

Socio-economic and international  
differences in cancer survival –  
*can we do better?*



**NAACCR Annual Meeting, Toronto ON, Canada  
11 June 2002**

# Variations in cancer outcome

- **Public education and culture**
- **Extent of disease at diagnosis**
- **Equality of access to optimal treatment**
- **Implementation of best practice**
- **Organisation of treatment services**
- **Human and financial resources**

# *Can we do better ?*

- **Methodology**
- **Scope of data and analyses**
- **Output of results**
- **Impact on health policy**
- ...
- *To achieve equity in cancer control*

## Can we do better ? *methods*

- Standardise analytic methods
  - estimate, explain, intervene, monitor
- Develop SES-specific life tables
- Quantify avoidable deaths
- Model the impact of covariates
- Quantify *trends* in socio-economic gradient
- Quantify trends in population "cure"

# Survival analysis for population studies

*Cancer patients do not all die of cancer*

- **Relative survival**

- separates cancer risk and background risk (everyone)
- uses vital statistics to account for background risk
- survival relative to that of general population

- ***Advantages***

- does not require information on cause of death
- long-term survival (cancer hazard falls, other hazard rises)
- enables estimation of avoidable deaths (excess mortality)

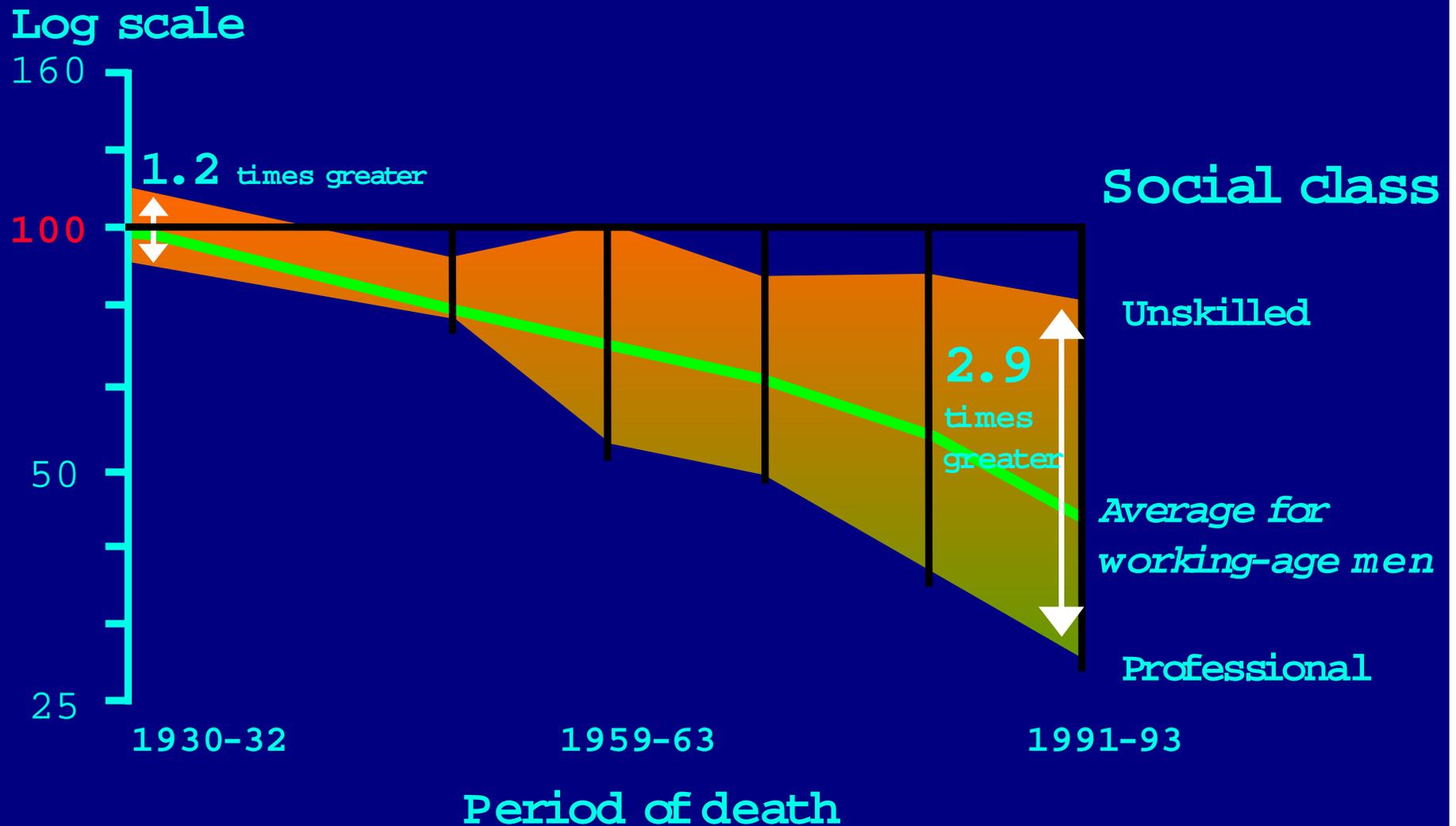
# Relative survival - expected mortality

Background risk of death (life tables)  
by age

- sex
- calendar year (period) of death
- country or region
- socio-economic status
- race or ethnic group
- ...

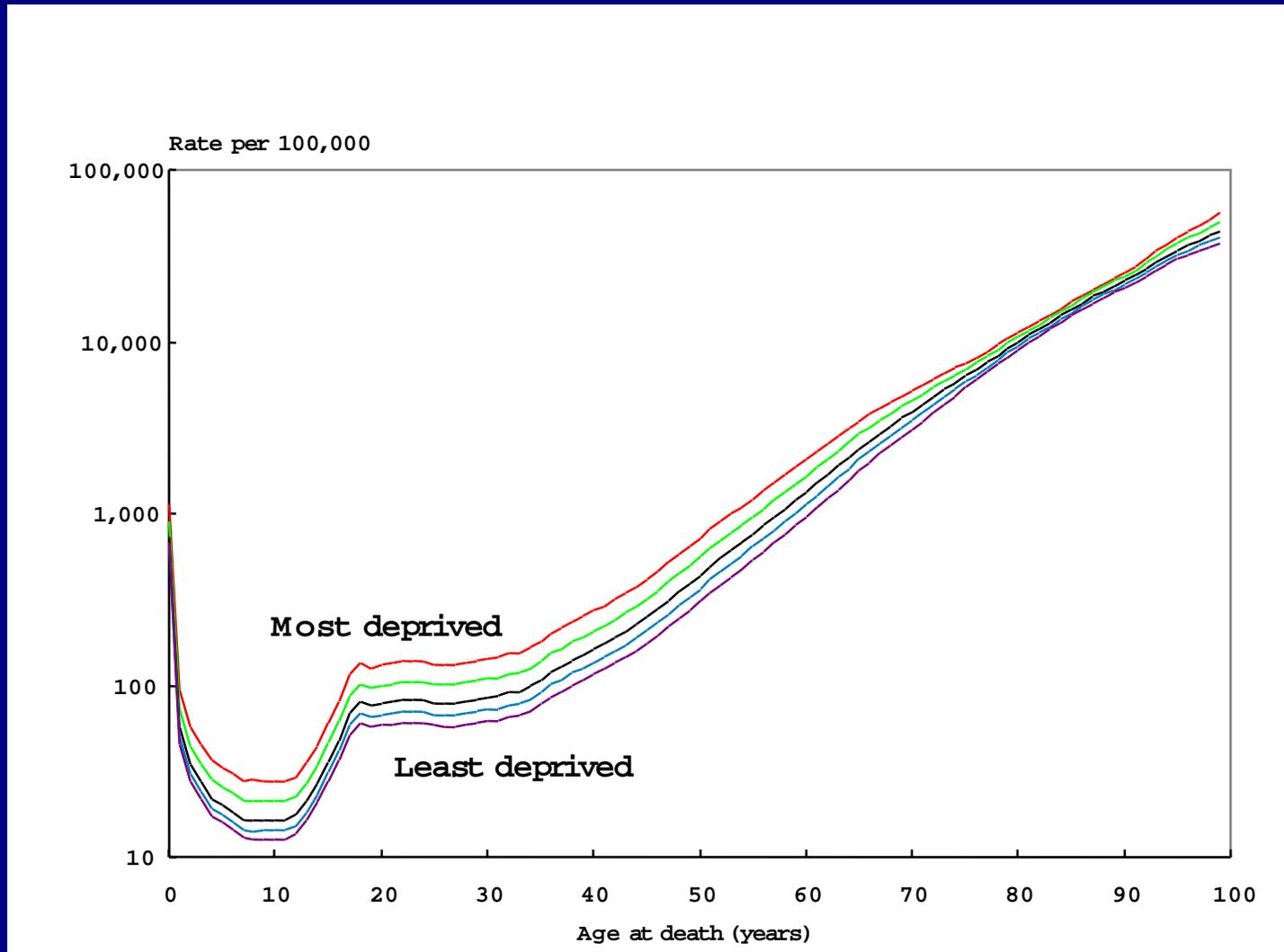
# The widening health gap in England and Wales

