The Cost Implications of Non-Completion

A Markov Model

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Plan

• Background
• Aims
• Method
  • Literature review
  • Data
  • Decision tree
  • Markov model
• Results
• Conclusion
Background

- Clinical problem
  - Antibiotic course
  - Post-surgery physio
- Non-completion in PD
- Consequences
  - Health
  - Social
    - Crime
  - Institutional
    - Staff moral
  - Economic
• Economic consequences
  • Criminal justice costs
  • Unemployment costs
  • NHS costs
Aims

- Consequences of non-completion
  - Are non-completers more likely to return to prison and less likely to return to the community?
- Find the cost consequences
  - Do completers and non-completers incur differing costs?
- Is economic modelling a viable method for the evaluation of interventions in PD?
Method | Literature Review

• We looked for:
  • The economic costs of PD
  • The cost consequences of non-completion

• We found:
  • Prevalence data
  • Small cost of illness studies
  • Trials
  • Non-economic consequences of non-completion
Method | Data

- Arnold Lodge PDU
  - 95 cases
  - Up to 10 year follow-up
    - Mean: 5 years
    - Minimum: 6 months
  - Collected yearly
    - Weekly information
Method | Decision Tree

Arnold Lodge Admission

- Treatment Completer
  - M

- Non-Completer
  - M
Method | Decision Tree

- Completion rate
  - 51%
- Average length of stay
  - Completers: 76 weeks
  - Non-completers: 14 weeks
Method | Markov Model

- Why it’s useful
  - Other models – not appropriate
  - Useful when patients easily defined
    - In terms of costs
  - Can simulate real life
  - Used poorly in past

- What we need to know
  - States
  - Transition probabilities
  - Costs
Markov Model | States

- Prison
- Hospital
  - High Secure
  - Medium Secure
  - Low Secure
  - Non-Secure
- Dead
- Community
  - Specialist services
  - Cost can vary dramatically
    - Unlikely in this population
Markov Model | States

- Dead
- Community
- Prison
- Non-Secure Hospital
- High Secure Hospital
- Medium Secure Hospital
- Low Secure Hospital
• Any state to any state
• Markov cycle
  • weekly
• What is the probability than an individual will move from A to B?
  • Proportions?
  • Different for completers/non-completers
  • Weekly timeline of 95 individuals
    • Average weekly chance of transfer
<table>
<thead>
<tr>
<th>Security Level</th>
<th>Cost Per Person Per Week</th>
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<tbody>
<tr>
<td>Community</td>
<td>£186.56</td>
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<tr>
<td>Prison</td>
<td>£721.15</td>
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<tr>
<td>Low Secure</td>
<td>£2,901.32</td>
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<tr>
<td>Medium Secure</td>
<td>£3,811.93</td>
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<td>High Secure</td>
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<tr>
<td>None Secure</td>
<td>£2,019.43</td>
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<tr>
<td>Dead</td>
<td>£0.00</td>
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</tbody>
</table>
Markov Model

Dead
£0.00

Community
£186.56

High Secure Hospital
£5169.79

Prison
£721.15

Non-Secure Hospital
£2019.43

Medium Secure Hospital
£3811.93

Low Secure Hospital
£2901.32

Research making a difference to practice
<table>
<thead>
<tr>
<th>Year</th>
<th>Completers</th>
<th>Non-Completers</th>
<th>Difference</th>
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<tbody>
<tr>
<td>1</td>
<td>£168,234</td>
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<td>5</td>
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<td>£91,312</td>
<td>-£15,535</td>
</tr>
</tbody>
</table>
Conclusion

- Non-completers are likely to incur greater costs
- Increasing completion rate could save money
- An engagement intervention could be cost-effective
- Economic modelling is an ideal way to evaluate such an intervention