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Recent trends of cancer in Europe: A combined approach of incidence, survival and mortality for 17 cancer sites since the 1990s

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ABSTRACT

Introduction: We present a comprehensive overview of most recent European trends in population-based incidence of, mortality from and relative survival for patients with cancer since the mid 1990s.

Methods: Data on incidence, mortality and 5-year relative survival from the mid 1990s to early 2000 for the cancers of the oral cavity and pharynx, oesophagus, stomach, colorectum, pancreas, larynx, lung, skin melanoma, breast, cervix, corpus uteri, ovary, prostate, testis, kidney, bladder, and Hodgkin's disease were obtained from cancer registries from 21 European countries. Estimated annual percentages change in incidence and mortality were calculated. Survival trends were analyzed by calculating the relative difference in 5-year relative survival between 1990–1994 and 2000–2002 using data from EUROCARE-3 and -4.

Results: Trends in incidence were generally favorable in the more prosperous countries from Northern and Western Europe, except for obesity related cancers. Whereas incidence of and mortality from tobacco-related cancers decreased for males in Northern, Western and Southern Europe, they increased for both sexes in Central Europe and for females nearly everywhere in Europe. Survival rates generally improved, mostly due to better access to specialized diagnostics, staging and treatment. Marked effects of organised or opportunistic screening became visible for breast, prostate and melanoma in the wealthier countries. Mortality trends were generally favourable, except for smoking related cancers.

Conclusion: Cancer prevention and management in Europe is moving in the right direction. Survival increased and mortality decreased through the combination of earlier detection, better access to care and improved treatment. Still, cancer prevention efforts have much to attain, especially in the domain of female smoking prevalence and the emerging obesity epidemic.

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1. Introduction

Cancer has become a major public health problem in Europe with an estimated prevalence of about 3%, increasing to 15% at old age. Almost 50% of deaths at middle age is caused by cancer, partly resulting from lowering mortality from other causes of death. In 2002, 26% of all cancer cases in the world were diagnosed in Europe.[1] Figs. 1 and 2 show the distribution of estimated cancer incidence and mortality for 2006; breast, colorectal, prostate and lung cancers were the most important cancer types in Europe.[2]

The progress against cancer is often focussed on survival of individual cancer patients. The recent paper on trends in survival of cancer across Europe up to 2002 by the EUROCARE group clearly showed that the most marked improvements occurred among patients with colorectal, breast, prostate and thyroid cancer and lymphomas, both Hodgkin's and non-Hodgkin's.[3] Little explicit clarification was given for the observed differences between the countries. These differences may be due to variation in the baseline characteristics of the covered populations, e.g. selective areas in a country or state with large proportions of inhabitants having a high

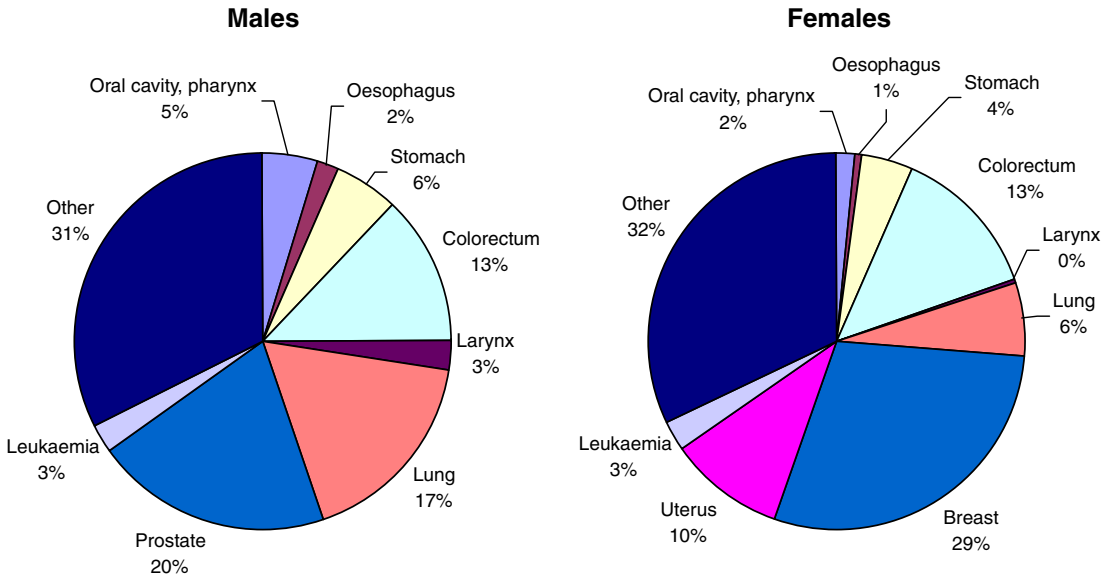

Fig. 1 – Distribution of new cancer cases in Europe by gender, 2006 Source: Ferlay et al.[2]

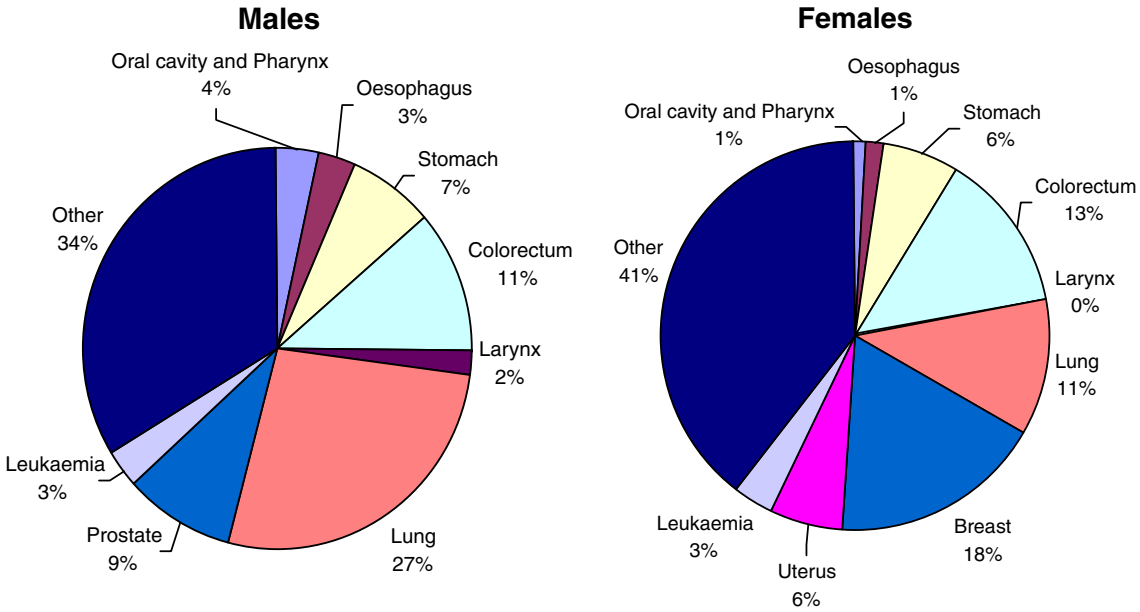

Fig. 2 – Distribution of cancer deaths in Europe by gender, 2006 Source: Ferlay et al.[2]

Table 1 – Possible explanations for combined changes in trends in incidence of, survival for and mortality from cancer

Incidence	Survival	Mortality	Plausible explanation(s) for changes
↑	↑	↑	Higher prevalence of risk factors, earlier diagnosis and/or shifts to unfavourable subsites/-types. If incidence increased faster than survival, mortality rates also increase.
↑	↑	=	• 'Artificial' increases in incidence due to e.g. screening, leading to increased survival rates due to lead-time bias, but not resulting in any changes in mortality. • Higher prevalence of risk factors, favourable shifts in stage-distribution and/or subsites/-types and/or improved treatment. The net result is no changes in mortality.
↑	↑	↓	'Artificial' increase in incidence due to e.g. screening, increased survival due to favourable shifts in stage-distribution and/or subsites/-types and effective early treatment, resulting in decreasing mortality after 5–10 years.
↑	=	↑	Higher prevalence of risk factors for aggressive tumours
↑	↓	↑	Higher prevalence of risk factors, unfavourable shifts in stage-distribution and/or subsites/-types.
=	↑	↓	Improved treatment
=	=	=	No changes
=	↓	↑	Worsening case-mix, e.g. when screening manages to detect most if not all slow growing tumours
↓	↑	↓	Lower risk factor prevalence and/or pre-malignant screening, more favourable case-mix and/or better staging or treatment
↓	=	↓	Lower risk factor prevalence and/or more restrictive classification and/or pre-malignant screening – without changes in survival will result in decreasing mortality rates
↓	↓	=	Lower risk factor prevalence and/or more restrictive classification, resulting in worsening survival
All other combinations of incidence, survival mortality trends			Probably registrion artefacts or problems (e.g. missing cases, incomplete follow-up, coding errors).

socio-economic status. Other explanations are the potentially selective incompleteness of cases at time of detection or diagnosis and during follow-up.

In the US, survival improvements were also revealed and largely determined by marked improvements in detection, thereby introducing lead-time and length bias, together with shifts in classification, subtype, and subsite resulting in pseudo-improvements of survival rates.[4] To circumvent these problems, it is preferred to study simultaneously trends in cancer incidence and survival, also because both affect mortality.[5,6] Survival improvements are more often preceded by rises in incidence than followed by decreases in mortality. Table 1 summarises possible explanations for changes in incidence, survival, and mortality.

In this article we present the most recent trends in incidence, mortality, and survival over the last decade across Europe of 17 tumour sites, derived from cancer registries and mortality statistics.

2. Methods

Data of the following 17 tumour sites (and corresponding ICD-10 code) were collected: oral cavity and pharynx (C00-14), oesophagus (C15), stomach (C16), colorectal (C18-21), pancreas (C25), larynx (C32), lung (C33-34), skin melanoma (C43), female breast (C50), cervix (C53), corpus uteri (C54-55), ovary (C56), prostate (C61), testis (C62), kidney (C64-66/C68), bladder (C67), and Hodgkin's disease (C81). They were derived from 21 European cancer registries, grouped into four regions: Northern Europe (Denmark, Finland, Norway, Sweden, Ireland, and the United Kingdom), Western Europe (Austria, France, Germany, The Netherlands, and Switzerland), Southern Europe (Croatia, Italy, Malta, Slovenia, and Spain) and Central Europe (Czech Republic, Lithuania, and Poland). The sources of age-standardized (World Standard Population) incidence, mortality and survival for each country and their coverage are summarised in Table 2.

Five-year relative survival estimates were collected from the EUROCARE-3 ,[7–9] the EUROCARE-4 study,[3] and from a variety of national or regional cancer registry websites or annual reports. Trends in incidence and mortality between 1994 and 2006 (for details, see Table 2) were analyzed by calculating the estimated annual percentage change (EAPC) based on the published age-standardized rates per year, using the Joinpoint Regression Program (version 3.0) from the Surveillance Research Program of the US National Cancer Institute (http://srab.cancer.gov/joinpoint/). If the EAPC was significantly different from zero it was termed an increasing or decreasing trend. The EAPCs for incidence for Switzerland and Lithuania were based on periods and not on annual rates.

Table 2 – Data sources of cancer incidence, mortality and 5-year relative survival

	Country	Serving population of cancer registration (in millions)	proportion of national population covered by cancer registration, %	Incidence		Mortality		5-year relative survival[a]	
				Period of diagnosis	Source	Period of death	Source	Period	Source
Northern Europe	Denmark	5.4	100	1994–2003	NORDCAN database[76]	1994–2001	NORDCAN database[76]	–	–
	Finland	5.3	100	1994–2005	NORDCAN database[76]	1994–2005	NORDCAN database[76]	2003–2005	Website Finnish Cancer Registry[77]
	Norway	4.7	100	1994–1995 1996–2005[b]	NORDCAN database[76] Report 'Cancer in Norway 2005'[78]	1994–2004	NORDCAN database[76]	1956–2000	Report 'Cancer in Norway 2005'[78]
	Sweden	9.1	100	1994–2005[c]	Report 'Cancer Incidence in Sweden 2005'[79]	1994–2004	NORDCAN database[76]	–	–
	Ireland	4.3	100	1994–2005	Website National Cancer Registry Ireland[80]	1994–2002[d] 2003–2004	Website National Cancer Registry Ireland[80] Website Central Statistics Office Ireland[82,83]	1994–2001	Report 'Patterns of care and survival of cancer patients in Ireland 1994 to 2001'[81]
	UK England & Wales	53	100	1995–2004[e]	Website National Statistics[84]	1995–1998 1999–2005	WHO mortality database[85] Website National Statistics[87]	1971–2001	Website Cancer Research UK[86]
	UK Northern Ireland	1.7	100	1994–2005	Website Northern Ireland Cancer Registry[88]	1994–2005[f]	Website Northern Ireland Cancer Registry[88]	1993–2004	Report 'Survival of cancer patients in Northern Ireland 1993–2004'[89]
	UK Scotland	5.1	100	1994–2004	Website Scottish Cancer Registry[90]	1994–2006	Website Scottish Cancer Registry[90]	1977–2001	Website Scottish Cancer Registry[90]
Western Europe	Austria (Tyrol)	0.7	8	1994/5–2003	Website Tyrol Cancer Registry[91]	1994–1997[g] 1998–2003	WHO mortality database[85] Website Tyrol Cancer Registry[91]	–	–
	France	8	13	1995–2000[h]	Website French Institute for Public Health Surveillance[92]	1995–2002	WHO mortality database[85]	1989–1997	Report 'Survie des patients atteints de cancer en France'[93]
	Germany (Saarland)	1.1	1.3	1994–2005	Website Saarland Cancer Registry[94]	1994–2005	Website Saarland Cancer Registry[94]	2000–2002	Gondos, A et al.[73]
	Netherlands	16	100	1994–2003	Website Comprehensive Cancer Centres Netherlands[95]	1994–2003	Website Comprehensive Cancer Centres Netherlands[95]	1988–2003 1955–2002	Website Comprehensive Centre Amsterdam[96] Website Comprehensive Centre Eindhoven[97]

	Switzerland	7.5	58	1993–2003[k]	Report 'Cancer in Switzerland (volume 1)'[98]	1995–2004[l]	WHO mortality database[85]	–	Website Geneva Cancer 0Registry[99]
Southern Europe	Croatia	4.4	100	1994–2004	Croatian National Cancer Registry	1994–2004	WHO mortality database[85]	–	–
	Italy (Modena)	0.7	1.2	1994–2005	Website Modena Cancer Registry[100]	1994–2005	Website Modena Cancer Registry[100]	1988–2005	Report 'Cancer in Modena 1988–2005'[101]
								1995–1999	Report 'Italian cancer figures, report 2007: Survival'[102]
	Malta	0.4	100	1994–2005	Website Malta National Cancer Registry[103]	1994–2006[m]	Website Malta National Cancer Registry[103]	–	–
	Slovenia	2.0	100	1994–1997	EUROCIM version 4.0[75]	1994–2003	WHO mortality database[85]	1993–2002	Reports 'Cancer incidence in Slovenia 2001–2003'[104–106]
				2001–2003	Reports 'Cancer incidence in Slovenia 2001–2003'[104–106]				
	Spain	3.5	8	1994–1997[n] 2002[o]	EUROCIM version 4.0[75]	1994–2003	WHO mortality database[85]	–	–
Central Europe	Czech Republic	10	100	1994–2004	Website Czech National Oncological Register[107]	1994–2004[p]	Website Czech National Oncological Register[107]	1995–1999	Report 'Cancer Incidence 2004 in the 0Czech Republic'[108]
	Lithuania	3.4	100	1993–2004	Website Lithuanian Cancer Registry[109]	1993–2004	WHO mortality database[85]	–	–
	Poland	38	100	1994–1997[q]	EUROCIM version 4.0[75]	1994–1996	WHO mortality database[85]	–	–
				1999–2004	Website National Cancer Registry Poland[110]	1999–2005	Website National Cancer Registry Poland[110]		

(*continued on next page*)

Table 2 – continued

a If available data were used from the EUROCARE-3[7,9] and the EUROCARE-4 project.[3]
b Data of ovarian, kidney, and bladder cancer from NORDCAN database.[76]
c Data of corpus uteri, kidney, and bladder cancer from NORDCAN database.[76]
d Data of oral cavity & pharyngeal, laryngeal, oesophageal, ovarian, testicular, and bladder cancer from WHO mortality database.[85]
e Only available for England.
f Data of laryngeal cancer from the WHO mortality database.[85]
g Data of stomach, colorectal, lung, breast, and prostate cancer from the Tyrol cancer registry.[111–115]
h Data from the FRANCIM network (Bas-Rhin, Calvados, Doubs, Gironde, Haut-Rhin, Hérault, Isère, Loire-Atlantique, Manche, Somme, Tarn, Vendée). For cancers of the digestive tract also the specialised registries of Côte-d'Or, Saône et Loire, Calvados, Finistère and for haematologic tumours also from Côte-d'Or, Gironde and Basse Normandie. The registry of Côte d'Or also provided information on gynaecologic and breast cancers.
k Used incidence rates are estimates for total Switzerland.
l Data of testicular, kidney cancer, and Hodgkin's disease from the report 'Cancer in Switzerland (volume 2)'.[116]
m Data of oral cavity & pharyngeal, oesophageal, and testicular cancer until 2004 from WHO mortality database.[85]
n Data from Spanish cancer registries of: Albacete, Asturias, Basque Country, Canary Islands, Cantabria, Catalonia (Tarragona), Cuenca, Girona, Granada, Mallorca, Murcia, Navarra, Zaragoz.
o Data of 2002 from Spanish cancer registries of: Catalonia (Tarragona), Girona and Guipúzcoa.
p Data of Hodgkin's disease from WHO mortality database[85].
q Data from Polish cancer registries of: Lower Silesia (Dolnoslaskie), (Kujawsko-Pomorskie), Lubelskie, Lubuskie, Lodzkie, Malopolskie, Mazowieckie, Opolskie, Podkarpackie, Podlaskie, Pomorskie, Slaskie, Swieto-Krzyskie, Warminsko-Mazurskie, Wielkopolskie, Zachodniopomorskie.

Survival trends were analyzed by calculating the relative difference in 5-year relative survival estimates for patients diagnosed between 1990–1994 and 2000–2002. For cancers of the oral cavity and pharynx, larynx, oesophagus, pancreas, ovary, testis and bladder, survival data were retrieved from literature and individual cancer registries or consortia of cancer registries, because for these tumours data of 2000–2002 were not yet available from EUROCARE.

A survival trend was determined as an increasing or decreasing trend if the 5-year survival rate changed more than one percent-points in cancers with a poor prognosis (5-year relative survival <20%) and more than two percent-points in other cancers.

3. Results & comments

Results are presented in the accompanying tables, figures and text. Annual incidence and mortality rates per registry are provided on-line, and can be accessed at: http://www.eurocadet.org/documents/index.php?map=%2FEurocadet+publications%2FOnline+tables+trends+in+Europe+2008%2F.

