12 Head and neck cancer

12.1 Summary

Head and neck cancers are the 11th most common cancer in Ireland, accounting for 2.8% of all cancers in men and 1.1% in women, when non-melanoma skin cancer is excluded (table 12.1). Each year, approximately 276 men and 101 women are diagnosed with a tumour in the head and neck. During 1994-2003, incidence decreased by 2.5% per annum in men and rose by slightly over 1% per annum in women.

Table 12.1 Summary information for head and neck cancer in Ireland, 1994-2003

	females	males
% of all new cancer cases	0.8%	2.0%
% of all new cancer cases excluding non-melanoma skin cancer	1.1%	2.8%
Average number of new cases per year	101	276
Average number of deaths per year (ICD9 140-148)	96	37
Age standardised incidence rate per 100,000 (European standard population)	5.3	17.4
Estimated annual percentage change in rate 1994-2003	1.2%	-2.5%

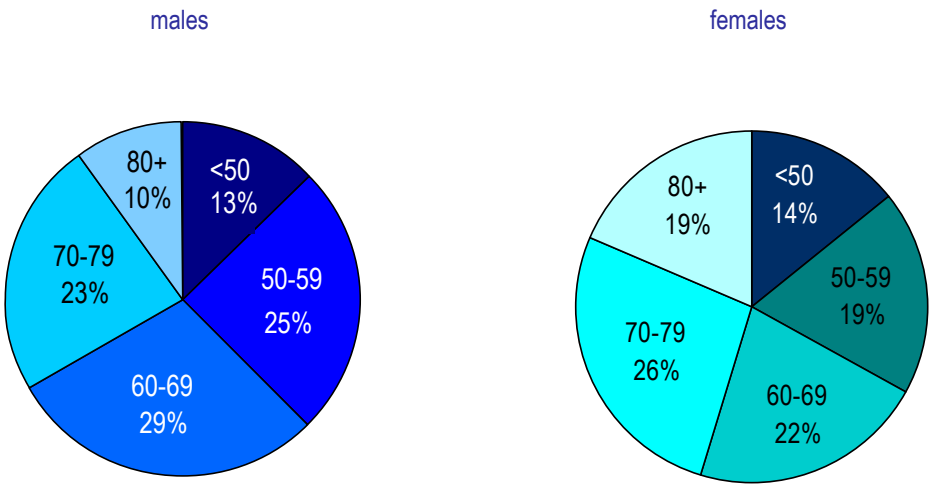
Head and neck cancer is a collective term for a range of cancers encompassing more than 15 major sites and over 30 specific sub-sites (table 12.2). In both sexes, the largest number are cancers of the larynx (36% in men and 20% in women), and cancers of the tongue (15% in men and 17% in women). Lip cancers have been excluded from the analysis, as cancers of the skin of lip (usually grouped with skin cancers) and cancers of the lip (grouped with head and neck cancers) are often difficult to distinguish in practice, making data on cancer of the lip relatively unreliable. Cancers of the lip also have more in common, aetiologically, with non-melanoma skin cancer than with other cancers of the head and neck.

The age distribution of head and neck cancer was different for males and females (figure 12.1). Two-thirds of cases in men, but just over half in women, were aged under 70 at diagnosis, while the proportion of women diagnosed at 80 or over was nearly twice that of men (19% vs 10%). However, because of the much higher number of men with these cancers, the absolute number of men affected was higher than that of women at every age.

Table 12.2 Sites of head and neck cancer in Ireland, 1994-2003

	ICD10 code	% of all head and neck cancers	
		females	*males*
base of tongue	C01	4%	5%
other tongue	C02	13%	10%
gum	C03	3%	2%
floor of mouth	C04	6%	6%
palate	C05	4%	2%
other and unspecified parts of mouth	C06	7%	4%
parotid gland	C07	8%	5%
other and unspecified major salivary glands	C08	4%	1%
tonsil	C09	5%	5%
oropharynx	C10	2%	3%
nasopharynx	C11	3%	4%
piriform sinus	C12	5%	6%
hypopharynx	C13	5%	2%
other and ill-defined sites in the oral cavity and pharynx	C14	3%	4%
nasal cavity and middle ear	C30	4%	2%
accessory sinuses	C31	5%	2%
larynx	C32	20%	36%

