10.2 Results Visualization

When a SNOMED CT enabled query over patient records is executed, the results of this query can be visualized in a number of ways, including tables, charts, scatter diagrams and colored epidemiology maps. While some of these results visualization techniques can be used with any coding system, others are able to utilize the unique features of SNOMED CT in powerful ways.

For example, figure 10.2-0 shows a report produced by Cerner's data warehouse query tool. This tool uses a simple graphical interface which directly creates powerful reports using the SNOMED CT hierarchy content. The screenshot below in figure 10.2-0 shows a report of attendances with diagnoses which are a descendant of the SNOMED CT concept 417746004 [traumatic injury].

![Figure 10.2-1: Report produced by Cerner's data warehouse query tool](image)

SNOMED CT’s rich polyhierarchy provides a vast number of potential ‘aggregators’ for analytics, and possible views of SNOMED CT encoded data. This polyhierarchy can be exploited by visual exploratory data analysis tools to enable the visual inspection of complex datasets.

For example, the NHS have been using the Gephi open-source network analysis and visualization software, to explore SNOMED CT encoded renal datasets.

The first representation (in figure 10.2-0) shows a projection of all concepts directly-coded in the patient data, with the node size reflecting the frequency of each code. 36689008 [acute pyelonephritis] has a high frequency in the data and is therefore represented by a big node, while 254915003 [clear cell carcinoma of kidney] has a low frequency in the data and is therefore represented by a small node.

Using a simple concentration algorithm, which aggregates subsumed concepts up to a given threshold, the representation in figure 10.2-0 is achieved. In this representation, the size of the purple nodes reflects the frequency of each code plus its subtypes, the size of the blue nodes reflects the frequency of each code’s subtypes, and the size of the red nodes reflects the frequency of each code on its own. This enables trends to be visually detected – for example, 36171008 [glomerulonephritis] and 36171008 [acute pyelonephritis] - even when the frequency of these concepts themselves is relatively low.
Innovative data visualization and analysis tooling is expected to become much more widespread as the powerful capabilities of SNOMED CT content are increasingly utilized.