Editorial

Large complex terminologies: more coding choice, but harder to find data – reflections on introduction of SNOMED CT (Systematized Nomenclature of Medicine – Clinical Terms) as an NHS standard

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Introduction

The Systematized Nomenclature of Medicine – Clinical Terms (SNOMED CT) is now an NHS standard. The NHS Connecting for Health website states:

‘SNOMED CT has been selected and approved as the terminology to be adopted by the NHS in England. It is the most comprehensive international terminology currently available and can be used across all care settings and all clinical domains.’

SNOMED CT stands for the Systematized Nomenclature of Medicine Clinical Terms, and consists of comprehensive scientifically validated content. SNOMED CT is available in more than 50 countries and has been adopted as the standard clinical terminology for the NHS in England.

This Editorial explores whether this should be cause for widespread rejoicing among the health informatics community or whether there are concerns about using such a large and complex system.

History

SNOMED was originally created by the College of American Pathologists, though ownership was subsequently transferred to a not-for-profit organisation in Denmark, the International Health Terminology Standards Development Organisation (IHTSDO).

There seems little doubt about the comprehensive nature of SNOMED CT; research suggests that it allows nearly all clinical concepts to be readily coded. Sophisticated linkage is included within SNOMED CT which allows relationships to be made between terms; one term can have many parents. There are a number of free SNOMED browsers, including the Snowlake Browser which enables you to search for a term and look for its relationships.

Observing SNOMED CT linkage

I looked up the term ‘constipation’ using the Snowlake Browser. Constipation (code 14760008) is a ‘Functional disorder of the intestine’ and a ‘Disorder of the
colon’. This is very sophisticated and all seemed to fit well. This seemed so much better that the relatively simple Read (5byte) version 2 hierarchies we are used to using in UK practice. In Read version 2 ‘constipation’ sits in three different hierarchies: symptoms, mental disorders and digestive system diseases. In the Read terminology there is a constipation symptom code (19C..) which unhelpfully contains a child code for ‘not constipated’ (19C1.); the ‘psychogenic constipation’ (E2654) sitting in the mental disorders chapter; and ‘constipation functional’ (J520.).

However, I also noticed in the SNOMED CT browser that there were further constipation codes. There are: ‘constipation NOS’ (finding – 162083002) and ‘constipation NOS’ (disorder – 660821000000105). Both these terms only linked to ‘limited status concept’ (inactive concept – 443559000). This was much less impressive, it meant that there were no other links at all. However, as searching for ‘constipation’ is unlikely to be clinically important I moved on to other conditions more likely to have a significant impact on health.

I next looked at ‘myocardial infarction’ and found ‘acute myocardial infarction NOS’ (194811003) also attached to the inactive concept code. The same was the case for ‘other acute’ and ‘inferior’ myocardial infarction. Other reports have suggested that there may be problems with the way SNOMED CT links in clinically important hierarchies.

Big choice of concepts: but potential problems with searching

There is no doubt about the comprehensiveness of SNOMED CT, however, the multiple hierarchies potentially make searching extremely difficult. Taking the constipation example above – in Read 2 if I search for symptom (19C%, excluding 19C1), mental disorder (E2564), and digestive system disease codes (J520%), I should capture all the information about constipation. What hierarchical searches can I make with SNOMED CT? This is especially difficult where key codes might be linked to ‘limited status concept’ codes.

Our experience of searching UK general practice systems using the Read Clinical Terms version 3, bears out this concern. We have extracted data as part of a quality improvement trial in chronic kidney disease. The existence of multiple parents for terms inevitably means that parent codes have many more child codes; and hierarchical searches yield a lot less useful data than when searching the hierarchical systems (like Read 2).

Is keeping different linkages up-to-date just too complex?

There is an apocryphal story told about a medical student training in the 1970s who was asked the cause of duodenal ulcers. Caught on the spot he blurted out ‘Infections, sir!’ This response was met by laughter from his colleagues and derision from the head of the firm. Subsequently we have discovered that the overwhelming majority of duodenal ulcers are caused by an infection with a bug called *Helicobacter* and probably the majority of gastric ulcers. I hoped that if I looked at duodenal ulcer in the SNOMED CT browser I might see a link to *Helicobacter pylori*. Unfortunately I was disappointed. None of the first five codes linked to infection, and one had the ‘limited status concept’ link. I tried the other way round – looking up *Helicobacter* to see if there was a link to duodenal ulcer. The first link to the organism was unhelpful, the second to ‘*Helicobacter*-associated disease’ (6185008) did contain a link to ‘*Helicobacter*-related gastritis’ (89538001) but there was no direct link, or link through this code, to duodenal ulcer.
The costs and effort of the implementation of SNOMED may be profound

The adoption of SNOMED in the UK health services SNOMED has stimulated little discussion and is viewed by many in the NHS as a ‘distant’ event. Few primary or secondary healthcare organisations and even fewer clinicians took any steps in preparing for the implementation SNOMED. In secondary care, coding of diagnosis for central returns is performed mainly by clinical coders and data clerks using the International Classification of Disease version 10 (ICD10). This coding is done using a unique set of guidelines and conventions within the NHS following a special course and using a restricted access manual. Training of thousands of such non-clinical individuals to use a much more complex clinical coding system is not a trivial task. The interpretation and reporting of the more complex submitted data by central NHS information services to inform commissioning is another major issue: new costing models will needed to be constructed to replace existing models and their impact on payment by results assessed. Discussion on the implications of the implementation SNOMED in NHS organisations has not thus far been sufficient, and might usefully be deferred. A much more minor change in the coding system used for hospital procedures caused NHS hospital coders considerable stress, and a recommendation was made that future changes should include a proper change management system.

Summary

The idea of a comprehensive coding system, able to code any concept has allure; similarly linking a term to related concepts. However, there appear to be flaws: firstly just getting these links right and keeping them up-to-date, secondly how you find data in such a comprehensive system? If limited lists have to be imposed to make things usable why not just stick with the limited list?

Routine data offers enormous opportunities for quality improvement and research; we should avoid putting this at risk until these issues are resolved. Perhaps a head-to-head test of SNOMED CT v. the widely used combination of the International Classification of Disease (ICD) and the International Classification of Primary Care (ICPC) is needed to resolve these important issues. Further debate is needed about the pros and cons of SNOMED CT. Are these teething problems or fundamental flaws?

REFERENCES

1 NHS Connecting for Health. UK Terminology, SNOMED CT. www.connectingforhealth.nhs.uk/systems/services/data/uktc/snomed
4 Snoflake Browser. On-line SNOMED CT Browser. www.snoflake.co.uk/
5 de Lusignan S. Codes, classifications, terminologies and nomenclatures: definition, development and application in practice. Informatics in Primary Care 2005; 13(1):65–70.