Care Pathways, variance and Ontologies: future medical research possibilities

Mark Olive
Bristol Institute of Technology

Supervised by
Tony Solomonides
Background

- Rather than a clinical or healthcare research background, this work has arisen from information systems / health informatics research. In particular, research for European Commission projects:
  - **SHARE** – Looking at the future of biomedical research, where healthcare and research are intelligently brought together.
  - **EuroPGDcode** – Examining future directions for research into Preimplantation Genetic Diagnosis (PGD).
  - **MammoGrid** – A validated database of digital mammograms.

Mark Olive, Bristol Institute of Technology, University of the West of England, Bristol
Pathways and Variance

- Pathways as a source of data for research.
- Examples of situations where branching pathways and/or variance/audit data has been recognised as helpful in the alteration of a pathway.

- What variance tracking and analysis ‘should’ be; variance analysis leading to changes in pathways in response to emerging evidence from practice.

- Current analyses – primary, secondary and tertiary analysis.
- The need for coding, enabled by electronic pathways.
Ontologies for research

• What are ontologies?
  • The concepts and interrelationships within a given domain

• What are they useful for?
  • Common understanding, enabling aggregation
  • Domain knowledge reuse
  • Separating domain knowledge from operational knowledge, a key area where an *ontology* + *problem solving method* approach is different from more formal modelling such as with PROforma, GLIF, etc.
  • Assumptions made explicit
A general ontology for care pathways

- Used to unify pathways, to aid in data extraction, and for embedding into an electronic health record.

Mark Olive, Bristol Institute of Technology, University of the West of England, Bristol
An example from PGD research

- Preimplantation genetic diagnosis (PGD) and EuroPGDcode

- Research questions
  - Detailed questions involve previous periods of care for patients of interest.

- A proposed system to gather data for PGD research
  - Using ontologies
  - Using a method to infer pathways from the EHR
Ontologies for healthcare

- Problem area: minimising and resolving drug interactions when a patient follows multiple pathways in parallel.
- Using ontologies to identify problematic drug interactions.
- Data from BNF, etc. could be used to provide more information and better guidance.
- Use of variance data.

Mark Olive, Bristol Institute of Technology, University of the West of England, Bristol
Conclusion

• Confidence in using pathway data for research.
  • Variance useful as an indicator of when further research is required?
  • Linking variances to outcomes?

• Future work and any questions

Thanks for your attention!

For this presentation and related work, visit
http://www.cems.uwe.ac.uk/~me2olive/

Mark Olive
Mark2.Olive@uwe.ac.uk