



**The Actuarial Profession**

making financial sense of the future

# Trends in Critical Illness Risk Costs

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# Trends in Critical Illness Risk Costs

## An update from the CI Trends Research Group

- Historic trends in incidence for the major CIs
  - Variations over time, by sex, by smoker status, by socio-economic group
  - Focussing on the age group 40 - 60
- Mapping a range of possible future outcomes for CI risk costs
- Based on our presentation at the Life Convention 2004

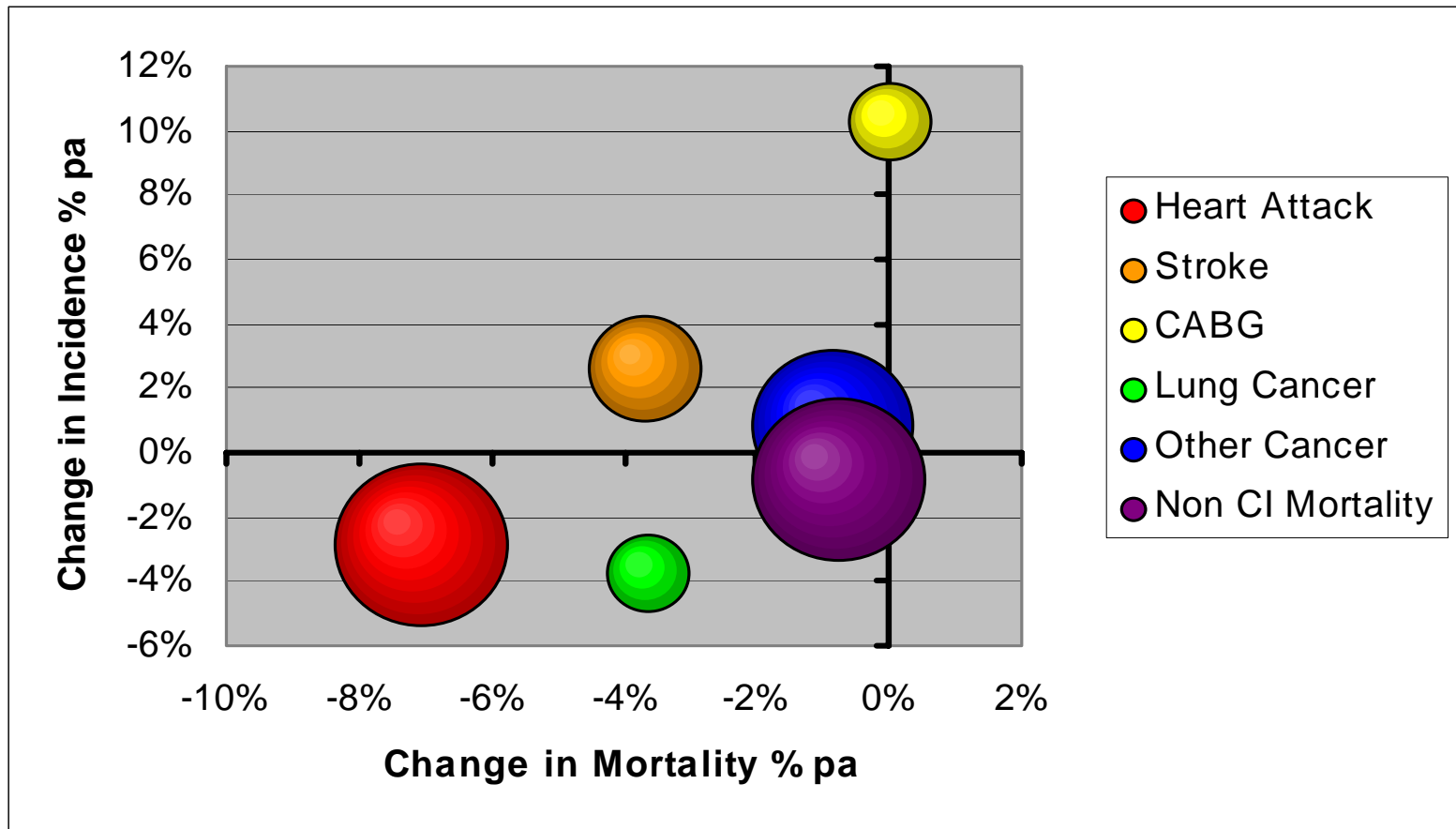
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# Summary of Trends in CI Incidence and Mortality

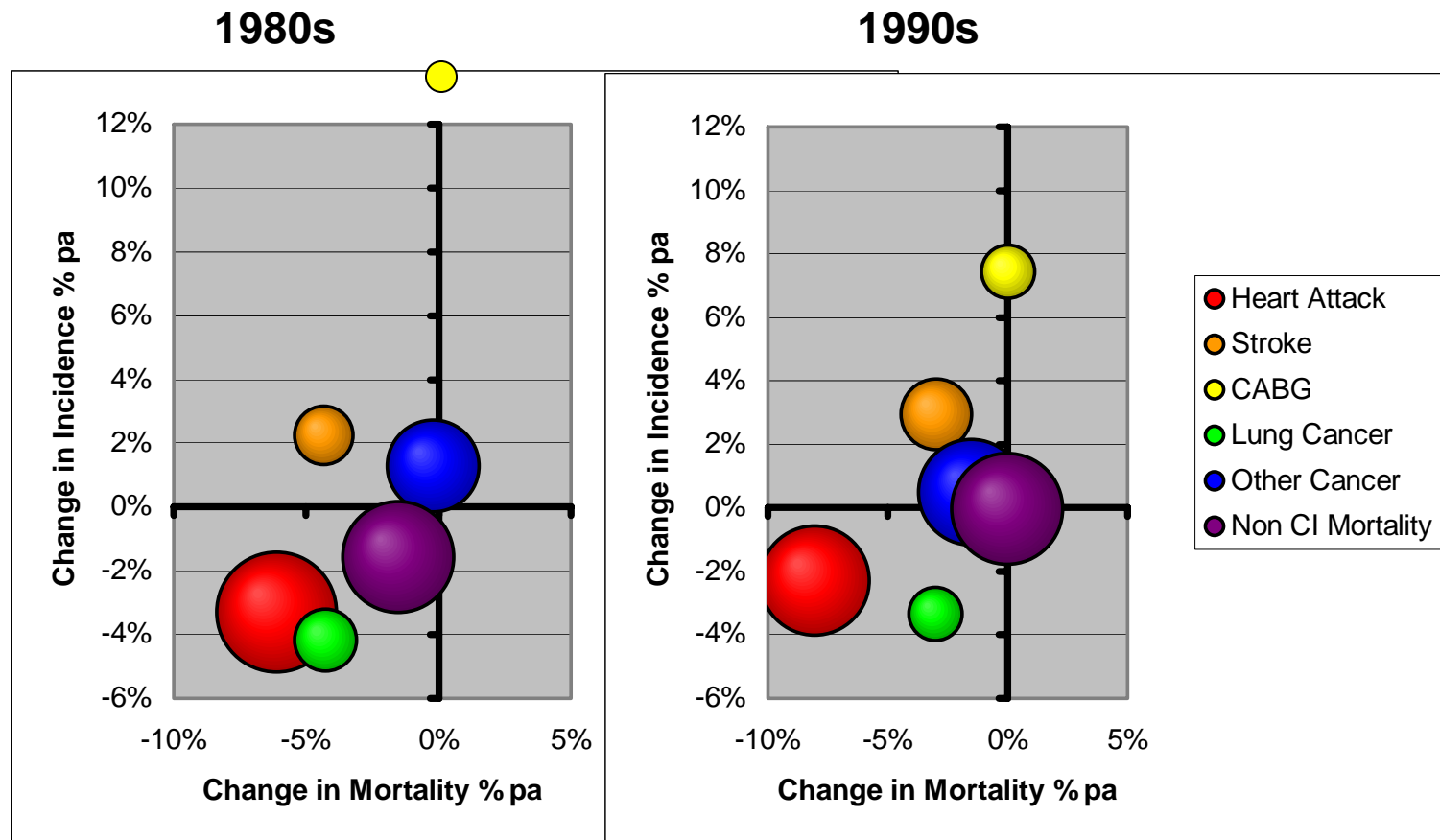
Best Estimate Avg Change % pa, England & Wales, 1980-2000  
Men, aged 40 - 60



Size of Balls Indicates Relative Importance of CI Measured by Incidence Rate.

