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International differences in breast cancer survival and 'cure': impact of social deprivation

A comparative study of England and Australia

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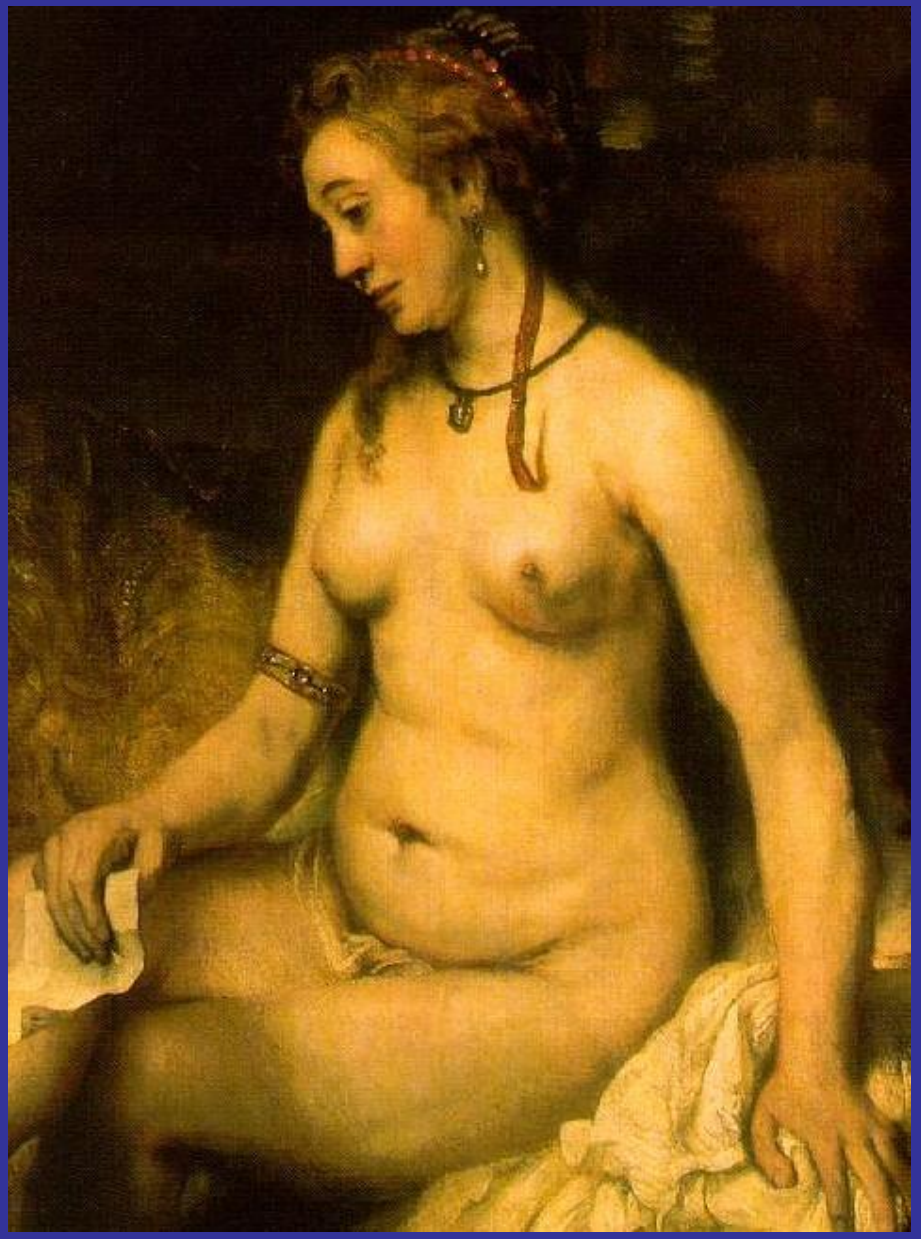
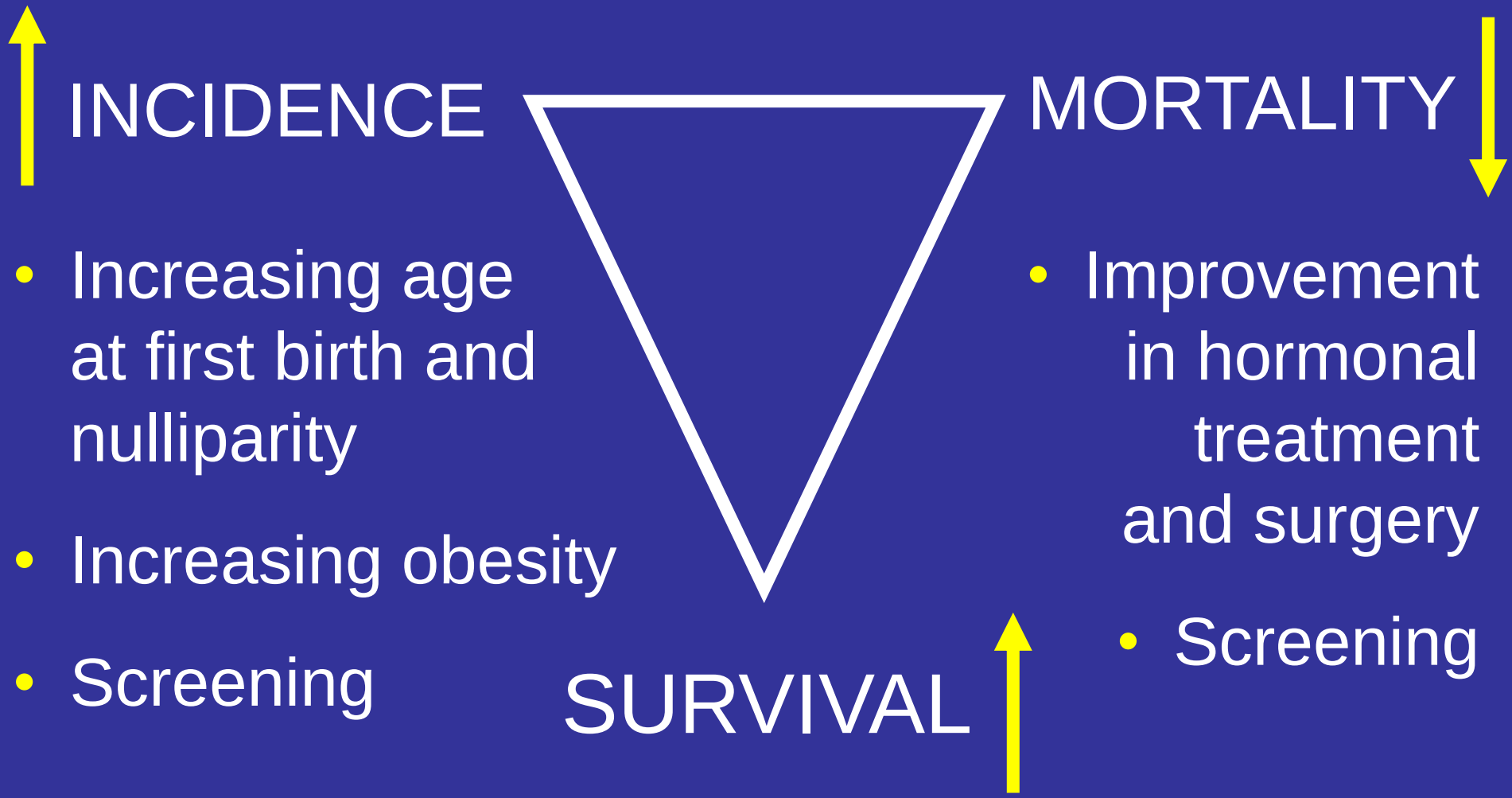
Breast cancer - overview

