

Chapter 17

Oesophagus

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Summary

- In the UK and Ireland in the 1990s, oesophageal cancer accounted for 1 in 40 diagnosed cases and 1 in 25 deaths from cancer.
- Geographical variations in incidence and mortality were very similar because survival from this cancer is very low.
- There was a north-south divide across Great Britain, with high incidence in Scotland and North West England, and low incidence in the south east of England.
- Incidence was highest in western Scotland, urban areas of North West England, and north Wales – areas associated with high levels of deprivation.
- This pattern is likely to be related to known risk factors for oesophageal cancer – smoking, alcohol consumption, poor nutrition and obesity – which are associated with deprivation.
- There are clear similarities between geographical variations in oesophageal cancer and those in cancers of the larynx, lip, mouth and pharynx, and lung.

Incidence and mortality

In the 1990s, oesophageal cancer was diagnosed in around 4,200 males and 2,900 females each year in the UK and Ireland. Males were more than twice as likely to be diagnosed with oesophageal cancer as females. Overall, the age-standardised incidence rate in males was 13 per 100,000, and in females was 5.9, a male-to-female ratio of around 2.2:1. Oesophageal cancer is largely a disease of the elderly, and cases were rare below the age of 50. Age-specific incidence rates increased sharply above the age of 50 to peak in the oldest age groups in both males and females. The lifetime risk^{1,2} of being diagnosed with oesophageal cancer was around one per cent in males and 0.5 per cent in females, in England and Wales.³

In the 1990s, around 4,200 males and 2,700 females in the UK and Ireland died from oesophageal cancer each year. The overall age-standardised mortality rate was 12.8 per 100,000 for males and 5.3 for females. The male-to-female ratio of the

rates was higher than that for incidence, 2.4:1, consistent with a slightly better survival in females than in males. Following the age-specific pattern for incidence, the mortality rate increased sharply above the age of 50 to peak in those aged 85 and over.

Incidence and mortality trends

The incidence of oesophageal cancer increased during the 1980s and 1990s, although less steeply in females than males. In England and Wales, the age-standardised incidence rate rose by around 70 per cent in males and 35 per cent in females between 1971 and 1998.⁴ Trends in mortality over time closely followed those in incidence due to the low survival from oesophageal cancer; the age-standardised mortality rate increased by around 65 per cent in males and 30 per cent in females between 1971 and 1999 in England and Wales.⁴

Survival

Survival from oesophageal cancer in England and Wales for patients diagnosed in 1996-99 was low – around 30 per cent after one year and 8 per cent after five years.⁵ Figures for patients diagnosed in Scotland⁶ and in Northern Ireland during the 1990s⁷ were similar, with the exception that five-year survival was notably higher for women in Northern Ireland (19 per cent). Survival decreased with age and was considerably better than average in the youngest patients (aged 15-39).⁵

Geographical patterns in incidence

By far the highest incidence of oesophageal cancer in both males and females occurred in Scotland (Figure 17.1). The age-standardised rate for males was 28 per cent higher, and that for females was 39 per cent higher, than the UK and Ireland average (Table B17.1). Rates were slightly above average for females in Wales, close to the average for both sexes in Northern Ireland, below average for males in Ireland and both males and females in England. Within England, the North West was the only region in which incidence was higher than average for both sexes. Rates were close to the average in Trent and the West Midlands, and below average in the Northern and Yorkshire; Eastern; London; and South East regions.

In Scotland, incidence rates were above average in 8 out of 15 health authorities, with particularly high rates in the west of the country (Figure 17.3). Incidence was also above average in both males and females in the urban areas of the North West (Liverpool; St Helen's and Knowsley; and Manchester), and in Nottingham and North Wales (Table B17.1).

The maps for incidence (Map 17.1) show notably higher than average rates in Scotland, and a north-south divide in England, with higher rates in the urban areas of the North West and

West Midlands and lower rates in the South East. The notable exception to this pattern was around North Yorkshire where rates were lower than average. Rates were also lower in large parts of Northern Ireland and Ireland. Compared to other countries within Europe, Scotland had the highest incidence of oesophageal cancer in females and the second highest in males, after some areas of northern France. Age-standardised incidence rates were also very high compared to the rest of Europe in the north west of England for both males and females (the area covered by the North Western and Merseyside and Cheshire cancer registries).⁸

Geographical patterns in mortality

The geographical pattern for mortality from oesophageal cancer was very similar to that for incidence, because survival from this cancer is low. Rates were highest in Scotland; in males mortality was 26 per cent higher and in females it was 40 per cent higher than the average for the UK and Ireland (Figure 17.2). There was a north-south divide in England, as for incidence, with lower than average rates in the south. Mortality rates were above average in both sexes in the North West and in males in the West Midlands, and close to average in Ireland, Wales and the Trent region. Mortality was below average in females in Northern and Yorkshire, in males in the South West, and in both sexes in Northern Ireland, and the Eastern, London, and South East regions of England.

The pattern of health authorities in which the mortality rates were either above or below average for both sexes was very similar to that for incidence (Figure 17.4). Mortality was lowest in London, where the rate was below average in males and females in 5 out of 14 health authorities, being 14-17 per cent below the average for the UK and Ireland overall (Table B17.1).

The overall mortality-to-incidence ratio (M:I ratio) for the UK and Ireland was close to one in males and slightly lower in females, consistent with survival being very low in males and slightly higher in females (Table B17.1). It is of note that the M:I ratio was greater than one in Ireland and several regions of England (in males only), which suggests an under-ascertainment of cases or more likely that there has been some misclassification between oesophagus and stomach in the mortality data.^{4,9}

The geographical patterns in incidence and mortality for cancer of the oesophagus are closely similar to those for cancers of the larynx (Ch 10), lip, mouth and pharynx (Ch 12), and lung (Ch 13). In particular the north-south divide across Great Britain is striking, with consistently high rates in Scotland and the North West of England and low rates in the south.