Oral cavity and pharyngeal cancer (C00-14). Within Europe incidence among males in the most recent period varied substantially between 5.9 (Finland) and 32 (France) per 100,000. Mortality rates varied considerably less and were highest in countries where incidence was moderate, e.g. in Croatia and Lithuania. Incidence rates among females were highest in Northern and Western Europe and were consistently lower than those for males. The male-to-female ratio decreased during the last 10 years and recently varied between 1.5 and 2.5 in Northern Europe to 7.7 in Lithuania. During the past decade incidence and mortality rates were stable in most European countries, except for a decrease in incidence in Northern Europe and France, Spain, and Slovenia among males, and an increase in incidence among females in some Northern and Western European countries (Table 3a). Five-year relative survival rates improved during the past decade in Europe, especially for oro- and nasopharyngeal cancer (Table 3b, 3c).

As smoking is one of the main risk factors for these tumours, the observed trends in incidence largely reflect changes in smoking rates, which decreased amongst European males and increased among females in many Southern and Central European countries. For cancers of the oral cavity, alcohol consumption, especially in combination with smoking, is also an important risk factor, as are Epstein-Barr virus and Human papillomavirus infections.[10]

Oesophageal cancer (C15). Oesophageal cancer is relatively uncommon in Western societies with varying incidence and mortality patterns during the past decade in Europe. Highest incidence and mortality rates were observed in Ireland and the UK. Rates were low in Southern and Central Europe, especially among females. Increases in incidence and mortality rates were observed among males in Sweden, England, and the Netherlands, and among females in Norway, France and Slovenia. Trends were decreasing in French, German, Slovenian, and Spanish males and in Finnish, Scottish and Croatian females (Table 4a). Five-year relative survival improved or remained stable varying between 7 (Slovenian males) and

Table 3a – Trends in incidence of and mortality from oral cavity and pharyngeal cancer (C00-14) in Europe by gender

	Country	Period	Incidence						Mortality					
			Males			Females			Males			Females		
			WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)
Northern Europe	Denmark[a]	1994–2003[1]	12.1	12.1	0.4 (−0.8, 1.7)	3.7	5.0	**3.0** (0.7, 5.4)	4.6	4.6	0.8 (−2.0, 3.7)	1.5	1.5	−0.0 (−3.6, 3.7)
	Finland[a]	1994–2005	7.4	5.9	**−1.5** (−2.7, −0.3)	3.4	3.7	0.6 (−1.1, 2.4)	2.1	1.9	0.0 (−2.2, 2.3)	0.9	0.8	−2.2 (−4.5, 0.1)
	Norway[a]	1994–2005[2]	7.8	6.6	**−1.4** (−2.5, −0.3)	3.5	4.1	0.3 (−1.7, 2.4)	3.1	2.4	−2.0 (−4.0, 0.0)	1.0	0.7	−3.0 (−6.8, 0.9)
	Sweden[b]	1994–2005[2]	7.4	6.4	−0.7 (−1.6, 0.2)	3.2	4.1	1.5 (−0.1, 3.1)	2.2	2.3	0.4 (−1.4, 2.3)	0.8	1.0	0.6 (−2.5, 3.8)
	Ireland	1994–2005[2]	10.9	9.0	**−3.1** (−5.2, −0.9)	2.5	3.4	1.2 (−1.2, 3.7)	4.2	3.0	**−3.8** (−5.5, −2.0)	1.3	1.3	−1.5 (−4.3, 1.3)
	UK England & Wales[c]	1995–2004[3]	5.9	7.6	**2.7** (2.0, 3.4)	2.8	3.5	**2.0** (0.8, 2.3)	2.6	2.6	−0.5 (−1.4, 0.4)	1.0	1.0	−0.2 (−1.3, 1.0)
	UK Northern Ireland	1994–2005	10.3	7.4	**−2.9** (−4.8, −0.8)	3.4	3.9	−0.6 (−3.4, 2.4)	2.9	2.3	**−2.6** (−5.5, 0.4)	1.1	1.4	−1.9 (−7.3, 4.0)
	UK Scotland	1994–2004[4]	10.5	11.8	0.6 (−0.4, 1.6)	3.9	4.8	1.3 (−0.7, 3.4)	4.3	3.9	−1.0 (−2.1, 0.2)	1.7	1.5	**−2.2** (−4.3, −0.2)
Western Europe	Austria (Tyrol)	1995–2003	12.6	9.3	−0.4 (−7.9, 7.8)	3.0	4.5	−1.5 (−10.1, 7.9)	6.5	5.8	−3.5 (−13.5, 7.6)	1.0	1.3	5.7 (−3.0, 15.1)
	France	1994–2000[5]	34.7	32.2	**−1.2** (−1.3, −1.2)	4.3	4.7	**1.6** (1.2, 2.0)	11.3	8.8	**−3.6** (−4.5, −2.7)	1.3	1.4	0.5 (−1.1, 2.2)
	Germany (Saarland)	1994–2005	18.3	17.2	−1.0 (−2.2, 0.3)	4.0	4.4	1.2 (−3.1, 5.7)	10.1	8.6	−1.0 (−4.3, 2.4)	1.3	1.7	2.7 (−2.3, 7.8)
	Netherlands	1994–2003	9.4	9.3	−0.3 (−1.6, 1.0)	4.1	4.8	**1.5** (0.4, 2.6)	2.9	3.1	0.6 (−0.6, 1.8)	1.1	1.4	1.9 (−0.4, 4.2)
	Switzerland	1993–2003[6]	14.1	12.9	−1.2 (−7.4, 5.5)	4.4	5.2	2.2 (−2.3, 7.0)	4.9	4.4	**−1.8** (−3.4, −0.1)	1.0	1.0	1.7 (−1.8, 5.3)
Southern Europe	Croatia	1994–2004	17.7	18.8	−0.1 (−3.8, 3.7)	1.8	3.2	3.8 (−1.7, 9.6)	11.7	10.0	−1.8 (−3.6, 0.2)	1.1	1.0	0.4 (−3.3, 4.2)
	Italy (Modena)	1994–2005	7.7	6.3	−1.0 (−4.4, 2.7)	1.5	2.7	7.8 (−6.5, 24.3)	4.3	1.3	−5.5 (−12.2, 1.7)	1.0	0.6	5.0 (−4.0, 14.8)
	Malta	1994–2005[2]	No data			No data			1.8	3.3	−2.4 (−12.9, 9.3)	1.6	1.3	−6.6 (−19.7, 8.7)
	Slovenia	1994–2003	21.9	16.0	**−3.0** (−4.1, −1.9)	2.1	2.9	4.1 (−0.1, 8.5)	10.9	7.6	**−3.3** (−6.4, −0.1)	1.1	1.2	2.5 (−3.8, 9.3)
	Spain[d]	1994–2002[7]	20.8	12.7	**−6.4** (−8.2, −4.6)	2.2	1.8	−2.7 (−6.0, 0.8)	7.1	5.8	**−2.0** (−2.8, −1.2)	0.9	0.8	−0.7 (−2.2, 0.8)
Central Europe	Czech Republic	1994–2004	11.8	12.3	**0.8** (0.0, 1.5)	2.4	2.8	1.1 (−0.5, 2.6)	7.3	7.4	0.6 (−0.3, 1.5)	0.9	1.1	0.5 (−1.8, 2.8)
	Lithuania	1993–2004[8]	14.1	15.3	1.1 (−2.2, 4.5)	1.8	2.0	3.2 (−22.7, 37.8)	9.2	10.3	**2.3** (0.3, 4.2)	0.9	0.7	−0.4 (−4.0, 3.4)
	Poland	1994–2004[3]	10.2	9.2	−1.1 (−2.2, 0.1)	2.0	2.4	0.9 (−0.6, 2.5)	6.1	5.8	−0.6 (−1.3, 0.2)	1.0	1.1	0.2 (−1.5, 1.9)

a Inclusive C46.2.
b Mortality inclusive C46.2.
c Incidence only for England.
d Incidence data valid for C00-06 + C10-14.
1 Mortality until 2001.
2 Mortality until 2004.
3 Mortality until 2005.
4 Mortality until 2006.
5 Mortality until 2002.
6 Only average incidence for periods 1993–1996, 1997–1999, and 2001–2003 and mortality for 1995–2004.
7 Mortality until 2003.
8 Only average incidence for periods 1993–1997, 1998–2000, 2001–2002, and 2003–2004.
* EAPC: estimated annual percentage change, calculated based on the rates during the indicated period.

Table 3b – Trends in 5-year relative survival for oral cavity and pharyngeal cancer in Europe[a]

	Country	Period	5-year relative survival		Period	5-year relative survival		Trend in survival
			Males	Females		Males	Females	
Northern Europe	UK England & Wales[b]	1991–1995	45.0	55.5	1996–1999	47.2	55.4	↑/=
	UK Northern Ireland	1993–1996	49.3	50.9	2001–2004	53.9	57.1	↑
	UK Scotland[b]	1992–1996	42.4	49.9	1997–2001	47.5	56.1	↑
Western Europe	France[c]	1992–1994	31.0	46.0	1995–1997	32.0	49.0	=/↑
	Germany (Saarland)	–	–		2000–2002	51.9		?
	Netherlands (Amsterdam)[b]	1993–1996	59.0		2001–2005	61.0		↑
	Netherlands (Amsterdam)[d]	1993–1996	40.0		2001–2005	45.0		↑
	Netherlands (Eindhoven)[b]	1990–1994	55.0		2000–2002	58.0		↑
	Netherlands (Eindhoven)[d]	1990–1994	25.0		2000–2002	37.0		↑
	Switzerland (Geneva)	1990–1994	44.0	53.0	1994–1998	47.0	59.0	↑
Southern Europe	Italy (Modena)[e]	1990–1997	44.0	58.0	1999–2005	56.0	65.0	↑
	Italy[f]	–	–	–	1995–1999	58.0	58.0	?
Total Europe								
oral cavity		1990–1994[g]	44.4		1995–1999[h]	48.5		↑
oropharynx		1990–1994[g]	31.0		1995–1999[h]	39.8		↑
nasopharynx		1990–1994[g]	42.2		1995–1999[h]	50.2		↑
hypopharynx		1990–1994[g]	24.2		1995–1999[h]	25.5		=

a Data reported by individual cancer registries or consortia of cancer registries (sources are shown in Table 1).
b Data valid for oral cavity cancer (C01-06).
c Data valid for C01-06 + C09-13.
d Data valid for pharyngeal cancer (C09-14).
e Data valid for head & neck cancer (C01-14, C30-32).
f Data valid for head & neck cancer (C01-06, C09-13, C30-32).
g Data reported by the EUROCARE-3 study.[117]
h Data reported by the EUROCARE-4 study.[9]

Table 3c – Overview of recent trends in incidence of, survival for and mortality from oral cavity and pharyngeal cancer in Europe

Incidence	Survival	Mortality	Countries	
			Males	Females
↑	↑	=	UK-England & Wales	France, Netherlands
↑	=	=	–	UK-England & Wales
↑	?	=	Czech Republic	Denmark
=	↑	=	UK-Scotland, Netherlands, Italy	UK-Northern Ireland, Switzerland, Italy
=	↑	↓	Switzerland	UK-Scotland
=	?	↑	Lithuania	–
=	?	=	Denmark, Sweden, Austria, Germany, Croatia, Poland	Finland, Norway, Sweden, Ireland, Austria, Germany, Croatia, Slovenia, Spain, Czech Republic, Lithuania, Poland
↓	↑	↓	UK-Northern Ireland	–
↓	=	↓	France	–
↓	?	=	Finland, Norway	–
↓	?	↓	Ireland, Slovenia, Spain	–
?	?	=	Malta	Malta

23% (Germany), except for Italian and Slovenian males, where survival decreased (Table 4b and 4c).

The diverging trends is probably due to geographical variation in the two major subgroups that constitute oesophageal cancer: adenocarcinoma and squamous cell carcinoma and their risk factors. In the Western world, the incidence of adenocarcinoma was mainly rising, while the incidence of squamous cell carcinomas remained stable.[11] Smoking and alcohol consumption are known to be associated with an increased risk of squamous cell carcinoma, while Barrett's oesophagus, largely related to increasing weight and obesity and resulting reflux, is an important risk factor for adenocarcinoma.[12] Modest improvements in survival seem to have occurred during the last decade, most likely related to the increased incidence of adenocarcinoma and the increasing regionalization of surgery.[13,14] The decreases in survival among Italian and Slovenian males are probably due to increasing completeness of data.

Stomach cancer (*C16*). Incidence and mortality rates of stomach cancer varied considerably within Europe, being

Table 4a – Trends in incidence of and mortality from oesophageal cancer (C15) in Europe by gender

	Country	Period	Incidence						Mortality					
			Males			Females			Males			Females		
			WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)
Northern Europe	Denmark	1994–2003[1]	5.6	6.1	1.4 (−0.0, 2.9)	1.7	1.7	1.0 (−1.0, 3.1)	5.9	6.6	**2.0** (0.3, 3.9)	1.6	1.8	2.0 (−2.4, 6.6)
	Finland	1994–2005	3.8	3.4	0.3 (−1.3, 1.9)	1.3	1.1	**−2.6** (−4.7, −0.5)	2.5	2.9	−0.1 (−2.1, 2.0)	0.9	1.0	−2.6 (−5.7, 0.7)
	Norway	1994–2005[2]	2.3	3.5	2.1 (−0.4, 4.6)	1.0	1.2	**2.8** (0.2, 5.5)	2.8	3.5	1.2 (−1.5, 3.8)	0.8	1.1	3.1 (−0.5, 6.9)
	Sweden	1994–2005[2]	3.0	3.9	**1.8** (0.8, 2.9)	1.0	0.9	0.1 (−2.5, 2.8)	2.9	3.5	1.6 (−0.4, 3.6)	0.8	0.9	2.0 (−0.4, 4.4)
	Ireland	1994–2005[2]	7.7	8.1	0.4 (−1.3, 2.1)	4.1	3.5	−0.9 (−2.3, 0.6)	8.6	7.4	−0.8 (−2.3, 0.9)	4.0	3.3	−1.9 (−4.2, 0.5)
	UK England & Wales[a]	1995–2004[3]	8.3	9.2	**1.3** (1.0, 1.6)	3.6	3.4	−0.3 (−1.1, 0.5)	8.3	8.7	**0.6** (0.3, 0.9)	3.3	3.1	−0.5 (−1.0, 0.1)
	UK Northern Ireland	1994–2005	9.5	8.9	−0.9 (−3.6, 2.0)	2.9	2.5	−2.0 (−5.0, 1.1)	8.0	8.2	0.3 (−1.5, 2.1)	3.4	2.6	−1.7 (−3.7, 0.4)
	UK Scotland	1994–2004[4]	11.5	12.1	0.3 (−0.5, 1.1)	5.4	5.1	**−1.8** (−3.3, −0.2)	10.5	10.7	0.1 (−0.5, 0.7)	4.8	3.8	**−1.7** (−3.1, −0.3)
Western Europe	Austria (Tyrol)	1995–2003	3.1	4.7	0.3 (−8.1, 9.5)	0.7	0.6	−1.0 (−14.6, 14.9)	1.9	2.5	0.4 (−10.4, 12.5)	1.0	0.2	−13.9 (−31.2, 7.7)
	France	1994–2000[5]	10.9	9.3	**−2.6** (−2.8, −2.5)	1.3	1.5	**2.6** (1.5, 3.6)	9.7	7.4	**−3.4** (−4.1, −2.6)	1.0	1.1	1.1 (−0.2, 2.4)
	Germany (Saarland)	1994–2005	8.5	5.6	**−2.6** (−4.3, 1.0)	0.9	1.7	2.8 (−1.5, 7.4)	4.8	4.8	−0.7 (−2.8, 1.4)	0.8	2.1	6.9 (−1.8, 16.3)
	Netherlands	1994–2003	6.3	8.0	**3.0** (2.0, 4.0)	2.2	2.5	0.7 (−0.9, 2.3)	6.2	7.5	**1.8** (0.6, 3.0)	2.0	2.1	0.6 (−0.9, 2.1)
	Switzerland	1993–2003[6]	5.5	5.8	0.7 (−7.2, 9.3)	1.5	1.5	−0.0 (−12.6, 14.4)	5.2	4.5	−0.2 (−1.7, 1.3)	1.1	0.8	−1.1 (−4.4, 2.2)
Southern Europe	Croatia	1994–2004	6.0	5.3	**−2.1** (−4.1, −0.1)	1.0	0.6	−5.3 (−10.3, 0.1)	5.1	4.5	−1.2 (−4.0, 1.6)	0.8	0.5	**−5.0** (−7.2, −2.7)
	Italy (Modena)	1994–2005	1.7	0.8	−0.7 (−8.0, 7.1)	0.6	0.5	4.3 (−7.6, 17.6)	2.6	1.6	−1.5 (−7.7, 5.3)	0.6	0.8	−3.0 (−16.0, 12.0)
	Malta	1994–2005[2]	No data			No data			4.5	0.9	**−9.1** (−16.8, −0.7)	1.9	0.4	−9.7 (−21.1, 3.4)
	Slovenia	1994–2003	7.0	5.4	−2.0 (−4.1, 0.2)	0.6	0.9	**5.0** (2.4, 7.7)	7.5	3.9	**−5.0** (−9.0, −0.6)	0.6	0.7	3.2 (−5.2, 12.4)
	Spain	1994–2002[7]	7.5	5.6	−1.5 (−11.3, 9.5)	0.7	0.8	4.1 (−7.8, 17,4)	5.6	4.8	**−2.2** (−2.7, −1.6)	0.5	0.5	1.0 (−0.8, 2.7)
Central Europe	Czech Republic	1994–2004	5.4	5.1	−0.1 (−1.9, 1.8)	0.5	0.8	1.4 (−2.6, 5.6)	4.4	4.3	−0.4 (−1.7, 1.0)	0.3	0.6	3.0 (−1.8, 7.9)
	Lithuania	1993–2004[8]	6.0	6.6	1.1 (−2.0, 4.4)	0.6	0.5	−3.4 (−14.4, 9.0)	6.3	7.0	1.5 (−0.4, 3.3)	0.6	0.4	−1.6 (−6.0, 3.1)
	Poland	1994–2004[3]	4.3	4.3	−0.1 (−0.8, 0.6)	0.8	0.8	−2.2 (−4.4, 0.1)	4.9	4.6	0.2 (−1.1, 0.8)	0.8	0.8	−0.9 (−2.6, 0.9)

a Incidence only for England.
1 Mortality until 2001.
2 Mortality until 2004.
3 Mortality until 2005.
4 Mortality until 2006.
5 Mortality available until 2002.
6 Only average incidence for periods 1993–1996, 1997–1999, and 2001–2003 and mortality for 1995–2004.
7 Mortality until 2003.
8 Only average incidence for periods 1993–1997, 1998–2000, 2001–2002, and 2003–2004.
* EAPC: estimated annual percentage change, calculated based on the rates during the indicated period.

