Eur J Cancer, Vol. 29A, No. 16, pp. 2315–2319, 1993.
Printed in Great Britain

0959–8049/93 $6.00 + 0.00

Feature Articles

Cancer Incidence in Five Continents, Vol. VI

A Review by Fabio Levi

By D.M. Parkin, C.S. Muir, S.L. Whelan, Y.-T. Gao, J. Ferlay and J. Powell. IARC Scientific Publication No. 120. Lyon, IARC, 1992, 1020 pp. ISBN 9283221206. £120

THIS IS the sixth issue from the series *Cancer Incidence in Five Continents* started by R. Doll, P. Payne and J. Waterhouse in 1966 [1], including detailed data on cancer registration in various areas of the world. Over the years, the number of cancer registries providing data of acceptable quality has steadily increased to reach 137 registries, covering 166 populations in 48 countries, over the period 1983–1987. These include 122 registries, which had already reported data in the previous volume [2], and 44

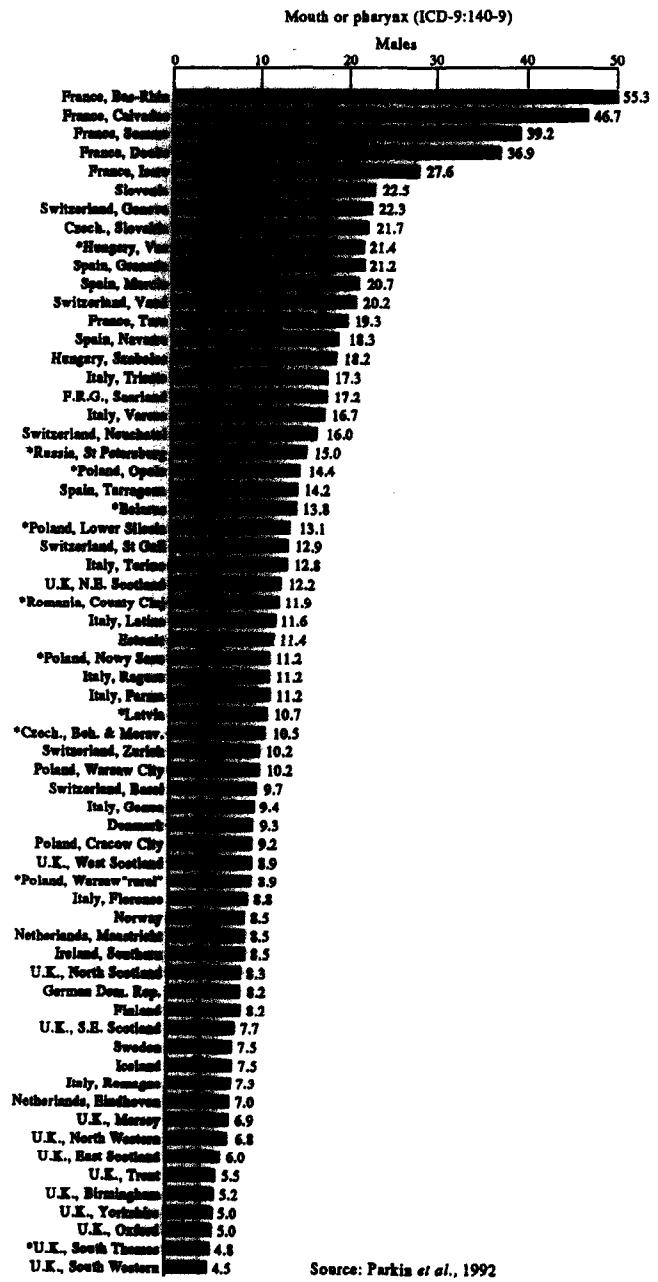

Fig. 1.

