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

Heather Grain

and

Evelyn Hovenga

eHealth Education

The state of the secondary data house

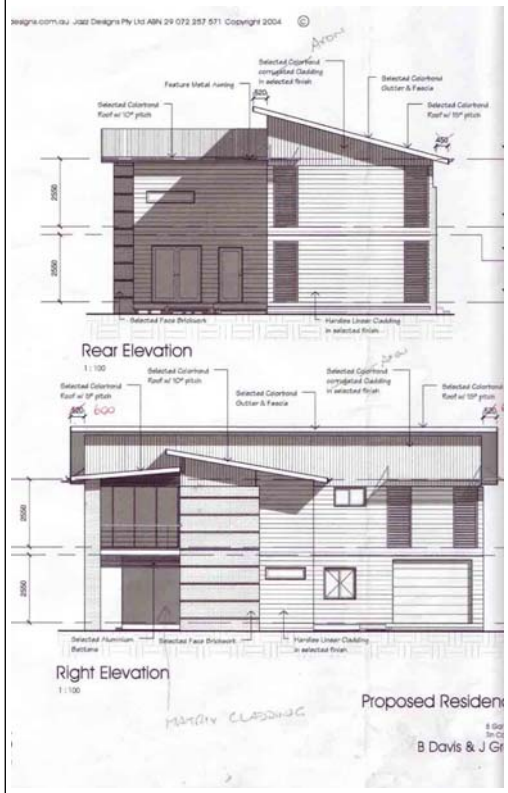
- Example:
  - 1970's morbidity reporting established
  - Design… 1978
    - diagnosis 1,
    - diagnosis 2,
    - diagnosis 3,
    - diagnosis 4,
    - diagnosis 5
    - procedure 1
    - procedure 2
    - procedure 3

Design 2009

diagnosis 1
diagnosis 2
…….
diagnosis 50

procedure 1
procedure 2
procedure 3
…….
procedure 50

Time to build or renovate

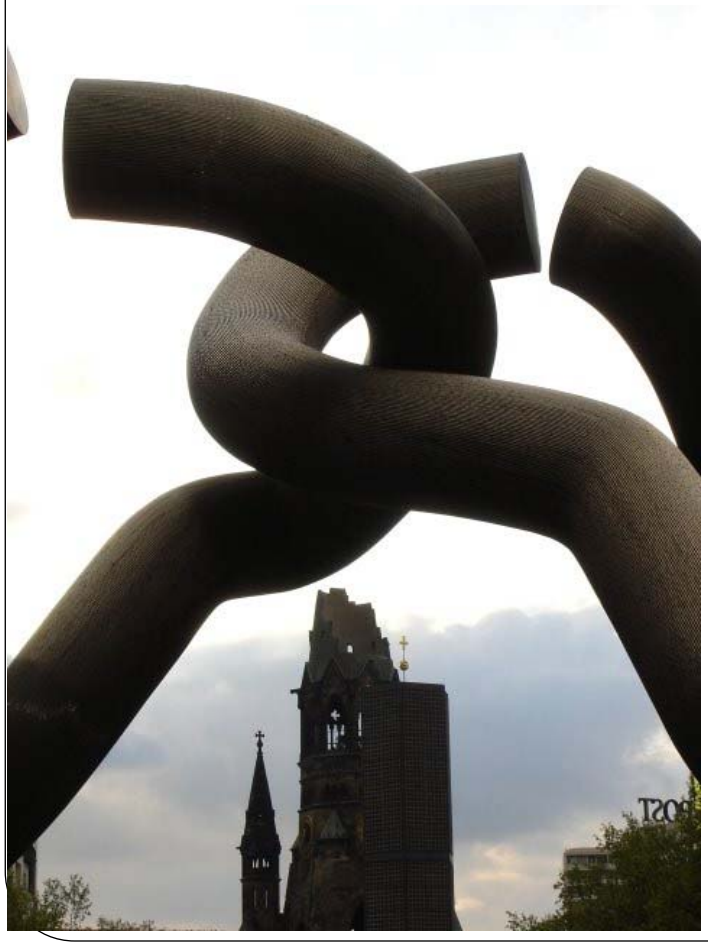


- Promise of EHRs to improve quality and availability of secondary data
- Many criticisms of existing secondary data and systems
- In a time of change – there are opportunities to leverage and improve more than the main focus (EHR).
- This work identifies the dinosaur in the room and asks you….
  - Will 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…



