Investigating the utility of period survival analysis in measuring variation in long term prognosis of cancer patients by West Midlands acute NHS Trusts

NCIN & UKACR Annual Conference
15-17 June 2011, Hilton London Metropole

Dr Tim Evans
West Midlands Cancer Intelligence Unit

Tel: 0121 414 4274    Fax: 0121 414 7712
e-mail: tim.evans@wmciu.nhs.uk

Acknowledgements

Paul Dickman, Karolinska Institute
Advise and guidance on use of strs programme

John Broggio & Catherine Bray, WMCIU
Analysis and discussion
Aims

Identify any significant differences in survival at different Trusts in WM

Introduction

Survival – it’s important

**Question:** Is mortality an appropriate outcome indicator? Are there others to be considered?

**What was said:** ‘independent survival’ - a more positive outcome measure than mortality

**Govt response:** measures of survival rather than mortality allow a more accurate reflection of the NHS’ contribution to helping people to recover
Introduction

Three characters:

Dr George

Dr Mario

The Analyst - Bill

The problem

Data Please!!

2000

Dr George

The Analyst - Bill

West Midlands Cancer Intelligence Unit
The problem

Dr George

Not happy!
Not my cases

The Analyst - Bill

Sad! How to solve?

The problem

Dr Mario

....I see mainly old and deprived

The Analyst - Bill

Interesting! How do I solve?
The solution?...

How to solve?

Perhaps....

Eureka!

What do these numbers represent?

71.2

81.5

77.2

71.2
Life expectancy

Two methods:

Cohort – looks at the mortality rate of a 65yr old person in 2004, a 66yr old person in 2005 and so on

Period – looks at the mortality rates in a given period i.e. in 2004 the mortality rate of 65, 66 and 67yr olds was…….

Period analysis assumes no change in mortality rates in future

Application to survival analysis
Method

I have a method

Case mix problem? Sorted...

Results

What did Bill do?

• Assigned a Trust ‘first seen’ to each tumour
  ▪ Cancer Waiting Times (CWT)
  ▪ WMCIU internal algorithm
    – ~97% match

• Common Cancers

• Trusts with large caseload
  ▪ >8,000 cases across 4 common cancers
    – Diagnosed 1998-2009
What did Bill do?

- Selected survival period 2007-2009
- Used deprivation specific life tables
- Investigated age standardised survival method
  - Dropped from analysis

Results: 10 yr Breast RS

[Bar chart showing relative survival rates for different trusts, indicating periods of analysis and cohort analysis.]
Results: 5 yr Lung RS

Results: 5 yr Bowel RS
Results: 5 yr Bowel RS

Dr Mario’s Trust

Results: 10 yr Prostate RS
Results: 10 yr Breast RS

None of these data truly adjust for case mix

Warning!
Results: 5 yr Lung RS

[Bar chart showing relative survival rates for different trusts, with Dr George's Trust highlighted.]

West Midlands Cancer Intelligence Unit
Excess mortality rate ratio

Lung Cancer 0-5 Years

Dr George’s Trust

Unadjusted EMRR
Adjusted EMRR

West Midlands Cancer Intelligence Unit
Conclusions: who is happiest?
Three characters:

- Dr George
- The Analyst - Bill
- Dr Mario
Recap

Differences between period and cohort method

  Recency vs. statistical efficiency

  Cohort and period tell different story

Effect of small improvements in survival

Age standardisation

Further work
  Extension of EMRR to extract RS estimates
  Apply to Trust of surgery

Thank you

Any questions?
Bonus Slides! – Prostate

West Midlands Cancer Intelligence Unit

Bonus Slides! – Breast

West Midlands Cancer Intelligence Unit