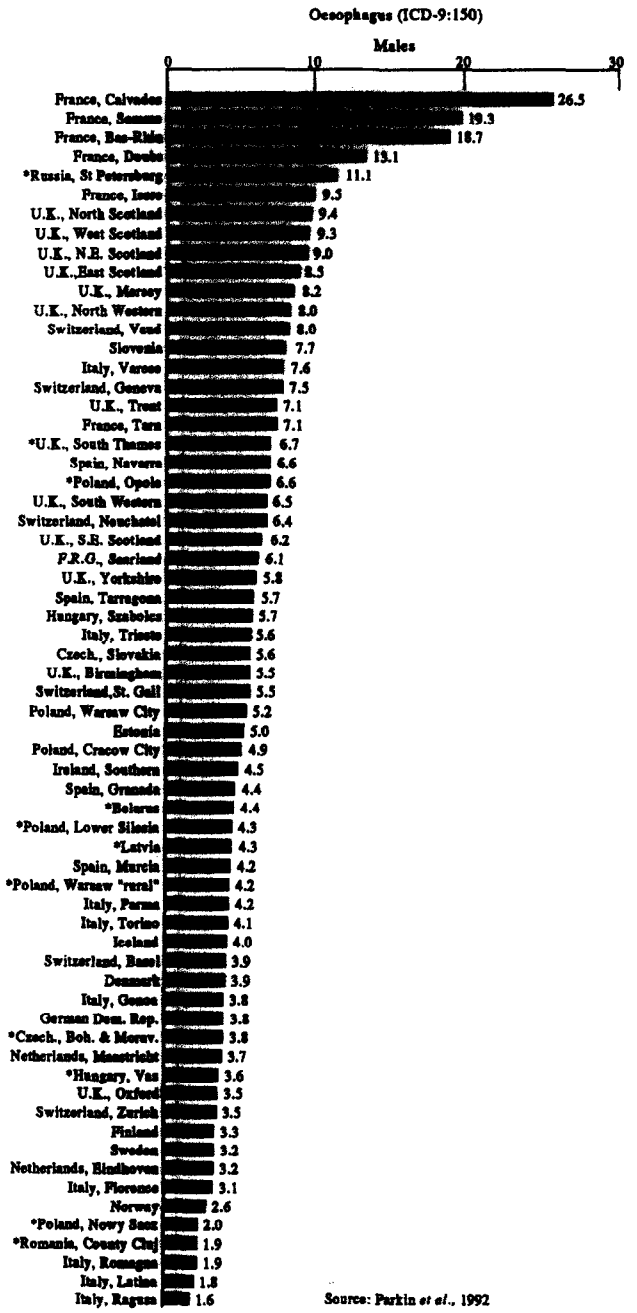

Fig. 2.

new registries, including three from Africa which, as a continent, was not present in volume V. Regrettably, 15 registries present in volume V, were not included in volume VI.

After an introduction by J. Waterhouse, who was among the editors of the previous five volumes, several chapters deal with technical problems, with comprehensive discussion on techniques of registration, classification, coding practices and processing of data.

Several indicators of data quality are also presented to assist interpretation of cancer statistics from each registry. This led to the inclusion of data from 'borderline' registries, appropriately indicated in the text and tables.

The standard presentation for each of the 137 registries includes a description of the structure and of the target population, a histogram of the age distribution of the population, and two tables (one for each sex) including total number of registered cases, age-specific incidence rates from 50 cancers or groups of cancers, overall crude rate, percent of all cancers, cumulative rate until age 64 and 74, and age-standardised rate on the world population.

The last section includes age-standardised incidence rates for separate sub-sites (i.e. four-digit rubrics), and age-standardised incidence and cumulative incidence rates (three-digit rubrics) listed per site and including standard errors of the rates.

Standard errors are one of the several innovations introduced in volume VI, but almost certainly the most important is the inclusion on a computer diskette of almost all of the printed data for volume VI, together with a corresponding diskette for volume V.