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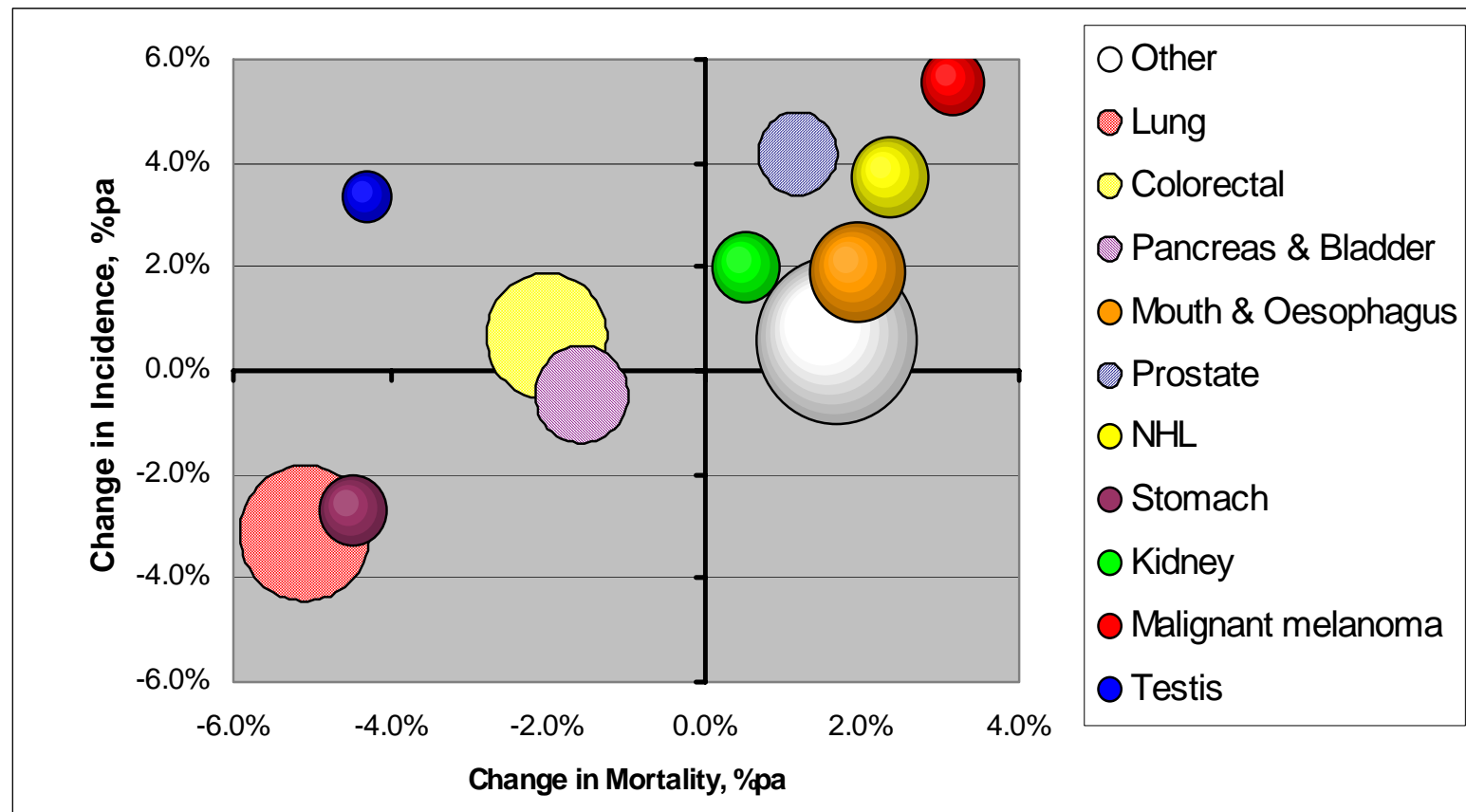
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# Summary of Trends in Cancer Incidence and Mortality