Table 4b – Trends in 5-year relative survival for oesophageal cancer in Europe[a]

	Country	Period	5-year relative survival		Period	5-year relative survival		Trend in survival
			Males	Females		Males	Females	
Northern Europe	Finland	–	–	–	2003–2005	10.0	19.0	?
	Norway	1991–1995	5.4	–	1996–2000	7.3	–	↑
	UK England & Wales	1991–1995	7.0	8.0	2000–2001	8.0	8.0	=
	UK Northern Ireland	1993–1996	5.7	14.4	2001–2004	10.3	17.9	↑
	UK Scotland	1992–1996	7.7	8.4	1997–2001	10.4	9.3	↑/=
Western Europe	France	1992–1994	10.0	12.0	1995–1997	9.0	13.0	=
	Germany (Saarland)	–	–		2000–2002	22.6		?
	Netherlands (Amsterdam)	1993–1996	13.0		2001–2005	13.0		=
	Netherlands (Eindhoven)[b]	1990–1994	10.0		2000–2002	10.0		=
	Switzerland (Geneva)	1990–1994	13.0	–	1994–1998	13.0	–	=
Southern Europe	Italy (Modena)	1990–1997	3.0	17.0	1998–2005	14.0	8.0	↑/↓
	Italy	–	–	–	1995–1999	11.0	14.0	?
	Slovenia	1993–1997	3.0	17.0	1998–2002	7.0	9.0	↑/↓
Total Europe		1990–1994[c]	9.0		1995–1999[d]	12.3		↑

a Data reported by individual cancer registries or consortia of cancer registries (sources are shown in Table 1).
b 3-year relative survival.
c Data reported by the EUROCARE-3 study.[117]
d Data reported by the EUROCARE-4 study.[9]

Table 4c – Overview of recent trends in incidence of, survival for and mortality from oesophageal cancer in Europe

Incidence	Survival	Mortality	Countries	
			Males	Females
↑	=	↑	UK-England & Wales, Netherlands	–
↑	=	=	–	France
↑	↓	=	–	Slovenia
↑	?	=	Sweden	Norway
=	↑	=	Norway, UK-Northern Ireland/Scotland, Italy	UK-Northern Ireland
=	↑	↓	Slovenia	–
=	=	=	Switzerland	UK- England & Wales, Netherlands
=	↓	=	–	Italy
=	?	↑	Denmark	–
=	?	=	Finland, Ireland, Austria, Czech Republic, Lithuania, Poland	Denmark, Sweden, Ireland, Austria, Germany, Switzerland, Spain, Czech Republic, Lithuania, Poland
=	?	↓	Spain	Croatia
↓	↑	↓	–	UK-Scotland
↓	=	↓	France	–
↓	?	=	Germany, Croatia	Finland

generally higher in Southern and Central Europe and always twice as high in males compared with females. In most European countries, incidence and mortality rates have been dropping, while 5-year relative survival slowly improved (Table 5a and 5b, Fig. 3).

A combination of improved methods of fresh food preservation with higher vitamin C content and reduced salting,[15] decreased smoking prevalence and, more importantly, decreasing infection rates of Helicobacter Pylori ,[16] has probably resulted in the observed decreases in incidence and, subsequently, mortality. Contrary to the downward trends for non-cardia cancers, incidence rates for cancers of the cardia, initially representing less than 20% of all gastric cancers, have been reported to increase or remain stable.[17,18] Differences in gastric cancer survival are largely related to age, subsite and histological type, with few changes over time[19] regardless of the country. On one hand the shift from the pylorus to the cardia has negative implications for survival because of the worse prognosis of cardia tumours. This may be countered however, by earlier detection due to larger availability of endoscopy, especially when followed by adequate surgery.[20]

Colorectal cancer (C18-21). Incidence of colorectal cancer among males increased modestly in most countries and markedly in Austria, Croatia, Slovenia, Spain, and the Czech Republic. Among females, the incidence rates were stable with some decreases in Scotland, Northern Ireland, and Poland, contrasting a clear increase in Spain. The male-to-female ratio

Table 5a – Trends in incidence of and mortality from stomach cancer (C16) in Europe by gender

	Country	Period	Incidence						Mortality					
			Males			Females			Males			Females		
			WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)
Northern Europe	Denmark	1994–2003[1]	8.7	7.1	**−2.3** (−3.4, −1.2)	3.7	3.5	−1.8 (−4.4, 0.9)	6.4	5.2	**−4.1** (−6.7, −1.4)	3.0	2.7	**−3.7** (−7.1, −0.1)
	Finland	1994–2005	13.6	8.3	**−4.3** (−5.3, −3.3)	7.5	4.5	**−4.0** (−4.9, −3.1)	10.8	6.5	**−4.6** (−5.4, −3.7)	4.6	3.7	**−2.9** (−4.4, −1.3)
	Norway	1994–2005[2]	12.0	6.7	**−4.3** (−5.4, −3.3)	6.0	4.2	**−2.9** (−4.3, −1.6)	9.6	5.6	**−4.8** (−6.5, −3.0)	4.7	2.9	**−4.9** (−6.4, −3.4)
	Sweden	1994–2005[2]	9.1	6.2	**−3.1** (−3.8, −2.4)	4.1	2.9	**−2.9** (−4.1, −1.6)	7.0	4.9	**−3.5** (−4.2, −2.7)	3.7	2.7	**−2.6** (−3.7, −1.5)
	Ireland	1994–2005[2]	13.4	10.5	**−2.6** (−3.2, −1.9)	6.0	5.1	**−1.7** (−2.5, −0.9)	10.3	7.0	**−4.5** (−5.5, −3.6)	5.5	2.8	**−4.8** (−6.6, −3.0)
	UK England & Wales[a]	1995–2004[3]	13.0	8.9	**−4.1** (−5.0, −3.2)	5.0	3.7	**−3.4** (−4.1, −2.7)	9.4	5.9	**−4.8** (−5.2, −4.4)	3.9	2.5	**−4.0** (−4.6, −3.4)
	UK Northern Ireland	1994–2005	15.0	8.4	**−4.0** (−6.2, −1.8)	5.7	4.7	**−2.7** (−4.4, −1.1)	11.7	6.3	**−3.9** (−6.0, −1.8)	4.1	3.3	−2.4 (−4.8, 0.1)
	UK Scotland	1994–2004[4]	15.5	11.2	**−3.2** (−4.0, −2.5)	6.9	5.0	**−3.7** (−4.6, −2.7)	10.7	6.8	**−3.3** (−4.0, −2.7)	4.9	3.0	**−4.4** (−6.1, −2.7)
Western Europe	Austria (Tyrol)	1994–2003	22.8	14.4	**−4.5** (−7.2, −1.7)	10.4	7.1	**−3.5** (−5.9, −1.1)	16.1	8.1	**−7.3** (−8.7, −5.9)	8.8	4.9	**−4.9** (−7.9, −1.9)
	France	1994–2000[5]	10.3	9.0	**−2.2** (−2.4, −2.0)	4.0	3.4	**−2.7** (−2.7, −2.6)	7.3	5.9	**−2.7** (−3.1, −2.2)	2.8	2.3	**−2.4** (−2.8, −1.9)
	Germany (Saarland)	1994–2005	15.9	14.1	**−1.8** (−2.6, −1.0)	9.2	6.0	**−3.8** (−5.7, −1.9)	11.2	9.4	**−3.7** (−5.9, −1.6)	6.5	3.7	**−4.7** (−5.8, −3.6)
	Netherlands	1994–2003	13.7	9.7	**−3.8** (−4.3, −3.3)	5.7	4.2	**−2.3** (−3.4, −1.1)	10.8	7.3	**−4.4** (−5.1, −3.6)	4.4	3.2	**−2.8** (−4.2, −1.4)
	Switzerland	1993–2003[6]	10.7	8.5	−3.0 (−12.9, 8.0)	4.9	4.0	−2.6 (−14.5, 10.9)	7.1	4.6	**−4.4** (−5.7, −3.2)	3.1	2.1	**−4.9** (−5.7, −4.0)
Southern Europe	Croatia	1994–2004	26.0	19.2	**−3.0** (−5.2, −0.9)	10.0	8.1	**−2.6** (−4.3, −0.8)	20.9	16.4	**−2.8** (−4.6, −1.1)	8.3	6.2	**−3.0** (−4.1, −1.8)
	Italy (Modena)	1994–2005	27.8	15.2	**−4.4** (−6.6, −2.2)	12.6	8.2	**−4.0** (−6.8, −1.1)	22.5	8.8	**−5.0** (−8.4, −1.5)	11.2	4.6	**−5.9** (−8.6, −3.2)
	Malta	1994–2005[4]	14.3	10.5	−2.9 (−7.6, 2.2)	5.6	4.2	−2.4 (−5.7, 0.9)	10.3	6.7	**−5.1** (−7.7, −2.3)	5.8	3.4	−1.4 (−5.8, 3.2)
	Slovenia	1994–2003	24.9	19.1	**−2.9** (−4.1, −1.8)	10.6	8.1	**−3.6** (−4.9, −2.3)	21.2	12.9	**−4.2** (−6.2, −2.3)	7.8	5.6	**−4.7** (−6.8, −2.5)
	Spain	1994–2002[7]	17.0	12.5	−3.1 (−6.4, 0.4)	6.8	6.5	0.3 (−4.7, 5.4)	13.2	9.2	**−3.7** (−4.1, −3.3)	5.8	4.2	**−3.8** (−4.5, −3.1)
Central Europe	Czech Republic	1994–2004	17.8	12.1	**−3.9** (−4.6, −3.2)	9.3	6.2	**−3.9** (−4.6, −3.2)	15.2	9.5	**−4.8** (−5.5, −4.1)	7.1	4.6	**−4.5** (−5.1, −3.8)
	Lithuania	1993–2004[8]	29.7	24.7	**−2.1** (−3.3, −0.9)	12.6	10.6	−1.4 (−11.4, 9.7)	28.5	21.1	**−3.0** (−3.7, −2.3)	12.1	8.0	**−2.5** (−3.6, −1.4)
	Poland	1994–2004[3]	23.1	13.8	**−5.8** (−7.0, −4.5)	8.0	5.0	**−5.4** (−6.7, −4.2)	19.7	13.6	**−3.2** (−3.5, −2.9)	7.0	4.9	**−3.2** (−3.6, −2.8)

a Incidence only for England.
1 Mortality until 2001.
2 Mortality until 2004.
3 Mortality until 2005.
4 Mortality until 2006.
5 Mortality until 2002.
6 Only average incidence for periods 1993–1996, 1997–1999, and 2001–2003 and mortality for 1995–2004.
7 Mortality until 2003.
8 Only average incidence for periods 1993–1997, 1998–2000, 2001–2002, and 2003–2004.
* EAPC: estimated annual percentage change, calculated based on the rates during the indicated period.

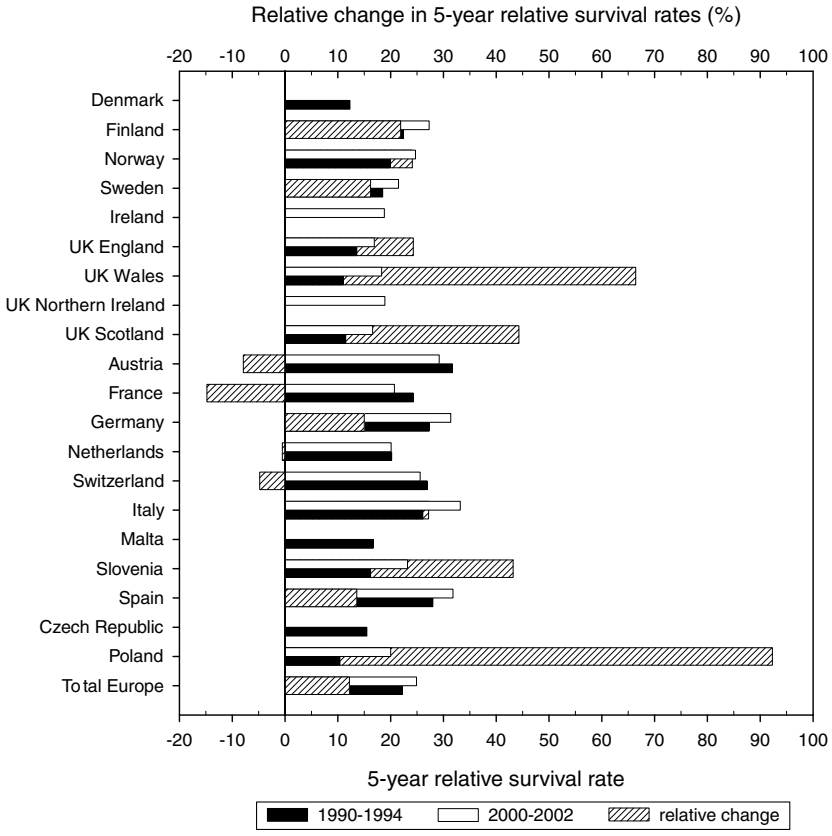

Fig. 3 – Trends in 5-year age-adjusted relative survival for stomach cancer in Europe Sources: EUROCARE-3[7] and EUROCARE-4.[3]

Table 5b – Overview of recent trends in incidence of, survival for and mortality from stomach cancer in Europe

Incidence	Survival	Mortality	Countries	
			Males	Females
=	↑	↓	Spain	Spain
=	=	↓	Switzerland	Switzerland
=	?	=	–	Malta
=	?	↓	Malta	Denmark, Lithuania
↓	↑	=	–	UK-Northern Ireland[a]
↓	↑	↓	Finland, Norway, Sweden, UK[a], Germany, Italy, Slovenia, Poland	Finland, Norway, Sweden, UK-England & Wales/Scotland, Germany, Italy, Slovenia, Poland
↓	=	↓	Netherlands	Netherlands
↓	↓	↓	Austria, France	Austria, France
↓	?	↓	Denmark, Ireland, Croatia, Czech Republic, Lithuania	Ireland, Croatia, Czech Republic

a Survival trends of UK-Northern Ireland are based on a report of the North-Ireland Cancer Registry[89].

remained stable at 1.5. Mortality rates decreased across Europe but remained very high in Denmark, Norway, and Ireland in comparison with other Northern and Western European countries (Table 6a). Five-year relative survival increased, especially in Poland, Slovenia, and the Czech Republic (Fig. 4, Table 6b).

The increasing incidence rates may be due to a relatively late, but rapid transition towards a life style being increasingly rich in sugar, red and processed meat, poor in fiber consumption and physical activity, resulting in increasing body mass index.[21–23] Improvement of survival, especially in younger patients, is probably due to positive changes in detection and treatment of colorectal cancer since the mid 1990s. This includes a widespread availability of endoscopy, either or not as part of screening activities, Total Mesorectal Excision (TME) surgery for rectal cancer, and more widespread use of (pre-operative) radiotherapy.[24–26] The high mortality rate in some Northern European countries is possibly caused by

Table 6a – Trends in incidence of and mortality from colorectal cancer (C18-21) in Europe by gender

	Country	Period	Incidence						Mortality					
			Males			Females			Males			Females		
			WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)
Northern Europe	Denmark	1994–2003[1]	38.6	40.4	**1.0** (0.4, 1.7)	29.3	29.4	0.2 (−0.7, 1.1)	23.8	21.0	**−1.8** (−2.8, −0.8)	15.5	15.2	−0.0 (−1.7, 1.7)
	Finland	1994–2005	25.3	27.8	0.6 (−0.0, 1.2)	19.1	20.4	0.5 (−0.1, 1.1)	13.0	10.7	**−1.1** (−1.9, −0.2)	8.1	7.5	**−1.1** (−2.2, −0.1)
	Norway	1994–2005[2]	39.1	42.8	**1.0** (0.5, 1.5)	33.7	33.7	0.4 (−0.0, 0.7)	19.8	18.4	**−0.8** (−1.4, −0.2)	13.9	12.4	−1.0 (−2.2, 0.2)
	Sweden	1994–2005[2]	31.0	31.2	**0.5** (0.1, 0.9)	24.5	26.9	**0.8** (0.2, 1.3)	13.3	12.6	−0.4 (−1.0, 0.3)	10.1	9.6	**−0.7** (−1.3, −0.2)
	Ireland	1994–2005[2]	44.2	44.3	−0.0 (−0.5, 0.5)	27.5	27.5	0.2 (−0.6, 0.9)	22.0	19.6	**−1.7** (−2.9, −0.6)	13.2	10.3	**−2.3** (−3.9, −0.7)
	UK England & Wales[a]	1995–2004[3]	34.8	35.6	−0.2 (−0.8, 0.4)	22.8	23.0	−0.5 (−1.3, 0.3)	18.1	14.6	**−2.1** (−2.3, −1.8)	11.5	9.2	**−2.3** (−2.7, −1.9)
	UK Northern Ireland	1994–2005	44.1	42.9	−0.4 (−1.6, 0.8)	28.6	23.5	**−1.6** (−2.5, −0.7)	19.7	16.0	−1.2 (−3.0, 0.6)	13.3	10.4	**−2.3** (−4.0, −0.5)
	UK Scotland[b]	1994–2004[4]	41.4	42.0	0.0 (−0.8, 0.8)	28.7	25.8	**−0.9** (−1.8, −0.1)	21.5	17.2	**−1.7** (−2.1, −1.3)	13.6	10.0	**−2.7** (−3.4, −2.0)
Western Europe	Austria (Tyrol)	1994–2003	38.8	45.0	**2.3** (0.0, 4.7)	23.9	26.1	1.1 (−0.3, 2.6)	18.6	16.5	−1.0 (−7.3, 5.7)	8.4	8.5	−1.3 (−4.0, 1.5)
	France	1994–2000[5]	37.6	39.1	**0.7** (0.6, 0.7)	24.0	24.6	**0.4** (0.3, 0.5)	16.5	15.6	**−0.6** (−1.3, −0.0)	9.7	8.8	**−1.0** (−1.7, −0.2)
	Germany (Saarland)	1994–2005	53.6	51.0	0.4 (−0.4, 1.1)	34.2	31.9	−0.1 (−0.9, 0.8)	23.1	18.7	**−2.3** (−2.8, −1.9)	16.3	10.2	**−3.1** (−4.8, −1.4)
	Netherlands	1994–2003	37.2	40.6	**0.9** (0.5, 1.3)	27.7	29.4	**0.8** (0.3, 1.3)	17.7	16.9	**−0.7** (−1.3, −0.0)	12.5	11.7	**−1.1** (−1.7, −0.5)
	Switzerland	1993–2003[6]	35.4	36.3	0.3 (−1.7, 2.4)	22.9	23.6	0.4 (−0.7, 1.5)	15.7	12.6	**−2.4** (−3.2, −1.5)	9.2	7.4	**−1.6** (−2.6, −0.6)
Southern Europe	Croatia	1994–2004	32.2	44.0	**2.6** (0.1, 5.2)	19.1	22.2	2.4 (−0.3, 5.2)	19.6	24.0	2.0 (−0.4, 4.4)	11.3	11.5	0.6 (−1.3, 2.5)
	Italy (Modena)	1994–2005	46.3	47.2	1.0 (−0.2, 2.3)	31.0	29.9	1.2 (−1.1, 3.5)	23.2	15.7	**−1.9** (−3.8, −0.0)	8.9	8.1	−1.2 (−4.4, 2.1)
	Malta[b]	1994–2005[4]	35.7	32.5	0.9 (−1.5, 3.4)	23.8	18.6	−0.9 (−3.6, 1.9)	23.1	15.2	**−3.1** (−5.1, −0.9)	11.8	12.1	−0.1 (−2.0, 1.9)
	Slovenia	1994–2003	37.7	45.2	**2.6** (1.9, 3.4)	22.5	25.1	1.0 (−0.0, 2.1)	21.5	25.3	0.5 (−1.1, 2.1)	13.2	13.0	**−2.1** (−3.9, −0.3)
	Spain	1994–2002[7]	34.3	46.3	**4.4** (0.1, 9.0)	20.5	27.3	**3.5** (0.5, 6.5)	16.1	17.6	**0.9** (0.6, 1.3)	10.3	9.4	**−1.0** (−1.4, −0.6)
Central Europe	Czech Republic	1994–2004	53.4	58.4	**1.1** (0.4, 1.8)	28.5	29.9	0.3 (−0.3, 0.9)	34.4	30.7	**−0.8** (−1.6, −0.0)	16.5	14.8	**−1.1** (−1.7, −0.4)
	Lithuania	1993–2004[8]	25.6	29.2	1.9 (−2.2, 6.2)	16.8	20.0	2.7 (−12.6, 20.7)	17.1	18.6	0.5 (−0.2, 1.2)	11.7	10.4	**−1.2** (−2.2, −0.3)
	Poland	1994–2004[3]	26.7	27.8	−0.2 (−1.6, 1.3)	17.9	16.8	**−1.1** (−2.2, −0.0)	16.0	18.8	**1.6** (1.3, 2.0)	10.8	10.8	0.2 (−0.7, 1.0)

a Incidence only for England.
b Data valid for C18-20.
1 Mortality until 2001.
2 Mortality until 2004.
3 Mortality until 2005.
4 Mortality until 2006.
5 Mortality until 2002.
6 Only average incidence for periods 1993–1996, 1997–1999, and 2001–2003 and mortality for 1995–2004.
7 Mortality until 2003.
8 Only average incidence for periods 1993–1997, 1998–2000, 2001–2002, and 2003–2004.
* EAPC: estimated annual percentage change, calculated based on the rates during the indicated period.