Risk factors and aetiology

There are two main histological types of oesophageal cancer; squamous cell carcinoma (SCC), which is most common in the upper two thirds of the oesophagus; and adenocarcinoma, which is most common in the lower third. The distribution of these subtypes and trends in their incidence over time differ between the sexes. In England and Wales, adenocarcinomas accounted for over 40 per cent of oesophageal cancers in males and 20 per cent in females, while the pattern was reversed for SCCs (20 per cent in males and 40 in females);³ the remaining 40 per cent of tumours in each sex were most likely classified as unspecified carcinomas. The incidence of SCC increased by around 25 per cent in males and 40 per cent in females between 1971 and 1998, so that in 1998 there were similar numbers of SCCs in both sexes (male-to-female ratio of 1.1:1). In contrast, the incidence of adenocarcinoma increased three fold in females and almost six fold in males over the same period, resulting in a male-to-female ratio of 4.8:1 in 1998 (data for England and Wales).⁹

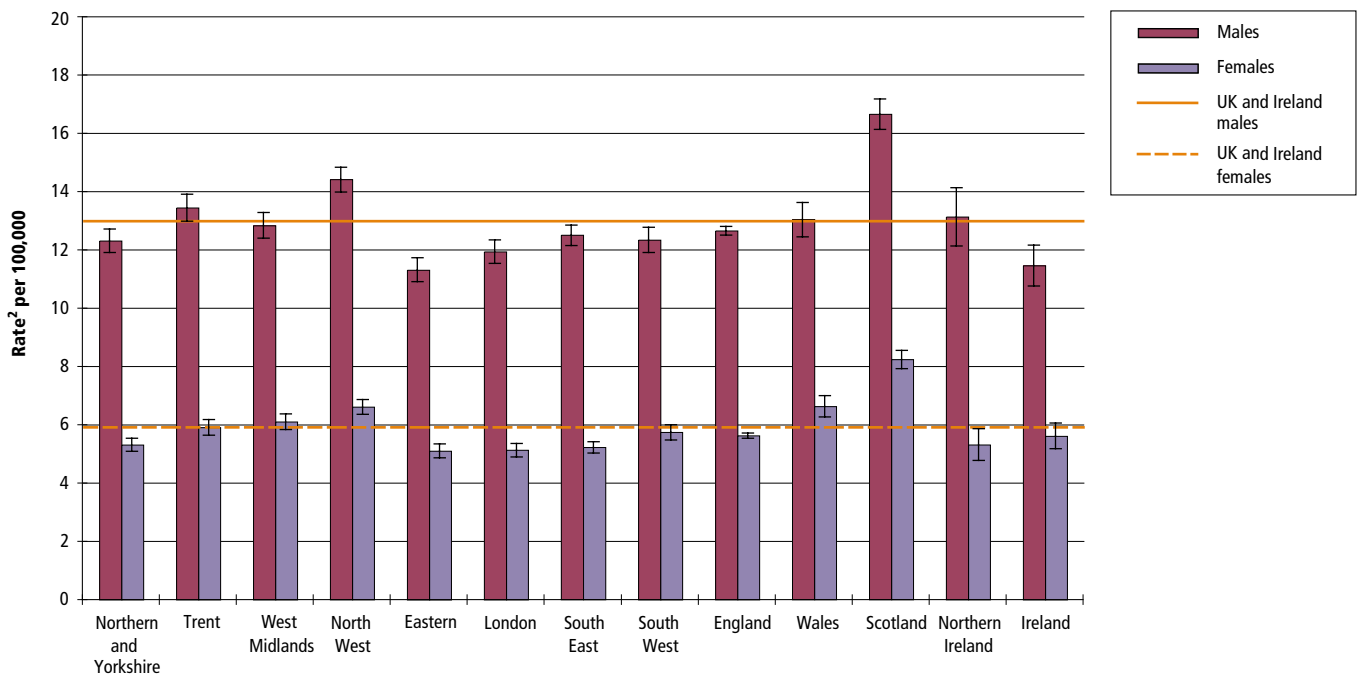
The risk factors also differ between the two main subtypes. For SCC, the main risk factors are excessive alcohol consumption and tobacco smoking, which in combination have an effect that is greater than additive. In a study from France, the risk of developing oesophageal cancer was increased five fold in heavy smokers, more than ten fold in heavy drinkers and about fifty fold in individuals with both habits.¹⁰ Low consumption of fresh fruit, vegetables, meat and dairy products are also associated with SCC. However in developed countries, 90 per cent or more of the risk can be attributed to alcohol and tobacco, and rising alcohol consumption has been suggested as one possible explanation for the increase in oesophageal cancer throughout the twentieth century.¹¹

Adenocarcinoma is preceded by a condition called Barrett's oesophagus, which is caused by chronic gastro-oesophageal reflux. A recent study of patients in Northern Ireland with this condition found that it increased the risk of developing oesophageal cancer eight fold, but only in patients who had high-grade dysplasia (specialised intestinal metaplasia). However, only a small proportion can have gone on to develop oesophageal cancer, as it accounted for only 5 per cent of deaths in patients with Barrett's oesophagus.¹² Smoking is associated with an increased risk of adenocarcinoma (as well as with SCC) and overall, over 70 per cent of deaths from cancer of the oesophagus in England in 1998-2002 were estimated to be attributable to smoking.¹³ Low consumption of fresh fruit and vegetables is also associated with oesophageal adenocarcinoma, but the main risk factor is obesity. The increasing prevalence of obesity in the UK population may have contributed to the increasing incidence of adenocarcinoma of the oesophagus.¹⁴