*Death ratios by social class, men 15-64 years, 1930-1993*

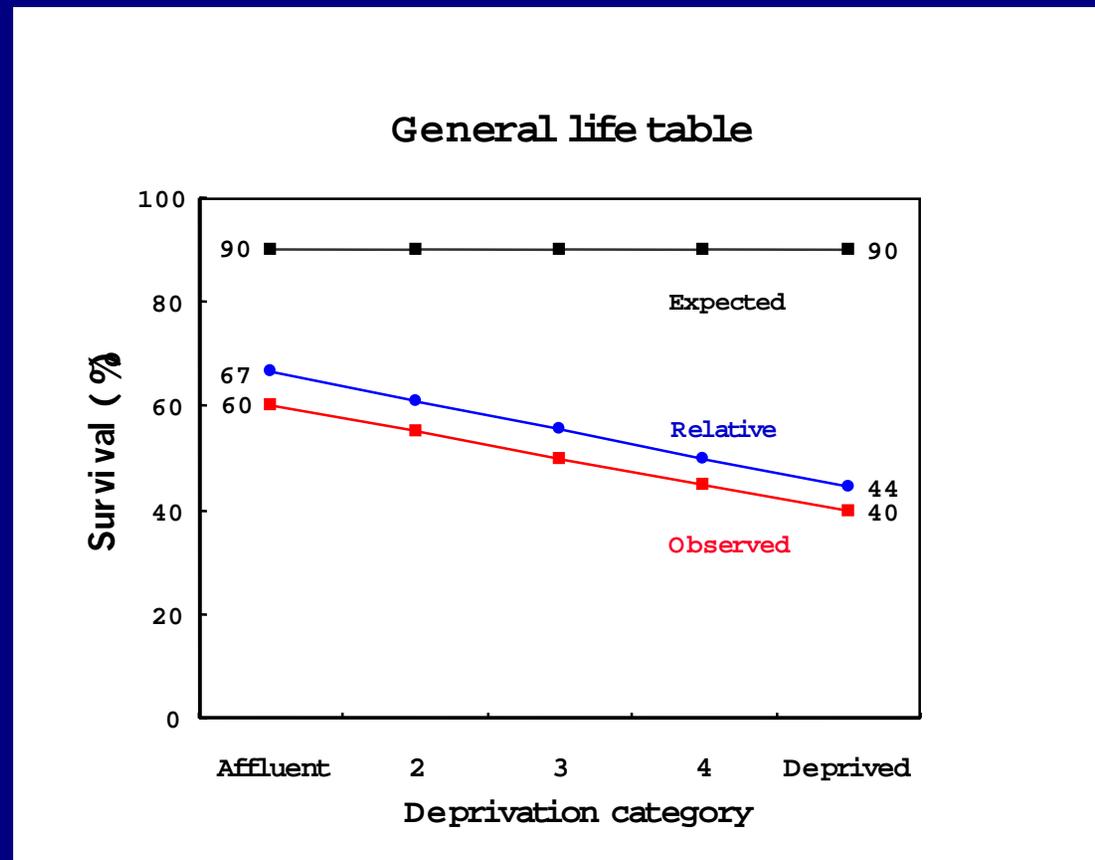


*Adapted from OHN web-site, Dec 2000*

# Death rates by deprivation category: males, England and Wales, 1990-92

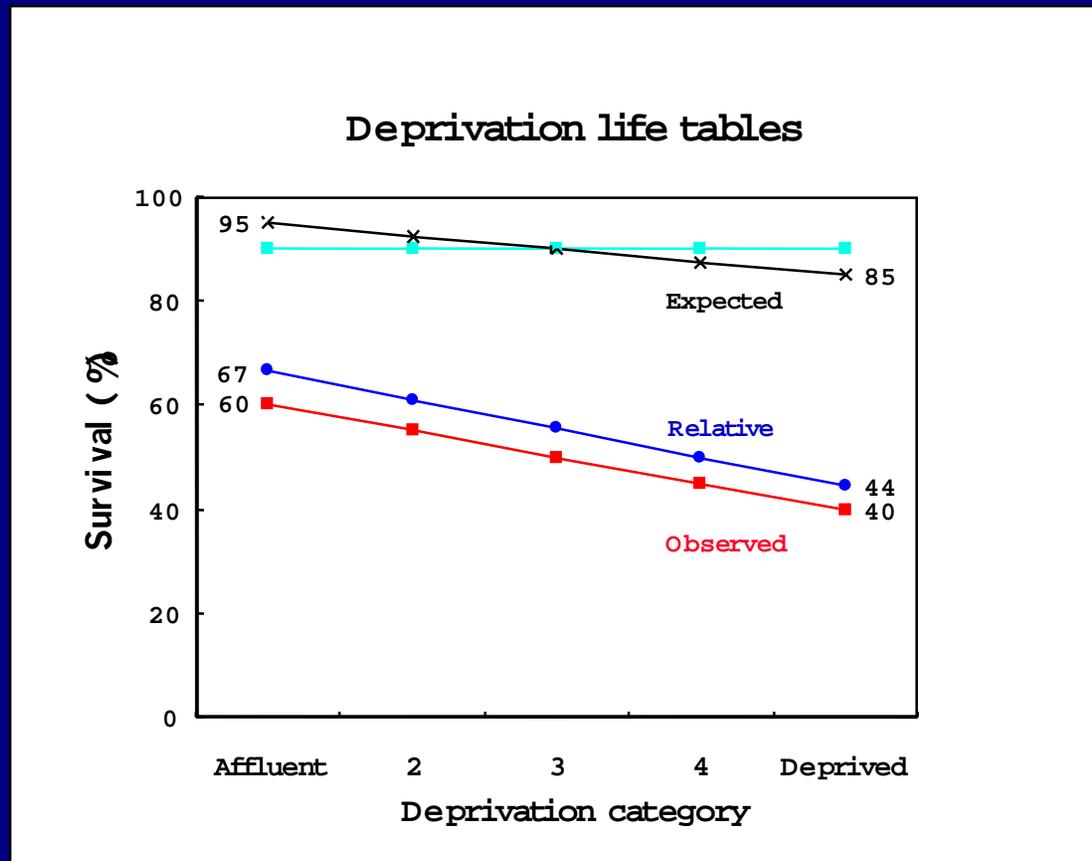


# Life tables and bias in deprivation gradient - 1

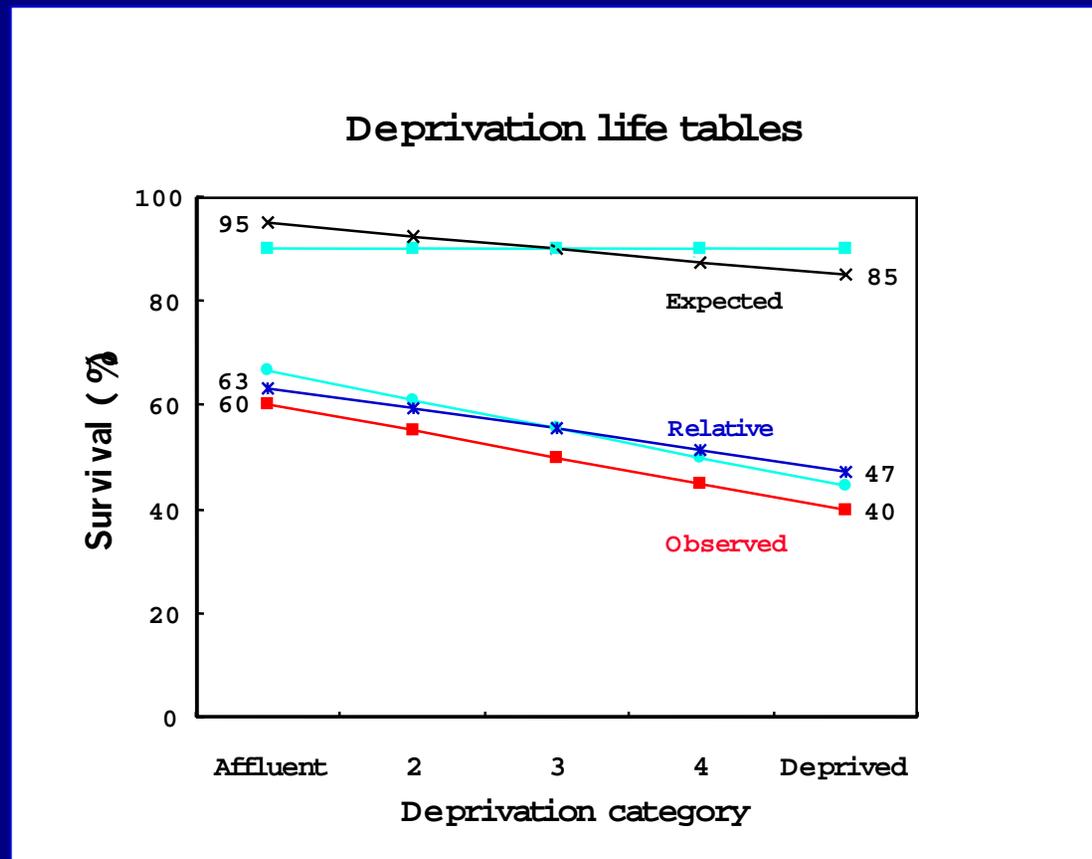


