



## The fall in breast cancer mortality in Europe

Fabio Levi<sup>a,\*</sup>, F. Lucchini<sup>a</sup>, E. Negri<sup>b</sup>, C. La Vecchia<sup>b,c</sup>

<sup>a</sup>Unité d'épidémiologie du cancer and Registre vaudois des tumeurs, Institut universitaire de médecine sociale et préventive, Rue du Bugnon 17, 1005 Lausanne, Switzerland

<sup>b</sup>Istituto di Ricerche Farmacologiche "Mario Negri", Via Eritrea 62, 20157 Milan, Italy

<sup>c</sup>Istituto di Statistica Medica e Biometria, Università degli Studi di Milano, Via Venezian 1, 20133 Milan, Italy

Received 22 November 2000; received in revised form 7 March 2001; accepted 30 March 2001

Between 1981 and 1997, breast cancer mortality at age 20–69 years has decreased by 22% in the UK and 19% in the USA, and a 25% decline has been projected to the year 2000 [1]. In the European Union as a whole, overall age-standardised mortality from breast cancer declined by 7% between 1988 and 1996 [2].

Since the largest advances in breast cancer diagnosis and treatment have been obtained in women below the age of 70 years, and the adoption of various interventions responsible for some reduction in breast cancer mortality has not been homogeneous across various European countries [2], it is therefore of interest to consider recent trends in breast cancer mortality in different countries and in separate age groups. Data were abstracted from the World Health Organization (WHO) database, re-coded according to the Ninth Revision of the International Classification of Diseases (ICD), and standardised by quinquennia of age using the world standard population [3], for comparative purposes with other areas of the world. The pattern of trends described was in any case similar using the European standard population.

Table 1 gives age-standardised breast cancer death certification rates around 1988 and 1998 in three separate age groups (20–49, 50–69, 70–79 years) for 32 European countries, and in the European Union (EU) as a whole. In all Western European countries, except Belgium (whose data, were not available after 1994), breast cancer mortality at age 20–49 years declined. The overall decline in the EU was 16.3%, from 12.3 to 10.3/100 000, and most countries — including the largest ones — had a rate close to 10/100 000. The decline was larger in the UK, but the absolute value in 1998 (11.6) was still comparatively high. The pattern was inconsistent for the Eastern European countries considered

(i.e. former non-market economy European countries), which however had considerably lower breast cancer rates in the 1980s [3].

Likewise, in the age group 50–69 years, most Western European countries, except Norway, showed a fall in breast cancer mortality, for an average of 8.6% in the European Union (from 73.1 to 66.8/100 000). France, Germany and Italy had rates very close to 65/100 000, while the UK showed a larger decline, but still had a higher death rate (74.4). In Eastern Europe, rates started from lower values, but were generally stable or upwards.

At age 70–79 years, the overall decline in the EU was 4%, from 116.5 to 111.8/100 000. France, Germany and Italy had rates between 101.9 and 115.3, while the UK had a larger decline (−15.1%), but still a higher absolute value in 1998 (129.0).

Fig. 1 gives a global figure of trends in breast cancer mortality at age 20–69 years in 22 selected European countries, providing meaningful and comparable data from the early 1960s onwards, plus the Russian Federation and Ukraine for which data were available since the early 1980s.

Fig. 2 gives comparable data for the whole EU, and six selected Eastern European countries providing meaningful data since the early 1980s. The former Czechoslovakia, since 1992, includes the Czech Republic and Slovakia; data for other Eastern European countries were not available in a comparable format in the 1980s. In the EU, breast cancer mortality rates at age 20–69 years rose from 23.8/100 000 in 1960–1964 to reach a peak of 29.7 in 1985–1989, and subsequently fell to 27.3, i.e. a rate comparable to that registered in the mid-1970s. In Eastern Europe, comparable rates rose from 14.4 in 1960–1964 to 24.1 in 1990–1994, and subsequently stabilised in 1995–1997 (24.2/100 000).

Table 2 gives breast cancer mortality rates for the same geographical areas and selected calendar periods and at age 70 years or over, and 20–69 years, over the

\* Corresponding author. Tel.: +41-21-314-7311; fax: +41-21-323-0303.

E-mail addresses: fabio.levi@inst.hospvd.ch (Fabio Levi).