(continued on page 192)

Figure 17.1

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

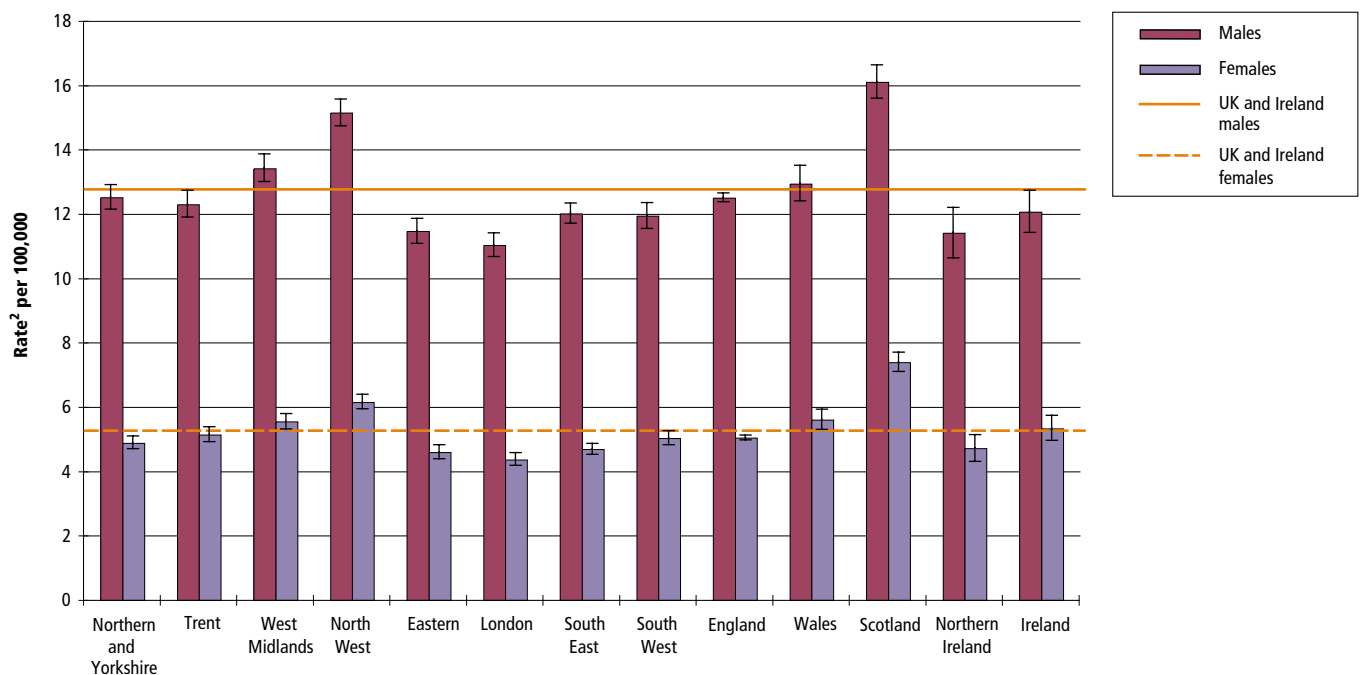


1 Northern Ireland 1993-99, Ireland 1994-99

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

Figure 17.2

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

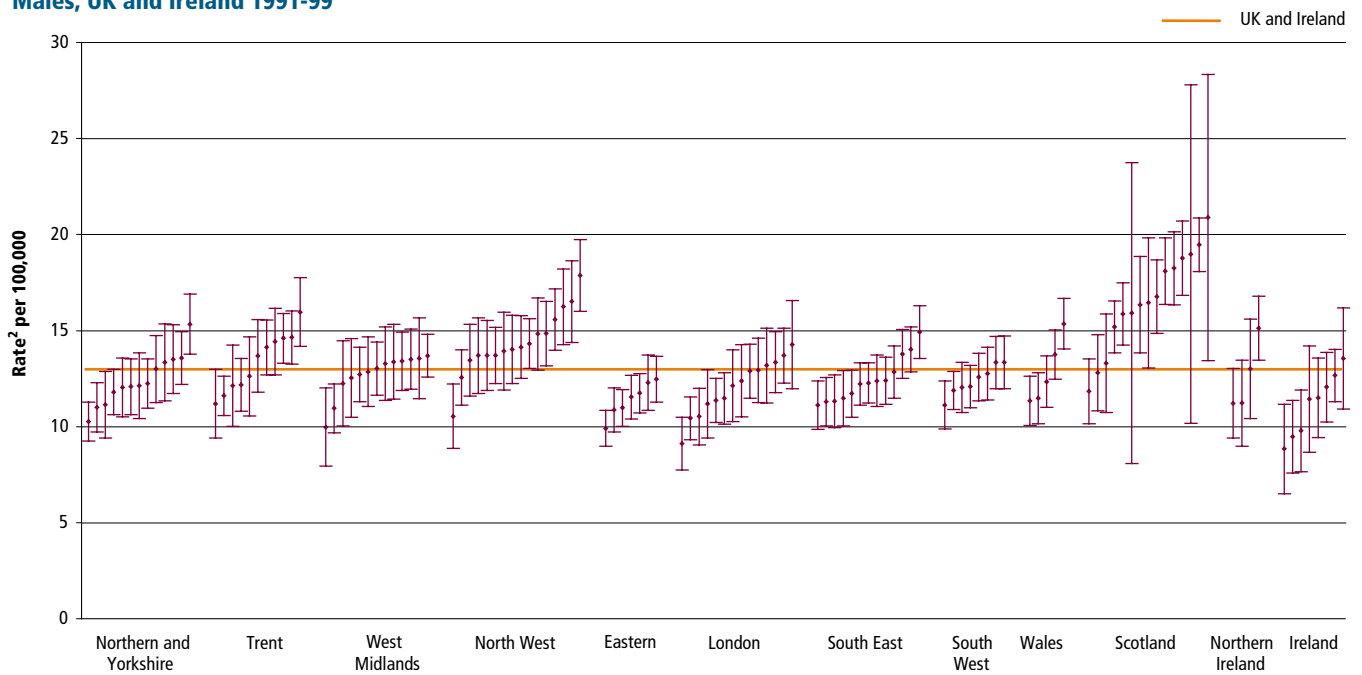