23 % gap in relative survival between affluent and deprived

# Life tables and bias in deprivation gradient - 2

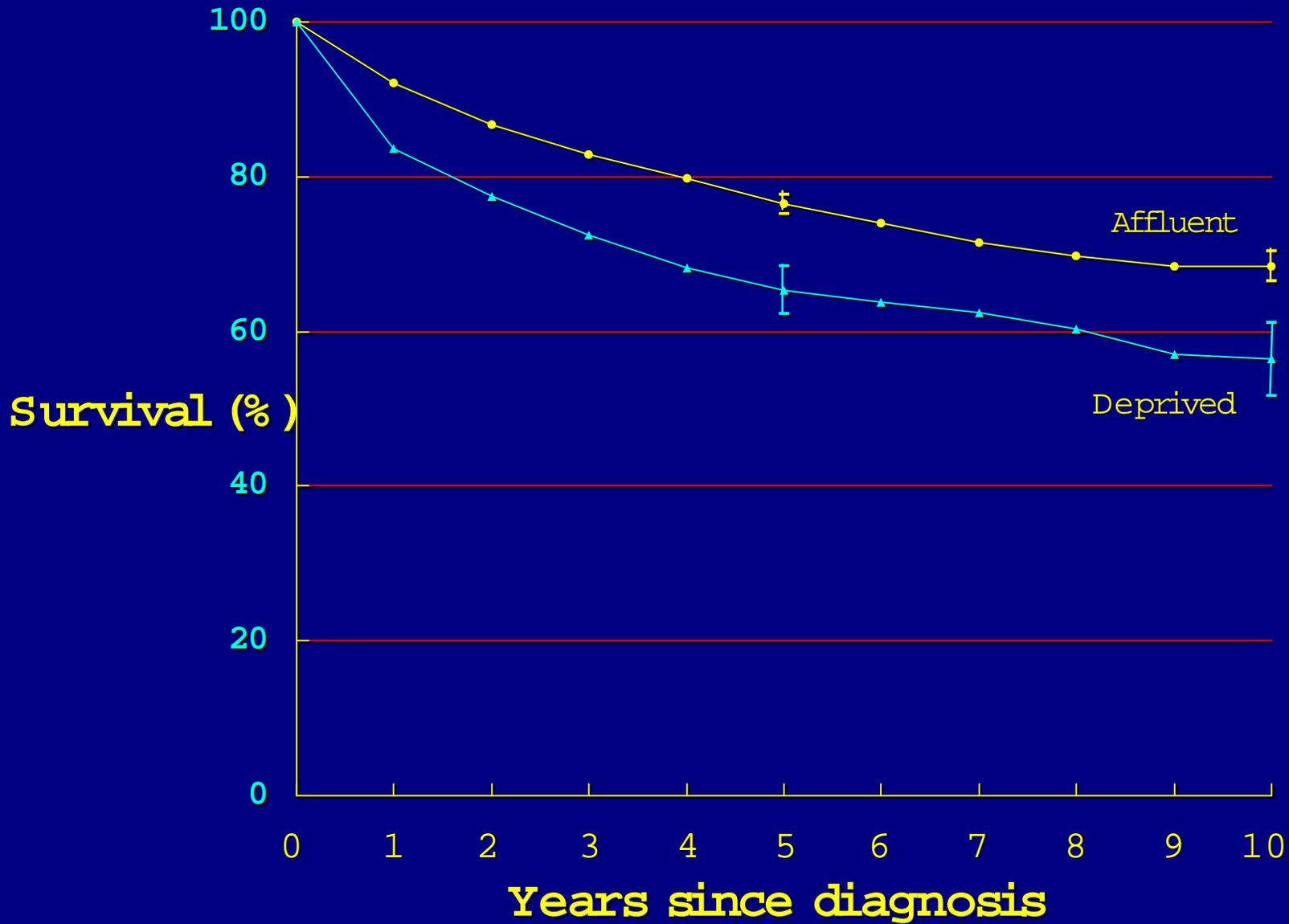


# Life tables and bias in deprivation gradient - 3



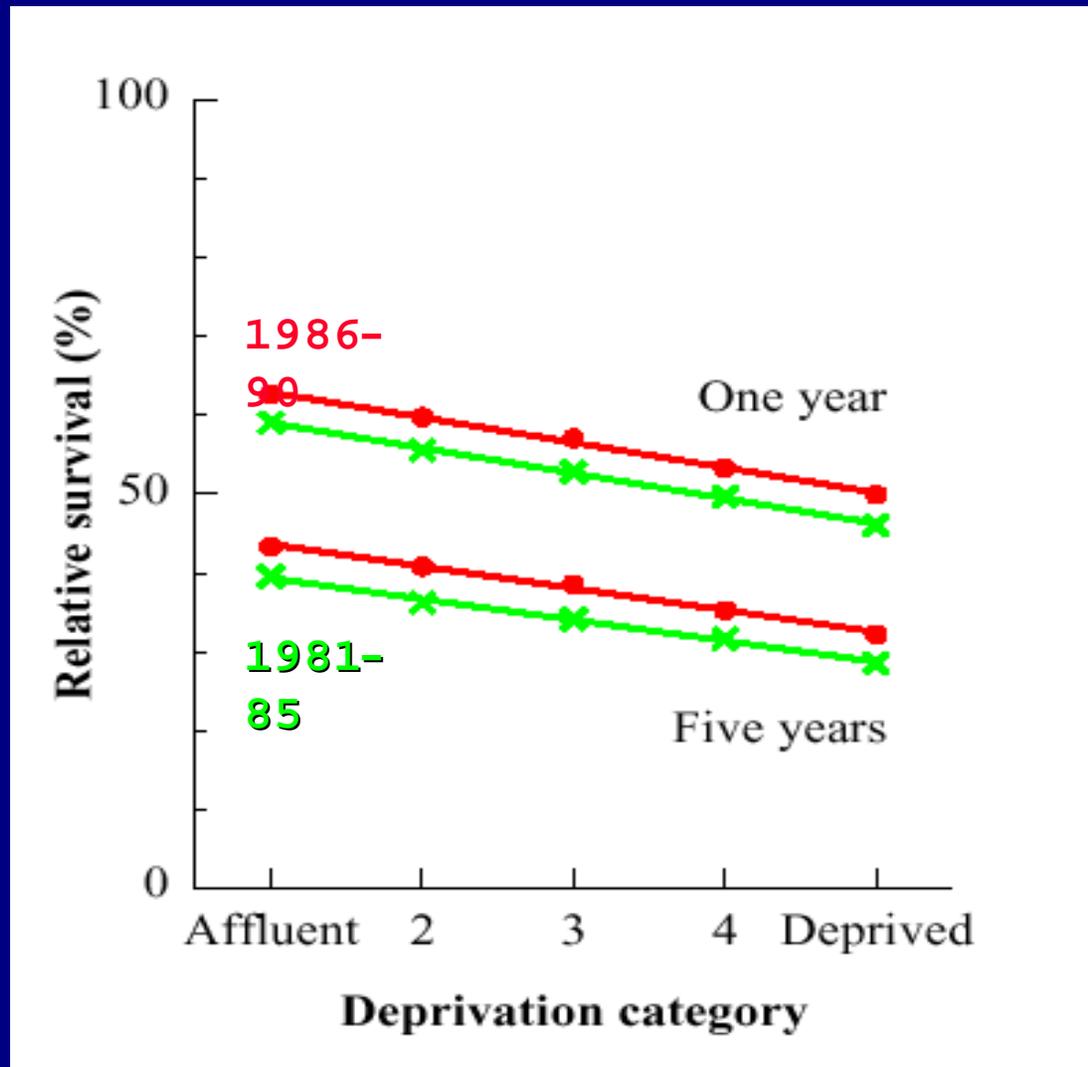
16 % gap in relative survival between affluent and deprived

