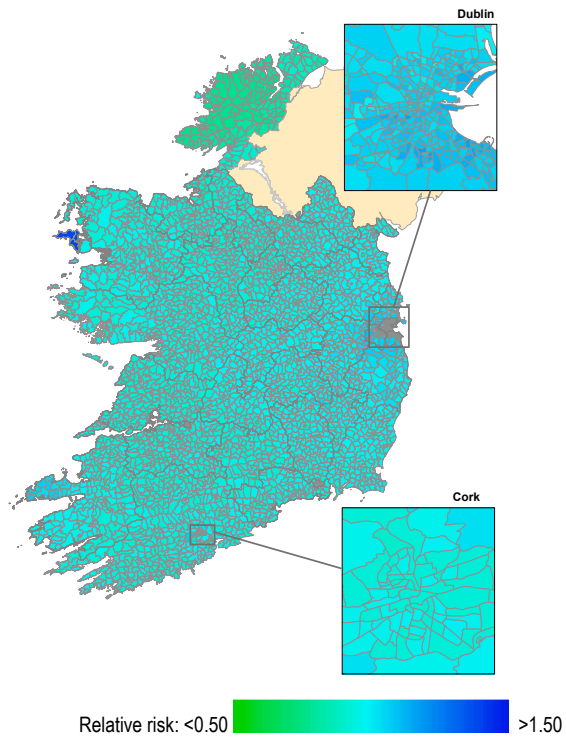


## 15 Geographical distribution of other cancers

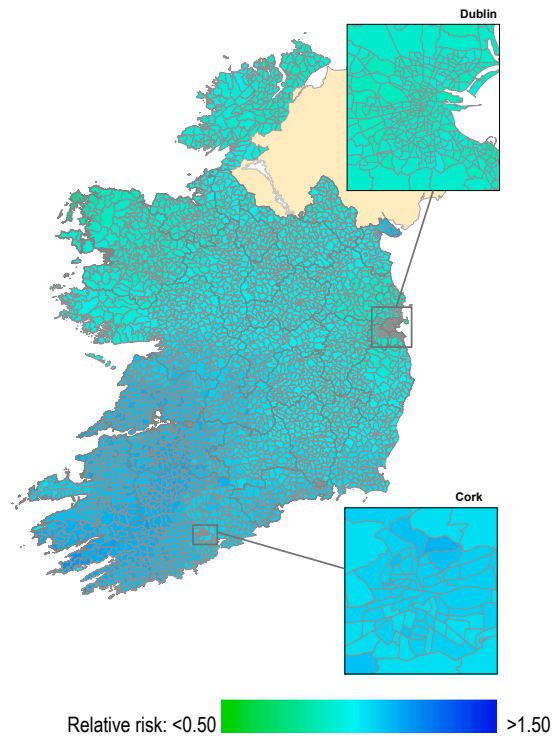
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Maps 15.1-15.7 show the smoothed relative risks for seven other cancer sites. For cancers of the brain and central nervous system, no clear geographical variation was evident. Cancers of the pancreas and corpus uteri and leukaemia had a slightly higher incidence in the southwest; lymphoma and cancers of the kidney were more common in the east; and incidence of ovarian cancer was slightly higher in the southeast. However, all of these patterns were weak and no inference can be drawn from them.

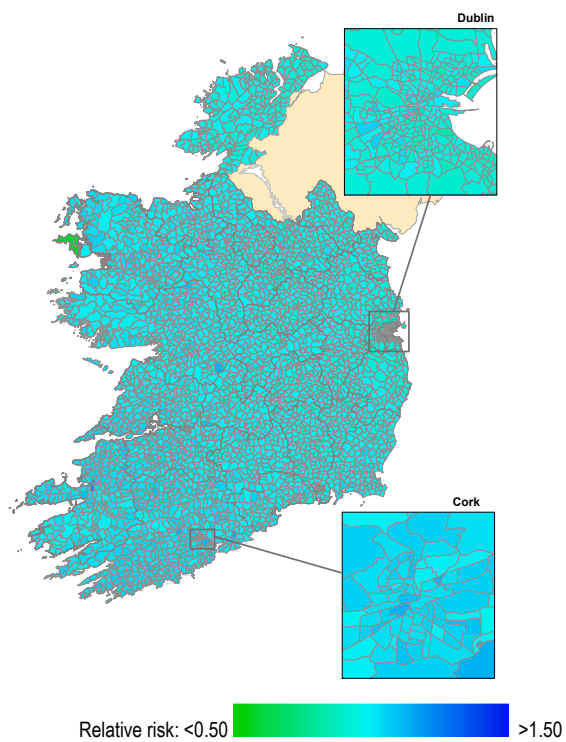
Map 15.1 Lymphoma, smoothed relative risks:  
both sexes