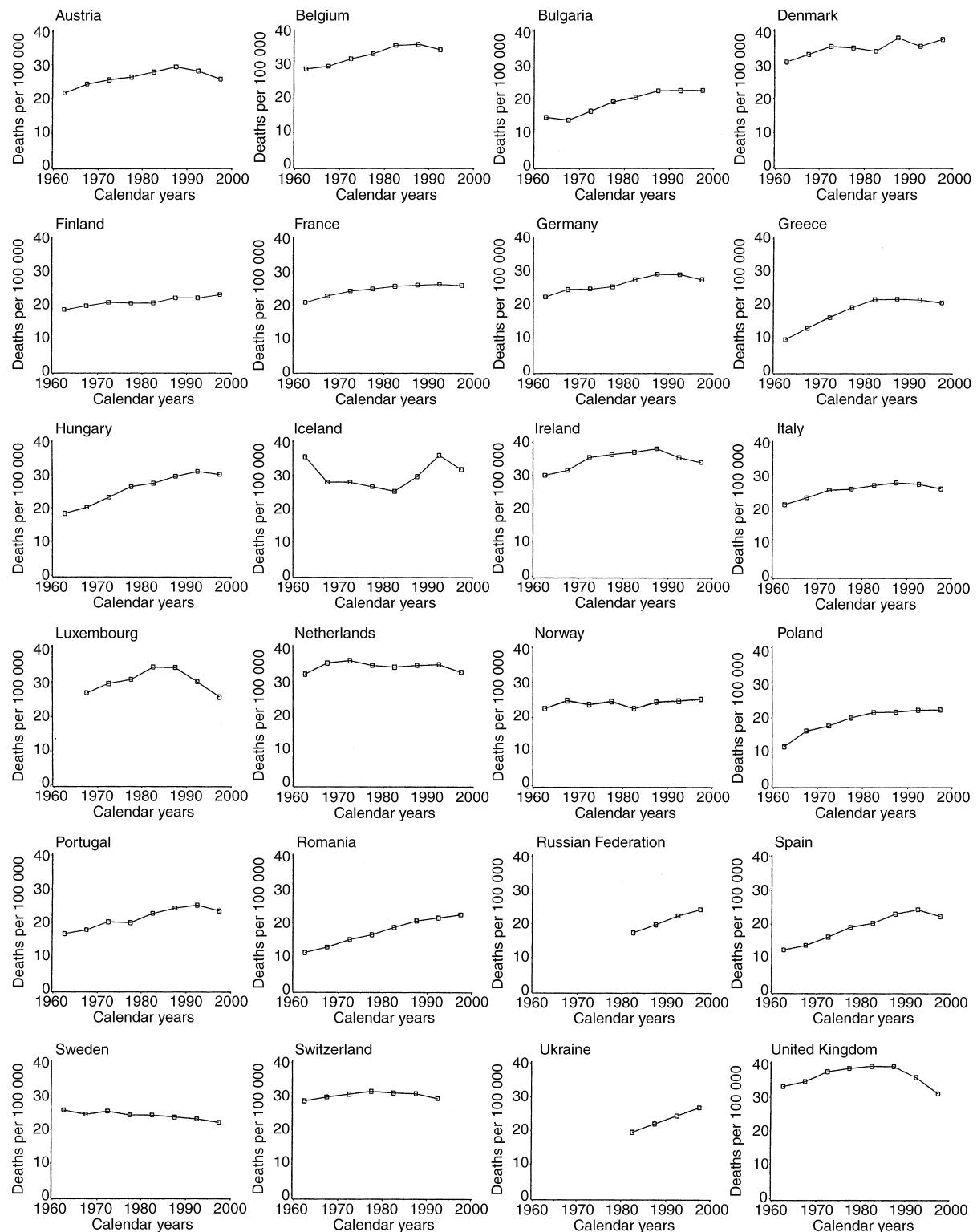


Fig. 1. Trends in age-adjusted (world population) death certification rates from breast cancer per 100 000 women aged 20–69 years in 24 selected European countries, between 1960 and 1997.

period 1960–1997. Insufficient data were available for 1998 to provide meaningful rates on an aggregate level. Some decline in the breast cancer death rates in the EU was observed over the last few years also at age 70 years

or over (from 138.3 in 1990–1994 to 134.9 in 1995–1997), while in Eastern Europe, breast cancer mortality at age 70 years or over was still increasing, to reach 106.7 in 1995–1997.

