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Original Paper

Relative Survival in Elderly Cancer Patients in Europe

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In this paper different patterns of survival by age and gender are presented for 17 European countries which participated in the EUROCARE II programme. Survival data were available for 701 521 patients aged between 65 and 99 years from 44 population-based cancer registries. Age-standardised relative survival rates at 1 and 5 years from diagnosis were computed. Relative risks (RRs) of death for those aged between 65 and 99 years compared with those aged between 55 and 64 years were estimated by gender and country. In general, the elderly had a large survival disadvantage, particularly 1 year after diagnosis and in women. Poorer survival rates in the elderly were observed for patients from Eastern European countries for almost all sites. However, relative survival of the elderly with respect to younger patients was similar in the different geographic areas. The results are in agreement with other population-based studies, confirming a worse prognosis for the elderly in both sexes. This may be explained by changes in biology and the natural history of the tumour and the occurrence of severe comorbidities, potentially affecting preventive, diagnostic and therapeutic strategies. The lack of equality in providing adequate treatment to elderly cancer patients should be addressed as a matter of urgency by health-care providers. © **1998 Elsevier Science Ltd. All rights reserved.**

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INTRODUCTION

THE EUROPEAN population is dramatically ageing, with the number of people aged 60 years or more growing by 0.8 million or 1% per year, currently representing 21% of the EU population [1]. By 2050 this figure is predicted to increase up to 40% [1]. By then a third of this elderly population might be aged 80 years or more. EUROSTAT, the Statistical Office of the European Community in Luxembourg, recently affirmed that "European Union babies born now could have a life expectancy as high as 87 and 83 years, respectively in girls and boys" [1]. Currently, Germany and Italy have the highest proportion of elderly patients, but by 2050, the EUROSTAT report foresees that Italy and Spain will have the smallest percentage of subjects younger than 20 years (14–22%). In this demographic context the epidemiological observation of an exponential rise in disease with age assumes a striking relevance. The cancer burden in the elderly has achieved such a magnitude as to represent a real issue for all national health systems and a major challenge for clinical oncologists and researchers [2, 3].

According to estimates of EUCAN90, a software program produced by the International Agency for Research on Cancer on epidemiological data on cancer in European Union countries, in 1990 approximately 58% of all cancers and 69% of all cancer mortality occurred in elderly patients (aged 65 years or more). The ratio of estimated incidence rates in the 75 years or more and 55–64 age groups was 2.9 and 2.2 for all cancers in European men and women, respectively [4]. In addition to these considerations, a number of clinical problems still exist in managing elderly patients, partly due to real difficulties in applying standard treatment protocols to people suffering from multiple comorbid conditions and physiological impairment and partly due to a lack of specific medical information on this particular section of the population [5, 6].

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For these reasons, the EUROCARE II project devoted particular attention to survival in the elderly, in order to increase awareness of the need to develop better strategies of prevention and clinical management. In this report, different patterns of survival distribution by age and across 17 countries are presented and discussed.

PATIENTS AND METHODS

The EUROCARE II programme provided survival data on 701 521 elderly European patients aged 65–99 years and diagnosed between 1985 and 1989. Data were collected from 44 population-based cancer registries of 17 countries. Characteristics of each registry and of national coverage of registration are reported in other papers in this special issue.

The quality of incidence data and the percentage of the population over the age of 65 years in each country are shown in Table 1. Sweden had the highest proportion of the population aged 65 or more, with 15% of men and 20% of women compared with 11% and 16% for the pooled population. DCO (Death Certificate Only) and autopsy cases were excluded from analysis of survival. Elevated DCO proportions (more than 5%) were evident in Eastern countries (except Estonia), Austria, Germany, England and Spain, whilst very low percentages were characteristic of Nordic countries. Different methods among registries in collecting cases from autopsies and in managing the DCO cases would have to be seriously considered as determinants of possible bias that, particularly for the oldest age groups, could affect survival rates [7]. The low percentage of lost cases indicates good follow-up procedures even in the elderly population. Variation in microscopical verification seemed to be related to DCO percentages.

