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Patterns of Childhood Cancer Incidence and Mortality in Europe

Fabio Levi, Carlo La Vecchia, Franca Lucchini, Eva Negri and Peter Boyle

Histograms including age-standardised (0–14 years, world standard) incidence and mortality rates from selected childhood cancers are presented for 21 European cancer registration areas and 24 countries. The overall range of variation in all childhood cancer incidence rates across various cancer registration areas in Europe was around a factor 1.5, with highest rates in Spain, Italy, Sweden and France, and lowest rates in Poland, Hungary, UK, Germany and Yugoslavia. For most single cancer sites, however, the observed pattern is essentially attributable to random variation alone. A clearer pattern, however, emerged with reference to mortality. The overall range of variation, in fact, was around a factor two in both sexes, with highest rates in Bulgaria, Portugal, Hungary, Czechoslovakia and Poland, and the lowest rates in Austria, UK, Germany, The Netherlands and Finland. Trends in mortality from childhood cancers between 1950 and 1989 were also presented. Recent declines were observed for total childhood cancer mortality, leukaemias, kidney cancer (Wilms' tumours), Hodgkin's disease and other lymphomas in most European countries. These declines, however, were generally earlier and larger in northern as compared with southern and, mostly, with eastern European countries. This pattern of trends likely reflects the different adoption and impact of newer efficacious therapies of childhood cancer, and hence, confirms that there is ample scope for further reduction in childhood cancer mortality in several eastern and some southern European countries.
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INTRODUCTION

THE AIM of this report is to provide, in a standard format, figures of incidence and mortality from main childhood cancer sites in various European cancer registration areas and countries. This work offers general baseline documentation and description of the overall picture of childhood cancer incidence and mortality in Europe, and could constitute a basis for potential inferences on determinants of differences in childhood cancer rates. Further, since several childhood cancers are now amenable to treatment, variation in certified mortality and comparisons between pattern of incidence and mortality and comparative analysis of trends in mortality over the last few decades may provide useful clues towards the differential utilisation and impact of newer treatments in various European geographical areas.

MATERIALS AND METHODS

Age-standardised (on the world standard population) [1] incidence rates from 0 to 14 years for selected cancers or groups of cancers in 21 European cancer registration areas were abstracted from the volume of *International Incidence of Childhood Cancer* published by the International Agency for Research on Cancer [2]. A total of 11 cancers or groups of cancers, plus total cancer mortality, were abstracted, using the same histo-pathologic classification adopted in that volume [2]. Table 1 gives the list of cancer registration regions, the calendar period, and the average annual population.

Childhood cancer mortality rates (age-standardised 0–14 years, world standard) for 24 European countries (excluding the former Soviet Union and a few small countries such as Iceland, Liechtenstein, Malta, etc.) were computed for the period 1950–1989 on the basis of the official death certification data provided by the World Health Organization (WHO) database. The corresponding average annual population is given in Table 2. Death certification data allowed separate analysis of six cancer sites: all leukaemias, Hodgkin's disease, all non-Hodgkin lymphomas, malignant bone neoplasms, kidney cancer (Wilms' tumour), eye (retinoblastoma), plus total cancer mortality. During the calendar period considered, four different revisions of the International Classification of Diseases (ICD) [3–6] were in operation. Nonetheless, there were no major changes in the classification or coding of these cancers or groups of cancers between the sixth and the ninth revisions of the ICD. It was impossible, however, to obtain meaningful death certification data for neoplasms of the nervous system on account of difficulties in histopathological classification and of changes in the classification of neuroblastoma, which is coded in part to the organ affected (chiefly, the adrenal gland, i.e. with cancers of the endocrine organs), in part to connective and soft tissue sarcomas, and in part to the nervous system.

Incidence and mortality rates are graphically presented in two groups of histograms, including the most recent available incidence (Fig. 1) and (whenever available) mortality rates (Fig. 2) for each sex, respectively. Figure 3 gives trends in age-standardised (0–14 years; world standard) mortality rates from 1950 to 1989 for all childhood cancers and each separate cancer or group of cancers considered.

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Table 1. Average annual population (age 0–14) in 21 European cancer registry regions

Cancer registry region	Calendar period	Males	Females
Czechoslovakia, Slovakia	1970–1979	631 099	603 599
Denmark	1978–1982	550 496	525 278
Finland	1970–1979	531 516	509 555
France, Bas-Rhin	1975–1984	102 141	98 105
France, Lorraine, Provence-Alpes-Côte d'Azur and Corse (L-PACA-C)	1983–1985	687 993	656 439
GDR (1976–80)	1976–1980	1 744 100	1 658 500
FRG, Co-operative Register (CR)	1982–1984	5 097 995	4 864 396
FRG, Saarland	1967–1982	121 189	116 040
Hungary	1975–1984	1 171 851	1 107 396
Italy, Province of Torino	1967–1981	256 739	243 595
Netherlands, Dutch Childhood Leukaemia Study Group (DCLSG)*	1973–1982	1 703 583	1 632 143
Netherlands, South-East Registry (SOOZ), Eindhoven	1973–1983	98 227	94 117
Norway	1970–1979	484 158	460 082
Poland, Warsaw City	1970–1979	167 014	159 287
Spain, Zaragoza	1973–1982	96 113	90 245
Sweden	1970–1982	853 734	811 164
Switzerland, Three Western Cantons of Geneva, Neuchâtel and Vaud (TWC)	1974–1983	96 482	92 448
UK, England and Wales	1971–1980	5 707 800	5 407 900
UK, Manchester	1971–1983	484 161	459 534
UK, Scotland	1971–1980	644 800	611 900
Yugoslavia, Slovenia	1971–1980	217 897	206 512

*Incidence data provided only for leukaemias.

Table 2. Average annual population (age 0–14) in 24 selected European countries (1985–1989)

Country	Males	Females
Austria	688 500	658 100
Belgium	930 400	886 800
Bulgaria	965 800	916 500
Czechoslovakia	1 906 900	1 822 600
Denmark	469 200	449 300
Finland	487 300	465 600
France	5 749 200	5 466 700
Germany, GDR	1 645 900	1 566 900
Germany, FRG	4 660 700	4 436 100
Greece	1 047 700	979 000
Hungary	1 147 900	1 091 000
Ireland	522 000	495 100
Italy	5 411 700	5 135 400
Netherlands	1 409 700	1 348 200
Norway	417 100	397 700
Poland	4 921 800	4 694 600
Portugal	1 175 900	1 116 300
Romania	3 397 800	3 119 000
Spain	4 531 700	4 256 800
Sweden	773 100	735 700
Switzerland	578 300	552 000
UK, England and Wales	4 843 800	4 594 000
UK, Scotland	497 900	473 200
Yugoslavia	2 828 600	2 665 900

RESULTS AND DISCUSSION

This report has mainly a descriptive value, and is therefore not directly intended to draw inferences. A few general comments are, nonetheless, useful for supporting data interpretation.

First, problems of random variability for most childhood cancers are substantial, and are clearly greater in relation to incidence data (often based on smaller populations) and more rare cancers. A simple comparison between male and female incidence figures indicates that, for several cancer sites, the apparent variability is essentially attributable to random variation alone, since there are substantial differences in the figures for the two sexes. Thus, the true variability is probably limited [7]. Clearer patterns, however, were distinguishable for some cancer sites: for instance, incidence rates from brain and nervous system neoplasms tended to be systematically elevated in Sweden and other Nordic countries, France and Italy (Turin), and low in Germany and surrounding countries, UK and most eastern European cancer registration areas. Incidence rates from Hodgkin's disease and other lymphomas tended to be higher in Italy, Yugoslavia, Czechoslovakia and Spain, and low in Nordic countries, Poland and Hungary. Leukaemias were again elevated in Spain and Italy, but also in Norway, Finland and Sweden, and showed low incidence in most eastern European areas. Thus, the overall range of variation in all cancer incidence rates across various cancer registration areas in Europe was around a factor 1.5 in both sexes, with higher rates in Spain, Italy, Sweden and France, and low rates in Poland, Hungary, UK, Germany and Yugoslavia.

With reference to mortality, the pattern of rates was confused and probably largely influenced by random variation for bone and kidney (Wilms' tumour), but clear and systematic pictures emerged for other sites, and particularly for lymphomas and leukaemias, since higher mortality rates were observed in eastern and southern European countries, and were 50–100% higher as compared with those of most northern European countries. Thus, the range of variation in total childhood cancer mortality was around a factor two in both sexes, with higher rates in Bulgaria, Portugal, Hungary, Czechoslovakia and Poland, and the lower rates in Austria, UK, Germany, The Netherlands and Finland.

Trends in mortality for selected childhood cancers between 1950 and 1989 are graphically presented in Fig. 3. Declines were observed for total childhood cancer mortality, leukaemias, kidney cancer (Wilms' tumour), Hodgkin's disease and other lymphomas in most European countries, particularly from the late 1960s onwards. These declines, however, were generally earlier and larger in northern as compared with southern and, mostly, with eastern European countries. Steady falls in childhood cancer mortality were still evident over the most recent calendar periods, indicating that these favourable trends are likely to continue in the near future and that there is scope for further improvement in the management of and survival from childhood cancer. Trends in mortality are more difficult to interpret for eye cancer (retinoblastoma), particularly due to the low absolute numbers of deaths, and for bone neoplasms (Ewing's sarcomas), possibly because the impact of newer conservative treatment is not clear [9].

Overall, during the last three decades, childhood cancer mortality has declined by an average 40% in western European countries, but only by approximately 20% in Eastern Europe [8]. This pattern of trends most likely reflects the different adoption and impact of newer therapies of childhood cancer in

various European geographical areas. These improvements have been due to the availability and adoption of effective multidrug chemotherapy, together with the introduction of improved diagnostic techniques, of various supportive measures to overcome toxicity and the availability of megavoltage radiation [9–13].

Thus, the distribution of rates of childhood cancer mortality in various European countries, and the corresponding trends over time, together with the absence of systematic patterns for incidence, again confirms that there is ample scope for further reduction in childhood cancer mortality, particularly in several eastern (and also some southern) European countries, which may be obtained through better availability and introduction of currently available treatments [8].

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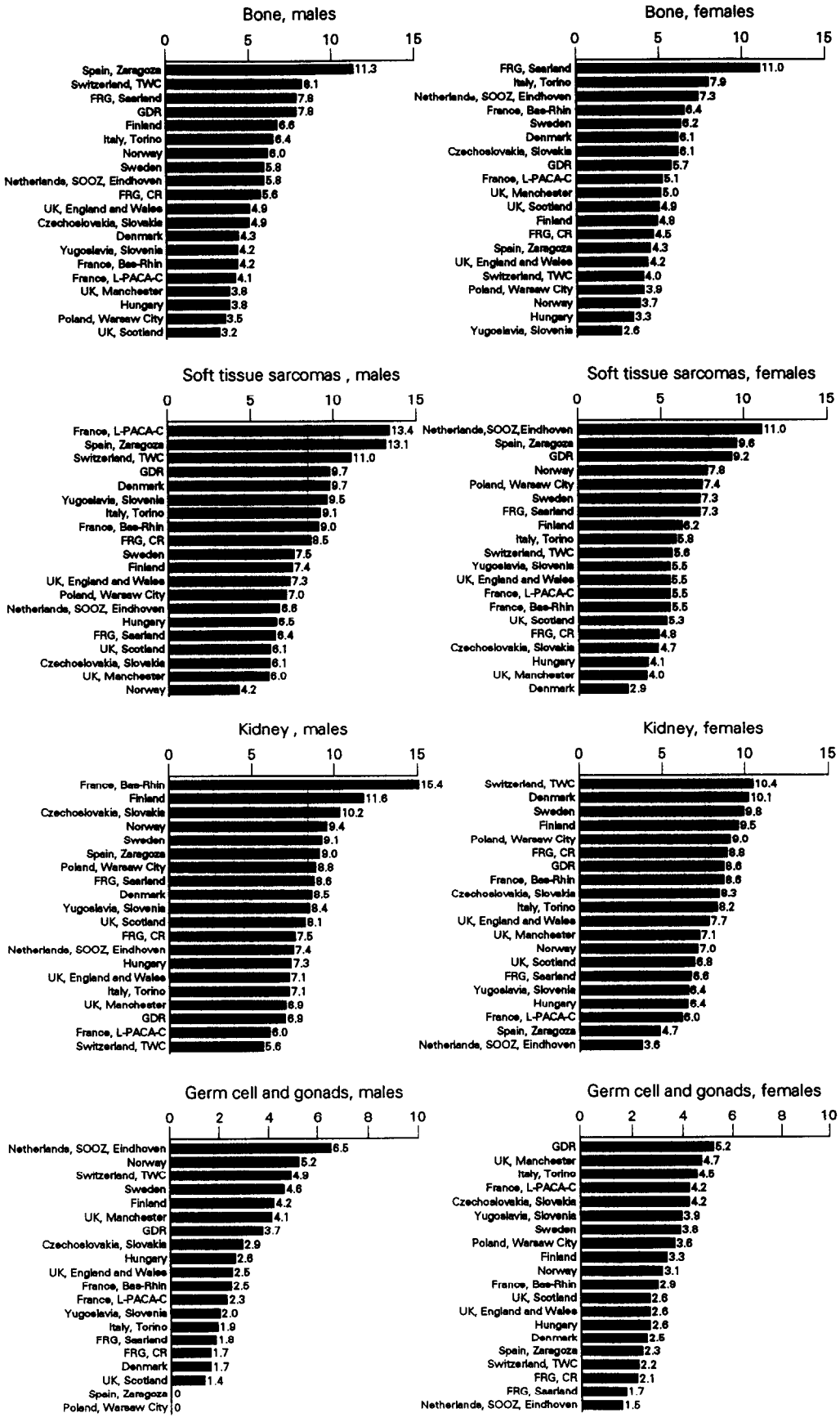

Fig. 1 (a–d). Age-standardised 0–14 years (on the world standard population) incidence rates of selected childhood cancers in various European cancer registry regions, mostly *circa* 1975.