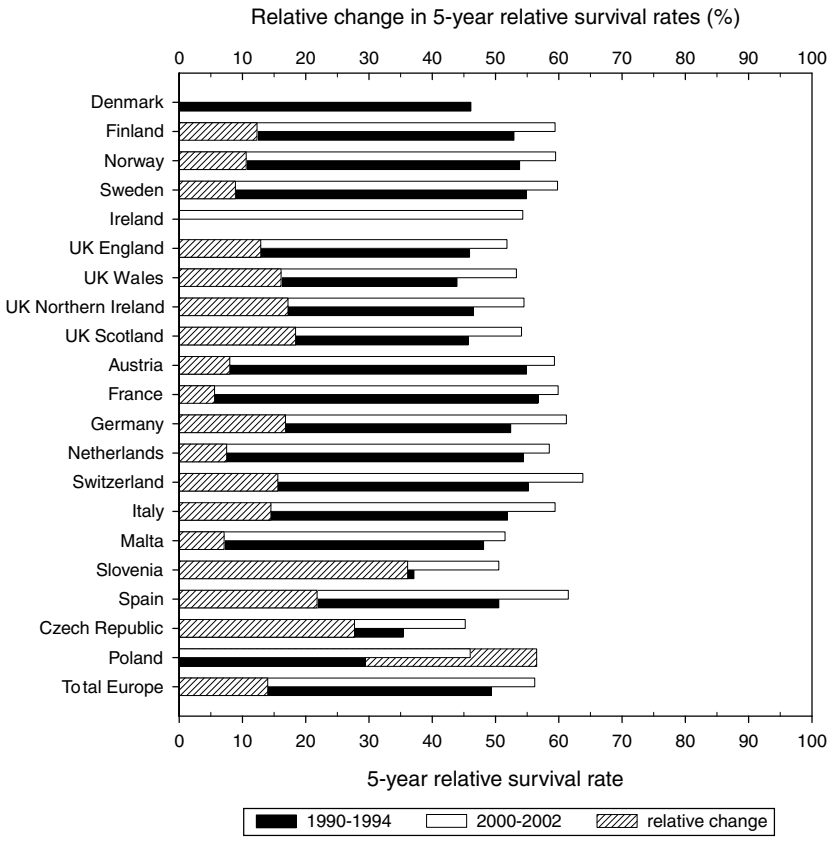

Fig. 4 – Trends in 5-year age-adjusted relative survival for colorectal cancer in Europe Sources: EUROCARE-3[9] and EUROCARE-4.[3]

Table 6b – Overview of recent trends in incidence of, survival for and mortality from colorectal cancer in Europe

Incidence	Survival	Mortality	Countries	
			Males	Females
↑	↑	↑	Spain	–
↑	↑	=	Austria, Slovenia	–
↑	↑	↓	Norway, France, Netherlands, Czech Republic	France, Netherlands, Spain
↑	?	=	Croatia	–
↑	?	↓	Denmark	–
=	↑	↑	Poland	–
=	↑	=	UK-Northern Ireland	Norway, Austria, Italy, Malta
=	↑	↓	Finland, Ireland[a], UK-England & Wales/Scotland, Germany, Switzerland, Italy, Malta	Finland, Ireland[a], UK-England & Wales, Germany, Switzerland, Slovenia, Czech Republic
=	?	=	Lithuania	Denmark, Croatia
=	?	↓	–	Lithuania
↓	↑	=	–	Poland
↓	↑	↓	–	UK-Northern Ireland/Scotland

a Survival trends are based on a report of the Ireland Cancer Registry[81].

deficient access to endoscopic care, and less effective patient management.[27]

Pancreatic cancer (C25). Incidence and mortality rates of pancreatic cancer were similar across Europe and quite stable over time. However, in Denmark and France, incidence and mortality increased, and they decreased in Sweden and Poland (Table 7a). Rates were higher among males than females (male-to-female ratio 1.5). Five-year relative survival remained very low varying between 2 and 8% (Table 7b and 7c).

Pancreatic mortality rates have increased throughout Europe between the late 1950s and the 1980s among males, and the 1990s among females followed by a leveling off which is

Table 7a – Trends in incidence of and mortality from pancreatic cancer (C25) in Europe by gender

	Country	Period	Incidence						Mortality					
			Males			Females			Males			Females		
			WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)
Northern Europe	Denmark	1994–2003[1]	7.2	8.3	**2.0** (0.9, 3.2)	6.0	6.6	**1.9** (0.2, 3.6)	8.0	7.1	0.3 (−2.7, 3.4)	6.2	6.8	1.5 (−0.7, 3.8)
	Finland	1994–2005	8.9	8.7	0.1 (−1.0, 1.2)	6.3	6.9	0.7 (−0.4, 1.9)	8.4	8.5	0.3 (−0.8, 1.4)	6.3	6.2	1.0 (−0.6, 2.6)
	Norway	1994–2005[2]	7.7	7.0	−0.1 (−1.0, 0.8)	6.1	5.2	−0.3 (−1.5, 0.9)	7.6	7.4	0.1 (−1.2, 1.4)	5.6	5.9	0.2 (−1.0, 1.6)
	Sweden	1994–2005[2]	6.7	5.0	**−2.2** (−3.4, −0.9)	5.4	4.4	**−1.3** (−2.4, −0.3)	7.5	7.1	−0.4 (−1.3, 0.4)	6.7	6.6	−0.2 (−1.0, 0.6)
	Ireland	1994–2005[2]	6.9	6.6	−0.0 (−1.3, 1.2)	5.4	5.5	−0.4 (−2.0, 1.3)	8.5	6.6	**−1.5** (−2.8, −0.1)	4.9	5.0	0.3 (−1.2, 1.8)
	UK England & Wales[a]	1995–2004[3]	6.8	6.7	−0.2 (−0.6, 0.3)	5.0	5.2	0.3 (−0.7, 1.4)	6.4	6.3	−0.2 (−0.6, 0.2)	4.8	5.1	0.6 (−0.1, 1.2)
	UK Northern Ireland	1994–2005	5.7	7.3	0.5 (−2.8, 4.0)	5.0	3.8	0.3 (−2.8, 3.4)	6.2	6.6	−0.4 (−2.7, 2.1)	5.0	4.4	0.4 (−2.0, 2.8)
	UK Scotland	1994–2004[4]	6.9	6.3	−1.0 (−2.5, 0.6)	5.3	4.9	−0.1 (−1.6, 1.4)	6.1	5.8	−0.3 (−1.3, 0.7)	4.8	4.6	0.2 (−0.9, 1.3)
Western Europe	Austria (Tyrol)	1995–2003	7.3	5.9	0.1 (−6.5, 7.3)	4.5	4.6	1.7 (−5.6, 9.6)	10.0	6.9	−2.2 (−6.8, 2.6)	4.0	5.8	**6.8** (2.5, 11.2)
	France	1994–2000[5]	5.4	5.8	**1.2** (0.9, 1.4)	2.9	3.2	**1.9** (1.4, 2.4)	7.4	7.6	**0.7** (0.1, 1.3)	3.9	4.5	**1.8** (1.1, 2.4)
	Germany (Saarland)	1994–2005	7.5	7.1	2.6 (−0.3, 5.6)	4.7	6.0	1.6 (−1.2, 4.4)	9.1	8.0	1.0 (−1.1, 3.1)	5.7	5.2	0.1 (−2.5, 2.7)
	Netherlands	1994–2003	6.3	5.3	−1.0 (−2.6, 0.6)	4.6	4.3	−1.0 (−2.3, 0.4)	7.3	6.8	−0.5 (−1.5, 0.5)	5.2	5.4	0.3 (−0.6, 1.2)
	Switzerland	1993–2003[6]	7.4	7.6	0.3 (−5.0, 6.0)	5.0	4.7	−0.8 (−3.3, 1.7)	7.0	6.7	−0.1 (−0.7, 0.5)	5.2	4.6	−0.5 (−1.9, 1.0)
Southern Europe	Croatia	1994–2004	8.3	9.1	0.5 (−1.5, 2.5)	3.7	4.9	1.3 (−1.4, 4.2)	7.7	7.3	0.7 (−1.9, 3.3)	3.5	4.8	1.4 (−1.3, 4.2)
	Italy (Modena)	1994–2005	9.8	8.0	1.5 (−2.0, 5.0)	7.8	6.4	−0.8 (−4.6, 3.2)	10.3	8.5	−1.1 (−4.0, 2.0)	5.9	4.6	**−1.5** (−2.7, −0.2)
	Malta	1994–2005[4]	9.9	5.7	−1.5 (−5.6, 2.8)	3.7	3.4	1.9 (−4.0, 8.2)	10.4	6.9	−3.1 (−6.3, 0.2)	4.2	5.1	0.6 (−2.0, 3.3)
	Slovenia	1994–2003	8.4	8.5	1.2 (−2.2, 4.6)	4.1	4.7	1.9 (−1.6, 5.6)	7.6	8.2	1.1 (−0.2, 2.4)	4.1	4.9	1.5 (−2.0, 5.2)
	Spain	1994–2002[7]	6.6	7.1	2.1 (−5.2, 10.0)	4.0	4.4	2.0 (−2.3, 6.3)	6.0	6.6	**1.3** (0.7, 1.9)	3.7	3.7	0.8 (−0.2, 1.9)
Central Europe	Czech Republic	1994–2004	11.1	10.7	−0.0 (−1.0, 0.9)	7.0	6.8	0.3 (−0.6, 1.2)	10.5	9.4	−0.7 (−1.6, 0.2)	6.3	6.1	−0.2 (−0.8, 0.5)
	Lithuania	1993–2004[8]	11.2	9.4	−1.4 (−7.4, 5.1)	5.0	4.5	−0.2 (−10.2, 10.9)	9.9	9.9	−0.6 (−1.5, 0.4)	4.7	4.4	−0.6 (−2.2, 1.0)
	Poland	1994–2004[3]	8.8	6.4	**−3.9** (−5.4, −2.4)	6.4	4.1	**−4.2** (−6.4, −1.8)	8.1	8.2	−0.1 (−0.6, 0.4)	5.0	4.9	0.0 (−0.4, 0.5)

a Incidence only for England.
1 Mortality until 2001.
2 Mortality until 2004.
3 Mortality until 2005.
4 Mortality until 2006.
5 Mortality until 2002.
6 Only average incidence for periods 1993–1996, 1997–1999, and 2001–2003 and mortality for 1995–2004.
7 Mortality until 2003.
8 Only average incidence for periods 1993–1997, 1998–2000, 2001–2002, and 2003–2004.
* EAPC: estimated annual percentage change, calculated based on the rates during the indicated period.

Table 7b – Trends in 5-year relative survival for pancreatic cancer in Europe by gender[a]

	Country	Period	5-year relative survival		Period	5-year relative survival		Trend in survival
			Males	Females		Males	Females	
Northern Europe	Finland	–	–	–	2003–2005	4.0	2.0	?
	Norway	1991–1995	2.5	3.2	1996–2000	3.4	3.2	=
	UK England & Wales	1991–1995	2.0	2.0	2000–2001	2.0	2.0	=
	UK Northern Ireland	1993–1996	2.9		1997–2000	2.5		=
	UK Scotland	1992–1996	2.9	2.6	1997–2001	2.8	3.3	=
Western Europe	France	1992–1994	3.0	7.0	1995–1997	8.0	6.0	↑/=
	Germany (Saarland)	–	–		2000–2002	5.3		?
	Netherlands (Amsterdam)	1993–1996	2.0		2001–2005	3.0		↑
	Netherlands (Eindhoven)[b]	1990–1994	7.0		2000–2002	3.0		↓
Southern Europe	Italy (Modena)	1990–1997	3.0	3.0	1998–2005	3.0	4.0	=
	Italy	–	–	–	1995–1995	5.0	6.0	?
	Slovenia	–	–	–	1998–2002	5.0	5.0	?
Central Europe	Czech Republic	–	–	–	1995–1999	4.3	–	?
Total Europe		1990–1994[c]	4.2		1995–1999[d]	5.5		↑

a Data reported by individual cancer registries or consortia of cancer registries (sources are shown in Table 1).
b 3-year relative survival.
c Data reported by the EUROCARE-3 study.[117]
d Data reported by the EUROCARE-4 study.[9]

Table 7c – Overview of recent trends in incidence of, survival for and mortality from pancreatic cancer in Europe

Incidence	Survival	Mortality	Countries	
			Males	Females
↑	↑	↑	France	–
↑	=	↑	–	France
↑	?	=	Denmark	Denmark
=	=	=	Norway, UK, Netherlands, Italy	Norway, UK, Netherlands
=	=	↓	–	Italy
=	?	↑	Spain	Austria
=	?	=	Finland, Austria, Germany, Switzerland, Croatia, Malta, Slovenia, Czech Republic, Lithuania	Finland, Ireland, Germany, Switzerland, Croatia, Malta, Slovenia, Spain, Czech Republic, Lithuania
=	?	↓	Ireland	–
↓	?	=	Sweden, Poland	Sweden, Poland

confirmed by our data.[28] This leveling off is partly due to the decline in smoking which is the main risk factor for pancreatic cancer.[15,29,30] Factors related to obesity, such as type 2 diabetes and high blood glucose levels[31] also seem to be important risk indicators, as well as occupational exposures to pesticides or dyes.[32,33]Previously postulated associations with coffee and alcohol consumption were not confirmed.[34] No major improvements in treatment have occurred, causing the survival rates to remain stable. Centralization of surgery may contribute to future improvement in survival of pancreatic cancer.

Laryngeal cancer (C32). Incidence and mortality rates of cancer of the larynx varied considerably throughout Europe, especially among males. Lowest rates were observed in the Scandinavian countries, except in Denmark, and highest rates in Southern and Central Europe (Table 8a). This cancer was 4 (Scotland) to 49 (Spain) times more common among males than females. In all European regions, both incidence and mortality rates declined over the past decade, especially among males, for incidence more markedly in Northern Europe, and mortality in Southern Europe. However, in most countries, 5-year relative survival did not show marked improvements, except for Northern Irish, Scottish and Swiss males (Table 8b and 8c).

