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Healthcare Conference 2005

Using our Resources Wisely

24-26 April 2005
Scarman House, University of Warwick

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## Past and Future Trends in Contraction and Diagnosis of Serious Illnesses

Neil Robjohns
Munich Re UK Life Branch

Dr Philip Smalley
RGA International Corporation

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## A Brief Summary of the Past

Neil Robjohns
Head of Pricing, Munich Re UK Life Branch
Chairman of Critical Illness Trends Research Group

## Outline

- The CI Trends Research Group
- Some Detail on Trends
  - Cancer
  - Heart Attack
  - Stroke
- Summary of Trends - The Big Picture
  - 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

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## Critical Illness Trends Research Group

- Our Aims :

  To examine underlying trends in the factors influencing UK Insured Critical Illness claim rates, and from these, to assess :
  - The historic trend in incidence and death rates for the major CI's
  - Any pointers for future trends in Standalone CI, Mortality and hence Accelerated CI.
- Formed in March 2001

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## Critical Illness Trends Research Group
**Population Data versus Insured Data**

- Insured Data ⟹ CMI CI experience study
  - Relevant, but …
  - Limited in volume, age range and depth
  - Short time series and trends drowned out by noise
- Population Data ⟹ CI Trends Research Group
  - Need to distil proxy for insured subset, but …
  - Large volume, full age range, and lots of depth
  - Long time series
  - Combine with knowledge of medical developments to give a platform for projection of a range of future outcomes

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## Critical Illness Trends Research Group
**Group Members and our Current Focus**

| | Cancer | Heart Attack & Stroke | Non-CI Mort[y] & Overall Proj[n] |
|---|---|---|---|
| Actuaries | Richard Morris | Scott Reid | Hamish Galloway |
| | Neil Robjohns | Joanne Wells | Martin Gilbert |
| Medical Experts | Professor Rubens | Dr Richard Croxson | |
| | Consultant Oncologist | Consultant Cardiologist | |

- Former members include Azim Dinani, Sue Elliott and Daniel Ryan

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## Critical Illness Trends Research Group
**Focus of Work**

2001
- UK Trends in Cancer (30 years), Heart Attack & Stroke (10 years)

2002
- Further analysis of UK trends, including by deprivation category
- International comparisons
- Initial look at MS and TPD

2003
- Modelling lung cancer and cancer screening programmes
- Trends in Non-CI mortality
- Interaction of trends in Heart Attack, CABG and angioplasty

2004
- Mapping a range of possible future outcomes

2005
- Update and consolidate analysis to publish paper (and data ?)

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## Critical Illness Trends Research Group

**The complete published works … so far**

Presentations :

- Healthcare Conference 2001 (workshop B1)
- Healthcare Conference 2002 (plenary, workshops A1, B1, C3)
- Healthcare Conference 2003 (workshop A1)
- CI Seminar at Staple Inn, 23 May 2003
- Healthcare Conference 2004 (workshop B1/D3)
- Life Convention 2004 (concurrent session D09)
- CI Seminar at Staple Inn, 02 December 2004

Articles :

- The Actuary, May 2003 and June 2003

All available via www.actuaries.org.uk



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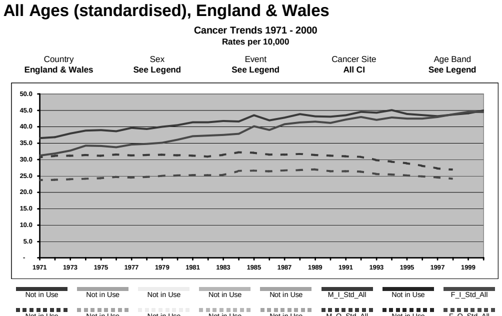
## Cancer Incidence and Mortality Rates, 1971 - 2000

