

Chapter 7

Colorectal

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Summary

- In the UK and Ireland, in the 1990s, colorectal cancer accounted for about 1 in 8 newly diagnosed cancers and 1 in 9 deaths from cancer.
- Incidence rates were highest in Scotland, Ireland and Northern Ireland. Rates for males in some of the more urban areas of the midlands and north of England, and for females in parts of the south of England, were slightly above average; rates in most of London and parts of the south east of England were slightly below average.
- Although the geographical pattern of mortality rates was broadly similar to that for incidence, there was more evidence of a north-side divide across England, particularly for males.
- Possible risk factors for colorectal cancer – poor diet, obesity and smoking – are associated with deprivation and may explain some of the geographical variation in incidence.
- The significant difference in five-year survival between affluent and deprived areas observed in England and Wales and in Scotland may in part explain the higher mortality rates, relative to incidence, in some of the areas that have higher levels of socio-economic deprivation.

Introduction

Cancers of the colon and rectum have been considered together here because in many instances it can be difficult to determine in which of these sites within the large bowel a cancer is located. In particular, cancers of the sigmoid colon may be coded to either colon or rectum, since this subsite is also referred to as the 'rectosigmoid junction', which is considered to be part of the rectum.

Incidence and mortality

In the UK and Ireland in the 1990s, there were about 17,600 newly diagnosed cases of colorectal cancer each year in males, of which 62 per cent were in the colon and 38 per cent in the rectum. There were about 16,300 cases in females, of which 71 per cent were in the colon and 29 per cent in the rectum. Colorectal cancer accounted for 13 per cent of all diagnosed

cancer cases in males, in whom it was the third most common cancer after lung and prostate cancer, and 12 per cent of cases in females, where it was the second most common after breast cancer.

Overall, the age-standardised incidence rates were 53 and 35 per 100,000 in males and females respectively, giving a male-to-female ratio of about 1.5:1. Colorectal cancer is predominately a disease of the elderly¹ and the age-specific incidence rates rose steeply from about age 50 for both males and females. In England and Wales, the lifetime risk² of being diagnosed with colorectal cancer in 1997 was 5.7 per cent (1 in 18) in males and 4.9 per cent (1 in 20) in females.³

In the 1990s, about 9,500 males died from colorectal cancer in the UK and Ireland each year; of these deaths, 65 per cent were from colon cancer and 35 per cent from rectal cancer. About 9,100 females died each year from colorectal cancer; of these, 73 per cent were from colon cancer and 27 per cent from rectal cancer. Colorectal cancer accounted for 11 per cent of cancer deaths in males in whom it was the third most common cause of cancer death after lung and prostate cancer, and 12 per cent of cancer deaths in females, where it was also the third most common, after breast and lung cancer.

Overall, the age-standardised mortality rates were 28 and 18 per 100,000 in males and females respectively, giving a male-to-female ratio of about 1.6:1, slightly higher than that for incidence, suggesting slightly better survival for females. The age-specific mortality rates followed a similar pattern to those for incidence, with rates rising steeply in both males and females from about age 50.

Incidence and mortality trends

For males in England and Wales, the age-standardised incidence rates of colon and rectal cancer were broadly similar in the early 1970s. The rates for the two cancers later diverged as the incidence of colon cancer increased by 30 per cent between 1971 and 1997, compared with an increase of only 6 per cent for rectal cancer over the same period. For females, the incidence of colon cancer was about twice that of rectal cancer in the early 1970s. The rise in incidence rates of colon and rectal cancer was more gradual at 5 per cent for both cancers between 1971 and 1997. By 1997, the ratio of colon to rectal cases was similar in males and females.^{1,4}

Despite these increases in incidence, there have been declines in the age-standardised mortality rates from both colon and rectal cancer since 1950. The mortality rates from colon cancer fell by 33 per cent in males and 53 per cent in females between 1950 and 1999. Mortality from rectal cancer fell by 56 per cent for both males and females over the same period.

For males in Scotland in 1975, the age-standardised incidence rate of colon cancer was approximately 50 per cent higher than that of rectal cancer, and for females, it was nearly three times higher. Between 1975 and 1997 there was an increase in both cancers in males, particularly from the late 1980s, and more so in rectal cancer. For females, the rise in incidence rates of both cancers was less marked. Mortality trends were broadly similar to those in England and Wales, with the exception of deaths from rectal cancer in males, where the age-standardised mortality rate began rising again from 1990, to reach levels previously seen in the early 1960s.⁵

Survival

Survival from colon and rectal cancers is now moderate, having improved significantly since the early 1970s.⁶ For patients diagnosed in England and Wales in 1996–99, five-year relative survival from colon cancer was 47 per cent in males and 48 per cent in females. This compares with 42 per cent for males and 43 per cent for females diagnosed in 1991–95, an improvement of about 5 percentage points. For those diagnosed with rectal cancer in 1996–99, five-year survival was 47 per cent for males and 51 per cent for females. Again, this was an improvement (of more than 6 percentage points) from 1991–95, when survival was 40 per cent in males and 45 per cent in females.⁷ Five-year survival from colorectal cancer was around 50 per cent for patients diagnosed in Scotland,⁸ Northern Ireland⁹ and Ireland,¹⁰ in the 1990s.

Geographical patterns in incidence

For the constituent countries of the UK and Ireland, the incidence rates of colorectal cancer were between 18 and 22 per cent higher than the average for the UK and Ireland for males in Scotland, Ireland and Northern Ireland. Similarly, for females, the incidence rates were 23 and 19 per cent higher in Northern Ireland and Scotland, respectively, and 11 per cent higher in Ireland. The incidence rate for males was also slightly higher than average in Wales.

Within England, the incidence rates for males were slightly above average in the West Midlands, and below average in the London, Eastern, South East and Trent regions. For females, incidence rates were slightly below average in the Trent, Northern and Yorkshire, and Eastern regions, and almost 20 per cent below average in London (Figure 7.1).