Using Hakulinen and Abeywickrama's method [8], the age-standardised relative survival rates at 1 and 5 years from diagnosis (and their 95% confidence intervals, CIs) were computed for patients aged between 65 and 99 years. For countries where the registration coverage was not complete, the national estimates were calculated as a function of the covariates gender, age and registry area by means of a multiple regression model [9]. These estimates were computed by appropriate weighting of the gender-, age- and registry-specific expected relative survival values. Differences between older (65–99 years) and younger patients (55–64 years) of both sexes were estimated by the relative risk (RR) of death in each country, computing the ratio of logarithms of relative survival rates. The same method was applied to describe geographical differences.

RESULTS

Table 2 shows the age-standardised relative survival rates at 1 and 5 years from diagnosis for cancer patients of all ages and the 65–99 age group between 1985 and 1989, calculated on all pooled data of the European registries participating in the EUROCARE II project. Prognosis for every considered tumour site was poorer in the 65–99 age group with a greater gap for women. For all cancers combined, survival rates for the 65–99 age group were 57% in men and 63% in women at 1 year from diagnosis. At 5 years, survival decreased to 39% in men and 47% in women. For older women, major differences ($P < 0.05$) in survival, compared with all ages, were

Table 1. *Data quality for the elderly (aged* 65 *years or more) in participating European countries*, 1985–1989 *(EUROCARE* II*)*

			Cases aged ≥ 65 years							
	% aged ≥ 65 years			Mean age (years)				% Lost to		
Country	Males	Females	No.	Men	Women	% all cases	% HV	follow up	% DCO	% Autopsies
Northern Europe										
Iceland	10	12	2149	76	76	57	87	0	0.3	4.4
Finland	10	17	42 197	74	76	58	90	0	1.0	3.6
Sweden*	15	20	21 918	75	76	66	97	0	0	8.5
Denmark	13	18	73 948	75	76	60	92	0	0	0
U.K.										
Scotland	12	18	65 655	74	76	62	67	0	4.8	0
England	13	19	362 966	75	76	66	63	0.3	9.5	0.7
Western and Central Europe										
The Netherlands*	10	15	6981	74	75	53	93	1.0	NA	0
Germany*	11	19	14 687	74	76	57	80	0	11.1	0.7
Austria*	11	19	3206	75	76	61	78	0	15.4	1.4
Switzerland*	12	17	8902	75	77	58	99	0.8	1.2	4.8
France*	12	17	14 446	75	76	51	93	0.4	NA	0
Southern Europe										
Italy*	13	18	56 503	74	76	57	73	0.5	4.9	0.2
Spain*	12	16	20 929	74	75	55	76	0.1	13.2	0.4
Eastern Europe										
Slovenia	8	14	12 723	74	75	47	76	0.3	7.3	3.1
Slovakia	8	12	34 970	73	74	47	67	0	11.0	7.1
Poland*	8	13	8579	73	75	45	55	1.4	8.3	0.9
Estonia	8	16	9011	73	74	44	74	0.6	0.2	6.5
Europe	11	16	759 770†	74	76	60	72	0.2	6.7	1.4

HV, histological verification; DCO, death certificate only. * < 20% of the national population covered. †Includes DCO and autopsy cases (these were excluded from the survival analysis). NA, not available.

Table 2. Age-standardised survival rates (ASSR %) at 1 and 5 years from diagnosis by gender. All ages versus 65–99 years patients, 1985–1989 (EUROCARE II)