**All Ages (standardised), England & Wales**

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## Cancer Incidence and Mortality Rates, 1971 - 2000
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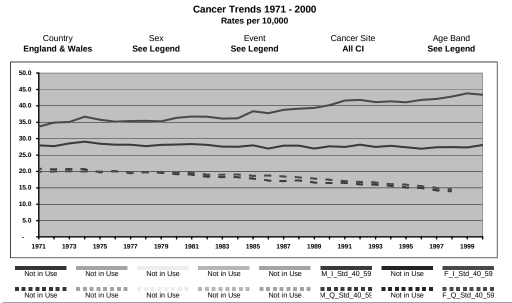


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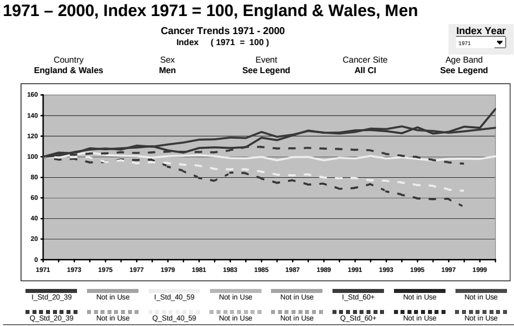
## Trend in Cancer Incidence and Mortality Rates
### 1971 – 2000, Index 1971 = 100, England & Wales, Men

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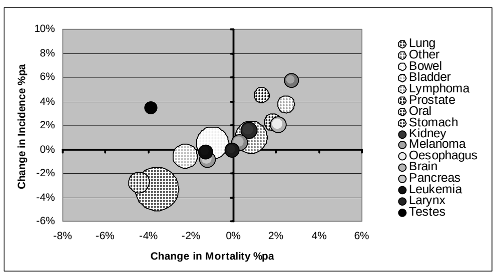
## Summary of Trends in Cancer Incidence and Mortality
### Average Change % pa, England & Wales, by cancer site
### Men, aged 40 - 59, 1971-2000




Size of balls represents relative importance of cancer site measured by incidence rates

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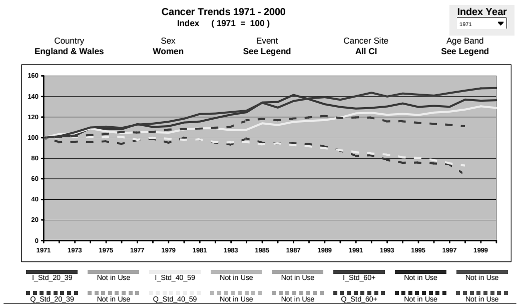
## Trend in Cancer Incidence and Mortality Rates

**1971–2000, Index 1971 = 100, England & Wales, Women**



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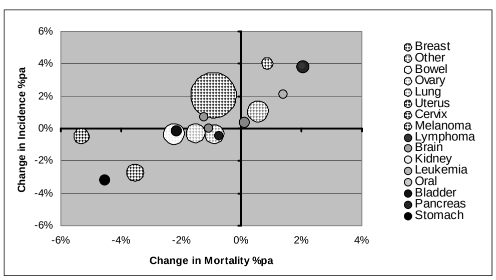
**Average Change % pa, England & Wales, by cancer site**
**Women, aged 40 - 59, 1971-2000**

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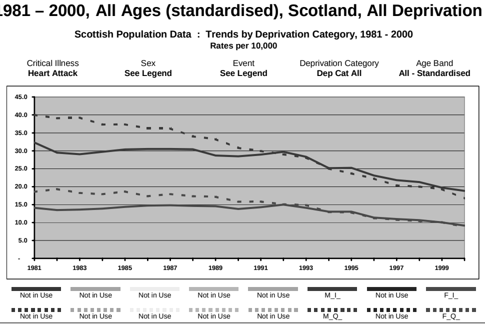
## Heart Attack Incidence and Mortality Rates