Average Change % pa, for Men, aged 40 - 59, over 1971 - 97

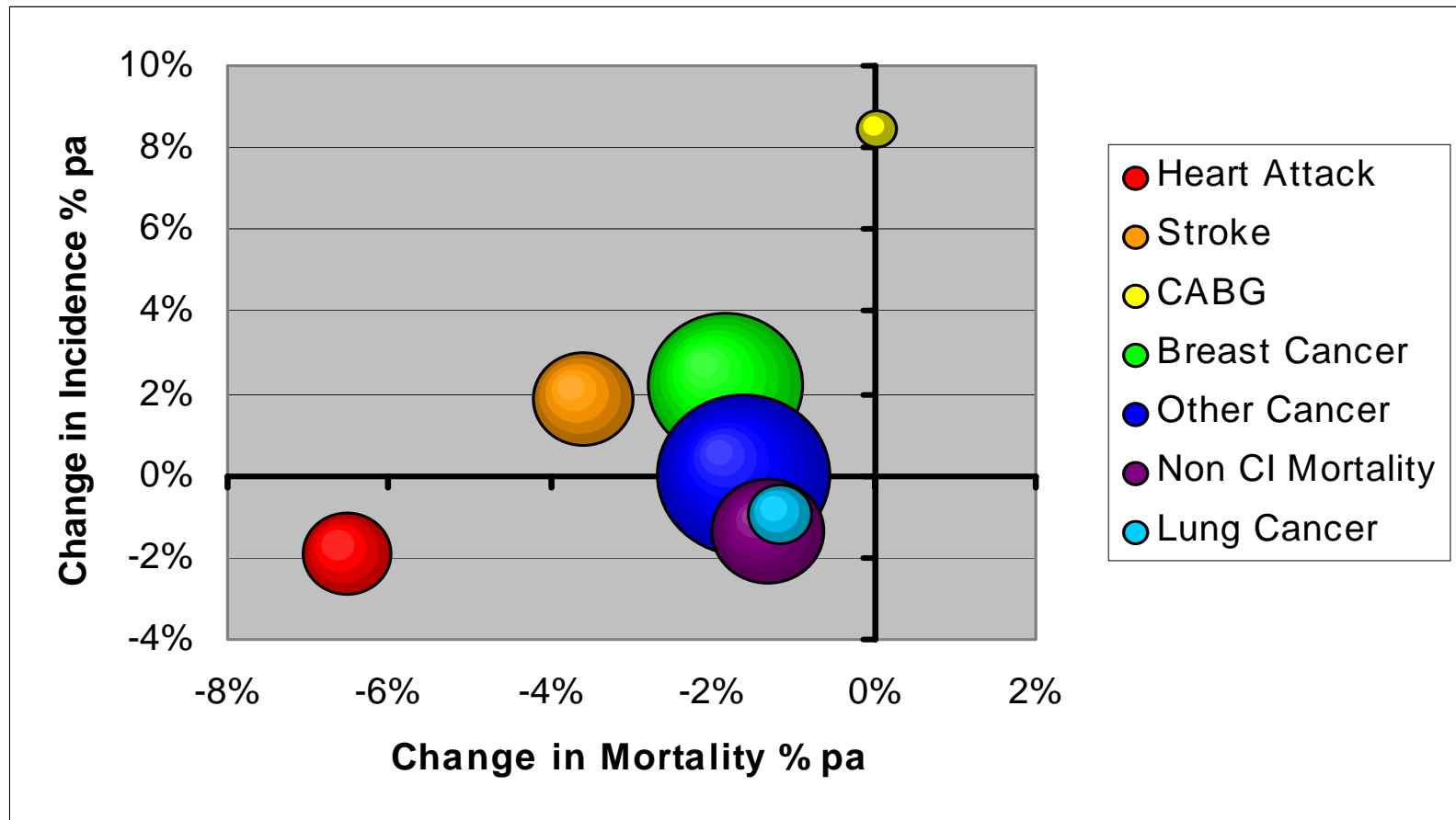


Size of Balls Indicates Relative Importance of Cancer Site, Measured by Incidence Rates in 1997.

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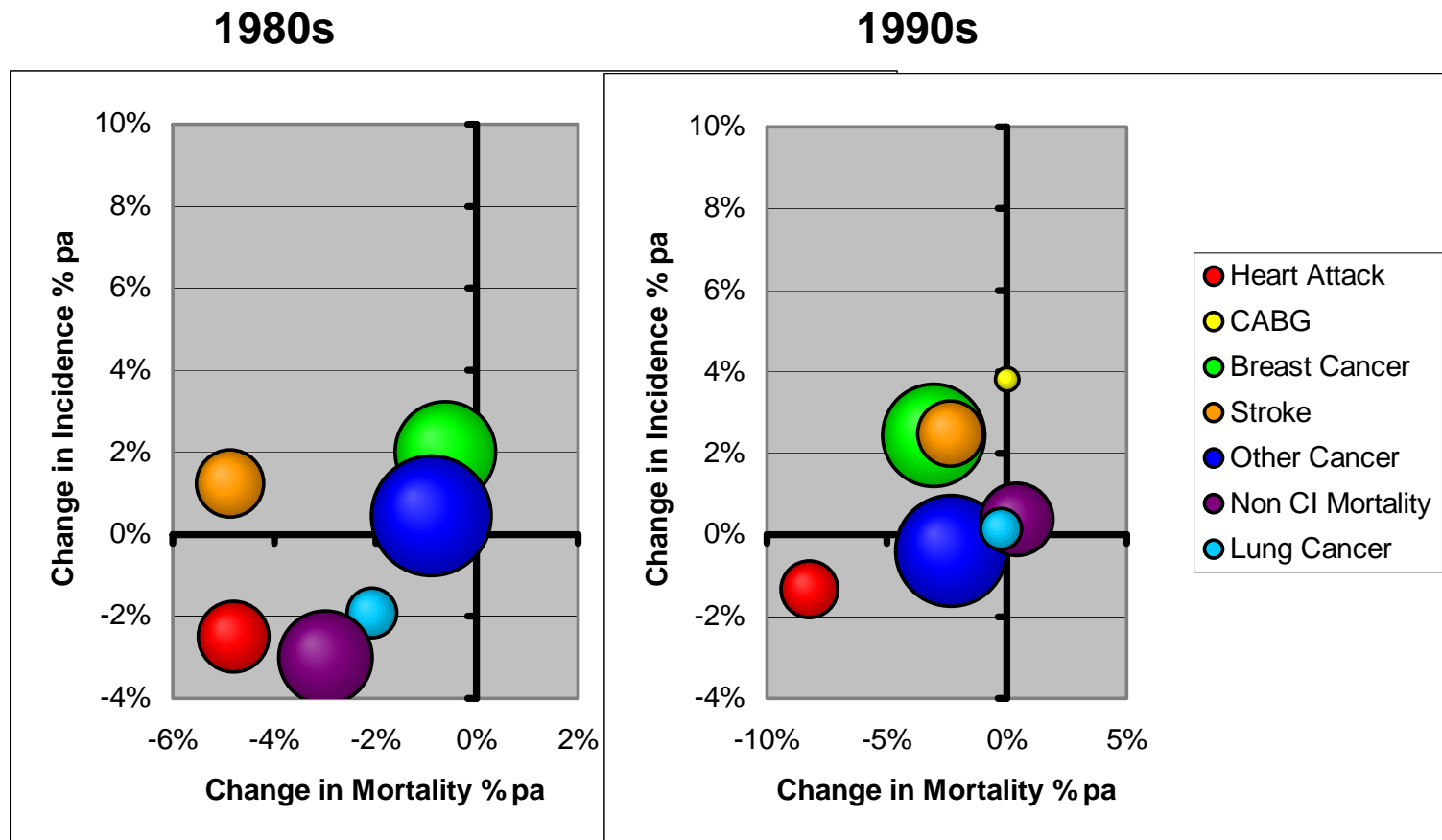
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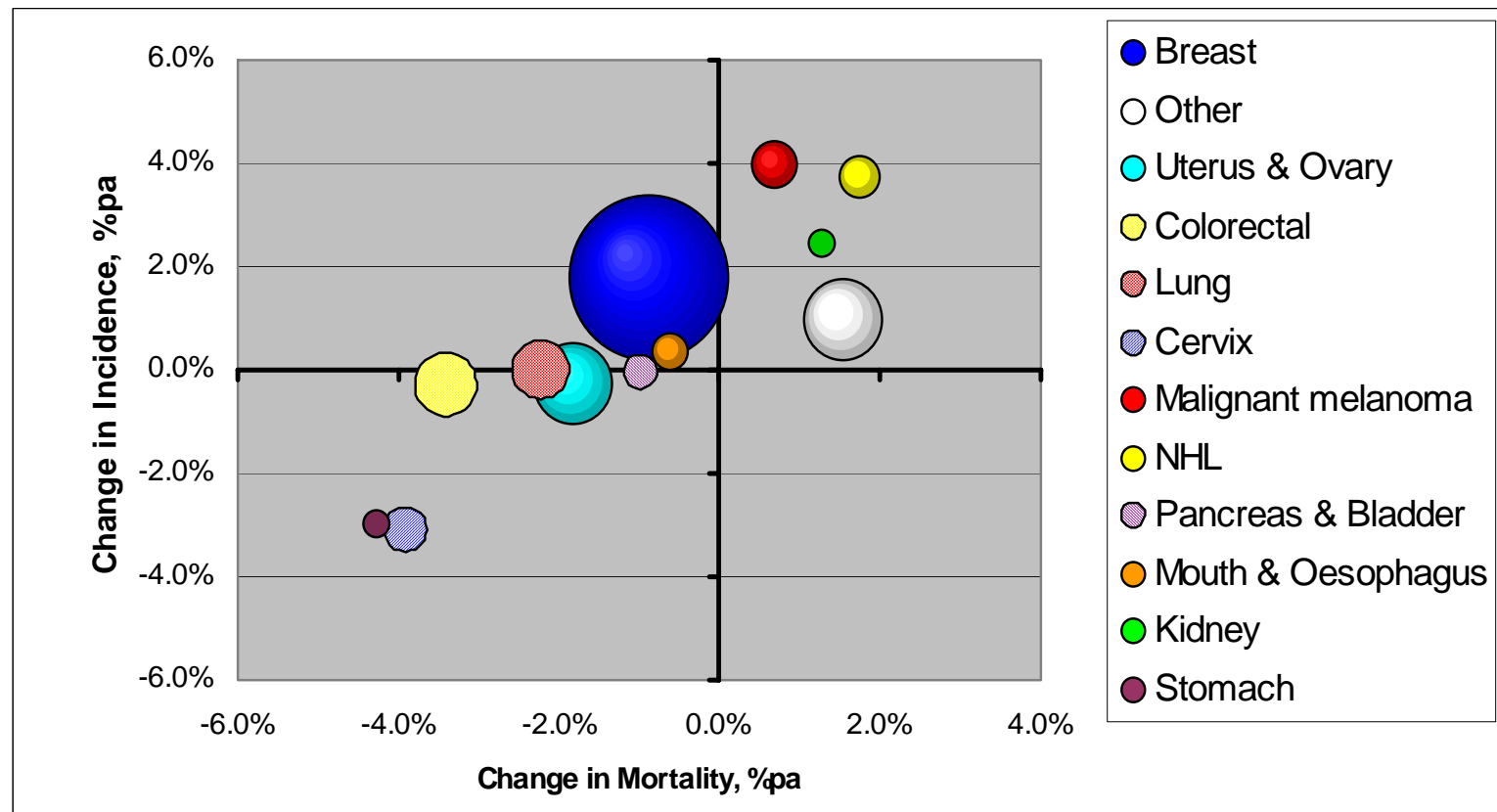