1 Scotland 1991-99, Ireland 1994-2000

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

Figure 17.3a

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

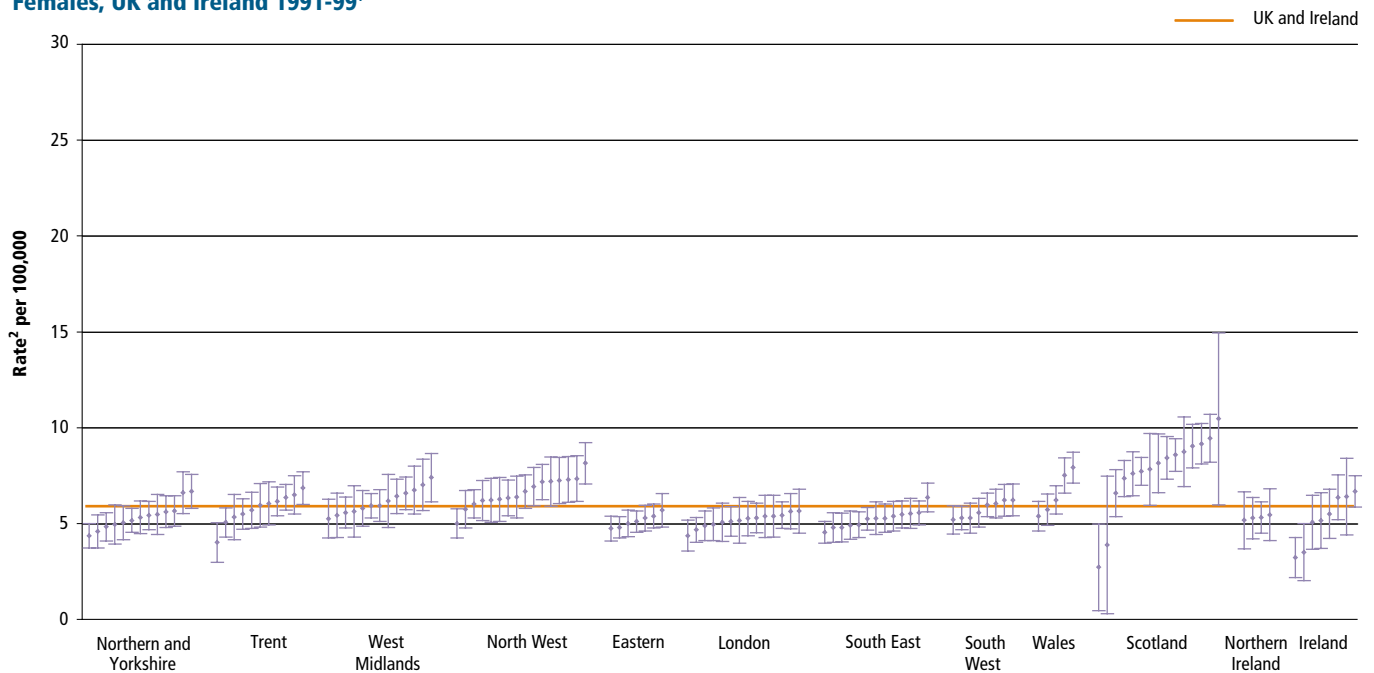


1 Northern Ireland 1993-99, Ireland 1994-99

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

Figure 17.3b

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