Table 1

Age-standardised<sup>a</sup> death certification rates per 100 000 women from breast cancer in Europe, 1988–1998<sup>b</sup>

Country	Age 20–49 years		% Change in rates	Age 50–69 years		% Change in rates	Age 70–79 years		% Change in rates
	1988	1998		1988	1998		1988	1998	
Austria	10.9	8.8	−19.3	76.8	61.1	−20.4	116.2	116.9	+0.6
Belarus	8.8	10.5	+19.3	38.4	49.8	+29.7	42.2	62.1	+47.2
Belgium	13.5	13.7	+1.5	92.8	83.9	−9.6	138.7	137.4	−0.9
Bulgaria	11.4	9.6	−15.8	52.7	43.0	−18.4	78.1	79.8	+2.2
Croatia	9.7	12.6	+29.9	53.0	60.1	+13.4	96.8	137.2	+41.7
Czech Republic	10.8	7.5	−30.6	68.1	67.9	−0.3	126.3	119.2	−5.6
Denmark	14.9	11.9	−20.1	99.2	94.6	−4.6	139.1	166.2	+19.5
Estonia	9.3	10.5	+12.9	46.2	63.9	+38.3	72.9	86.3	+18.4
Finland	11.3	9.9	−12.4	59.6	54.5	−8.6	82.3	75.0	−8.9
France	10.3	9.9	−3.9	67.2	66.3	−1.3	104.2	101.9	−2.2
Germany	12.1	9.8	−19.0	73.5	65.5	−10.9	117.3	115.3	−1.7
Greece	8.6	7.9	−8.1	54.8	48.6	−11.3	77.1	83.7	+8.6
Hungary	13.3	11.8	−11.3	67.2	73.4	+9.2	125.4	135.0	+7.7
Iceland	4.4	5.3	+20.5	104.6	53.9	−48.5	72.8	115.4	+58.5
Ireland	17.3	10.7	−38.2	92.2	88.0	−4.6	128.2	139.3	+8.7
Italy	11.8	10.1	−14.4	69.0	64.8	−6.1	107.3	106.8	−0.5
Lithuania	12.4	11.9	−4.0	51.7	59.8	+15.7	74.5	81.3	+9.1
Luxembourg	14.8	9.9	−33.1	99.7	49.7	−50.2	169.5	127.0	−25.1
Malta	17.0	13.8	−18.8	99.4	84.0	−15.5	199.1	208.8	+4.9
Moldova Republic	12.4	10.5	−15.3	40.4	51.4	+27.2	40.2	53.7	+33.6
The Netherlands	13.7	13.3	−2.9	88.0	80.8	−8.2	152.3	150.8	−1.0
Norway	11.1	10.4	−6.3	59.6	64.3	+7.9	125.1	108.0	−13.7
Poland	9.2	9.4	+2.2	54.7	53.7	−1.8	74.5	86.7	+16.4
Portugal	12.0	10.6	−11.7	55.3	53.1	−4.0	75.9	81.3	+7.1
Romania	10.4	9.9	−4.8	51.2	55.6	+8.6	62.8	75.0	+19.4
Russian Federation	10.0	11.5	+15.0	44.5	58.1	+30.6	52.7	73.2	+38.9
Slovenia	10.9	9.9	−9.2	70.4	65.4	−7.1	110.8	120.9	+9.1
Spain	11.1	9.7	−12.6	55.6	51.1	−8.1	78.7	82.1	+4.3
Sweden	11.2	7.6	−32.1	58.7	55.6	−5.3	108.9	91.5	−16.0
Switzerland	12.1	10.3	−14.9	80.7	75.0	−7.1	146.4	124.8	−14.8
The Netherlands	13.7	13.3	−2.9	88.0	80.8	−8.2	152.3	150.8	−1.0
Ukraine	11.5	12.7	+10.4	49.0	62.9	+28.4	50.1	72.6	+44.9
United Kingdom	15.7	11.6	−26.1	96.3	74.4	−22.7	152.0	129.0	−15.1
European Union <sup>c</sup>	12.3	10.3	−16.3	73.1	66.8	−8.6	116.5	111.8	−4.0

<sup>a</sup> Age-adjusted by quinquennia of age, using the world standard population.<sup>b</sup> Data were available up to 1994 for Belgium and Switzerland, 1996 for Denmark, Finland, Iceland, Ireland, Italy, Poland and Sweden, 1997 for Austria, France, Germany, Greece, Luxembourg, The Netherlands, Norway, Russian Federation, Spain, United Kingdom.<sup>c</sup> Includes Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom.

Thus, a fall in breast cancer mortality below the age of 70 years was observed over the last decade in all Western (but not Eastern) Europe, likely reflecting advancements in survival [4] following mammography screening [5] and therapeutic advancements [6,7]. There is also a systematic tendency towards levelling of rates across Europe, with a larger decline in the UK, which started from higher absolute values, also on account of different criteria of classification and coding of cancer at death in England and Wales up to 1992, which may have affected death rates by reducing them by approximately 5% [8]. The persisting unfavourable trends in Eastern Europe indicate the importance of interventions for breast cancer control, as well as for other neoplasms and conditions that are influenced by deprivation and amenable to treatment in these areas of the continent [9–11].