These innovations represent substantial improvements, although probably due to space limitations, some interesting information previously published was omitted. An omission many may miss is, for instance, the distinction between urban

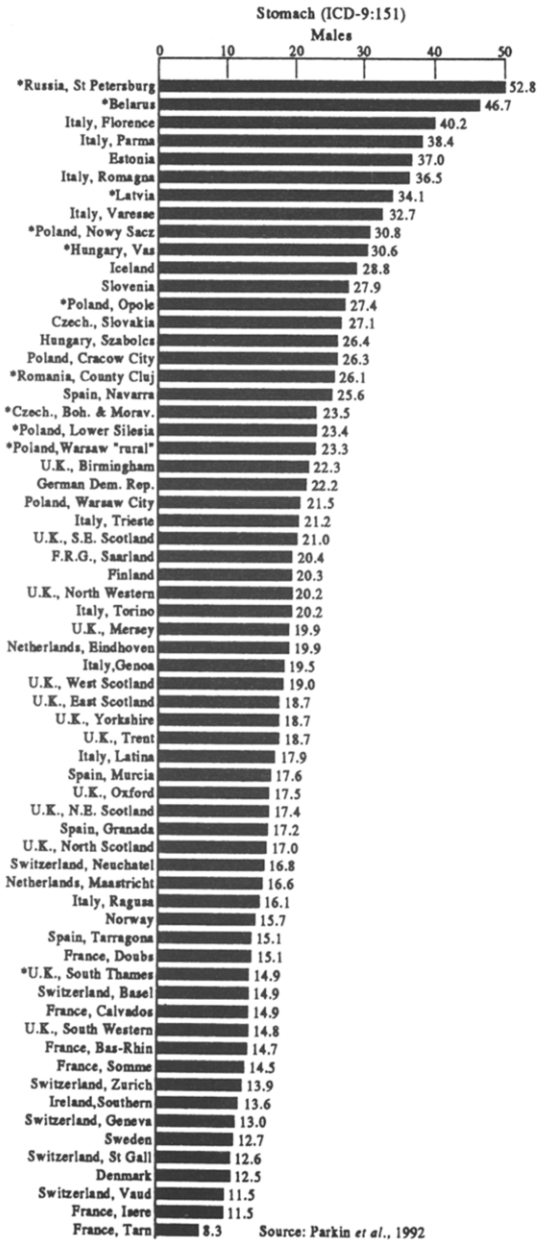

Fig. 3.