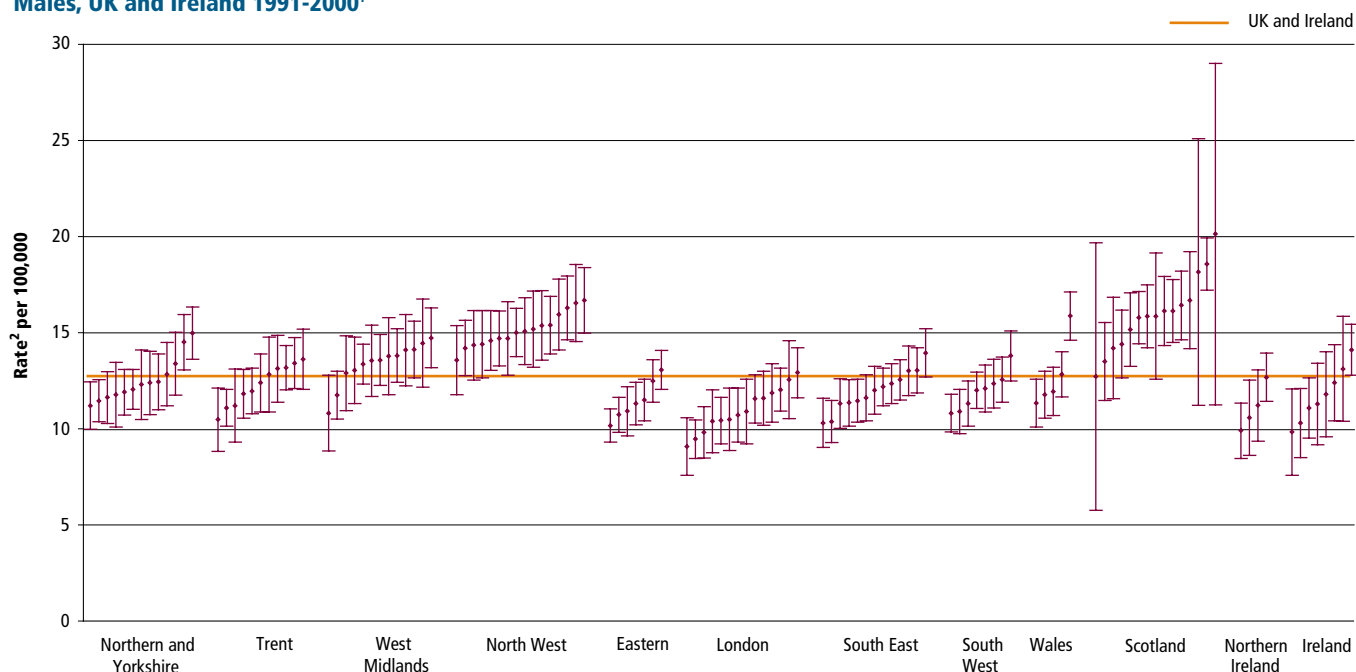


1 Northern Ireland 1993-99, Ireland 1994-99

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

Figure 17.4a

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

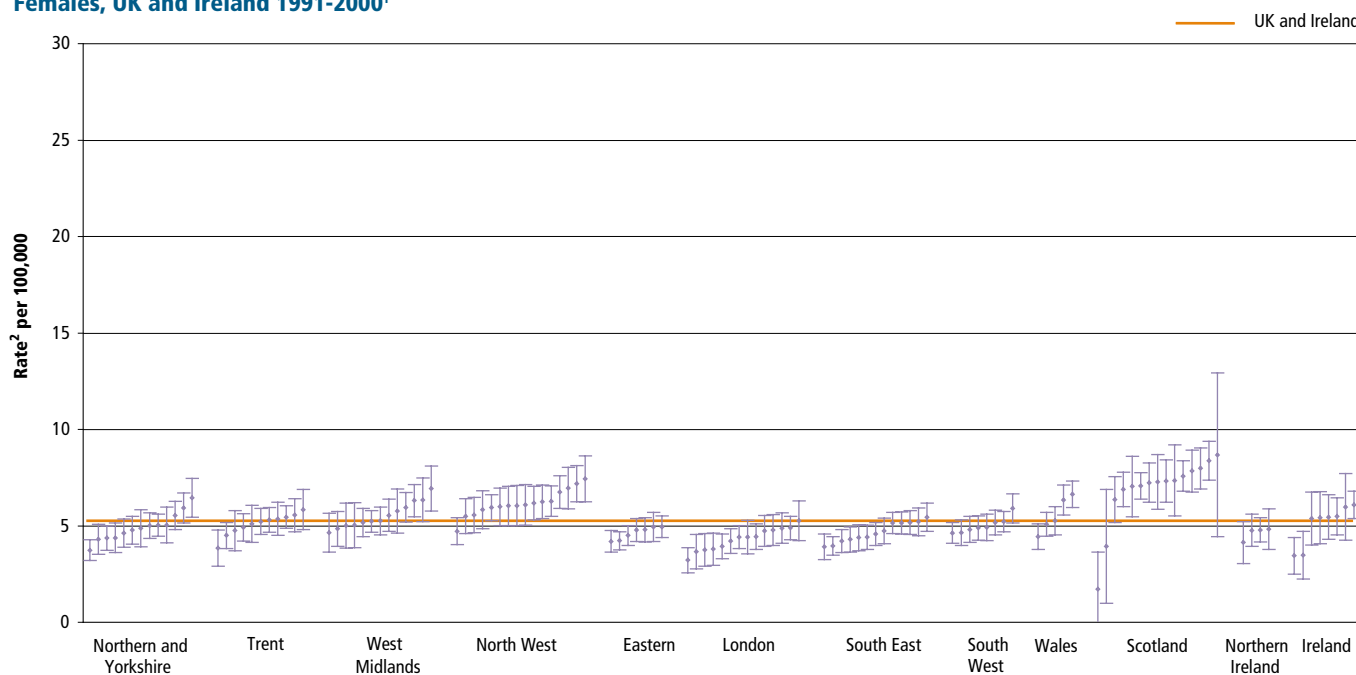


1 Scotland 1991-99, Ireland 1994-2000

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