Within each country, or region of England, the differences in the incidence rates between the highest and lowest health authorities were generally only 20–30 per cent (Figure 7.3) – this is a very narrow range compared with most of the other major cancers, especially those strongly related to deprivation

(such as cervix [Chapter 6], lip, mouth and pharynx [Chapter 12], larynx [Chapter 10], lung [Chapter 13] and stomach [Chapter 21]).

The maps for incidence (Map 7.1) show relatively high rates in Scotland and Northern Ireland for both males and females, and relatively low rates in parts of the London, South East and Eastern regions of England. For males, there were also high rates in some of the more urban areas of the North West, Northern and Yorkshire, and West Midlands regions and in parts of Ireland including the Eastern health authority, which includes Dublin. For females, rates were relatively high in two of the more rural areas of the West Midlands, and in parts of the South East and South West regions, and lower than average in parts of the Trent, and Northern and Yorkshire regions. The geographical patterns in the incidence of colon and rectal cancer (not shown) were similar to each other, and of course to the patterns for colorectal cancer.

Geographical patterns in mortality

The broad geographical patterns in the age-standardised mortality rates from colorectal cancer were closely similar to those for incidence, with higher than average mortality in Scotland, Ireland and Wales for both males and females. Mortality rates were also higher than average in Northern Ireland for females.

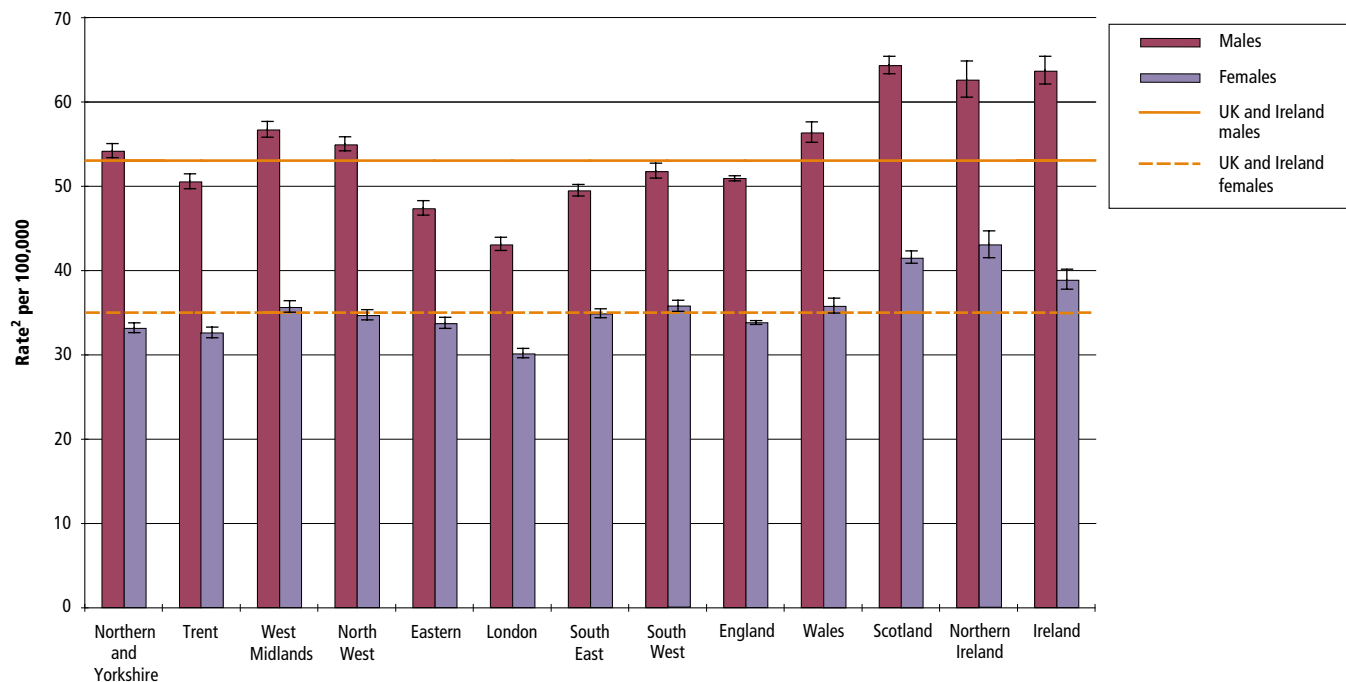
Within England, for males, mortality was slightly above average in the North West, West Midlands, and Northern and Yorkshire regions, and below average in the London, Eastern, South East and South West regions. For females, there was little regional variation in mortality: the largest difference from the average, in London, was only 10 per cent (lower) (Figure 7.2). Within each country, or region of England, the differences in mortality rates between the highest and lowest health authority were similar to those for incidence, being generally only 10–30 per cent (Figure 7.4).

The maps for mortality (Map 7.2) show broadly similar patterns to that for incidence. There were higher than average rates in Scotland for both males and females, in Northern Ireland for females and in much of Ireland for males; the lowest rates occurred in London. For males, the pattern of higher mortality in the more urban areas of the North West, Northern and Yorkshire, and West Midlands regions was more pronounced than for incidence. In addition, there were higher than average rates in south Wales. The lowest rates were in the southern half of England. For females, rates were also relatively high in some of the more urban areas of the north of England, and low in London. The maps for mortality indicate a north-south divide within England that is slightly more marked than for incidence.