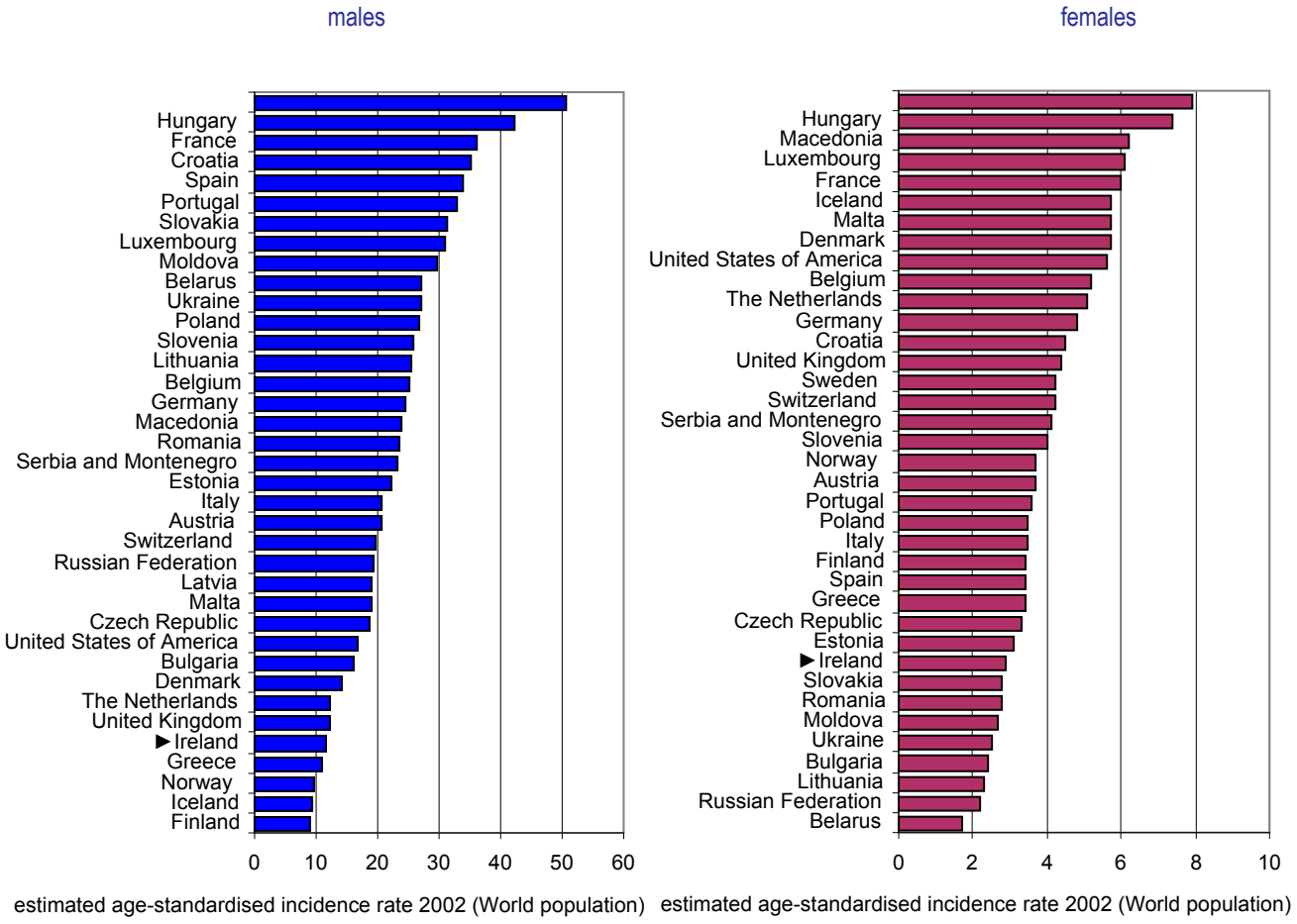
Figure 12.1 Age distribution of head and neck cancer cases, 1994-2003, males and females



12.2 International variations in incidence

Head and neck cancer incidence in both men and women in Ireland is among the lowest in Europe (figure 12.2). The incidence in men in Ireland is close to that in the UK, while that in women is much lower. International patterns in head and neck cancer are hard to interpret, because the individual cancer sites included within this group occur at different relative frequencies in different countries.