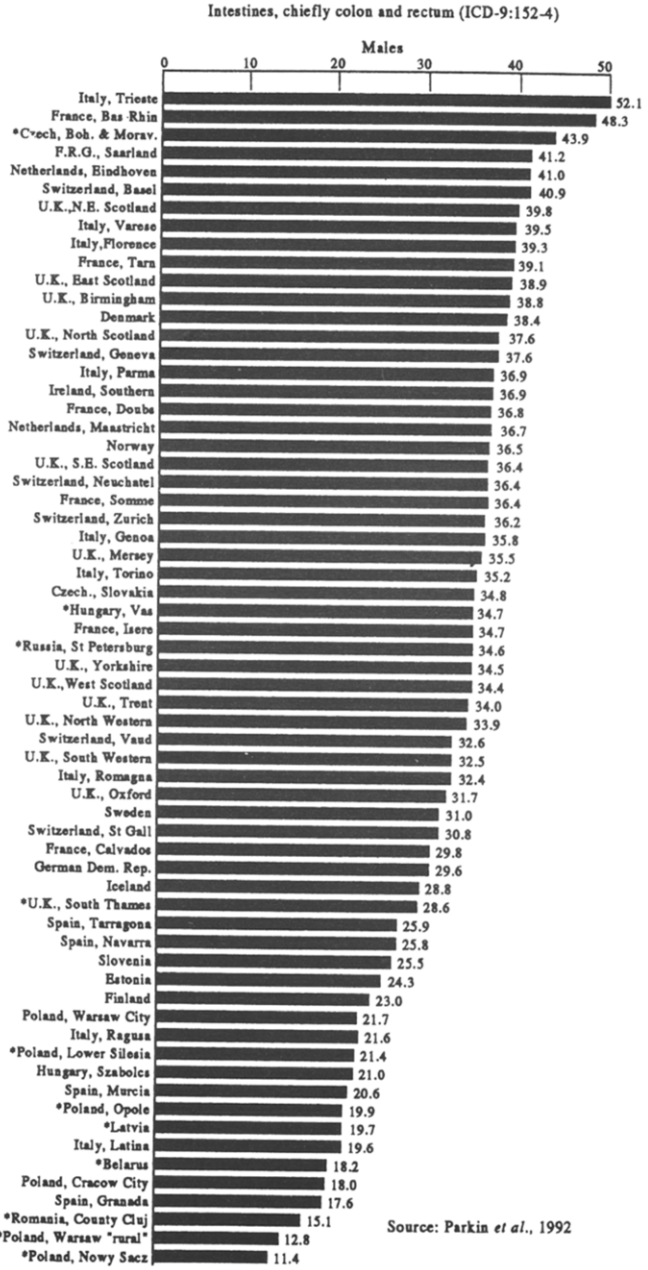

Fig. 4.

and rural areas for 13 registries, published up to volume V, which has been used for interesting epidemiological inference [3].

Cancer Incidence in Five Continents, with its uniquely large amount of data, is essentially a technical report, and a basic reference for cancer epidemiologists. The hope is that, like previous volumes, it will be widely utilised to further analyse and understand the geographical variation in cancer incidence, and hence open perspectives for hypothesis formulation and testing.

With special focus for the readers of the *European Journal of Cancer*, to illustrate the possibility of using data on cancer incidence, histograms are illustrated here (Figs 1–9) and briefly discussed for a few selected cancer sites, on a European scale [4].

Among males (Fig. 1), the range of variation for incidence of oropharyngeal cancer was over a factor 10, the highest rate (55.3/100 000) being in Bas-Rhin, France, followed by Calvados (46.7/100 000) and other French registries, Slovenia and Geneva, Switzerland, Slovakia, Hungary and several Spanish registries. The lowest rates, around 5/100 000, were in the U.K., followed by several Nordic countries. Among females, the lowest rates (i.e. between 1.1 and 2.0/100 000) were in Spain, southern Italy and eastern Europe.

The highest incidence rates of oesophageal cancer in males, as for oral and pharyngeal cancer, were in France, with a value of 26.5/100 000 males in Calvados, followed by Somme and several other French registries (Fig. 2). High rates were also reported from St Petersburg, Russia and, in contrast with oral cancer, from Scotland, U.K. The lowest rates, between 1.6 and 3/100 000, were from southern Italy, Nordic countries and some central European registration areas.

In both sexes, the highest incidence rates of gastric cancer (Fig. 3) were from St Petersburg, Russia (52.8/100 000 males),

