WEBINAR

FHIR x OMOP

How will OMOP CDM & OHDSI tools, and FHIR fit into the EHDS architecture?

OHDSI BELGIUM

Monday 16 March 2026

Report

Content

Introduction

The “FHIR x OMOP” webinar, held on 16 March 2026 via Google Meet, was organised under the umbrella of OHDSI Belgium. The primary objective was to explore the coexistence and complementary roles of two major healthcare data standards – FHIR (Fast Healthcare Interoperability Resources) and OMOP CDM (Observational Medical Outcomes Partnership Common Data Model) – and to understand how Belgium and the European Health Data Space (EHDS) are navigating their integration.

The webinar was a direct follow-up to the OHDSI EU Symposium 2025, where a closing panel debate generated a rich audience poll. The top-voted themes – including EHDS interoperability, data governance, and practical implementation realities – set the agenda for this community session. It also built on the full-day “FHIR x OMOP” workshop organised by OHDSI Belgium in September 2024 (Comet, Brussels), supported by InterSystems and Tiro.Health.

Three speakers—Nick Marly, Thierry Klein MD, and Fadi Glor—presented distinct stakeholder perspectives, followed by an open discussion. The “any other business” segment was brief. Special thanks to all speakers for their valuable contributions.

You can relive the webinar watching this link and consult the presented slide deck here.

> 100 health data enthusiasts attended this webinar live - #DataSavesLives

Key insights & takeaways

FHIR and OMOP CDM are complementary, not competing

- **FHIR**: is optimized for real-time data exchange and primary use, enabling interoperability across EHR systems, mobile apps, and health IT solutions.
- **OMOP CDM**: provides a standardized framework for storing and analyzing observational health data, supporting large-scale research and cross-institutional collaboration.

Belgium has made **clear policy** choices: FHIR + SNOMED CT for primary use, OMOP for secondary use – backed by legislation, incentives, and public investment.

The EHDS represents a paradigm shift

- It is no longer the data holder alone who decides who can access data for secondary use – an independent Health Data Access Body (HDAB) grants access based on a legal basis.
- Key deadlines: first priority data for primary use exchange by 2029; minimal data sets for secondary use from 2031.
- Citizens can opt out by purpose category (not by data), with limited exceptions for genomics and wellness apps.

Hospitals face real implementation challenges

- 70–85% of EHR data is unstructured free text – AI-assisted structuring (LLMs, NLP) is the only realistic path to FHIR and OMOP compliance at scale.
- Many EHR vendors are not yet ready with FHIR APIs or SNOMED CT bindings, especially for smaller hospitals.
- Information is lost in a naive FHIR → OMOP mapping: SNOMED CT Templates offer a 'write once, export anywhere' framework that preserves clinical richness for both use cases.
- Time is quality for clinicians – every additional data-entry burden reduces both clinician buy-in and data quality.

Industry's role: abstract the complexity

- Hospitals should focus on becoming FHIR-ready (already required by Belgian legislation); industry handles the FHIR → OMOP conversion.
- A 'Trunk Architecture' – one central FHIR repository feeding all downstream uses – is the antidote to fragmented, hard-to-maintain bespoke connections.
- A no-code, automated FHIR-to-OMOP pipeline (now available on AWS Marketplace and supported by OHDSI HADES) significantly lowers the barrier for hospitals.

The Belgian OMOP ecosystem is converging

- Existing networks (SPECTRA in Brussels, INAH in Wallonia, MOVE in Liège, and FHIN and Levilo in Flanders) are technically aligned and discussions to converge into a single federated network are ongoing.
- Future FOD Data Capabilities and Innovation calls will provide financial sustainability; pharma co-funding is being explored, without granting privileged data access.

Background - Understanding FHIR and OMOP CDM

Introduction to FHIR

FHIR is a standard developed by Health Level Seven International (HL7) to enable the **exchange and integration** of healthcare data across diverse systems. It organizes data into modular "resources" (Patient, Observation, Medication, Procedure, etc.), each with a standardized structure. FHIR supports real-time data exchange via REST APIs and is widely adopted globally due to its compatibility with modern web technologies.

In Belgium, FHIR is the mandated standard for primary use within the BIHR ecosystem, underpinned by SNOMED CT coding and national Care Sets (aligned with the EHDS priority datasets: International Patient Summary, electronic prescriptions/dispensations, and discharge letters).