The most important environmental risk factors are smoking and alcohol consumption.[35,36]The relative risks of smokers seem to be higher for supraglottic than glottic cancer, which is in accordance with the anatomical location of supraglottic tissue, being more readily exposed to tobacco smoke than the other laryngeal subsites. The decreasing smoking

Table 8a – Trends in incidence of and mortality from laryngeal cancer (C32) in Europe by gender

	Country	Period	Incidence						Mortality					
			Males			Females			Males			Females		
			WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)
Northern Europe	Denmark	1994–2003[1]	5.8	4.4	**−3.4** (−5.6, −1.1)	1.1	0.7	−3.7 (−7.0, 0.0)	2.2	1.6	**−3.5** (−8.3, −1.7)	0.5	0.4	−2.4 (−12.1, 8.3)
	Finland	1994–2005	3.4	2.1	**−3.7** (−5.0, −2.4)	0.2	0.2	−2.7 (−7.4, 2.2)	0.9	0.7	−2.6 (−6.3, 1.2)	0.1	0.1	33.9 (−39.5, 196.8)
	Norway	1994–2005[2]	3.2	2.5	**−2.3** (−4.3, −0.3)	0.9	0.5	−4.1 (−8.5, 0.5)	0.8	0.9	−0.5 (−3.3, 2.4)	0.2	0.1	−6.0 (−13.0, 1.6)
	Sweden	1994–2005[2]	2.3	2.1	−0.9 (−2.7, 0.9)	0.2	0.3	**4.7** (0.4, 9.3)	0.8	0.6	−1.7 (−5.4, 2.1)	0.1	0.1	−19.7 (−56.9, 49.6)
	Ireland	1994–2005[2]	4.4	4.8	0.7 (−1.4, 2.8)	0.9	0.8	−1.8 (−6.6, 3.2)	1.9	1.4	−0.7 (−4.8, 3.6)	0.7	0.2	−7.1 (−15.6, 2.3)
	UK England & Wales[a]	1995–2004[3]	4.0	3.5	**−1.8** (−2.8, −0.7)	0.8	0.6	**−2.0** (−3.5, −0.5)	1.5	1.1	**−2.9** (−3.7, −2.0)	0.3	0.2	**−5.0** (−7.7, −2.3)
	UK Northern Ireland	1994–2005[5]	No data			No data			1.8	1.8	−0.3 (−4.8, 4.3)	0.5	0.3	6.5 (−18.0, 38.2)
	UK Scotland	1994–2004[4]	6.6	5.9	−0.8 (−2.7, 1.1)	1.4	1.4	−1.1 (−4.3, 2.2)	2.0	1.6	−2.0 (−4.4, 0.5)	0.6	0.4	−1.4 (−3.9, 1.1)
Western Europe	Austria (Tyrol)	1995–2003	5.0	4.4	−1.2 (−6.5, 4.3)	0.5	0.4	−3.8 (−28.9, 30.2)	3.2	2.3	**−3.7** (−6.4, −1.0)	0.3	0.2	−44.1 (−83.1, 85.6)
	France	1994–2000[5]	10.6	9.3	**−2.1** (−2.2, −2.0)	0.7	0.7	0.0 (−, −)	5.7	3.2	**−6.7** (−8.2, −5.2)	0.3	0.2	**−4.6** (−8.4, −0.7)
	Germany (Saarland)	1994–2005	8.2	6.2	−0.5 (−3.4, 2.6)	0.7	0.9	−0.3 (−3.9, 3.4)	4.1	3.4	−3.5 (−8.0, 1.2)	0.3	0.3	−5.5 (−15.2, 5.4)
	Netherlands	1994–2003	6.0	4.6	**−3.2** (−3.8, −2.7)	0.9	0.8	−2.3 (−4.8, 0.2)	1.9	1.6	−1.8 (−4.2, 0.6)	0.3	0.3	3.3 (−3.3, 10.2)
	Switzerland	1993–2003[6]	4.8	4.5	−0.8 (−10.9, 10.4)	0.5	0.8	6.4 (−6.9, 21.6)	1.7	1.5	−1.3 (−3.8, 1.3)	0.2	0.2	4.7 (−4.4, 14.7)
Southern Europe	Croatia	1994–2004	12.2	9.5	−1.7 (−4.4, 1.1)	0.7	0.7	−0.6 (−5.7, 4.9)	8.1	6.2	−3.0 (−6.5, 0.7)	0.4	0.4	−0.6 (−7.3, 6.5)
	Italy (Modena)	1994–2005	9.4	7.3	−2.4 (−5.2, 0.6)	1.4	0.2	−5.2 (−17.2, 8.5)	3.4	1.7	**−5.8** (−10.8, −0.5)	0.5	0.1	−16.8 (−64.9, 97.4)
	Malta	1994–2005[4]	6.7	4.3	−3.1 (−6.4, 0.5)	0.0	0.0	3.9 (−55.4, 142.0)	3.3	3.9	−4.7 (−12.3, 3.5)	0.0	0.0	−36.8 (−74.0, −53.5)
	Slovenia	1994–2003	8.3	6.5	−1.2 (−3.9, 1.7)	0.7	0.4	0.4 (−9.9, 11.9)	5.1	3.1	**−5.4** (−8.1, −2.5)	0.3	0.2	−0.5 (−11.7, 12.1)
	Spain	1994–2002[7]	15.9	9.9	**−5.1** (−8.6, −1.4)	0.3	0.2	−5.8 (−22.3, 14.1)	6.4	4.7	**−3.4** (−4.2, −2.6)	0.1	0.2	**7.4** (0.3, 15.1)
Central Europe	Czech Republic	1994–2004	7.5	6.8	**−1.3** (−2.6, −0.0)	0.4	0.5	−0.1 (−3.9, 3.9)	4.6	3.3	**−3.0** (−4.0, −2.0)	0.2	0.1	−1.0 (−8.6, 7.3)
	Lithuania	1993–2004[8]	9.9	9.0	−1.4 (−4.1, 1.3)	0.4	0.2	−5.0 (−29.1, 27.3)	7.7	5.6	**−4.1** (−5.6, −2.5)	0.3	0.2	−3.6 (−9.7, 3.1)
	Poland	1994–2004[3]	12.1	8.8	**−3.7** (−4.6, −2.8)	1.4	1.0	−1.7 (−4.6, 1.2)	7.5	6.1	**−2.2** (−2.7, −1.6)	0.6	0.5	0.4 (−2.4, 3.3)

a Incidence only for England.
1 Mortality until 2001.
2 Mortality until 2004.
3 Mortality until 2005.
4 Mortality until 2006.
5 Mortality until 2002.
6 Only average incidence for periods 1993–1996, 1997–1999, and 2001–2003 and mortality for 1995–2004.
7 Mortality until 2003.
8 Only average incidence for periods 1993–1997, 1998–2000, 2001–2002, and 2003–2004.
* EAPC: estimated annual percentage change, calculated based on the rates during the indicated period.

Table 8b – Trends in 5-year relative survival for laryngeal cancer in Europe[a]

	Country	Period	5-year relative survival		Period	5-year relative survival		Trend in survival
			Males	Females		Males	Females	
Northern Europe	Finland[b]	–	–	–	2003–2005	58.0	60.0	?
	UK England & Wales	1991–1995	62.0	–	2000–2001	65.0	–	↑
	UK Northern Ireland	1993–1996	62.0	59.9	2001–2004	76.6	56.6	↑/↓
	UK Scotland	1992–1996	60.4	56.3	1997–2001	64.3	54.1	↑/↓
Western Europe	France	1992–1994	52.0		1995–1997	53.0		=
	Germany (Saarland)	–	–		–	61.3		?
	Netherlands (Amsterdam)	1993–1996	74.0		2001–2004	81.0		↑
	Netherlands (Eindhoven)[c]	1990–1994	85.0		2000–2002	86.0		=
	Netherlands (Eindhoven)[d]	1990–1994	44.0		2000–2002	44.0		=
	Switzerland (Geneva)	1990–1994	66.0	56.0	1994–1998	74.0	57.0	↑/=
Southern Europe	Italy	–	–	–	1995–1999	71.0	73.0	?
	Slovenia	1993–1997	60.0	65.0	1998–2002	60.0	64.0	=
Northern Europe	Czech Republic	–	–	–	1995–1999	49.9	–	?
Total Europe		1990–1994[e]	60.6		1995–1999[f]	63.1		↑

a Data reported by individual cancer registries or consortia of cancer registries (sources are shown in Table 1).
b Data valid for epiglottis.
c Data valid for glottis.
d Data valid for supraglottis.
e Data reported by the EUROCARE-3 study.[117]
f Data reported by the EUROCARE-4 study.[9]

Table 8c – Overview of recent trends in incidence of, survival for and mortality from laryngeal cancer in Europe

Incidence	Survival	Mortality	Countries	
			Males	Females
↑	?	=	–	Sweden
=	↑	=	UK-Scotland, Switzerland	Netherlands
=	=	=	–	Switzerland, Slovenia
=	=	↓	Slovenia	France
=	↓	=	–	UK-Scotland
=	?	↑	–	Spain
=	?	=	Sweden, Ireland, Germany, Croatia, Malta	Denmark, Finland, Norway, Ireland, Austria, Germany, Croatia, Italy, Malta, Czech Republic, Lithuania, Poland
=	?	↓	Austria, Italy, Lithuania	–
↓	↑	↓	UK-England & Wales	–
↓	↑	=	Netherlands	–
↓	=	↓	France	–
↓	?	=	Finland, Norway	–
↓	?	↓	Denmark, Spain, Czech Republic, Poland	UK-England & Wales
?	↑	=	UK-Northern Ireland	–
?	↓	=	–	UK-Northern Ireland

prevalences among (mainly) European males will therefore have contributed strongly to the decreases in incidence and mortality. Heavy alcohol use is also related to laryngeal cancer, and marked dose-response curves have been observed.[37] More importantly, there is a strong interaction between the effects of smoking and alcohol consumption and their combined effect may result in very high relative risks.

Lung cancer (C33-34). In most European countries incidence and mortality rates decreased among males in the last decade, except in Norway, Sweden, Austria (Tyrol), Switzerland, Croatia, Spain, and Lithuania where the rates remained stable. The variation in recent incidence among males was about 3-fold, with highest rates in Poland (63 per 100,000) and lowest in Sweden (22 per 100,000). In contrast to males, incidence and mortality rates have increased rapidly among females, except in Denmark and the UK (where rates were already very high), Austria, Croatia, Malta, Spain, and Lithuania. Recent incidence rates varied 7-fold, with lowest rates in Spain and Lithuania (5 and 6 per 100,000) and highest rates in Scotland and Denmark (37 and 33 per 100,000). The male-to-female ratio decreased and varied from 1.3 to 1.8 in Northern Europe (except in Finland with 3.5) to 10 in Spain in the most recent period

Table 9a – Trends in incidence of and mortality from lung cancer (C33-34) in Europe by gender

	Country	Period	Incidence						Mortality					
			Males			Females			Males			Females		
			WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)
Northern Europe	Denmark	1994–2003[1]	50.5	44.1	**−1.0** (−1.7, −0.4)	31.3	32.6	1.1 (0.4, 1.8)	49.1	42.3	**−2.4** (−3,3, −1,4)	28.2	27.9	−0.3 (−1.2, 0.7)
	Finland	1994–2005	48.1	33.5	**−3.4** (−3.9, −2.9)	8.8	9.7	**1.2**(0.5, 2.0)	40.6	29.2	**−3.4** (−3.7, −3.0)	6.8	8.2	**1.8** (0.9, 2.7)
	Norway	1994–2005[2]	36.8	33.7	−0.4 (−1.0, 0.1)	15.8	21.3	**3.1** (2.0, 4.3)	32.0	30.0	−0.4 (−0.9, 0.2)	13.5	17.3	**2.4** (1.1, 3.7)
	Sweden	1994–2005[2]	24.9	22.0	−0.5 (−1.1, 0.1)	13.6	16.7	**2.7** (1.7, 3.6)	22.9	20.1	**−1.2** (−1.5, −0.8)	11.1	15.3	**2.6** (1.7, 3.4)
	Ireland	1994–2005[2]	47.7	38.5	**−1.3** (−1.9, −0.7)	18.4	22.7	**2.3** (1.7, 3.0)	45.4	35.3	**−2.2** (−3.1, −1.3)	18.6	18.7	−0.1 (−1.4, 1.3)
	UK England & Wales[a]	1995–2004[3]	51.5	39.2	**−3.1** (−3.5, −2.7)	22.7	22.5	−0.2 (−0.5, 0.2)	46.3	33.1	**−3.3** (−3.5, −3.1)	19.8	19.1	**−0.4** (−0.6, −0.2)
	UK Northern Ireland	1994–2005	59.3	40.2	**−2.6** (−3.7, −1.5)	22.7	21.9	−0.0 (−0.8, 0.5)	47.2	34.9	**−2.3** (−3.0, −1.7)	17.4	18.0	0.3 (−0.7, 1.3)
	UK Scotland	1994–2004[4]	74.2	55.4	**−2.9** (−3.4, −2.5)	34.2	36.9	0.0 (−0.9, 1.0)	66.4	44.6	**−3.1** (−3.5, −2.7)	29.6	30.8	−0.1 (−0.5, 0.4)
Western Europe	Austria (Tyrol)	1994–2003	42.8	42.0	−1.3 (−3.3, 0.7)	12.4	12.8	2.0 (−1.6, 5.7)	37.5	36.9	−1.3 (−3.0, 0.5)	10.4	12.1	3.4 (−0.8, 7.8)
	France	1994–2000[5]	50.9	52.2	**0.4** (0.4, 0.5)	6.7	8.6	**4.2** (4.0, 4.3)	46.3	44.1	**−0.6** (−1.1, −0.2)	5.8	8.3	**4.1** (3.1, 5.2)
	Germany (Saarland)	1994–2005	63.4	52.7	**−2.2** (−2.8, −1,6)	15.7	17.8	**3.4** (1.2, 5.6)	57.8	47.4	**−2.5** (−3.4, −1.7)	11.7	15.0	**2.8** (1.6, 4.0)
	Netherlands	1994–2003	67.4	47.7	**−3.7** (−4.0, −3,4)	15.6	21.8	**3.7** (3.3, 4.2)	62.7	46.0	**−3.3** (−3.7, −2.9)	13.3	18.8	**4.0** (3.6, 4.4)
	Switzerland	1993–2003[6]	46.3	41.7	−1.4 (−3.2, 0.5)	13.0	15.7	**2.6** (2.2, 2.9)	36.9	31.2	**−1.9** (−2.6, −1.2)	9.4	11.7	**3.3** (2.1, 4.5)
Southern Europe	Croatia	1994–2004	70.3	60.4	−1.8 (−4.0, 0.4)	10.0	12.1	2.2 (−0.0, 4.4)	63.0	58.0	−1.2 (−3.3, 1.0)	8.3	10.8	**2.7** (0.7, 4.8)
	Italy (Modena)	1994–2005	71.9	48.9	**−3.0** (−4.3, −1.6)	10.5	15.0	**2.9** (0.3, 5.5)	68.7	42.6	**−3.9** (−4.9, −2.9)	11.2	10.6	0.4 (−2.2, 3.1)
	Malta[b]	1994–2005[4]	45.1	29.9	**−4.0** (−6.0, −1.9)	4.8	7.0	1.9 (−0.4, 4.2)	42.5	35.1	**−2.3** (−3.8, −0.7)	6.1	5.3	0.5 (−4.4, 5.6)
	Slovenia	1994–2003	62.4	58.9	**−2.1** (−4.0, −0.2)	9.7	14.9	**5.0** (3.4, 6.6)	61.0	49.6	**−2.7** (−3.2, −2.2)	8.5	12.4	**3.8** (2.5, 5.3)
	Spain	1994–2002[7]	52.6	52.6	0.4 (−1.6, 2.3)	4.6	5.3	2.2 (−1.0, 5.6)	48.5	45.5	**−0.8** (−1.1, −0.4)	3.8	5.3	**3.8** (3.4, 4.3)
Central Europe	Czech Republic	1994–2004	74.1	60.1	**−2.4** (−2.9, −1.8)	12.5	15.4	**1.9** (1.2, 2.7)	65.3	51.9	**−2.7** (−3.2, −2.2)	10.1	11.6	**1.5** (0.8, 2.3)
	Lithuania	1993–2004[8]	65.8	54.4	−1.9 (−5.9, 2.3)	6.3	6.4	0.6 (−9.3, 11.5)	63.3	51.6	**−1.8** (−2.3, −1.3)	6.3	5.6	−0.3 (−2.1, 1.6)
	Poland	1994–2004[3]	85.6	63.1	**−3.7** (−4.6, −2.8)	15.6	13.9	**−2.4** (−4.8, −0.1)	71.3	64.6	**−0.9** (−1.1, −0.6)	10.7	14.3	**2.6** (2.0, 3.2)

a Incidence only for England.
b Data valid for C34.
1 Mortality until 2001.
2 Mortality until 2004.
3 Mortality until 2005.
4 Mortality until 2006.
5 Mortality until 2002.
6 Only average incidence for periods 1993–1996, 1997–1999, and 2001–2003 and mortality for 1995–2004.
7 Mortality until 2003.
8 Only average incidence for periods 1993–1997, 1998–2000, 2001–2002, and 2003–2004.
* EAPC: estimated annual percentage change, calculated based on the rates during the indicated period.

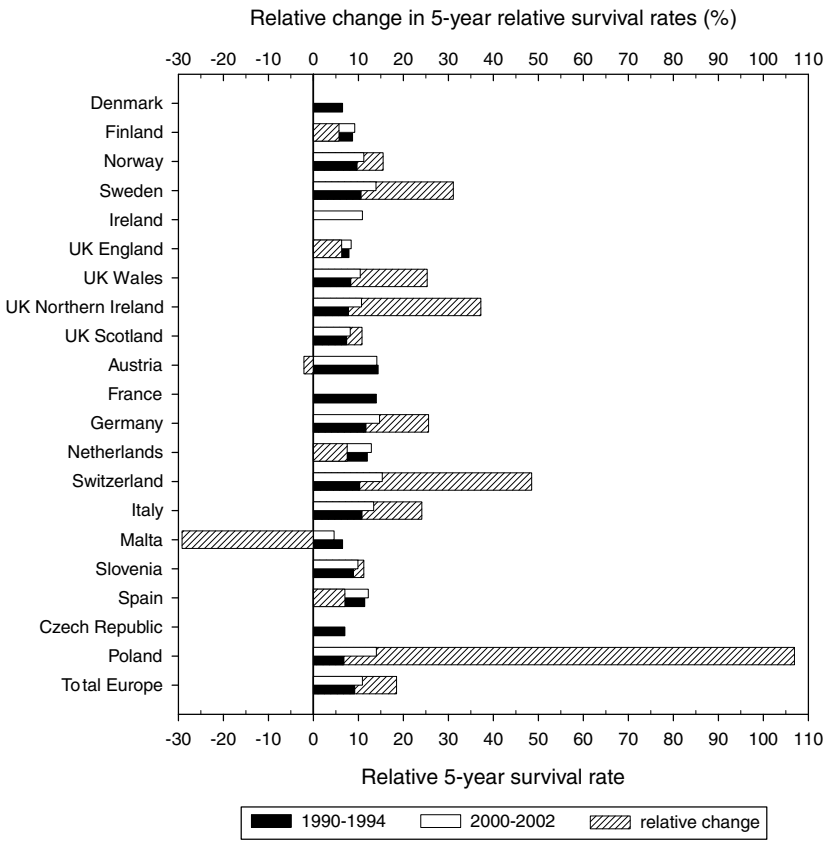

Fig. 5 – Trends in 5-year age-adjusted relative survival for lung cancer in Europe Sources: EUROCARE-3[9] and EUROCARE-4.[3]

Table 9b – Overview of recent trends in incidence of, survival for and mortality from lung cancer in Europe

Incidence	Survival	Mortality	Countries	
			Males	Females
↑	↑	↑	–	Norway, Sweden, Germany, Switzerland
↑	↑	=	–	Italy
↑	=	↑	–	Finland, France[a], Netherlands, Slovenia
↑	=	=	–	Ireland[b]
↑	=	↓	France[a]	–
↑	?	↑	–	Czech Republic
=	↑	↑	–	UK-England & Wales
=	↑	=	Norway	UK-Northern Ireland
=	↑	↓	Sweden, Switzerland	–
=	=	↑	–	Spain
=	=	=	Austria	UK-Scotland, Austria
=	=	↓	Spain	–
=	↓	=	–	Malta
=	?	↑	–	Croatia
=	?	=	Croatia	Denmark, Lithuania
=	?	↓	Lithuania	–
↓	↑	↑	–	Poland
↓	↑	↓	UK-Nor thern Ireland, Germany, Italy, Poland	–
↓	=	↓	Finland, Ireland[b], UK-England & Wales/Scotland, Netherlands, Slovenia	–
↓	↓	↓	Malta	–
↓	?	↓	Denmark, Czech Republic	–

a Survival trends are based on a report of FRANCIM.[93]
b survival trends are based on a report of the Ireland Cancer Registry.[81]

Table 10a – Trends in incidence of and mortality from melanoma (C43) in Europe by gender

