

Advances in Research on Non-Communicable Diseases

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Several overlapping agendas

Basic science research

Epidemiology and clinical
research

Public health research



Basic science research

Chemistry and biology

Molecular biology

Genetics

Genomics and proteonomics

Epidemiology research

Tobacco and health:

- 50% heavy smokers die of tobacco-related diseases
- heavy smokers lose 10 years of life

Diet and NCDs:

- Coronary heart disease and cholesterol fractions
- ~ 35% of cancer

Some NCDs are caused by factors in the environment, we do not know how much.



Public health research

Major reductions in CHD in many countries

Major alleviation of the tobacco epidemic in males in some countries

Impact of cervical screening

Failure of many behavioral science interventions

Basic research in cancer

- Carcinogenesis
- Viruses
- Molecular epidemiology
- The genetics revolution



Cancer epidemiology

- Tobacco and many cancers
- Occupation
- Hormonal risk and protective factors
- Diet and nutrition
- Environment?
- Genetic polymorphisms

Etiology of cancer of the cervix

- A specific HPV type (16, 18, 33, etc) is a necessary but not sufficient cause
- Host and genetic factors may be critical
- Co-factors - smoking, oral contraceptives, HIV and other STDs, ? diet
- Vaccination - a realisable dream
 - > prophylactic
 - > therapeutic

Breast cancer is (in part) preventable

- Age at first birth
- Breast feeding
- Physical activity
- Weight reduction
- Alcohol
- Diet: energy, fat, cereals etc
- Smoking?

Effects of oral contraceptives on NCDs

- Increases risk of thrombosis related episodes,
 - especially in smokers
- Increases risk of breast cancer
- Protective effect on ovary and endometrium cancer