(continued on page 88)

Figure 7.1

**Colorectal: incidence by sex, country, and region of England
UK and Ireland 1991-99¹**

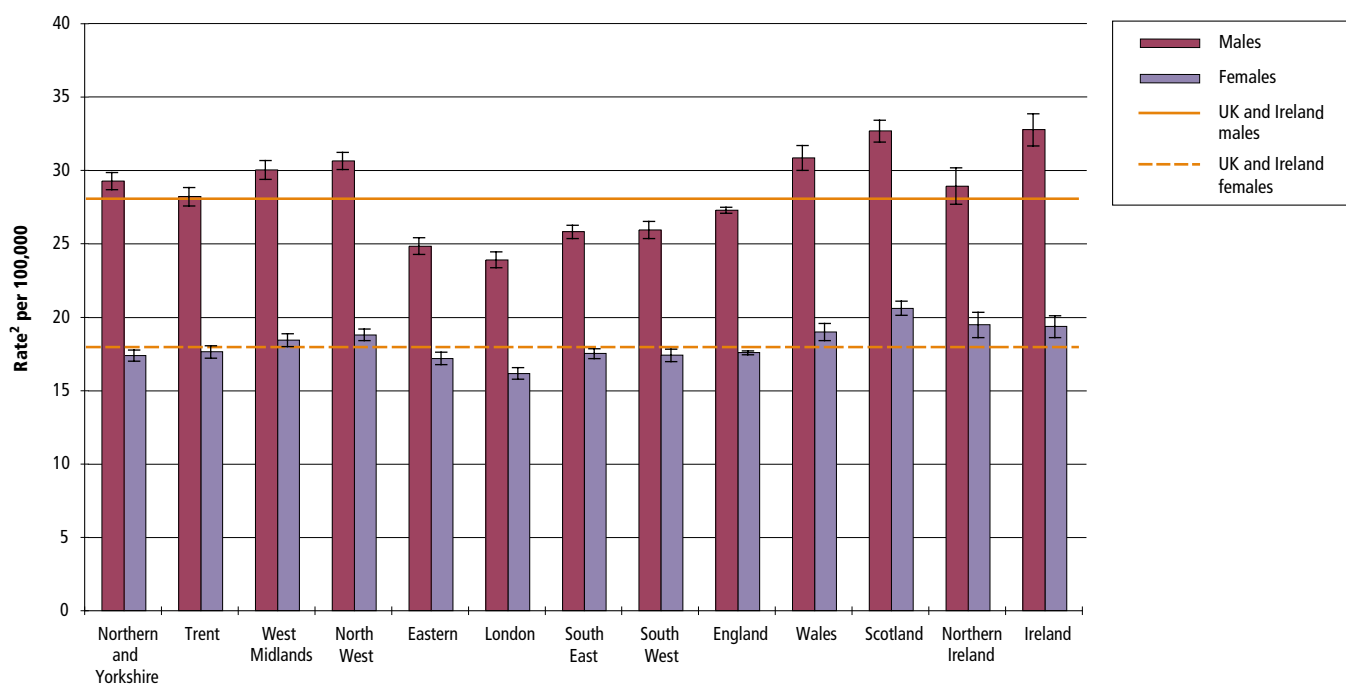


¹ Northern Ireland 1993-99, Ireland 1994-99

² Age standardised using the European standard population, with 95% confidence interval

Figure 7.2

**Colorectal: mortality by sex, country, and region of England
UK and Ireland 1991-2000¹**

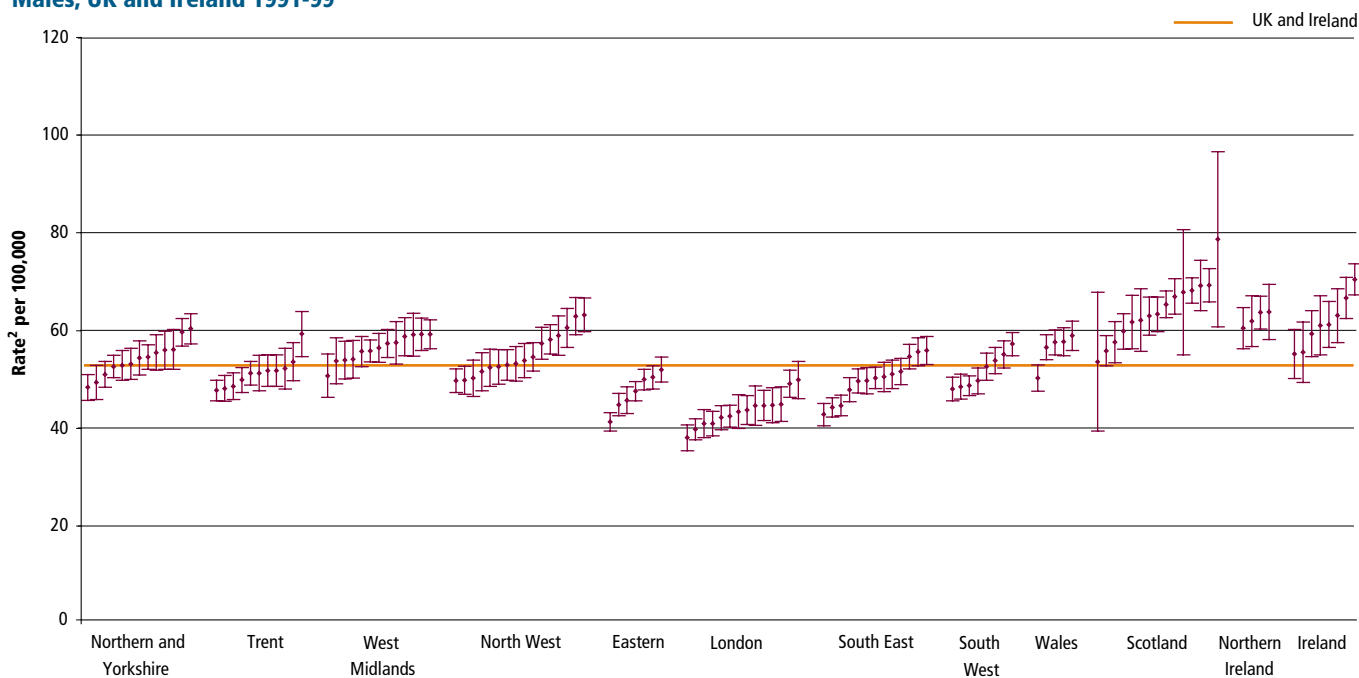


¹ Scotland 1991-99, Ireland 1994-2000

² Age standardised using the European standard population, with 95% confidence interval