Figure 17.4b

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

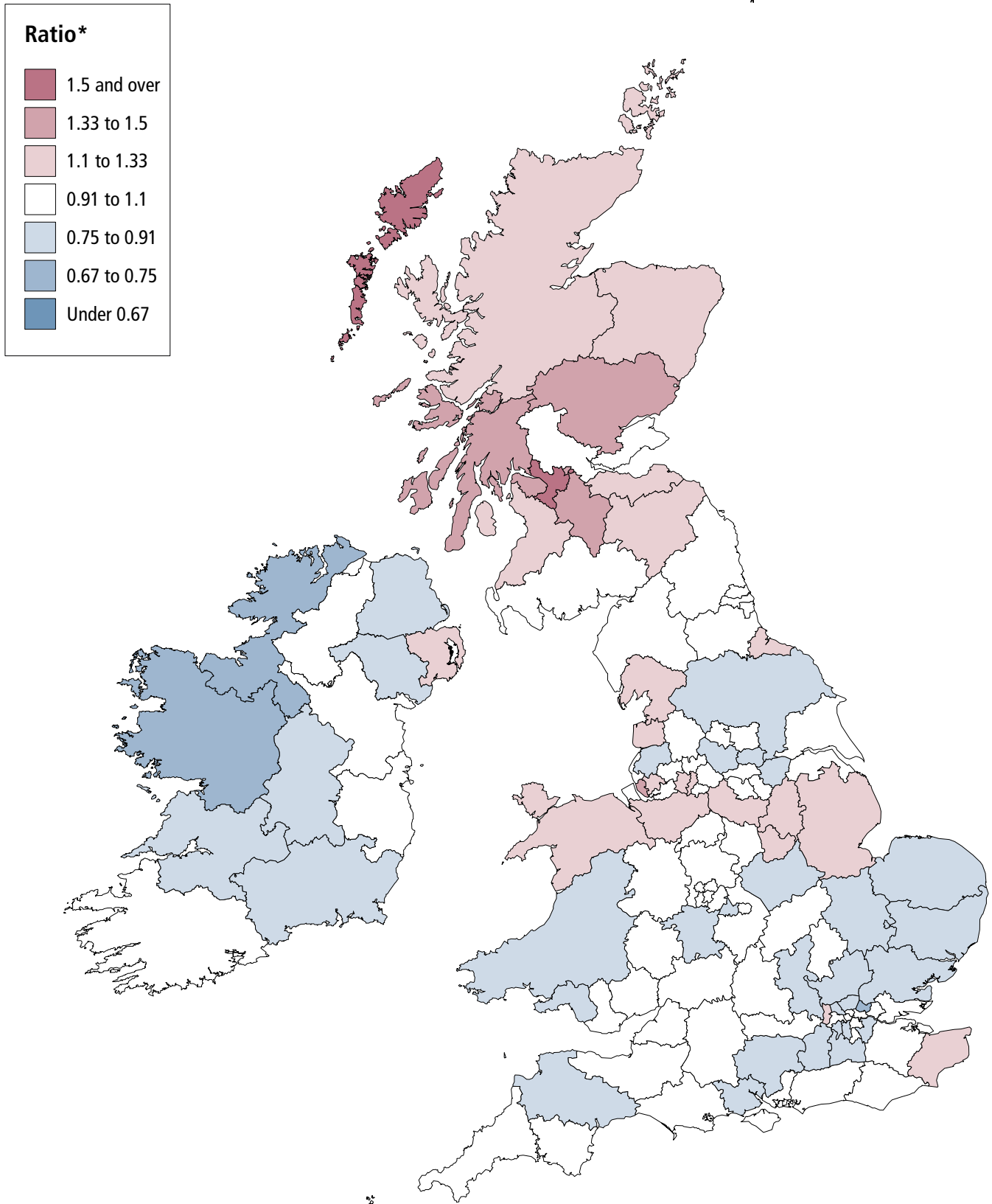


1 Scotland 1991-99, Ireland 1994-2000

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

Map 17.1a

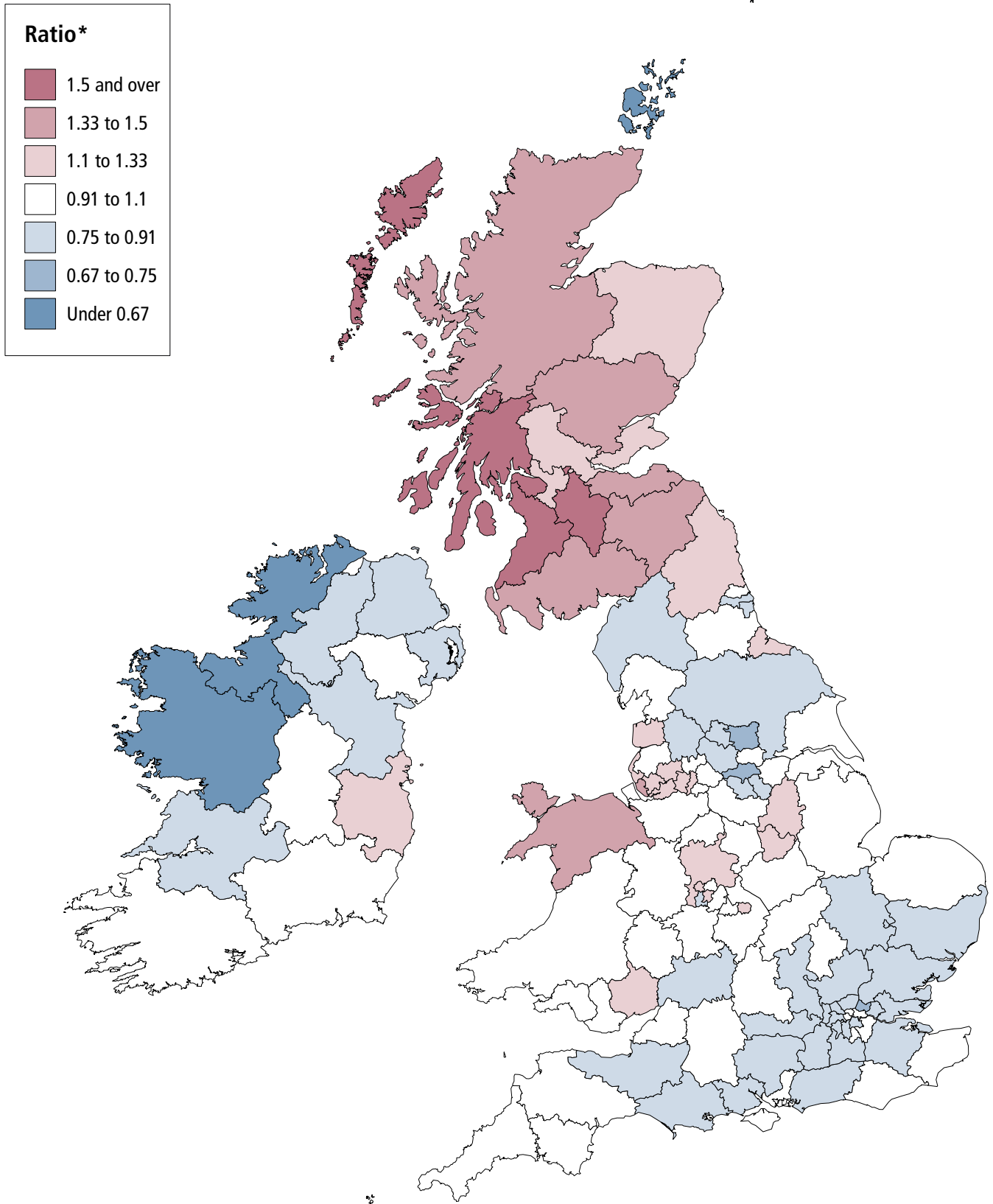
Oesophagus: incidence* by health authority,
Males, UK and Ireland, 1991-99