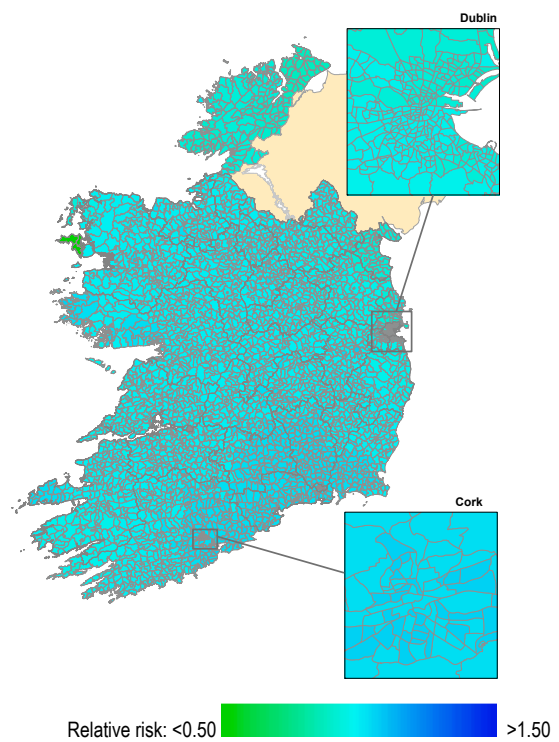
Map 15.2 Leukaemia, smoothed relative risks:  
both sexes



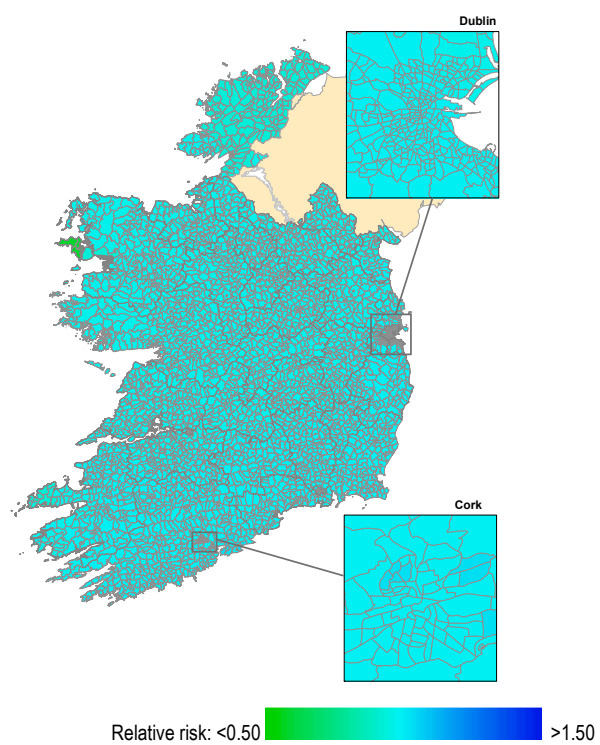
Map 15.3 Pancreatic cancer, smoothed relative risks:  
both sexes



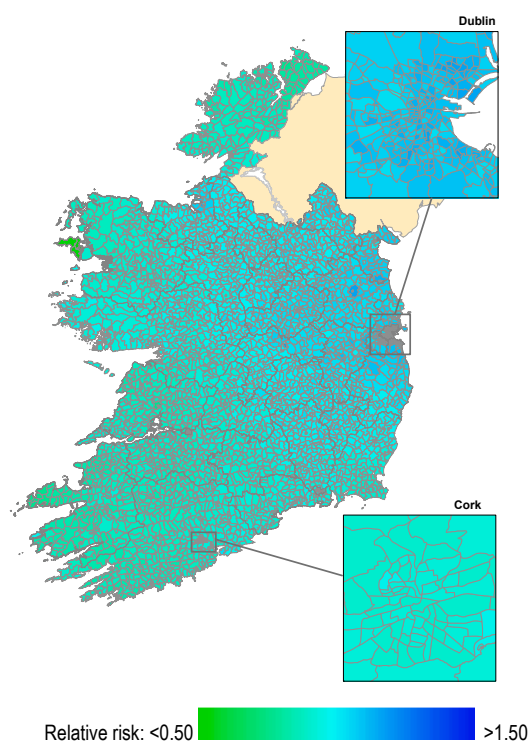
Map 15.4 Ovarian cancer, smoothed relative risks:  
females



