Challenges in health data – secondary data, modelling meaning.....

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and
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The state of the secondary data house

- Example:
  - 1970’s morbidity reporting established
  - Design… 1978
    - diagnosis 1,
    - diagnosis 2,
    - diagnosis 3,
    - diagnosis 4,
    - diagnosis 5
  - procedure 1
  - procedure 2
  - procedure 3

- Design 2009
  - diagnosis 1
  - diagnosis 2
  - ……
  - diagnosis 50
  - procedure 1
  - procedure 2
  - procedure 3
  - ……
  - procedure 50
Time to build or renovate

- Promise of EHRs to improve quality and availability of secondary data
- Many criticisms of existing secondary data and systems
- In a time of change – there are opportunities to leverage and improve more than the main focus (EHR).
- This work identifies the dinosaur in the room and asks you….
  - Will tweeking be enough to deliver benefits?
  - Is now the time to make real change?
The Project

• Identifies Entities and Relationships in the current Admitted Episode Morbidity Data Set to:
  • Understand the potential to enrich the meaning and knowledge represented in this data
  • Reduce collection costs and improve the quality of data collected.
  • Technically understand the concepts involved to support effective integration into EHR systems.
What was included...

- Diagnosis and Procedure fields collected for inpatient care
- Modelling the entities and relationships between these data:
  - Understand what information is included in these two fields
  - Review of state requirements for collection and coding rules.

- What was not done: relevance or scope of ICD to represent the concepts.
## Jurisdiction Variations

<table>
<thead>
<tr>
<th>Clinical data items</th>
<th>National</th>
<th>NSW</th>
<th>QLD</th>
<th>VIC</th>
<th>WA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principle Diagnosis</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Co-Diagnosis</td>
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<td>✓</td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Additional Diagnoses</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Diagnosis Type</td>
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<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Procedures</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Additional Procedures</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>External causes of injury or poisoning</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>External cause related to associated diagnosis</td>
<td></td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>External cause associated with the complication</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Places of occurrence of external cause</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Activity when injured</td>
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<td></td>
<td></td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Morphology</td>
<td></td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
Are collections really different?
Ontological analysis

- Identify what is actually recorded
- Understand the relationships between what is recorded.
- The process
  - Based upon international and national models.
  - Review of real cases from Victorian Admitted Episode Data
  - Review of instructions and rules in the coding system
  - Case by case
    - Small number of codes, large number of codes, no procedures, many procedures.
<table>
<thead>
<tr>
<th>Entity</th>
<th>Represented in ICD-10-AM as a:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Principal diagnosis</td>
<td>Disease code (may not be an injury or morphology code)</td>
</tr>
<tr>
<td>Clinical finding</td>
<td>Disease code (additional diagnoses)</td>
</tr>
<tr>
<td>Injury</td>
<td>Disease code</td>
</tr>
<tr>
<td>Morphological Structure</td>
<td>Morphology code</td>
</tr>
<tr>
<td>Organism</td>
<td>Disease code (as a causative agent of disease)</td>
</tr>
<tr>
<td>Substance</td>
<td>Procedure (use of substance) and as cause of injury or disease</td>
</tr>
<tr>
<td>External Cause of Injury</td>
<td>Combination of Physical Object and Physical Agent</td>
</tr>
<tr>
<td>Hazard</td>
<td>Disease code</td>
</tr>
<tr>
<td>Activity</td>
<td>Disease code</td>
</tr>
<tr>
<td>Service</td>
<td>Disease code</td>
</tr>
<tr>
<td>Place of Occurrence of Injury</td>
<td>Specification of geographic and environmental locations for the purpose of national morbidity reporting</td>
</tr>
<tr>
<td>Person</td>
<td>Disease Code</td>
</tr>
<tr>
<td>Procedure</td>
<td>Procedure Code</td>
</tr>
<tr>
<td>Anaesthesia</td>
<td>Procedure Code</td>
</tr>
</tbody>
</table>
Relationship examples:

- Has causative agent
- Has external cause
- Has place of occurrence
- Has associated activity
- Has associated finding
- Has associated
- Has morphology
- Has history of
- Has duration
- Has cause of death
- Has subject of information

- Has treatment
- Has test
- Has anaesthesia
- Has procedure
- Has quantity
The opportunity

• Basis for further development and understanding of state and national data collection,
• Inform build/renovate decision
• Improve quality through the ability to compare to the clinical information model
My challenge...

- Data is no longer just something you ask someone to collect
- Collection has a continuum that needs understanding and design
- Will we continue with a system designed in the 1970’s or take the opportunity for real change that will set us up to gain greater value and more flexibility from the information we have…
Thank you

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