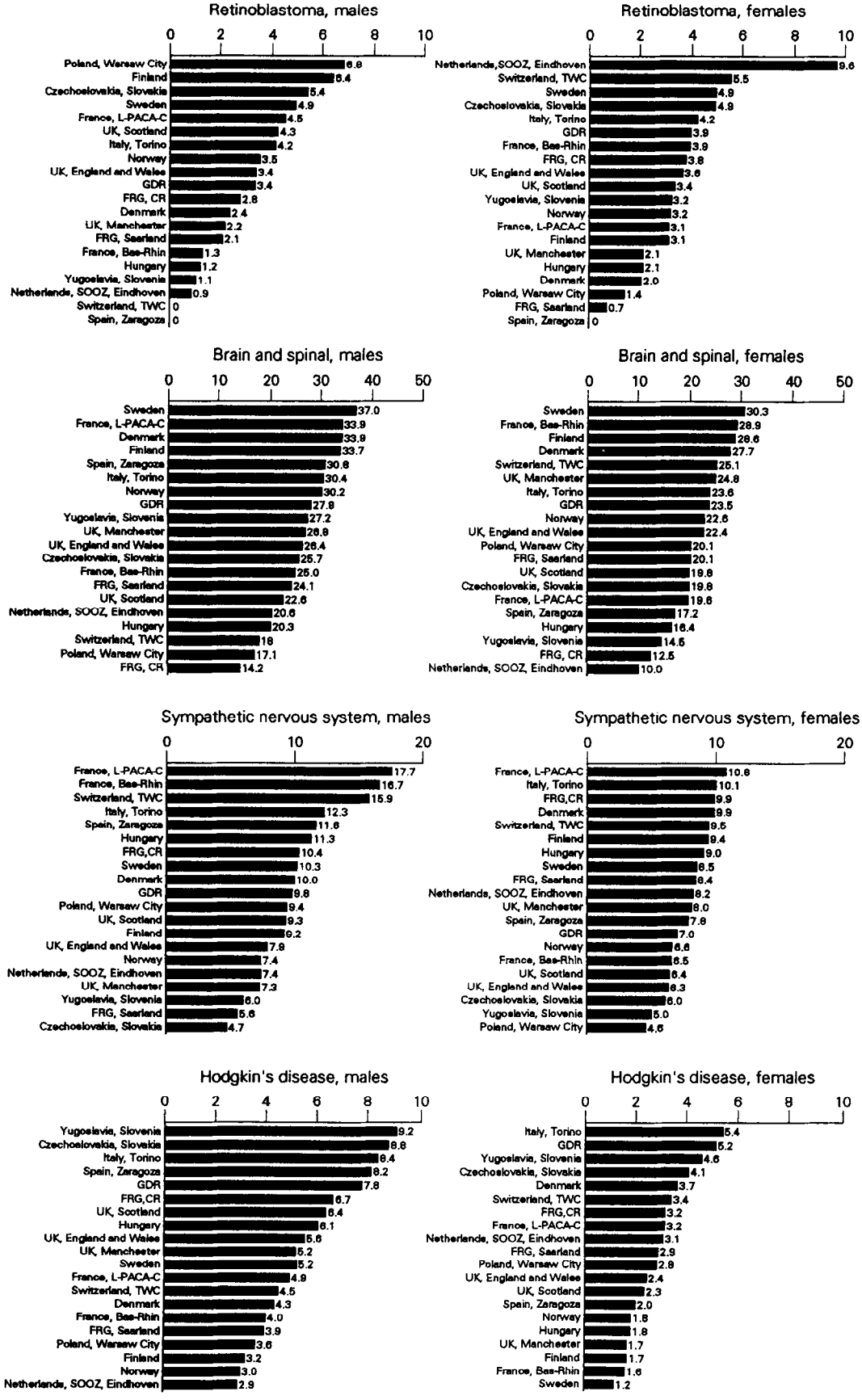
Retinoblastoma, males
0 2 4 6 8 10
Poland, Warsaw City 6.8
Finland 6.4
Czechoslovakia, Slovakia 5.4
Sweden 4.9
France, L-PACA-C 4.5
UK, Scotland 4.3
Italy, Torino 4.2
Norway 3.5
UK, England and Wales 3.4
GDR 3.4
FRG, CR 2.8
Denmark 2.4
UK, Manchester 2.2
FRG, Saarland 2.1
France, Bas-Rhin 1.3
Hungary 1.2
Yugoslavia, Slovenia 1.1
Netherlands, SOOZ, Eindhoven 0.9
Switzerland, TWC 0
Spain, Zaragoza 0
Retinoblastoma, females
0 2 4 6 8 10
Netherlands,SOOZ, Eindhoven 9.6
Switzerland, TWC 5.5
Sweden 4.9
Czechoslovakia, Slovakia 4.9
Italy, Torino 4.2
GDR 3.9
France, Bas-Rhin 3.9
FRG, CR 3.8
UK, England and Wales 3.6
UK, Scotland 3.4
Yugoslavia, Slovenia 3.2
Norway 3.2
France, L-PACA-C 3.1
Finland 3.1
UK, Manchester 2.1
Hungary 2.1
Denmark 2.0
Poland, Warsaw City 1.4
FRG, Saarland 0.7
Spain, Zaragoza 0
Brain and spinal, males
0 10 20 30 40 50
Sweden 37.0
France, L-PACA-C 33.9
Denmark 33.9
Finland 33.7
Spain, Zaragoza 30.6
Italy, Torino 30.4
Norway 30.2
GDR 27.8
Yugoslavia, Slovenia 27.2
UK, Manchester 26.8
UK, England and Wales 26.4
Czechoslovakia, Slovakia 25.7
France, Bas-Rhin 25.0
FRG, Saarland 24.1
UK, Scotland 22.6
Netherlands, SOOZ, Eindhoven 20.6
Hungary 20.3
Switzerland, TWC 18
Poland, Warsaw City 17.1
FRG, CR 14.2
Brain and spinal, females
0 10 20 30 40 50
Sweden 30.3
France, Bas-Rhin 28.9
Finland 28.6
Denmark 27.7
Switzerland, TWC 25.1
UK, Manchester 24.8
Italy, Torino 23.6
GDR 23.5
Norway 22.6
UK, England and Wales 22.4
Poland, Warsaw City 20.1
FRG, Saarland 20.1
UK, Scotland 19.8
Czechoslovakia, Slovakia 19.8
France, L-PACA-C 19.6
Spain, Zaragoza 17.2
Hungary 16.4
Yugoslavia, Slovenia 14.6
FRG, CR 12.5
Netherlands, SOOZ, Eindhoven 10.0
Sympathetic nervous system, males
0 10 20
France, L-PACA-C 17.7
France, Bas-Rhin 16.7
Switzerland, TWC 15.9
Italy, Torino 12.3
Spain, Zaragoza 11.6
Hungary 11.3
FRG,CR 10.4
Sweden 10.3
Denmark 10.0
GDR 9.8
Poland, Warsaw City 9.4
UK, Scotland 9.3
Finland 9.2
UK, England and Wales 7.9
Norway 7.4
Netherlands, SOOZ, Eindhoven 7.4
UK, Manchester 7.3
Yugoslavia, Slovenia 6.0
FRG, Saarland 5.6
Czechoslovakia, Slovakia 4.7
Sympathetic nervous system, females
0 10 20
France, L-PACA-C 10.6
Italy, Torino 10.1
FRG,CR 9.9
Denmark 9.9
Switzerland, TWC 9.5
Finland 9.4
Hungary 9.0
Sweden 8.5
FRG, Saarland 8.4
Netherlands, SOOZ, Eindhoven 8.2
UK, Manchester 8.0
Spain, Zaragoza 7.8
GDR 7.0
Norway 6.6
France, Bas-Rhin 6.5
UK, Scotland 6.4
UK, England and Wales 6.3
Czechoslovakia, Slovakia 6.0
Yugoslavia, Slovenia 5.0
Poland, Warsaw City 4.6
Hodgkin's disease, males
0 2 4 6 8 10
Yugoslavia, Slovenia 9.2
Czechoslovakia, Slovakia 8.8
Italy, Torino 8.4
Spain, Zaragoza 8.2
GDR 7.8
FRG,CR 6.7
UK, Scotland 6.4
Hungary 6.1
UK, England and Wales 5.6
UK, Manchester 5.2
Sweden 5.2
France, L-PACA-C 4.9
Switzerland, TWC 4.5
Denmark 4.3
France, Bas-Rhin 4.0
FRG, Saarland 3.9
Poland, Warsaw City 3.6
Finland 3.2
Norway 3.0
Netherlands, SOOZ, Eindhoven 2.9
Hodgkin's disease, females
0 2 4 6 8 10
Italy, Torino 5.4
GDR 5.2
Yugoslavia, Slovenia 4.6
Czechoslovakia, Slovakia 4.1
Denmark 3.7
Switzerland, TWC 3.4
FRG,CR 3.2
France, L-PACA-C 3.2
Netherlands, SOOZ, Eindhoven 3.1
FRG, Saarland 2.9
Poland, Warsaw City 2.8
UK, England and Wales 2.4
UK, Scotland 2.3
Spain, Zaragoza 2.0
Norway 1.8
Hungary 1.8
UK, Manchester 1.7
Finland 1.7
France, Bas-Rhin 1.6
Sweden 1.2

Fig. 1 (e–h).