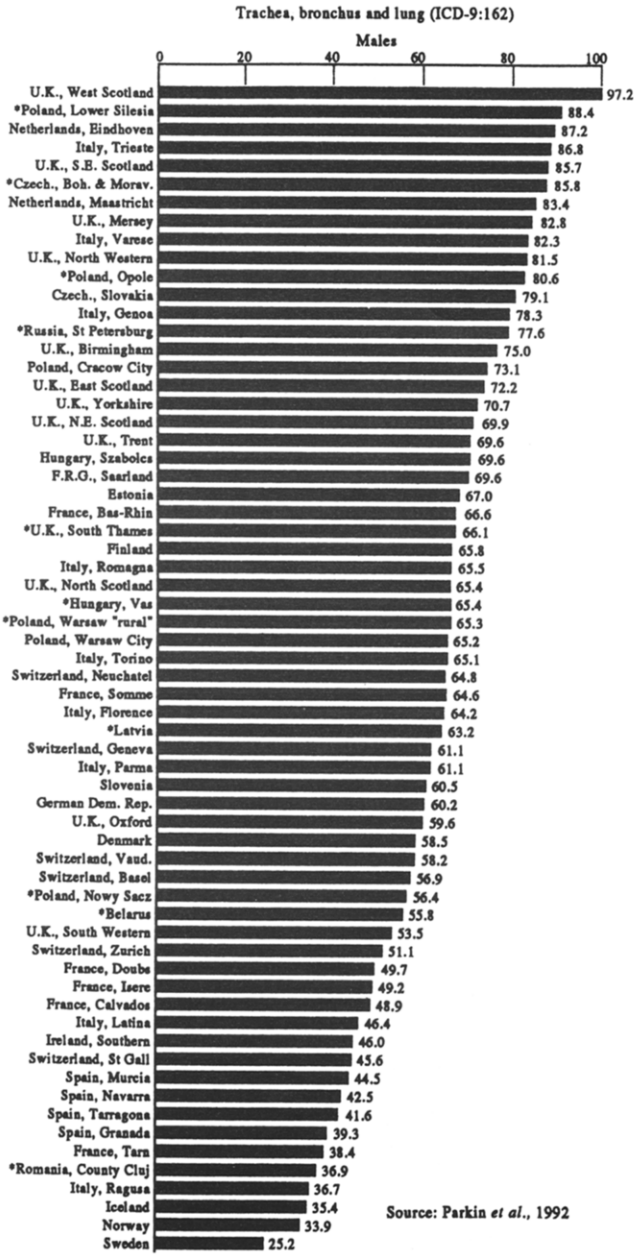

Fig. 5.

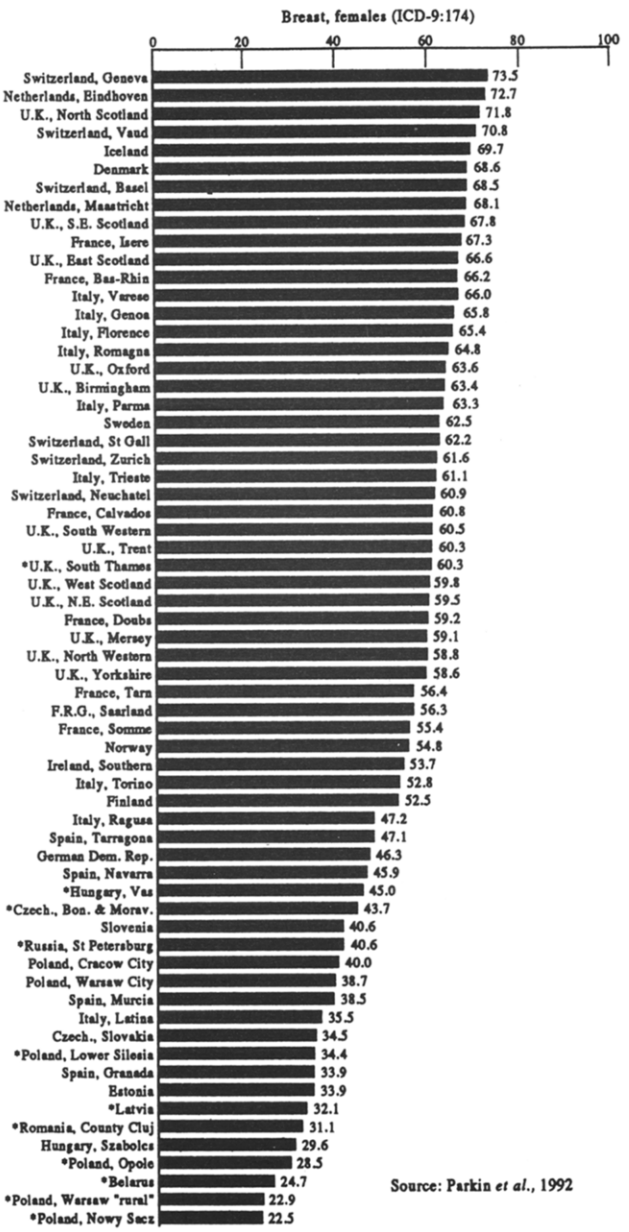

Fig. 6.

and in other areas of the former Soviet Union (Belarus, Estonia and Latvia), and also in central Italy (Florence, Parma and Romagna). Poland and other eastern European countries also had high rates in both sexes. The lowest rates (between 8 and 15/100 000 males) were in France, Switzerland, Nordic countries and the U.K.