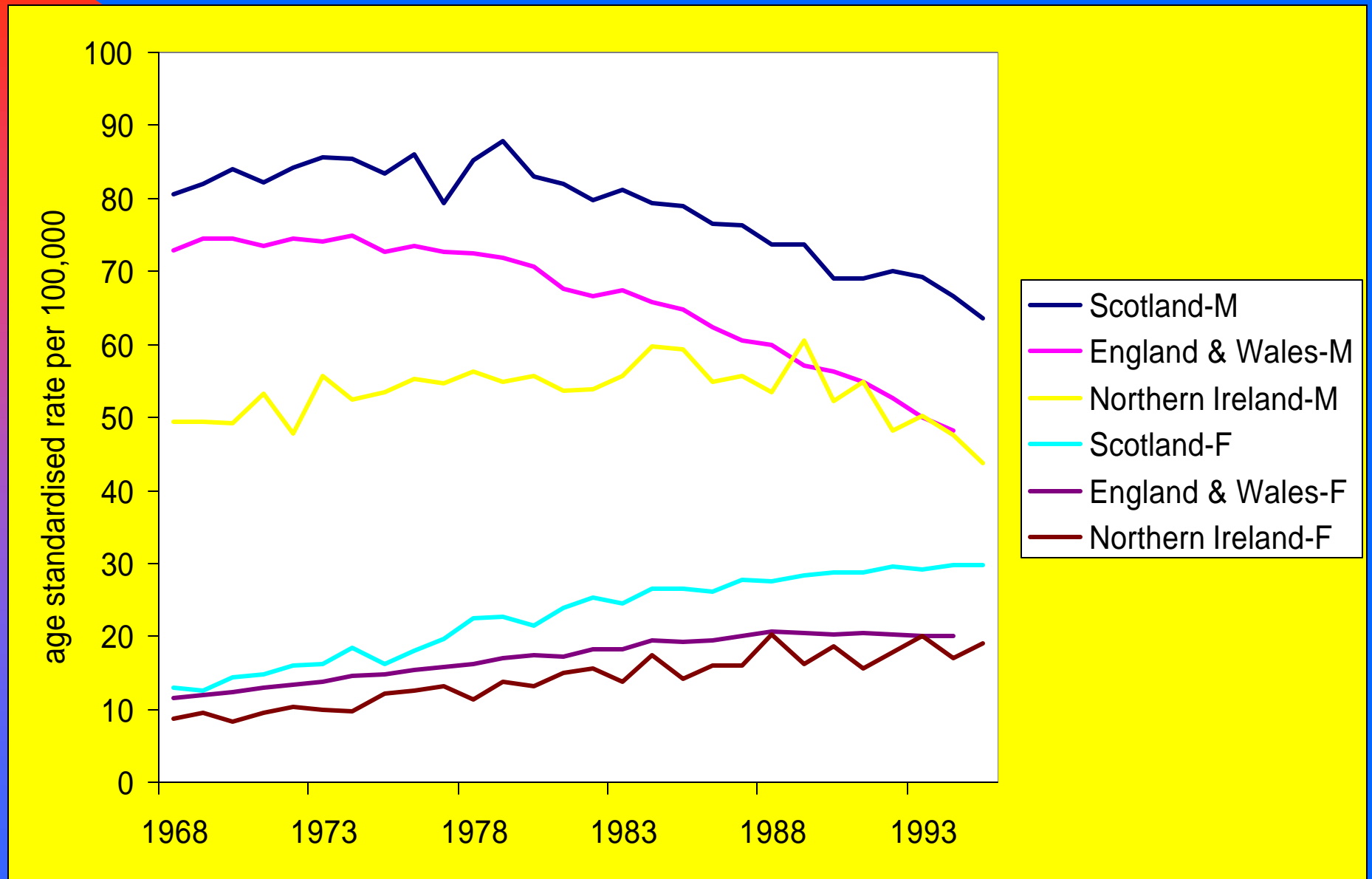
Chemoprevention

- Cholesterol lowering agents for CHD
- Beta-carotene for lung cancer failed
- Tamoxifen for breast cancer