# Breast cancer survival and deprivation



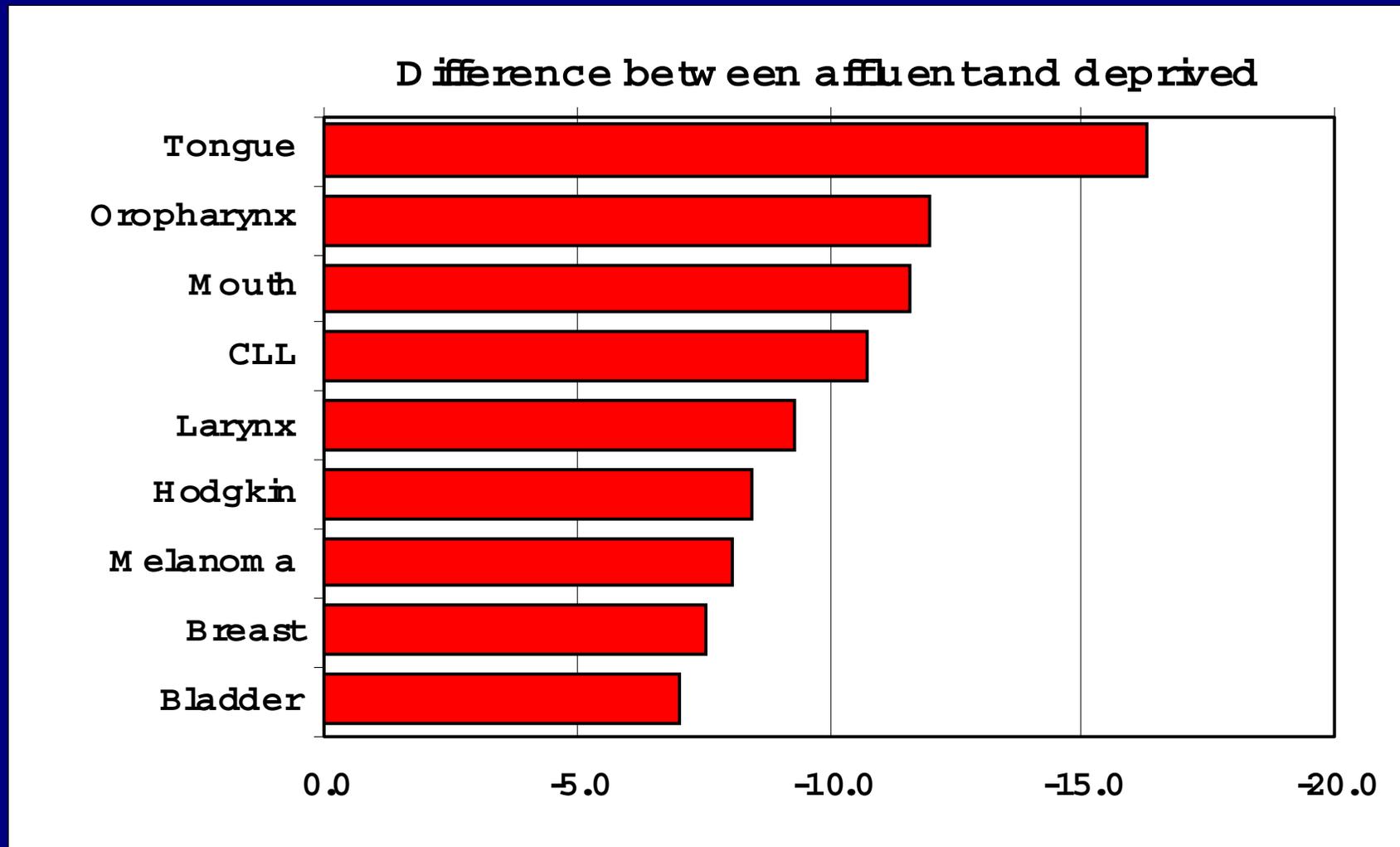
# Survival by deprivation - all cancers combined

Adults diagnosed 1981-85 and 1986-90



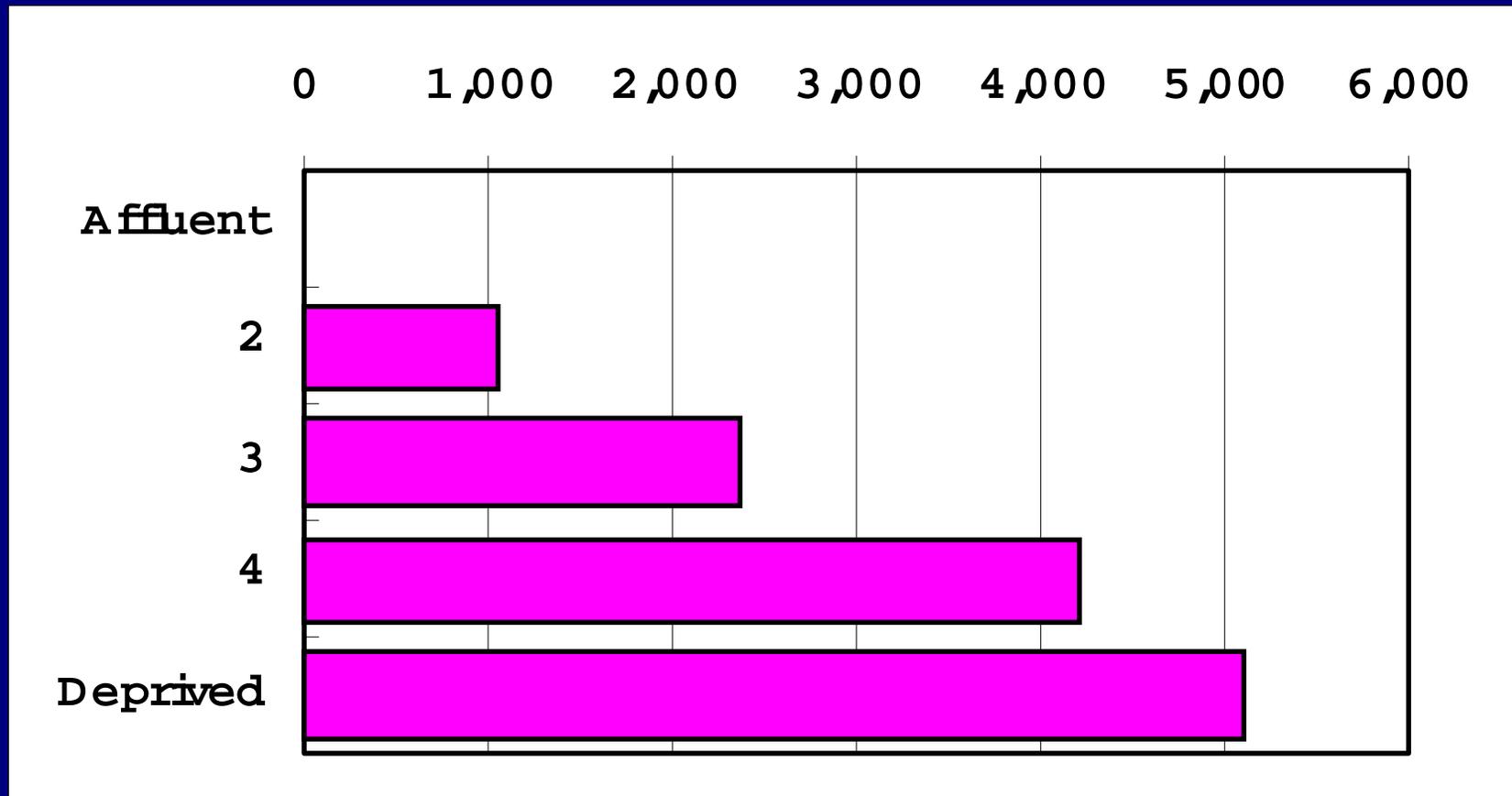
# Deprivation gap in five-year survival (%)