When all colorectal cancer incidences were considered together (Fig. 4), the highest rates for males were in Trieste, Italy (52.1/100 000), Bas-Rhin, France (48.3/100 000), Bohemia and Moravia (43.9/100 000), followed by registration areas in Germany, the Netherlands, Switzerland, Scotland, U.K. and northern and central Italy. The lowest rates (below 20/100 000) were in Poland, Latvia, Belarus, southern Italy and Spain.

In both sexes, the highest incidence rate of lung cancer (Fig. 5) was in Scotland (97.2/100 000 males; 33.6/100 000 females). Other high incidence rates for males were from Lower Silesia, Poland (88.4), Eindhoven, the Netherlands (87.2) and Trieste, Italy (86.8). Incidence was also high in Bohemia and Moravia, other British, north Italian and Dutch registration areas, as well as in St Petersburg, Russia. The lowest lung cancer incidence rate for males was in Sweden (25.2/100 000), followed by Norway (33.9) and Iceland (35.4). Southern Italy, Spain, France and Romania also tended to have low lung cancer incidence for males. Among females, all the high incidence areas were in the U.K. (between 25 and 34/100 000), although Iceland (25.9/100 000) and Denmark (23.1/100 000) were in the upper part of the distribution. Registered incidence was low in Spain, southern Italy and France. These figures essentially reflect the different spreading of the tobacco-related lung cancer epidemic for both sexes in various European countries, and the subsequent adoption of measures for tobacco control [5].

The highest breast cancer incidence rates (between 68 and 73/100 000) were in French-speaking Switzerland, the Netherlands, the U.K., Iceland and Denmark (Fig 6). The rates of most European registries ranged between the relatively narrow

