Is cancer epidemiology different in Western Europe to that in Eastern Europe?

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Introduction

There are great regional differences in cancer incidence and mortality overall and at specific organ sites in the world [1] and in Europe [2]. This article examines the geographic variations in cancer burden in 2002 and reviews the published evidence to explain the differences. Cancer incidence and mortality estimates for 2002 are from the GLOBOCAN database [3]. In this database, European countries are divided into four regions: northern, eastern, southern and western. The grouping of European countries is different in several databases [3, 4], each serving its special purpose. For this review, European countries have been regrouped into north-western (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Norway, Portugal, Spain, Sweden, Switzerland, The Netherlands, UK) and central-eastern (Albania, Belarus, Bosnia Herzegovina, Bulgaria, Czech Republic, Croatia, Estonia, FYR Macedonia, Latvia, Lithuania, Hungary, Moldova, Poland, Romania, Russian Federation, Slovakia, Slovenia, Serbia and Montenegro, Ukraine). The latter includes predominantly countries from the former socialist block.

The overall cancer burden in Europe

In 2002, there were an estimated 2,814,578 incident cases of all forms of cancer (except non-melanoma skin cancer) diagnosed in Europe (53% in males and 47% in females), 1,804,197 in north-western countries (54% in males and 46% in females) and 1,010,381 in central-eastern countries (51% in males and 49% in females). Of 1,697,658 cancer deaths (56% in males and 44% in females), 993,679 were in north-western countries (56% in males and 44% in females) and 703,979 in central-eastern countries (56% in males and 44% in females).

After adjusting for different age structures the overall estimated incidence rates in males and females were higher in north-western than among central-eastern countries (Figure 1), while mortality was higher in males in central-eastern European countries (Figure 2).

High all-cancer mortality rates for a number of central-eastern European countries despite lower incidence reflect the distribution of the most frequent cancers and poor survival of these patients. While several published analyses of trends in cancer mortality in Europe over the past 30 years show that in the majority of countries of the former European Union the age-standardised mortality from the most common cancer sites has fallen since the late 1980s, in the majority of eastern European countries the situation is less favourable [5–8].

Most frequent cancer sites

The most frequent cancer site (except non-melanoma skin cancer) in males in north-western countries was prostate, followed by lung, colon and rectum, bladder, and stomach, while in central-eastern Europe lung represented one-quarter of all cancer sites, followed by colon and rectum, stomach, prostate, and bladder. Among causes of death, lung cancer was the most important in both broad regions (Figure 3).

In females in north-western countries, breast cancer accounted for 30% of all new cancer cases (except non-melanoma skin cancer), followed by colorectal and lung, while in central-eastern countries breast and colorectal cancer were followed by ovarian and cervical cancer. While the proportion of deaths from breast and colorectal cancer are similar in both regions, cervical cancer accounts for 6% of all cancer deaths in females in central-eastern Europe (Figure 4).

Lung cancer is still the biggest public health problem in Europe, especially in the central-eastern part, where it accounts for nearly one-third of all cancer deaths in males. Since the most important risk factor for lung cancer is tobacco smoking [9], trends in lung cancer incidence and mortality reflect the stage of the smoking epidemic in different countries. While in some western European countries the mortality from lung cancer, especially among younger men (age 30–64 years), has started to decline owing to a modification in the smoking habits from generation to generation, there is an increasing trend in females [10]. Decrease in mortality in males has been noted in some central-eastern European countries in the 1990s, such as Estonia, Latvia, Lithuania and Slovenia, while in Hungary and Poland there was at least no further increase observed till the end of the 1990s [11]. Unfortunately, there is still an increasing trend in mortality persisting among females [12].

Excess calorie intake and insufficient levels of physical activity leading to obesity clearly increase the risk of colon cancer, and constant rises in its incidence have been observed.
Mortality in most countries where no screening programmes were introduced, or were still in the upwards direction in many central-eastern countries, e.g. Czech Republic, Hungary and Slovakia. While mortality trends tend to decrease in some of the north-western countries from 1990s onwards, they were still in the upwards direction in many central-eastern countries [14]. Apart from different lifestyles, these differences may also be due to earlier diagnosis, new treatment modalities and hence better survival in some western countries, but not to such an extent in eastern countries [15].

Trends in the incidence of and mortality from breast cancer result from a variety of influences including screening programmes, such as those introduced in several European countries in the late 1980s [16]. Quite substantial increases in incidence up to the mid-1990s were observed in countries where no screening programmes were introduced, or were regional or in the pilot stage. Mortality in most countries increased from the 1950s until at least the 1980s, particularly within populations undergoing economic development [13]. The incidence is high in many of western, but also central-eastern, countries, e.g. Czech Republic, Hungary and Slovakia.
European countries. The decline is often confined to women aged <64 years old [17].

While primary prevention by non-smoking or smoking cessation is the best measure to decrease the incidence of and mortality from lung cancer in both sexes, secondary prevention by screening is aimed to reduce mortality from cervical, breast and colorectal cancer [18]. Although organised cervical screening programmes are known to reduce cervical cancer incidence and mortality, opportunistic screening as currently present in the majority of central-eastern countries is not so effective, as cervical cancer is still among most frequent cancer sites and causes of death among females in central-eastern Europe [19].

Conclusions

In general, there are regional differences in cancer burden and time trends across Europe. These can be partially explained by differences in cancer risk factors, lifestyle-related and environmental, including tobacco, alcohol, dietary habits and pollution. The results from the EUROCARE studies revealed great variations in cancer survival among European countries that are mostly due to differences in screening, timing of diagnosis and treatment [20–22].

Many differences have their roots in social and economic inequalities as a consequence of political systems that existed among various geopolitical regions in Europe. It is hoped that the application of current knowledge on cancer prevention, early diagnosis and treatment will reduce the current disadvantage registered in cancer burden in central-eastern Europe.

References