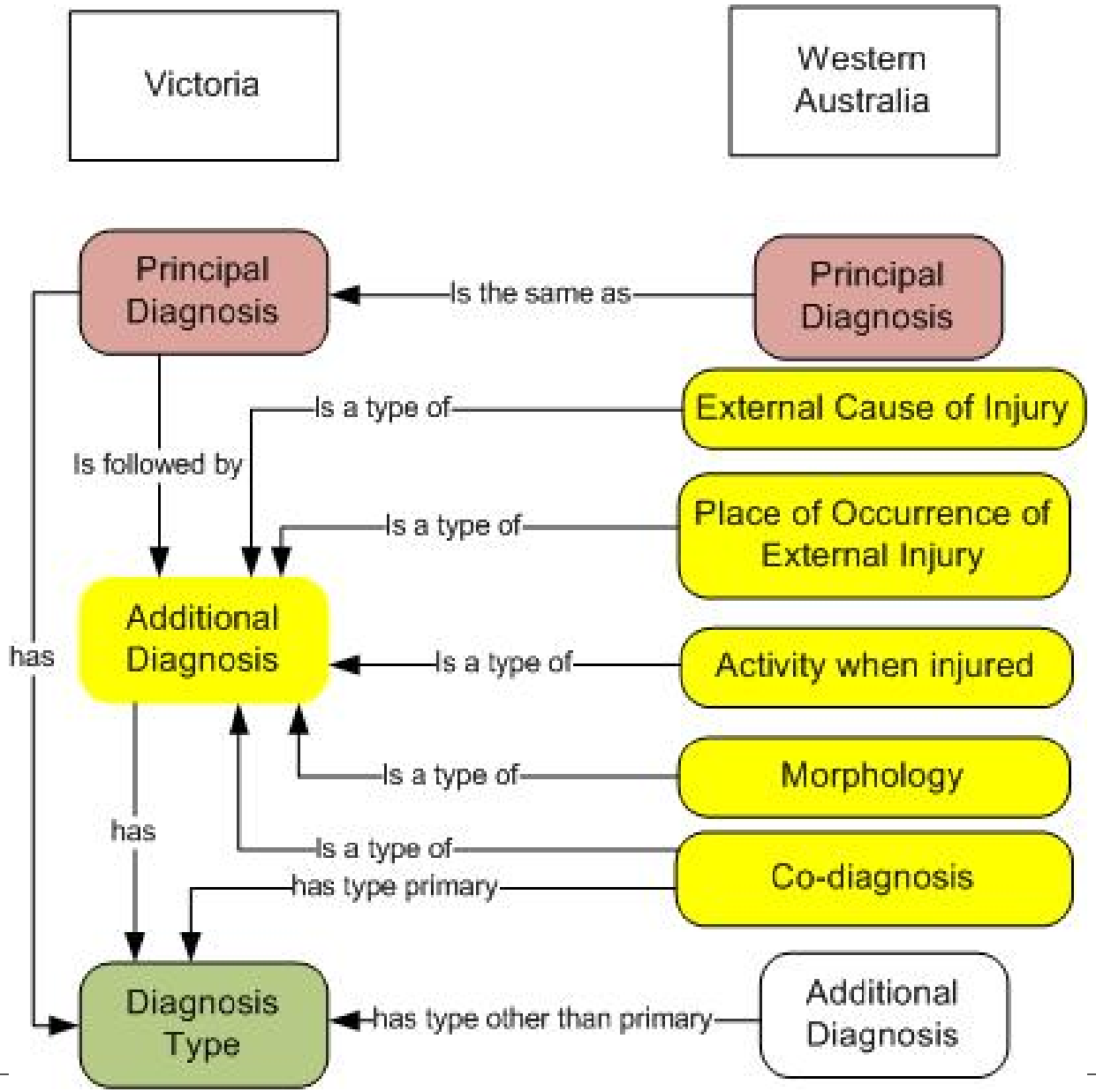
- Diagnosis and Procedure fields collected for inpatient care
- Modelling the entities and relationships between these data:
  - Understand what information is included in these two fields
  - Review of state requirements for collection and coding rules.

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

Jurisdiction Variations

Clinical data items	National	NSW	QLD	VIC	WA
Principle Diagnosis	✓	✓	✓	✓	✓
Co-Diagnosis					✓
Additional Diagnoses	✓	✓	✓	✓	✓
Diagnosis Type			✓	✓	
Procedures	✓	✓		✓	
Additional Procedures					✓
External causes of injury or poisoning	✓	✓	✓		✓
External cause related to associated diagnosis			✓		
External cause associated with the complication			✓		
Places of occurrence of external cause	✓				✓
Activity when injured	✓				✓
Morphology			✓		✓

Are collections really different?