England and Wales, patients diagnosed 1986-90



# Avoidable deaths within five years of diagnosis

All cancers combined, by deprivation category



2 FRIDAY, APRIL 23, 1999

*Daily Telegraph*

NEWS

# Poor are losers in 'cancer lottery'

6 The Guardian Friday April 23 1999

National News

## Cancer survival linked to wealth

## Rich patients more likely to survive cancer

Evening Standard

22 APR 1999 P 5

## 12,000 who could beat cancer if they were rich

Friday, April 23, 1999 Published at 13:07 GMT 14:07 UK

Health

### Cancer more likely to kill poor

# International comparison of bowel cancer survival modelling the impact of covariates

	<i>Basic model</i>	<i>+ Age + Sex</i>	<i>+ Sub- site</i>	<i>+ Histology</i>	<i>+ Stage</i>
	<i>RER</i>	<i>RER</i>	<i>RER</i>	<i>RER</i>	<i>RER</i>
<b>USA</b>	1	1	1	1	1
<b>Switzerland</b>	1.30	1.28	1.28	1.35	1.24
<b>France</b>	1.34	1.32	1.36	1.23	1.58
<b>Finland</b>	1.45	1.46	1.42	1.24	1.05
<b>Italy</b>	1.54	1.54	1.55	1.33	1.31
<b>England</b>	1.90	1.86	1.75	1.38	1.34
<b>Slovenia</b>	2.35	2.40	2.39	1.86	1.64

*Gatta et al., in preparation*

# Survival and the notion of "cure"

## 'Cure' of cancer in an individual

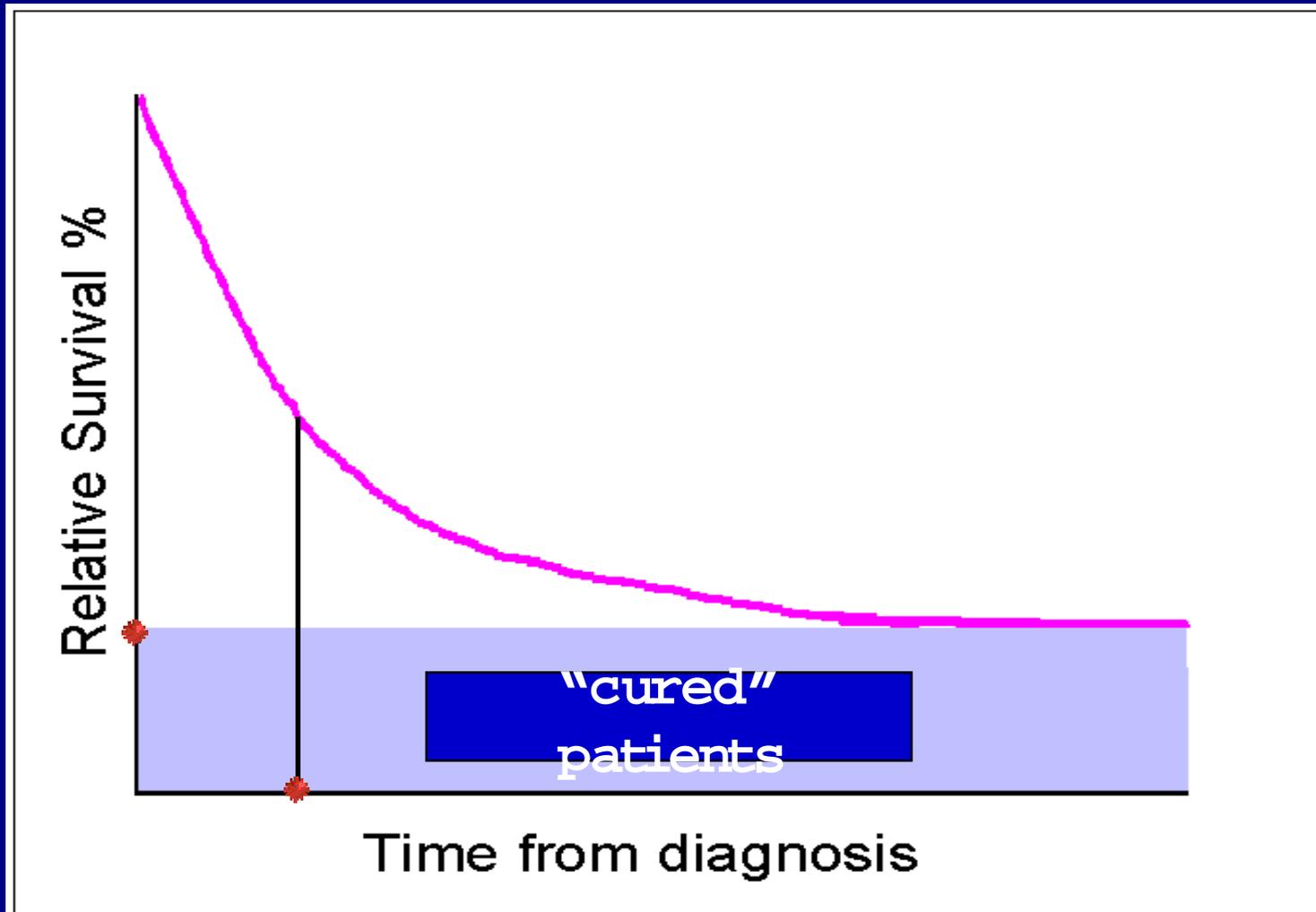
- no disease remains, all malignant cells eliminated
- normal life expectancy for patient's age, sex ...
- implies *permanent remission in a given patient*

## 'Cure' of cancer in a population

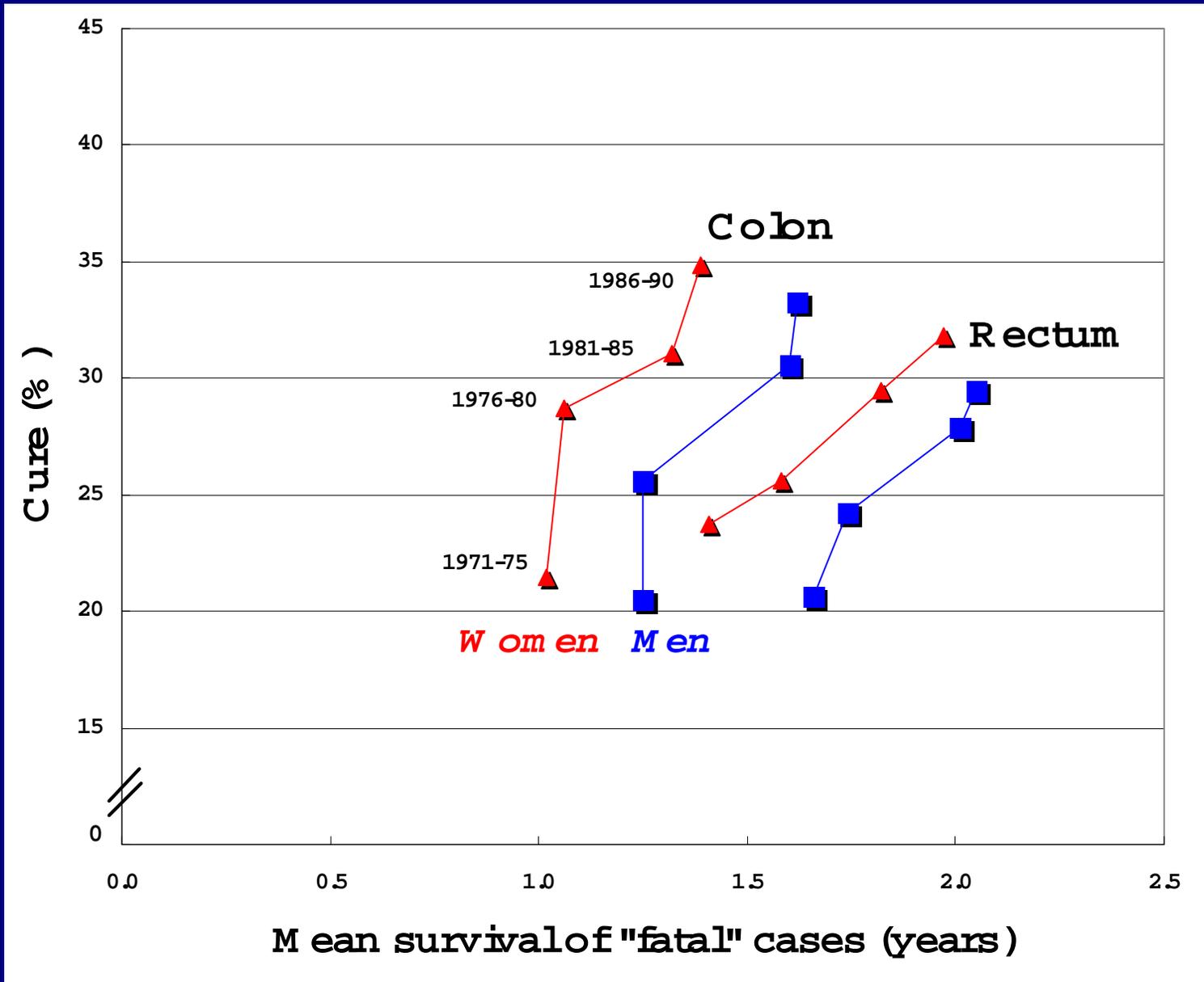
- mortality not different from the general population
- relative survival curve has become flat