Figure 7.3a

**Colorectal: incidence by health authority within country, and region of England
Males, UK and Ireland 1991-99¹**

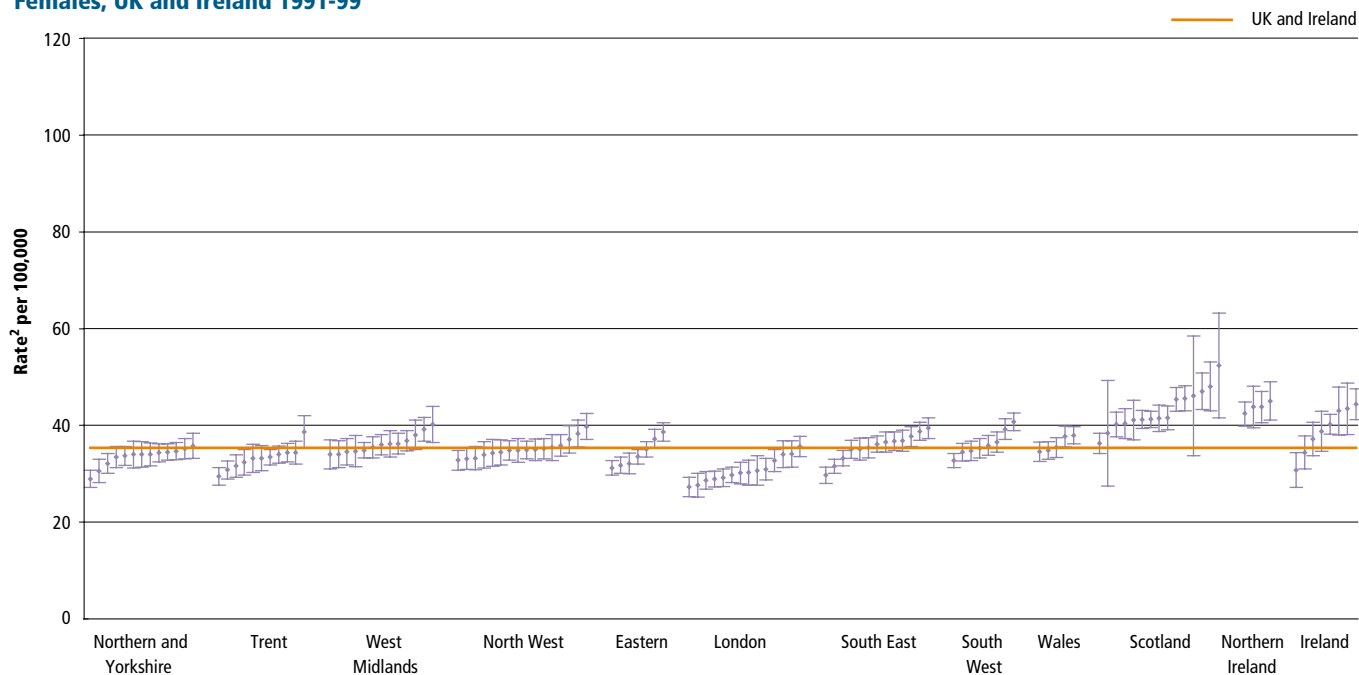


1 Northern Ireland 1993-99, Ireland 1994-99

2 Age standardised using the European standard population, with 95% confidence interval

Figure 7.3b

**Colorectal: incidence by health authority within country, and region of England
Females, UK and Ireland 1991-99¹**

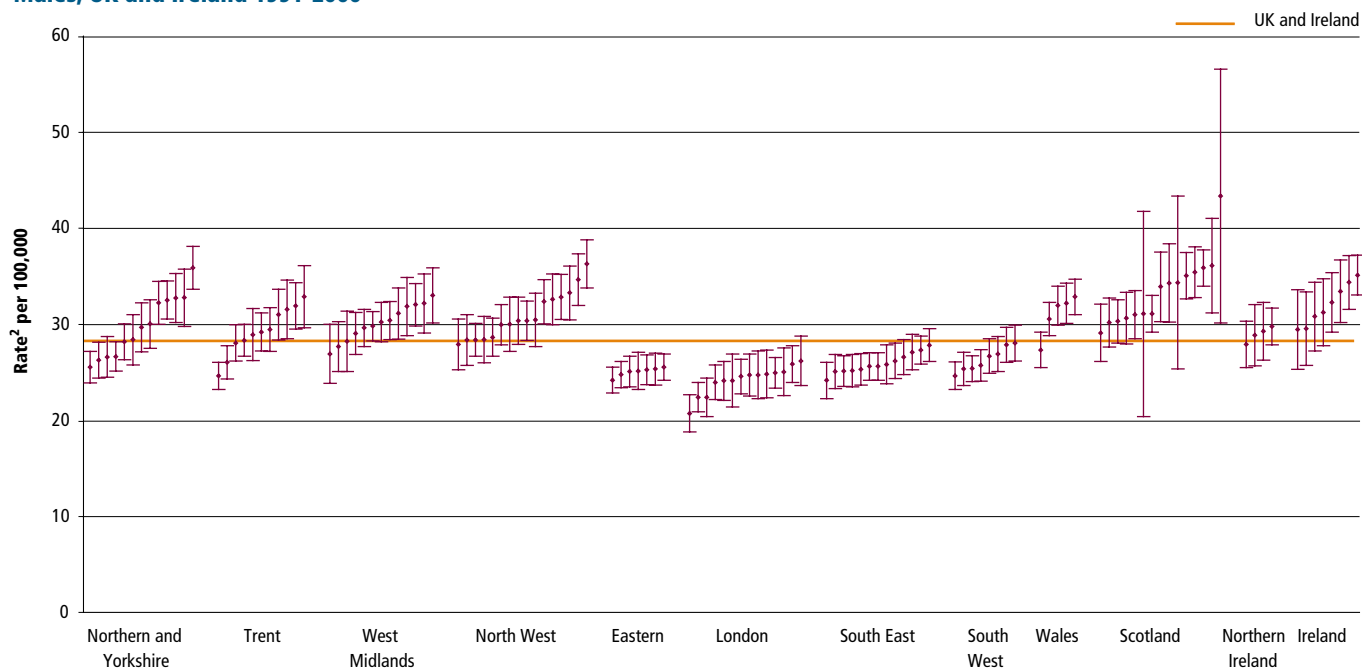


1 Northern Ireland 1993-99, Ireland 1994-99