- Worldwide, the most common malignancy in women
- 20% of all cancers
- 36,000 cases diagnosed in England and Wales during year 2000
- 10% of the female population of Leeds



Breast cancer overview



- Increasing age at first birth and nulliparity
- Increasing obesity
- Screening

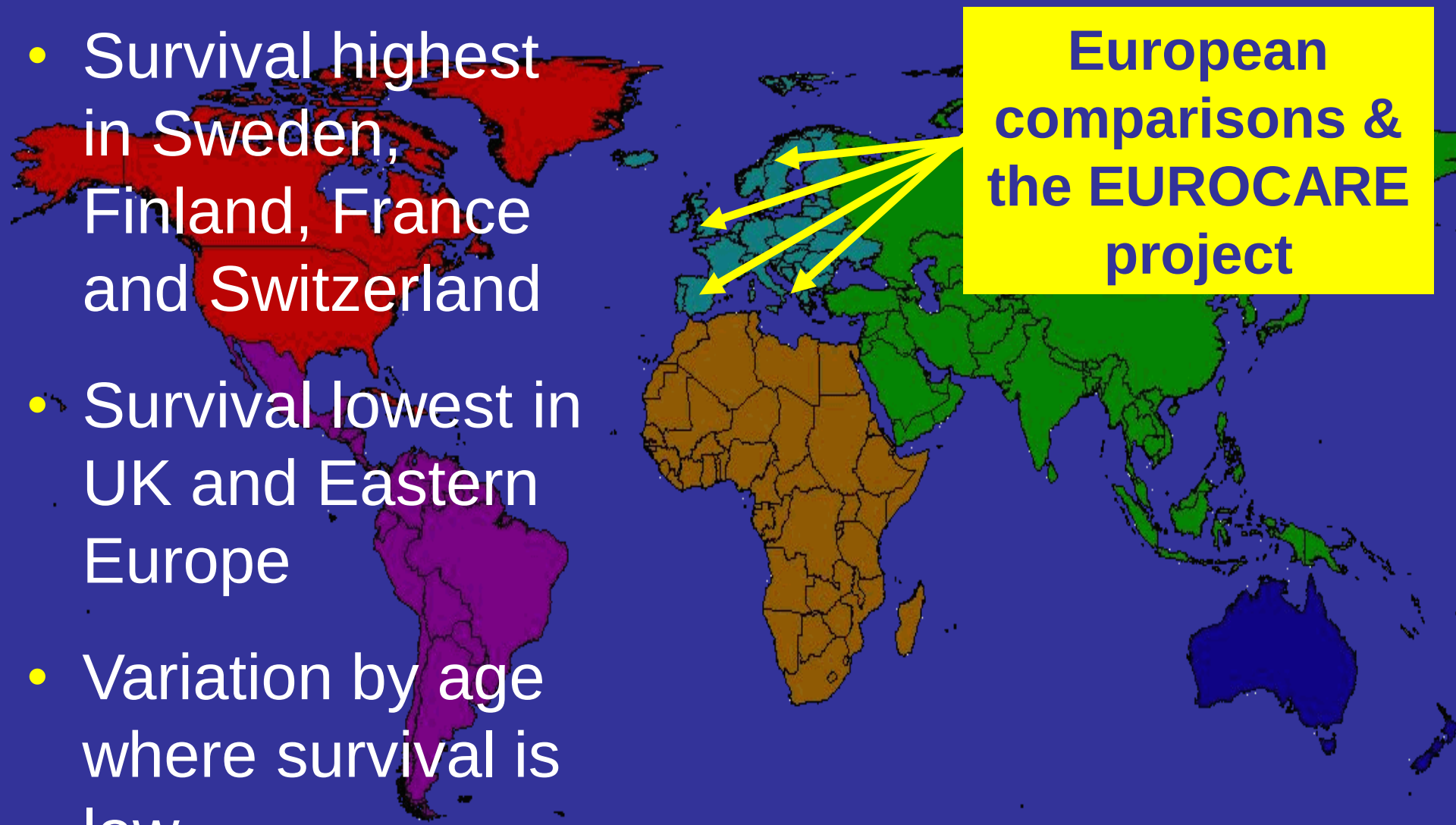
- Improvement in hormonal treatment and surgery
- Screening