• even patients may still die of cancer

# Relative survival and population "cure"



# More bowel cancers are being cured

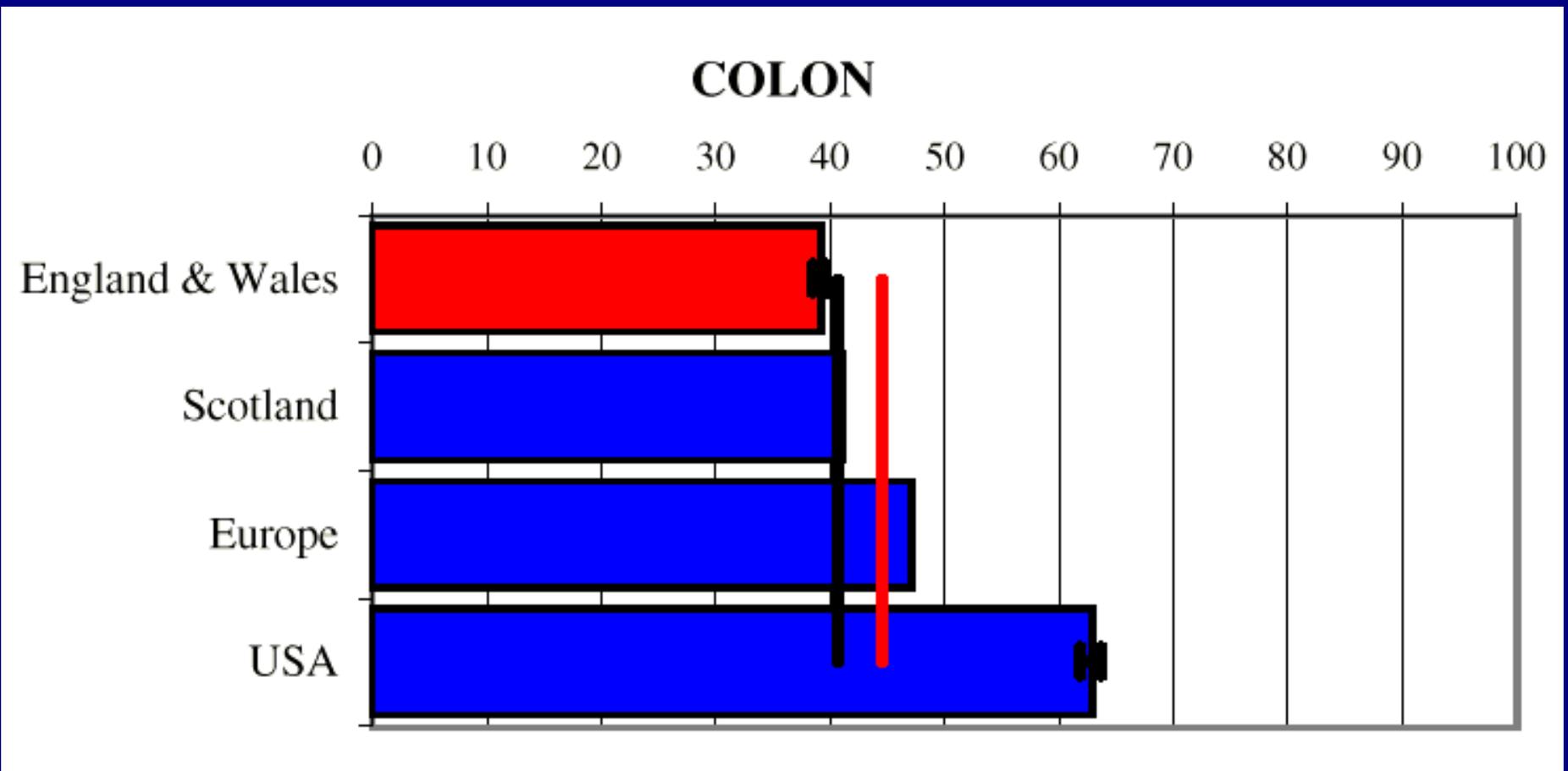


## Can we do better? *scope*

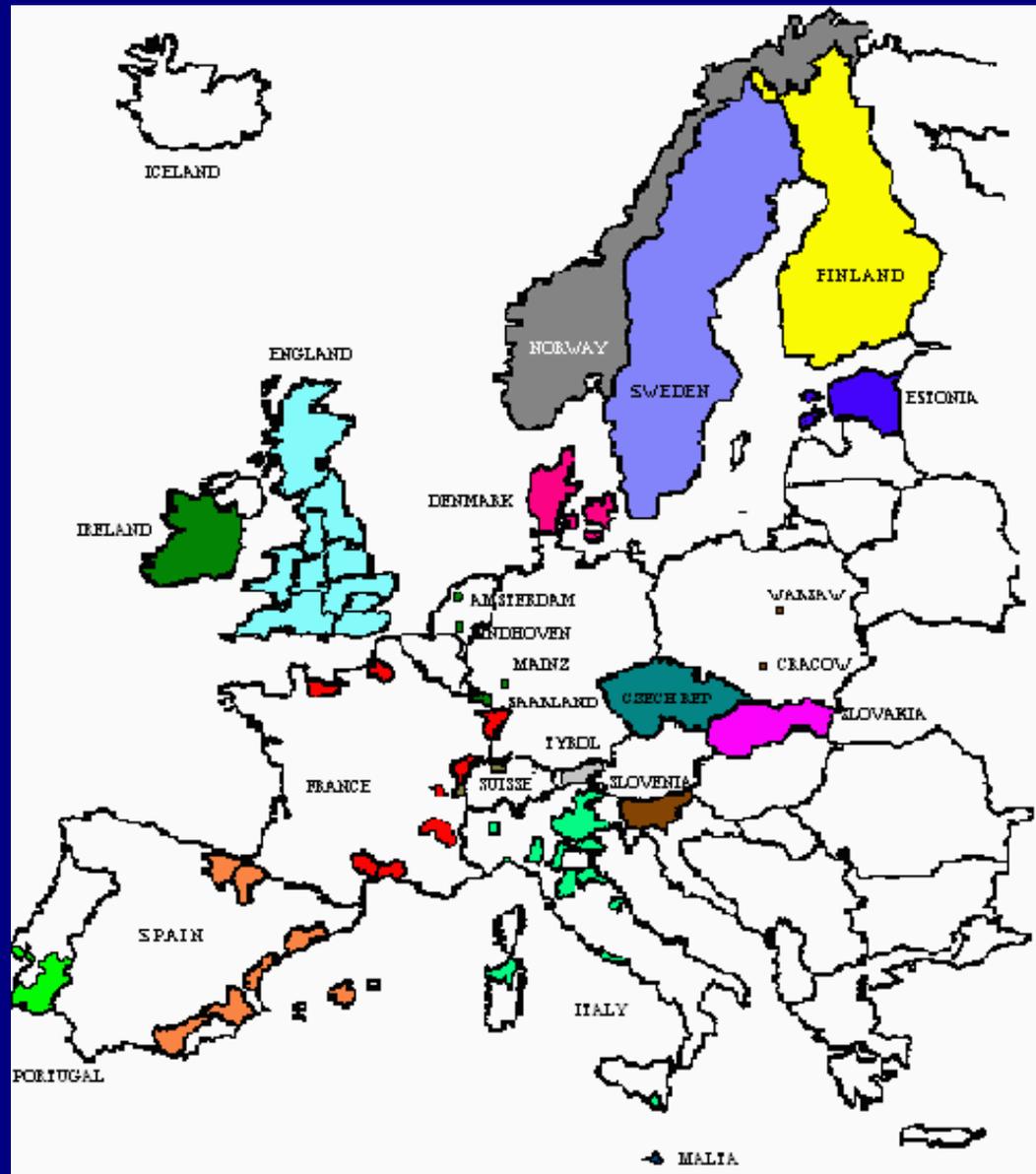
- Surveillance of (national) cancer survival
- Extend international survival analyses
- Routine international publication
- Patterns of treatment and care
- Reviews of cancer pathology

# Colon cancer - five-year relative survival (%)

England & Wales (1986-90), Europe (1985-89), USA (1986-90)

