Chapter 5

Breast

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Summary

- In the UK and Ireland in the 1990s, breast cancer accounted for 1 in 4 cases of cancer, and 1 in 5 deaths from cancer in females.
- There was little geographical variation in incidence and even less for mortality.
- In only a handful of areas in south east England were incidence rates more than 10 per cent above average; in a few areas in the far north of England, and in most of Ireland, rates were more than 10 per cent below average.
- The areas with higher incidence rates tended to be the more affluent ones.
- There is no obvious link between the observed variations in breast cancer incidence and known risk factors for the disease.

Incidence and mortality

Breast cancer is the most common cancer in women worldwide, although cervical cancer is more common in some developing countries.[1] Breast cancer in men is extremely rare[2] and is not considered in this atlas. Breast cancer accounts for about 25 per cent of all malignancies in women; the proportion is higher in women in western, developed, countries. Both incidence and mortality vary considerably around the world.[3-5] Incidence has been rising in many parts of the world, including the USA, Canada, Europe, the Nordic countries, Singapore and Japan.[6,7]

Breast cancer has long been the most common cancer in females in the UK and Ireland, accounting for almost 1 in 3 of all malignant cancers in the 1990s (in females), when there were on average almost 39,000 new cases each year – almost 2.5 times as many as for colorectal cancer (16,300), the second most common cancer in women (see Chapter 2). The age-standardised incidence rate was 108 per 100,000, more than double the rate for colorectal cancer. Age-specific rates were very low in women under 40, increasing rapidly above this age to a peak in women aged 85 and over.

Breast cancer has also been the most common cause of cancer death in women, accounting for almost 1 in 5 of all cancer deaths, and 5 per cent of all deaths in women in the 1990s. There were on average 14,600 deaths each year from breast cancer in women in the UK and Ireland, just under 10 per cent more than for lung cancer (13,400), the second most common cause of cancer death in women. The age-standardised mortality rate for the UK and Ireland was 35 per 100,000, 17 per cent higher than the rate for lung cancer. The overall mortality-to-incidence ratio for breast cancer was 0.33. As for incidence, age-specific mortality increased steeply above age 40, reaching a peak in the oldest age group.

Incidence and mortality trends

During the 1990s, the earlier underlying upward trends in incidence rates in almost all age groups continued, but in Great Britain were overlaid by the effects of the introduction of mammographic screening of women aged 50-64, which started in 1988 and reached full population coverage around 1994.[8] Screening began in Northern Ireland in 1993; there was no organised breast-screening programme in Ireland during the 1990s. Rates were also affected by the increasing numbers of post-menopausal women using hormone replacement therapy.[9] In England and Wales, the first (prevalence) round of screening resulted in increases in incidence of around 25 per cent in women aged 50-64; subsequently, rates in women aged 50-54, many of whom were being screened for the first time, remained at the higher level, but rates in women aged 55-64 returned to the pre-screening trends.[10,11] Incidence in women aged 65-69 fell in the latter part of the period: many cancers in these women would have been detected several years earlier (when they were in the younger age groups) during the prevalence round of screening.

Mortality from breast cancer in the UK was among the highest in the world in the mid-1980s.[11] By the late 1990s, the rate in women aged 55-69 in England and Wales had fallen dramatically, by over 20 per cent; about a third of this was directly due to the beginning of the effect of screening, and two thirds to improved treatment – both chemotherapy and the increasingly widespread use of adjuvant tamoxifen – and to indirect effects of screening such as raised awareness leading to earlier presentation and diagnosis outside the screening programme.[12]