2 Age standardised using the European standard population, with 95% confidence interval

Figure 7.4a

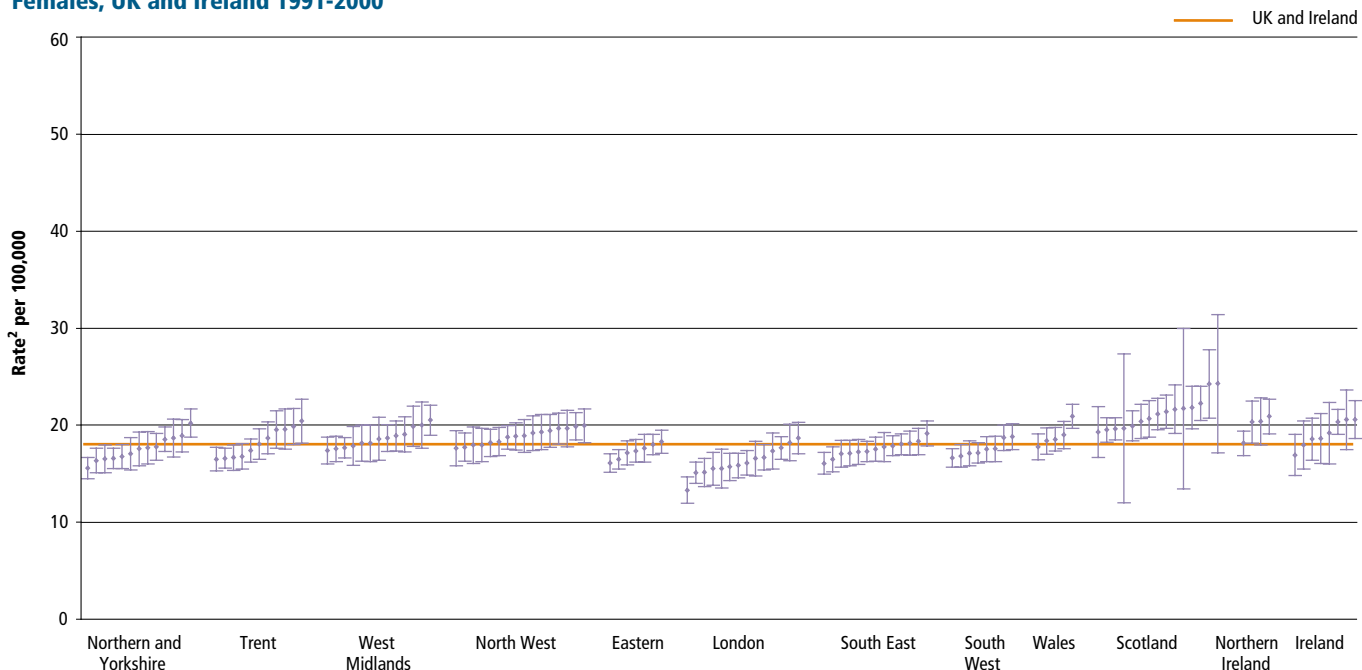
**Colorectal: mortality by health authority within country, and region of England
Males, UK and Ireland 1991-2000¹**



¹ Scotland 1991-99, Ireland 1994-2000
² Age standardised using the European standard population, with 95% confidence interval

Figure 7.4b

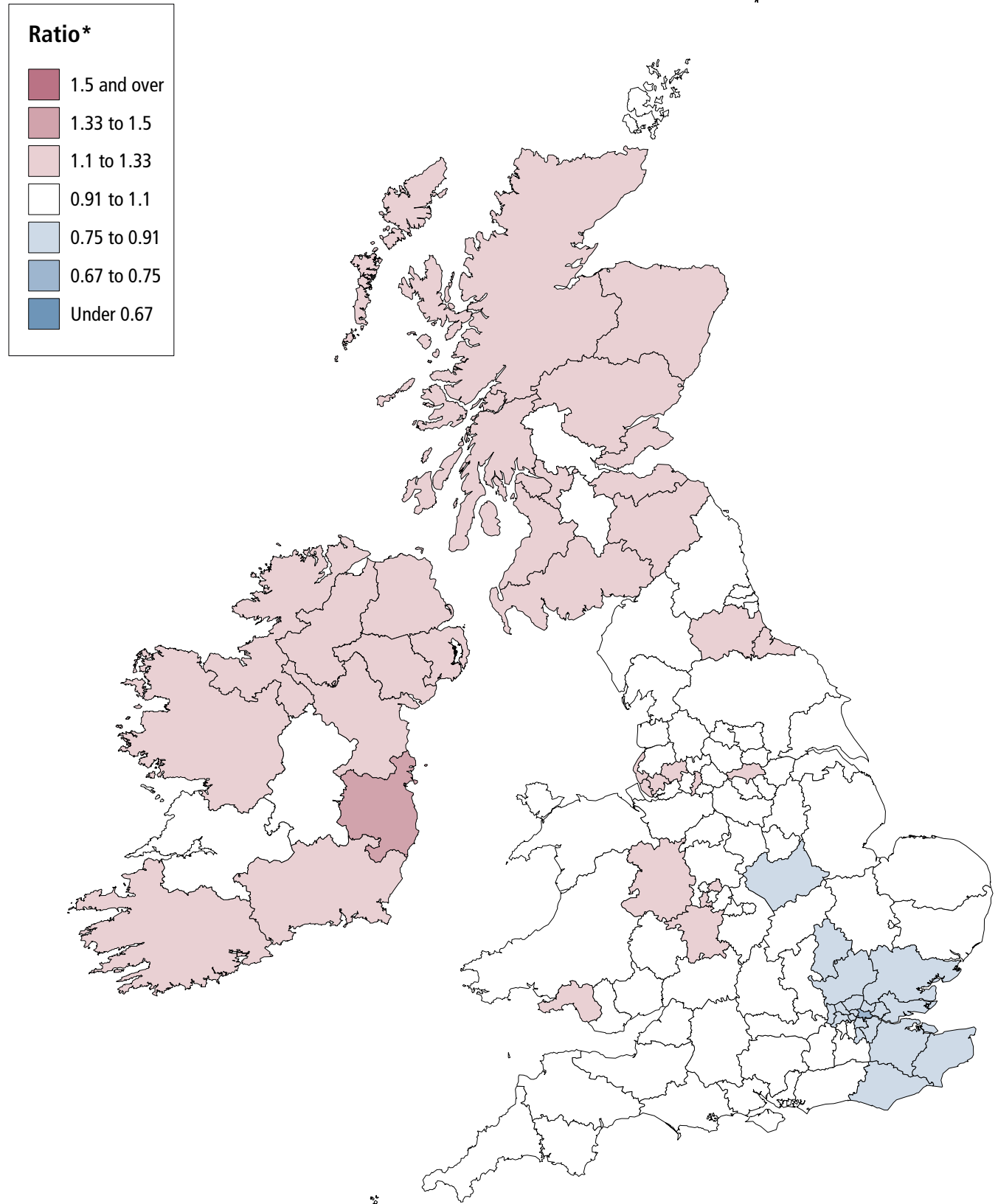
**Colorectal: mortality by health authority within country, and region of England
Females, UK and Ireland 1991-2000¹**



