OHDSI Korea Chapter
2022

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Available CDM sources from hospitals across Korea

- As of November 2022, 60 databases have been converted into OMOP CDM (3 administrative claim data, 57 hospitals)
- 73M patients with duplication from hospitals (Korea population: 51M)

No.	기관명	진행 현황	No.	기관명	진행 현황	No.	기관명	진행 현황
1	건강보험심사평가원	56,579,726	21	고려대학교 안산병원	1,387,837	41	순천향대학교 천안병원	887,228
2	건강보험심사평가원 (샘플코호트)	9,822,577	22	고려대학교 안암병원	1,891,753	42	아주대학교병원	2,714,449
3	국민건강보험공단	55,651,898	23	국립암센터	103,573	43	연세대세브란스병원	3,605,088
4	가천길병원	1,566,877	24	국민건강보험공단 일산병원	1,367,483	44	연세원주세브란스병원	781,671
5	가톨릭대 서울성모병원	3,212,915	25	국제성모병원	403,989	45	용인세브란스병원	291,349
6	가톨릭대 여의도성모병원	2,279,292	26	단국대학교병원	1,104,309	46	울산대학교병원	400,609
7	가톨릭대 의정부성모병원	961,029	27	대구가톨릭대학교병원	1,688,980	47	원광대학교병원	818,503
8	가톨릭대 성빈센트병원	1,102,630	28	동국대학교 일산병원	695,280	48	이화여자대학교목동병원	1,992,163
9	강남세브란스병원	1,661,794	29	명지병원	880,392	49	이화여자대학교 서울병원	
10	강동경희대학교병원	736,140	30	부산대학교병원	791,935	50	인천세종병원	143,638
11	강동성심병원	1,101,850	31	분당서울대학교병원	2,006,000	51	인하대학교병원	1,978,186
12	강북삼성병원	1,331,694	32	분당차병원	2,363,386	52	전남대학교병원	1,982,117
13	강릉아산병원	915,776	33	삼성서울병원	3,575,923	53	전북대학교병원	1,466,713
14	강원대학교병원	542,934	34	서울대학교병원	3,240,850	54	제천명지병원	219,574
15	건국대학교병원	1,063,104	35	서울아산병원	4,896,016	55	창원경상국립대병원	279,403
16	건양대학교병원	555,005	36	세종부천병원	368,603	56	충남대학교병원	645,922
17	경북대학교병원	1,324,716	37	세종충남대학교병원	94,562	57	칠곡경북대학교병원	510,182
18	경상국립대학교병원	618,872	38	순천향대학교 구미병원	737,448	58	한국원자력의학원	487,965
19	경희의료원	2,101,456	39	순천향대학교 부천병원	940,767	59	한양대학교병원	1,783,111
20	고려대학교 구로병원	2,106,320	40	순천향대학교 서울병원	1,221,073	60	화순전남대학교병원	434,688

KCD7 and EDI have been incorporated into OMOP Vocabulary

Acute myocardial infarction

DETAILS

Domain ID	Condition
Concept Class ID	KCD7 code
Vocabulary ID	KCD7
Concept ID	42488360
Concept code	I21
Validity	Valid
Concept	Non-standard
Synonyms	급성 심근경색증
Valid start	01-Jul-2017
Valid end	31-Dec-2099

TERM CONNECTIONS (7)

RELATIONSHIP	RELATES TO	CONCEPT ID	VOCABULARY
Non-standard to Standard map (OMOP)	Acute myocardial infarction	312327	SNOMED
Subsumes	Acute myocardial infarction, unspecified	42488366	KCD7
	Acute subendocardial myocardial infarction	42488365	KCD7
	Acute transmural myocardial infarction of anterior wall	42488361	KCD7
	Acute transmural myocardial infarction of inferior wall	42488362	KCD7
	Acute transmural myocardial infarction of other sites	42488363	KCD7
	Acute transmural myocardial infarction of unspecified site	42488364	KCD7