	Country	Period	Incidence						Mortality					
			Males			Females			Males			Females		
			WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)
Northern Europe	Denmark	1994–2003[1]	10.8	13.6	**2.1** (0.6, 3.6)	14.6	16.9	1.2 (−1.2, 3.7)	2.8	3.0	0.3 (−2.8, 3.5)	2.1	2.3	1.3 (−5.6, 8.6)
	Finland	1994–2005	8.4	10.3	**2.0** (1.0, 3.1)	6.1	8.5	**2.7** (2.0, 3.5)	2.3	2.5	0.2 (−1.8, 2.2)	1.1	0.9	−1.5 (−3.7, 0.7)
	Norway	1994–2005[2]	15.3	16.1	−0.1 (−1.2, 1.1)	15.8	15.7	−0.3 (−1.8, 1.3)	4.3	3.8	0.3 (−1.9, 2.5)	2.3	2.9	0.9 (−3.0, 4.9)
	Sweden	1994–2005[2]	11.9	13.7	**1.4** (0.5, 2.4)	12.2	13.9	**1.6** (0.6, 2.7)	2.6	2.4	−0.0 (−1.4, 1.3)	1.6	1.9	**2.5** (0.7, 4.3)
	Ireland	1994–2005[2]	6.2	9.3	**4.4** (2.9, 5.8)	10.5	13.1	**2.5** (1.1, 3.8)	1.4	1.7	1.4 (−3.6, 6.5)	1.0	1.7	4.4 (−0.0, 9.0)
	UK England & Wales[1]	1995–2004[3]	5.5	9.0	**5.9** (4.9, 6.9)	7.7	10.6	**4.1** (2.9, 5.4)	1.9	2.0	**1.1** (0.2, 2.1)	1.4	1.5	0.2 (−0.5, 0.9)
	UK Northern Ireland	1994–2005	7.2	8.7	**3.0** (0.7, 5.3)	10.1	10.9	**2.2** (0.5, 3.8)	1.3	2.2	**7.5** (4.6, 10.6)	1.7	0.9	**−3.5** (−6.6, −0.3)
	UK Scotland	1994–2004[4]	6.7	10.5	**3.4** (2.0, 4.8)	9.9	12.9	1.9 (−0.2, 4.1)	1.6	2.1	**2.0** (0.5, 3.5)	1.0	1.2	1.1 (−1.2, 3.5)
Western Europe	Austria (Tyrol)	1995–2003	8.2	21.5	**10.6** (3.9, 17.9)	7.5	17.5	**7.0** (1.3, 13.0)	2.3	2.0	−4.4 (−10.0, 1.6)	1.4	0.6	−1.9 (−23.2, 25.2)
	France	1994–2000[5]	5.4	7.6	**5.8** (5.5, 6.1)	7.2	9.5	**4.8** (4.6, 5.0)	1.5	1.6	**2.1** (0.6, 3.6)	1.1	1.1	−0.3 (−1.8, 1.1)
	Germany (Saarland)	1994–2005	7.0	7.7	2.1 (−0.1, 4.4)	4.9	9.0	**5.1** (3.0, 7.2)	1.8	1.6	0.1 (−3.3, 3.6)	0.9	0.7	1.4 (−5.8, 9.2)
	Netherlands	1994–2003	8.1	10.4	**3.5** (2.4, 4.5)	11.3	14.7	**3.2** (2.0, 4.3)	2.4	2.5	**2.1** (0.6, 3.7)	1.6	1.7	0.8 (−1.1, 2.8)
	Switzerland	1993–2003[6]	12.6	15.3	2.6 (−3.2, 8.8)	12.6	15.5	2.8 (−3.0, 9.0)	2.6	2.6	−2.6 (−5.1, 0.0)	1.3	1.6	0.4 (−2.5, 3.4)
Southern Europe	Croatia	1994–2004	3.4	6.2	**5.8** (0.9, 10.9)	2.9	6.3	**7.4** (3.1, 11.9)	2.3	2.9	5.0 (−0.8, 11.0)	1.2	2.2	3.4 (−0.2, 7.1)
	Italy (Modena)	1994–2005	7.8	9.0	−0.3 (−5.9, 5.7)	6.7	7.0	−1.0 (−4.6, 2.8)	1.0	1.9	7.3 (−1.7, 17.1)	1.2	0.9	−0.9 (−8.5, 7.2)
	Malta	1995–2005[4]	3.0	4.5	**8.4** (2.8, 14.4)	5.5	10.3	4.1 (−1.4, 9.8)	0.8	1.7	4.0 (−9.0, 19.0)	0.3	0.4	−6.4 (−18.3, 7.2)
	Slovenia	1994–2003	7.7	11.7	5.0 (1.0, 9.2)	7.6	10.5	**5.4** (2.1, 8.8)	2.5	3.2	2.9 (−2.6, 8.7)	2.7	2.2	−4.8 (−9.6, 0.4)
	Spain	1994–2002[7]	No data			No data			1.1	1.2	0.3 (−2.3, 3.0)	0.9	0.8	−1.1 (−2.5, 0.4)
Central Europe	Czech Republic	1994–2004	8.1	11.0	**3.5** (2.6, 4.5)	7.2	9.5	**2.5** (1.0, 4.0)	2.8	3.0	−0.3 (−1.7, 1.1)	1.9	1.7	0.1 (−1.7, 2.0)
	Lithuania	1993–2004[8]	2.6	3.8	5.1 (−0.4, 10.8)	4.0	4.5	3.7 (−30.1, 53.8)	1.1	1.3	3.1 (−0.5, 6.8)	1.1	1.4	3.3 (−0.4, 7.2)
	Poland	1994–2004[3]	2.9	3.7	1.8 (−0.0, 3.6)	3.8	3.4	−1.2 (−3.5, 1.2)	1.6	2.0	**1.5** (0.5, 2.5)	1.3	1.2	−0.2 (−1.8, 1.3)

a Incidence only for England.
1 Mortality until 2001.
2 Mortality until 2004.
3 Mortality until 2005.
4 Mortality until 2006.
5 Mortality until 2002.
6 Only average incidence for periods 1993–1996, 1997–1999, and 2001–2003 and mortality for 1995–2004.
7 Mortality until 2003.
8 Only average incidence for periods 1993–1997, 1998–2000, 2001–2002, and 2003–2004.
* EAPC: estimated annual percentage change, calculated based on the rates during the indicated period.

Table 10b – Overview of recent trends in incidence of, survival for and mortality from melanoma in Europe

Incidence	Survival	Mortality	Countries	
			Males	Females
↑	↑	↑	UK, Netherlands	–
↑	↑	=	Finland, Malta, Czech Republic	Finland, UK-England & Wales, Germany, Netherlands, Slovenia, Czech Republic
↑	↑	↓	–	UK-Northern Ireland
↑	=	↑	France[a]	Sweden
↑	=	=	Sweden, Austria	Austria, France[a]
↑	?	=	Denmark, Ireland, Croatia	Ireland, Croatia
=	↑	↑	Poland	–
=	↑	=	Germany, Italy, Slovenia	UK-Scotland, Italy, Malta, Poland
=	=	=	Norway, Switzerland	Norway, Switzerland
=	?	=	Lithuania	Denmark, Lithuania
?	↑	=	Spain	Spain

a Survival trends are based on a report of FRANCIM.[93]

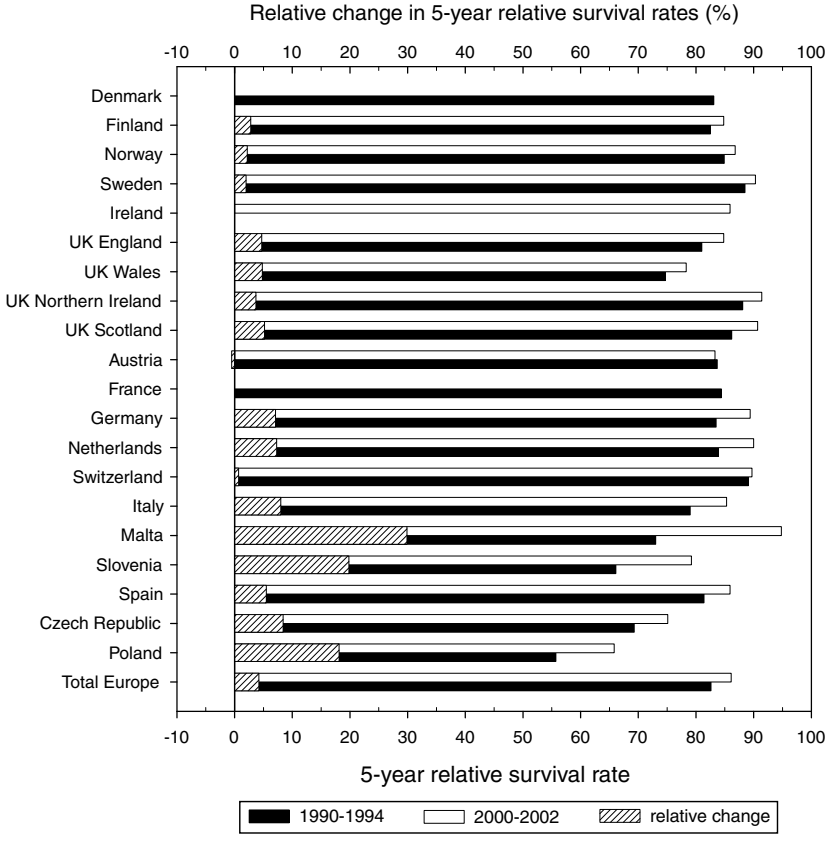

Fig. 6 – Trends in 5-year age-adjusted relative survival for melanoma in Europe Sources: EUROCARE-3[9] and EUROCARE-4.[3]

(Table 9a). Five-year relative survival of lung cancer slightly improved over time from 9 to 11% in Europe with a marked relative increase of 107% in Poland (Fig. 5, Table 9b).

Geographical variations in lung cancer risk are influenced by past exposure to tobacco smoking. There are however indications that rates are starting to decline among younger females in some countries, which will translate into declining incidence and mortality rates in females in the near future.[38]

Improvement in survival such as in Poland is likely caused by better access to care and treatment if there were no changes in data completeness.

Skin melanoma (*C43*). In some European countries incidence rates for skin melanoma continued to increase in others, they started to stabilize. In contrast with incidence, mortality rates have stabilized in most countries, except for the English, French, Dutch and Polish males and Swedish females (Table 10a). Over the past decade, 5-year relative survival rates improved in most countries with a relative increase varying from 1 to 30%. Improvements in survival were often stronger in countries with markedly increasing incidence rates (Fig. 6, Table 10b).

Table 11a – Trends in incidence of and mortality from female breast cancer (C50) in Europe

	Country	Period	Females					
			Incidence			Mortality		
			WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)
Northern Europe	Denmark	1994–2003[1]	75.2	85.3	**1.6** (1.1, 2.1)	25.8	24.9	−1.6 (−3.4, 0.3)
	Finland	1994–2005	66.4	82.2	**1.8** (1.4, 2.2)	15.3	13.7	**−1.4** (−1.9, −0.9)
	Norway	1994–2005[2]	58.3	75.7	**2.3** (1.4, 3.1)	19.9	15.5	**−2.5** (−3.2, −1.8)
	Sweden	1994–2005[2]	78.6	87.1	**1.4** (1.1, 1.8)	16.6	15.6	**−1.1** (−1.9, −0.3)
	Ireland	1994–2005[2]	69.8	86.0	**2.3** (1.8, 2.8)	26.1	21.9	**−1.9** (−2.9, −0.8)
	UK England & Wales[a]	1995–2004[3]	75.5	88.0	**1.6** (1.1, 2.1)	25.1	19.6	**−2.3** (−2.6, −2.1)
	UK Northern Ireland	1994–2005	73.2	80.8	**1.1** (0.5, 1.8)	26.1	17.9	**−2.6** (−4.1, −1.0)
	UK Scotland	1994–2004[4]	76.2	87.5	**1.1** (0.5, 1.6)	26.8	19.4	**−2.3** (−2.8, −1.7)
Western Europe	Austria (Tyrol)	1994–2003	68.8	77.7	**1.6** (0.8, 2.5)	22.1	15.8	**−3.0** (−4.6, −1.4)
	France	1994–2000[5]	78.4	88.9	**2.1** (2.1, 2.2)	19.7	18.3	**−0.8** (−1.3, −0.3)
	Germany (Saarland)	1994–2005	73.2	73.8	0.4 (−0.3, 1.2)	21.5	19.8	−1.4 (−2.9, 0.2)
	Netherlands	1994–2003	88.2	90.6	**0.9** (0.3, 1.6)	26.7	21.8	**−2.0** (−2.7, −1.4)
	Switzerland	1993–2003[6]	77.3	84.8	1.3 (−5.4, 8.4)	23.0	17.5	**−2.4** (−3.7, −1.1)
Southern Europe	Croatia	1994–2004	45.7	52.9	1.6 (−1.2, 4.4)	18.1	17.9	−0.6 (−2.0, 1.0)
	Italy (Modena)	1994–2005	75.5	91.4	**1.6** (0.2, 2.9)	22.9	16.6	**−3.8** (−7.1, −0.4)
	Malta	1994–2005[4]	65.1	73.6	0.2 (−0.9, 1.2)	36.5	20.4	**−5.0** (−7.3, −2.7)
	Slovenia	1994–2003	47.8	64.4	**2.7** (1.5, 3.8)	21.3	18.7	−1.0 (−2.5, 0.5)
	Spain	1994–2002[7]	55.4	73.4	**4.0** (0.8, 7.3)	17.5	13.9	**−2.6** (−3.2, −2.1)
Central Europe	Czech Republic	1994–2004	55.0	62.5	**1.8** (1.0, 2.6)	23.5	19.0	**−2.1** (−2.6, −1.7)
	Lithuania	1993–2004[8]	37.7	43.2	3.3 (−26.5, 45.0)	19.7	17.4	−0.7 (−1.5, 0.0)
	Poland	1994–2004[3]	36.2	40.6	0.5 (−0.6, 1.6)	15.9	14.9	**−0.9** (−1.3, −0.5)

a Incidence only for England.
1 Mortality until 2001.
2 Mortality until 2004.
3 Mortality until 2005.
4 Mortality until 2006.
5 Mortality until 2002.
6 Only average incidence for periods 1993–1996, 1997–1999, and 2001–2003 and mortality for 1995–2004.
7 Mortality until 2003.
8 Only average incidence for periods 1993–1997, 1998–2000, 2001–2002, and 2003–2004.
* EAPC: estimated annual percentage change, calculated based on the rates during the indicated period.

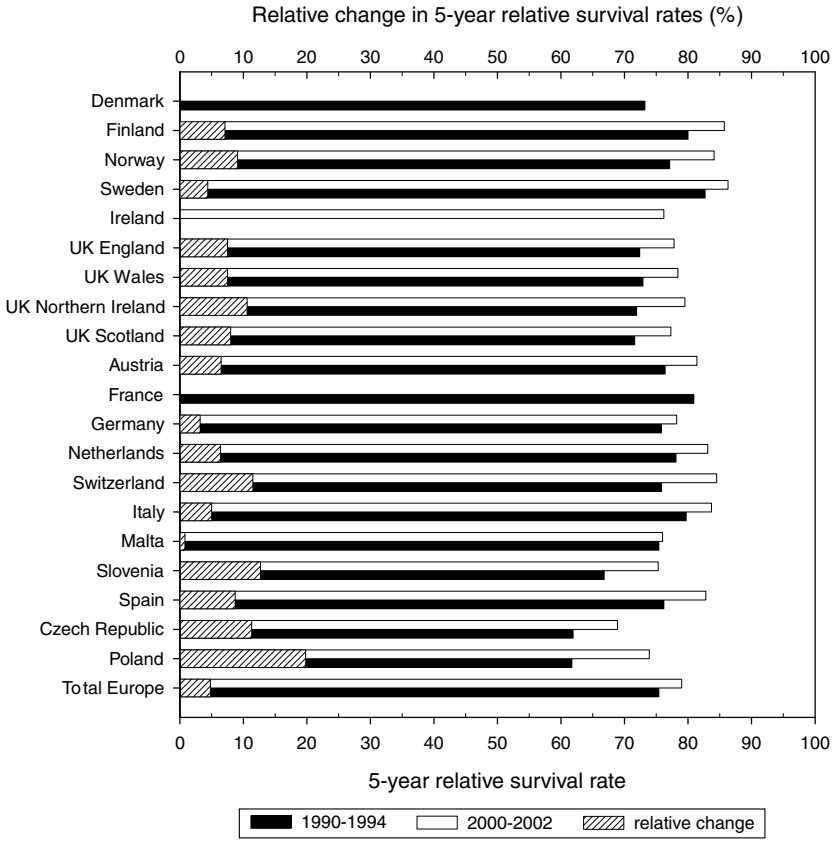

Fig. 7 – Trends in 5-year age-adjusted relative survival for female breast cancer in Europe Sources: EUROCARE-3[9] and EUROCARE-4.[3]

Table 11b – Overview of recent trends in incidence of, survival for and mortality from female breast cancer in Europe

Incidence	Survival	Mortality	Countries
			Females
↑	↑	=	Slovenia
↑	↑	↓	Finland, Norway, Sweden, Ireland[a], UK, Austria, France[b], Netherlands, Italy, Spain, Czech Republic
↑	?	=	Denmark
=	↑	=	Germany
=	↑	↓	Switzerland, Poland
=	=		Malta
=	?	=	Croatia, Lithuania

a Survival trend is based on a report of the Ireland Cancer Registry.[81]
b Survival trend is based on a report of FRANCIM.[93]

The increasing incidence rates of skin melanoma, reported since the 1960s has always been attributed to the ever increasing popularity of intensive sunbathing. Recently, the incidence rates started to level off or decrease starting among young people in the Nordic countries.[39] Possibly the efforts of campaigns, like EUROMELANOMA[40] which aimed to increase the awareness of skin melanoma and the risks of excessive sunbathing and sunburns, are starting to show an effect. Screening programs exist for people belonging to Familial Atypical Multiple Mole Melanoma (FAMMM) families, which are at increased risk of developing a melanoma. Melanomas occurring on the trunk generally have a worse prognosis than those occurring on the limbs or head and neck.

In absence of new treatment, the observed improvements of survival can be explained by earlier detection accompanied by a more adequate excision of early diagnosed melanomas.[41] The counterintuitive change in Austria suggest that data quality might have been imperfect, e.g. incompleteness of data.