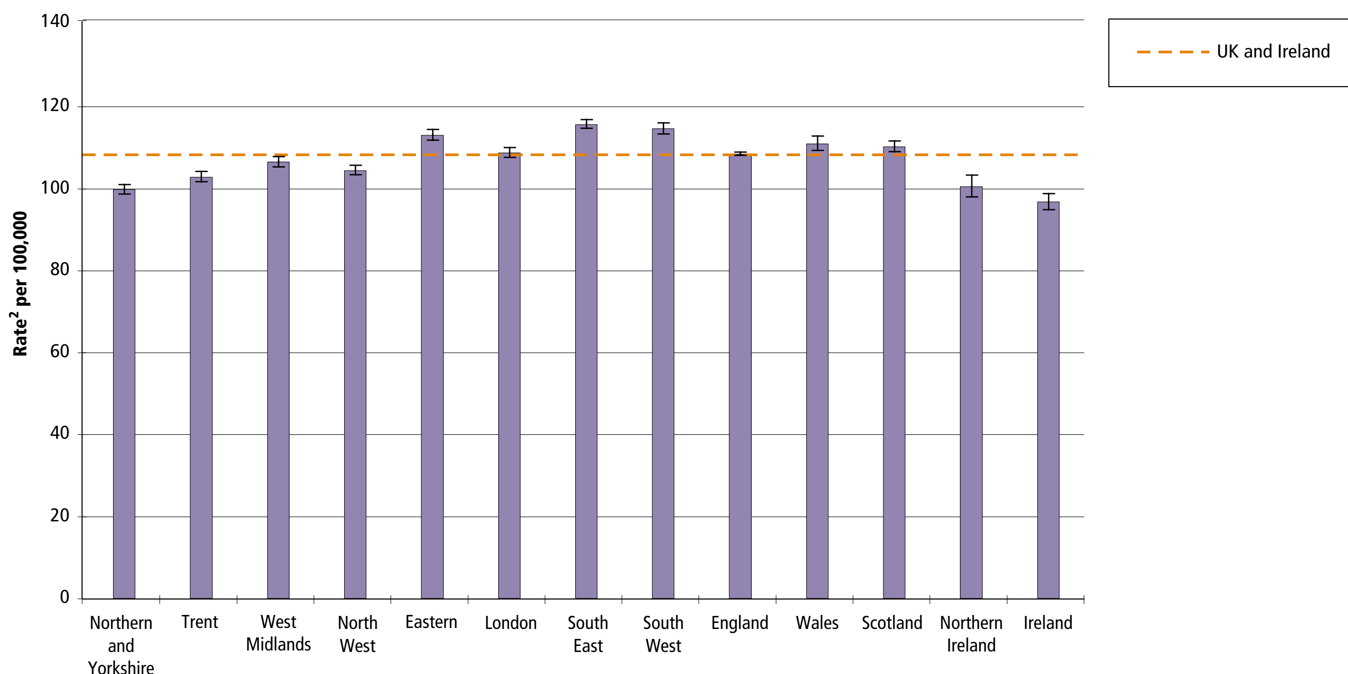
Survival

Even in the late 1980s, five-year (relative) survival from breast cancer was very good in the UK, at around 65 per cent,[13,14] and better than for the other major cancers in women – lung, colorectal and ovary.

(continued on page 68)

Figure 5.1

Breast: incidence by country, and region of England
Females, UK and Ireland 1991-99[1]