¹ Scotland 1991-99, Ireland 1994-2000
² Age standardised using the European standard population, with 95% confidence interval

Map 7.1a

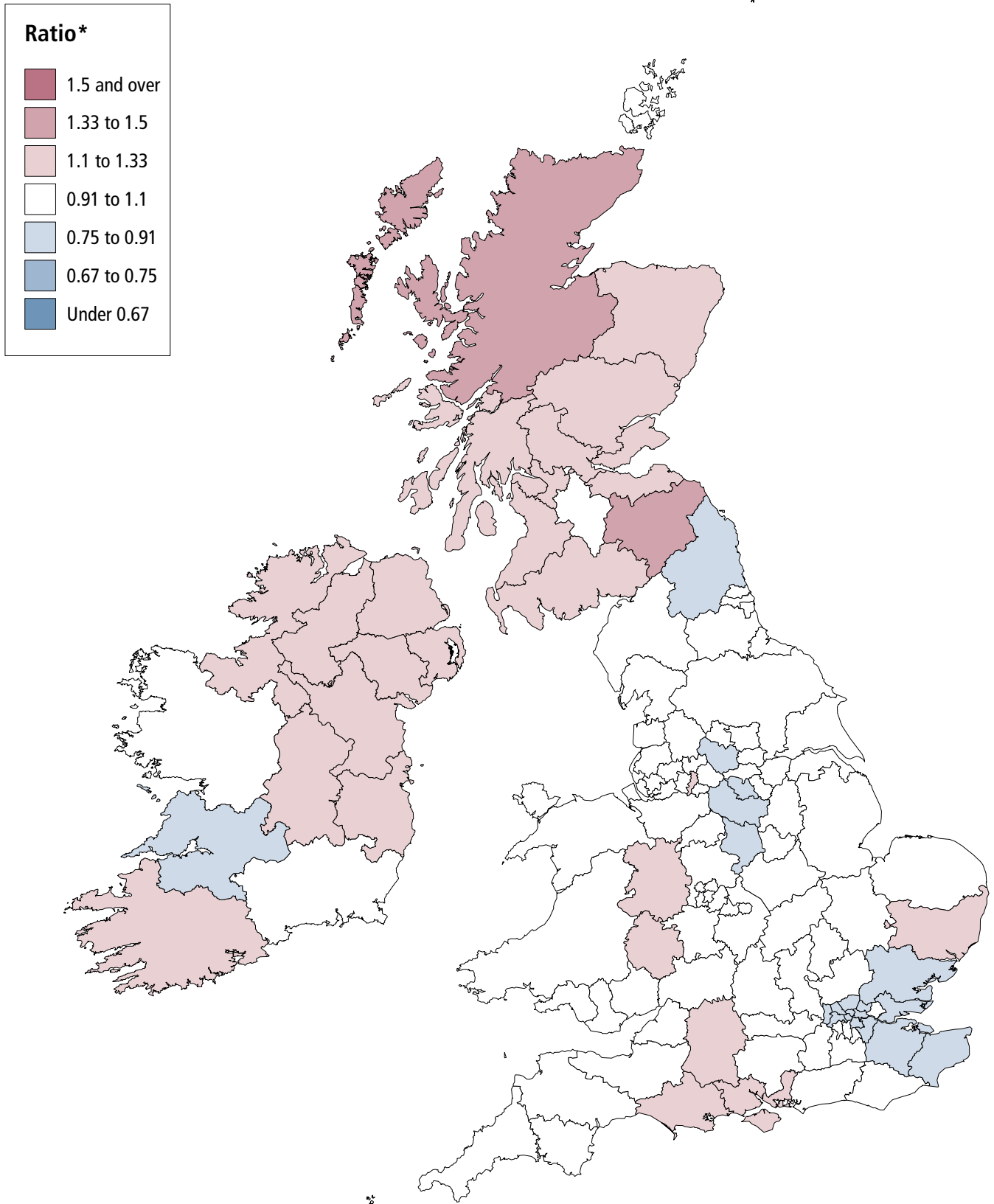
Colorectal: incidence* by health authority
Males, UK and Ireland 1991-99



*Ratio of directly age-standardised rate in health authority to UK and Ireland average

