

Swiss National Strategy for Data Interoperability to Leverage Research

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THE SWISS PERSONALIZED HEALTH NETWORK



Build a national infrastructure for exchanging and reusing consented data acquired in the health care and research system. [1]

Connect the different actors in the Swiss health care system.

Enable research in the field of personalized medicine in Switzerland

Interoperability: exchanging data in a secure and meaningful way, enabling « collaborative research by making the meaning of health-related data understandable to humans and machines. » [2]



A Strategy was needed to bring semantic interoperability to health data in Switzerland through the SPHN.

SEMANTIC REPRESENTATION

Objective



To develop a semantic framework based on recognized standards, without imposing a particular one, in order to allow usage based on purpose and context, and to represent the concept unambiguously.

Method



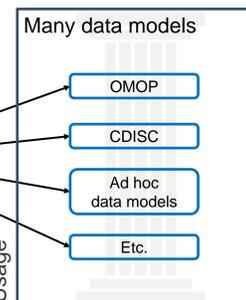
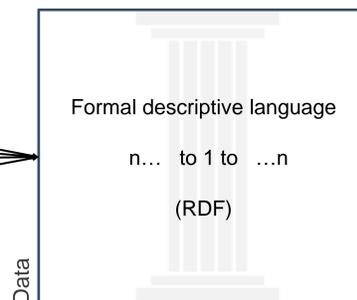
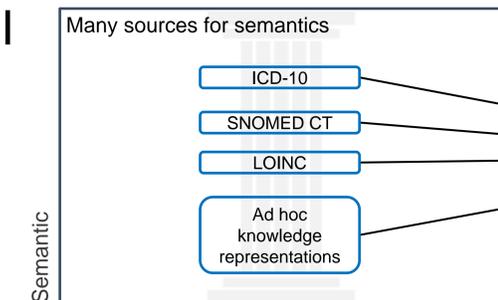
Concepts must first be clearly defined according to their usage, then encoded in one or more standards to ensure interoperability

Outcome



The creation of the SPHN dataset, comprised of 63 active concepts made up of 54 attributes defined in one or more international standards. This number is constantly growing and being added to.

THREE-PILLAR STRATEGY



Concept SPHN: Administrative Gender
Description: the gender of the individual used for administrative purposes

Meaning binding: 365873007 |Gender finding (finding)|

Standard: SNOMED CT

Value set: 703117000 |Masculine gender (finding)|; 703118005 |Feminine gender (finding)|; 74964007 |Other (qualifier value)|; 261665006 |Unknown (qualifier value)|

RDF: resource: CHE_108_907_884-AdministrativeGender-id_1 a sphn:AdministrativeGender ; sphn:hasAdministrativeGenderCode resource:Snomed_ct-703117000 ;

OMOP: table = person
CONCEPT.vocabulary_id = 'Gender'
column = gender_concept_id

DATA STORAGE AND TRANSPORT

Objective



To allow for scalable and flexible data transfer and storage, while maintaining the description of the data in a semantically unconstrained way

Method



In order to preserve sustainability and plasticity, descriptive formalisms were chosen to permit flexible storage and transport queries.

Outcome



RDF was the chosen standard as it allows to build a multigraph by representing knowledge with simple statements known as «triples», in addition to being highly scalable and permitting advanced queries.

AD-HOC DATA MODEL CONVERSION

Objective



To transform data from a single flexible representation to many possible rigid, data-model-oriented representations, thus providing a way of sharing data between communities

Method



Based on user's needs, ad hoc conversions to targeted data models, creating a reusable one-to-many mapping catalogue

Outcome



Project-specific conversions of the data into different formats via converters, which can then be queried and used for research purposes



1. Gaudet-Blavignac C, Raisaro JL, Touré V, Österle S, Cramer K, Lovis C. A National, Semantic-Driven, Three-Pillar Strategy to Enable Health Data Secondary Usage Interoperability for Research Within the Swiss Personalized Health Network: Methodological Study. JMIR Med Inform. 2021 Jun 24;9(6):e27591. doi: 10.2196/27591. PMID: 34185008; PMCID: PMC8277320.

2. <https://sphn.ch/network/data-coordination-center/the-sphn-semantic-interoperability-framework/>