Semantic Interoperability & Data Harmonisation

Fields marked with * are mandatory.

Introduction

On behalf of the European Commission's Directorate-General for Health and Food Safety (DG SANTE) and the European Health and Digital Executive Agency (HaDEA), we are pleased to invite you to participate in a survey for the project "**Support Centre for the European Electronic Health Record Exchange Format (EEHRxF) and for the Interoperability and Security of Electronic Health Record Systems**". This contract is carried out by EY in partnership with FORTH and aims to provide implementation support for the adoption and interoperability of EHR systems across Europe. Its main purpose is to make health data more accessible, secure and useful across all EU Member States.

This survey is part of the second consultation cycle and focuses on **semantic interoperability and data harmonisation** as essential foundations for meaningful, consistent and clinically safe cross-border EHR exchange. The input collected will support the identification of priority gaps, effective practices and concrete needs for tools, guidance and capacity-building in this area. It will directly inform the thematic workshop of this cycle and follow-up actions, including the consolidation of requirements and specifications, the definition of validation rules and the development of a digital toolkit for the Format and harmonised components of EHR systems.

The overall objective is to **examine how healthcare organisations and ecosystem actors manage clinical terminologies, structured data and data transformations**, and to identify practical challenges related to semantic alignment, terminology mapping, multilingual complexity and data quality. The questions address both clinical and technical perspectives, including the use of standard terminologies, structured templates and tools supporting semantic consistency and harmonised data structures.

Should you be willing to disseminate this information among your members, or if you would like to schedule a short online briefing, please contact us at: support.eehrxf@be.ey.com.

Privacy Question

Privacy Statement

EEHRxF_Support_Centre_DPN.pdf

* Your responses will be anonymised and grouped together with those of all other participants. They will be used strictly for research purposes and may help inform policy.

By proceeding, you confirm that you have read and understood the information above regarding data processing.

Do you consent to the use of your responses as described and agree to participate in the survey?

- (●) Yes
- ( ) No

Section 1 - General Information

* Please select the option that best describes your stakeholder group:

- [ ] Patients & representatives
- [ ] Healthcare providers (hospitals, clinics)
- [x] Healthcare professionals (individual doctors, nurses, allied health)
- [ ] EHR vendors & IT suppliers
- [ ] Health insurers
- [ ] Pharma & med-tech industry
- [ ] Academia & research institutions
- [ ] Regulators, policymakers, national authorities
- [ ] Cross-border health initiatives
- [ ] Standards/certification bodies & international organisations
- [ ] EC expert groups
- [ ] Horizontal organisations (cybersecurity, AI, identity, data protection)
- [ ] Other (please specify)

* In which geographical region are your activities primarily located?

Belgium

Can you provide the name of your institution/organisation? (Optional)

Council of European Dentists

Can you provide your role within your institution/organisation? (Optional)

Section 2 - Involvement in the European Electronic Health Record Exchange Format (EEHRxF)

* How would you describe your current level of involvement in EEHRxF?

- ○ Not involved — no activities underway
- ◉ Initial awareness — aware, monitoring updates
- ○ Active planning — plans, resources or roadmap drafted
- ○ Implementation in progress — activities started (pilots / procurement / configuration)
- ○ Advanced implementation — rollout largely complete / routine operation
- ○ N/A

* Which areas of the EEHRxF adoption and implementation are most relevant to your work? (Select all that apply)

- ☑ Interoperability and technical standards
- ☑ Semantic interoperability and data harmonisation
- ☑ Security and data privacy (including identity management and logging) in EHR exchange
- ☑ Compliance and regulatory requirements
- ☐ Patient engagement
- ☑ Training and capacity building
- ☐ Testing and certification
- ☐ Other (please specify)

Section 3 - EEHRxF Semantic Interoperability

Semantic interoperability refers to the ability of different systems and users to exchange health data with a shared and unambiguous understanding of its meaning. It ensures that clinical information, such as diagnoses, procedures, laboratory results or prescriptions, is interpreted consistently across settings, using common terminologies, codes and data models.

How critical and useful is for the following use cases related to data exchange and clinical use?