**1981 – 2000, All Ages (standardised), Scotland, All Deprivation Cat**

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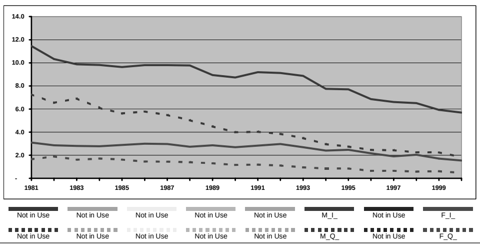
## Heart Attack Incidence and Mortality Rates

### 1981 – 2000, Ages 40 – 59 (standardised), Scotland, All Dep Cat

**Scottish Population Data : Trends by Deprivation Category, 1981 - 2000**
**Rates per 10,000**

| Critical Illness | Sex | Event | Deprivation Category | Age Band |
|---|---|---|---|---|
| **Heart Attack** | **See Legend** | **See Legend** | **Dep Cat All** | **40-59 standardised** |






## Trend in Heart Attack Incidence and Mortality Rates

### 1981 – 2000, Index 1981 = 100, Scotland, Men, All Deprivation Cat

**Scottish Population Data : Trends by Deprivation Category, 1981 - 2000**
**Index (1981 = 100 )**

**Index Year** 1981

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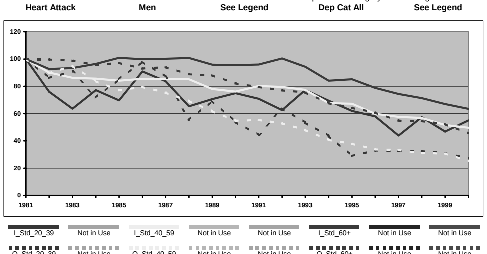




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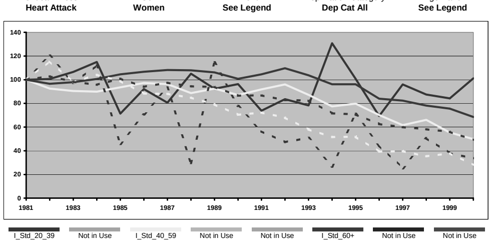
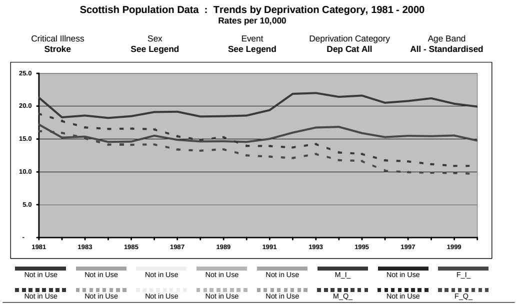


## Stroke Incidence and Mortality Rates

### 1981 – 2000, All Ages (standardised), Scotland, All Deprivation Cat

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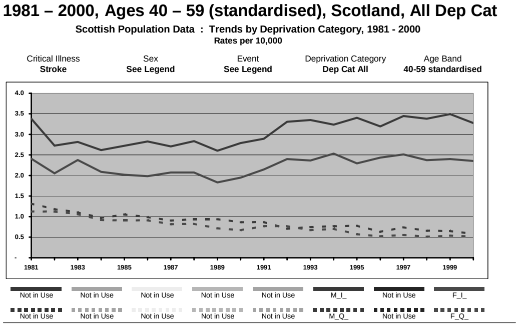


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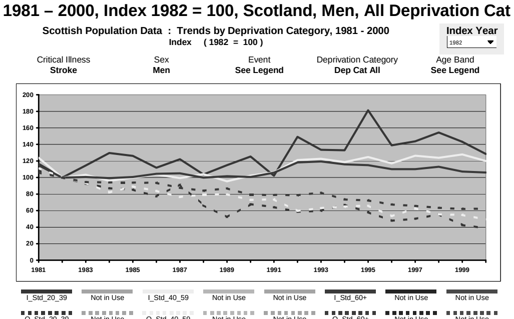


