CHAPTER I

AIMS AND OBJECTIVES

The aims and objectives of producing a cancer atlas have not changed in principle since the previous Cancer Atlas of the European Economic Community was completed (Smans, Muir & Boyle, 1992). But with rising trends in the incidence of many cancers, and the general shift in the age distribution of the population towards the elderly – in whom most cancers occur – it is essential that all available information be used to improve prospects for the prevention and control of cancer.

Maps may be topographic or thematic. The former display the physical features, the location of cities and towns, roads, railways, and the like, while the latter concentrate on displaying the geographical occurrence and variation of a single phenomenon – the *theme* of the map. In this atlas the theme is cancer mortality; the history of thematic mapping has been described in an outstanding monograph (Robinson, 1982).

The geographical representation of cancer on maps describes the *cancer scenery* of a country (Frenztel-Beyme et al., 1979). As cancer occurs in people, not geographical areas, the initial purpose of a cancer atlas lies in the identification of geographical areas that require more detailed study and, above all, the formulation of aetiological hypotheses to account for the observed differences. These hypotheses can then be pursued by appropriate analytical and environmental studies. Furthermore, priorities for cancer prevention can be better identified and tailored to the local needs.

These aims are attainable. Over 2,000 years ago, Hippocrates listed the kinds of question which should be asked when relating disease to environment and geographical distribution. A classical and frequently cited example comes from an outbreak of cholera in London in 1854. John Snow, by recording and mapping the addresses of the victims of the epidemic, was able to show that the disease was much commoner in people drinking water supplied by the Southwark and Vauxhall Water Company and, more precisely, from a pump in Broad Street, than in those drinking water from other sources. Removing the handle from the Broad Street pump effectively stopped the epidemic.

The first map for cancer was apparently produced for females in England and Wales by Haviland in 1875. Haviland, who observed that ‘by studying the geographical laws of disease we shall know where to find its exciting as well as its predisposing causes and how to avoid it’, was ‘struck by the definite character of the arrangement that the mortality assumes throughout the country’. Stocks, who mapped cancer mortality in England and Wales in the 1930s, later attempted to correlate the distribution, as had Haviland (1875), with the mineral content, notably zinc and cadmium, of the soil (Stocks, 1928, 1936, 1937, 1939). Howe (1963, 1970) published national disease atlases in the United Kingdom, and described the historical mapping of disease.

There was a renaissance of cancer mapping when Burbank (1971) published computer-drawn maps of the distribution of cancer mortality for the 49 states which comprised the United States of America. The state was soon recognised as being too large an areal unit, which resulted in the publication of a County Cancer Atlas in two volumes, one for whites and one for non-whites (Mason et al., 1975, 1976).

The present atlas, based on over 5.5 million deaths from cancer and 2.2 billion person-years of observation, reveals many distinctive patterns of cancer mortality distribution within the European Union and the European Economic Area (EU-EEA) Member States which clearly and urgently require further study from the standpoint of causation. The maps may also be used as an aid in planning the provision of the health services required to combat this disease and, importantly, identifying sub-national areas where specific interventions are required to reduce mortality from cancer.

The maps

The sources of the data and the methods of computation and technical details concerning the production of the maps are outlined in Chapter 2. The maps present age-standardised mortality rates by sex (see below) for 1,278 areas designated as being at levels II or III as defined by the European Commission (EC) statistical services. These areas, identified by a five-character code, frequently have a national equivalent such as Département in France, county in England and Wales, or Kreise in Germany. More details of the regions used in each country are given in the relevant country-specific section in Chapter 4 (below).

For a given cancer the main map shows the higher rates in shades of orange/red, the median rates in yellow and the lower rates in shades of green (see Kemp et al., 1985, for a fuller explanation). The distribution of the mortality rates is shown in the top right corner of each map. It should be borne in mind that in the main maps a given colour will represent a different range of values according to the site of cancer. In addition, a smaller map is presented (in the lower right of the chart) in which each colour represents the same range of values for every cancer site. This indicates whether mortality rates for that site were generally high (darker colours) or low (lighter colours). Information from the statistical tables on which the maps are based can be obtained from IARC.

Validity of the data in this atlas

Perhaps the most important requirement of a cancer mortality atlas is that it should present the geographical mortality patterns with a minimum of distortion. Chapter 3 thus contains information which will alert readers to possible sources of bias; many of the factors influencing interpretation are also examined in much greater detail elsewhere in the Atlas.

Availability of cancer mortality data

Mortality data were made available for the period 1993-1997 from all the 25 Member States of the European (as of May 2004) and three Member States of the European Economic Area (Iceland, Norway and Switzerland). This is a marked increase over the nine countries included in the previous atlas (Smans, Muir & Boyle, 1992). One important consequence is that there is much more comparable information available about cancer mortality rates and patterns in the Nordic Countries (Iceland, Norway, Sweden, Finland and Denmark), the Baltic States (Estonia, Latvia and Lithuania), central Europe (Czech Republic, Hungary, Poland, Slovakia and Slovenia) and around the Mediterranean (Cyprus, Greece, France, Italy, Malta and Spain). Geographically broader and more meaningful assessments of cancer risk can, therefore, be made now than previously.

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