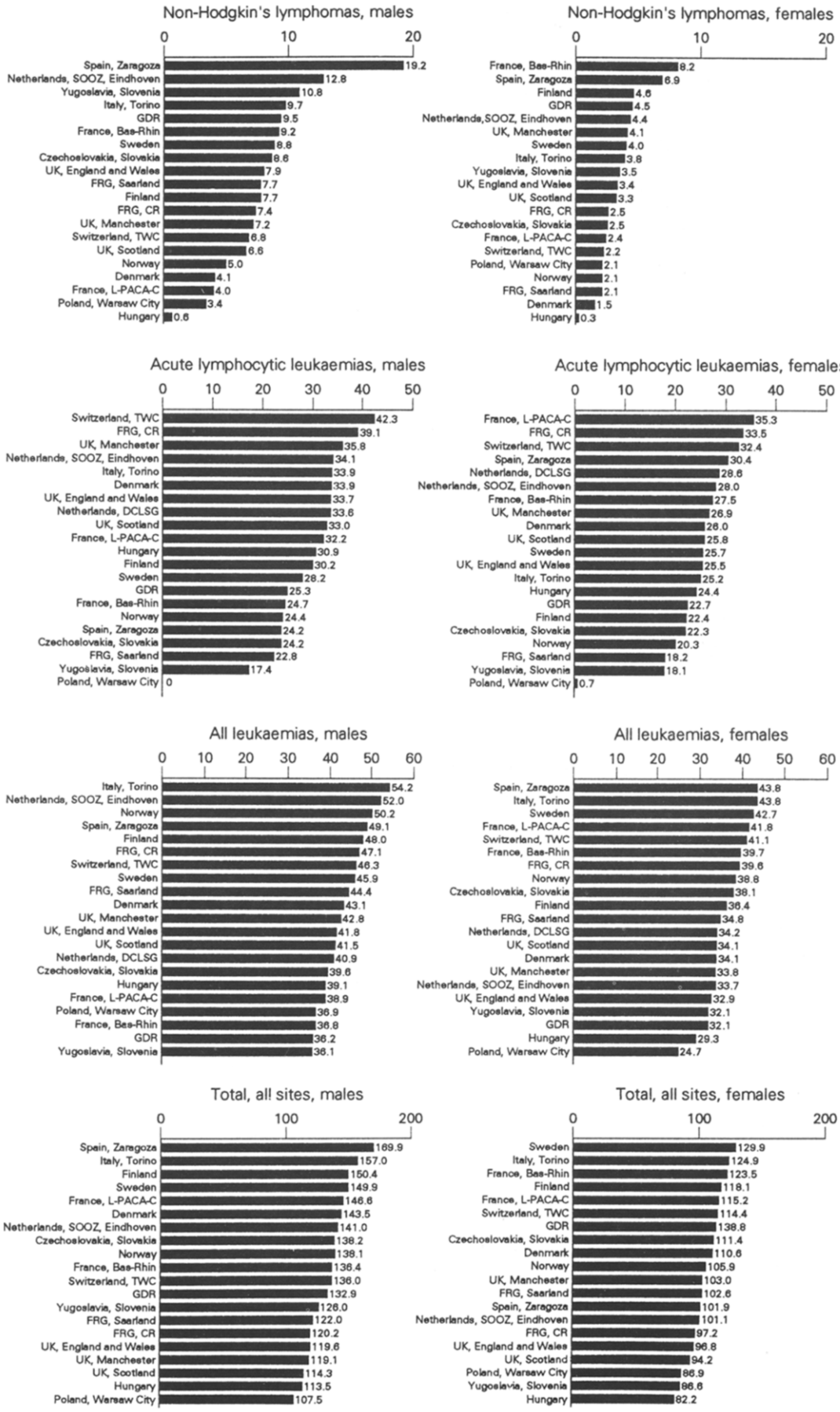
Non-Hodgkin's lymphomas, males
0 10 20
Spain, Zaragoza 19.2
Netherlands, SOOZ, Eindhoven 12.8
Yugoslavia, Slovenia 10.8
Italy, Torino 9.7
GDR 9.5
France, Bas-Rhin 9.2
Sweden 8.8
Czechoslovakia, Slovakia 8.6
UK, England and Wales 7.9
FRG, Saarland 7.7
Finland 7.7
FRG, CR 7.4
UK, Manchester 7.2
Switzerland, TWC 6.8
UK, Scotland 6.6
Norway 5.0
Denmark 4.1
France, L-PACA-C 4.0
Poland, Warsaw City 3.4
Hungary 0.6
Non-Hodgkin's lymphomas, females
0 10 20
France, Bas-Rhin 8.2
Spain, Zaragoza 6.9
Finland 4.6
GDR 4.5
Netherlands, SOOZ, Eindhoven 4.4
UK, Manchester 4.1
Sweden 4.0
Italy, Torino 3.8
Yugoslavia, Slovenia 3.5
UK, England and Wales 3.4
UK, Scotland 3.3
FRG, CR 2.5
Czechoslovakia, Slovakia 2.5
France, L-PACA-C 2.4
Switzerland, TWC 2.2
Poland, Warsaw City 2.1
Norway 2.1
FRG, Saarland 2.1
Denmark 1.5
Hungary 0.3
Acute lymphocytic leukaemias, males
0 10 20 30 40 50
Switzerland, TWC 42.3
FRG, CR 39.1
UK, Manchester 35.8
Netherlands, SOOZ, Eindhoven 34.1
Italy, Torino 33.9
Denmark 33.9
UK, England and Wales 33.7
Netherlands, DCLSG 33.6
UK, Scotland 33.0
France, L-PACA-C 32.2
Hungary 30.9
Finland 30.2
Sweden 28.2
GDR 25.3
France, Bas-Rhin 24.7
Norway 24.4
Spain, Zaragoza 24.2
Czechoslovakia, Slovakia 24.2
FRG, Saarland 22.8
Yugoslavia, Slovenia 17.4
Poland, Warsaw City 0
Acute lymphocytic leukaemias, females
0 10 20 30 40 50
France, L-PACA-C 35.3
FRG, CR 33.5
Switzerland, TWC 32.4
Spain, Zaragoza 30.4
Netherlands, DCLSG 28.6
Netherlands, SOOZ, Eindhoven 28.0
France, Bas-Rhin 27.5
UK, Manchester 26.9
Denmark 26.0
UK, Scotland 25.8
Sweden 25.7
UK, England and Wales 25.5
Italy, Torino 25.2
Hungary 24.4
GDR 22.7
Finland 22.4
Czechoslovakia, Slovakia 22.3
Norway 20.3
FRG, Saarland 18.2
Yugoslavia, Slovenia 18.1
Poland, Warsaw City 10.7
All leukaemias, males
0 10 20 30 40 50 60
Italy, Torino 54.2
Netherlands, SOOZ, Eindhoven 52.0
Norway 50.2
Spain, Zaragoza 49.1
Finland 48.0
FRG, CR 47.1
Switzerland, TWC 46.3
Sweden 45.9
FRG, Saarland 44.4
Denmark 43.1
UK, Manchester 42.8
UK, England and Wales 41.8
UK, Scotland 41.5
Netherlands, DCLSG 40.9
Czechoslovakia, Slovakia 39.6
Hungary 39.1
France, L-PACA-C 38.9
Poland, Warsaw City 36.9
France, Bas-Rhin 36.8
GDR 36.2
Yugoslavia, Slovenia 36.1
All leukaemias, females
0 10 20 30 40 50 60
Spain, Zaragoza 43.8
Italy, Torino 43.8
Sweden 42.7
France, L-PACA-C 41.8
Switzerland, TWC 41.1
France, Bas-Rhin 39.7
FRG, CR 39.6
Norway 38.8
Czechoslovakia, Slovakia 38.1
Finland 36.4
FRG, Saarland 34.8
Netherlands, DCLSG 34.2
UK, Scotland 34.1
Denmark 34.1
UK, Manchester 33.8
Netherlands, SOOZ, Eindhoven 33.7
UK, England and Wales 32.9
Yugoslavia, Slovenia 32.1
GDR 32.1
Hungary 29.3
Poland, Warsaw City 24.7
Total, all sites, males
0 100 200
Spain, Zaragoza 169.9
Italy, Torino 157.0
Finland 150.4
Sweden 149.9
France, L-PACA-C 146.6
Denmark 143.5
Netherlands, SOOZ, Eindhoven 141.0
Czechoslovakia, Slovakia 138.2
Norway 138.1
France, Bas-Rhin 136.4
Switzerland, TWC 136.0
GDR 132.9
Yugoslavia, Slovenia 126.0
FRG, Saarland 122.0
FRG, CR 120.2
UK, England and Wales 119.6
UK, Manchester 119.1
UK, Scotland 114.3
Hungary 113.5
Poland, Warsaw City 107.5
Total, all sites, females
0 100 200
Sweden 129.9
Italy, Torino 124.9
France, Bas-Rhin 123.5
Finland 118.1
France, L-PACA-C 115.2
Switzerland, TWC 114.4
GDR 138.8
Czechoslovakia, Slovakia 111.4
Denmark 110.6
Norway 105.9
UK, Manchester 103.0
FRG, Saarland 102.6
Spain, Zaragoza 101.9
Netherlands, SOOZ, Eindhoven 101.1
FRG, CR 97.2
UK, England and Wales 96.8
UK, Scotland 94.2
Poland, Warsaw City 86.9
Yugoslavia, Slovenia 86.6
Hungary 82.2

Fig. 1 (i–l).

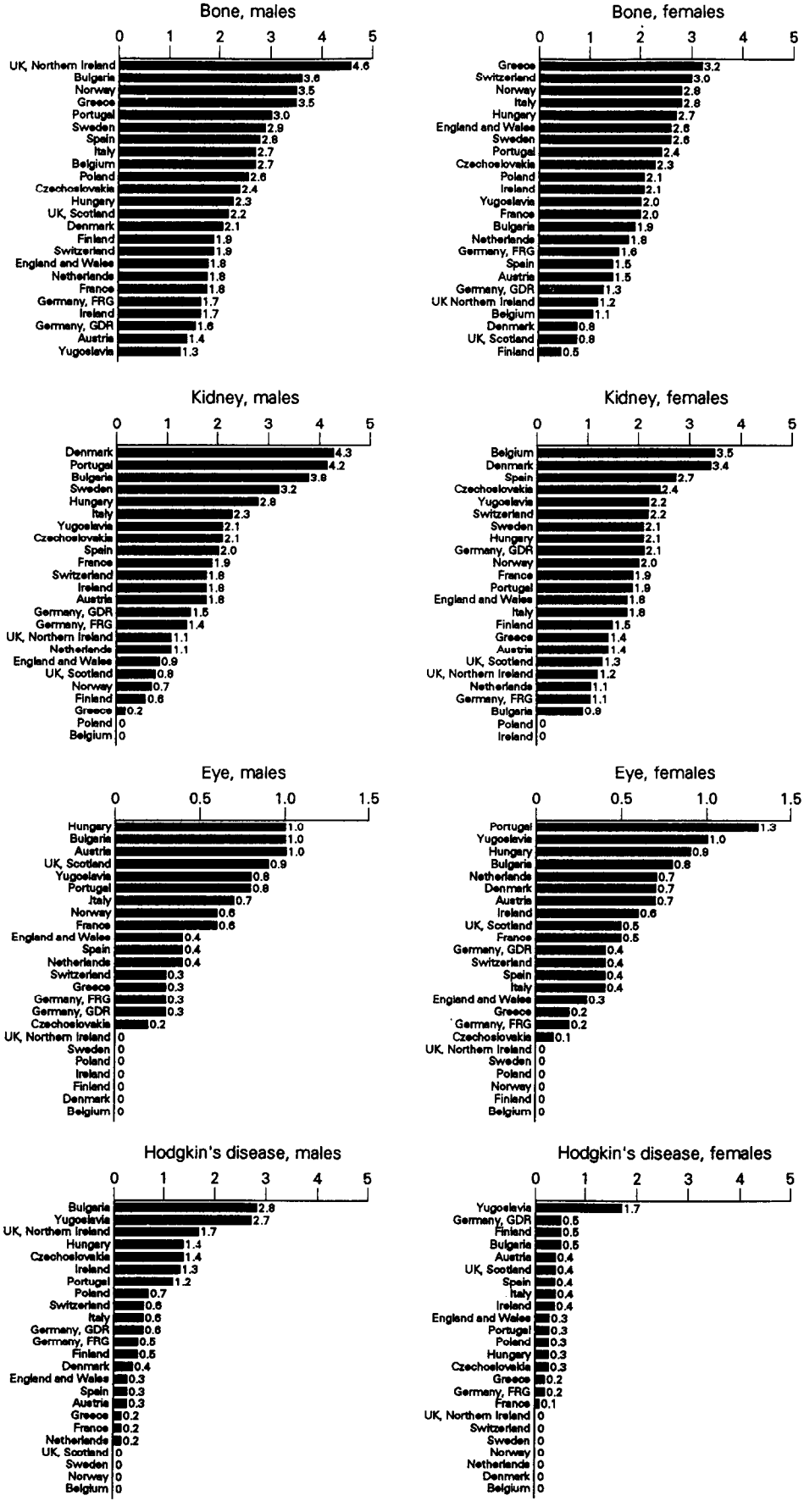

Fig. 2 (a–d). Age-standardised 0–14 years (on the world standard population) death certification rates from selected childhood cancers in various European countries, 1985–1989.