Female breast cancer (C50). Breast cancer incidence varied considerably in Europe with lowest rates in Central Europe, Croatia and Slovenia (41 to 64 per 100,000) and highest rates in the Netherlands and Italy (91 per 100,000). Both the highest and lowest mortality rates were observed in Northern Europe (in Denmark and Finland, respectively). In most European countries, incidence rates increased over the past decade,

Table 12a – Trends in incidence of and mortality from cervical cancer (C53) in Europe

	Country	Period	Females					
			Incidence			Mortality		
			WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)
Northern Europe	Denmark	1994–2003[1]	12.8	10.8	**−3.1** (−4.4, −1.7)	4.3	2.9	−4.2 (−8.2, 0.0)
	Finland	1994–2005	3.7	3.3	−0.8 (−2.4, 0.9)	1.2	1.0	−1.7 (−5.5, 2.3)
	Norway	1994–2005[2]	11.3	9.4	**−2.6** (−3.7, −1.5)	3.3	2.0	**−4.1** (−5.9, −2.2)
	Sweden	1994–2005[2]	7.8	6.6	**−1.1** (−2.1, −0.2)	2.0	1.9	−1.2 (−3.4, 1.0)
	Ireland	1994–2005[2]	8.4	9.9	0.6 (−1.4, 2.5)	2.7	3.3	−1.5 (−4.2, 1.3)
	UK England & Wales[a]	1995–2004[3]	8.2	6.4	**−2.8** (−3.2, −2.3)	3.1	1.9	**−4.8** (−5.4, −4.3)
	UK Northern Ireland	1994–2005	7.4	8.2	−1.6 (−3.7, 0.5)	3.2	1.1	**−4.9** (−9.6, −0.0)
	UK Scotland	1994–2004[4]	9.9	8.0	**−2.8** (−3.9, −1.6)	3.6	2.1	**−3.6** (−4.8, −2.4)
Western Europe	Austria (Tyrol)	1995–2003	13.7	10.0	0.1 (−4.0, 4.3)	5.5	2.8	−7.9 (−16.7, 2.0)
	France	1994–2000[5]	9.1	8.0	**−2.1** (−2.4, −1.8)	1.7	1.4	−1.4 (−3.7, 1.0)
	Germany (Saarland)	1994–2005	12.1	9.0	**−2.8** (−5.2, −0.3)	3.4	2.3	−1.6 (−5.8, 2.9)
	Netherlands	1994–2003	6.5	4.9	**−3.3** (−4.6, −1.9)	1.7	1.4	−2.1 (−5.1, 0.9)
	Switzerland	1993–2003[6]	6.9	5.6	−2.7 (−6.5, 1.2)	2.0	1.2	**−5.9** (−8.2, −3.4)
Southern Europe	Croatia	1994–2004	12.3	9.9	**−2.0** (−3.9, −0.2)	2.8	2.3	**−2.0** (−3.8, −0.3)
	Italy (Modena)	1994–2005	8.4	3.8	−4.5 (−9.0, 0.1)	1.1	0.1	−6.3 (−20.8, 10.9)
	Malta	1994–2005[4]	10.1	2.1	**−11.3** (−16.8, −5.5)	0.4	1.2	−1.2 (−9.6, 13.2)
	Slovenia	1994–2003	13.2	15.0	−0.4 (−3.1, 2.4)	3.3	3.0	**−4.0** (−7.0, −0.9)
	Spain	1994–2002[7]	No data			1.8	1.5	**−2.0** (−3.6, −0.5)
Central Europe	Czech Republic	1994–2004	17.3	13.9	**−1.8** (−2.6, −1.0)	5.8	4.8	**−2.1** (−3.1, −1.2)
	Lithuania	1993–2004[8]	14.6	20.1	5.4 (−21.5, 41.5)	7.5	8.7	**1.7** (0.5, 2.9)
	Poland	1994–2004[3]	17.2	11.9	**−3.4** (−4.2, −2.5)	7.5	5.7	**−2.4** (−3.0, −1.8)

a Incidence only for England.
1 Mortality until 2001.
2 Mortality until 2004.
3 Mortality until 2005.
4 Mortality until 2006.
5 Mortality until 2002.
6 Only average incidence for periods 1993–1996, 1997–1999, and 2001–2003 and mortality for 1995–2004.
7 Mortality until 2003.
8 Only average incidence for periods 1993–1997, 1998–2000, 2001–2002, and 2003–2004.
* EAPC: estimated annual percentage change, calculated based on the rates during the indicated period.

except in Germany, Switzerland, Croatia, Malta, Lithuania and Poland, where rates remained stable. Mortality rates decreased in most countries, except for the Danish, German, Croatian, Slovenian and Lithuanian females (Table 11a). Five-year relative survival rates have improved in all countries with a relative increase varying from 1% in Malta to 20% in Poland (Fig. 7, Table 11b).

The rising breast cancer incidence and survival rates are partly influenced by the presence of organised breast cancer screening programmes or opportunistic screening through increased detection of smaller and less aggressive tumours resulting in a decreasing mortality after 5–8 years.[42] This is attributed to lead-time bias because of earlier detection of breast cancer and to length bias due to detection of slow growing tumours and possibly a real effect on mortality due to effective treatment of early detected cancers. However, before the introduction of mass screening, incidence rates were already increasing in most countries suggesting the role of other risk increasing factors.[43] Some of the risk factors, age at menarche, age at first childbirth, number of children and the proportion of nulliparous women, have all changed in an adverse way and had probably a negative impact on the trend of breast cancer.[44] However these risk factors are difficult to modify.[45] Other lifestyle related risk factors are relatively more amenable to primary prevention interventions, including post-menopausal obesity, alcohol consumption and low physical activity.

Recent decreases in breast cancer incidence have been attributed to the decreased use of hormone replacement therapy, which will continue in the near future in countries where usage was high.[46,47]

The continuing rise in survival has also been observed before introduction of mass screening suggesting improved staging and treatment, such as application of tamoxifen in postmenopausal patients and chemotherapy in premenopausal patients.

Cervical cancer (C53). Incidence and mortality rates of cervical cancer varied greatly throughout Europe with highest rates in Central Europe and Slovenia and lowest rates in Finland, Italy and Malta. In contrast with most European countries where incidence and mortality rates decreased, rates remained stable in Finland, Ireland, Austria (Tyrol), and Italy (Modena). Lithuania was the only country included in this study that showed increases in cervical cancer mortality

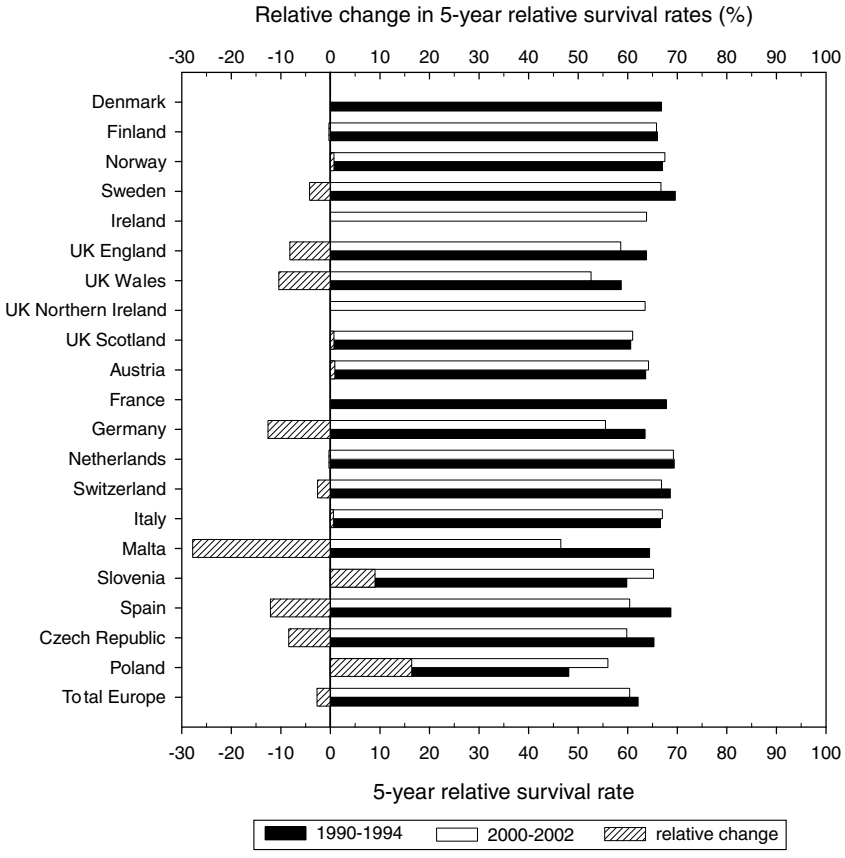

Fig. 8 – Trends in 5-year age-adjusted relative survival for cervical cancer in Europe Sources: EUROCARE-3[7] and EUROCARE-4.[3]

Table 12b – Overview of recent trends in incidence of, survival for and mortality from cervical cancer in Europe

Incidence	Survival	Mortality	Countries
			Females
=	↑	↓	UK-Northern Ireland[a]
=	=	=	Finland, Austria, Italy
=	=	↓	Switzerland
=	?	↑	Lithuania
=	?	=	Ireland
↓	↑	↓	Slovenia, Poland
↓	=	=	Netherlands, France[b]
↓	=	↓	Norway, UK-Scotland
↓	↓	=	Sweden, Germany, Malta
↓	↓	↓	UK-England & Wales, Czech Republic
↓	?	=	Denmark
↓	?	↓	Croatia
?	↓	↓	Spain

a Survival trend is based on a report of the Northern Ireland Cancer Registry.[89]
b Survival trend is based on a report of FRANCIM.[93]

(Table 12a). Five-year survival improved remarkably in Slovenia and Poland with a relative increase between 9 and 16%. In other parts of Europe, survival remained stable or decreased. In general the 5-year survival was between 60% and 70% (Fig. 8, Table 12b).

The main cause of cervical cancer is sexually transmitted infection of human papilloma virus (HPV).[48] Geographical variations are mainly due to historical patterns of risk factors like sexual behaviour, age at first coitus, oral contraceptive use, the number of sexual partners, smoking, and, the influence of screening activities. Screening for cervical cancer can lower incidence rates up to 80%. Such low rates have indeed been accomplished in countries with long-running, effective screening programs, like Finland and the Netherlands.[49] In countries where organised screening programs have been recently introduced or improved, decreases in

Table 13a – Trends in incidence of and mortality from corpus uteri cancer (C54) in Europe

	Country	Period	Females					
			Incidence			Mortality		
			WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)
Northern Europe	Denmark	1994–2003[1]	13.4	12.5	−0.5 (−1.3, 0.4)	2.8	1.9	−3.5 (−8.6, 2.0)
	Finland	1994–2005	13.5	14.6	0.3 (−0.8, 1.5)	2.2	2.2	−0.1 (−1.6, 1.4)
	Norway	1994–2005[2]	12.3	16.2	**2.5** (1.7, 3.2)	2.6	1.6	−2.2 (−5.3, 1.0)
	Sweden	1994–2005[2]	13.5	14.7	0.3 (−0.4, 1.1)	1.4	1.1	−0.5 (−2.5, 1.6)
	Ireland	1994–2005[2]	8.0	10.7	**1.9** (0.5, 3.3)	1.7	1.3	−1.2 (−4.3, 1.9)
	UK England & Wales[a,b]	1995–2004[3]	9.6	11.7	**2.5** (1.8, 3.2)	2.2	2.4	**1.0** (0.0, 2.0)
	UK Northern Ireland	1994–2005	8.3	13.4	**5.5** (3.7, 7.3)	1.2	0.9	2.6 (−2.3, 7.7)
	UK Scotland	1994–2004[4]	8.9	11.1	**1.5** (0.4, 2.7)	1.9	1.6	0.8 (−2.1, 3.7)
Western Europe	Austria (Tyrol)	1995–2003	12.3	11.9	−1.2 (−4.7, 2.4)	1.5	1.8	−1.7 (−13.3, 11.4)
	France[c]	1994–2000[5]	9.8	9.2	**−1.1** (−1.1, −1.0)	3.5	2.9	**−2.1** (−3.0, −1.2)
	Germany (Saarland)	1994–2005	14.0	12.8	−1.5 (−3.1, 0.1)	1.2	1.1	−0.4 (−6.9, 6.5)
	Netherlands[b]	1994–2003	11.2	11.6	0.3 (−0.4, 1.0)	2.4	2.0	−0.3 (−1.9, 1.3)
	Switzerland[b]	1993–2003[6]	12.9	12.4	**−0.5** (−1.0, −0.1)	2.5	2.3	−1.5 (−3.6, 0.7)
Southern Europe	Croatia[b]	1994–2004	11.2	12.2	−0.3 (−2.5, 1.9)	4.2	3.1	**−3.8** (−6.8, −0.6)
	Italy (Modena)	1994–2005	12.9	16.4	2.8 (−0.7, 6.4)	1.2	1.1	−3.7 (−10.5, 3.7)
	Malta[b]	1994–2005[4]	18.4	16.5	−1.0 (−3.1, 1.2)	4.0	3.7	−1.8 (−5.4, 2.0)
	Slovenia[b]	1994–2003	14.9	17.1	**1.6** (0.5, 2.6)	5.0	3.7	**−4.2** (−7.6, −0.7)
	Spain[c]	1994–2002[7]	11.0	11.2	0.4 (−1.3, 2.0)	3.2	2.6	**−2.5** (−3.4, −1.6)
Central Europe	Czech Republic	1994–2004	17.9	18.2	−0.1 (−0.5, 0.4)	4.5	4.0	**−2.3** (−3.5, −0.9)
	Lithuania[b]	1993–2004[8]	14.0	16.6	5.2 (−41.4, 88.9)	5.4	3.5	**−3.4** (−4.9, −2.0)
	Poland[b]	1994–2004[3]	11.9	13.8	0.6 (−0.9, 2.1)	3.8	3.2	**−1.4** (−2.0, −0.7)

a Incidence only for England.
b Data valid for C54-55.
c Mortality data valid for C54-55.
1 Mortality until 2001.
2 Mortality until 2004.
3 Mortality until 2005.
4 Mortality until 2006.
5 Mortality until 2002.
6 Only average incidence for periods 1993–1996, 1997–1999, and 2001–2003 and mortality for 1995–2004.
7 Mortality until 2003.
8 Only average incidence for periods 1993–1997, 1998–2000, 2001–2002, and 2003–2004.
* EAPC: estimated annual percentage change, calculated based on the rates during the indicated period.

incidence and mortality are observed.[50–52] The improvement of survival in Slovenia and Poland is probably due to improvement of treatment and not yet an effect of screening. The decreasing survival rates in some European countries where mortality rates were already low can be explained by effective screening, causing a shift in the stage distribution by detection of pre-malignant lesions and slow growing tumours and leaving the more aggressive tumours with a worse prognosis.[53] This might be compensated again by advances in treatment that happened during the 1990s.

Corpus uteri cancer (C54). The recent incidence rate of corpus uteri cancer varied between 9.2 (France) and 18 (Czech Republic) per 100,000. In most countries incidence rates remained stable, except in Norway, Ireland, the UK and Slovenia where rates were increasing. Mortality rates were dropping mostly in Southern and Central Europe, but remained still higher than other parts of Europe (Table 13a). Consistently, in most countries, moderate improvements in 5-year survival were observed, except for Malta, where the relative improvement was 28% (Fig. 9, Table 13b).

Geographical variation in cancer incidence of the corpus uteri across Europe can be due to variation in prevalence of risk factors like oestrogen replacement therapy, sequential oral contraceptives, nulliparity and obesity.[34,54] The higher mortality in Southern and Central Europe is probably indicating some disparity in the early diagnosis and treatment of patients.[54] However, the observed increased 5-year survival in these countries indicates improvements and probably the mortality will decrease further. The counterintuitive change of survival in Austria and Spain suggest that data quality might have been imperfect, e.g. incompleteness of (follow-up) data.

Ovarian cancer (C56). Within Europe, incidence and mortality rates of ovarian cancer were largely similar and quite stable or decreasing over time (Table 14a). Five-year survival improved slightly over time in Europe from 37 to 42% (Table 14b and 14c).

Ovarian cancer has different risk factors like personal or family history of breast or ovarian cancer, obesity, oestrogen replacement therapy, no oral contraceptive use, late age at

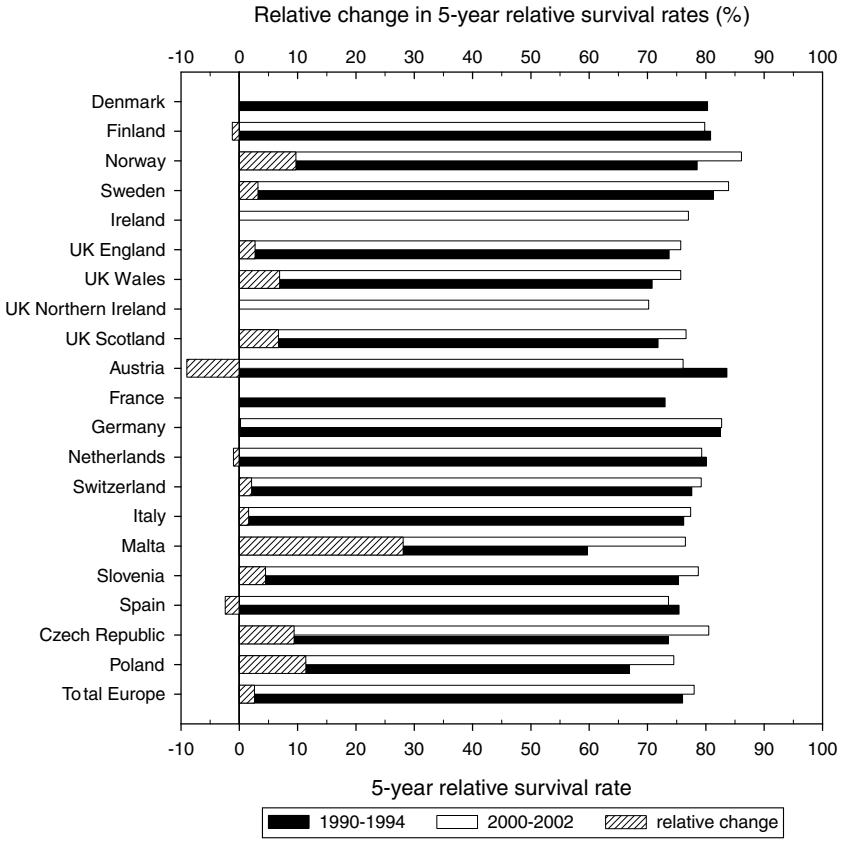

Fig. 9 – Trends in 5-year age-adjusted relative survival for corpus uteri cancer in Europe Sources: EUROCARE-3[7] and EUROCARE-4.[3]

Table 13b – Overview of recent trends in incidence of, survival for and mortality from corpus uteri cancer in Europe

Incidence	Survival	Mortality	Countries
			Females
↑	↑	↑	UK-England & Wales
↑	↑	=	Norway, UK-Northern Ireland[a]/Scotland
↑	↑	↓	Slovenia
↑	?	=	Ireland
=	↑	=	Sweden, Malta
=	↑	↓	Czech Republic, Poland
=	=	=	Finland, Germany, Netherlands, Italy
=	=	↓	Spain
=	↓	=	Austria
=	?	=	Denmark
=	?	↓	Croatia, Lithuania
↓	↑	↓	France[b]
↓	=	=	Switzerland

a Survival trend is based on a report of the Northern Ireland Cancer Registry.[89]
b Survival trend is based on a report of FRANCIM.[93]

last birth and more debatable is the use of fertility drugs and/or subfertility.[55] Five-year survival rates for ovarian cancer are largely determined by the stage at diagnosis: with early diagnosis and treatment, the 5-year relative survival rate is over 90%. Unfortunately, ovarian cancer has very non-specific symptoms and only a small percentage of cases are found at an early stage. In addition, age is also an important prognostic factor.[56] Five-year relative survival rates are substantially lower for females aged 70 and over compared with younger females (Table 14b). In the south-eastern Netherlands, improvements in survival were accomplished in the elderly since the late 90's only.[56] Surgical management of ovarian cancer and regionalisation of care were also reported to be related to improved survival.[57,58]