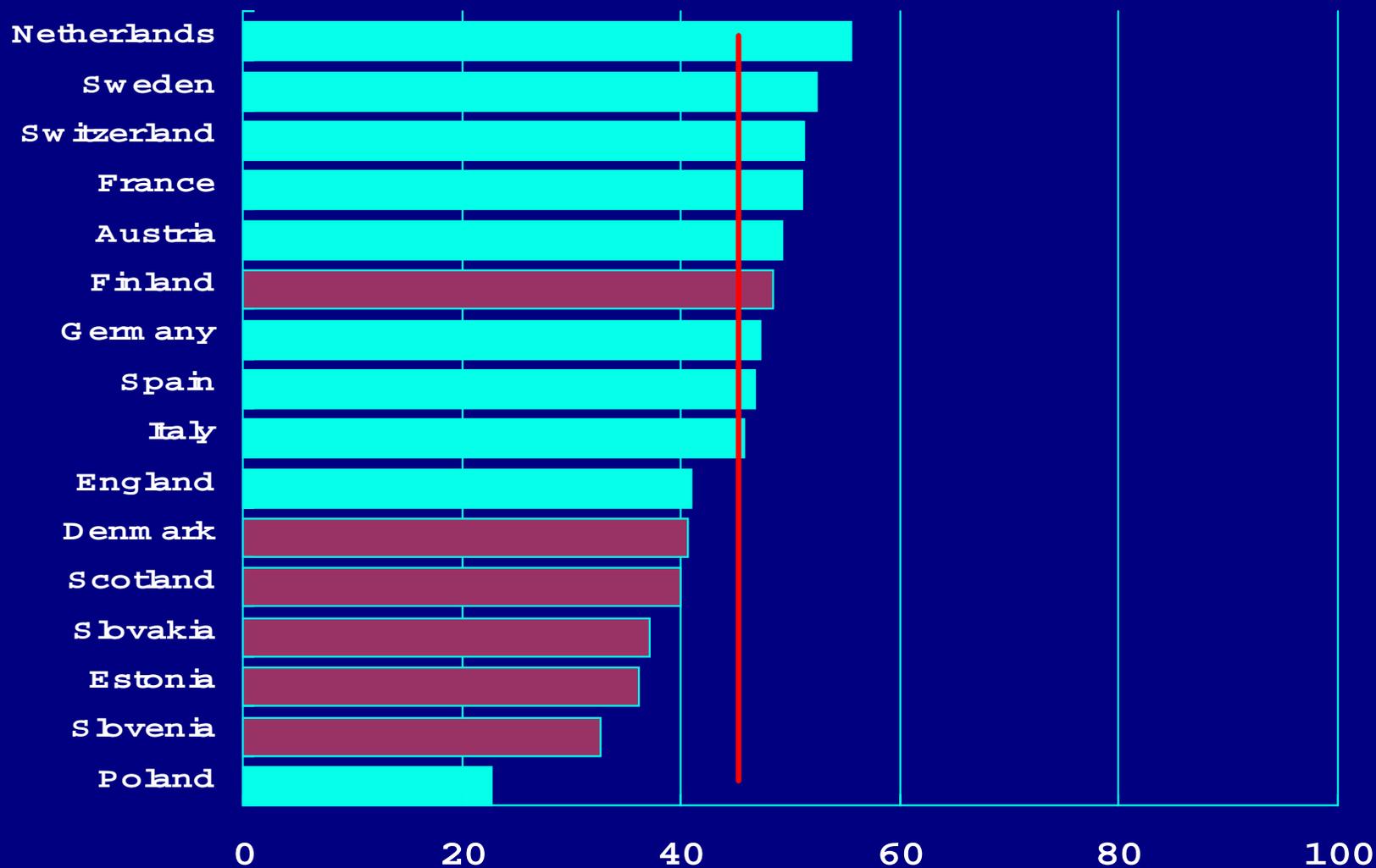


# Countries and regions in EUROCARE



# Colorectal cancer: five-year survival (%)

*Patients diagnosed 1985-89*



*Coebergh et al., 1998*

# UK cancer care worst in Europe doctors say

DR KENNETH Calman, the chief medical officer, will con-

by Lois Rogers

UK 'failing in diagnosis of cancer patients'

News

DAILY EXPRESS Wednesday May 17 1995 23

# Losing the cancer war

CANCER victims in England and Scotland have less chance of survival than those in the rest of western Europe.

By JAMES DAVIES

Europe. And those suffering from cancer of the breast, ovary and cervix also have a poorer prognosis. The findings, published yester-

at least five years. It found only eight per cent of patients in the UK with stomach cancer live for five years after being diagnosed — half the European average.

Just a third with cancer of the

British victims have lower chance of life

crucial — including breast, large bowel and stomach — there are substantial differences. Overall, patients in Finland, Switzerland and the

THE TIMES WEDNESDAY MAY 17 1995

## Survival rate below norm in British cancer cases

Breast cancer survival in UK lowest in West

Stiff upper lip that leaves British women more likely to die from cancer

# Perceptions of cancer survival

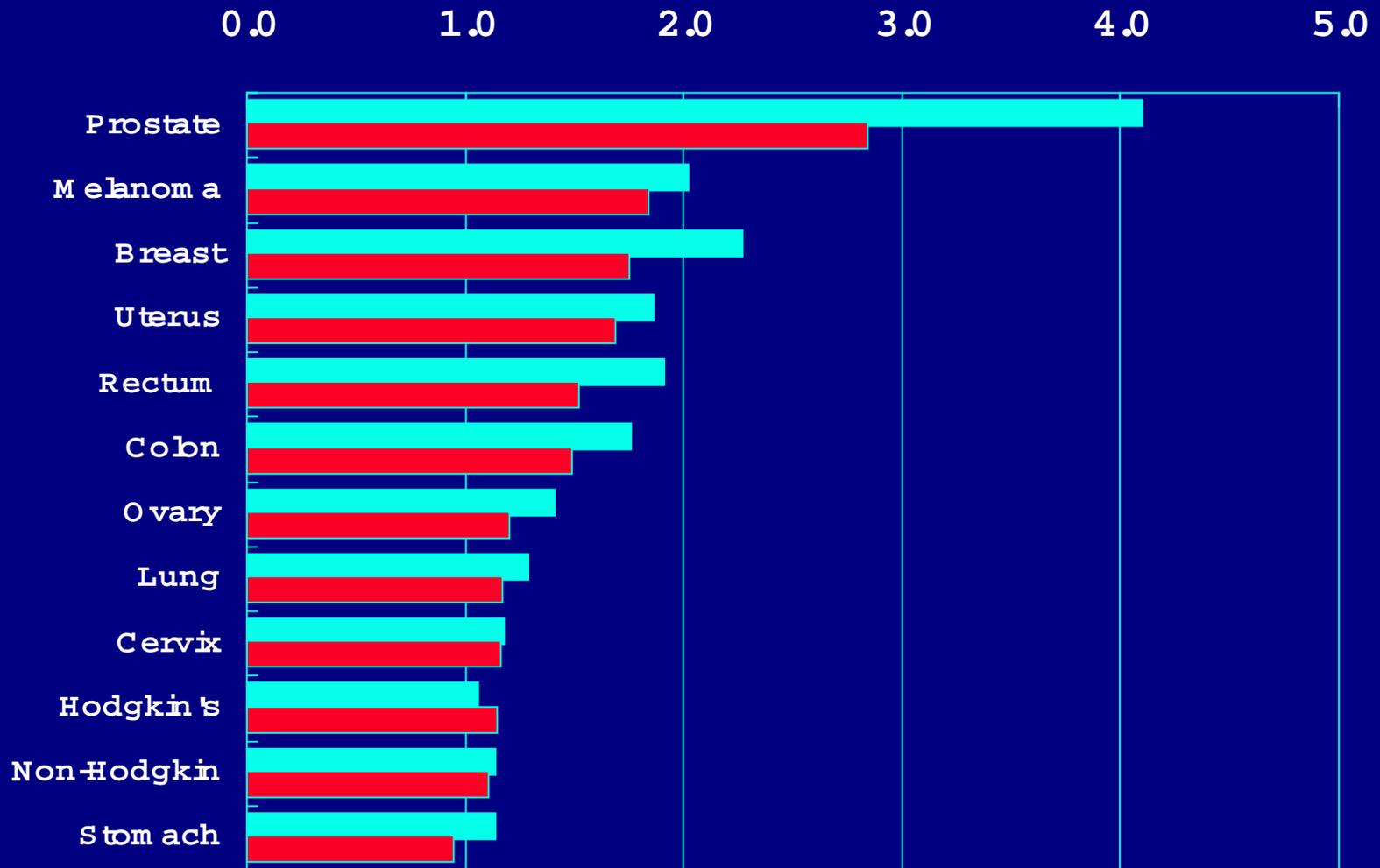
## UK vs. Europe

- Low European rank
- Inequality between social groups
- Delays in diagnosis and treatment
- Many avoidable deaths