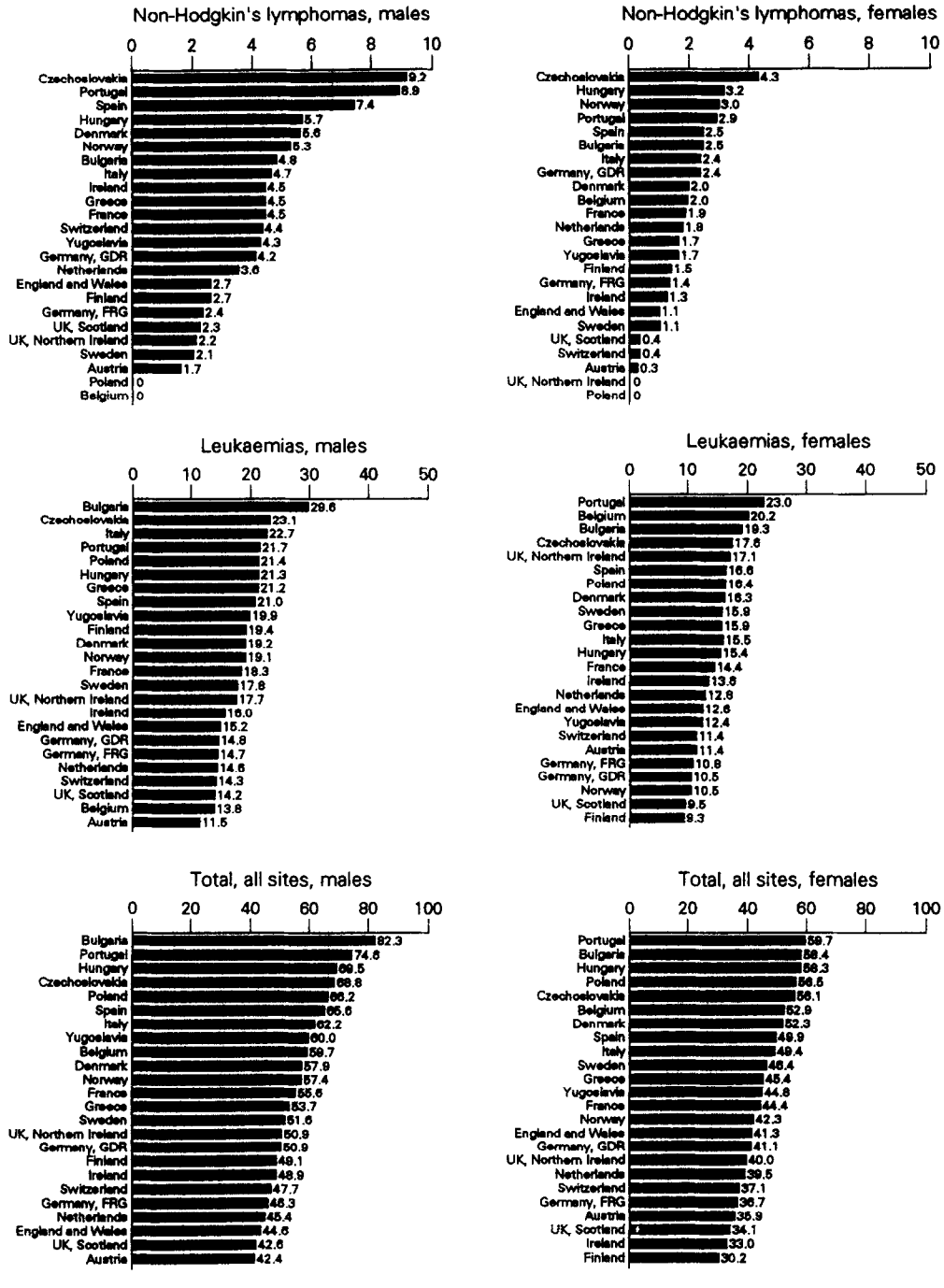
Non-Hodgkin's lymphomas, males
0 2 4 6 8 10
Czechoslovakia 9.2
Portugal 8.9
Spain 7.4
Hungary 5.7
Denmark 5.6
Norway 5.3
Bulgaria 4.8
Italy 4.7
Ireland 4.5
Greece 4.5
France 4.5
Switzerland 4.4
Yugoslavia 4.3
Germany, GDR 4.2
Netherlands 3.6
England and Wales 2.7
Finland 2.7
Germany, FRG 2.4
UK, Scotland 2.3
UK, Northern Ireland 2.2
Sweden 2.1
Austria 1.7
Poland 0
Belgium 0
Non-Hodgkin's lymphomas, females
0 2 4 6 8 10
Czechoslovakia 4.3
Hungary 3.2
Norway 3.0
Portugal 2.9
Spain 2.5
Bulgaria 2.5
Italy 2.4
Germany, GDR 2.4
Denmark 2.0
Belgium 2.0
France 1.9
Netherlands 1.8
Greece 1.7
Yugoslavia 1.7
Finland 1.5
Germany, FRG 1.4
Ireland 1.3
England and Wales 1.1
Sweden 1.1
UK, Scotland 0.4
Switzerland 0.4
Austria 0.3
UK, Northern Ireland 0
Poland 0
Leukaemias, males
0 10 20 30 40 50
Bulgaria 29.6
Czechoslovakia 23.1
Italy 22.7
Portugal 21.7
Poland 21.4
Hungary 21.3
Greece 21.2
Spain 21.0
Yugoslavia 19.9
Finland 19.4
Denmark 19.2
Norway 19.1
France 18.3
Sweden 17.8
UK, Northern Ireland 17.7
Ireland 16.0
England and Wales 15.2
Germany, GDR 14.8
Germany, FRG 14.7
Netherlands 14.6
Switzerland 14.3
UK, Scotland 14.2
Belgium 13.8
Austria 11.5
Leukaemias, females
0 10 20 30 40 50
Portugal 23.0
Belgium 20.2
Bulgaria 19.3
Czechoslovakia 17.6
UK, Northern Ireland 17.1
Spain 16.6
Poland 16.4
Denmark 16.3
Sweden 15.9
Greece 15.9
Italy 15.5
Hungary 15.4
France 14.4
Ireland 13.6
Netherlands 12.8
England and Wales 12.6
Yugoslavia 12.4
Switzerland 11.4
Austria 11.4
Germany, FRG 10.8
Germany, GDR 10.5
Norway 10.5
UK, Scotland 9.5
Finland 9.3
Total, all sites, males
0 20 40 60 80 100
Bulgaria 82.3
Portugal 74.6
Hungary 69.5
Czechoslovakia 68.8
Poland 66.2
Spain 65.6
Italy 62.2
Yugoslavia 60.0
Belgium 59.7
Denmark 57.9
Norway 57.4
France 55.6
Greece 53.7
Sweden 51.6
UK, Northern Ireland 50.9
Germany, GDR 50.9
Finland 49.1
Ireland 48.9
Switzerland 47.7
Germany, FRG 46.3
Netherlands 45.4
England and Wales 44.6
UK, Scotland 42.6
Austria 42.4
Total, all sites, females
0 20 40 60 80 100
Portugal 59.7
Bulgaria 58.4
Hungary 58.3
Poland 56.5
Czechoslovakia 56.1
Belgium 52.9
Denmark 52.3
Spain 49.9
Italy 49.4
Sweden 46.4
Greece 45.4
Yugoslavia 44.8
France 44.4
Norway 42.3
England and Wales 41.3
Germany, GDR 41.1
UK, Northern Ireland 40.0
Netherlands 39.5
Switzerland 37.1
Germany, FRG 36.7
Austria 36.9
UK, Scotland 34.1
Ireland 33.0
Finland 30.2

Fig. 2 (e–g).

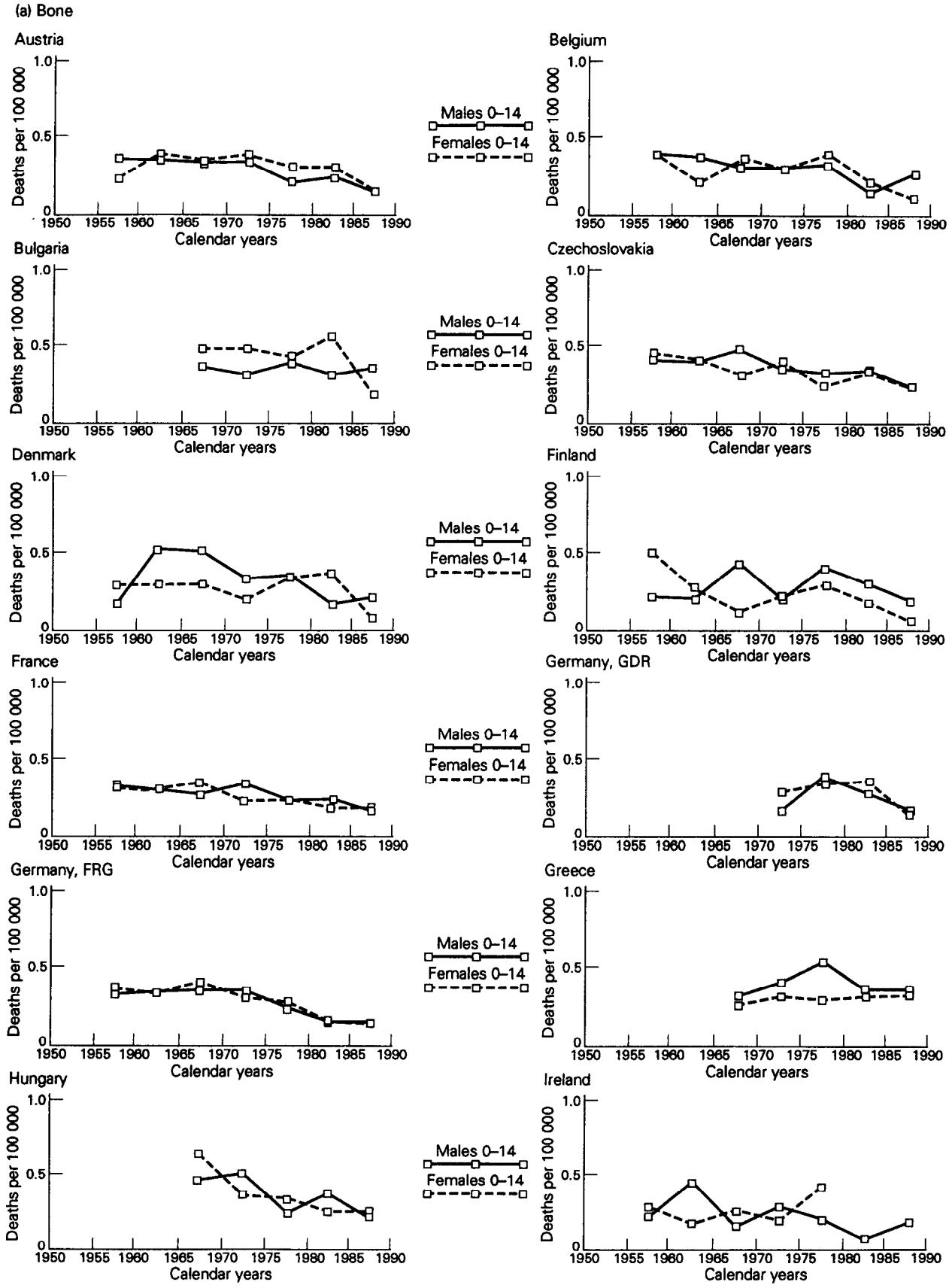

Fig. 3 (a). Trends in age-standardised 0–14 years (on the world standard population) death certification rates from selected childhood cancers in various European countries, 1950–1989.

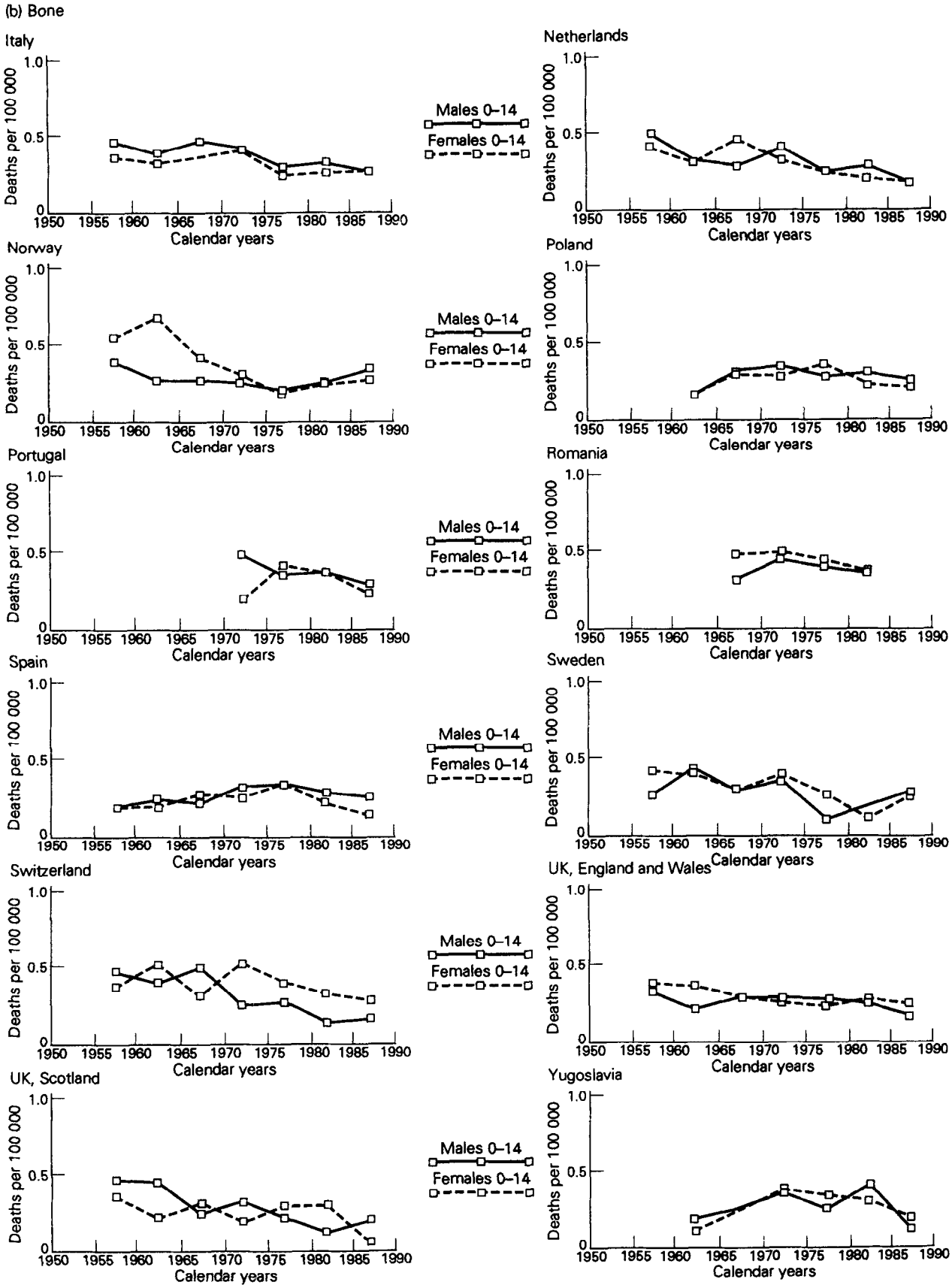
(b) Bone
Italy
Netherlands
Norway
Poland
Portugal
Romania
Spain
Sweden
Switzerland
UK, England and Wales
UK, Scotland
Yugoslavia
Males 0–14
Females 0–14
Deaths per 100 000
Calendar years
1.0
0.5
0
1950 1955 1960 1965 1970 1975 1980 1985 1990

Fig. 3 (b).