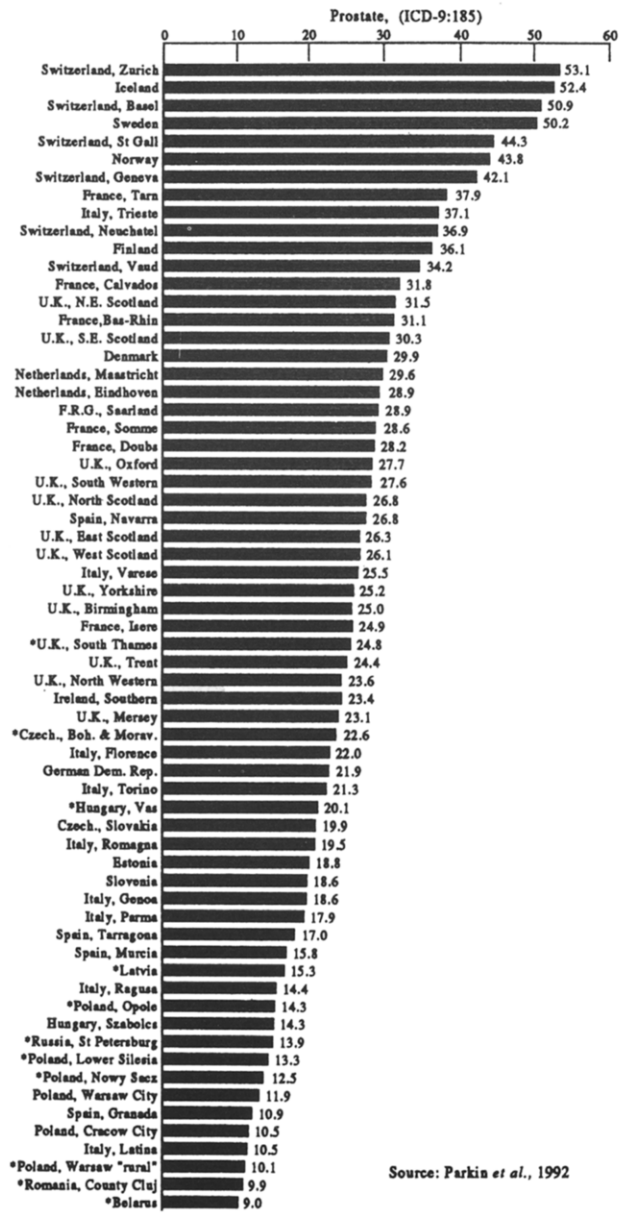

Fig. 7.

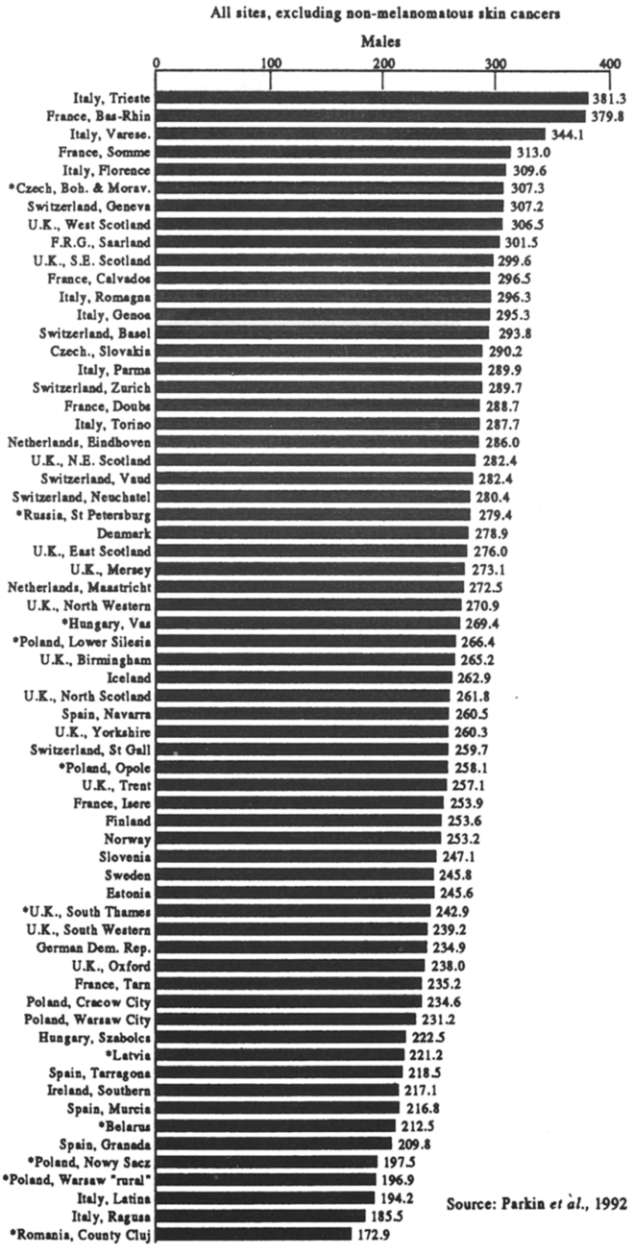

Fig. 8.