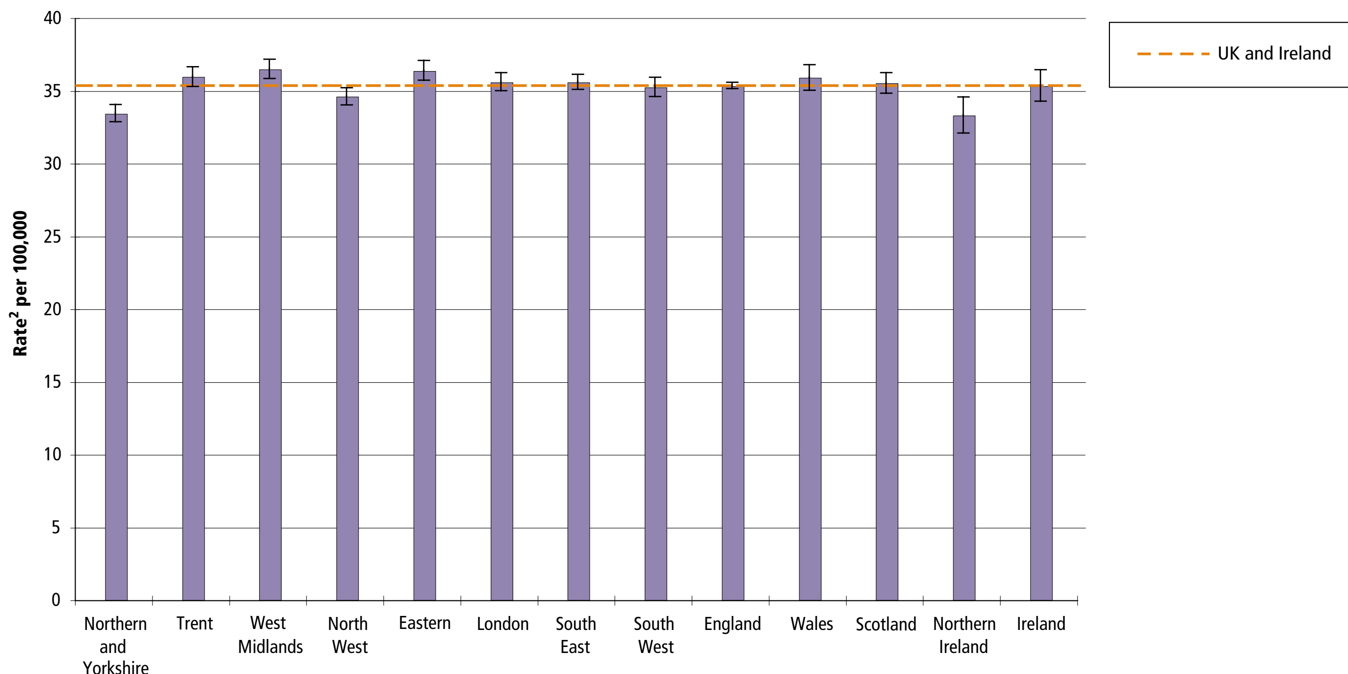


1 Northern Ireland 1993-99, Ireland 1994-99

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

Figure 5.2

Breast: mortality by country, and region of England
Females, UK and Ireland 1991-2000[1]

