

11.3 Concept Definition Issues

While SNOMED CT is the most comprehensive clinical terminology in the world, containing an extensive set of logic-based definitions which enable a broad range of powerful analytics, some challenges still exist, including:

- Logical versus vernacular
- Minimum sufficient sets
- Incomplete modelling

These challenges are described in more detail in this section.

Logical Versus Vernacular

In some cases, the strict logical meaning of a term may differ somewhat from the local vernacular (or common) use of that term. For example, the assertions below in SNOMED CT are logically sound but may be counterintuitive to clinicians:

- |insect bite of nose| **is a subtype of** |head injury|
- |laceration of radial artery| **is a subtype of** |cardiovascular disease|.

Examples, such as these, exist in which the formal logical definitions of these concepts may lead to hierarchies that differ from what may be expected by some clinicians.

Minimum Sufficient Sets

SNOMED CT definitions include the set of necessary and sufficient conditions that define the given concept. However, SNOMED CT does not currently distinguish the minimum sets which are sufficient to define these concepts. For example, the defining relationships of 154283005 |pulmonary tuberculosis| are:

```
116680003 |is a| = 64572001 |disease|
```

```
246075003 |causative agent| = 113858008 |mycobacterium tuberculosis complex|
```

```
116676008 |associated morphology| = 6266001 |granulomatous inflammation|
```

```
363698007 |finding site| = 39607008 |lung structure|
```

While the associated morphology of 'granulomatous inflammation' is necessarily present, the following set of defining relationships are sufficient to infer 154283005 |pulmonary tuberculosis|:

```
116680003 |is a| = 64572001 |disease|
```

```
246075003 |causative agent| = 113858008 |mycobacterium tuberculosis complex|
```

```
363698007 |finding site| = 39607008 |lung structure|
```

As a consequence if the following expression was recorded in a health record:

```
64572001 |disease| :  
  246075003 |causative agent| = 113858008 |mycobacterium tuberculosis complex|  
  363698007 |finding site| = 39607008 |lung structure|
```

This expression would *not* be returned by the following query:

```
<< 154283005 |pulmonary tuberculosis|
```

However, the query:

```
< 64572001 |disease| :  
  246075003 |causative agent| = << 113858008 |mycobacterium tuberculosis complex|  
  363698007 |finding site| = << 39607008 |lung structure|
```

would correctly return both the concept "154283005 |pulmonary tuberculosis|" and the above expression as required. In this way, the design of appropriate queries can help to mitigate this issue.

Incomplete Modelling

The SNOMED CT Concept Model continues to evolve to allow more concepts to be fully defined. For example, the 'Observable Entity' and 'Substance' hierarchies each have new concept models being developed, which will allow these concepts to be more fully defined in future releases of SNOMED CT. When the concept models for these hierarchies are incorporated, SNOMED CT's expressive power and analytics capabilities will be further expanded.

In those hierarchies for which the concept model has been established for some time (e.g. Clinical finding), ongoing expansion to SNOMED CT's formal logical definitions continues. However, there still remains some concepts which do not yet have all possible defining relationships included. This issue will be mitigated over time as more of SNOMED CT's concepts continue to be modelled.
