COCPIT: A Tool for Integrated Care Pathway Variance Analysis

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Care Pathway Variance Analysis (CPVA)

- Identification of the difference between observed patient’s record (EHR) and expected integrated care pathway (ICP)

- Requires:
  - Computable definition of expected
  - Observed data in electronic form
  - Software codes for analysis
  - Storage and processing resources
Applications

• Audit
  – Process
  – Outcome
  – Inequality
  – Economic
  – Characterise the primary-secondary care interaction

• Improvement
  – Inefficiency detection
  – Service redesign
  – Service integration
Research Aim and Objectives

• **AIM:** Enable health professionals to perform the care pathway variance analysis (CPVA) without specialist knowledge of databases or IT systems

• **OBJECTIVES:**
  – Develop CPVA methodology
  – Implement methodology as web-based tool (COCPIT)
  – Test COCPIT using Stroke and Kidney disease data from Salford
  – Specialise COCPIT to CPVA applications
Software Development Approach

• User centred design
• Agile methodology
  – Task list
  – Sprints
  – SCRUM meetings
• C#, Microsoft .net framework (v3), SQL server, Silverlight
ICP definition

Node definitions
- Conditions

Branch nodes
- Branch conditions

Edge definitions
- Start/End Nodes
- Capacity
- Transition times

A
{Condition}

Transition Times
Transition Time Distribution
Variance from expected
Proportion of population
Proportion of expected
Flow capacity
Proportion of capacity utilised

B
{branch condition}

Proportion Transition from non-adjacent node
Proportion Entering Pathway here

Proportion Transition to non-adjacent node
Proportion Leaving Pathway here

Proportion of population
Proportion of expected
Code set search

**Conditions Editor**

**Edit Event Condition**

- **dia**: Compound analgesics A-L (navigational concept)
- **dia1**: Aspirin/paracetamol/codeine tablets (product)
- **diat**: Aspirin+papaveretum 500mg/10mg dispersible tablet (product)
- **diaO**: Co-codaprin 8mg/500mg dispersible tablet (product)
- **dia7**: Co-proxanol 32.5mg/325mg tablet - product
- **diaf**: Equagesic tablet
Condition editor
Data Requirements

• Coded Clinical Events
  – e.g. SNOMED-CT, READ, OPCS, custom
• Clinical event supporting data
  – E.g. HbA1C test result value
• Timestamps
  – Resolution consistent with ICP
• Unique patient identifier
• Optionally demographics
  – Age, gender, ethnicity, etc.
Analysis

• Count of matches to each node
• Count of matches of unique patients to each node
• The point in time a patient matches to each node
• From these values we can also then calculate values such as time between events, and summary statistics for number of node visits and duration.
Comparison of sub-populations
Presentation of Results
Conclusion

• Salford Integrated Record
  – 2.5m events, 100k patients

• Stroke survival analysis
  – Replication of analysis developed by statistician

• Application to data quality analysis
Thank you for listening