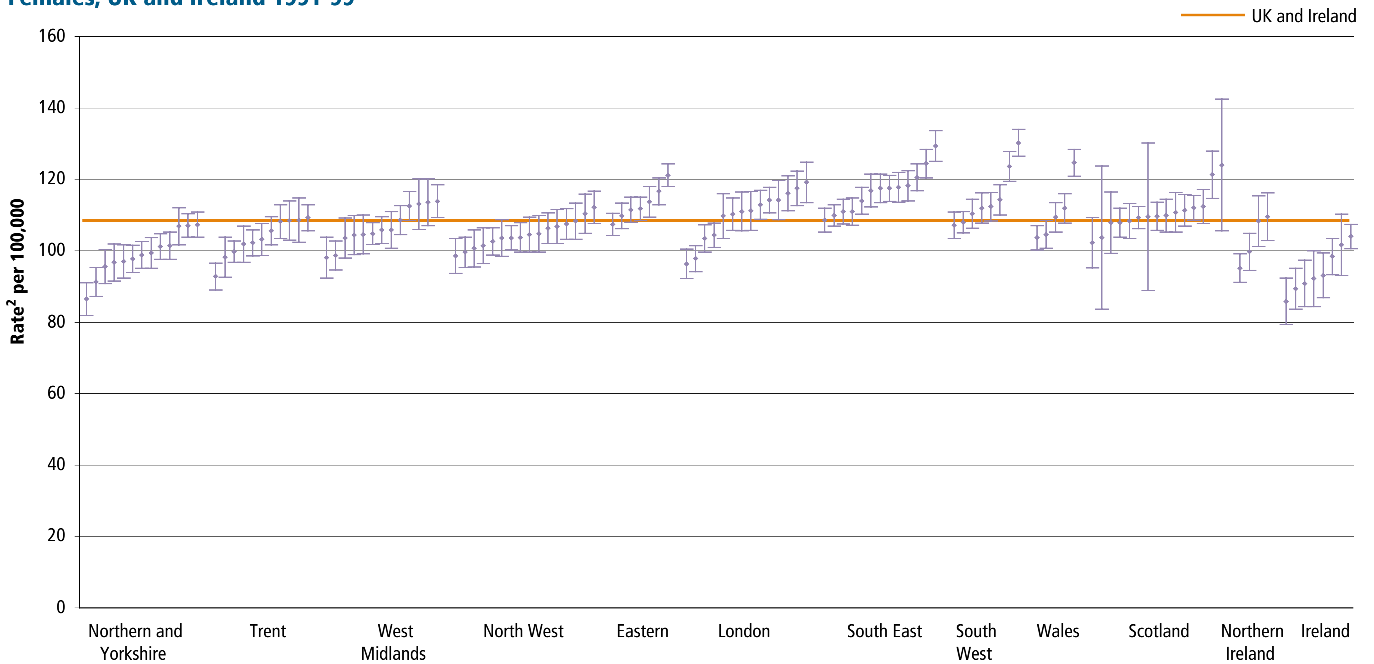


1 Scotland 1991-99, Ireland 1994-2000

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

Figure **5.3**

Breast: incidence rates by health authority within country, and region of England Females, UK and Ireland 1991-99[1]

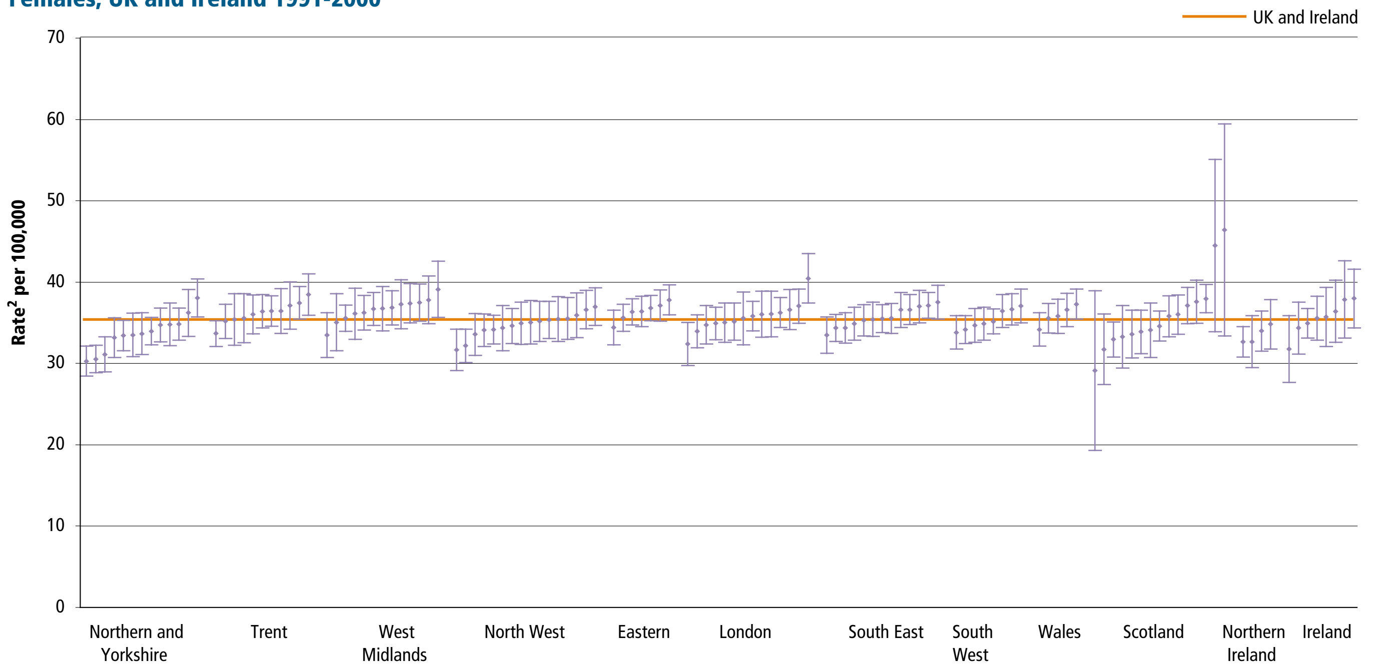


1 Northern Ireland 1993-99, Ireland 1994-99

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

Figure **5.4**

Breast: mortality by health authority within country, and region of England Females, UK and Ireland 1991-2000[1]