Introduction to OMOP CDM

OMOP CDM is a standardized framework developed by the OHDSI community to **support observational healthcare research**. Unlike FHIR, which focuses on real-time data exchange, OMOP CDM emphazises data standardization for research – organizing health data into a relational database schema with standardized vocabularies (SNOMED CT, ICD-10, RxNorm, LOINC, CVX, and more) and supporting federated, decentralized research models.

OMOP is widely adopted by over 4,000 organizations in 80 countries and is the chosen secondary-use standard for Belgium's EHDS implementation, linked to EHDEN and the DARWIN EU® real-world evidence ecosystem.

Comparative overview of FHIR and OMOP CDM

FHIR is optimized for clinical interoperability and real-time data exchange. OMOP CDM provides a standardized format for observational research data, excelling in long-term data storage and cross-institutional collaboration. A key distinction worth highlighting:

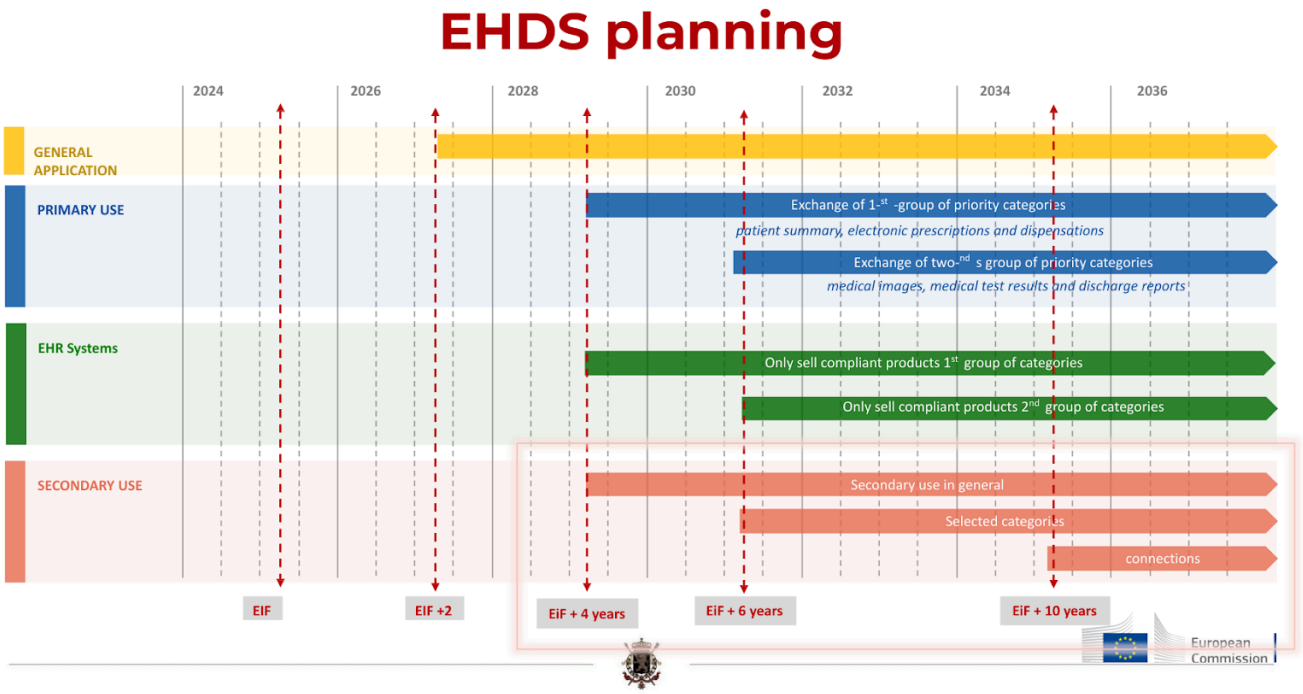
	FHIR	OMOP CDM
Scope	Real-time data exchange between systems	Organising observational health data for large-scale research
Use case	Data exchange through APIs	Data storage for federated research
Terminology	Set of code systems (SNOMED CT, LOINC, custom...)	Meta code system – OHDSI standardised vocabularies
Interoperability	Exchange of FHIR resources themselves	Sharing queries with other analysts instead of the data
Format	Resources in XML & JSON	Tables in a relational database schema

Three perspectives on FHIR x OMOP in Belgium

Policy makers' perspective - Nick Marly, *Advisor Cabinet Minister of Public Health & Social Affairs Vandenbroucke*

Nick Marly opened with a clear-eyed overview of **Belgium's position within the EHDS legal framework**. The regulation entered into force in early 2025 after approval by the European Parliament, and it represents a genuine paradigm shift in how health data will be made available and accessed.