Figure 12.2 Estimated incidence rate per 100,000 in 2002 for Europe and USA: head and neck cancer



Source: GLOBOCAN 2002 (Ferlay et al, 2004)

12.3 Risk factors

Table 12.2 Risk factors for head and neck cancer, by strength of evidence

	Increases risk	Decreases risk
Convincing or probable	Tobacco smoking and smokeless tobacco use[1,2]	
	Alcohol[3,4]	
	Infection with human papilloma viruses (HPV)[5]	
	Low socio-economic status[6]	
Possible		Fruit[3,7]
		Non-starchy vegetables[3,7]
		Foods containing carotenoids[3,7,8]

[1] International Agency for Research on Cancer, 2004b; [2] International Agency for Research on Cancer, 2007c; [3] World Cancer Research Fund / American Institute for Cancer Research, 2007; [4] International Agency for Research on Cancer, in press; [5] International Agency for Research on Cancer, 2007a; [6] Faggiano et al, 1997; [7] International Agency for Research on Cance, 2003; [8] carotenoids are found in vegetables, particularly those which are red or orange

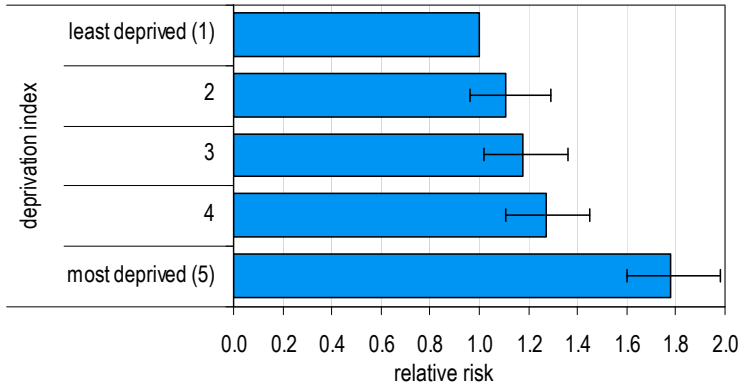
The major risk factors for most of the cancer sites within the group of head and neck cancer are the same - exposure to tobacco and alcohol (table 12.2). Both tobacco smoking and use of smokeless tobacco products, such as chewing tobacco or snuff, are causally related to many head and neck cancers. Risk increases substantially with duration of smoking and with number of cigarettes smoked, and falls with increasing time since quitting. With regard to alcohol, a causal relationship is clearly established and exposure to alcohol and smoking in combination greatly increases risk (Hashibe et al, 2009). It has been estimated that more than 70% of head and neck cancers are due to tobacco and alcohol, with 4% due to alcohol alone, 33% due to tobacco alone, and 35% due to tobacco and alcohol combined (Hashibe et al, 2009). Risk of most head and neck cancers is higher in those of lower socio-economic status, probably reflecting social class variations in exposure to tobacco and, perhaps also, alcohol.

Evidence of infection with human papilloma viruses (HPV) has been found in the oral cavity and larynx. These observations, together with results of epidemiological studies which have shown increased disease risk associated with HPV infection, has led the International Agency for Research on Cancer to conclude that various strains of HPV are causally implicated in some head and neck cancers (International Agency for Research on Cancer, 2007a). However, the natural history of oral HPV infection is still unclear.

There are some suggestions from systematic reviews that higher levels of intake of fruit and vegetables (non-starchy or carotenoid-rich) are associated with decreased risk of head and neck cancer.