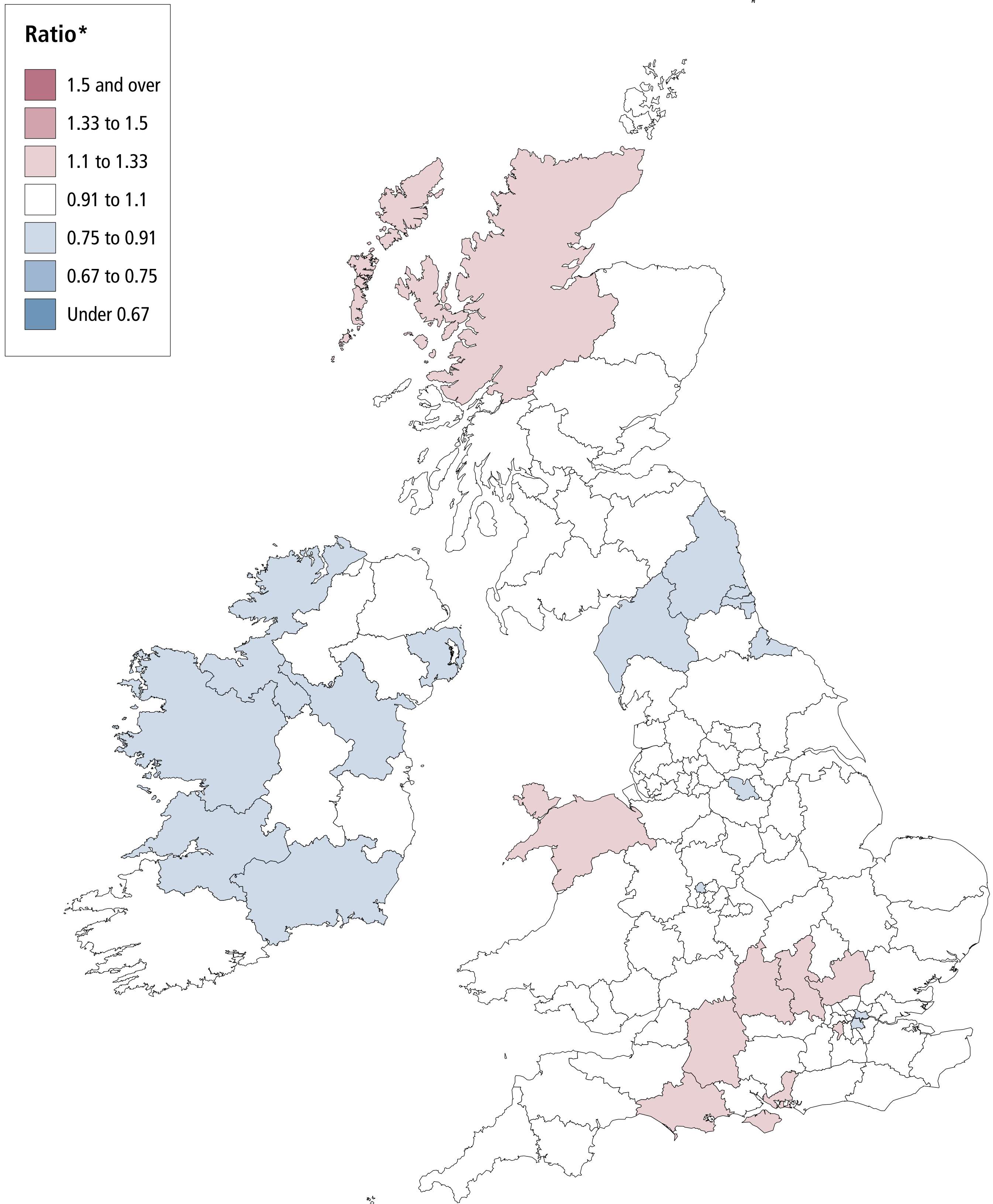


1 Scotland 1991-99, Ireland 1994-2000

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