For primary use, the first priority data categories – the International Patient Summary, electronic prescriptions and dispensations – must be exchangeable from 2029. For secondary use, the EHDS provides a legal basis for data access from 2029, with the first minimal data sets available from 2031. Citizens can opt out by purpose category (*not by data type*), with narrow exceptions for genomics and wellness apps.



EHDS implementation planning timeline (source: European Commission)

Belgium's eHealth ecosystem is already largely aligned (~95%) with EHDS principles. The BIHR architecture – built around FHIR, SNOMED CT Care Sets, and a Hub/MetaHub data-sharing network spanning 141 hospital vaults, 117 laboratory vaults, and three regional health vaults – provides a strong foundation. The eHealth Platform serves as Belgium's coordinating Digital Health Authority.

Belgium has invested significantly: €20M in Data Capabilities grants (2023–24) and €20M in Innovation grants (2024–25), with continued FOD/BMUC funding planned. Notable projects include DPI4INAH, QualiFHIR, and Shift (data capabilities), and Sepsis detection, Intake, and Readable Discharge Letter (innovation). On the secondary-use side, **Belgium has explicitly chosen OMOP**, citing its strong global community, the OMOP CDM model, available FHIR-to-OMOP engines, and its linkage to EHDEN and the DARWIN EU® real-world evidence ecosystem.

Three perspectives on FHIR x OMOP in Belgium

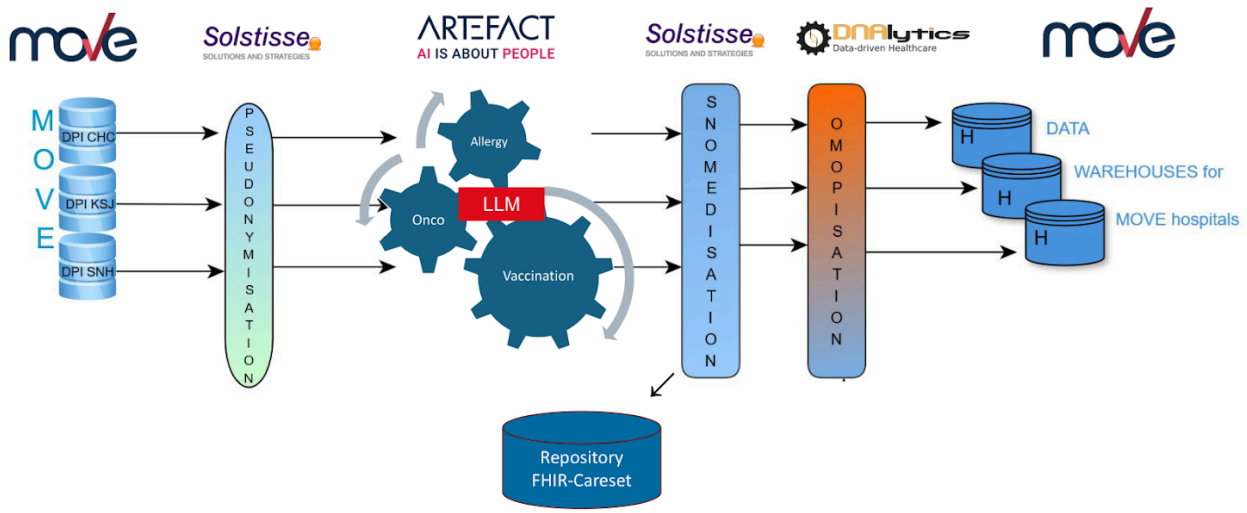
To drive **adoption**, Belgium is **adjusting its financing model**: an adjusted premium system focused on data registration, sharing and consultation; hospital lump-sum financing tied to SNOMED CT-based DRGs; and a "what's in it for me" value proposition through dashboards, clinical decision support, and knowledge tools fed back to care providers.