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

Map 17.1b

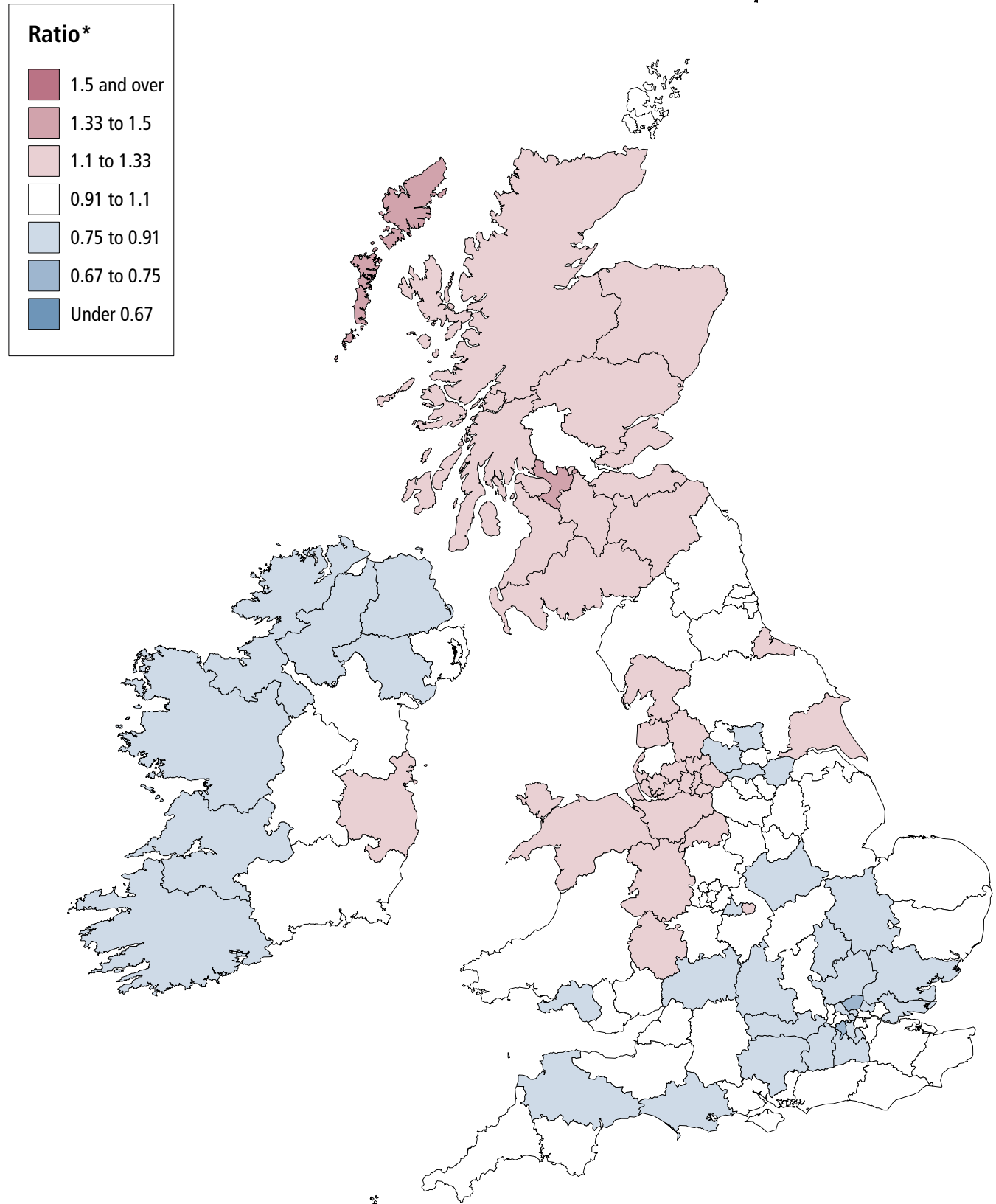
Oesophagus: incidence* by health authority, Females, UK and Ireland, 1991-99