- Aspirin (NSAIDS) for:
 - Coronary heart disease
 - Colo-rectal cancer

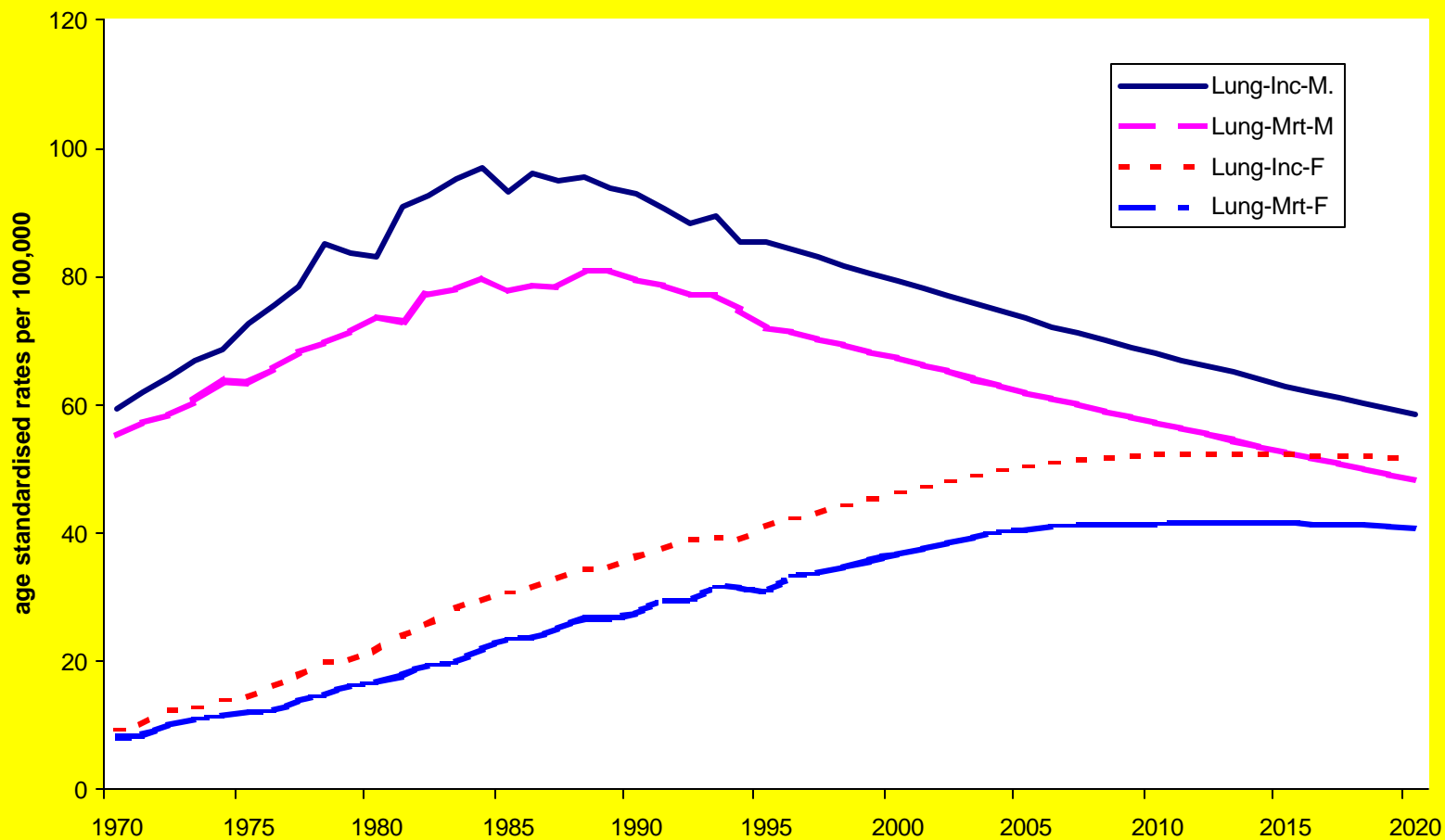
Impact of Epidemiology/Clinical/ Public Health Research

