Letters

Concerning SNOMED-CT content for public health case reports

In a recent JAMIA article,1 Deepthi Rajeeve asserts that ‘some of the existing concepts [in SNOMED CT] do not meet the case definition and do not represent reportable conditions because non-human conditions are included as children in the hierarchy’, specifically citing campylobacteriosis and porcine intestinal adenomatosis. The authors suggest creating a SNOMED CT hierarchy that is exclusively human conditions. First we must point out that the term they selected (campylobacteriosis) does not mean ‘campylobacter-induced disease in human beings’. Campylobacteriosis means (in SNOMED CT and in the real world) ‘disorder characterized by infection by any campylobacter species’. No information on the species affected is or should be implied. In fact, we believe that several disorders in this hierarchy, including the cited ‘porcine enteric adenomatosis’, are likely to be overspecified by the inclusion of species. Inclusion of species in the naming of disorders is an artifact of usage patterns that does not allow for the fact that many of these disorders can and often do cross species, an important consideration in the public health domain. Information regarding species, whether it be human or non-human, can and should be identified by the information model, not the terminology. We believe that pre-coordination of species into disease codes increases curation burden without significant benefit, and no supported arguments to date have refuted this belief. Second, the authors imply that this general code hierarchy is invalid for use in human cases because it has a non-human subtype. This is incorrect and represents an error of thinking, which could wreak havoc with proper use of terminology for data collection in public health. There is no principle in terminology or formal ontology to suggest that a supertype takes any meaning from its collection of subtypes.

The authors express concern that certain disorders of public health interest are represented in SNOMED CT by multiple concepts, citing typhoid and botulism. We believe that, while their analysis properly points to difficulties in using a reference terminology for reporting purposes, their proposed solution is both oversimplified and incorrect. In the case of botulism, the authors propose the creation of a single concept that is a supertype of both ‘infection with Clostridium botulinum’ and ‘botulism (intoxication)’. The solution to this problem must address the biological fact that all forms of botulism are a manifestation of intoxication with C. botulinum toxin but that the source of the toxin may either be infection (eg, wound botulism) or ingestion (eg, botulism food poisoning). In our opinion, this is likely not to be solved by instantiating a single supertype. That said, it must be pointed out that SNOMED CT’s hierarchy under botulism (the poisoning) does not adequately portray hierarchical information concerning the infectious nature of wound botulism, infantile botulism and intestinal botulism. In the case of typhoid, we agree that the SNOMED CT hierarchy and model for infectious disease should be improved. ‘Typhoid carrier’ is a true subtype of ‘typhoid infection’. Existing SNOMED CT definitions are not currently able to distinguish between them nor describe the subtle differences. If the hierarchy were re-arranged, ‘typhoid infection’ would be a supertype of both ‘active disease associated with typhoid infection’ and ‘typhoid carrier’.

We also agree that SNOMED CT lacks certain specific and important content. These issues can and should be corrected through the submission of carefully defined content that meets the needs of public health.

The authors’ analysis has emphasized the difficulties of applying a reference terminology in a real-world application. Robust terminologies such as SNOMED CT are necessarily complex, as they attempt to depict the complexities of medicine accurately. When using SNOMED CT, great care must be taken to understand fully the concepts being represented. Attempts at simplification to meet goals of a single application can lead to errors in meaning and problems in translating data. Balancing the needs of practical application with the importance of the purity and accuracy of the terminology is a very difficult task, but mechanisms do exist to enable practical solutions. For example, a subset could be created to focus the scope to reportable diseases of current human interest. Subsets would provide the ability to view and organize according to the needs of the users, while maintaining the accuracy and purity of the base terminology. As previously stated, content gaps and inaccuracies can and are being corrected through the submission of carefully defined content and review of current content. We applaud the authors’ support of the use of standards and are encouraged that they consider SNOMED CT an appropriate source of content. Through careful consideration of content and use of practical solutions, we believe that the authors’ concerns can be addressed while maintaining the accuracy of the terminology.

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In response to letter to the editor: ‘Concerning SNOMED-CT content for public health case reports’

We are grateful for the careful review of our article by Wilcke et al.1 We would like to reaffirm our belief that SNOMED CT is an extremely useful terminology and the best current choice for the representation of clinical findings generally, and specifically for the representation of findings in public health case reports. The broad use of SNOMED CT will lead to the understanding of important modeling issues as well as improved SNOMED CT content.

We appreciate the respondents’ clarification that ‘porcine enteric adenomatosis’ is a species-independent disorder. However, the fact that we held this erroneous opinion is understandable. ‘As Porcine’ is in the name of the term, and without further explanation, the ‘true’ meaning is difficult to discern. The name of the term is ambiguous, if not outright misleading. This situation points to the underlying difficulty of making it easy for users to understand the meaning of concepts in reference terminologies. Great emphasis has been placed on the accuracy and internal consistency of reference terminologies, with less emphasis on what is needed to make the content easily understood by clinical users and researchers. Human readable definitions would be a big help.

We agree with the respondents that, ‘Information regarding species, whether it be human or non-human can and should be identified by the information model, not the terminology.’ We are aware of the ongoing efforts to form a working relationship between creators of information models and terminology developers so that models and terminology can be created in unison, thereby removing ambiguity in data representation. We applaud and support these efforts.