KCD7 and EDI have been incorporated into OMOP Vocabulary

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Criteria		Explanation	EDI vocabulary	EDI in OMOP vocabulary
Uniqueness and exclusivity of the concept	Concept orientation	A concept must be linked with only one term	△	○
	Non-semantic concept identifiers	There must be a unique code representing a concept	×	○
	Coverage	The domain covered by the terminology system must be consistent and obvious	○	○
	Synonyms uniquely identified and mapped to relevant concepts	Synonyms, including abbreviations, are managed by unique identifiers, and related concepts are mapped	×	○
Hierarchies and relationships between concepts	Relation	The relation of each concept should be defined	×	○
	Multiple hierarchy	A concept can have multiple hierarchies	×	△
	Formal definition	Having a structure and definition that can be indexed and processed by computer	×	○
	Compositionality	Terms can be separated into atomic units and have compositional extensibility	×	×
Management system for vocabulary	Concept permanence	Even if the used term is updated, the previously used term should not be deleted	×	○
	Version control	When terminology is updated, version information, including changes, must be specified	×	○
	Multi-language	The terminology system supports multiple languages	△	○

EDI: Electronic Data Interchange, OMOP: Observational Medical Outcomes Partnership.

Perspective and Appraisal from OECD

Towards an Integrated Health Information System in Korea

Twenty-first-century health systems will be built around data and information. An integrated health information system enables the secure flow of data to where they can be used to create information and knowledge to advance policy and health system objectives. This report describes the requirem...

More

13 May 2022 | 129 pages | English

https://doi.org/10.1787/c4e6c88d-en | 9789264627987 (EPUB) | 9789264936386 (HTML) | 9789264828667 (PDF)

Author(s): OECD

Perspective and Appraisal from OECD

A committed research community and a common data model (CDM)

The number of analysts accessing health care datasets in research data centres or via remote data access services varies by dataset in many countries. The highest number of annual external data users in the 2020-21 OECD survey were reported by Korea and France. In Korea, the number of external analysts for the health sector is reported to be around 3 000 a year (1 500 through NHIS and 1 500 through HIRA).

A pleasing result of the dedicated researchers is the implementation of a common data model (CDM) across the country's health data. While Korean hospitals use different EMR systems and data formats, the EMR data of approximately 40 large hospitals have been mapped to the global Observational Medical Outcomes Partnership (OMOP) CDM by a group of dedicated academic researchers.

These hospitals are participating in the global Observational Health Data Science and Informatics (OHDSI) project where participating organisations are part of a federated network with a "privacy-by-design" approach where data remain at all times in the custody of the organisations holding them and network researchers submit queries and programs (distributed analytics) without accessing or visualising the personal data records. Code is shared through GitHub, supporting interoperability of data analytics as well as of data. Researchers can access only the data schema (structure and variables) to prepare statistical programmes (coding) or submit queries through a tool (ATLAS).

HIRA has also mapped much of its claims data to this model, creating the foundation of a rich and valuable data asset for health and medical research. HIRA coded linked health data to the OMOP CDM, including HIRA's national insurance claims data, for the purposes of encouraging secure access to timely data for global COVID-19 research as part of the OHDSI project. The project opened data for a large group of domestic and international researchers to collaborate on COVID-19 research while protecting data privacy and security within HIRA. Further, the Public Institutional Bioethics Review Board (IRB) of Korea's National Institute for Bioethics Policy supported the timeliness of this international research by deciding to exempt this COVID-19 research from IRB review.

Korea is among 17 OECD countries that have adopted or are considering the adoption of this standard which supports interoperability and mobile app development. Work is under way between HL7 FHIR and OHDSI to integrate the OMOP CDM into HL7 FHIR, which would perfectly position Korea for global research given Korea's investments in OMOP CDM.

