Methods

The purpose of this study is to:

Objectives

- Establishated Pharmacologic Classes (EPCs)
- Developed by Food and Drug Administration (FDA)
- Used as part of the Structured Product Label (SPL)
- Exists as a flat list (no hierarchical organization)
- Randomly selected EPCs
- Weighted kappa statistic for inter-rater consistency

Background

- National Cancer Institute thesaurus (NCI)
- National Library of Medicine (NLM)
- Medical Subject Headings (MeSH) hierarchy
- ATC contains ingredients not used or available in the U.S.
- ATC model not conducive to EPCs or easy navigation
- SNOMED CT, 77/108 =71.3%.
- MeSH was limited due to its purpose as a controlled vocabulary thesaurus
- MeSH classifications were found to be very broad and flat, and did not support the granularity of the EPCs

National Cancer Institute Thesaurus (NCI)

- Definitions of cancers, related diseases, cancer related medications, findings, and genes
- Only uses anatomy, and was therefore not evaluated in this study

National Drug File Reference Terminology (NDF-RT) hierarchy

- Separate drug hierarchies for:
  - Physiological effects (PE)
  - Chemical structure (CHEM)
  - Mechanism of action (MoA)
- NDF-RT harbors the EPC concepts
- EPCs mapped to physiological effect, chemical structure, and mechanism of action
- Disjoint hierarchies do not support a single hierarchy for EPC concepts
- Not evaluated further in this study

Systematized Nomenclature of Medicine Clinical Terms (SNOMED CT) hierarchy

- International Health Terminology Standard Development Organisation (IHTSDO)
- Drug hierarchies:
  - Pharmaceutical/biological Product
  - Substance
- Largest terminologies with over 311,000 active concepts
- Designated in the U.S. as the standard for electronic health information exchange and interoperability for many clinical domains, although not for medications

Terminologies evaluated with five-point Likert scale

- Definition Accuracy
- Completeness of information
- Structure
- Multiple entity names
- Subsetting capability
- Classification method
- Selection of best match from the drugs grouped by NDF-RT

Conclusions

- Each terminology has its own way of grouping objects
- SNOMED CT offered the most consistent representation of the EPC concepts
- Currently working on manually mapping EPC concepts to SNOMED CT in order to develop a drug class hierarchy using EPC concepts
- To assist with the mappings, we are utilizing lexical and instance-based matching techniques

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