Queen's University Belfast

HSC Public Health Agency
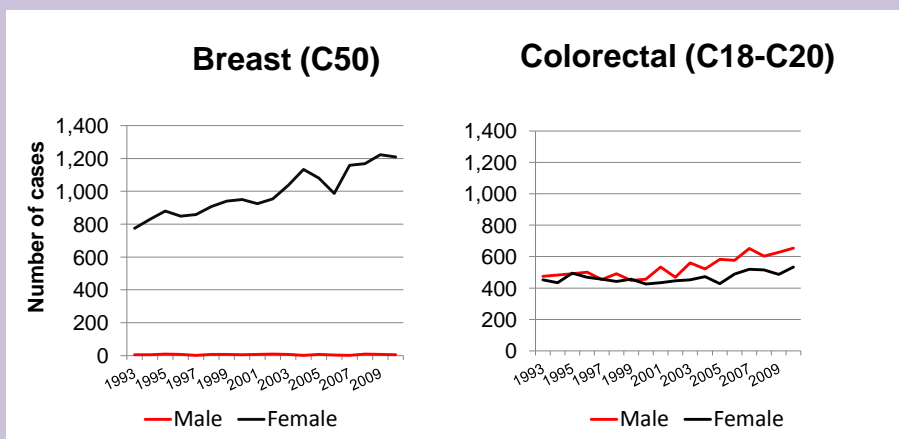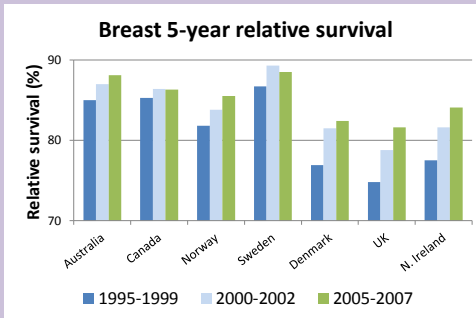
N. IRELAND Cancer Registry

Stage distribution and excess mortality rates in breast and colorectal cancer patients diagnosed in N. Ireland (NI) 1996-2007.

**Bannon FJ, Middleton RJ, Kelly J, McConnell J
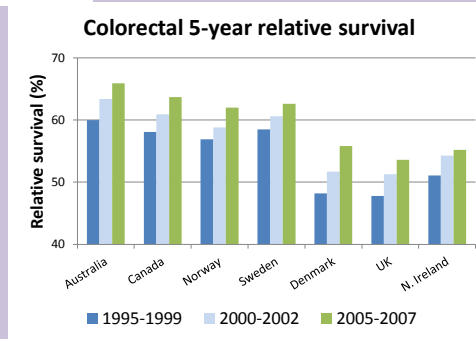Anderson B, Gavin AT.**

Northern Ireland Cancer Registry

Incidence Increasing

Breast (C50) — Colorectal (C18-C20)

Breast 5-year relative survival

Survival (ICBS) in the UK, while improved, is consistently below countries with similar health care systems and resource

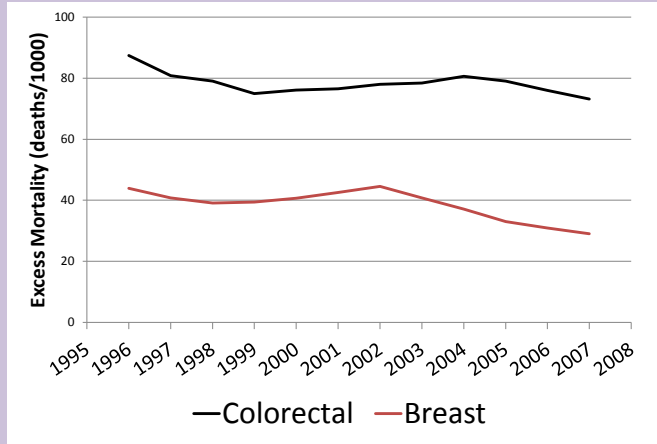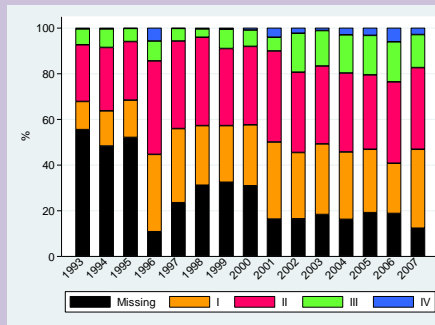### Colorectal 5-year relative survival