12.4 Electoral district characteristics and cancer incidence

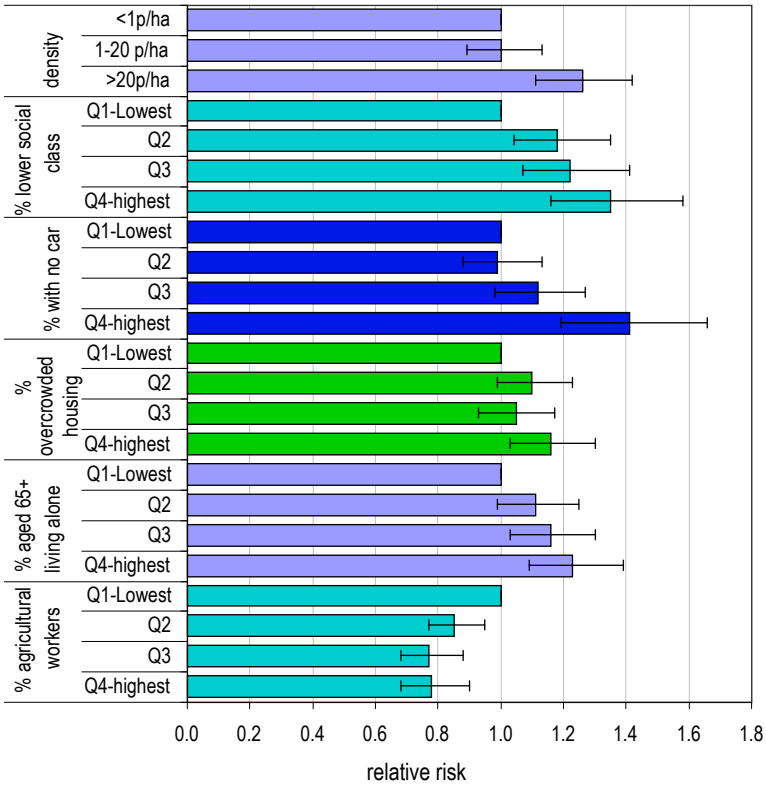
Figure 12.3 Adjusted relative risks of head and neck cancer by deprivation index: males



Adjusted for population density

There was a very strong association between head and neck cancer and the deprivation index of the area of residence in men (figure 12.3). The risk of being diagnosed with a head and neck tumour was almost 80% higher in the most deprived areas compared to the least deprived (RR=1.78, 95% CI 1.60-1.98).

Figure 12.4 Adjusted relative risks of head and neck cancer by area characteristics: males

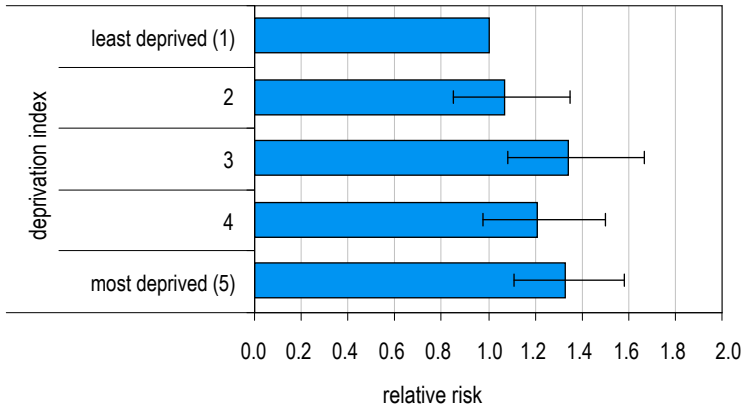


All variables mutually adjusted except % of agricultural workers (not adjusted for density)

While the incidence of head and neck cancer in men was the same in areas with 1-20 p/ha as in those with <1p/ha, the most densely populated areas (>20p/ha) had a higher incidence (RR highest vs lowest=1.26, 95% CI 1.11-1.42; figure 12.2).

Incidence was higher in areas with a higher proportion of lower social class, low car ownership, overcrowded housing or of elderly persons living alone. In contrast, areas with a high proportion of agricultural workers had lower risk.