Site	Men					Women				
	No. and % aged ≥ 65 years	% All ages		% 65–99 years		No. and % aged ≥ 65 years	% All ages		% 65–99 years	
		ASSR	(95% CI)	ASSR	(95%CI)		ASSR	(95% CI)	ASSR	(95% CI)
(a) 1-year										
All cancers	366 813 (61%)	61	(60–61)	57	(57–57)	334 708 (57%)	70	(70–70)	63	(62–63)
Stomach	26 166 (65%)	38	(37–39)	33	(32–34)	20 135 (77%)	43	(42–44)	38	(37–39)
Colon	27 561 (67%)	66	(65–67)	62	(61–64)	35 242 (73%)	66	(65–67)	62	(61–63)
Rectum	20 522 (64%)	72	(70–73)	67	(65–68)	18 083 (68%)	71	(70–73)	67	(66–69)
Pancreas	9807 (63%)	15	(14–16)	18	(12–15)	11 807 (77%)	15	(14–17)	13	(12–15)
Larynx	5541 (42%)	86	(85–87)	84	(82–85)	874 (50%)	84	(80–87)	79	(75–83)
Lung	78 909 (61%)	30	(30–31)	26	(25–27)	27 710 (64%)	28	(27–29)	24	(22–25)
Melanoma	2879 (31%)	90	(88–91)	86	(82–89)	4590 (33%)	94	(93–95)	90	(87–92)
Breast	–	–	–	–	–	62 785 (42%)	93	(92–93)	89	(88–90)
Cervix uteri	–	–	–	–	–	6851 (28%)	84	(83–85)	72	(70–74)
Corpus uteri	–	–	–	–	–	13 114 (48%)	87	(87–88)	82	(81–84)
Ovary	–	–	–	–	–	12 244 (45%)	62	(61–63)	45	(43–47)
Prostate	56 185 (86%)	84	(84–85)	83	(83–84)	–	–	–	–	–
Bladder	27 940 (66%)	83	(82–83)	79	(78–80)	10 448 (73%)	75	(74–77)	72	(70–74)
Kidney	7481 (50%)	67	(65–68)	60	(58–62)	5844 (60%)	67	(65–69)	60	(57–62)
Thyroid	609 (43%)	77	(73–80)	51	(45–59)	1800 (45%)	83	(81–84)	59	(55–64)
NHL	7235 (47%)	67	(65–68)	59	(56–61)	8542 (60%)	69	(68–71)	60	(58–62)
(b) 5-year										
All cancers	366 813 (61%)	41	(41–42)	39	(39–40)	334 708 (57%)	53	(52–53)	47	(46–47)
Stomach	26 166 (65%)	19	(18–20)	17	(15–18)	20 135 (77%)	24	(22–25)	20	(19–22)
Colon	27 561 (67%)	47	(45–48)	46	(44–48)	35 242 (73%)	46	(45–48)	44	(42–45)
Rectum	20 522 (64%)	42	(41–44)	41	(39–43)	18 083 (68%)	43	(41–44)	40	(38–42)
Pancreas	9807 (63%)	4	(3–5)	4	(3–5)	11 807 (77%)	4	(3–5)	3	(2–4)
Larynx	5541 (42%)	63	(61–65)	63	(59–66)	874 (50%)	65	(61–70)	60	(53–66)
Lung	78 909 (61%)	9	(8–9)	7	(6–7)	27 710 (64%)	10	(9–11)	7	(6–8)
Melanoma	2879 (31%)	68	(66–71)	60	(54–66)	4590 (33%)	81	(80–83)	75	(71–80)
Breast	–	–	–	–	–	62 785 (42%)	73	(72–73)	70	(68–71)
Cervix uteri	–	–	–	–	–	6851 (28%)	62	(60–63)	45	(42–48)
Corpus uteri	–	–	–	–	–	13 114 (48%)	73	(72–75)	63	(61–66)
Ovary	–	–	–	–	–	12 244 (45%)	33	(32–34)	19	(18–21)
Prostate	56 185 (86%)	55	(54–56)	55	(53–56)	–	–	–	–	–
Bladder	27 940 (66%)	65	(64–67)	61	(59–63)	10 448 (73%)	60	(58–62)	55	(52–58)
Kidney	7481 (50%)	47	(45–49)	40	(37–44)	5844 (60%)	49	(47–51)	40	(37–43)
Thyroid	609 (43%)	67	(64–71)	37	(28–48)	1800 (45%)	78	(75–80)	49	(43–56)
NHL	7235 (47%)	45	(43–47)	37	(33–41)	8542 (60%)	48	(46–50)	37	(35–40)

CI, confidence interval; NHL, non-Hodgkin's lymphoma.

observed both at 1 and 5 years after diagnosis in all sites, except larynx and pancreatic cancers. For men, a significant advantage for younger patients was noted both at 1 and 5 years for all cancers combined, non-Hodgkin's lymphoma (NHL), stomach, lung, bladder, kidney and thyroid cancers. For colon and rectal cancers, significant differences were observed at 1 year, but this was lost at 5 years.