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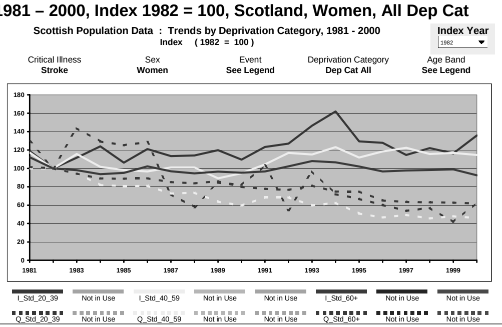


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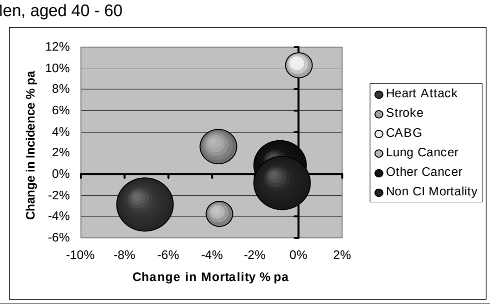
## Summary of Trends in CI Incidence and Mortality

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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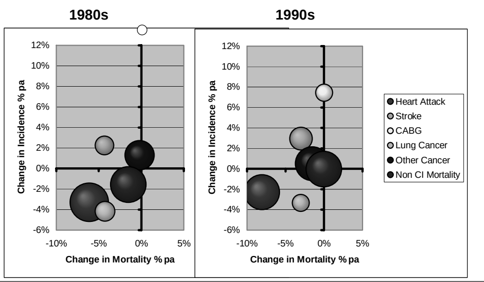


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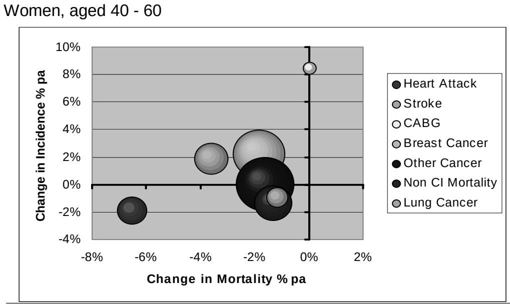


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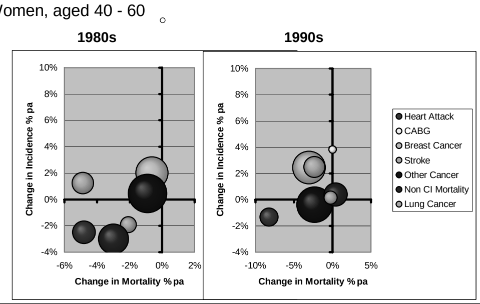


Size of Balls Indicates Relative Importance of CI Measured by Incidence Rate.

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**Summary of Trends in CI Incidence and Mortality**
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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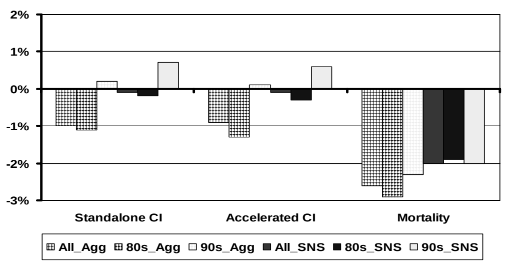
**Summary of Trends in CI Incidence and Mortality**
Rough Estimate Avg Change % pa, England & Wales, 1980-2000
Men, aged 40 - 60

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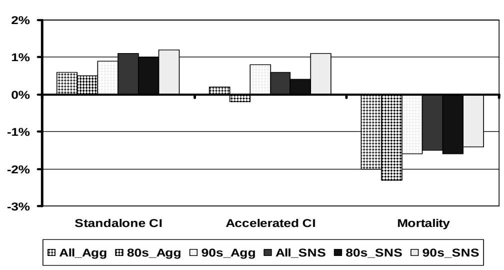