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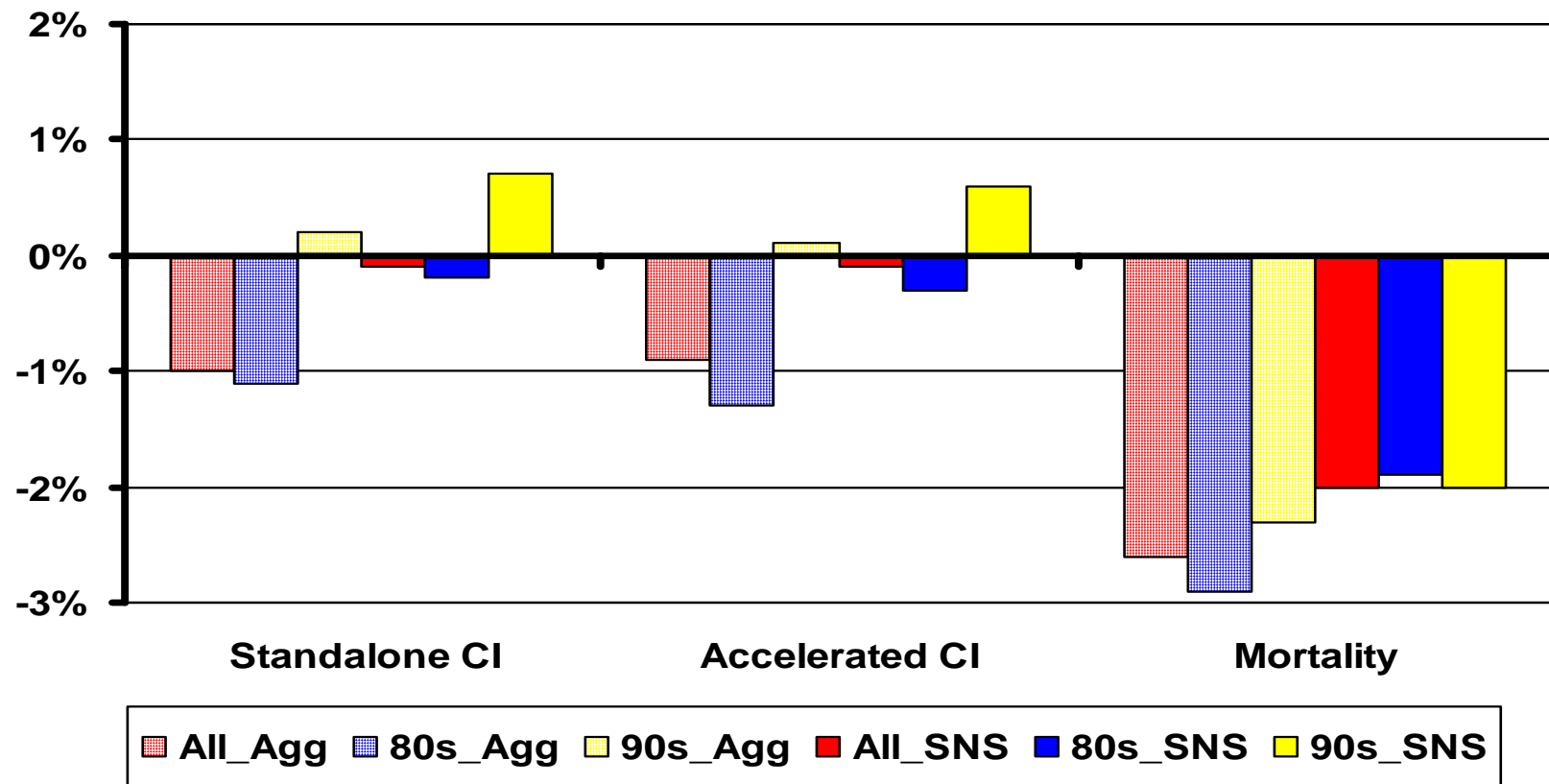
## Impact of Changes in Smoking Prevalence

Rough estimates of the risks faced by 'typical' smokers relative to those who have never smoked are :

- Heart Attack risk - 2 to 3 times higher
- Stroke risk - 2 to 4 times higher
- Overall Cancer risk - around double
- Lung Cancer risk - 10 to 15 times higher