Map **5.1**

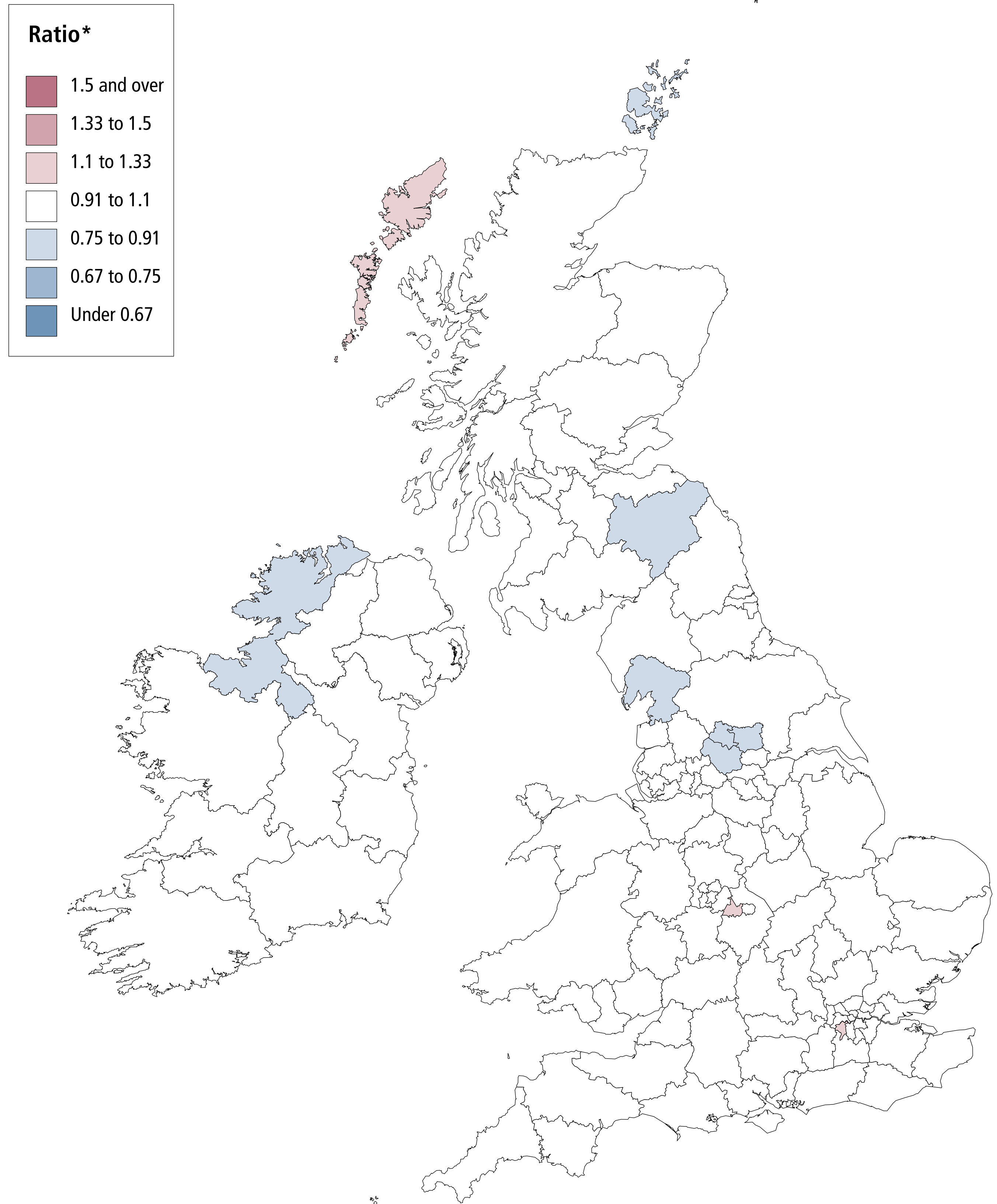
Breast: incidence* by health authority
Females, UK and Ireland 1991-99



