Background

Registries that wish to standardize their semantics

This would allow

- More consistent understanding of elements
- Broader vetting of elements across stakeholder groups
- Extension of data sets that have semantic overlap
- Creation of standards-based quality measures

Projects include emergency medical services, trauma, and neonatal registries. These are not patient tracking tools; they are designed exclusively to support research.

Purpose: Decide Which Elements to model in SNOMED CT and which to represent in the data model

Approach

1. Begin modeling data elements with available concepts.
2. Identify gaps, and draft concept-model solutions to illustrate issues graphically.
3. Re-draft using expression constraint language.
4. Sketch boundaries based on feasibility of modeling.
5. Compare consistency of boundaries across test elements.
6. Adjust boundaries and articulate their rationales.

Cases

1. Specification of element to inform collector.
2. Specification of element to support automated collection.
3. Specification of element to support element-specific inference within research repository.
4. Specification of element to support inference across elements within or across research repositories.
5. Specification of element to support construction of quality measures.
6. Specification of element to support construction of decision support prompts.

Conclusions

A. The concept model has limits both accidental and essential that make recording all relevant information in concepts undesirable.
   a. Accidental limits include the absence of certain concepts (post-mortem exam).
   b. Essential limits include elements with no definitional relationship to the focal concept, e.g., registry admission criteria, which are related to the finding only incidentally.
   c. It may be difficult in certain circumstances to assign a property to one of these categories. E.g., while concrete domains seem appropriate to define product strength, a product may be taken to be an ontologically coherent entity if it is not clear whether the size of a phenomenon can be used as an ontological definition of a phenomenon.
   d. Similarly, symptoms may be used as evidence for findings, but they cannot be used as definitional attributes. Whether they might in future be used in expression constraints is questionable; at present no attribute supports this use.
   e. Finally, elements that are properties of attribution, e.g., quantification of "after," have no mechanism for expression other than relationship group association.

B. The selection of specification/formation may be specific to the use case:
   a. Cases for extraction will require query languages (SQL, SPARQL) as well as expression constraint language specifications for the identification of relevant facts outside the purview of the concept definition. The facts so represented may not specify all qualifying data, e.g., registry inclusion criteria.
   b. Cases for inference may require full specification of relevant properties of concepts (e.g., in definitions or compositional grammar expressions).

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American College of Surgeons’ National Trauma Data Bank
Midline Shift (Element PM_05)

Vermont Oxford Network
Necrotizing Enterocolitis (Element 40a)