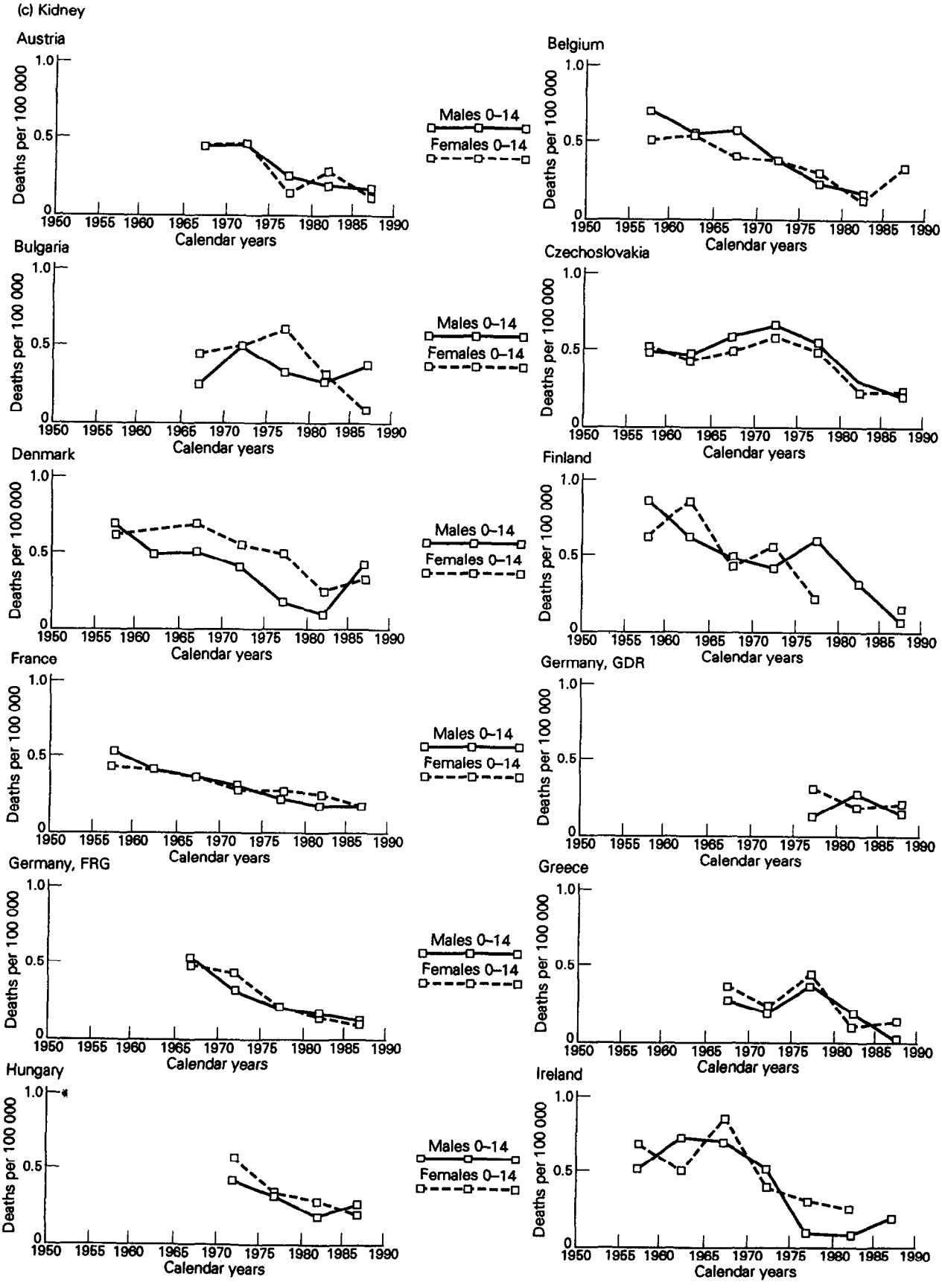
(c) Kidney
Austria
Belgium
Bulgaria
Czechoslovakia
Denmark
Finland
France
Germany, GDR
Germany, FRG
Greece
Hungary
Ireland
Males 0–14
Females 0–14
Deaths per 100 000
1.0
0.5
0
1950 1955 1960 1965 1970 1975 1980 1985 1990
Calendar years

Fig. 3 (c).

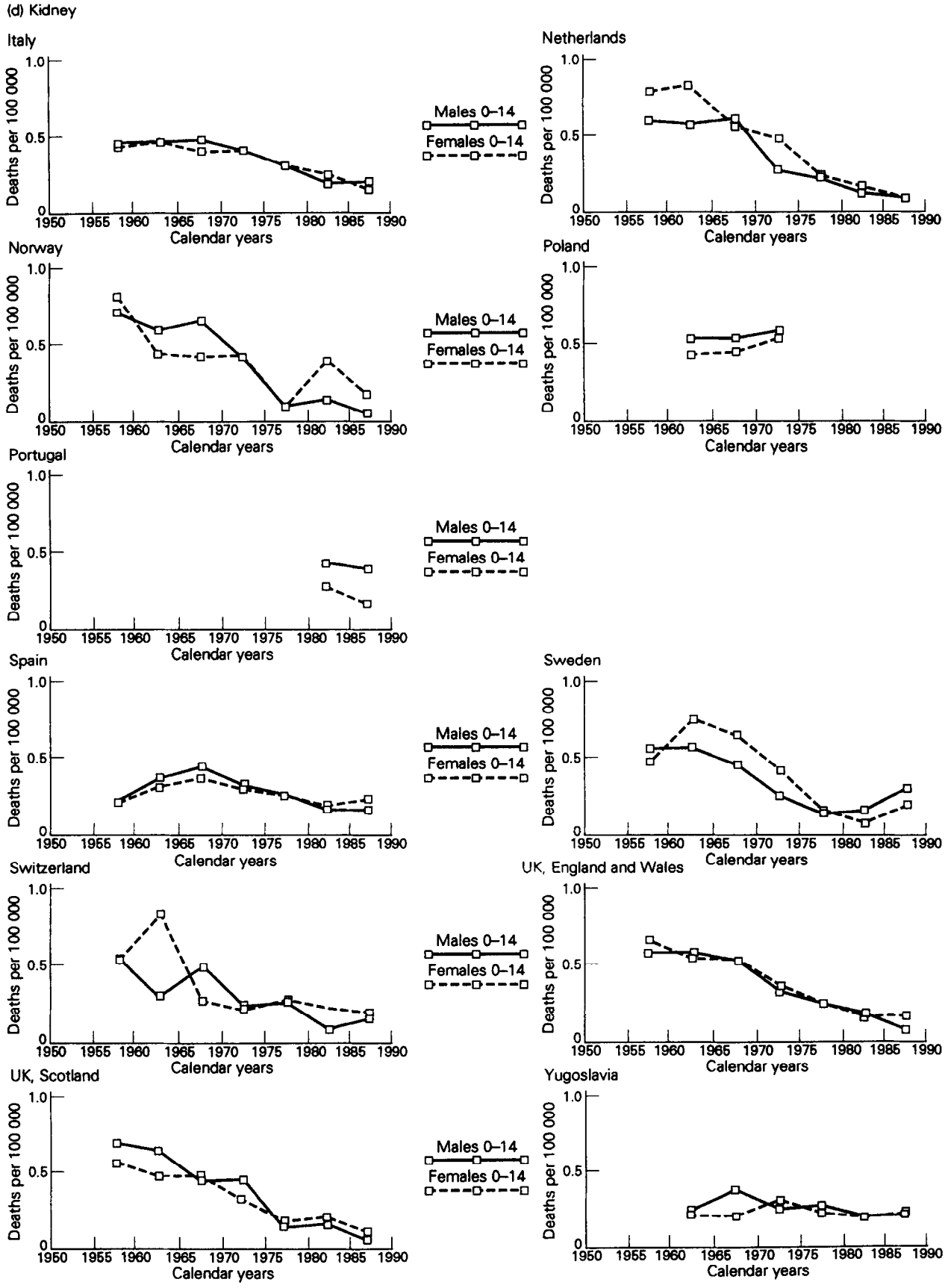
(d) Kidney
Italy
Netherlands
Norway
Poland
Portugal
Spain
Sweden
Switzerland
UK, England and Wales
UK, Scotland
Yugoslavia
Males 0–14
Females 0–14
Deaths per 100 000
Calendar years
1.0
0.5
0
1950 1955 1960 1965 1970 1975 1980 1985 1990

Fig. 3 (d).

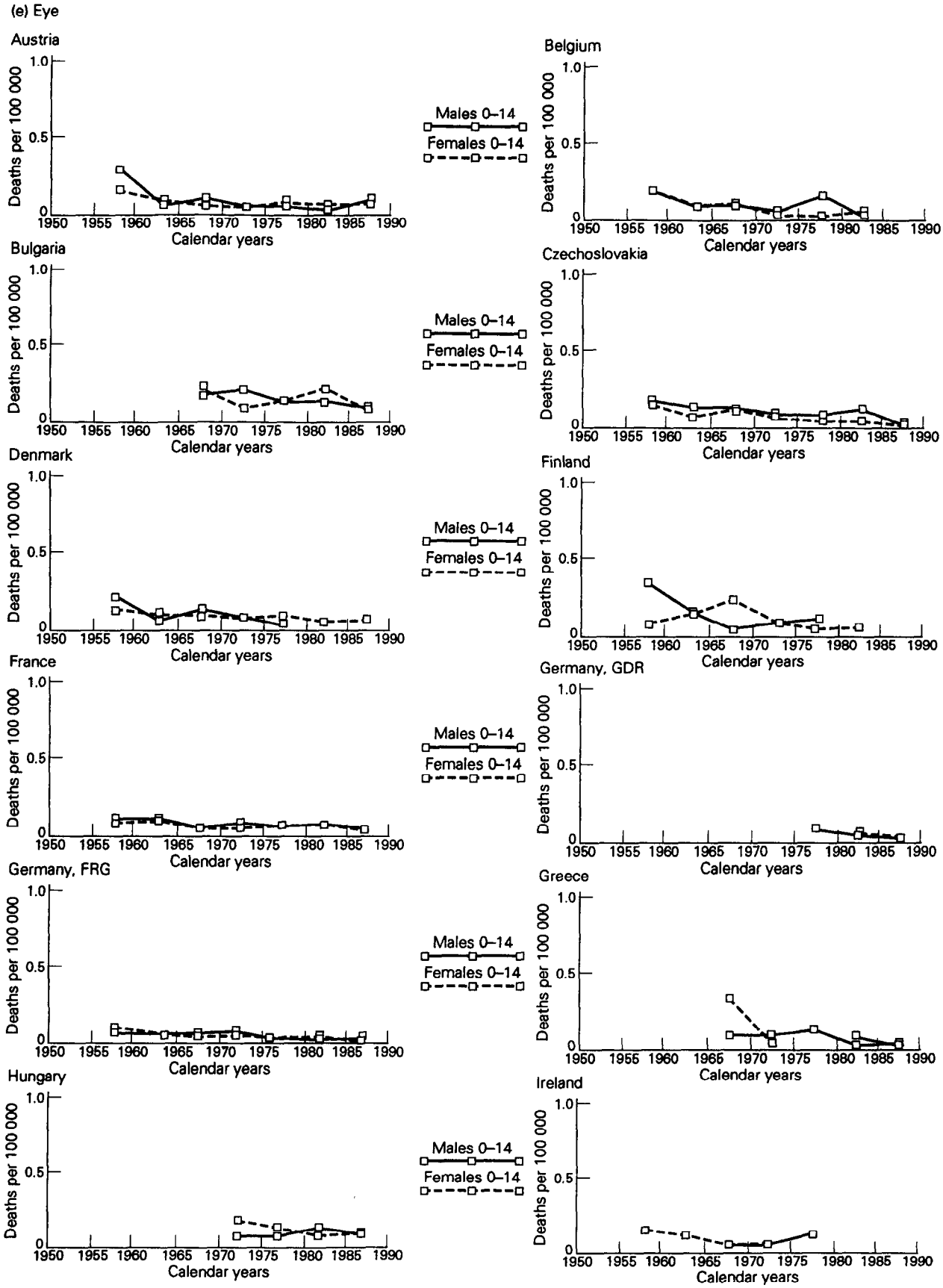
(e) Eye
Austria
Belgium
Bulgaria
Czechoslovakia
Denmark
Finland
France
Germany, GDR
Germany, FRG
Greece
Hungary
Ireland
Deaths per 100 000
1.0
0.5
0
1950 1955 1960 1965 1970 1975 1980 1985 1990
Calendar years
Males 0–14
Females 0–14

Fig. 3 (e).

