Practical Issues in Implementation: Colorectal Cancer Case Study

Miqdad Asaria
Case studies

• Aim to use case studies to illustrate
  – Practical issues in implementation
  – Presentation of results to decision makers
Colorectal Cancer Screening

• Differential impact of disease
  – Association between socio-economic deprivation and incidence of CRC

• Differential impact of healthcare (i.e. screening)
  – Association between socio-economic deprivation and screening uptake
  – Screening for CRC reduces mortality

• Tappenden et al evaluated population-based colorectal cancer screening programmes
  – Focus on biennial FOBT between ages 50-69 combined with follow up colonoscopy (our base case strategy)
  – Aim to adapt evaluation to estimate adjusted distribution
Data for Standard CEA

- CRC incidence
- CRC progression
- CRC HRQoL
- CRC mortality
- Non-CRC mortality
- CRC treatment costs
- By strategy
  - Uptake of screening
  - Uptake of follow up colonoscopy
  - Screening costs
Additional for Framework

- Value judgements to distinguish unfair inequalities
  - In this case inequalities associated with deprivation and ethnicity are deemed unfair

- Parameters that vary by demographic variables of interest to calculate health gains and costs by group
  - Pilot studies gave odds ratio for screening/colonoscopy uptake by
    - Gender, age, deprivation and ethnicity
  - For other parameters such as mortality
    - IMD used for deprivation in other studies but selected ethnicity variable less common

- Population size and life expectancy by variables of interest to calculate health levels
  - Covariance between ethnicity and IMD not reported

- How to allocate opportunity costs of this programme
  - Assume equal across all users of NHS
Comparator Strategies

• Hypothetical comparator policy
  – Social marketing to increase screening and follow up colonoscopy uptake
  – 100% uptake of both in all groups (max possible gain)
  – Arbitrary cost £100 million

• Results by variables of interest in terms of expected
  – Level of health
  – Change in health
Unadjusted Bivariate IMD

Total Health by Socio-Economic Group

- **FOBT**
- **FOBT+marketing**

QALYs

<table>
<thead>
<tr>
<th>Socio-economic deprivation</th>
<th>Most deprived (IMD5)</th>
<th>IMD4</th>
<th>IMD3</th>
<th>IMD2</th>
<th>Least deprived (IMD1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.0091</td>
<td>0.0082</td>
<td>0.0082</td>
<td>0.0072</td>
<td>0.0047</td>
</tr>
</tbody>
</table>
Unadjusted Bivariate Ethnicity

Total Health by Ethnicity Group

- ISC1_4
- ISC5

QALYs

- FOBT
- FOBT+marketing

0.0046
0.0066
Adjusted Univariate (per person)

Univariate Health Distribution

QALYs

- FOBT
- FOBT + £100 million marketing

Lowest health level → Highest health level

0.0092 0.0091 0.0083 0.0079 0.0080 0.0083 0.0073 0.0069 0.0048 0.0038
Treatment Effect (per person)

- **QALYs**
  - IMD5*ISC1_4
  - IMD5*ISC5
  - IMD4*ISC1_4
  - IMD4*ISC5
  - IMD3*ISC1_4
  - IMD3*ISC5
  - IMD2*ISC1_4
  - IMD2*ISC5
  - IMD1*ISC1_4
  - IMD1*ISC5

- **Screening uptake**
  - Health
  - FOBT
  - Colonoscopy
Discussion

• Additional data
  – CEA limited by prior data collection and adjusted analyses
  – Easier to accommodate common socio-demographic variables
  – Covariance an issue in parameter estimation and population size

• Small absolute differences
  – In health per person, in gradient and measures of inequality
  – Should results be presented per person or at population level?

• Further work to characterise uncertainty
  – In parameter values
  – In value judgements

• In further case study work what should we aim to illustrate?