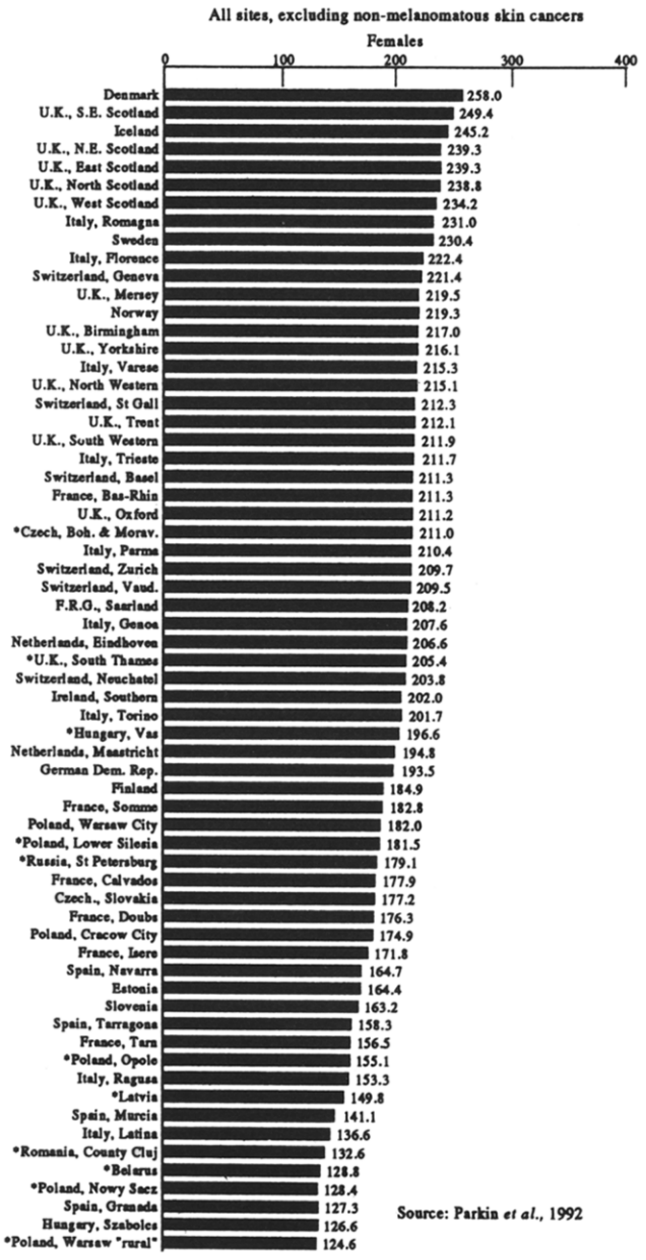

Fig. 9.

range of 50 and 65/100 000, but some areas of southern Italy, Spain and eastern Europe had lower incidence rates, under 25/100 000 in Belarus and rural Poland.

The highest prostatic cancer rates were in Switzerland (over 40/100 000), followed by Nordic countries (Fig. 7). France, Germany and the U.K. had intermediate values (i.e. between 20 and 30/100 000), while Spain, Italy and eastern Europe had lower rates. The lowest incidence was in Belarus (9.0/100 000). Thus, the range of incidence variation was almost a factor 6.

Finally, the category of all sites excluding non-melanomatous skin cancer is considered in Figs 8 and 9. The overall range of variation between various European registries in total cancer incidence was over a factor 2 in both sexes, i.e. between 380/100 000 males in Trieste, Italy and Bas-Rhin, France and females in Denmark and 125/100 000 females in rural Warsaw, Poland. In the upper part of the distribution of incidence in males there were several northern Italian registries, Somme, France, Bohemia and Moravia, Geneva, Switzerland, western Scotland, U.K., and Saarland, Germany. Low incidence rates were registered in southern Italy, Poland, Spain, Belarus and other eastern European registries. For females, after Denmark, the highest incidence rates were for Scotland, U.K. and Iceland (between 235 and 250/100 000), followed by Romagna and Florence, Italy, Sweden and Geneva, Switzerland. As for males, the lowest rates were in eastern Europe, Spain, southern Italy and Tarn, France. The sex ratios were highest in France (1.8–2.2) and lowest in the U.K. and Scandinavia (1.1–1.5). This variation in cancer incidence in Europe mainly reflects different stages of tobacco-related lung cancer epidemics in Europe as well as, among other factors, the impact of colorectal and also stomach cancer in both sexes, and of breast cancer in females, and prostate in males.

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Note: Reference 4, which includes histograms of cancer incidence and mortality for 30 areas in Europe over the period 1983–1987, is available on request from Dr F. Levi.