Perceived Risk of Re-identification in OMOP CDM among Korean Experts on OMOP CDM

- Overall, CDM users generally attributed high reliability for privacy protection to the intrinsic nature of CDM.

- There was little demand for additional de-identification methods
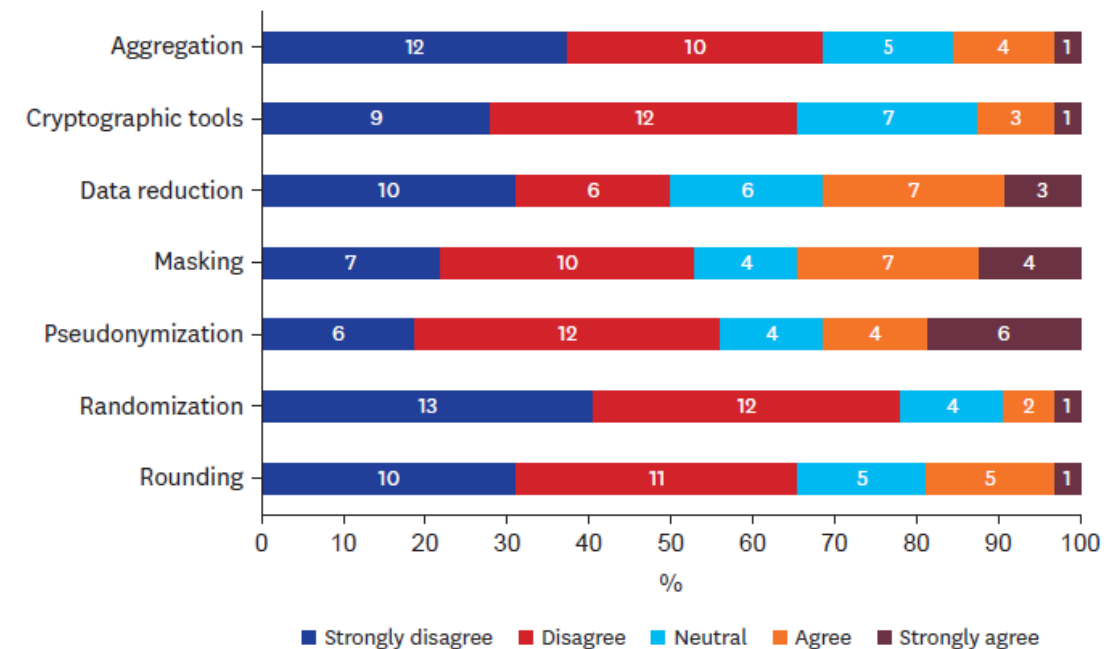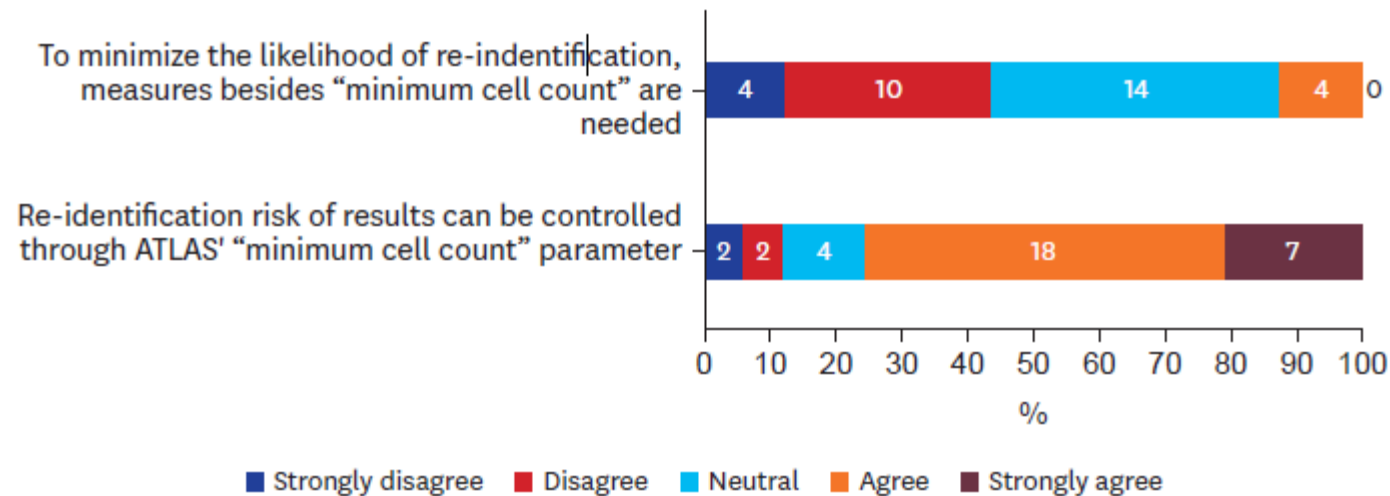
Analyses using FEEDER-NET