Map 7.1b

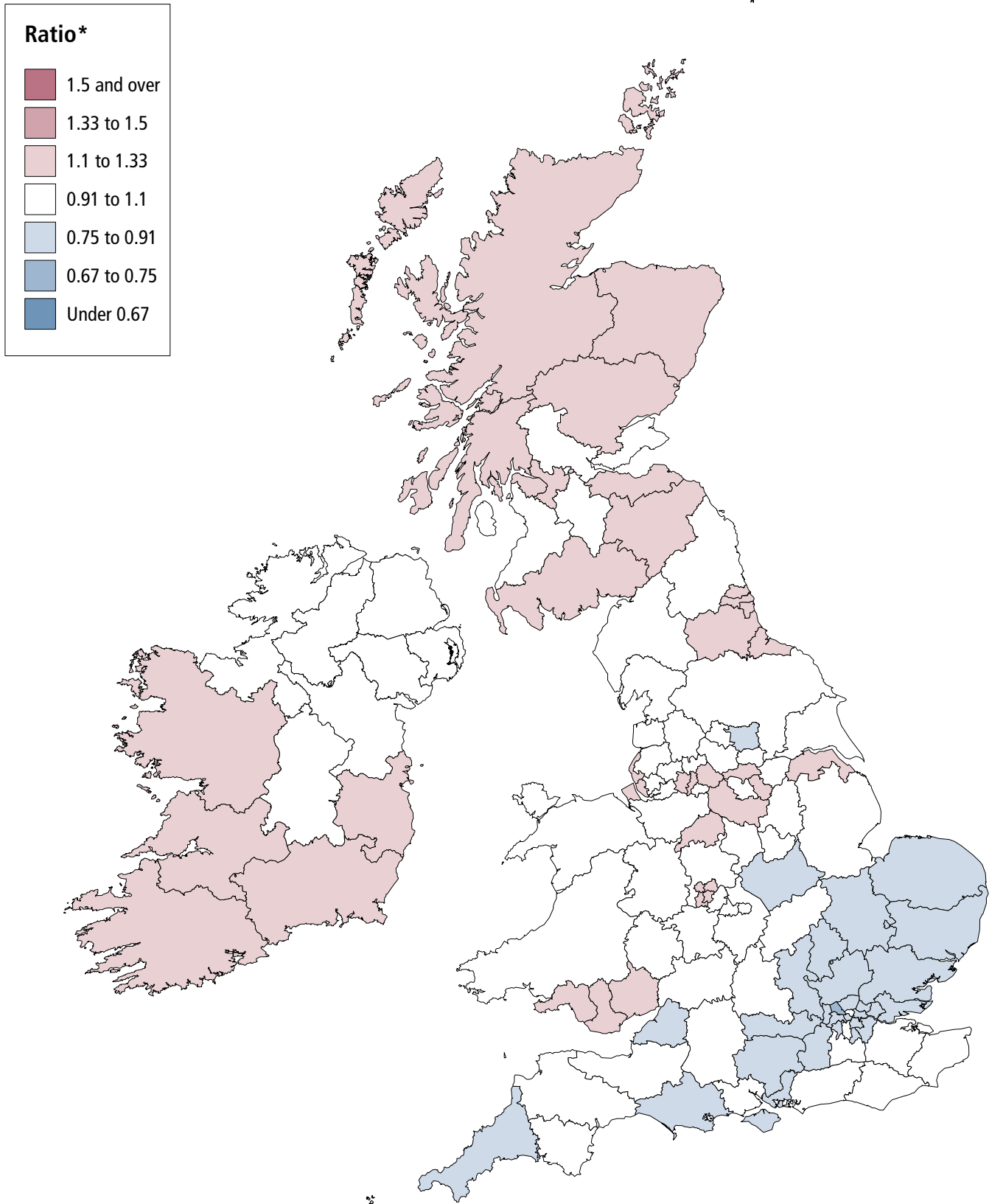
Colorectal: incidence* by health authority
Females, UK and Ireland 1991-99



*Ratio of directly age-standardised rate in health authority to UK and Ireland average

Map 7.2a

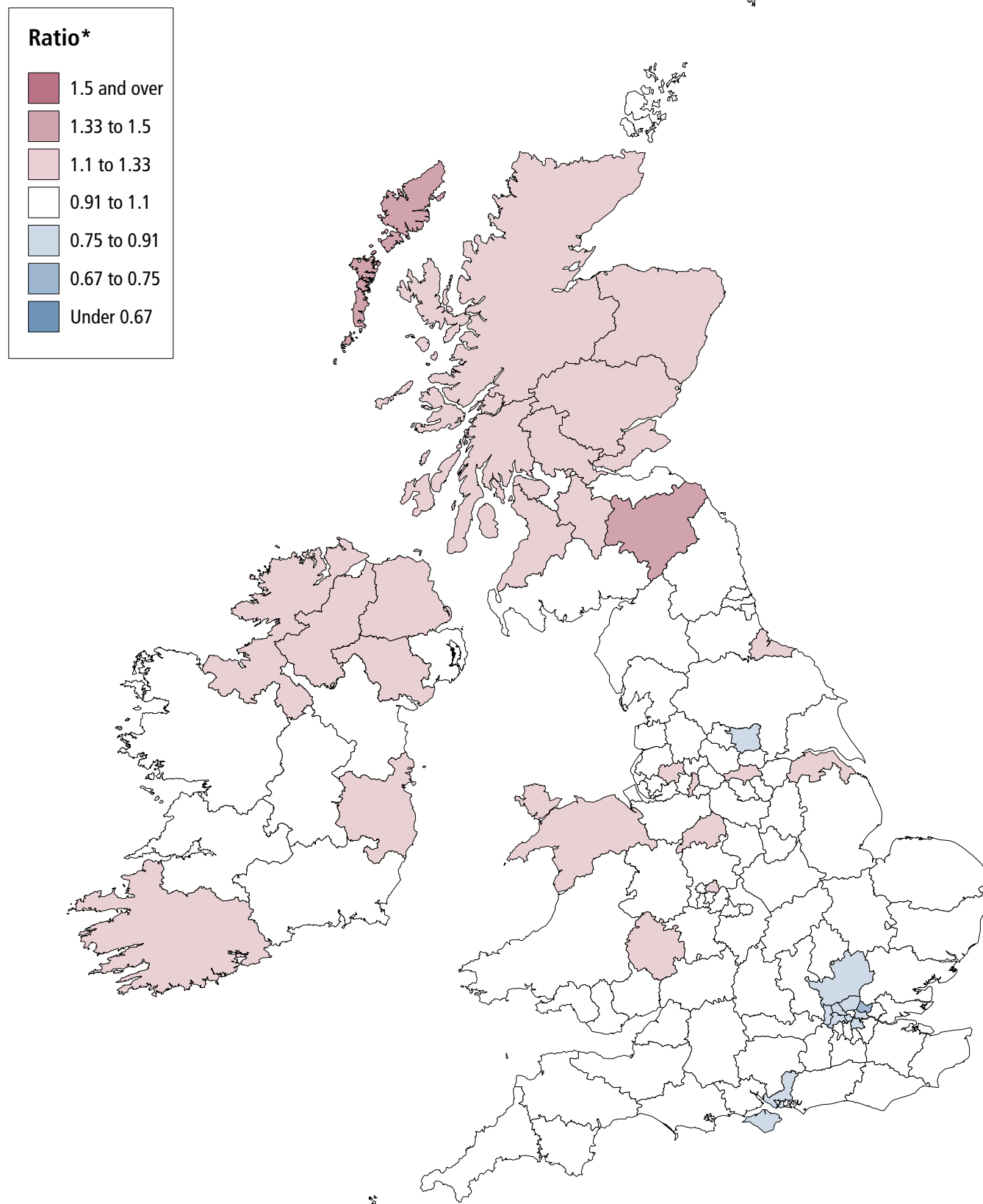
Colorectal: mortality* by health authority
Males, UK and Ireland 1991-2000