# UK-Europe cancer survival differences: better care *or* less complete registration?

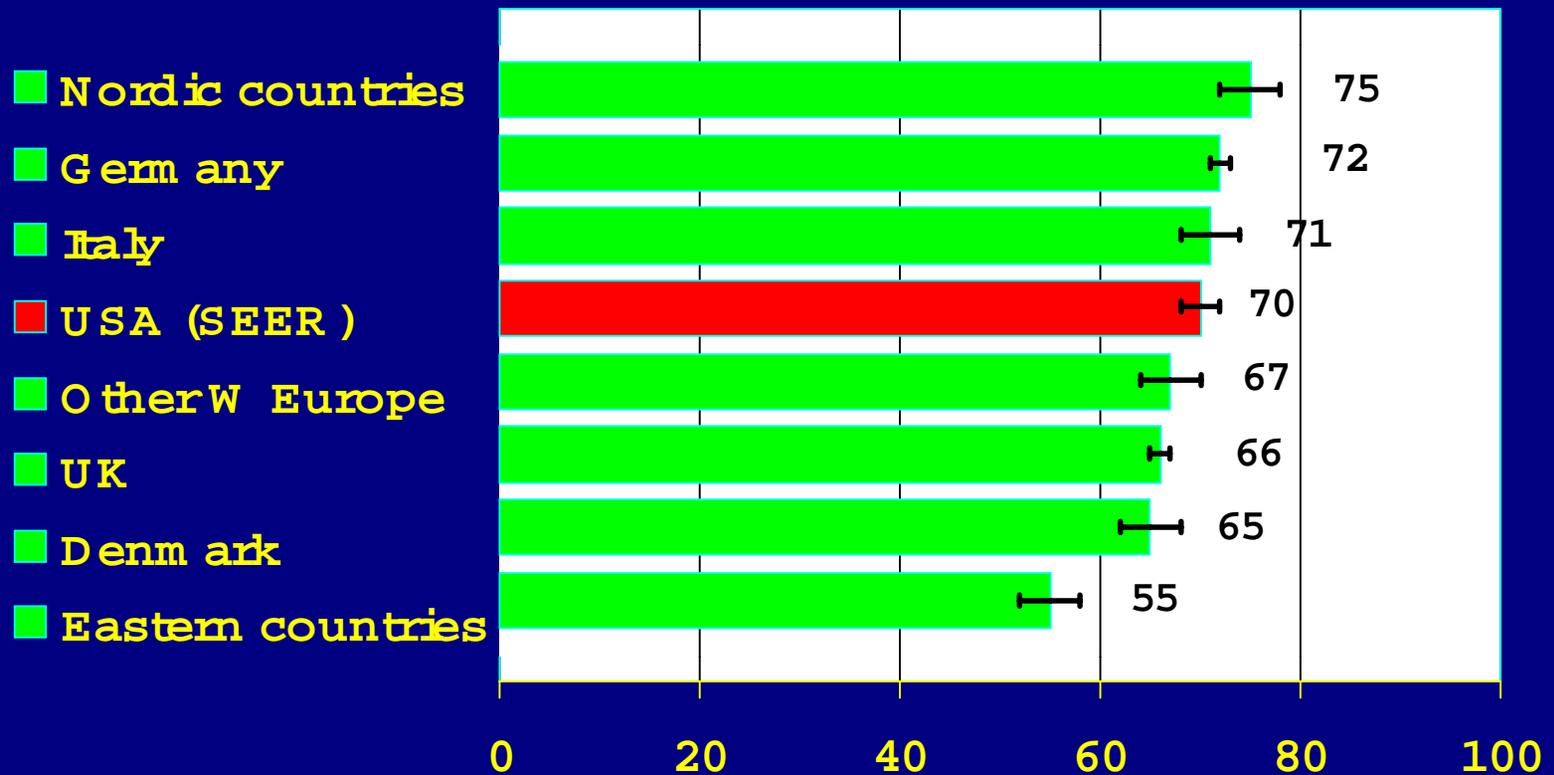
- Stringent central quality control
- Incidence checked against other sources
- Few areas with unexpected high survival ("immortals")
- More cases with poor survival excluded in UK
  
- Lower proportion operated
- Fewer operated cases with more than 6 nodes examined
- Fewer cases with liver scan
- More advanced disease at diagnosis
- Wide variations in treatment
- Fewer oncologists than other countries
- International survival ranking is variable

# Relative risk of death in Europe vs. USA: one and five years after diagnosis



# Childhood cancer survival, 1985-89

Europe (EUROCARE) vs. USA (SEER areas)



# International cancer survival differences need for a new study

40 years since last trans-Atlantic comparison

- more population-based data now available
- statistical methods greatly improved

Substantial increase in cancer burden

Public interest in cancer survival

Clinical questions over comparability of the estimates

- "It cannot possibly be due to differences in treatment."
- "It proves that survival data are useless."
- "You can't compare apples and oranges."

# International cancer survival differences need for a new study - CONCORD

Estimate survival in N American and European  
populations

Use common definitions, procedures and analytic methods

Seek to explain observed differences

- age, socio-economic status, geographic region
- stage at diagnosis and determinants of stage
- treatment
- disease definition and pathological review

# CONCORD study size

Phase 1 – patients diagnosed 1990–94

	<i>Population</i>	<i>Breast</i>	<i>Bowel</i>	<i>Prostate</i>	<i>Total</i>
<b>Canada</b>	19,029,349	51,203	49,975	44,565	145,743
<b>USA</b>	112,515,417	354,760	307,534	397,608	1,059,902
<b>Europe</b>	87,198,886	236,951	231,861	135,901	604,713
<b>Total</b>	218,743,652	642,914	589,370	578,074	1,810,358

## Can we do better? *output*

- **Assess impact of clinical guidance**
- **Address determinants of inequality**
- **Publish more timely results**
- **Persuade clinicians of their relevance**
- **Avoid military language**

# International cancer survival differences:

## social, demographic and economic links

For prostate, breast, rectum and stomach cancers:

- Overall life expectancy
- Proportion of GNP spent on health
- Percentage unemployment
- Number of hospital beds per million
- Number of CT scanners per million

can "explain" 50-70 % of international variation in cancer survival in Western Europe

Socioeconomic factors strong influence *within* countries

## Clinical reaction to EURO CARE-2

"... Unless more substantial data become available, the [evident] lack of basic epidemiological principles suggests that the UK government's cancer strategy is built on sand, and cancer care might be no worse in the UK than in the rest of Europe."



## Cancer, education and poverty

“The people who have not benefited from the war on cancer are those who don't have knowledge, ... resources and ... [health] insurance.”

“We have not done what America should do to allow its citizens a good chance of being protected from and cured of this lethal disease.”

*Harold P Freeman, Chair, US Cancer Panel, 1991*

## Hope - or despair ?

"... despite the continuing casualties, there is reason to believe the war against cancer has reached a turning point."

JM Nash, 1994

"An oncological time-bomb is ticking away as the post-World War II baby-boom reaches age 50 by the year 2000."

Can we do better? *policy*

- Explain results to public and politicians
- Confront the libertarian privacy lobby

# The Prime Minister's "cancer summit"

"We don't match other countries in its prevention, diagnosis and treatment.

It's not good enough."

"England and Wales generally lag behind Europe."

*Tony Blair MP, Daily Mail, 20 May 1999*

## “Challenging cancer”

“If the survival rates among the poorest matched those among the richest in England and Wales, 12,700 untimely deaths could have been prevented amongst those diagnosed between 1986 and 1990.”

## Public Health minister responds to EURO CARE

“The poorer survival rates in the United Kingdom for many cancers [are] to a large extent real. ...

“The NHS Cancer Plan [takes] account of these conclusions, setting out the actions required to achieve earlier diagnosis and to ensure patients receive high quality treatment.”

Medical research is threatened by  
insistence on patient consent

*"I don't expect patients just to tolerate  
the kind of work that the cancer  
registries and epidemiologists do:  
I believe they would be astonished if it  
weren't done."*

*Ben Traynor. Consenting adults. Guardian, 12 April 2001.*

# Science and policy

"Scientists think their work is neutral. It is not.

"Scientific knowledge is relevant to political debate. We need a generation of scientifically literate politicians to take policy-making forward."

*Dr Ian Gibson MP*

*Chair, UK Parliamentary & Science Committee, 23 Nov 1999*

## President's Cancer Panel, December 2001

- 3,400 cases and 1,500 deaths each day
- Some 50 million uninsured or under-insured
- Patients fighting their insurer to get care they need

### *Recommendations*

- Immediate cancer coverage for uninsured
- Reimbursement for anti-cancer drugs
- Standard benefit package for cancer patients in 2 years
- Establish systems to monitor treatment fairness
- Expand research into quality of care

# Tobacco as a cause of lung cancer - some reflections

“Scientists and physicians cannot be content with discoveries until their beneficial or protective outcome for the population has been fully realized.

... the scientific and medical community must become more proactive in public health matters.”