Gender-related differences

Generally, both young and elderly men experienced a lower relative survival than women, except for bladder cancer which had a significantly better prognosis for men (61% for elderly men versus 55% for women at 5 years), and to a lesser extent (not significant differences) for colon, rectal, pancreas, larynx and kidney cancers.

Age-related differences

Relative survival for all cancers combined, both at 1 and 5 years from diagnosis, decreased with age in both sexes by approximately 2% for men and 10% for women at 5 years between those aged between 65 and 69 years and those aged between 80 and 84 years (data not shown). In the 85–99 age group, only 1-year survival continued to decrease, whereas the rates at 5 years surprisingly rose (data not shown). Similar findings occurred for patients with stomach, colon and prostate cancers and cervix, ovary and bladder cancers in females (data not shown).

Table 3 shows the RRs of tumour-specific death, both at 1 and 5 years from diagnosis, for the 65–99 age group compared with the 55–64 age group. The RRs of dying for older patients, with respect to younger ones, were more than 1 for both sexes and for almost every site at 1 and 5 years from diagnosis, highlighting the strong relationship of survival to age. This was particularly evident at 1 year from diagnosis and for women.

At 1 year, RRs of more than 2 were observed only in women with NHL, thyroid, ovary and melanoma. RRs between 1.5 and 1.9 were found for rectal and bladder cancers in both sexes; for all cancers combined, colon, breast,

Table 3. Relative risk of death for European cancer patients aged 65–99 years compared with those aged 55–64 years by site and gender, 1985–1989 (EUROCARE II)

	Men		Women	
Site	1 year	5 years	1 year	5 years
Overall cancers	1.14	1.00	1.74	1.30
Stomach	1.35	1.21	1.48	1.26
Colon	1.36	1.06	1.59	1.18
Rectum	1.64	1.06	1.70	1.21
Pancreas	1.19	1.00	1.11	1.00
Larynx	1.36	1.00	1.50	1.47
Lung	1.28	1.20	1.36	1.25
Melanoma	1.43	1.24	2.05	1.38
Breast	–	–	1.70	1.09
Uterine cervix	–	–	1.94	1.43
Uterine corpus	–	–	1.98	1.76
Ovary	–	–	2.01	1.54
Prostate	1.50	1.06	–	–
Bladder	1.75	1.46	1.73	1.55
Kidney	1.44	1.25	1.83	1.84
Thyroid	1.79	1.88	2.74	2.38
NHL	1.62	1.36	2.19	1.78

NHL, non-Hodgkin's lymphoma.

kidney, uterine cervix, uterine corpus, and larynx cancers in women only; and for NHL, prostate and thyroid cancers in men only. At 5 years, RRs between 1.5 and 1.9 occurred in women for NHL, uterine corpus, ovary, kidney and bladder cancers. For thyroid cancer, the RRs were very high in both sexes: 2.38 for women and 1.88 for men.

Inter-country differences in survival

Table 4 shows age-standardised survival rates estimated at 5 years for the 65–99 age group for each cancer site for all countries combined and the countries with the highest and the lowest rates. For all cancers combined, in both sexes, a RR of 2.4 was observed, the lowest survival rate occurring in Poland, with the highest in men in Germany and the highest in women in Switzerland.