Measuring cancer survival

- Preferable measure for patient and clinician
- Separate studies are difficult to compare:
  - Reliant on accurate recording of dates (birth, diagnosis, death)
  - Different statistical methods
  - Inclusion (and exclusion) criteria

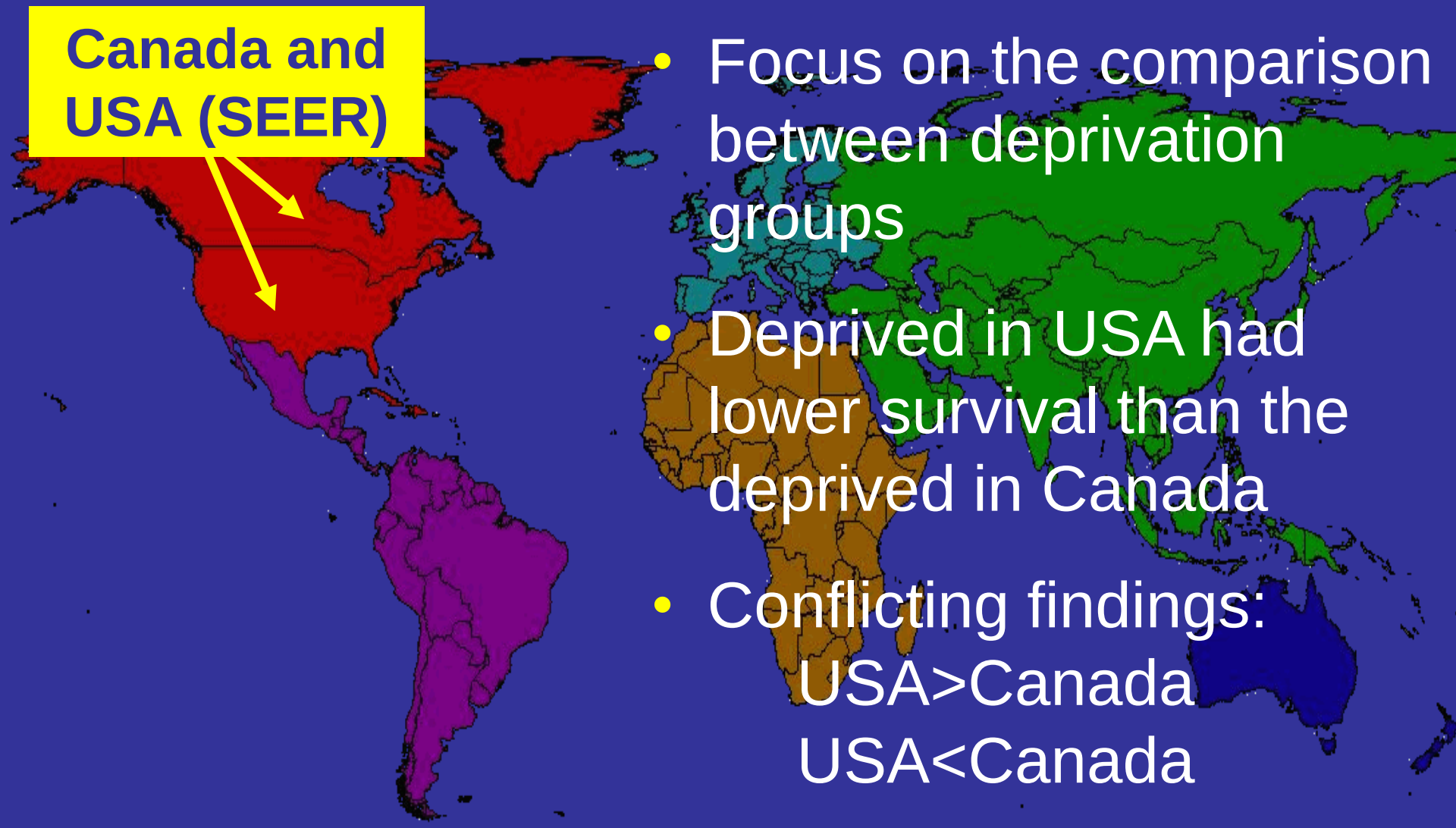
Comparative studies

- Survival highest in Sweden, Finland, France and Switzerland
- Survival lowest in UK and Eastern Europe
- Variation by age where survival is low