Ontological analysis

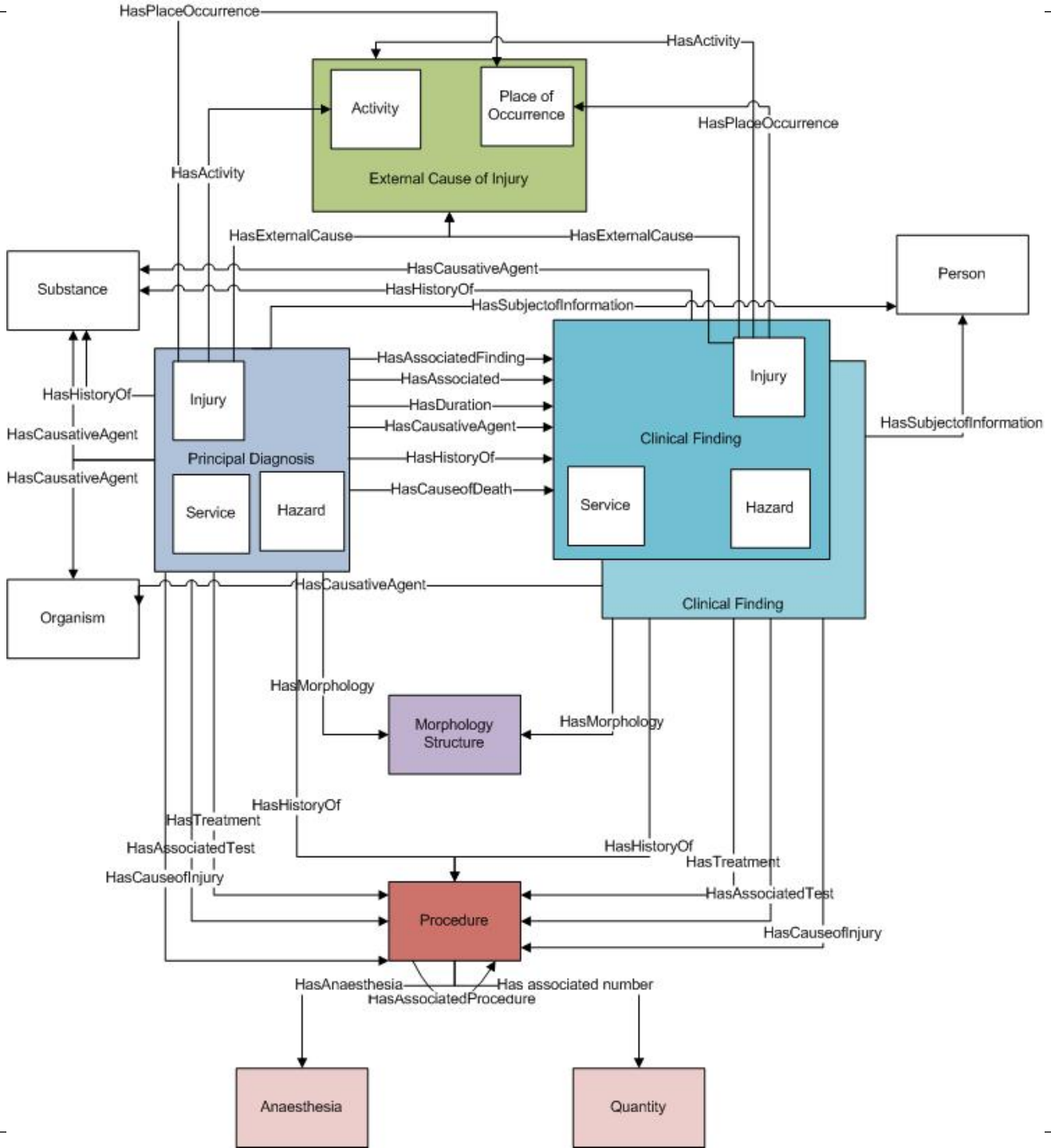
- Identify what is actually recorded
- Understand the relationships between what is recorded.
- The process
  - Based upon international and national models.
  - Review of real cases from Victorian Admitted Episode Data
  - Review of instructions and rules in the coding system
  - Case by case
    - Small number of codes, large number of codes, no procedures, many procedures.

Entities

Entity	Represented in ICD-10-AM as a:
Principal diagnosis	Disease code (may not be an injury or morphology code)
Clinical finding	Disease code (additional diagnoses)
Injury	Disease code
Morphological Structure	Morphology code
Organism	Disease code (as a causative agent of disease)
Substance	Procedure (use of substance) and as cause of injury or disease
External Cause of Injury	Combination of Physical Object and Physical Agent
Hazard	Disease code
Activity	Disease code
Service	Disease code
Place of Occurrence of Injury	Specification of geographic and environmental locations for the purpose of national morbidity reporting
Person	Disease Code
Procedure	Procedure Code
Anaesthesia	Procedure Code

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


HasPlaceOccurrence
HasActivity
Activity
Place of Occurrence
External Cause of Injury
HasPlaceOccurrence
HasActivity
HasExternalCause
HasExternalCause
Substance
HasCausativeAgent
HasHistoryOf
HasSubjectofInformation
Person
HasAssociatedFinding
HasAssociated
HasDuration
HasCausativeAgent
HasHistoryOf
HasCauseofDeath
Injury
Principal Diagnosis
Service
Hazard
Injury
Clinical Finding
Service
Hazard
HasSubjectofInformation
HasHistoryOf
HasCausativeAgent
HasCausativeAgent
Organism
HasCausativeAgent
Clinical Finding
HasMorphology
Morphology Structure
HasMorphology
HasHistoryOf
HasTreatment
HasAssociatedTest
HasCauseofInjury
HasHistoryOf
HasTreatment
HasAssociatedTest
HasCauseofInjury
Procedure
HasAnaesthesia
HasAssociatedProcedure
Has associated number
Anaesthesia
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

- Heather Grain
  - heather@lginformatics.com

- Evelyn Hovenga
  - E.hovenga@ehealtheducation.net