For most cancer sites, the highest RRs were observed in women, in particular for melanoma and pancreatic cancers, with RRs higher than 6, and for NHL, thyroid, bladder and kidney cancers, with RRs between 3.5 and 6. In men, only for the bladder, larynx and melanoma did RRs reach 3.5 or more. The lowest RRs occurred for lung, stomach and colon cancers in both sexes, kidney and thyroid cancers in men, ovary and uterine cervix cancers in women. Eastern European countries, particularly Poland and Estonia, exhibited the lowest survival values in both sexes for many sites.

Table 5 shows the RRs of death at 5 years by gender and country of the 65–99 versus 55–64 age groups for all cancers combined and some selected cancer sites. No striking differences were found among the different geographic areas, similar RRs being observed for men and women and between tumour sites.

DISCUSSION

One of the major advantages of the analysis of relative survival in population-based studies is that it is not affected by biases characteristic of clinical surveys, particularly case selection [10]. This is even more important for elderly cancer patients because they are not generally included in clinical trials because of comorbidity or other health conditions linked to ageing.

The relative survival data presented here showed a worse prognosis for elderly patients (65–99 years) in contrast to those aged between 55 and 64 years, suggesting a strong relationship of survival to age. The elderly have lower survival for every considered site, both at 1 and 5 years from diagnosis. These findings are consistent with other population-based reports on a large number of cases [11, 12], although this is the first time that survival of the elderly in Europe has been examined on such a scale.

Because of suboptimal standardisation of clinical information collection in different European registries, it is impossible

Table 4. Age–standardised survival rates (%) at 5 years from diagnosis in patients aged 65–99 years by gender. RRs of death for the highest and lowest values of survival of EUROCARE II countries

	Men			Women		
	All countries %	% Lowest–% highest country	RR*	All countries %	% Lowest–% highest country	RR*
Stomach	17	7 Poland–26 Germany	1.9	20	7 Poland–28 Austria	2.1
Colon	46	31 Estonia–60 The Netherlands	2.3	44	18 Poland–57 The Netherlands	3.2
Rectum	41	16 Poland–53 Iceland	2.9	40	18 Poland–52 The Netherlands	2.6
Pancreas	4	1 Sweden–16 Slovakia	2.7	3	0 Estonia–Iceland–9 Slovakia	> 6
Lung	7	4 Poland–13 Slovakia	1.6	7	4 Denmark–20 Slovakia	2.0
Larynx	63	44 Poland–82 Germany	4.0	60	50 Finland–77 Germany	2.7
Melanoma	60	40 Poland–77 Sweden	3.5	75	51 Poland–99 Switzerland	> 6
Breast	–	–	–	70	51 Poland–80 France	3.0
Ovary	–	–	–	19	10 Poland–34 Austria	2.1
Uterine cervix	–	–	–	45	31 Poland–60 Switzerland	2.3
Uterine corpus	–	–	–	63	51 Estonia–78 The Netherlands	2.7
Prostate	55	34 Poland–73 Switzerland	3.4	–	–	–
Bladder	61	23 Estonia–71 Germany	4.4	55	26 Estonia–72 Iceland	4.1
Kidney	40	28 Poland–48 The Netherlands	1.8	40	16 Estonia–61 Austria	3.7
Thyroid	37	22 Scotland–48 Denmark	2.0	49	36 Poland–82 Iceland	5.1
NHL	37	14 Estonia–50 France	2.8	37	26 Poland–71 Iceland	3.9
All sites	39	19 Poland–49 Germany	2.4	47	25 Poland–56 Switzerland	2.4

*Relative risk of death, reference category = country with the highest survival rate; NHL, non–Hodgkin's lymphoma.