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

Map 17.2a

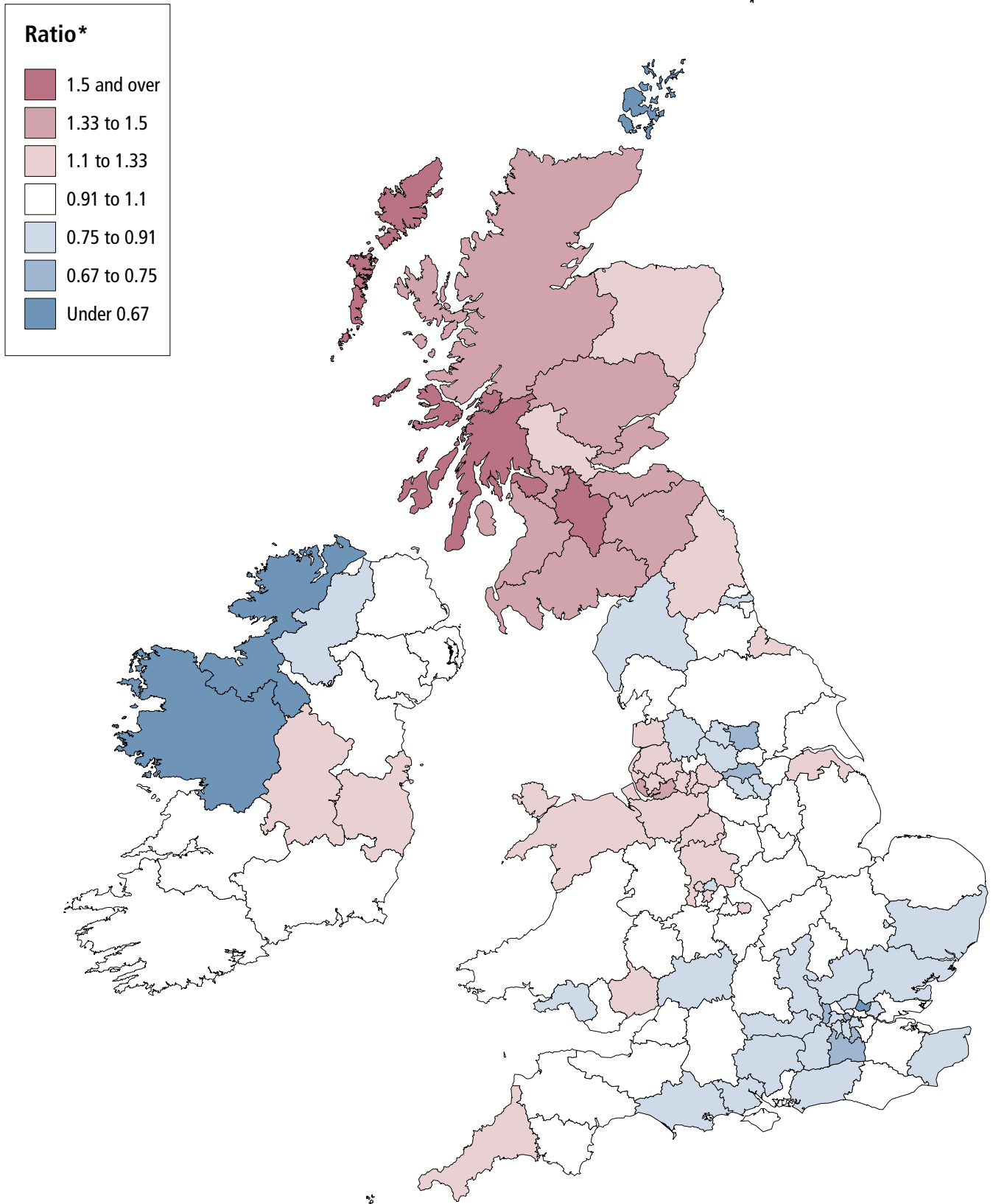
Oesophagus: mortality* by health authority,
Males, UK and Ireland, 1991-2000



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

Map 17.2b

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



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

Socio-economic deprivation

In most parts of the world oesophageal cancer is a disease of the poor, and there is a clearly higher risk among people of lower socio-economic status. In England and Wales the incidence of oesophageal cancer was positively associated with deprivation, with rates around 30 per cent higher in the most deprived groups.³ In Scotland the risk was increased two fold for males living in the most deprived areas.¹⁵ The association between oesophageal cancer and deprivation is likely to be related to levels of smoking and alcohol consumption, and nutritional status. People in lower socio-economic classes are more likely to smoke and consume more alcohol,¹⁶ and those in more deprived areas eat less fresh fruit and vegetables,¹⁷ which is an indicator of poor nutrition.

Differences have been observed in the relationships between histological subtypes of oesophageal cancer and deprivation. A study of oesophageal cancer in Scotland found no association between deprivation and adenocarcinoma, but a strong positive association for other subtypes,¹⁸ which is surprising, given that smoking is a risk factor for adenocarcinoma as well as for SCC. It has been suggested that this may be because the increased risk of oesophageal adenocarcinoma persists for up to 30 years after smoking cessation, and hence current deprivation category-specific incidence rates may reflect smoking patterns at a time when the prevalence of smoking was more evenly distributed across the social classes in the UK.¹⁸

The majority of the areas shown on the maps of the UK and Ireland (Maps 17.1 and 17.2) to have high rates of incidence and mortality are also areas with high deprivation scores according to the Carstairs index¹⁹ (see Appendix F), in particular, large areas of Scotland, North Wales, and urban areas of the North West and West Midlands in England. This pattern can also be seen from the maps for cancers of the larynx (Ch 10), lip, mouth and pharynx (Ch 12), and lung (Ch 13), clearly highlighting the association between deprivation and the risk factors shared by these cancers (smoking, and in some cases, alcohol consumption).

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