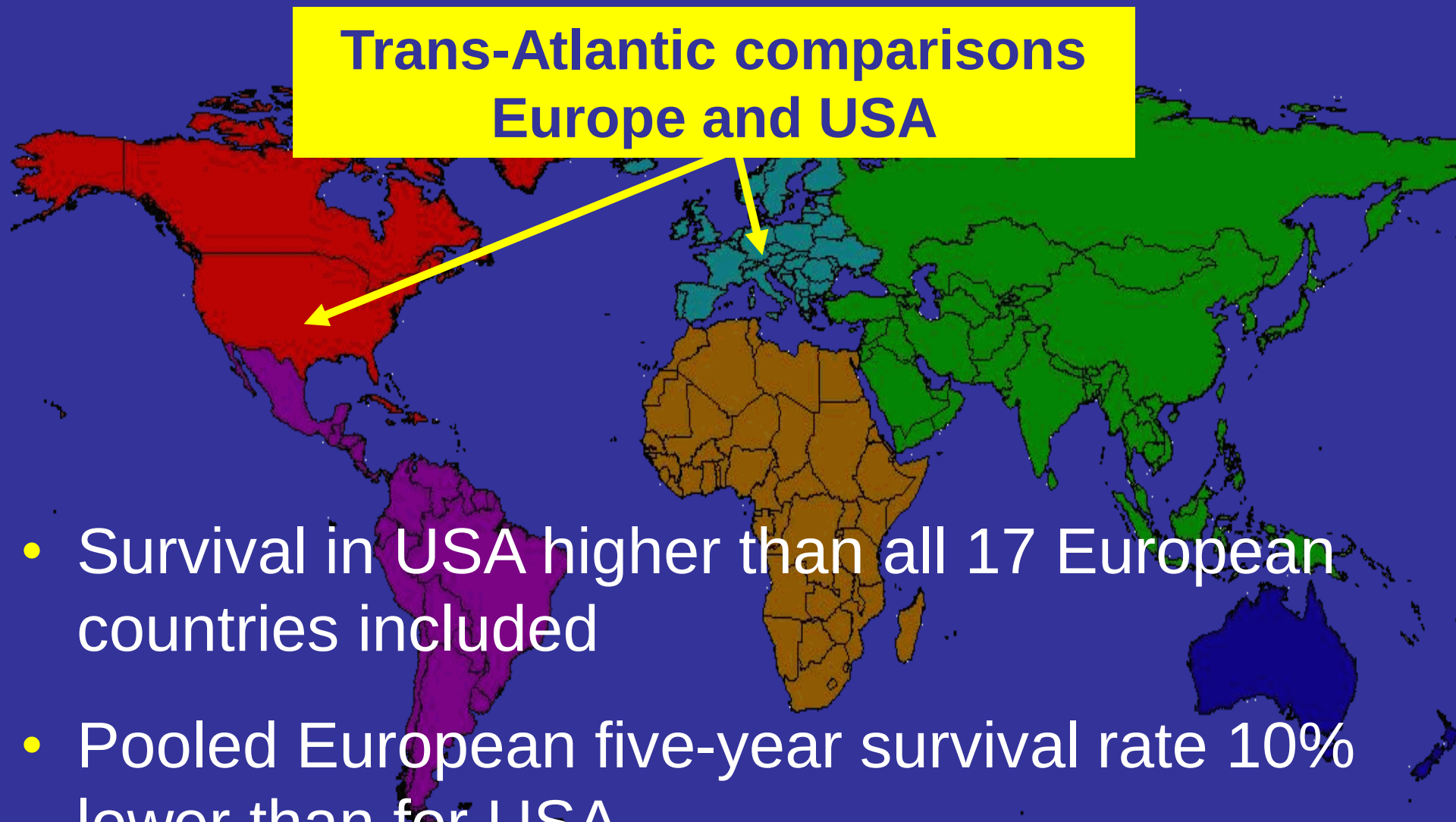
European comparisons & the EUROCARE project

Comparative studies



- Focus on the comparison between deprivation groups
- Deprived in USA had lower survival than the deprived in Canada
- Conflicting findings:
  - USA>Canada
  - USA<Canada