Table 5. *Relative risk of death at* 5 *years from cancer by selected site and gender for patients aged between* 65–99 *years versus those aged* 55–64 *years,* 1985–1989 *(EUROCARE* II*)*

	All cancers		Stomach		Colon		Lung		Bladder	Prostate	Breast	Cervix	Corpus	Ovary
	M	F	M	F	M	F	M	F	M	M	F	F	F	F
Northern Europe														
Iceland	1.25	1.30	1.20	2.12	1.03	1.00	1.08	0.92	3.73	1.65	1.06	–	1.79	0.86
Finland	0.97	1.64	1.32	1.52	1.00	1.34	1.14	1.31	1.32	0.85	1.37	1.65	2.15	1.12
Sweden*	1.03	1.42	1.25	1.54	1.00	1.03	1.33	1.05	1.25	1.04	1.21	1.30	1.97	1.74
Denmark	1.09	1.23	1.04	1.18	1.12	1.12	1.27	1.27	1.30	0.95	1.17	1.38	1.87	1.34
U.K.														
Scotland	1.09	1.35	1.09	1.27	0.95	1.06	1.19	1.27	–	1.19	1.23	1.44	2.31	1.47
England	1.09	1.26	1.22	1.26	1.09	1.09	1.24	1.24	1.52	1.12	1.25	1.60	2.07	1.34
Western and Central Europe														
The Netherlands*	1.09	1.33	1.00	1.56	1.18	0.84	1.17	1.45	1.04	1.00	0.92	1.84	1.45	1.13
Germany*	0.89	1.21	1.03	1.37	0.97	1.38	1.20	1.39	1.53	1.17	1.09	1.17	1.59	1.98
Austria*	1.15	1.57	1.64	0.92	1.68	1.28	1.25	1.54	2.66	1.25	1.07	1.56	3.39	1.47
Switzerland*	1.00	1.40	1.51	0.97	1.23	0.87	1.30	1.30	2.23	0.71	1.06	1.00	2.21	1.84
France*	0.83	1.25	1.26	1.29	0.94	1.09	1.17	1.07	1.30	0.85	0.90	1.75	1.86	1.51
Southern Europe														
Italy*	1.15	1.42	1.24	1.32	1.12	1.19	1.25	1.35	1.64	1.23	1.15	1.58	1.67	1.64
Spain*	0.95	1.24	1.15	0.97	1.19	1.26	1.08	1.33	1.38	0.97	0.96	1.96	1.73	1.12
Eastern Europe														
Slovenia	0.94	1.43	1.21	1.26	1.12	1.21	1.24	0.89	1.28	1.09	1.03	1.41	2.74	1.38
Slovakia	0.87	1.28	0.97	1.13	0.97	1.28	1.04	0.94	1.25	0.81	1.00	1.49	1.64	1.16
Poland*	1.10	1.43	1.25	1.45	1.09	1.30	1.21	1.15	–	1.21	1.17	1.47	1.98	2.13
Estonia	0.97	1.39	1.23	1.47	1.03	1.31	1.13	0.85	1.89	0.83	1.10	1.03	1.93	1.17
Europe	1.00	1.30	1.21	1.26	1.06	1.18	1.20	1.25	1.46	1.06	1.09	1.43	1.76	1.54

M, male; F, female. * < 20% of the national population covered.

to be definitive when discussing the lower relative survival rates in the elderly. However, it is possible to note some general points. Age at diagnosis can affect patients' survival for three main ways:

(1) by influencing the biology and natural history of the tumour and thereby its potential aggressiveness;
(2) by affecting, through performance status and comorbidities, preventive, diagnostic and therapeutical strategies; and
(3) by influencing psychological and social features of older patients and so their reaction to disease [11, 13, 14].

A noteworthy and more specific result concerns gender-related differences in the elderly. Generally, women experienced a more favourable prognosis than men, almost for all anatomical sites, but older women had much higher RRs of death compared with younger women, than the RRs of older men compared with younger men. The survival advantage for women before the age of 65 years levelled out after this age.

Kant and associates, analysing SEER programme data, found that survival differences between older and younger patients were greater for women than for men, probably due to a different stage distribution [11]. Mean age at diagnosis could be higher in women, but such a difference, although reported in our study, would not be sufficient to justify RRs so much higher. Psychological features, such as a closer attention and awareness of one's health and hormonal factors, commonly believed to be protective agents in young and middle-aged women, seem to change in the elderly [14–16]. Social factors could play a role in affecting the elderly, particularly for women: they are more likely to be widows, to suffer from social isolation, to have reduced financial resources and difficulties of access to transportation [16]; all these characteristics, added to educational level and cognitive status, become fundamental survival determinants and influence prognosis, even by delaying detection [17].

