Evaluating the UK Breast Screening Programme

Study design and practicalities

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Background

- UK breast screening programme started in 1987
- Decrease in breast cancer mortality rates since 1990
- Debate over relative contribution of screening and treatment changes
- Requirement to evaluate effectiveness
Difficulties of evaluating population screening programmes

- Lack of control group in most programmes
- Dilution
- Self-selection bias
- Confounding
- Small size of effect
UK evaluation study aims

• Primary
  Estimate effectiveness of the NHS breast screening programme in reducing breast cancer mortality

• Secondary
  Estimate effect of programme on death from all causes and all cancers
  Estimate effect of screening policy changes on effectiveness of the programme
Study design

• Cohort study
  Retrospective and prospective

• Exposure
  Screening data from national call/recall system

• Outcome
  Death registrations from UK Office for National Statistics
  Predicted breast cancer mortality
Control group

Staggered start to UK programme allows identification of contemporary comparison group

No. of screening areas

Start date

Early starting areas

Late starting areas
Dilution, bias, confounding & size of effect

- **Dilution**
  - Individual-level data

- **Self-selection bias**
  - Analyse by intention to treat

- **Confounding**
  - Socio-economic status
  - Treatment data

- **Size of effect**
  - Powered for 15% mortality difference after 7 years
Study area

- Choice of area:
  Feasibility of data collection
  Screening start date

- 38% of screening population of England & Wales (33% of UK)

- Representative of UK

- Cohort size: 4M
Health area re-organisation and data protection

• 2002: major re-organisation of health areas in England and Wales

• Climate of increased data protection

18 months to obtain permission to collect data
Obtaining individual mortality data

- Standard methods are impractical
  - Cost
  - Time

- Exploration of alternative data sources and linkage methods
Progress

- Collection of cohort
  2.7M women of eligible screening age up to 1995

- Collection of exposure data for these women
  7.3M screening episodes up to end 2004

- Method for collection of mortality data developed and piloted
Next stages

• Collection of mortality data

• Data validation

• Preliminary analyses

  Effect of screening programme 1995-2001
Concluding remarks

- Evaluation of population screening is technically and practically challenging

- Major hurdles can be overcome