	Very important	Important	Moderately important	Slightly important	Not important	Not applicable	Unsure
* Cross-border patient summary	◉	○	○	○	○	○	○
* Clinical decision-making	◉	○	○	○	○	○	○
* Secondary use of data	○	○	○	○	○	◉	○
* AI/analytics	○	○	○	◉	○	○	○
* Administrative workflows	○	○	○	◉	○	○	○

* What types of semantic interoperability issues have you experienced? (Select all that apply)

- [x] Inconsistent or fragmented use of coding systems/terminologies
- [ ] Differences in value sets or controlled vocabularies for similar use cases
- [ ] Lack of common data models or mismatches between data models and schemes
- [x] Ambiguous or unclear clinical data meaning or definitions
- [x] Missing or incomplete data values or metadata
- [x] Misalignment between local implementations and international standards
- [ ] Incorrect interpretation of exchange data
- [ ] Other (please specify)

* In which contexts have you experienced semantic interoperability issues? (Select all that apply)

- [ ] Within a single organisation
- [x] Across organisations within the same country
- [x] Cross-border exchange
- [x] Between care settings (e.g. primary care ↔ hospital)
- [x] Between different vendors' systems

* At which stage do semantic interoperability issues most commonly arise? (Select all that apply)

- [ ] Data entry/documentation
- [x] Data structuring/encoding
- [ ] Mapping/transformation
- [x] Data exchange
- [x] Data consumption/clinical use

* When different clinical terminology systems exist for representing similar concepts, which approach is preferred in your context?

- (●) Preference for international standards (e.g. SNOMED CT, LOINC)
- ( ) Preference for national or local systems
- ( ) Combination of international and local systems depending on the use case
- ( ) No clear preference / varies case by case
- ( ) Not sure

* The EEHRxF foresees the use of specific clinical terminology standards (such as SNOMED GPS, LOINC, etc.) for structured data exchange. Which of the following statements best describes your organisation's current situation with these requirements? (Select one)

- (●) We fully support all required terminology standards natively in our system
- ( ) We support some but not all — gaps exist for specific data categories
- ( ) We rely on a national or regional terminology server to bridge the gap
- ( ) We have not yet mapped our local codes to the required international standards
- ( ) Unsure
- ( ) Not applicable to my role or organisation

* How are terminology mappings implemented and managed in your organisation? (Select all that apply)

'Organisation' refers to your institution or, for vendors, the solutions/services you develop or deploy across clients.

- [x] Internally by IT or clinical teams
- [ ] Provided by system/vendor solution
- [x] Managed at national/regional level
- [x] Automated within EHR workflows
- [ ] Manual mapping processes
- [ ] Not systematically managed
- [ ] Mapping not yet performed

* Does your country or ecosystem provide centrally defined value sets or semantic profiles?

- ( ) Yes, fully defined and enforced
- (•) Partially defined
- ( ) Under development
- ( ) No
- ( ) Unsure

* For which data types is semantic interoperability currently reliable in your context? (Select all that apply)

- [x] Patient summaries
- [x] ePrescription
- [x] eDispensation
- [x] Medical imaging studies and related imaging reports
- [x] Medical test results, including laboratory and other diagnostic results and related reports
- [ ] Discharge reports
- [ ] None reliably interoperable

* What are the biggest semantic interoperability challenges you see in the European context? (Select all that apply)

- [x] Mapping local codes to international standards
- [ ] Inconsistent use of terminology across systems
- [ ] Lack of standard templates for structured data
- [x] Variability in clinical documentation practices
- [ ] Limited capacity or expertise
- [ ] Other (please specify)

* How effective do you believe current semantic interoperability practices are in ensuring meaningful and accurate data exchange?

- ( ) Very effective
- (•) Moderately effective
- ( ) Slightly effective
- ( ) Not effective
- ( ) Unsure

* Which actions and types of support would improve semantic interoperability across Europe the most? (Select all that apply)

- [x] Adoption of standard clinical terminologies across systems
- [ ] EU-supported mapping tools and terminology services
- [x] Improved documentation and implementation guidelines
- [ ] Common clinical data models and structured templates
- [x] Training on semantic standards (e.g. SNOMED CT, LOINC, ICD)
- [ ] Terminology mapping toolkits and practical implementation resources
- [ ] Access to pre-built value sets and semantic profiles
- [ ] Automated tools for semantic validation and consistency checking
- [x] EU-level best-practice repositories and knowledge sharing
- [ ] Other (please specify)

Section 4 - EEHRxF Data Harmonisation

Data harmonisation refers to the process of aligning data structures, formats and semantic representations across systems to ensure consistency, comparability and reusability of health information. In the context of EEHRxF, it enables the integration of heterogeneous data sources into a coherent and interoperable framework.

* How often do you observe inconsistencies in data structure or format that complicate data exchange?