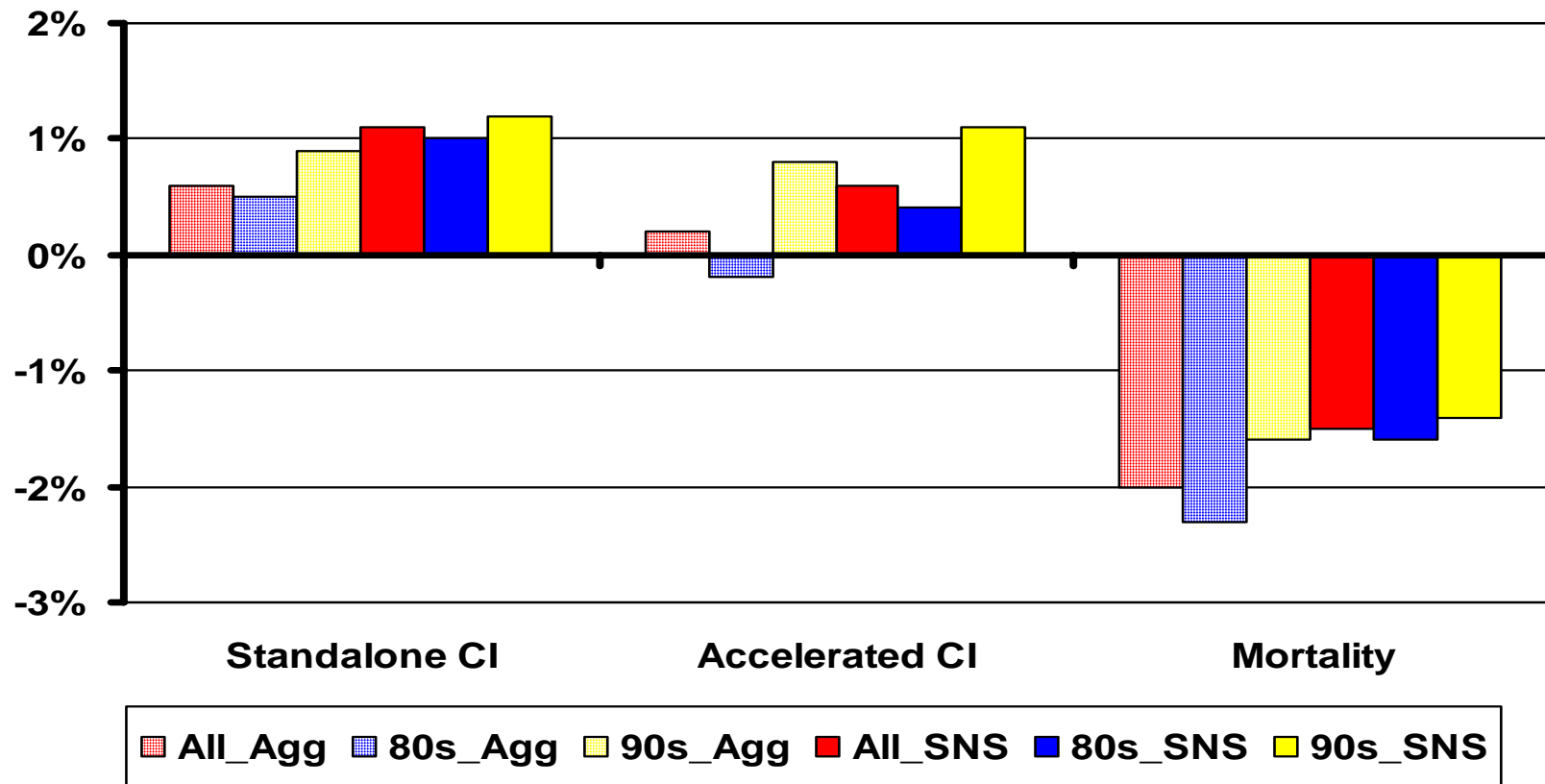
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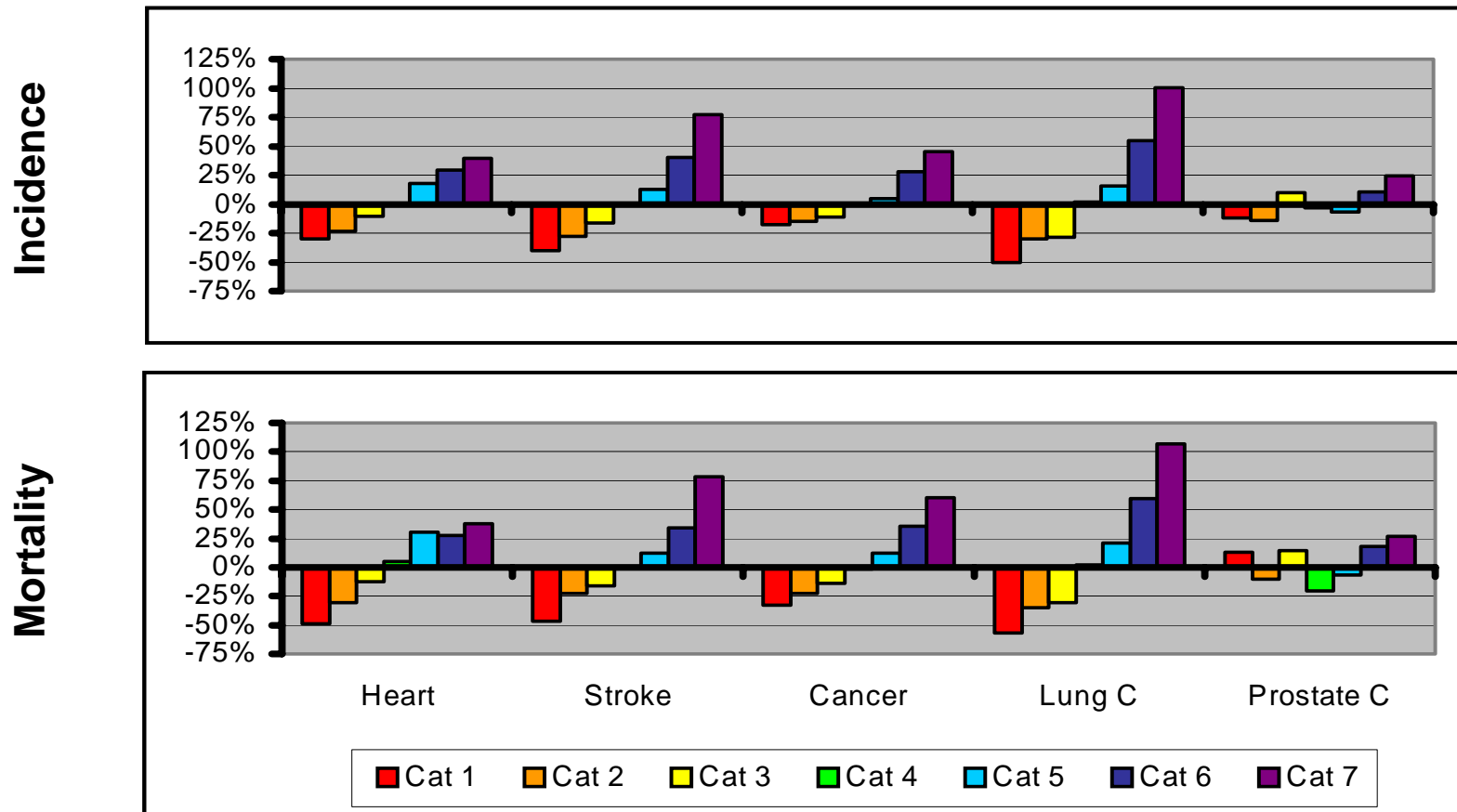