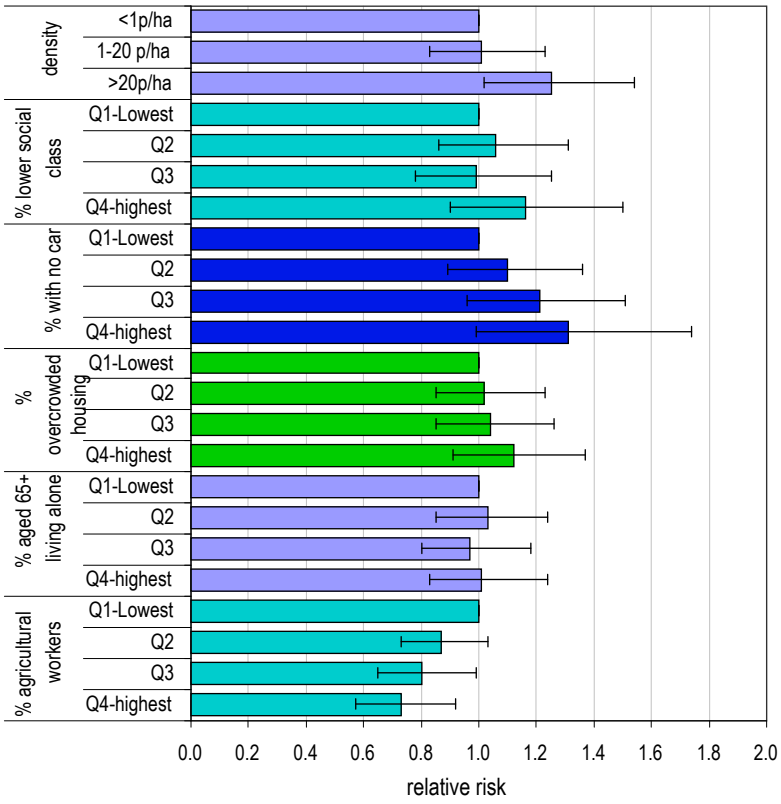
Figure 12.5 Adjusted relative risks of head and neck cancer by deprivation index: females



Adjusted for population density

As with men, there was a positive relationship between deprivation and head and neck cancer in women (figure 12.5), but the association was less strong than for men (RR most vs. least deprived areas=1.33, 95% CI 1.11-1.58).

Figure 12.6 Adjusted relative risks of head and neck cancer by area characteristics: females



All variables mutually adjusted except % of agricultural workers (not adjusted for density)

Risk of head and neck cancer in women was more than 20% higher in the most densely, compared to the least densely, populated areas (RR=1.25, 95% CI 1.02-1.54; figure 12.6).

The associations of other socio-demographic variables with head and neck cancer incidence were much weaker for women than for men. While a low proportion of agricultural workers was associated with higher incidence, the associations with the proportions having no car, lower social class and overcrowded housing were not statistically significant.

Socio-economic variation

Despite the strong association between a number of measures of deprivation and head and neck cancer in men, the association was less striking for women. This may be a result of the much higher proportion of laryngeal cancers, which are strongly tobacco-related, in men.