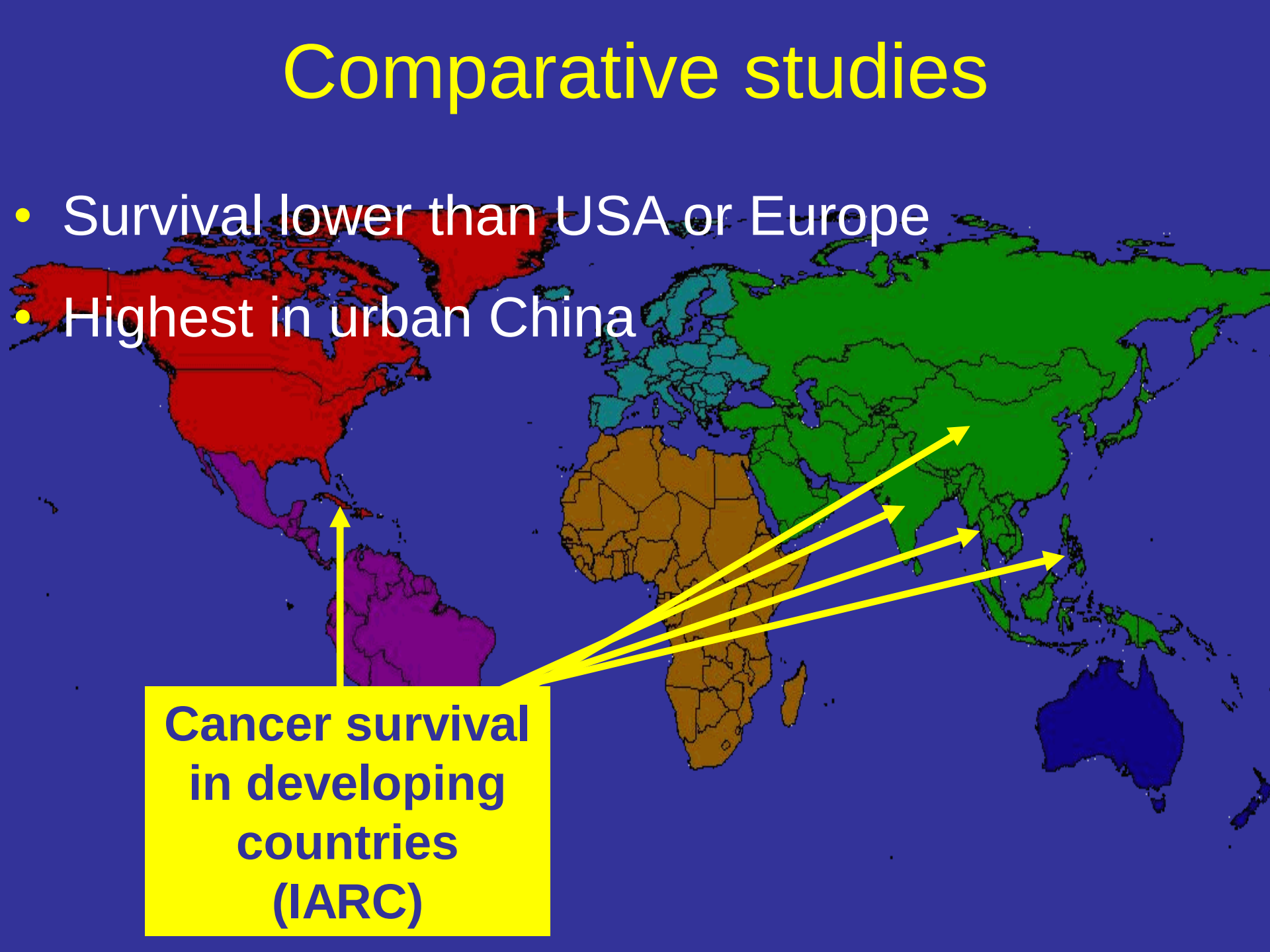
Comparative studies



- Survival in USA higher than all 17 European countries included
- Pooled European five-year survival rate 10% lower than for USA

Comparative studies

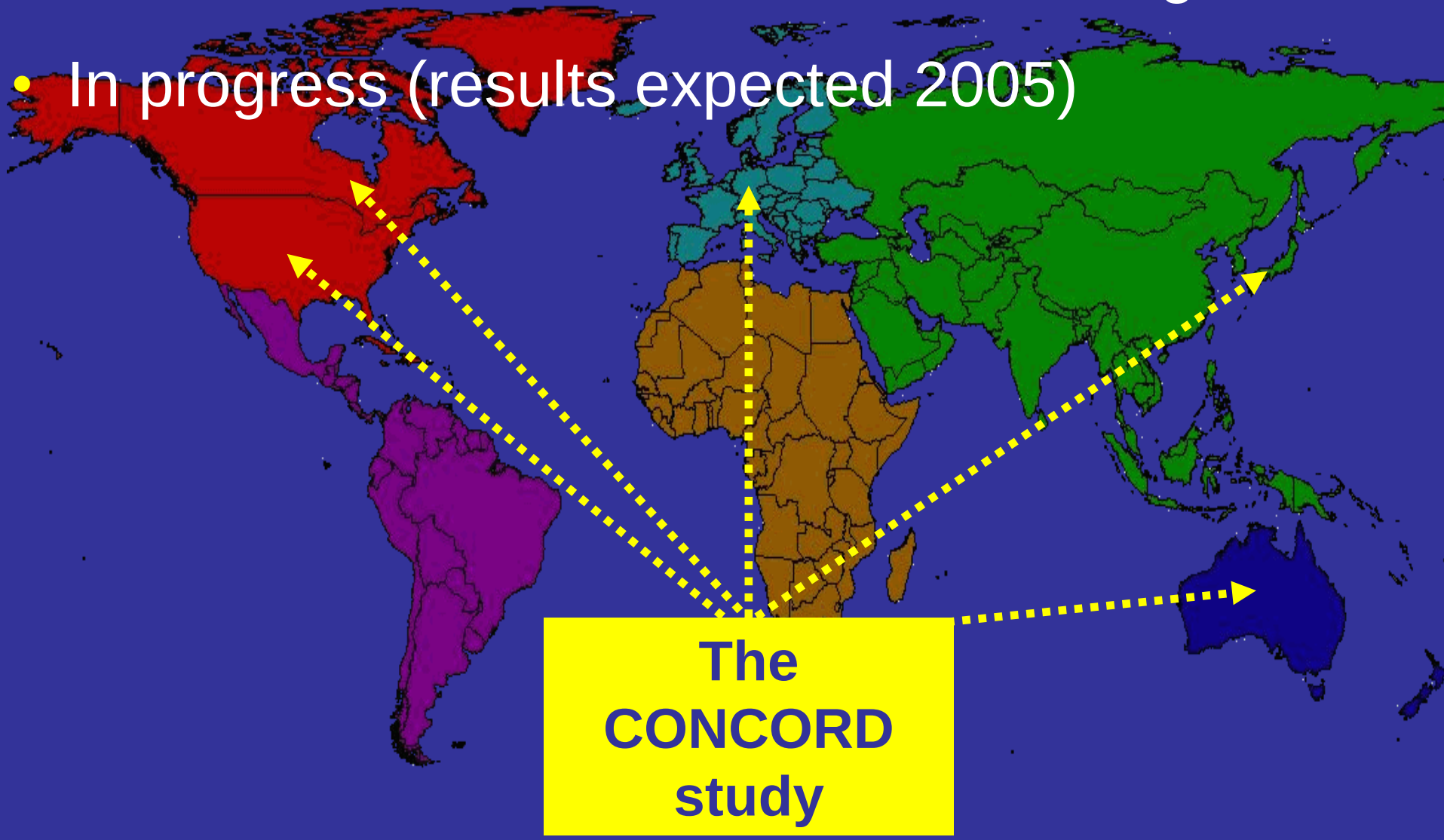
- Survival lower than USA or Europe
- Highest in urban China



Cancer survival in developing countries (IARC)

Comparative studies

- International collaboration of cancer registries
- In progress (results expected 2005)