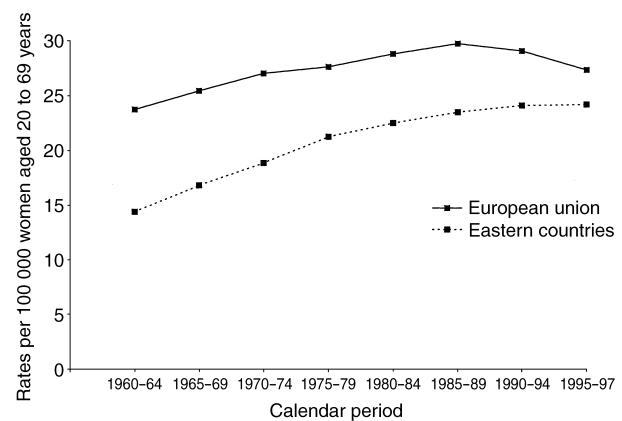


Fig. 2. Trends in age-adjusted (world population) death certification rates from breast cancer per 100 000 women aged 20–69 years in the European Union (EU) and six selected Eastern European countries (i.e. Bulgaria, Czech Republic, Hungary, Poland, Romania and Slovakia), between 1960 and 1997.

Table 2

Trends in age-standardised<sup>a</sup> death certification rates per 100 000 women at age 20–69 years and 70 years and over in the European Union<sup>b</sup> and six selected Eastern European countries<sup>c</sup>, 1960–1997

Calendar period	European Union		Eastern countries	
	Death rates at ages:		Death rates at ages:	
	20–69 years	≥ 70 years	20–69 years	≥ 70 years
1960–1964	23.8	110.6	14.4	55.1
1965–1969	25.4	114.3	16.8	64.4
1970–1974	27.0	113.4	18.8	73.2
1975–1979	27.6	117.3	21.2	82.2
1980–1984	28.8	126.5	22.5	86.8
1985–1989	29.7	136.2	23.5	94.5
1990–1994	29.1	138.3	24.1	101.1
1995–1997	27.3	134.9	24.2	106.7

<sup>a</sup> Age-adjusted by quinquennia of age, using the world standard population.

<sup>b</sup> Includes Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, The Netherlands, Portugal, Spain, Sweden, United Kingdom. Data were available up to 1994 for Belgium, 1996 for Denmark, Finland, Ireland, Italy, Poland and Sweden, 1997 for Austria, France, Germany, Greece, Luxembourg, The Netherlands, Norway, Spain, United Kingdom.

<sup>c</sup> Eastern countries include Bulgaria, Czech Republic, Hungary, Poland, Romania and Slovakia.

## Acknowledgements

This work was supported by the Swiss League against Cancer and the Italian Association for Cancer Research.

## References

1. Peto R, Boreham J, Clarke M, Davies C, Beral V. UK and USA breast cancer deaths down 25% in year 2000 at ages 20–69 years. *Lancet* 2000, **355**, 1822.
2. Levi F, Lucchini F, Negri E, La Vecchia C. The decline in cancer mortality in the European Union, 1988–1996. *Eur J Cancer* 2000, **36**, 1965–1968.
3. Levi F, Lucchini F, Negri E, Boyle P, La Vecchia C. Cancer mortality in Europe, and an overview of trends from 1955 to 1994. *Eur J Cancer* 1999, **35**, 1477–1516.
4. Quinn MJ, Martinez-Garcia C, Berrino F, EUROCARE Working Group. Variation in survival from breast cancer in Europe by age and country, 1978–1989. *Eur J Cancer* 1998, **34**, 2204–2211.
5. Cuzick J. Screening for cancer: future potential. *Eur J Cancer* 1999, **35**, 1925–1932.
6. Early Breast Cancer Trialists' Collaborative Group. Tamoxifen for early breast cancer: an overview of the randomized trials. *Lancet* 1998, **351**, 1451–1467.
7. Early Breast Cancer Trialists' Collaborative Group. Polychemotherapy for early breast cancer: an overview of the randomized trials. *Lancet* 1998, **352**, 930–942.
8. Rooney C, Devis T. Mortality trends by cause of death in England and Wales 1980–94: the impact of introducing automated cause coding and related changes in 1993. *Popul Trends* 1996, **86**, 29–35.
9. Marmot M, Bobak M. International comparators and poverty and health in Europe. *BMJ* 2000, **321**, 1124–1128.
10. La Vecchia C, Levi F, Lucchini F, Negri E. Trends in mortality from major causes in Europe, 1980–93. *Eur J Epidemiol* 1998, **14**, 1–8.
11. Zatonski WA, Boyle P. Health transformations in Poland after 1988. *J Epidemiol Biostat* 1996, **1**, 183–197.