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

Map 5.2

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



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

During the 1990s, five-year survival increased markedly, partly due to earlier diagnosis (lead-time bias) as a result of mammographic screening, although much of the apparent increases were real – as indicated by the sharp reductions in mortality despite the increases in incidence. By the late 1990s, five-year survival was around 80 per cent (England and Wales data).[15]

Geographical patterns in incidence

There was relatively little variation in the incidence of breast cancer in the UK and Ireland at the country and regional level, with rates only ranging from 97 per 100,000 in Ireland to 116 per 100,000 in the South East of England (less than 20 per cent higher) (Figure 5.1). In England, rates were generally lower than average in the north and slightly higher in the south (except London). There was also relatively little variation in the rates at the level of health authorities (Figure 5.3) – most of the rates in Northern and Yorkshire, in Trent and in Ireland were below average, while most of those in the Eastern, South East and South West regions of England were above. Many of these rates are not very far from the average in either absolute or relative terms, and the large numbers of statistically significantly differences from the overall average (Table B5.1) arise because of the very large numbers of cases. The map of incidence (Map 5.1) clearly shows that the vast majority of rates in the health authorities were within 10 per cent or so of the average (white). In England, only a few areas in the central south east were more than 10 per cent above the average, and a few in the north more than 10 per cent below; rates in Ireland were mostly more than 10 per cent below average.

Geographical patterns in mortality

At the regional and country level there was even less variation in breast cancer mortality than in incidence, with rates ranging only from 33.4 per 100,000 in Northern and Yorkshire to 36.5 per 100,000 in the West Midlands (less than 10 per cent higher) (Figure 5.2). There was also less variation in mortality than in incidence at the health authority level, with very few rates being significantly different from the UK and Ireland average (despite the large numbers of deaths) (Figure 5.4). The map of mortality (Map 5.2) shows that only a handful of areas had mortality rates that were more than 10 per cent above or below the average; the rates in the Western Isles, Orkney, and Shetland are based on relatively small numbers of deaths, have correspondingly wide confidence intervals, and are not significantly different from the overall average (Figure 5.4, Table B5.1).

Risk factors and aetiology

Most of the known risk factors for breast cancer relate to a woman's reproductive history – early menarche (onset of menstrual periods), late first pregnancy, low parity, and late menopause; endogenous hormones, both oestrogens and androgens, probably have an important role. Some types of benign breast disease increase the risk of developing malignant breast cancer. None of these risk factors is currently amenable to primary prevention.[16] Oral contraceptive use and hormone replacement therapy have been linked to increased risk.[9] Alcohol consumption is associated with an increased risk of breast cancer, but cigarette smoking appears not to increase risk.[17] Studies of migrant populations have suggested that differences in incidence between countries are social and environmental, rather than genetic, in origin; only about 5 per cent of breast cancer cases are due to the inheritance of dominant genes, such as BRCA-1 and BRCA-2.[18] Avoidance of obesity may decrease the risk of post-menopausal breast cancer, and switching from a high-fat and low-vegetable diet to a lower-fat, higher-vegetable diet may also contribute to a reduced risk.

Socio-economic deprivation

In England and Wales in the early 1990s, there was an inverse relationship between the incidence of breast cancer and deprivation, as defined by the Carstairs deprivation category:[19] incidence was about 30 per cent higher in the most affluent groups than in the most deprived.[11] In contrast, mortality was not related to deprivation, which implies that survival is better in the more affluent. In fact, survival from breast cancer has consistently been found to be higher in women from affluent areas than in those from deprived areas.[13,20,21] In south east England, women in the most deprived category (again defined by the Carstairs deprivation index) had a 35 per cent greater risk of death than women from the most affluent areas after adjustment for stage at diagnosis, morphological type, and type of treatment. In older women (65-99 years) however, part of the gradient can be explained by patients more often being diagnosed with advanced disease. In England and Wales as a whole, for women diagnosed in the late 1980s there were gaps between the most affluent and most deprived of around 5 percentage points in one-year (relative) survival and 7-8 percentage points in five-year survival.[13] For women diagnosed in the late 1990s, although survival had improved markedly in all groups, the gaps between the most affluent and most deprived remained.[22]

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