*Ratio of directly age-standardised rate in health authority to UK and Ireland average

Map 7.2b

Colorectal: mortality* by health authority
Females, UK and Ireland 1991-2000



*Ratio of directly age-standardised rate in health authority to UK and Ireland average

The maps for colon and rectal cancers (not shown) are closely similar to each other and to those for colorectal cancer, except that in Northern Ireland and Ireland, mortality from rectal cancer is relatively low for both sexes, but mortality from colon cancer is relatively high. These opposing patterns cancel each other out to some extent when the data for the two cancers are combined and so many of the areas on the maps of colorectal cancer show little or no variation from average. Since incidence appears to be relatively high for both colon and rectal cancers in Northern Ireland and Ireland, this suggests that proportionally more deaths were coded to colon than rectal cancer in these countries than in England, Wales and Scotland.

Risk factors and aetiology

The results of a large study of twins in Sweden, Denmark and Finland suggest that approximately 35 per cent of colorectal cancers might be explained by heritable factors.¹¹ However, geographical, temporal, and migrant studies suggest a more important role for environmental factors, especially diet, in the aetiology of colorectal cancer.¹² In particular, there is evidence that a diet high in vegetables decreases the risk of colorectal cancer, and although the role of dietary fibre intake is unclear,¹³ recently published results from the EPIC study (the European Prospective Investigation into Cancer and Nutrition) suggest that dietary fibre is protective.¹⁴ In England, more vegetables are consumed per person than in Scotland, but the overall vegetable consumption in Great Britain has fallen by about 20 per cent between 1974 and 2000.¹⁵ The association between meat consumption and colorectal cancer is inconsistent, and although positive associations have been observed more consistently for red meat and processed meat, these are based on a smaller volume of evidence.^{16,17}

There is also evidence that excess body weight is a risk factor for colorectal cancer,¹⁸ and since the prevalence of obesity is increasing in the UK population, this may have contributed to the increasing incidence.¹⁹ Conversely, there is evidence that regular physical activity is protective, especially in males, although this effect seems to be restricted to colon cancer.^{13,20}

Hormone replacement therapy has been shown to reduce the risk of colorectal cancer in females in a randomised trial setting.²¹ Hormonal factors may explain, at least in part, the lower risk of colorectal cancer in females than males. There is also a large body of evidence suggesting that regular use of aspirin reduces the risk of colorectal cancer, although the evidence relating to other types of non-steroidal anti-inflammatory drug (NSAID) is less substantial.²²

Although early studies of smoking and colorectal cancer showed no association, more recent studies have shown that long-term smokers are at increased risk.²³ The falling prevalence of smoking in Great Britain²⁴ appears to be inconsistent with the observed increases in the incidence of colorectal cancer. However, it is important to note that the latent period between exposure and development of disease may be much longer than for some other smoking-related cancers.²³ Certainly, the higher rates of smoking in Scotland compared with England²⁴ are consistent with the higher incidence of colorectal cancer north of the border.

It is important to note that, as well as reflecting changes in the prevalence of risk and protective factors over time, the apparent increase in incidence of colorectal cancer may be due partly to changing referral practices or increased patient awareness, leading to more colonic investigations being undertaken than previously.²⁵ Certainly, a proportion of cancers detected early may not otherwise have been diagnosed during the patient's lifetime. Currently, a pilot trial of colorectal cancer screening by faecal occult blood testing (FOBt) is taking place in Coventry, Warwickshire, and the north east of Scotland.²⁶ However, this cannot have influenced the geographical variation in incidence reported here because screening did not begin until 2000.

Five-year survival from colorectal cancer has improved over time, and despite the increasing incidence, mortality has declined, suggesting earlier detection of symptomatic disease and/or advances in treatment, such as improvements in peri-operative care.

Socio-economic deprivation

There is no substantial variation in the incidence of colorectal cancer across categories of socio-economic deprivation, measured using the Carstairs index,²⁷ either in England and Wales, or in Scotland.²⁸ The absence of an obvious association between deprivation and colorectal cancer is also apparent from the incidence maps of the UK and Ireland (Map 7.1). In fact, for females, incidence was higher in some of the more affluent areas of the South East, Eastern and West Midlands regions of England. Within London, incidence rates were lower than average in most areas, and in Scotland, rates were higher than average across the whole country.

Despite increases in survival in England and Wales from colon and rectal cancer in the 1990s, there was a significant difference in survival rates between affluent and deprived patients, from both cancers and for both sexes. For patients diagnosed in 1996–99, the gap in five-year survival between

the most deprived and the most affluent patients was 6 and 7 percentage points in males and females respectively, for colon cancer, and 9 and 8 percentage points in males and females respectively, for rectal cancer.²⁹ This gradient in survival with deprivation, which has also been observed in Scotland,³⁰ may in part explain the higher mortality rates, relative to incidence, in some of the areas that have higher levels of socio-economic deprivation (Table B7.1).

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