- Reduction in coronary heart disease incidence
 - Contribution of improved acute care to mortality reduction
- Reduction in several cancers

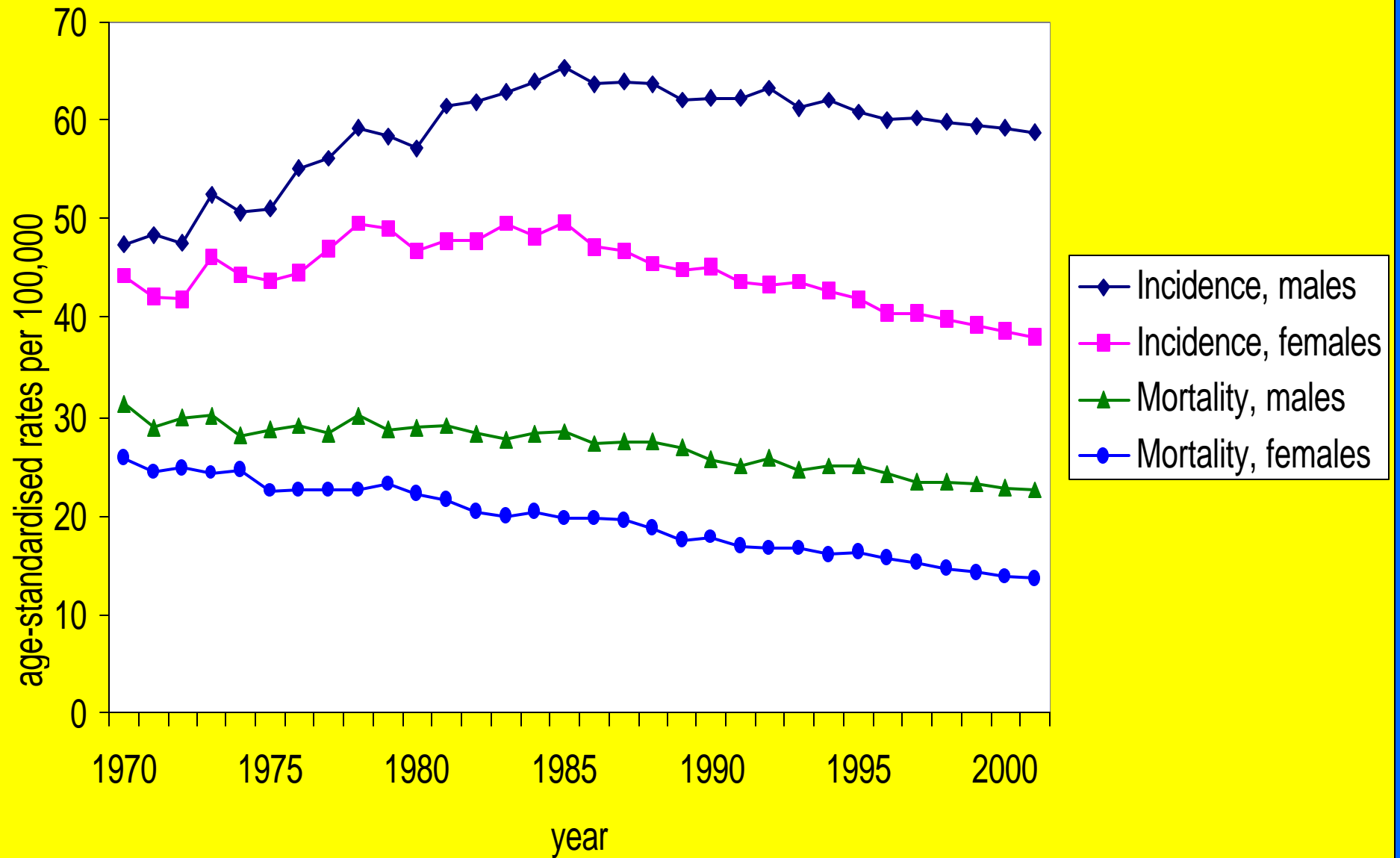
The lung cancer epidemic - UK



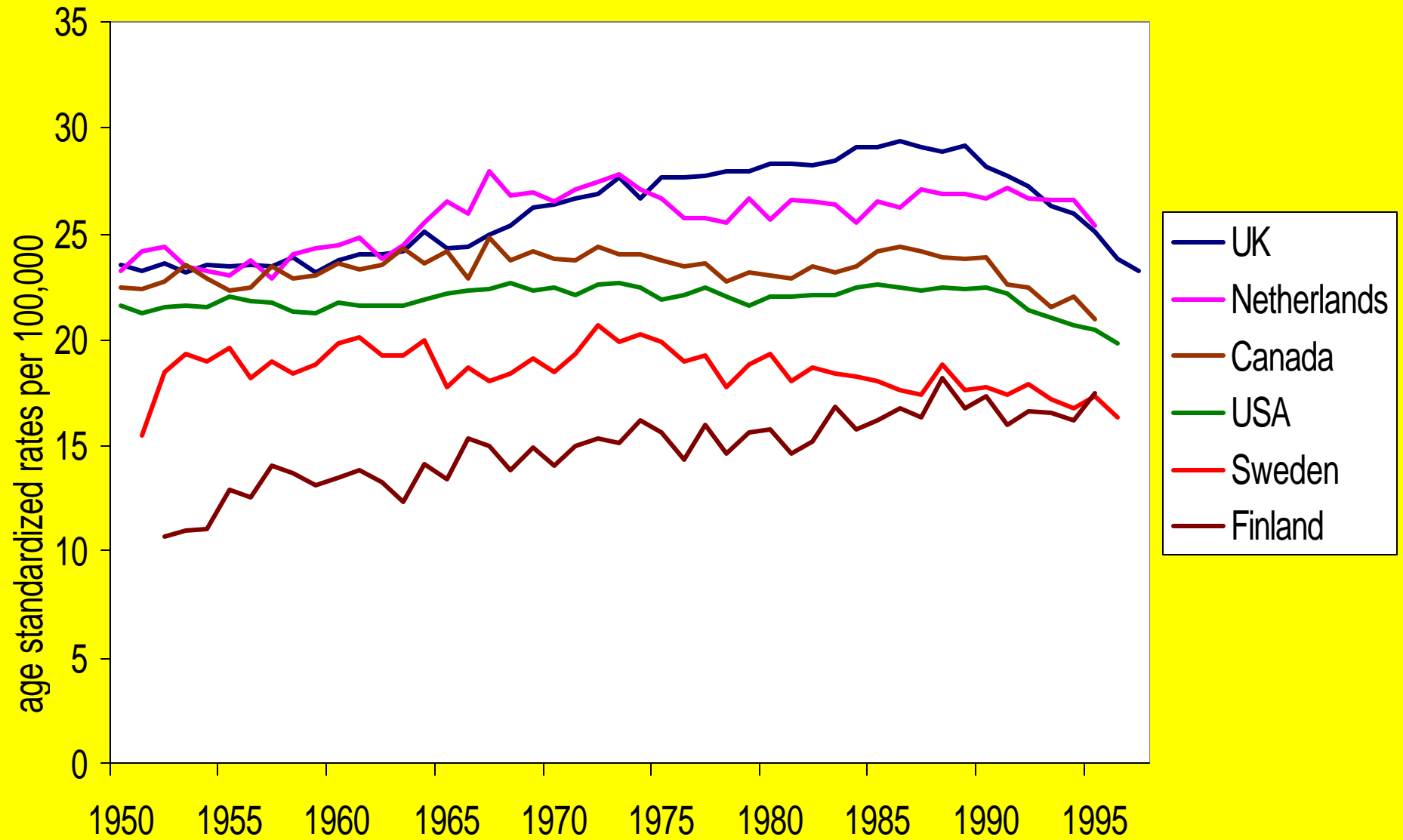