- FEEDER-NET is data platform for OMOP-CDM in Korea
- From March 2019 to November 2022, 18,307 analyses were conducted in the FEEDER-NET.
- From June 2020, 400 analyses have been conducted daily
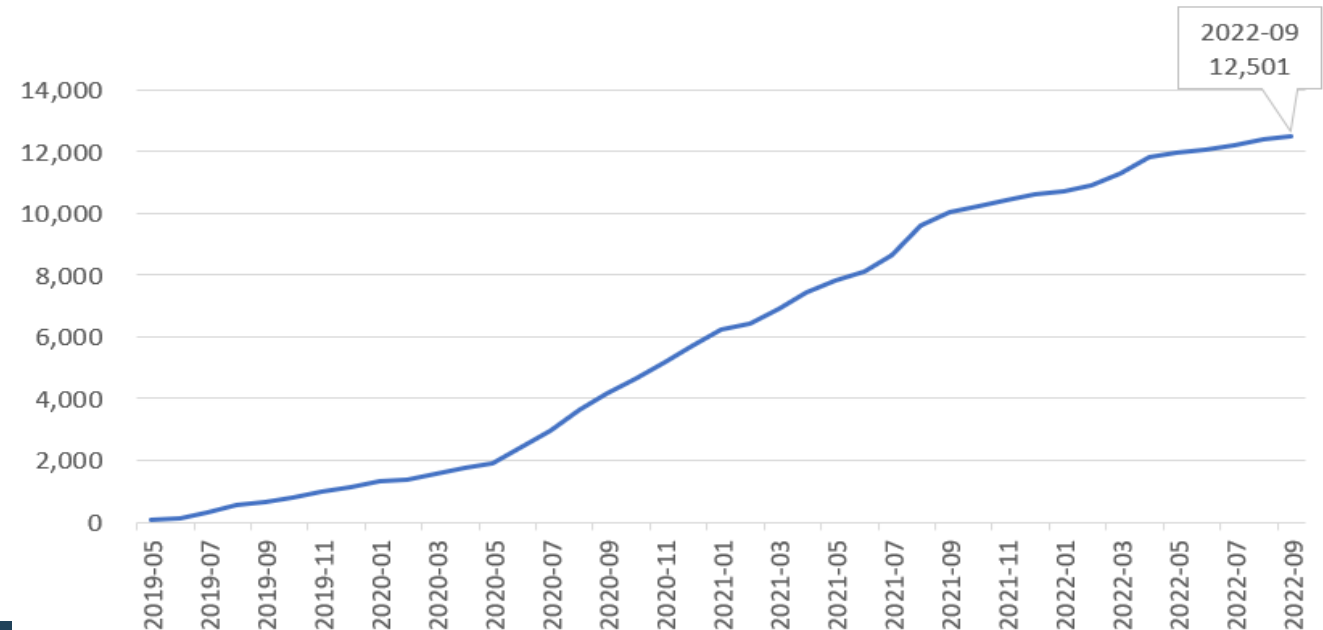
Research border-Free Zone, RFZ

- Hospitals participating the CDM RFZ apply the same policy for internal researchers to external researchers within the RFZ.
  CDM기반 연구망 사용시, 원내 연구자에게 허용하는 동등한 수준의 CDM 연구권한을 연구자유지대(RFZ) 협정에 참여하는 다른 기관 연구원에게도 부여한다.