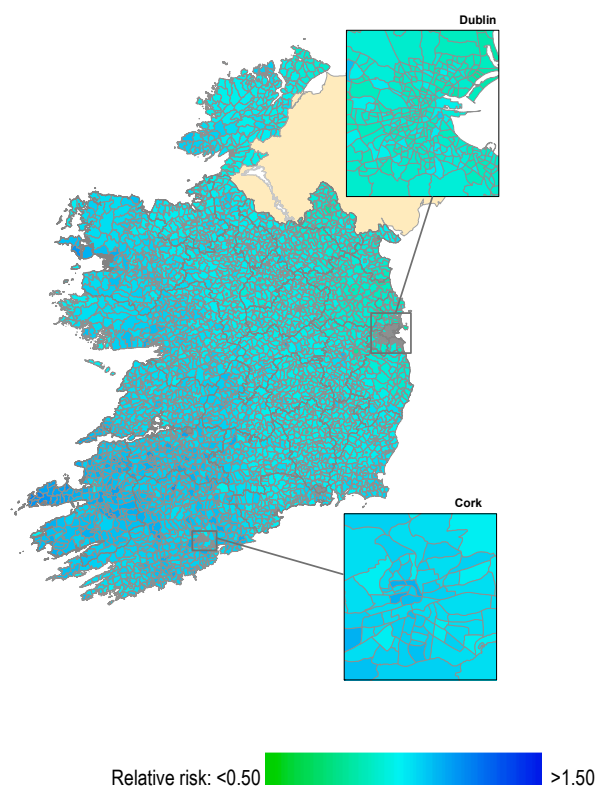
Map 15.5 Brain and central nervous system cancer, smoothed relative risks: both sexes



Map 15.6 Kidney cancer, smoothed relative risks: both sexes



Map 15.7 Cancer of the corpus uteri, smoothed relative risks: females



## 16 Discussion

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### Geographical variations

There are geographical variations in the risk of cancer across Ireland. For some cancers, these patterns are quite striking, while for others they are less marked. Although some similarities were apparent (which are described further below), the observed geographical variations were, in the main, different for different cancers. Generally, for those cancers that affect both sexes, the geographical distribution was similar for males and females. However, it must be kept in mind that these variations in risk do not mean that the spatial location itself causes cancer, but rather they are likely to reflect socio-economic differences in the population, geographical differences in exposure to risk factors and, for some cancer sites, variations in access to, or uptake of, screening or other cancer services. These issues are discussed in more detail below.

### Genetic, environmental and lifestyle risk factors

Several strands of evidence suggest that there are genetic differences between different parts of Ireland (Hill et al, 2000, Dolan et al, 2005 and references therein). Although there is a genetic component to the aetiology of many cancers, it is very unlikely that variations in genetic make-up alone could explain the geographical (and socio-economic) variations in cancer incidence seen in this report. Once specific genetic syndromes are discounted, inherited genetic factors make a minor contribution to susceptibility of most types of "sporadic" cancer (Lichtenstein et al, 2000). The seminal work by Doll and Peto almost 30 years ago estimated that four in every five cancers were due to lifestyle or environmental factors (Doll and Peto, 1981). Although more recent estimates suggest that the percentage of the cancer burden due to *well established* behavioural and environmental factors is somewhat lower (Danaei et al, 2005, International Agency for Research on Cancer, 2007d, Boffeta et al, 2009), the overwhelming importance of these factors in cancer aetiology is clear. In addition, while it is recognised nowadays that most diseases, including cancer, are a result of complex gene-environment interactions (Khoury et al, 2005), it is exposure to lifestyle factors which remains of paramount importance - after all, germline mutations or polymorphisms are determined at birth, but lifestyle exposures are potentially modifiable throughout life.

### Smoking

The observed higher incidence of lung cancer in cities and in the east of the country must reflect geographical variations in smoking habits, since 90% of lung cancers are caused by smoking (International Agency for Research on Cancer, 2004b). Smoking is also a major risk factor for cancers of the bladder and head and neck and, to a somewhat lesser extent, for cancers of the stomach, oesophagus and cervix. Therefore, some similarities between the geographical distributions of these cancers and lung cancer might have been expected. For bladder cancer, where two-thirds of cases in men and one-third in women are considered to be due to smoking (Brennan et al, 2000, Brennan et al, 2001), the maps showed some similarities to those for lung cancer, but did not fully correspond. For head and neck cancer, where up to 70% of cases may be due to smoking (Hashibe et al, 2009), there were again some similarities with the distribution of lung cancer, but also some differences. These observations suggest that other important risk factors probably play a role in the geographical distribution of bladder and head and neck cancer in Ireland. The distributions of cancers of the stomach,