The lung cancer epidemic - Canada



Canada - Incidence and mortality from Colo-rectal cancer

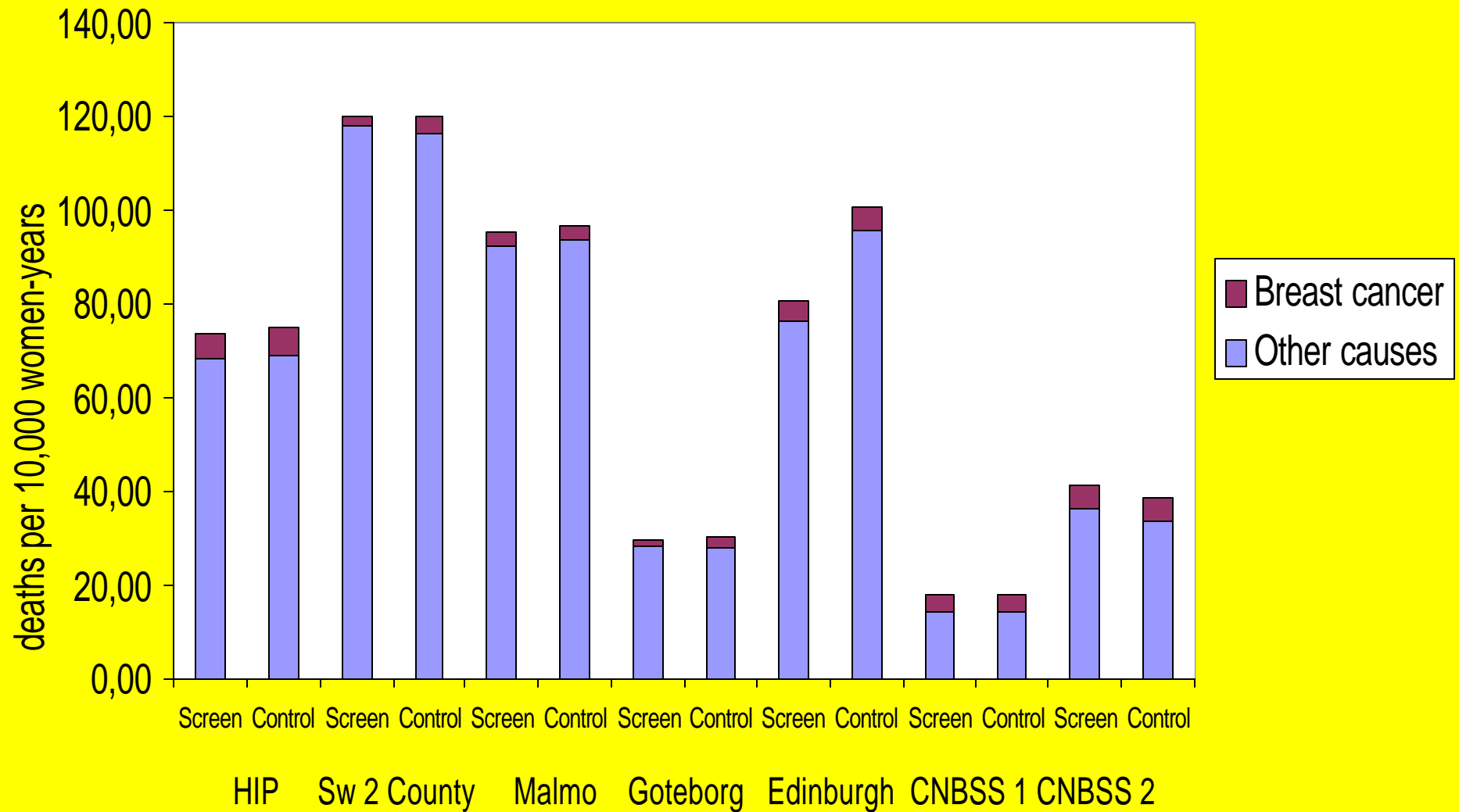


Trends in mortality from breast cancer



Mortality from breast cancer and other causes in the breast screening trials

(adapted from Black et al, 2002)