Hospitals' perspective - Thierry Klein MD, *CHR Haute Senne Hospital (MOVE Network)*

Thierry Klein brought a **hands-on perspective from the MOVE hospital network**, a large multi-site group in Wallonia. His presentation centred on the DPI4INAH project – a Data Capabilities-funded initiative tackling a fundamental problem: 70–85% of EHR data is unstructured (free-text clinical notes and narrative reports), severely limiting interoperability and reuse.

The project processed 8.7 million clinical documents to extract and standardise data on allergies (174,881 observations, 332 allergens, 38,253 patients), vaccinations (6,731 observations, 18 vaccine types), and oncology (140,442 observations, 35 cancer types, 28,004 patients). The pipeline uses LLMs for entity extraction, SNOMED CT coding via a purpose-built 'Transmit' tool, and then maps to OMOP for each MOVE hospital's data warehouse.

How does it work ? Unstructured Data ⟶ OMOP & FHIR



DPI4INAH pipeline: from unstructured hospital data to OMOP & FHIR (source: Thierry Klein / MOVE Network)

A key finding was that a **naive FHIR → OMOP mapping loses clinically important information** – for allergies alone, fields such as clinical status, reaction severity, exposure route, allergy category, and the recorder/encounter context are either lost or only partially preserved. The team's response was a multipurpose framework based on SNOMED CT Templates: a single richly coded record that can export to both FHIR (primary use) and OMOP (secondary use) without information loss. This approach has been submitted as an abstract for the OHDSI European Symposium 2026 in Rotterdam.

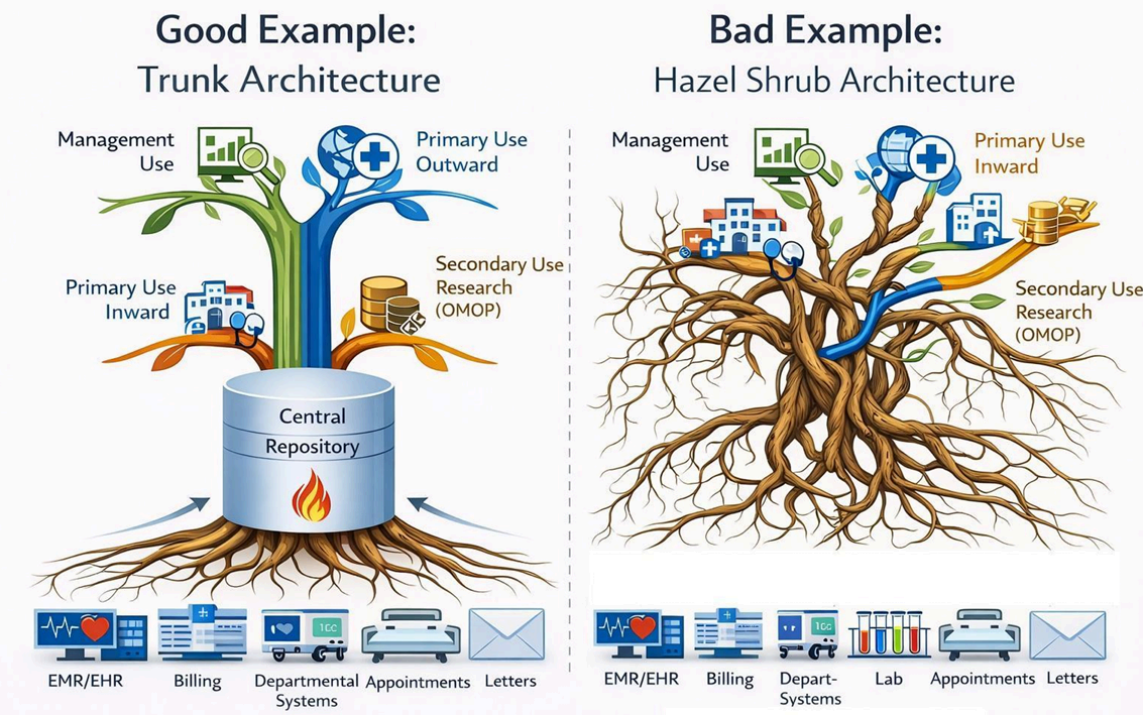
Three perspectives on FHIR x OMOP in Belgium

Thierry's broader message was direct: the **EHDS timeline is extremely ambitious**. His own hospital has SNOMED CT coded patient problems but is not yet ready to exchange allergies, vaccinations, or patient summaries. Most Belgian **hospital software vendors are not yet ready** either – this is the single biggest operational bottleneck. AI-assisted voice-to-text and auto-coding tools are the pragmatic path forward, but **time must be protected for clinicians**.