The survival variation between younger and older patients was greater at 1 than at 5 years after diagnosis. This suggests a major role for stage at presentation, by its aforementioned psychosocial determinants, by access to healthcare and by comorbid diseases that might mask cancer signs and symptoms, causing a delay in seeking medical advice [5, 18]. Five-year relative survival of elderly men, after an initial disadvantage at 1 year, probably caused by higher mortality of patients with unfavourable disease, could reach rates closer to middle-aged subjects, if they receive a curative treatment.

Cancer stage, being the most important prognostic variable almost for every cancer and for patients at any age, may even be more important in treatment planning of the elderly [14]. This seemed evident for elderly women with breast cancer at 1 year, with an increased RR of dying of 1.70, and a prognosis very similar to the middle-aged group at 5 years (RR = 1.09). These findings support those previously reported indicating problems with early detection, with an inadequate involvement and a lower attendance rate to screening programmes of persons aged 60 years or more [19, 20]. As a consequence, a more advanced stage in the elderly has been found by several authors [21]; when breast cancer is detected early and treated with definitive and curative intent, the elderly have a relatively good survival [11], probably favourably influenced by a less aggressive biological behaviour [22].

A particularly discouraging picture was seen for women with gynaecological cancers with a RR of death of 1.94–2.01

at 1 year and 1.43–1.76 at 5 years. These women are more likely to present with metastatic disease or to have unknown stage and not to benefit from radical surgery [11, 23]. Furthermore, cervical cancer screening programmes do not serve older women well, and there is a high percentage of never screened women or of under utilisers [24].

For elderly men, the situation was quite different, with a prognosis as good as younger counterparts for several common sites, such as colon, lung and prostate. As regards lung cancer, the little variation with age is obviously due to the very poor prognosis of patients at any age and to more favourable biological characteristics in older patients: SEER data support our results, showing an inverse significant relationship of stage to age, with younger men more likely to present with advanced lung disease [11], whereas other studies have found less aggressive histological types in the elderly [25, 26].

A poor prognosis in the elderly of both sexes, although with RRs of different magnitude, was observed for urinary tract cancers. For bladder cancer, this is consistent with reported problems of early diagnosis [11, 27] and with the impossibility of the elderly benefiting from improvements achieved in the treatment of 0–1 stages, with intrabladder administration of adjuvant chemotherapy [28]. Also, for NHL, both sexes experienced a much lower relative survival, with the additional problem of the dilemma of whether to decrease or maintain the same chemotherapy protocols applied to younger patients [6]. When chemotherapy is used for potentially curable tumours, such as NHL, certain leukaemias and Hodgkin's disease, aggressive protocols result in increased toxicity [14] which the elderly cannot tolerate. Thus, the development of specific protocols for elderly people are needed as well as improvement in their participation in clinical trials [29]. Some authors have reported that, for aggressive tumours such as NHL, the elderly have relatively good compliance with specific chemotherapy regimens [30].

Great variation in survival rates existed between countries, with the elderly in Eastern European countries experiencing much lower survival than other nations, a geographical pattern similar to that of younger patients. However, there were no striking variations in the RRs between countries for elderly patients compared with middle-aged patients and no country has a particularly poor prognosis for older people.

In conclusion, there was a decline in survival of cancer patients with age, more evident 1 year after diagnosis and in women. It is, therefore, of utmost importance that attention is paid to the health status of elderly patients so that this increasing and large minority of Europeans will receive adequate treatment in the third millenium.

1. EU population in 2050. Girls could live to 87 & boys to 83. Total population back to 1950 level? (Eurostat Statistics in focus, population and social conditions, no 7/97. Beyond the predictable: demographic changes in the EU up to 2050). PRESSOFFICE@EUROSTAT, CEC, BE. No 4597, 24 June 1997.
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APPENDIX

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