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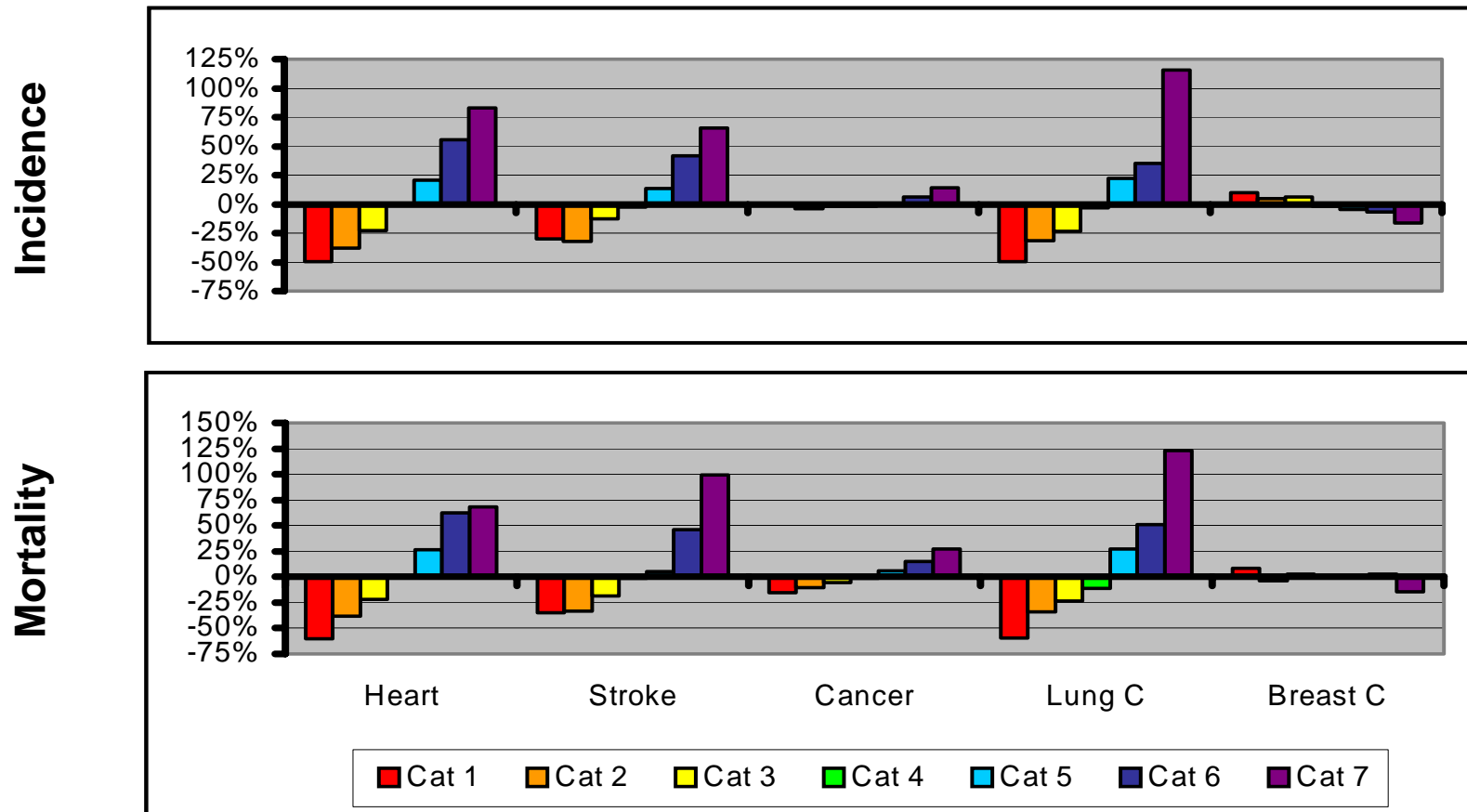
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# Relative CI Rates by Deprivation Category Scotland, 1989 – 93, Ages 40 – 59, Males



# Relative CI Rates by Deprivation Category Scotland, 1989 – 93, Ages 40 – 59, Females



# Summary of Trends in CI Incidence and Mortality

## Estimates for 40 – 60 age group, England & Wales, 1980-2000

At aggregate population level :

- **Mortality** rates have **fallen**  $2\frac{1}{2}\%$ pa for men, **2%**pa for women.
- **CI** incidence **fell**  $1\%$ pa for men, but has **risen**  $\frac{1}{2}\%$ pa for women.

But :

- Trends for the **1990's** were **worse than** for the **1980's**.
- **Changes in smoking** prevalence account for **falls** of a little under  $1\%$ pa for men and  $\frac{1}{2}\%$ pa for women, but are waning.
- Cancer is a larger part of total cost for insured lives than population.

So, for smoker-segregated rates in the 1990's the picture looks far worse :

- **CI** incidence **rose** by  $\frac{1}{2}$  to **1%**pa for **men**
- **CI** incidence **rose** by **1** to  **$1\frac{1}{2}\%$** pa for **women**

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- **Mapping a range of possible future outcomes for CI risk costs**



# Mapping a range of possible future outcomes for CI risk costs

- Summarize and compare a selection of scenarios we have evaluated
- Cautions :
  - Illustrative, but very rough, estimates
  - Still “work in progress”
  - Focus on cancer, heart attack, CABG and stroke only
  - Far from exhaustive, even for the CIs partially covered
  - Mix of high and low likelihood
  - Many overlaps and lots of gaps
  - Modelled individually - how might the scenarios combine ?

## Mapping a range of possible future outcomes for CI risk costs

### Key - Part 1

- Extrapolation of trends from the 1990's
- Obesity - “optimistic” and “pessimistic” scenarios
- Smoking - continuation of recent trends in smoking habits
- Convergence to USA CI incidence rates
- Convergence to EU CI incidence rates - “best” and “worst”
- Cancer Screening - Breast (extended down to age 40)
- Cancer Screening - Bowel Cancer - No polyps detected
- ▲ Cancer Screening - Bowel Cancer - 10% polyps detected
- ◆ Cancer Screening - Prostate (similar to USA experience)

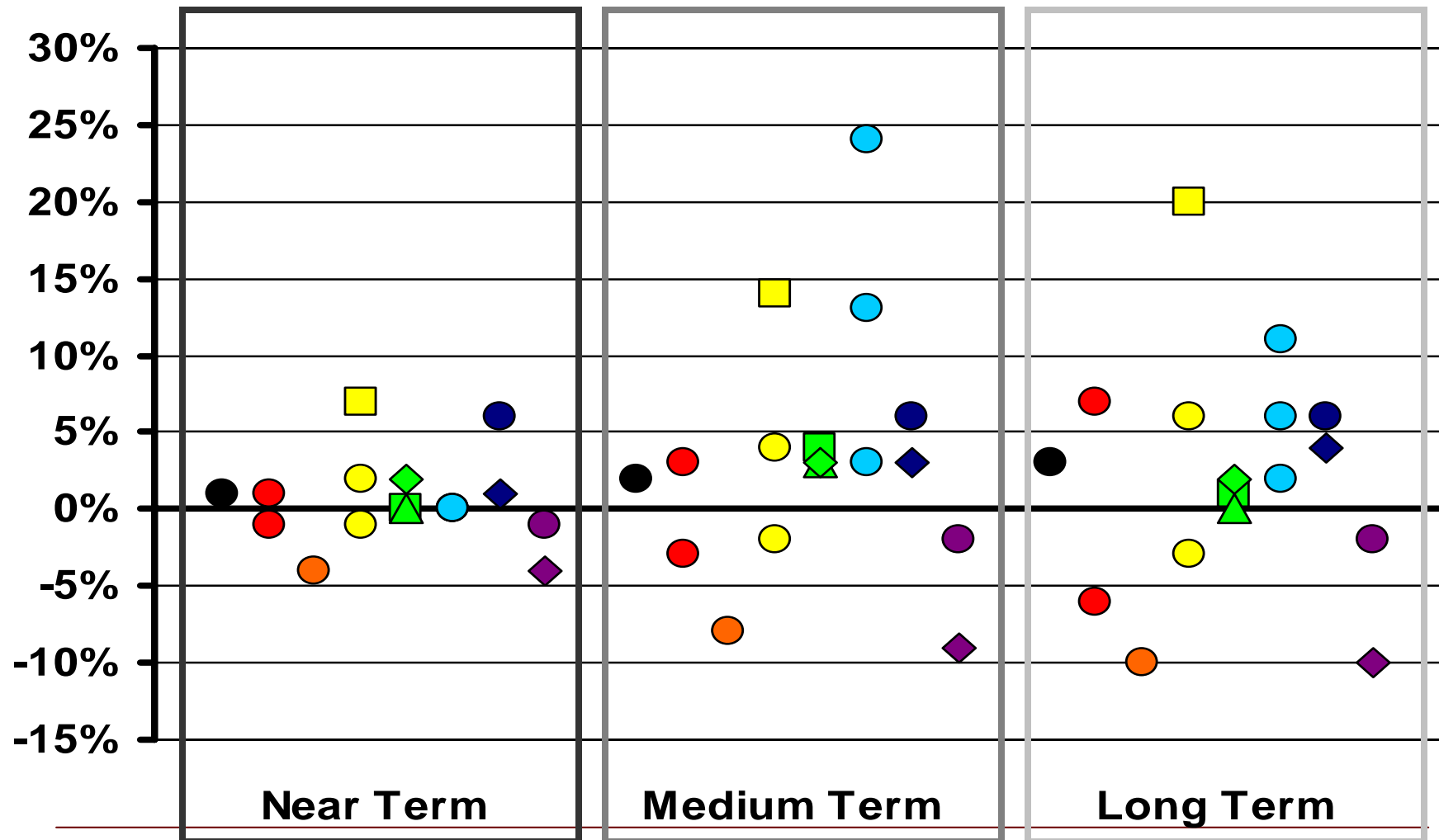
## Mapping a range of possible future outcomes for CI risk costs