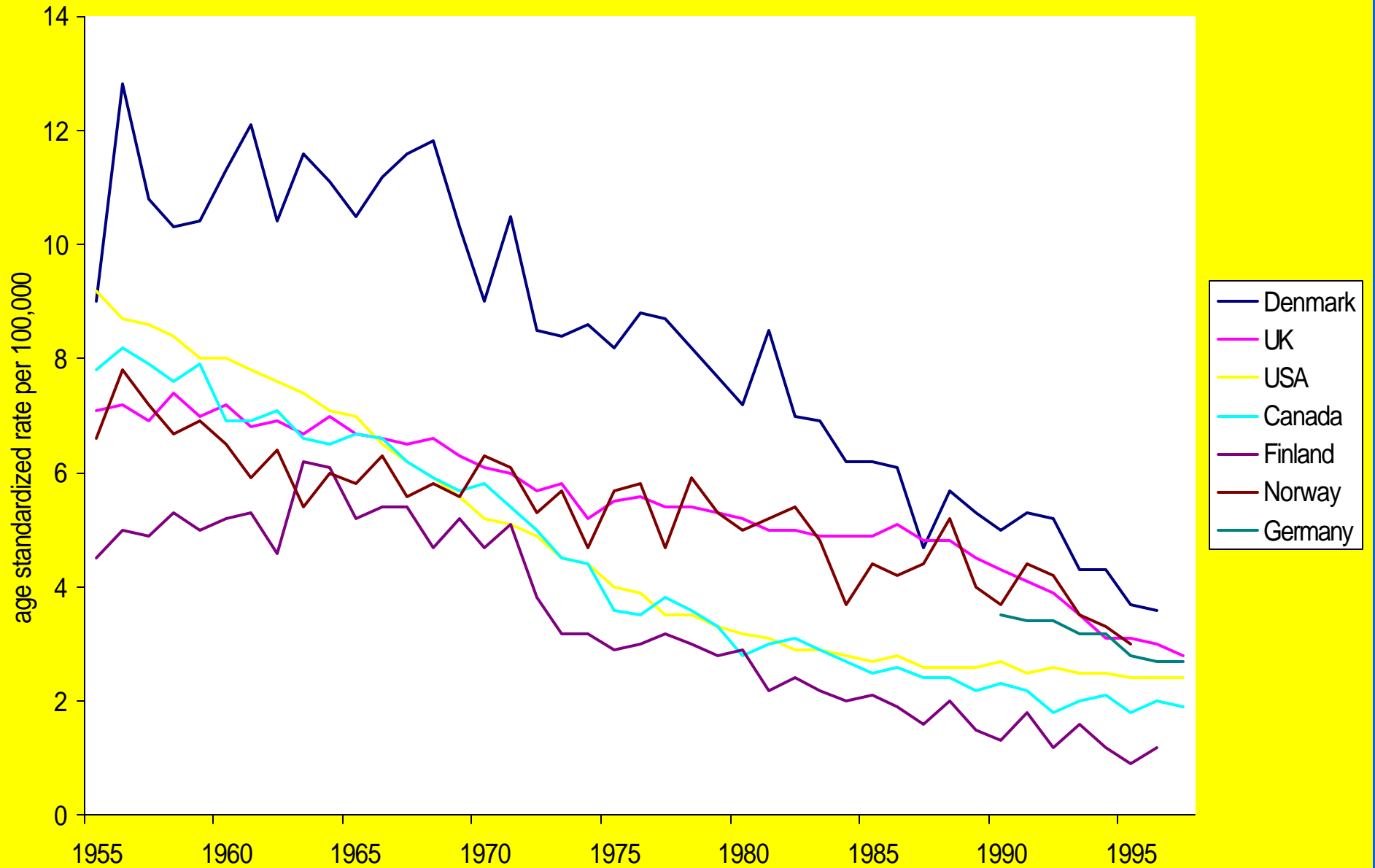


Conclusions on CNBSS trials

The benefit from screening derives from the earlier detection of palpable breast cancers, coupled with good therapy, not from the early detection of very small cancers.

This is accomplished both by good breast physical examinations and by mammography

Trends in mortality from Cancer of the Cervix



Prevention in Cancer Control

- Tobacco control the priority
- Dietary modification - plant foods
- Avoid known carcinogens in occupations and general environment
- Hepatitis B Vaccination
- Sex education for HIV, cervix cancer
- Promote physical exercise and weight reduction
- Sun avoidance

Screening in Cancer Control

- Use only effective strategies
- Educate professionals and public
- Base on Natural History of cancer
- Screen at right ages and frequency
- Maintain high quality
- Ensure adequate facilities available
- **Organization**

Time for cancer control measures to show an important impact

Prevention:

- Tobacco control 30 years
- Dietary modification 10-50 years
- Infection control 40 years

Screening

10 years

Treatment

5 years

Conclusions

Research on NCDs has already led to an important impact on Public Health in some countries

However, many countries have failed to benefit from these advances

Existing programs should be reorganised and new programs initiated as soon as possible, while research continues.