Survival Increasing

Basic question

- is increase in survival due to earlier stage detection or through better stage-specific survival (treatment)?
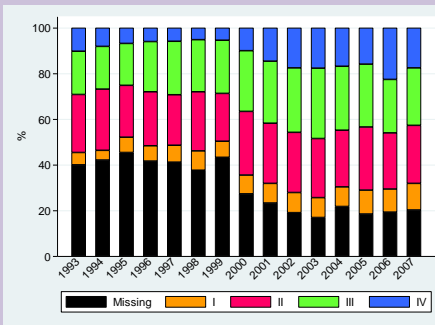
Overall fall in 3-year excess mortality rate
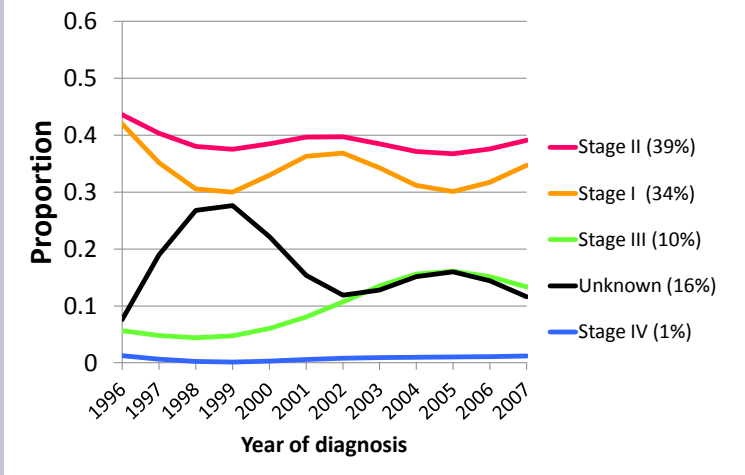(number of deaths/1000)
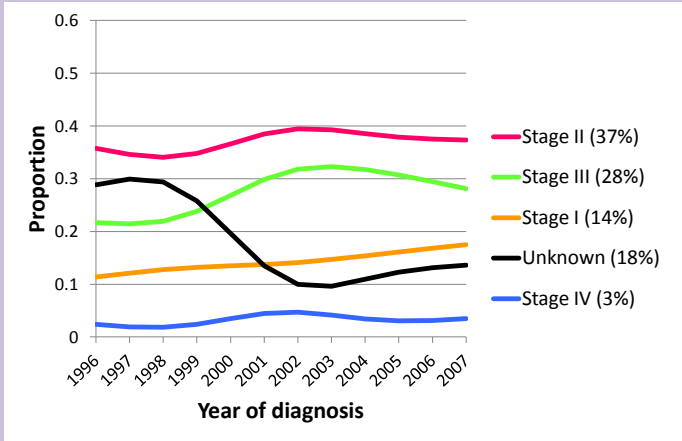

Stage proportions

Breast

Colorectal

Stage proportion trends breast
### (3 years post diagnosis)

Stage proportion trends colorectal
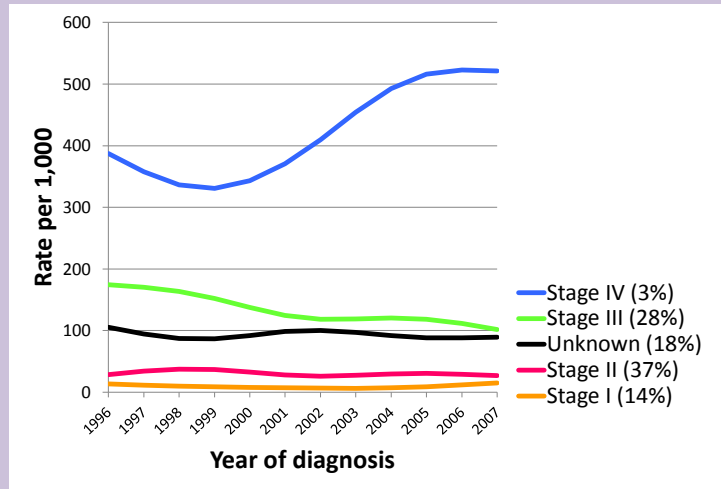### (3 years post diagnosis)