12.5 Mapping and geographical variation

Geographical variation

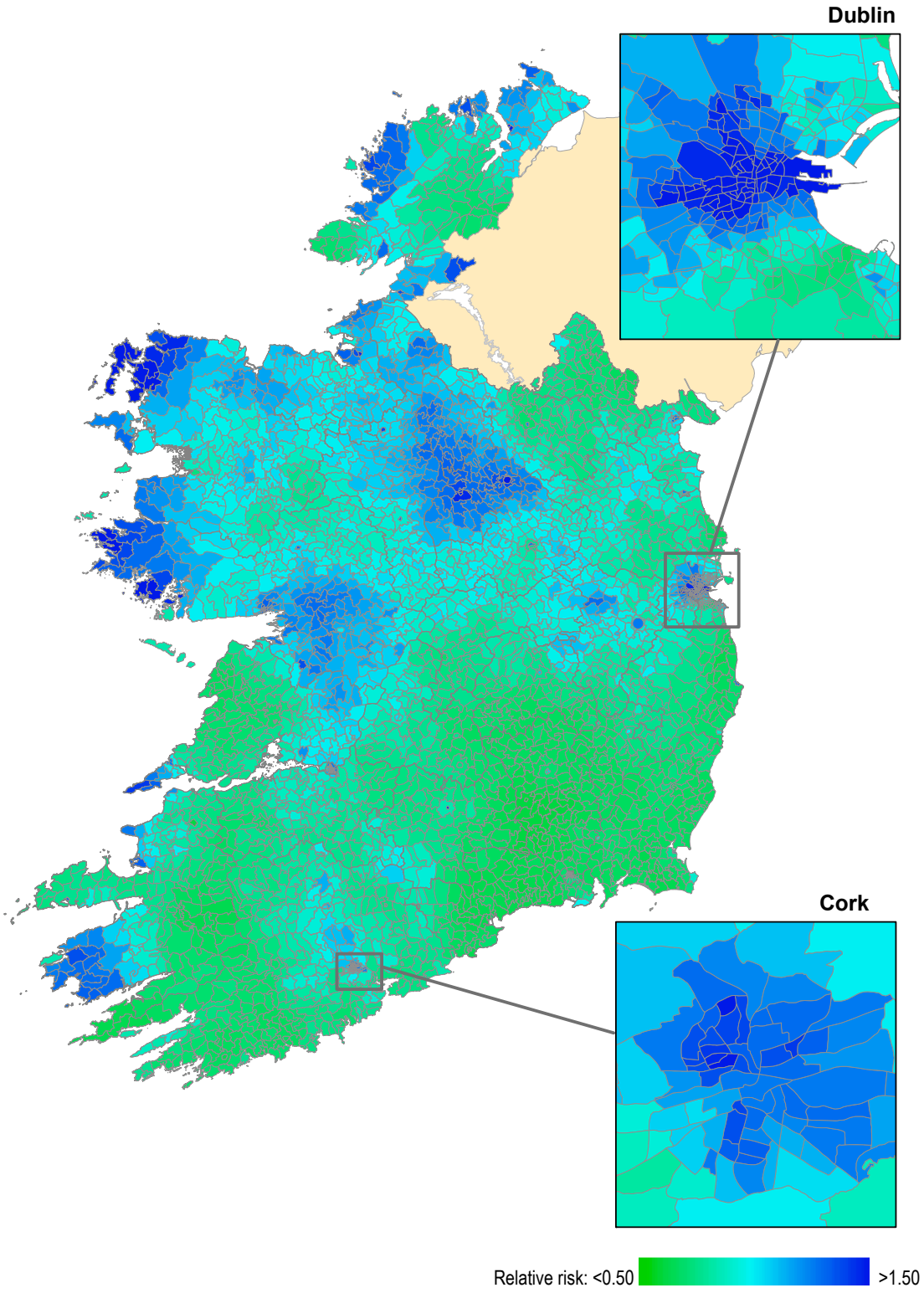
When both sexes were considered, the areas of higher incidence of head and neck cancer were, apart from the cities of Dublin and Cork, confined to the west of the country (map 12.1). When men and women were examined separately, the maps were slightly different (maps 12.2 and 12.3). For men, a number of areas appeared to have a higher incidence - Dublin, Cork, Limerick and Galway cities, a band running from Cork to Galway, a broad area in the north midlands, northwest Mayo and the Iveragh peninsula in Kerry. Within Cork and Dublin, head and neck cancer was more common in less affluent areas.

For women, there was less geographical variation in incidence than for men. There was a region of higher incidence in and around Dublin and in the northeast, with a smaller area with higher rates in the north-east tip of Donegal. In Dublin, as with men, areas of higher deprivation had a higher incidence.

