Academic / Government</td>
<td>$100</td>
<td>$120</td>
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<tr>
<td>Industry / Corporate</td>
<td>$200</td>
<td>$220</td>
</tr>
<tr>
<td>Student / Trainee</td>
<td>$50</td>
<td>$70</td>
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</table>

• Symposium page under preparation, including links for registration and poster submissions!