- In a case when an IRB approval or exemption is required, the hospitals within the RFZ will accept the IRB approval or exemption which the lead investigator received from their institution.
  CDM을 이용한 연구 중에서 IRB 승인·심의 면제가 필요한 경우, 주 연구책임자가 본인 소속 기관에서 IRB 승인·심의 면제를 득하였다면 협약기관은 이를 인정하기로 한다.

FEEDER-NET on RFZ

- Limitless access to ATLAS across the institutions on RFZ

Research Border Free Zone (RFZ)

- ## As of November 2022, 18 Korean hospitals have joined RFZ

Cardiovascular Diabetology

RESEARCH   **Open Access**

Impact of pitavastatin on new-onset diabetes mellitus compared to atorvastatin and rosuvastatin: a distributed network analysis of 10 real-world databases

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Abstract

Background: Statin treatment increases the risk of new-onset diabetes mellitus (NODM); however, data directly comparing the risk of NODM among individual statins is limited. We compared the risk of NODM between patients using pitavastatin and atorvastatin or rosuvastatin using reliable, large-scale data.

Methods: Data of electronic health records from ten hospitals converted to the Observational Medical Outcomes Partnership Common Data Model (n = 14,605,368 patients) were used to identify new users of pitavastatin, atorvastatin, or rosuvastatin (atorvastatin + rosuvastatin) for ≥ 180 days without a previous history of diabetes or HbA1c level ≥ 5.7%. We conducted a cohort study using Cox regression analysis to examine the hazard ratio (HR) of NODM after propensity score matching (PSM) and then performed an aggregate meta-analysis of the HR.

Results: After 1:2 PSM, 10,238 new pitavastatin users (15,998 person-years of follow-up) and 18,605 atorvastatin + rosuvastatin users (33,477 person-years of follow-up) were pooled from 10 databases. The meta-analysis of the HRs demonstrated that pitavastatin resulted in a significantly reduced risk of NODM than atorvastatin + rosuvastatin (HR 0.72; 95% CI 0.59–0.87). In sub-analysis, pitavastatin was associated with a lower risk of NODM than atorvastatin or rosuvastatin after 1:1 PSM (HR 0.69; CI 0.54–0.88 and HR 0.74; CI 0.55–0.99, respectively). A consistently low risk of NODM in pitavastatin users was observed when compared with low-to-moderate-intensity atorvastatin + rosuvastatin users (HR 0.78; CI 0.62–0.98).

Conclusions: In this retrospective, multicenter active-comparator, new-user, cohort study, pitavastatin reduced the risk of NODM compared with atorvastatin or rosuvastatin.

Keywords: Diabetes mellitus, Pitavastatin, Statin, Common data model

Ethics approval and consent to participate

This study was approved by the Institutional Review Board (IRB) of Kangdong Sacred Hospital (IRB number 2019-03-008) and Ewha Womans University Mokdong Hospital (IRB number 2020-09-026). The IRB waived written informed consent and approved this study. The other eight hospitals are affiliated with the Research Border Free Zone of Korea CDM data network, which recognizes IRB approval of the research organizing center and waives the need for individual IRB approval. This study complied with the principles of the Declaration of Helsinki.

From the recent publication of OHDSI Korea using 10 hospitals data, RFZ was noted, which eliminates overlapping effort for IRB approval.

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