Industry's perspective - Fadi Glor, *Country Manager Belgium, InterSystems*

Fadi Glor opened by acknowledging the fatigue hospitals feel when confronted with yet another data standard. His message: hospitals should not be asked to implement OMOP directly. Belgium's legislation already requires them to be FHIR-ready – and that is exactly the right starting point. Industry's role is to handle the FHIR → OMOP conversion.

He introduced the concept of a "Trunk Architecture": a central FHIR repository that feeds all downstream uses – primary use inward and outward, management dashboards, and secondary use/research via OMOP – from a single source of truth. The anti-pattern – the "Hazel Shrub Architecture", where each use case spawns its own bespoke database connection – is the current reality in many hospitals and is unsustainable.



Good example (Trunk Architecture) vs. bad example (Hazel Shrub Architecture) for hospital data integration (source: Fadi Glor / InterSystems)

InterSystems presented its **FHIR-to-OMOP pipeline**, now available on the AWS Marketplace and listed as a supported database platform in the OHDSI HADES tooling (InterSystems IRIS). The solution was built directly in response to the community's top pain points (data quality and ETL methods were the top two requests at the 2024 OHDSI Global Symposium survey). Key features include out-of-the-box FHIR-to-OMOP mapping with no custom scripting, fully automated ETL, built-in data quality dashboards, patient-level incremental refresh, support for 32+ pre-loaded standard terminologies, and both cloud (AWS SaaS) and on-premises deployment options. Custom local terminology mappings can be injected via a simple CSV file.

Reflections and discussion highlights

The presentations sparked an active discussion in the chat and open Q&A. A selection of themes that resonated most with participants:

- **Data granularity and negation**: how to represent absent conditions or vaccines recommended-but-not-administered was raised by several participants. The answer lies in SNOMED CT's native negation concepts and FHIR verification status fields, as detailed in the OHDSI FHIR-to-OMOP Implementation Guide (community workgroup, maturity level 1.0).

- **Closing the loop – OMOP back to primary use**: several participants highlighted the emerging use case of using OMOP research findings to validate and enrich primary clinical data. This secondary-to-primary feedback loop, enabled by AI, is seen as a promising next frontier and a potential topic for a future session.

- **Convergence of Belgian OMOP networks**: SPECTRE, INAH, and MOVE are technically close – all use OMOP CDM and similar technical architectures. Governance and funding discussions to converge into a single federated national network are actively progressing.

- **LLMs for OMOP mapping**: the OHDSI community is actively investigating large language models for concept mapping and ETL automation. The OHDSI EU Symposium 2026 (Rotterdam, April 18–20) will feature a dedicated workshop on this topic (Man vs Machine Vocab edition).

Conclusion and next steps

The webinar successfully demonstrated that FHIR and OMOP CDM can and should coexist as **complementary pillars of Belgium's health data ecosystem**. While challenges remain – particularly around EHR vendor readiness, the pace of SNOMED CT adoption, and the complexity of mapping between standards without information loss – the collaborative energy of the community, the clarity of Belgium's policy direction, and the availability of maturing tooling all point in a positive direction.

OHDSI Belgium will continue to facilitate discussions, webinars, and collaborative projects to refine these tools and processes. Participants are encouraged to engage with the community, share their experiences, and contribute to the growing Belgian health data ecosystem.

References & resources

- **FHIR x OMOP Workshop Report (Sept 2024)**: to consult via this link
- **OHDSI Europe Community Calls**: "OMOP & the European Health Data Space" March 2026 edition – recordings, slide deck of Peter Rijnbeek and report available
- **OHDSI FHIR-to-OMOP Implementation Guide**: community workgroup, maturity level 1.0 – ohdsi.org
- **InterSystems OMOP Platform**: AWS Marketplace – intersystems.com
- **Care Sets Belgium & FHIR Implementation Guides**: ehealth.fgov.be
- **Join the global OHDSI community**: ohdsi.org → "Join the Journey"

OHDSI BELGIUM

#OHDSIBelgium #JoinTheJourney #DataSavesLives

Follow our **OHDSI Belgium LinkedIn page** for news and updates

For questions or suggestions, contact: ilse.vermeulen@uhasselt.be