Excess mortality

1. **Excess mortality was estimated using a parametric approach employing a user-led Stata command stpm2.**
2. **Restricted cubic splines were employed to model non-linearity in:**
   - **underlying hazard (5 knots),**
   - **covariates calendar year (4 knots) and age (4 knots)**
   - **time-dependency of hazard with stage, year and age (2knots).**
3. **All patients directly adjusted for population mortality rates based on their age, sex, calendar year**
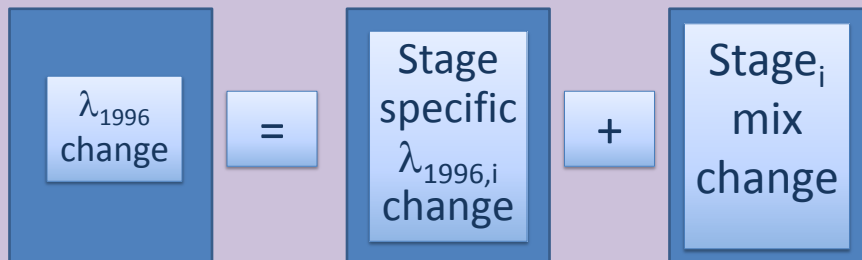
Smoothed trend in 3-year excess mortality breast
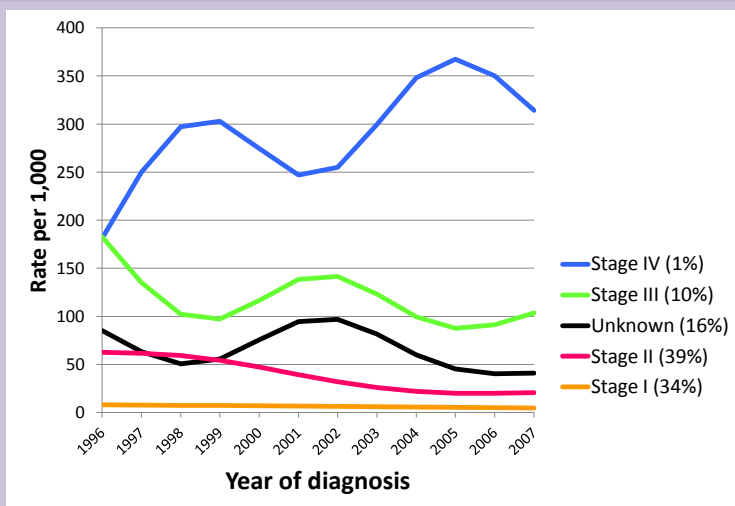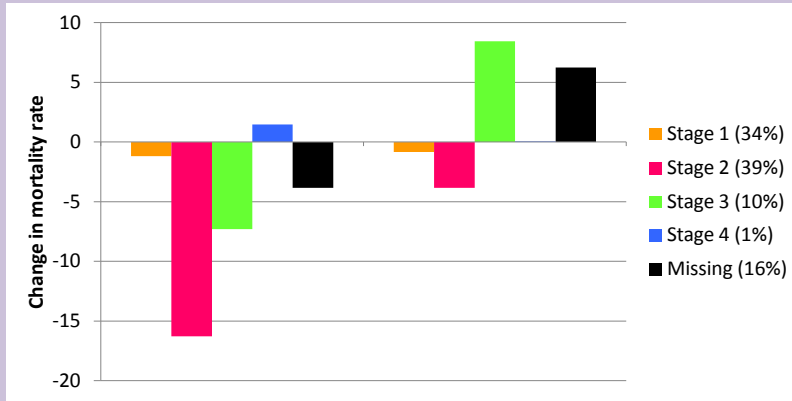
Smoothed trend in 3-year excess mortality colorectal

Separation of 3-year net mortality rate

$$\boxed{\lambda_{1996}\ \text{change}} \quad = \quad \boxed{\begin{array}{c}\text{Stage}\\\text{specific}\\\lambda_{1996,i}\\\text{change}\end{array}} \quad + \quad \boxed{\begin{array}{c}\text{Stage}_i\\\text{mix}\\\text{change}\end{array}}$$

$$\frac{d\lambda_{1996}}{dt} = \sum_{i=1}^{5}\left((P(\text{stage})_i) \times \frac{d\lambda_{1996,i}}{dt} + (\lambda_{1996,i}) \times \frac{d(P(\text{stage})_i)}{dt} \right)$$
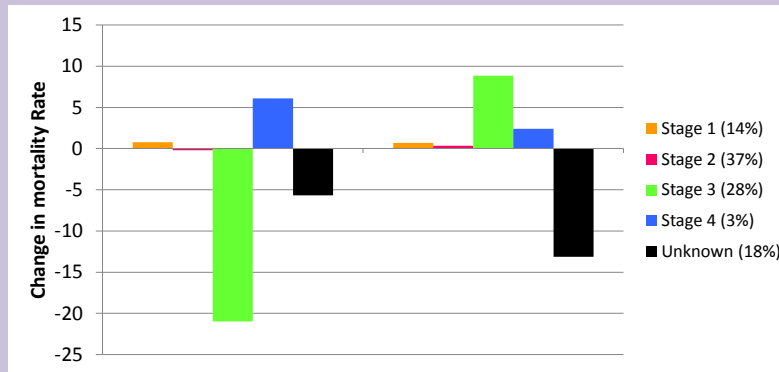
Separation of 3-year excess mortality fall
1999-2007 Breast

Separation of 3-year excess mortality fall
1996-2007 Colorectal

Summary

• **Overall 100% breast and 96% colorectal excess mortality reduction is due to treatment and not changed stage profile .**

•**Reductions in excess mortality for Breast were in Stage II and III from diagnosis**

• **but only Stage III in Colorectal and only from 6 months after diagnosis**

•**Potential to make further gains in mortality decrease by reducing the number of late-stage presentations.**