- ( ) Very often
- ( ) Often
- (•) Occasionally
- ( ) Rarely
- ( ) Never
- ( ) Unsure

* How is data harmonisation implemented in your organisation or in the solution(s) you provide/use?

'Organisation' refers to your institution or, for vendors, the solutions/services you develop or deploy across clients.

- (•) Standardised data models across systems
- ( ) Transformation at integration layer (middleware)
- ( ) Mapping at data exchange level
- ( ) Manual harmonisation
- ( ) Not systematically implemented

* Which aspects of data harmonisation present the greatest challenges in your context? (Select all that apply)

- [ ] Harmonising laboratory and diagnostic results
- [ ] Harmonising medical imaging data and metadata
- [x] Converting local data structures to standard formats
- [x] Data quality issues (e.g. duplicates, missing values, irregular formats)
- [ ] Lack of standardised templates or schemes

- [ ] Lack of automated data transformation tools
- [x] Limited support for structured data entry
- [ ] Inconsistent or incomplete metadata
- [x] Resource limitations (e.g. time, funding, expertise)
- [ ] Other (please specify)

* Where do data quality issues most commonly originate? (Select all that apply)
  - [ ] Data entry (clinical workflows)
  - [x] Legacy systems
  - [ ] Integration layers
  - [x] Data transformation processes
  - [ ] External data sources

* In your experience, which data types are most difficult to harmonise across countries? (Select all that apply)
  - [ ] Laboratory data
  - [x] Imaging data
  - [x] Administrative data
  - [x] Patient-generated data
  - [ ] Other (please specify)

* What is the main bottleneck in implementing data harmonisation? (Select the best option that applies)
  - ( ) Data quality
  - ( ) Lack of standards/templates
  - ( ) Integration complexity
  - (•) Resource constraints
  - ( ) Governance/coordination

* Which actions and types of support would most improve data harmonisation across Europe? (Select all that apply)
  - [ ] Standardised data models and templates
  - [ ] Tools for automated data transformation
  - [x] Guidance for harmonising specific data domains (e.g. imaging)
  - [x] Data quality improvement frameworks
  - [ ] Common reference datasets
  - [x] Transformation toolkits and implementation resources
  - [ ] Data quality assessment tools
  - [ ] Reference implementations
  - [x] Training on data harmonisation techniques
  - [ ] AI-assisted data harmonisation tools
  - [ ] Other (please specify)

Section 5 - Use of AI

The following questions focus on the use of AI in supporting semantic interoperability and data harmonisation.

* How relevant is the use of AI or machine-learning techniques in supporting data harmonisation in your opinion, and to what extent are such solutions currently used? (Select the option that best applies)
  - ○ Highly relevant, and actively used in our organisation
  - ○ Highly relevant, but not currently used
  - ○ Moderately relevant, and used to a limited extent
  - ◉ Moderately relevant, but not currently used
  - ○ Slightly relevant
  - ○ Not relevant
  - ○ Unsure

* For the AI or ML solutions currently used in your context, have they undergone an AI Act compliance assessment (e.g. internal evaluation, conformity checks, or external validation)?

  An AI Act compliance assessment refers to internal or external processes to verify that an AI system meets applicable EU AI Act requirements, such as risk classification, conformity checks, documentation and transparency obligations.
  - ○ Yes – formal compliance check performed
  - ○ Yes – informal/internal assessment performed
  - ○ No
  - ◉ Unsure

* To what extent are AI-related considerations (e.g. data sovereignty, data control, model transparency) a concern in your organisation when working with EHR data?

  'Organisation' refers to your institution or, for vendors, the solutions/services you develop or deploy across clients.
  - ◉ Major concern
  - ○ Moderate concern
  - ○ Minor concern
  - ○ Not a concern
  - ○ Not applicable
  - ○ Unsure

Section 6 - Engagement Preference

* How satisfied are you with the support provided by the EEHRxF Support Centre thus far?
  - ○ Very satisfied
  - ○ Satisfied
  - ○ Neither satisfied nor dissatisfied
  - ○ Dissatisfied
  - ○ Very dissatisfied
  - ◉ Not applicable / No experience with the Support Centre

* Would you be interested in joining follow-up interviews (approximately one-hour via MS Teams)?

- (●) Yes
- ( ) No

* Would you be interested in joining the Community of Practice for the Exchange Format (CoPEF) (online workspace with discussions, knowledge base, events)?

- (●) Yes
- ( ) No
- ( ) I am already part of the CoPEF

* If you selected 'Yes' for any of the two previous questions above, please provide your email address to be contacted by the Support Centre:

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Contact

Contact Form