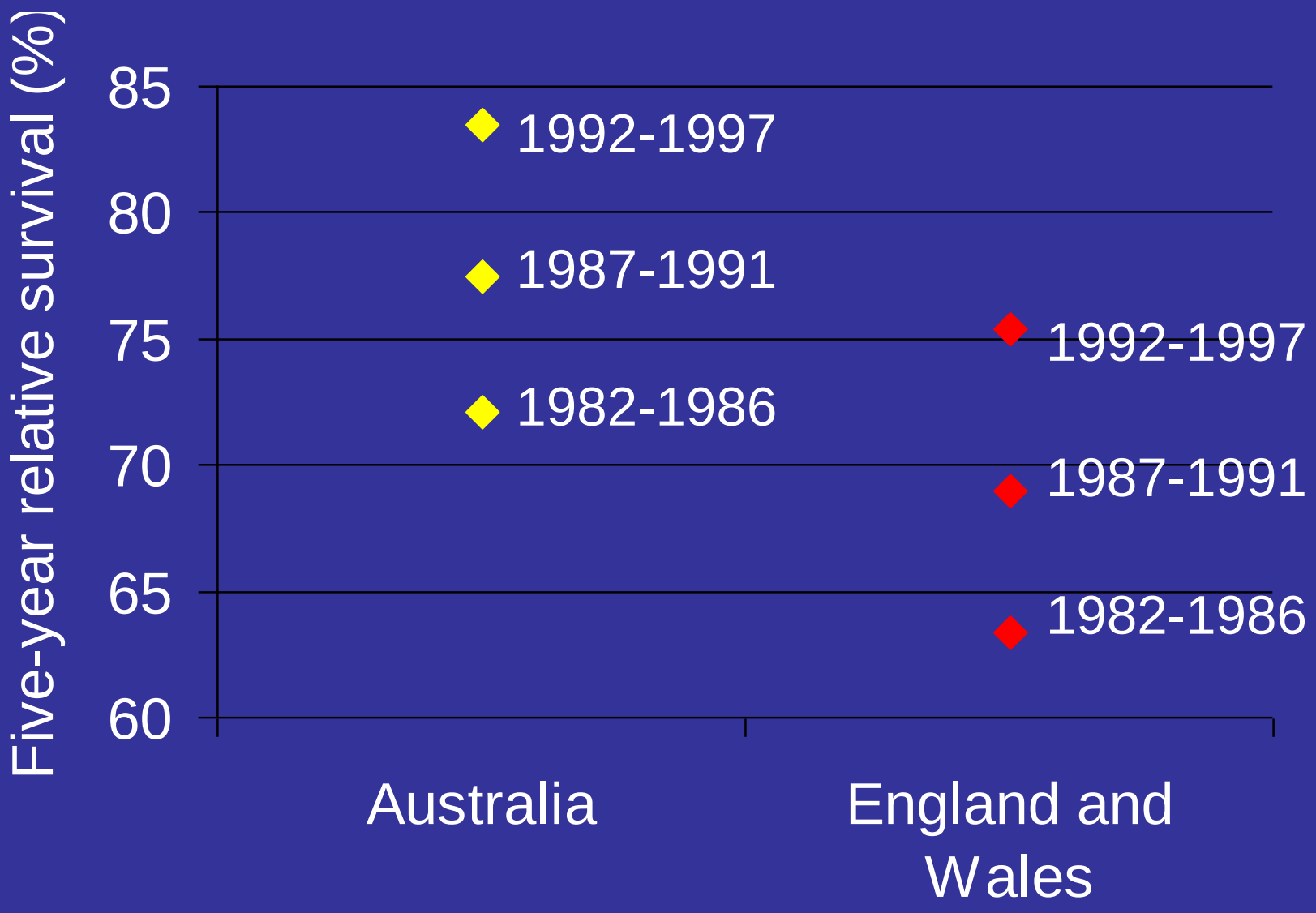
Implications from literature review

- Comparable data
- Comparable statistical methods
- National and sub-national analyses
- Adequate adjustment for age at diagnosis
- Multi-variate analyses
- Inclusion of diagnostic delay and treatment
- Adjustment for deprivation

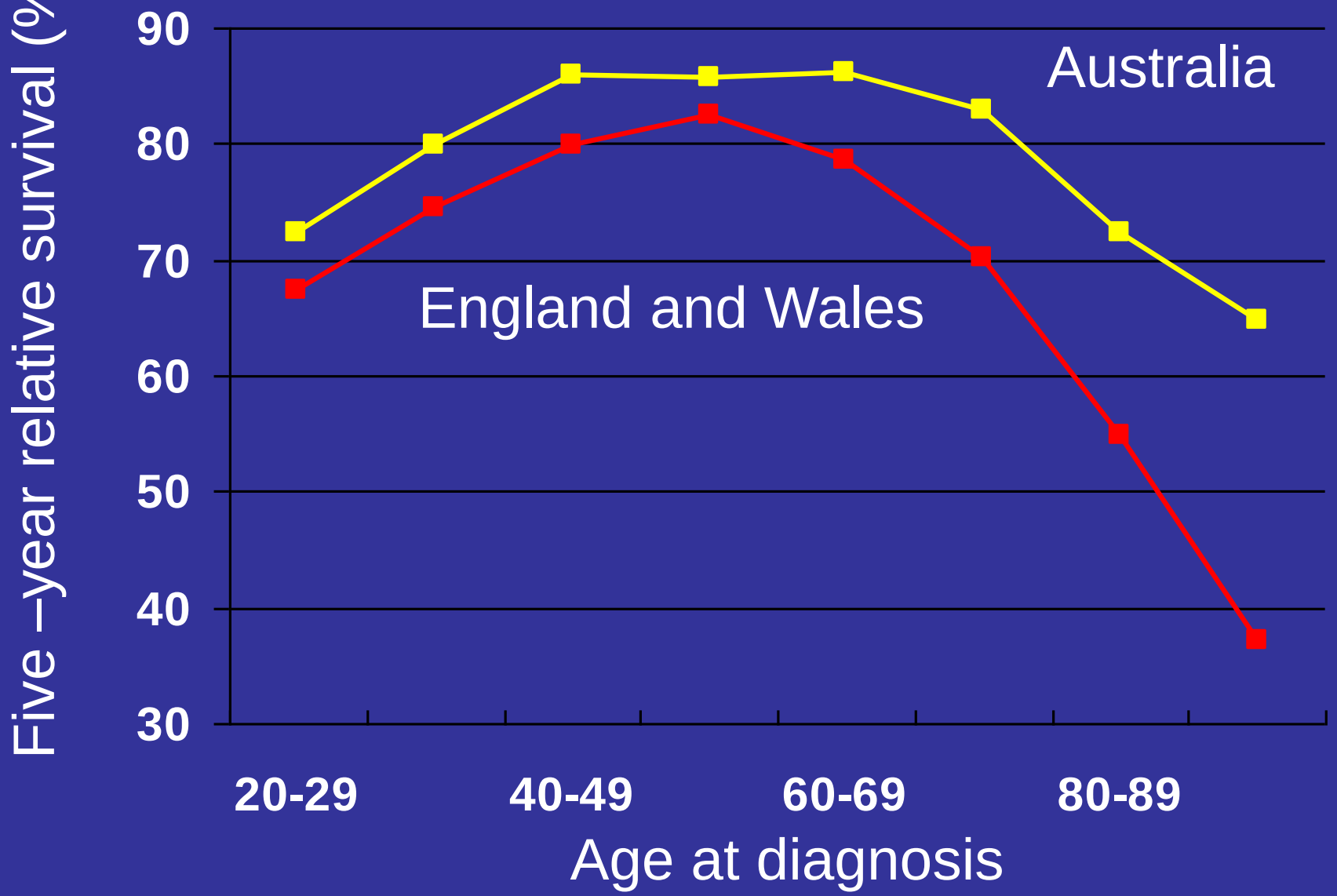
Comparison of breast cancer survival in Australia and England