### Key - Part 2

- Cancer Screening - “1 year” advancement in detection
- Cancer Screening - “3 year” advancement in detection
- Cancer Screening - “5 year” advancement in detection
- Impact of Troponin on heart attack diagnoses
- ◆ Definition drift on Strokes / TIAs
- Impact of Statins on heart attack rates
- ◆ Blue sky - polypills and cancer vaccinations

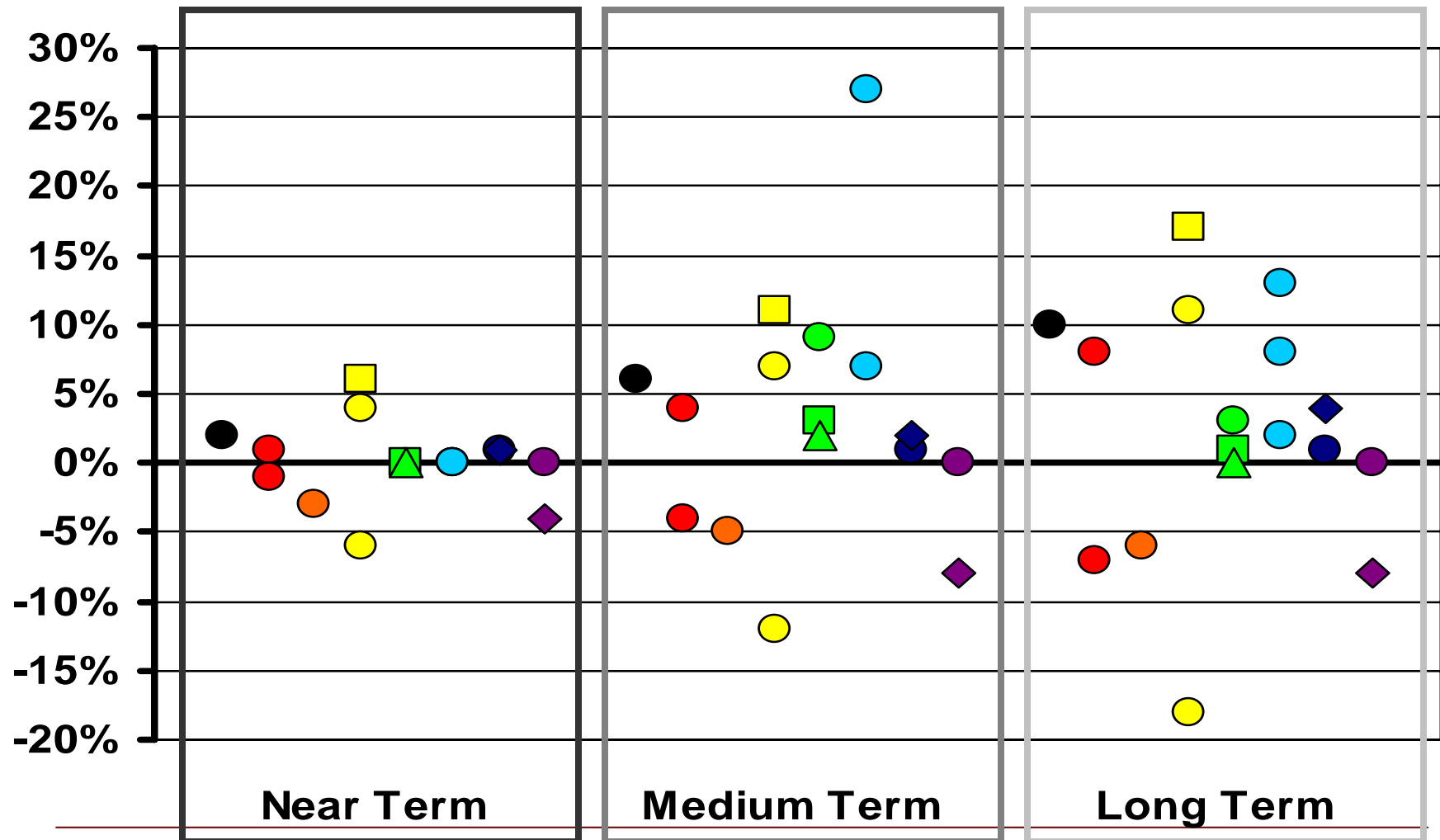
# Scenario Impact on Over CI Risk Rates for Males