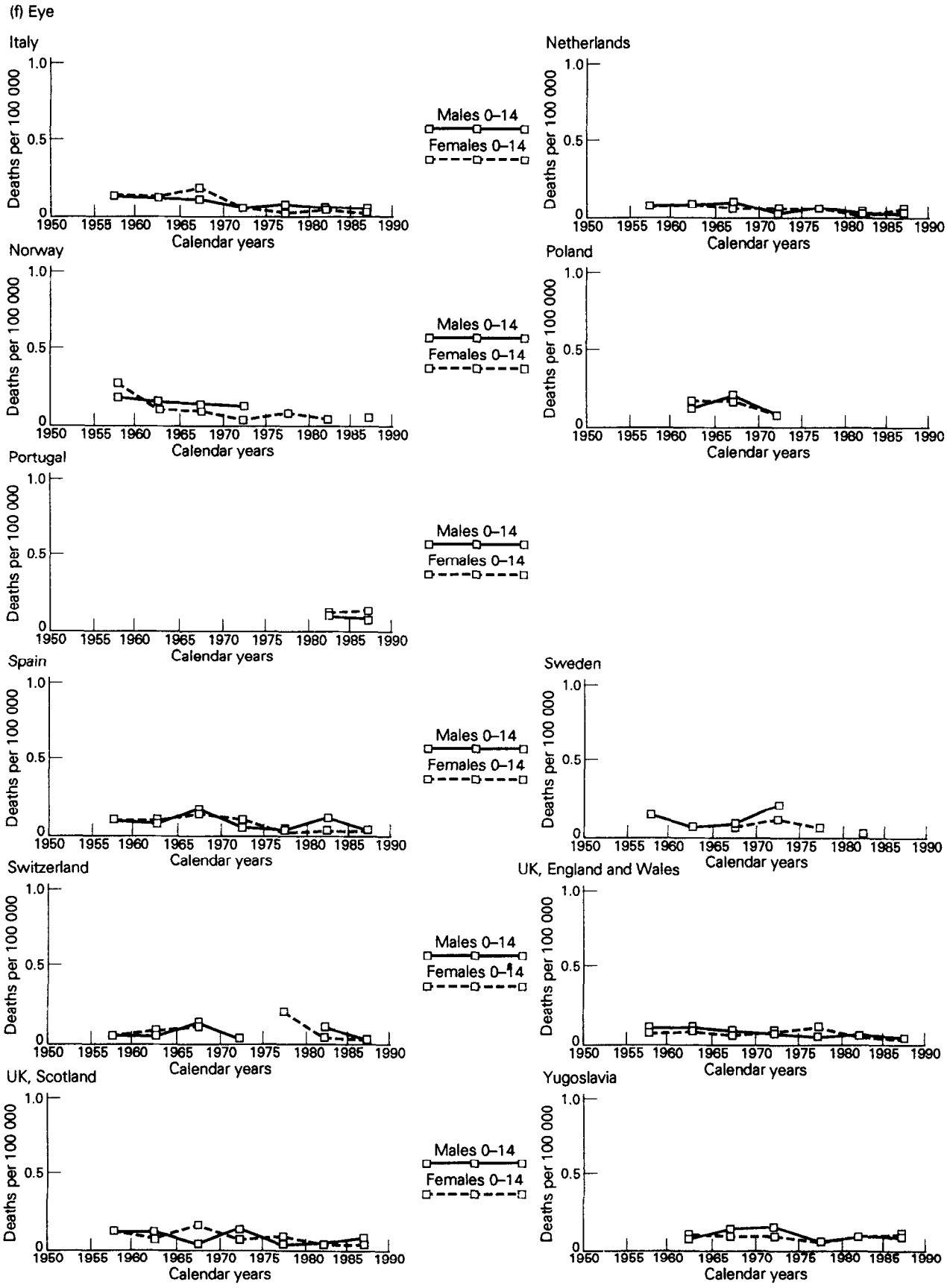
(f) Eye
Italy
Netherlands
Norway
Poland
Portugal
Spain
Sweden
Switzerland
UK, England and Wales
UK, Scotland
Yugoslavia
Males 0–14
Females 0–14
Deaths per 100 000
Calendar years
1.0
0.5
0
1950 1955 1960 1965 1970 1975 1980 1985 1990

Fig. 3 (f).

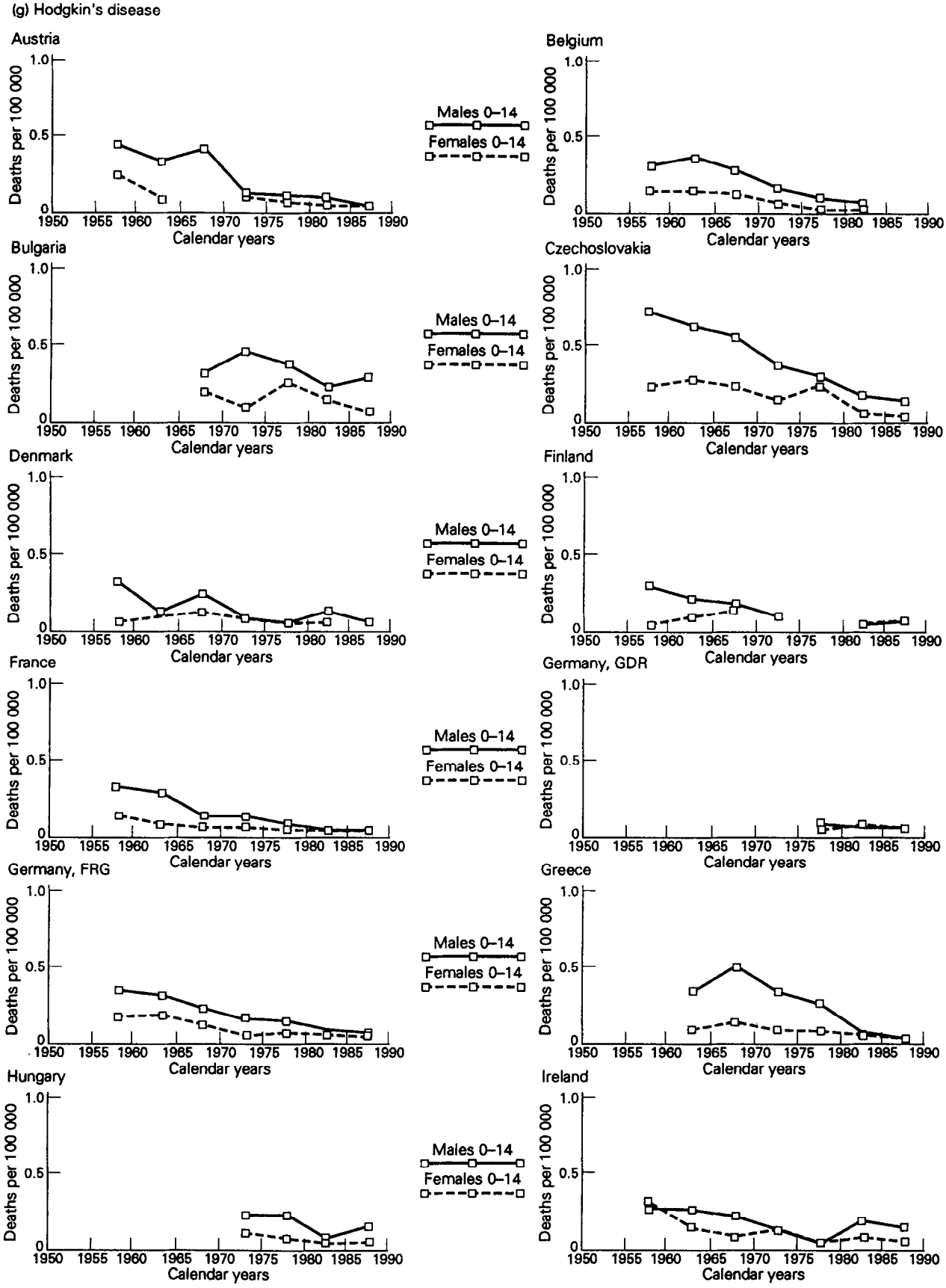
(g) Hodgkin's disease
Austria
Belgium
Bulgaria
Czechoslovakia
Denmark
Finland
France
Germany, GDR
Germany, FRG
Greece
Hungary
Ireland
Deaths per 100 000
1.0
0.5
0
1950 1955 1960 1965 1970 1975 1980 1985 1990
Calendar years
Males 0–14
Females 0–14

Fig. 3 (g).

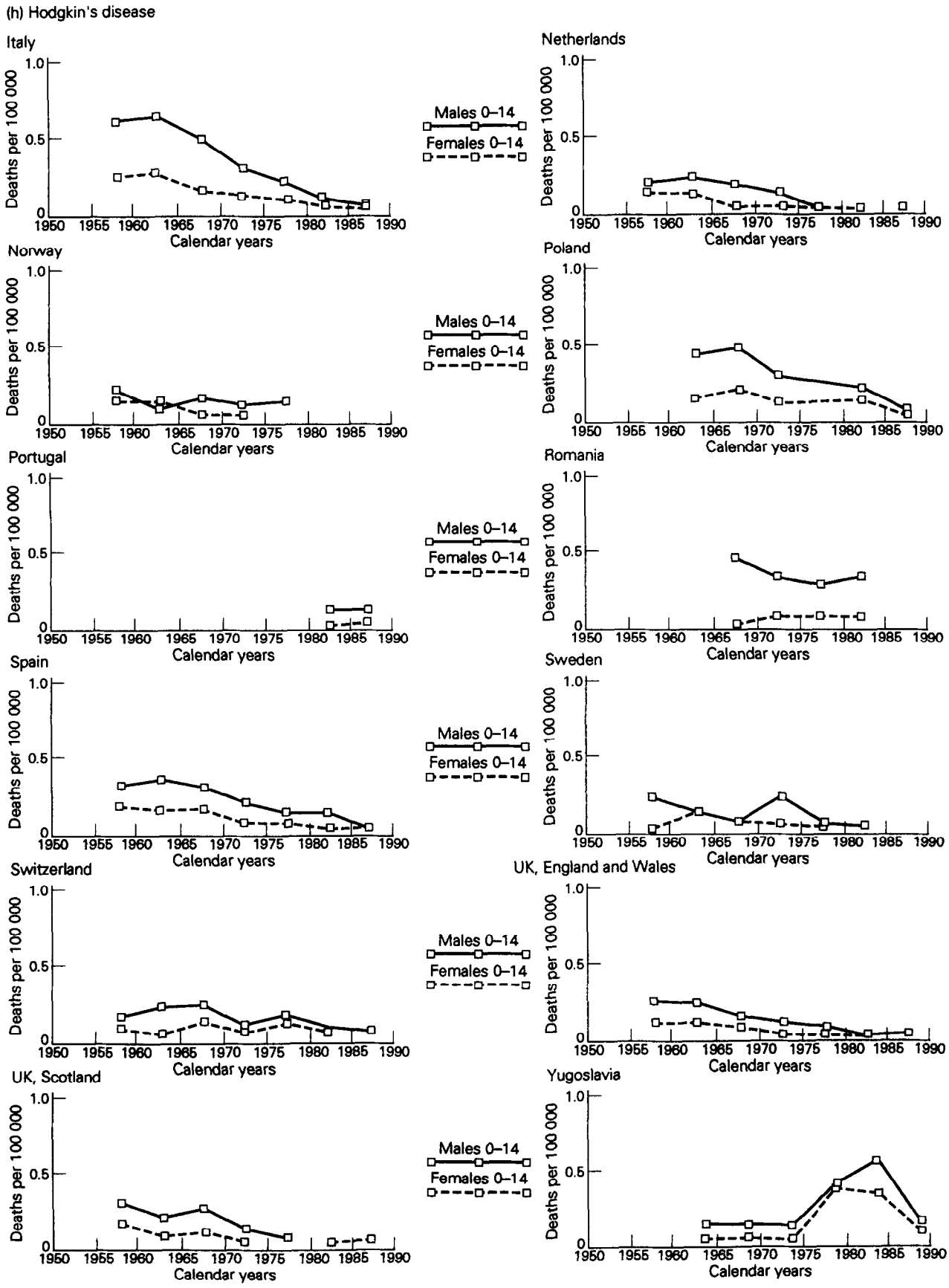
(h) Hodgkin's disease
Italy
Netherlands
Norway
Poland
Portugal
Romania
Spain
Sweden
Switzerland
UK, England and Wales
UK, Scotland
Yugoslavia
Males 0–14
Females 0–14
Deaths per 100 000
Calendar years
1.0
0.5
0
1950 1955 1960 1965 1970 1975 1980 1985 1990

Fig. 3 (h).