- Extend comparative studies to Australasia
- Important similarities
  - Nationalised health care
  - Caucasian population
  - National cancer registration
- Important differences
  - Survival rates
  - Deprivation gap in survival

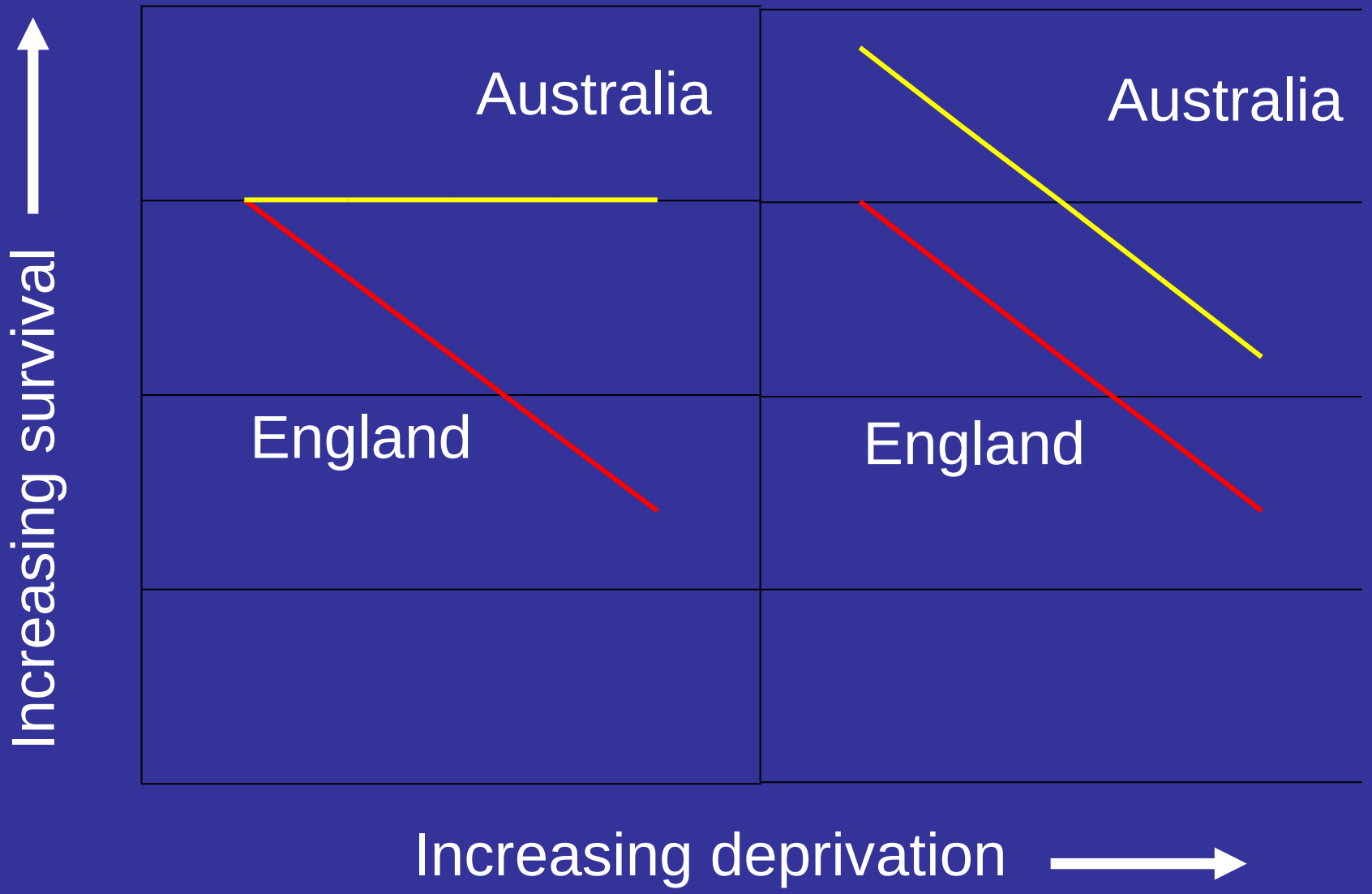
Survival contrasts



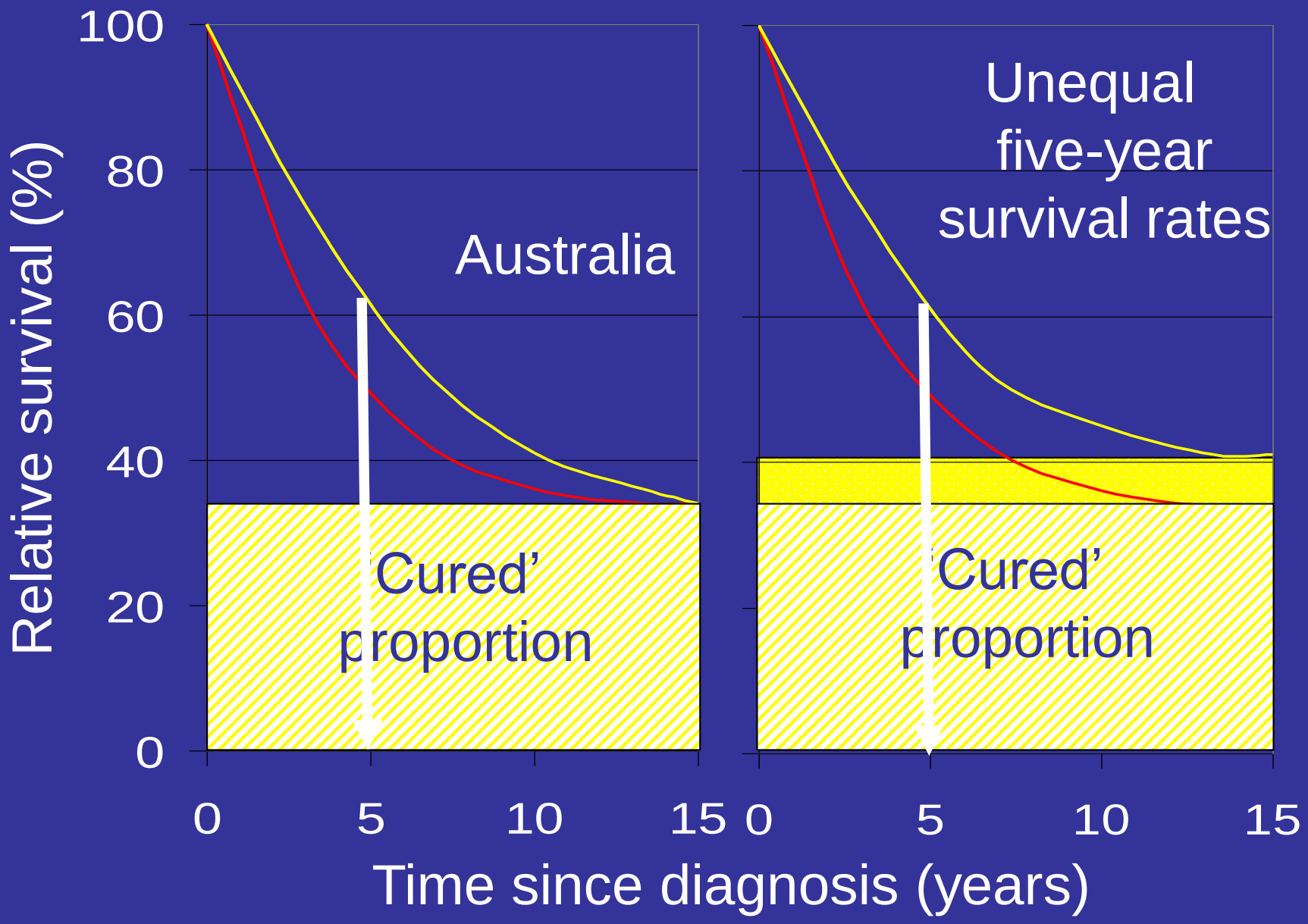
Survival contrasts



Survival contrasts



Survival contrasts



Aims

- Describe epidemiology of breast cancer
- Quantify the Australian advantage
- Compare the proportion ‘cured’
- Investigate reasons for differences
  - Between Australia and England
  - Within Australia and England
- Investigate the role of within-country variability in international differences

Planned analysis

- National data (‘big picture’) and registry data (detailed analyses)
- Incidence, relative survival and ‘cure’
- Several covariates:
  - deprivation category
  - age at diagnosis
  - stage of disease at diagnosis
  - screening history
  - time period of diagnosis

West Midlands Cancer Intelligence Unit

New South Wales Central Cancer Registry

- Population 5.3 million (West Midlands)

  6.4 million (New South Wales)
- Register c.3000 breast cancer cases per year
- Consistent geographic boundaries 1980-2004
- Screening history available for all women through national screening programme

Data: Breast cancers 1980-2004

Variables required	National Data	Registry Data
Patient and tumour identifiers	X	X
Dates of birth, diagnosis and death or censoring	X	X
Data quality indicators	X	X
Region/ State at diagnosis	X	
Area-based deprivation category		X
Tumour characteristics		X
Screening history		X

Measuring deprivation

- No individual measure in cancer registry data
- Area-based scores (census data)
- Several indices available
  - Carstairs, Townsend, IMD (England)
  - Townsend, SEIFA (Australia)
- Several possible geographies
  - English EDs (’91), OAs, Super-OAs (‘01), wards
  - Australian Collection districts (CDs)

Methods

- Relative survival analysis
  - Adjusts for background mortality
  - Permits valid comparisons between different groups of cancer patients
  - Country- and deprivation-specific life tables
- Age standardisation of survival
- Cure analysis
  - Testing of currently available models
  - Development of a more robust cure model

Research conducted in collaboration with the
West Midlands Cancer Intelligence Unit
and the
New South Wales Central Cancer Registry

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