## % Change in Overall CI risk Rate



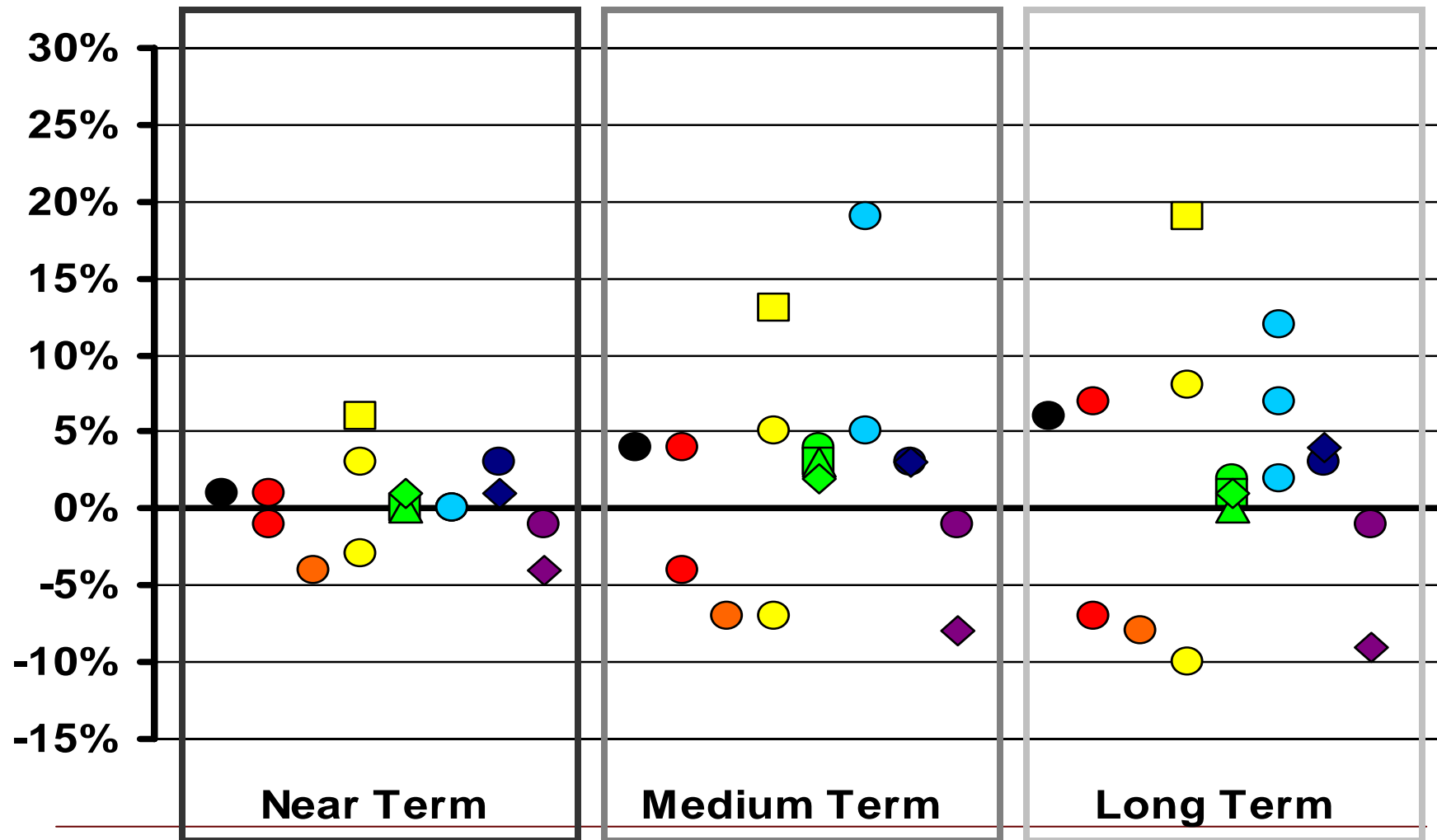
## Scenario Impact on Over CI Risk Rates for Females

### % Change in Overall CI risk Rate



# Scenario Impact on Over CI Risk Rates for All Lives

## % Change in Overall CI risk Rate



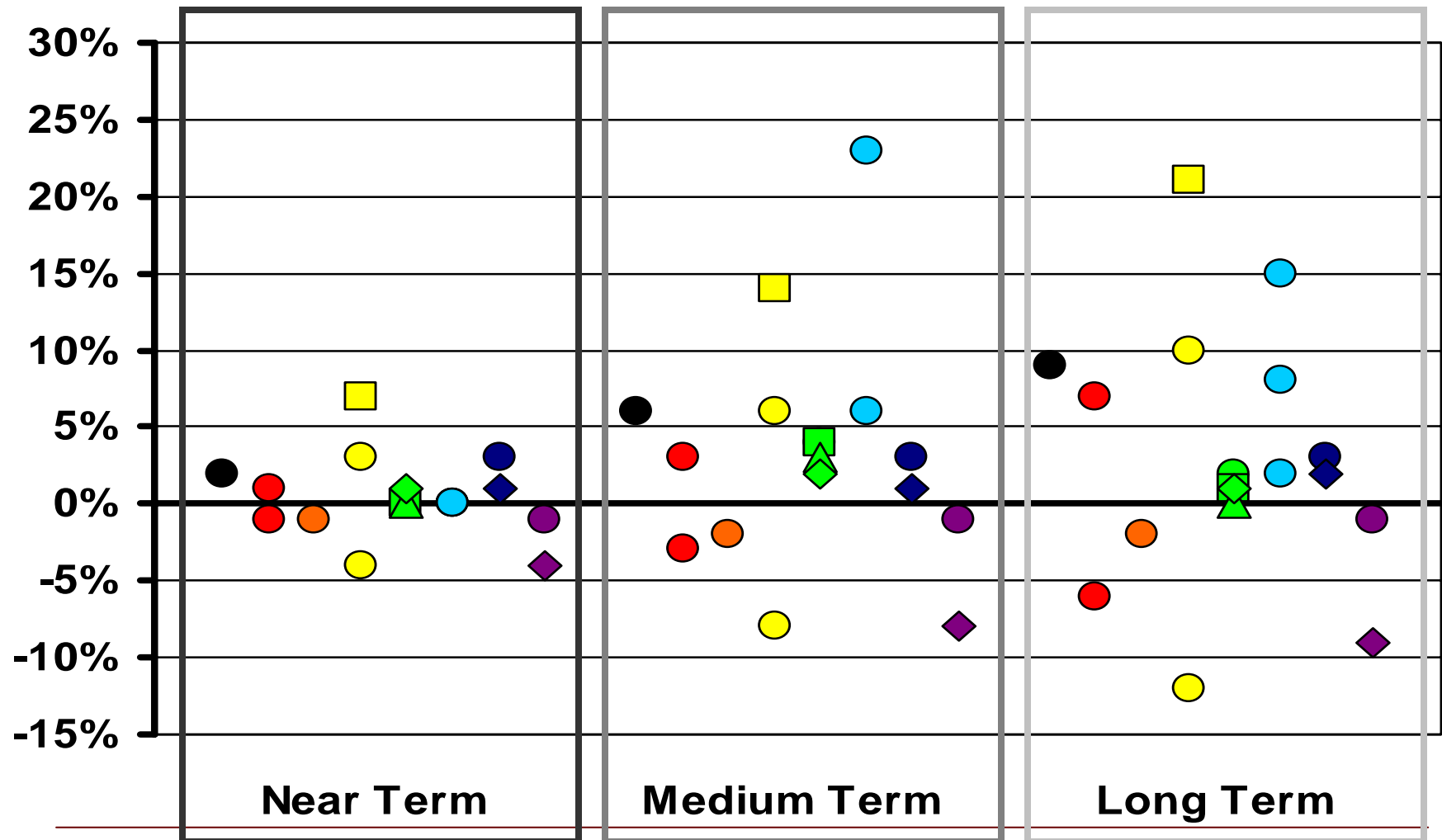
## Mapping a range of possible future outcomes for CI risk costs

### Shifting viewpoint from Population to Insured Lives

- Segregated non-smoker / smoker rates
  - Remove past beneficial trend in smoking prevalence
  - Affects extrapolation scenario and future impact of smoking habits
- Different socio-economic mix
  - Cancer gains in importance at expense of heart attack and stroke
  - Different access and attitudes to medical checks and treatment
- Different mix by sex
- Possible impacts from policyholder actions
  - Non-disclosure ; anti-selective lapses

# Scenario Impact on Over CI Risk Rates for Insured

## % Change in Overall CI risk Rate





# Mapping a range of possible future outcomes for CI risk costs - Key Observations

- **Caution : Work-in-progress and incomplete !**
- Many of the illustrated scenarios have relatively small impact - +/- 5% ...
- ... but we can readily envisage most dramatic scenarios
- Balance or imbalance of competing forces is critical
- Of the work so far, convergence with international rates perhaps gives the best indication of possible future ranges
- Typically, shifting from a population to an insured portfolio view magnifies the impact of any cancer-related scenarios



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We welcome your

- Questions and Discussion Points
- Proposals for Further Research