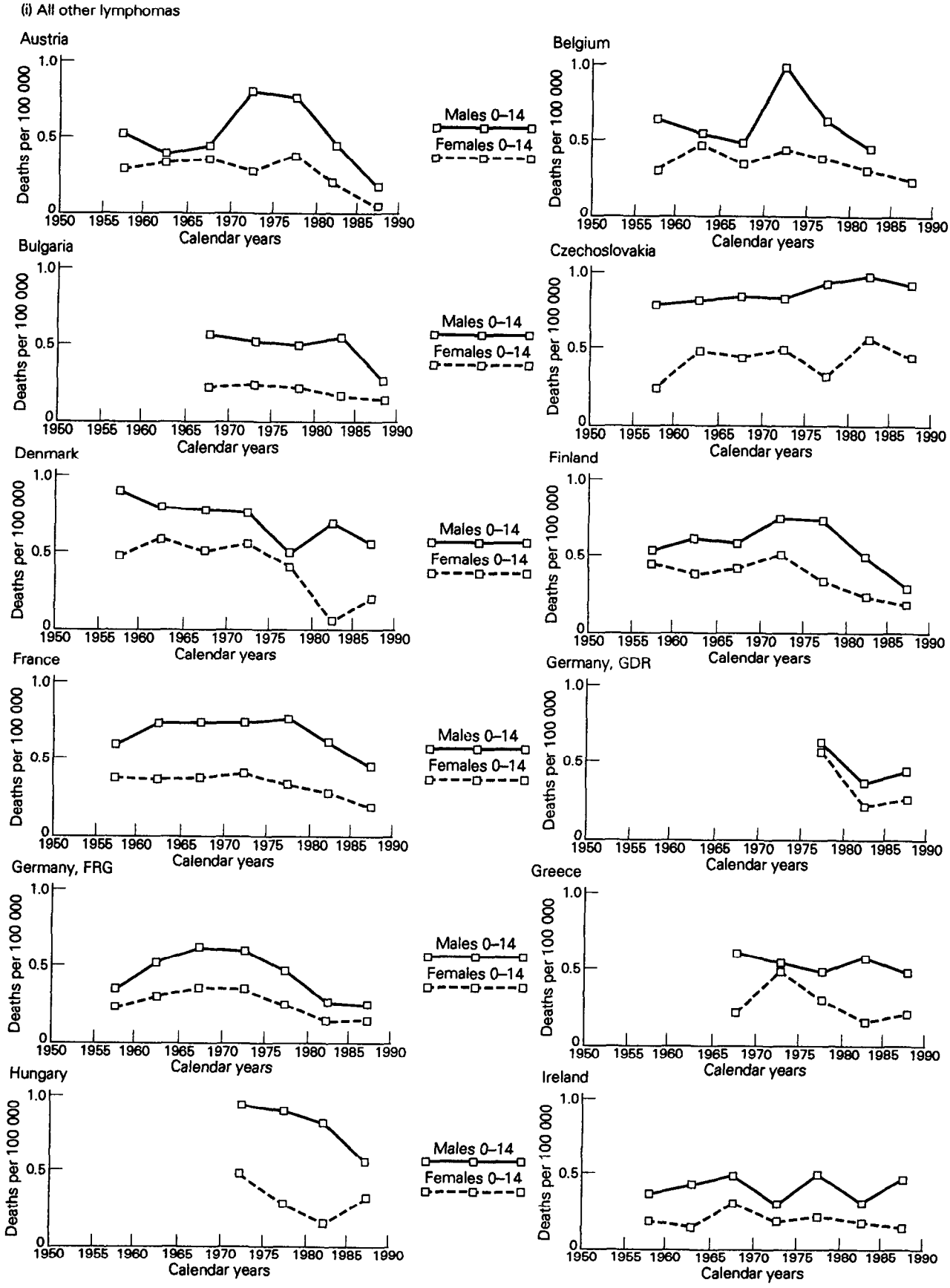
(i) All other lymphomas
Austria
Belgium
Bulgaria
Czechoslovakia
Denmark
Finland
France
Germany, GDR
Germany, FRG
Greece
Hungary
Ireland
Males 0–14
Females 0–14
Deaths per 100 000
1.0
0.5
0
1950 1955 1960 1965 1970 1975 1980 1985 1990
Calendar years

Fig. 3 (i).

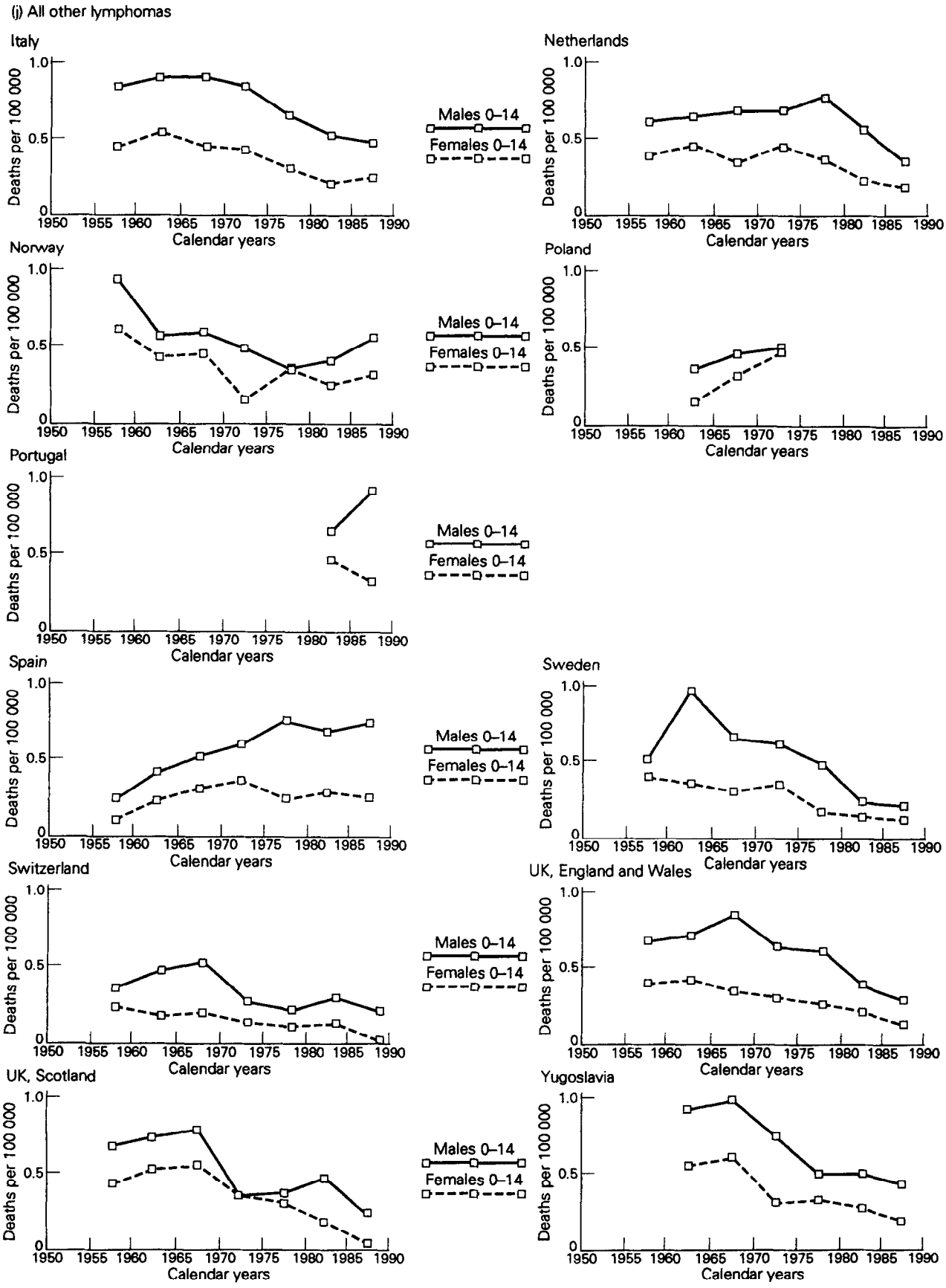
(j) All other lymphomas
Italy
Netherlands
Norway
Poland
Portugal
Spain
Sweden
Switzerland
UK, England and Wales
UK, Scotland
Yugoslavia
Males 0–14
Females 0–14
Deaths per 100 000
Calendar years
1.0
0.5
0
1950 1955 1960 1965 1970 1975 1980 1985 1990

Fig. 3 (j).

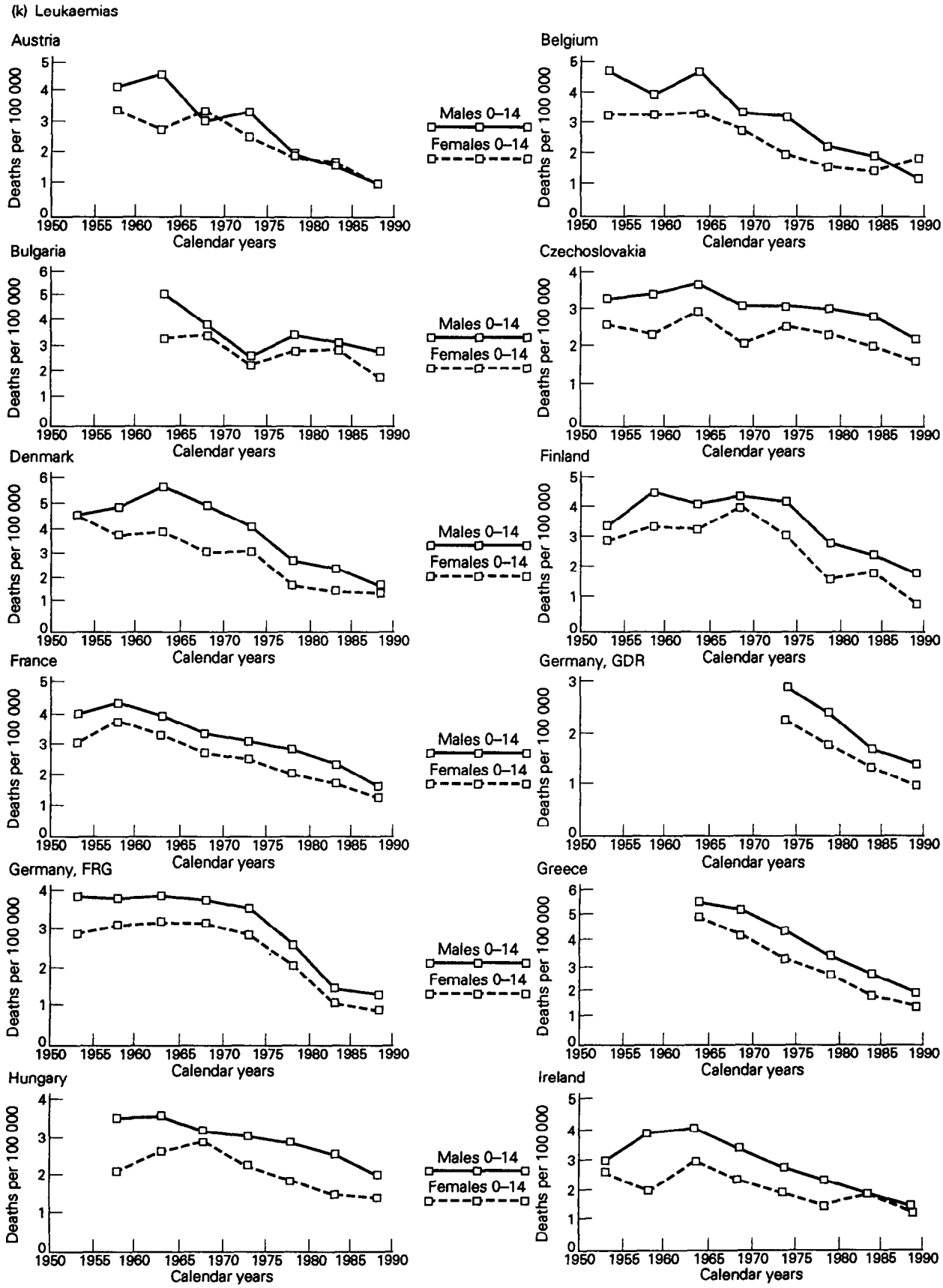
(k) Leukaemias
Austria
Belgium
Bulgaria
Czechoslovakia
Denmark
Finland
France
Germany, GDR
Germany, FRG
Greece
Hungary
Ireland
Males 0–14
Females 0–14
Deaths per 100 000
Calendar years
1950 1955 1960 1965 1970 1975 1980 1985 1990

Fig. 3 (k).