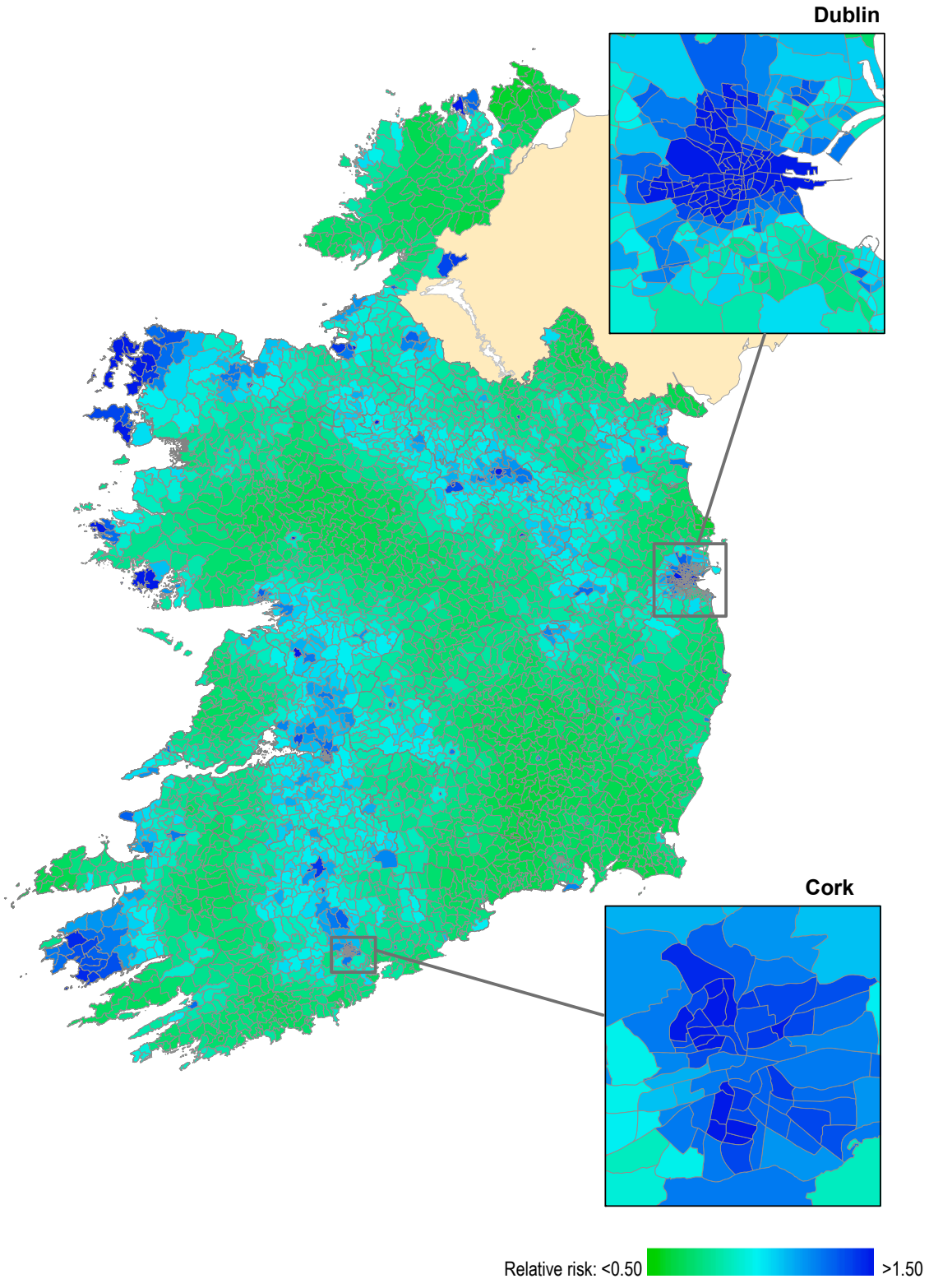
It would be interesting to know whether the areas of higher incidence in women extend into Northern Ireland. Data at the level of district councils suggests that some areas close to the border, including Fermanagh, Derry and Coleraine, have higher than average rates, (Donnelly et al, 2009).

Although the geographical distribution of head and neck cancer risk shared similarities with that for lung cancer (maps 7.1-7.3), some differences were seen, suggesting that factors other than tobacco smoking may have an influence. One possibility is alcohol, although other factors may also be involved. There were similarities between the incidence in men and the geographical pattern of heavy alcohol intake and smoking from the SLÁN survey data (Appendix 1). There were also some similarities between the pattern of head and neck cancer (for both sexes combined) and that of poverty, as measured by income, and lower social class (Appendix 1).

Map 12.1 Head and neck cancer, smoothed relative risks: both sexes



Map 12.2 Head and neck cancer, smoothed relative risks: males



Map 12.3 Head and neck cancer, smoothed relative risks: females