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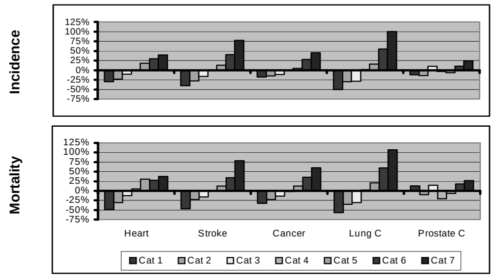
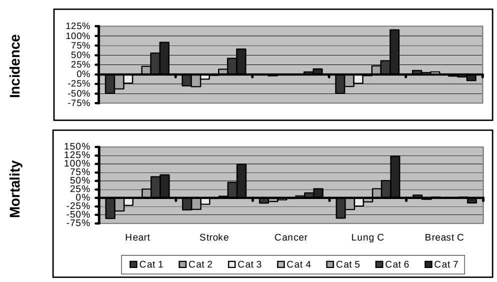
## Relative CI Rates by Deprivation Category
## Scotland, 1989 – 93, Ages 40 – 59, Males






## 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 2½**%pa for men, **2**%pa for women.
- **CI** incidence **fell 1**%pa for men, but has **risen ½**%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 **½**%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 **½ to 1**%pa for **men**
- **CI** incidence **rose** by **1 to 1½**%pa for **women**

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## 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 2

**Mapping a range of possible future outcomes for CI risk costs**
**Key  -  Part 1**

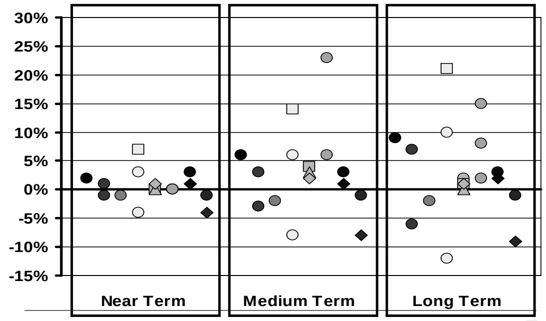
- Extrapolation of trends from the 1990’s
- Obesity  -  “optimistic” and “pessimistic” scenarios
- Smoking  -  continuation of recent trends in smoking habits
- Convergence to USA CI incidence rates
- Convergence to EU CI incidence rates  -  “best” and “worst”
- Cancer Screening  -  Breast (extended 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 Insured

% Change in Overall CI risk Rate

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## 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 can envisage more 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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## Mapping a range of possible future outcomes for CI risk costs - Key Issues

- Difficult to model the whole picture (‘top down’)
- We can more easily answer “What If ?” questions
  - ‘Bottom Up’
  - Start building up the jigsaw
  - But the puzzle may have very many pieces !
- Key difficulty is assessing likelihood
- Stress need to work with other professions to help us understand the rest of the jigsaw

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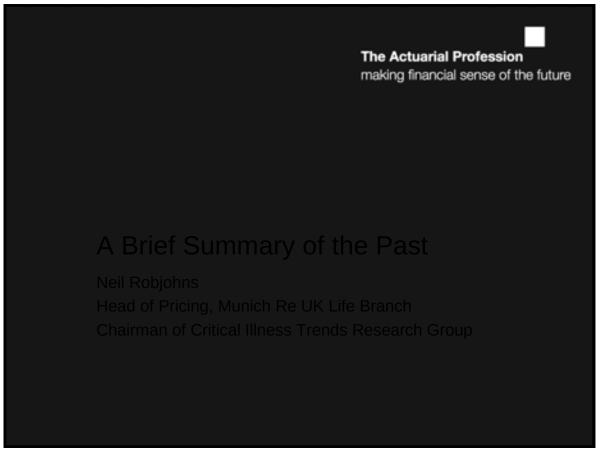
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