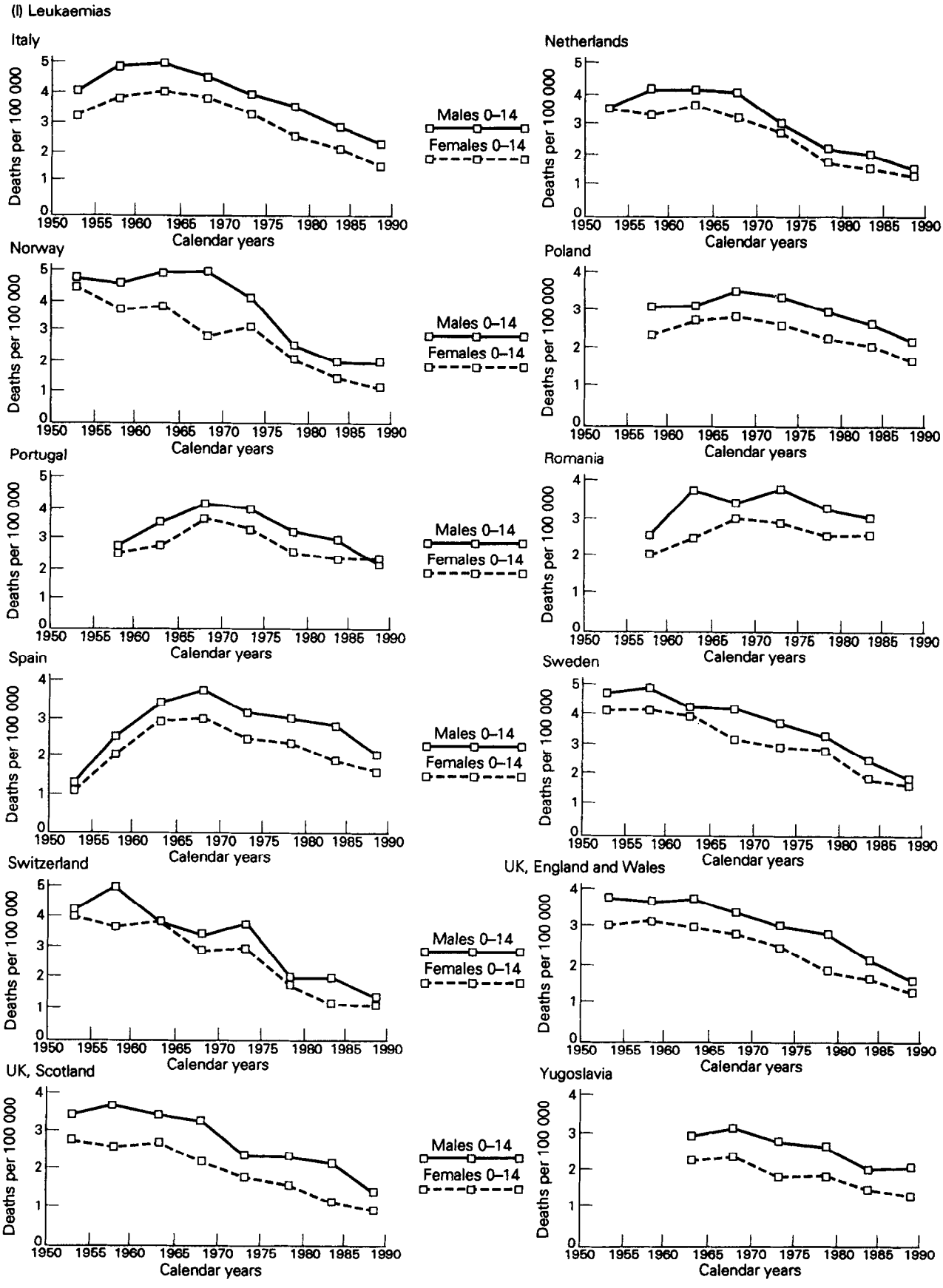
(I) Leukaemias
Italy
Netherlands
Norway
Poland
Portugal
Romania
Spain
Sweden
Switzerland
UK, England and Wales
UK, Scotland
Yugoslavia
Males 0–14
Females 0–14
Deaths per 100 000
Calendar years
1950 1955 1960 1965 1970 1975 1980 1985 1990

Fig. 3 (I).

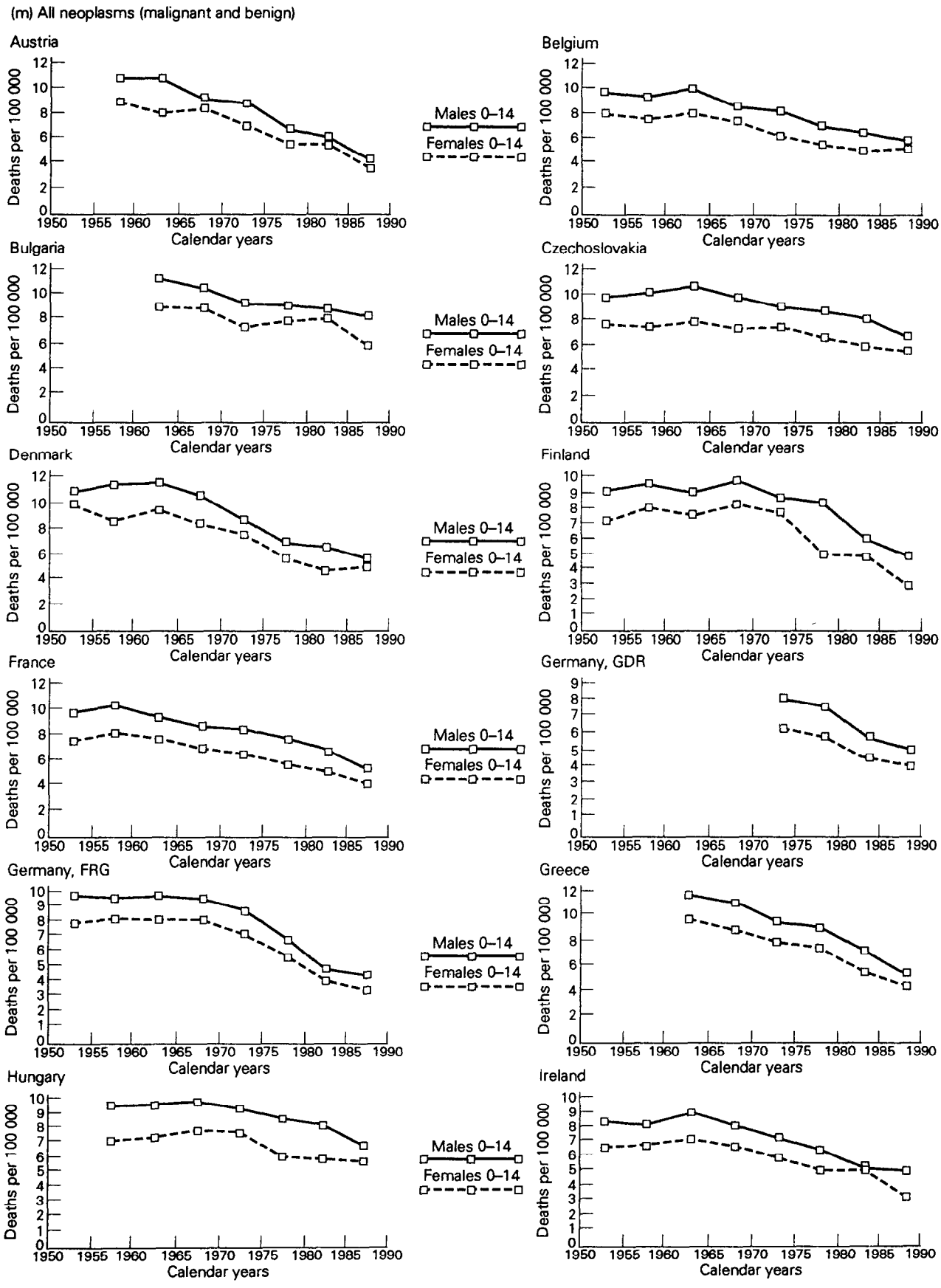
(m) All neoplasms (malignant and benign)
Austria
Belgium
Bulgaria
Czechoslovakia
Denmark
Finland
France
Germany, GDR
Germany, FRG
Greece
Hungary
Ireland
Deaths per 100 000
Calendar years
Males 0–14
Females 0–14

Fig. 3 (m).

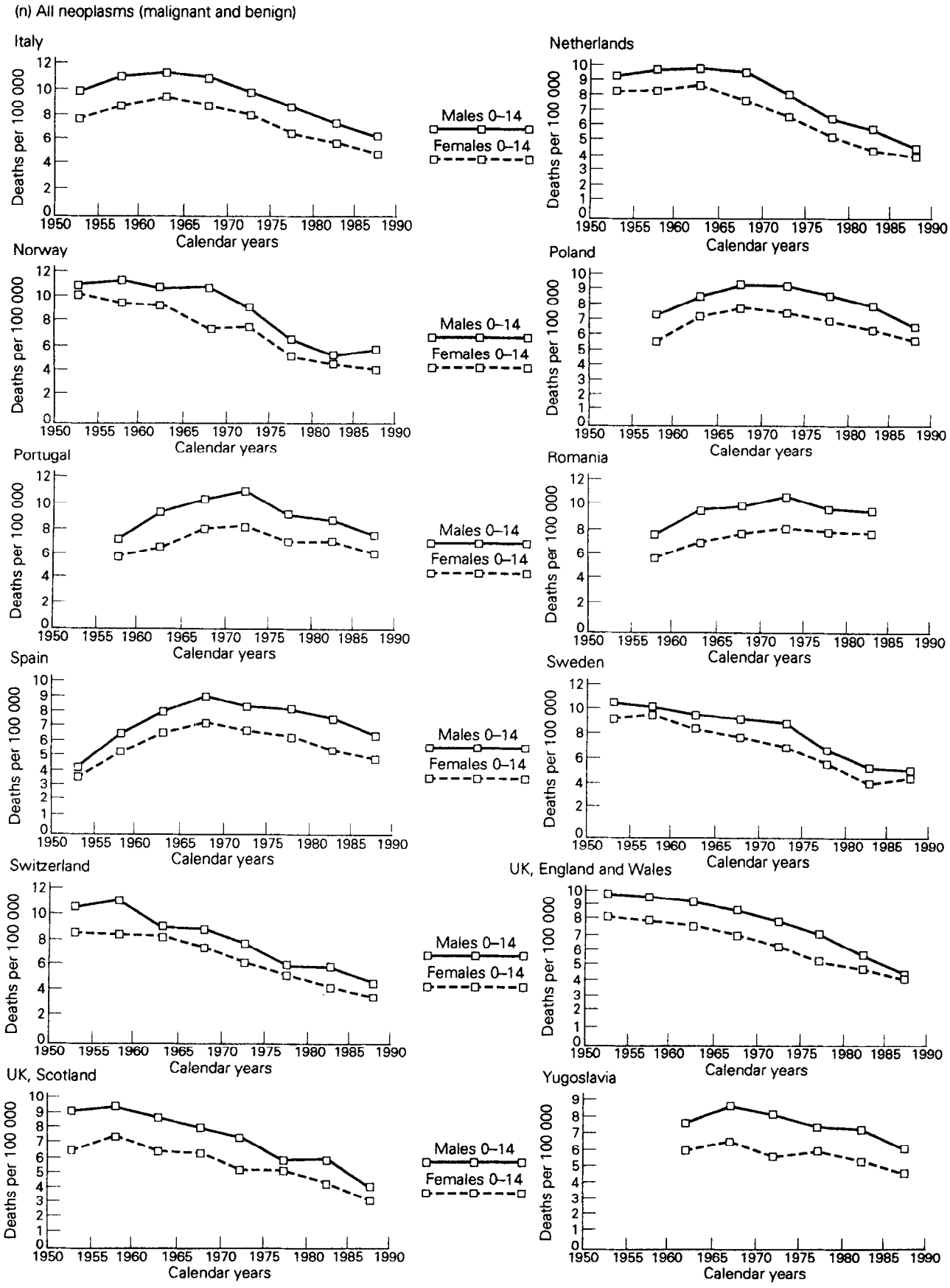
(n) All neoplasms (malignant and benign)
Italy
Netherlands
Norway
Poland
Portugal
Romania
Spain
Sweden
Switzerland
UK, England and Wales
UK, Scotland
Yugoslavia
Males 0–14
Females 0–14
Deaths per 100 000
Calendar years
1950 1955 1960 1965 1970 1975 1980 1985 1990

Fig. 3 (n).