Table 14a – Trends in incidence of and mortality from ovarian cancer (C56) in Europe

	Country	Period	Females					
			Incidence			Mortality		
			WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)
Northern Europe	Denmark[a]	1994–2003[1]	13.7	11.9	−0.8 (−2.1, 0.4)	9.0	8.4	−0.8 (−3.1, 1.5)
	Finland[a]	1994–2005	11.2	9.0	−1.0 (−2.2, 0.2)	6.4	5.4	−1.7 (−3.1, −0.3)
	Norway[a]	1994–2005[2]	14.3	11.2	**−1.4** (−2.6, −0.3)	7.9	7.4	−1.2 (−2.9, 0.5)
	Sweden[a]	1994–2005[2]	12.9	9.4	**−2.3** (−3.0, −1.6)	7.4	6.6	−1.1 (−2.3, 0.1)
	Ireland[a]	1994–2005[2]	12.8	13.2	0.1 (−1.0, 1.3)	8.4	8.2	−0.4 (−2.1, 1.4)
	UK England & Wales[a,b]	1995–2004[3]	13.3	12.3	**−0.8** (−1.4, −0.2)	8.1	7.1	**−1.4** (−2.0, −0.7)
	UK Northern Ireland	1994–2005	13.4	13.4	0.8 (−0.9, 2.5)	6.7	8.3	1.3 (−0.8, 3.4)
	UK Scotland	1994–2004[4]	13.8	12.8	−0.7 (−2.0, 0.5)	9.1	7.1	**−1.5** (−2.4, −0.6)
Western Europe	Austria (Tyrol)[a]	1995–2003	16.9	11.4	**−4.2** (−7.1, −1.3)	6.1	6.7	−2.7 (−9.3, 4.4)
	France[a]	1994–2000[5]	9.1	9.0	**−0.2** (−0.4, −0.1)	5.5	5.5	−0.2 (−0.6, 0.2)
	Germany (Saarland)[a]	1994–2005	11.1	8.7	−0.7 (−2.6, 1.2)	6.2	6.1	0.7 (−1.8, 3.4)
	Netherlands	1994–2003	10.7	8.3	**−3.0** (−3.5, −2.4)	7.7	5.9	**−3.1** (−3.9, −2.3)
	Switzerland	1993–2003[6]	11.7	11.4	−0.3 (−7.7, 7.6)	5.8	5.7	−0.4 (−1.8, 1.1)
Southern Europe	Croatia[a]	1994–2004	11.1	10.8	0.6 (−2.2, 3.4)	6.0	6.2	1.2 (−0.5, 3.0)
	Italy (Modena)[c]	1994–2005	13.9	7.9	−1.6 (−4.6, 1.6)	7.1	4.5	−2.7 (−6.5, 1.2)
	Malta	1994–2005[4]	11.7	8.1	−1.9 (−5.6, 2.0)	9.2	5.7	−1.8 (−5.5, 2.0)
	Slovenia[a]	1994–2003	12.1	11.5	**−1.9** (−3.6, −0.1)	7.5	6.8	−1.0 (−3.1, 1.1)
	Spain[a]	1994–2002[7]	No data			4.1	4.5	0.7 (−0.0, 1.5)
Central Europe	Czech Republic	1994–2004	14.0	14.0	−0.1 (−0.7, 0.5)	7.8	7.1	−0.3 (−1.5, 0.9)
	Lithuania[a]	1993–2004[8]	13.8	13.3	0.8 (−16.5, 21.5)	9.8	8.3	**−1.8** (−3.3, −0.2)
	Poland[a]	1994–2004[3]	12.0	11.2	**−1.2** (−2.0, −0.4)	6.6	7.6	**1.5** (1.0, 2.1)

a Data valid for C56-57.
b Incidence only for England.
c Data until 1999 valid for 183 (ICD-9), and from 2000 valid for C56 (ICD-10).
1 Mortality until 2001.
2 Mortality until 2004.
3 Mortality until 2005.
4 Mortality until 2006.
5 Mortality until 2002.
6 Only average incidence for periods 1993–1996, 1997–1999, and 2001–2003 and mortality for 1995–2004.
7 Mortality until 2003.
8 Only average incidence for periods 1993–1997, 1998–2000, 2001–2002, and 2003–2004.
* EAPC: estimated annual percentage change, calculated based on the rates during the indicated period.

Prostate cancer (C61). In contrast to mortality, incidence of prostate cancer varied largely across Europe with highest incidence rates in Finland, Sweden and Austria (Tyrol) (114, 112 and 106 per 100,000 respectively) and lowest rate in Poland (25 per 100,000). A dramatically increasing incidence trend was observed in all European countries except for The Netherlands and Austria (Tyrol), where rates already increased in previous periods. In Slovenia, Lithuania and Poland mortality rates increased while rates were decreasing or stable in other European countries (Table 15a). Relative improvements in five-year survival rates from 1990–2002 varied between 10% in Germany and the Czech Republic to 83% in Poland, resulting in 5-year survival rates of 58% (Czech Republic) to 87% (Switzerland) in 2000–2002 (Fig. 10, Table 15b).

The dramatic increase of incidence is mostly due to the introduction of (non-) organized PSA-testing, leading to detection of many latent cancers and artificially high survival rates. Differences in intensity of the use of PSA screening and the registration of these latent cancers make interpretation of incidence and survival complicated.

Testicular cancer (C62). Recent incidence rates of testicular cancer in Europe varied between 1.9 per 100,000 in Lithuania to 11 per 100,000 in Norway. Mortality rates were quite similar throughout Europe (Table 16a). In many countries an increased incidence trend was observed, in contrast with stable mortality trends. Five-year survival improved from 91 to 94% in Europe and varied between 94 and 100% (Table 16b and 16c).

Previous studies observed that increases in incidence are largely due to increases in the incidence of localised tumours among men born after the 1930s.[59–61] Factors like low birth weight, older maternal age, low birth order, maternal smoking during pregnancy, cryptorchidism convey an increased risk.[62–64] In all member countries of the European Union, maternal age has been increasing since 1994 and family sizes have been decreasing, possibly explaining the observed increases in trends.[44] The increase in survival and the decrease in mortality are attributed to the introduction of cisplatin-containing chemotherapy, which has proven to be the most effective treatment for non-seminoma

Table 14b – Trends in 5-year relative survival for ovarian cancer in Europe[a]

	Country	Period	5-year relative survival	Period	5-year relative survival	Trend in survival
Northern Europe	Finland	–	–	2003–2005	49.0	?
	Norway	1991–1995	39.9	1996–2000	44.1	↑
	UK England & Wales	1991–1995	31.0	2000–2001	41.0	↑
	UK Northern Ireland	1993–1996	41.6	2001–2004	43.6	↑
	UK Scotland	1992–1996	32.8	1997–2001	40.6	↑
Western Europe	France	1992–1994	39.0	1995–1997	40.0	=
	Germany (Saarland)	–	–	2000–2002	48.0	?
	Netherlands (Amsterdam)	1993–1996	37.0	2001–2005	40.0	↑
	Netherlands (Eindhoven) (<70 years)	1990–1994	47.0	2000–2002	54.0	↑
	Netherlands (Eindhoven) (⩾70 years)	1990–1994	18.0	2000–2002	24.0	↑
	Switzerland (Geneva)	1990–1994	39.0	1994–1998	48.0	↑
Southern Europe	Italy (Modena)	1990–1997	41.0	1998–2005	36.0	↓
	Italy	–	–	1995–1999	41.0	?
	Slovenia	1993–1997	37.0	1998–2002	46.0	↑
Central Europe	Czech Republic	–	–	1995–1999	45.0	?
Total Europe		1990–1994[b]	36.7	1995–1999[c]	41.6	↑

a Data reported by individual cancer registries or consortia of cancer registries (sources are shown in Table 1).
b Data reported by the EUROCARE-3 study.[8]
c Data reported by the EUROCARE-4 study.[9]

Table 14c – Overview of recent trends in incidence of, survival for and mortality from ovarian cancer in Europe

Incidence	Survival	Mortality	Countries
			Females
=	↑	=	UK-Northern Ireland, Switzerland
=	↑	↓	UK-Scotland
=	↓	=	Italy
=	?	=	Denmark, Finland, Ireland, Germany, Croatia, Malta, Czech Republic
=	?	↓	Lithuania
↓	↑	=	Norway, Slovenia
↓	↑	↓	UK-England & Wales, Netherlands
↓	=	=	France
↓	?	↑	Poland
↓	?	=	Sweden, Austria
?	?	=	Spain

testicular cancer, constituting about half of testicular cancer cases.[61,65]

An other explanation of the improved survival is a shift toward seminomas, which have a better prognosis than non-seminomas (Table 16b). Prognosis is also influenced by stage and age at diagnosis, with younger patients exhibiting better survival than older patients.[66]

Kidney cancer (*C64-66/C68*). Incidence and mortality of kidney cancer was lowest in Northern Europe and highest in Central Europe, especially in the Czech Republic. This tumour was about twice as frequent in males compared with females. Trends have been rather diverse across Europe, with increasing or stable incidence trends in countries throughout Europe and decreases in the Czech Republic, Austria, Sweden, the Netherlands, Poland and Finland (Table 17a). Survival rates improved across Europe (Fig. 11). This explains why, with the observed trends in incidence, mortality trends have been stable or decreasing in most countries, except for Irish and Slovenian males (Tables 1 and 20).

The most important environmental risk factors for kidney cancer include smoking, obesity and possibly hypertension. The observed trends in incidence therefore reflect of the generally decreasing smoking prevalence rates of European males, and increasing rates of obesity prevalence. For females, the patterns of risk factor prevalence differ strongly by European region, explaining the large variation in incidence, mortality and survival patterns (Table 17b). Previously it was believed that coffee and tea consumption would increase the risk of kidney cancer, but this has not been confirmed, except possibly for cancers of the renal pelvis and urether.[37]

Bladder cancer (*C67*). In the most recent period, incidence of bladder cancer varied across Europe from 10 (Northern Ireland) to 29 per 100,000 (Denmark, Austria, Italy and Spain). Trends in incidence are heavily influenced by changes in

Table 15a – Trends in incidence of and mortality from prostate cancer (C61) in Europe

	Country	Period	Males					
			Incidence			Mortality		
			WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)
Northern Europe	Denmark	1994–2003[1]	29.4	49.9	**6.2** (5.4, 7.1)	19.7	20.7	0.3 (–0.9, 1.4)
	Finland	1994–2005	57.7	114.0	**5.9** (5.1, 6.8)	17.1	14.8	**–1.6** (–2.6, –0.7)
	Norway	1994–2005[2]	60.5	91.7	**3.9** (2.5, 5.4)	23.6	20.5	**–1.5** (–2.2, –0.7)
	Sweden	1994–2005[2]	62.1	112.4	**6.4** (5.4, 7.4)	20.7	21.3	–0.2 (–1.0, 0.6)
	Ireland	1994–2005[2]	43.7	88.9	**8.0** (6.8, 9.2)	18.1	17.1	**–1.2** (–2.1, –0.2)
	UK England & Wales[a]	1995–2004[3]	39.7	64.0	**6.0** (4.7, 7.4)	17.1	14.9	**–0.9** (–1.5, –0.3)
	UK Northern Ireland	1994–2005	39.2	56.7	**4.6** (2.9, 6.2)	16.4	13.8	**–1.3** (–2.4, –0.3)
	UK Scotland	1994–2004[4]	42.8	56.3	**2.3** (1.0, 3.6)	16.6	14.1	**–1.1** (–1.7, –0.4)
Western Europe	Austria (Tyrol)	1994–2003	117.3	106.4	1.5 (–1.5, 4.5)	19.5	11.6	**–4.8** (–7.7, –1.7)
	France	1994–2000[5]	51.3	75.3	**6.7** (6.5, 6.8)	16.2	14.6	**–1.1** (–1.8, –0.4)
	Germany (Saarland)	1994–2005	52.0	71.0	**4.9** (3.0, 6.8)	12.5	15.0	–0.2 (–1.8, 1.4)
	Netherlands	1994–2003	55.4	61.4	0.6 (–0.0, 1.3)	19.2	16.3	**–2.2** (–2.7, –1.7)
	Switzerland	1993–2003[6]	66.0	86.1	**3.6** (1.4, 5.9)	20.0	16.3	**–2.0** (–2.7, –1.3)
Southern Europe	Croatia	1994–2004	21.6	35.1	**6.7** (4.7, 8.7)	13.4	15.4	1.8 (–0.4, 4.1)
	Italy (Modena)	1994–2005	43.8	91.3	**10.9** (6.8, 15.1)	17.5	7.4	**–5.1** (–7.8, –2.3)
	Malta	1994–2005[4]	23.3	45.9	**6.1** (3.9, 8.4)	13.6	7.8	**–3.7** (–6.0, –1.2)
	Slovenia	1994–2003	24.6	36.7	**4.2** (1.8, 6.8)	13.3	21.2	**3.7** (1.5, 6.0)
	Spain	1994–2002[7]	29.3	56.4	**8.9** (4.9, 13.1)	13.8	11.7	**–2.1** (–2.8, –1.3)
Central Europe	Czech Republic	1994–2004	30.4	52.3	**4.8** (3.6, 5.9)	16.3	17.1	0.1 (–0.6, 0.7)
	Lithuania	1993–2004[8]	26.0	71.1	**12.3** (5.7, 19.4)	15.5	19.2	**2.1** (1.4, 2.9)
	Poland	1994–2004[3]	16.7	24.5	**2.9** (1.4, 4.5)	10.8	12.9	**1.9** (1.3, 2.6)

a Incidence only for England.
1 Mortality until 2001.
2 Mortality until 2004.
3 Mortality until 2005.
4 Mortality until 2006.
5 Mortality until 2002.
6 Only average incidence for periods 1993–1996, 1997–1999, and 2001–2003 and mortality for 1995–2004.
7 Mortality until 2003.
8 Only average incidence for periods 1993–1997, 1998–2000, 2001–2002, and 2003–2004.
* EAPC: estimated annual percentage change, calculated based on the rates during the indicated period.

coding practices (including in situ carcinomas or not). These coding practices also influenced absolute levels of incidence and may explain part of the differences between countries. It is better to interpret trends in mortality rates, as these did not suffer from this problem.

Mortality trends decreased throughout Europe for males. Female mortality patterns differed throughout Europe, mostly decreasing or remaining stable with the exception of Poland, where mortality rates increased significantly (Table 18a). Five-year survival remained largely stable in Europe (Table 18b and 18c).

The favourable mortality trends in males are partly due to the declines in the smoking prevalence together with reduced occupational exposure to carcinogens. The decreases in females are more difficult to explain, as female smoking prevalence rates increased in many countries but mortality rates remained stable or decreased. Better control of urinary tract infections probably played a role, while the role of diet and other potential urinary tract carcinogens remains undefined.[67]

Despite small improvements in treatment, no improvements in survival were achieved, which is in line with earlier findings for Sweden since the 1970s.[68]

Hodgkin's disease (*C81*). In most European countries, incidence and mortality rates of Hodgkin's disease have been stable or slightly decreasing, with the exception of Norwegian, Dutch, Croatian and Slovenian males and English, Croatian and Italian females (Table 19a). Five-year survival for Hodgkin's disease was between 70% and 80% and has improved in all countries (Fig. 12, Table 19b).

The observed incidence and mortality trends are in accordance with previous reports on trends in Hodgkin's disease for all ages[69] and children.[70] Although there is much unclearness regarding the aetiology of Hodgkin's disease, some factors have been identified to contribute to the risk, including poor immunity (organ transplant patients, HIV patients) and Epstein Barr virus infection. Over time, new prognostic systems were developed stratifying patients into early stages (more or less favourable or intermediate), advanced stages and delivering effective chemotherapy suited for the individual tumour characteristics.[71] The combination of improved staging and more appropriate chemotherapy resulted in the observed improvements in survival rates.

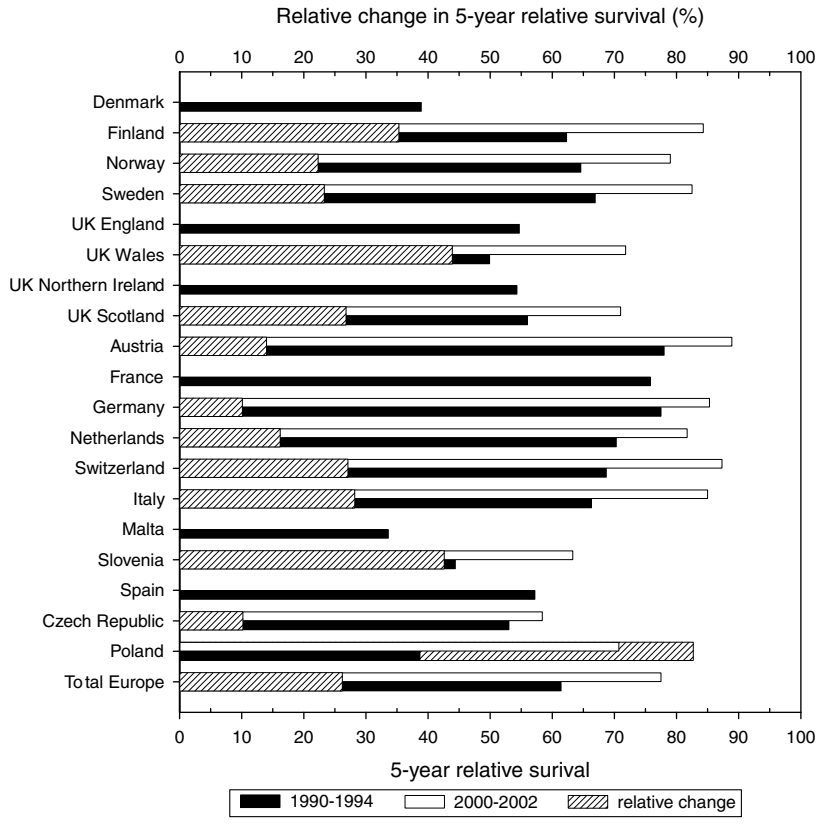

Fig. 10 – Trends in 5-year age-adjusted relative survival for prostate cancer in Europe Sources: EUROCARE-3[9] and EUROCARE-4.[3]

Table 15b – Overview of recent trends in incidence of, survival for and mortality from prostate cancer in Europe

Incidence	Survival	Mortality	Countries
			Males
↑	↑	↑	Slovenia, Poland
↑	↑	=	Sweden, Germany, Czech Republic
↑	↑	↓	Finland, Norway, Ireland[a], UK[b], Switzerland, Italy
↑	?	↑	Lithuania
↑	?	=	Denmark, Croatia
↑	=	↓	France[c]
↑	?	↓	Malta, Spain
=	↑	↓	Austria, Netherlands

a Survival trend is based on a report of Ireland Cancer Registry.[81]
b Survival trend of UK-Northern Ireland is based on a report of the Northern Ireland Cancer Registry.[89]
c Survival trend is based on a report of FRANCIM.[93]

4. General discussion

This study provides the most recent available overview of the burden of cancer in Europe. It is one of the few publications combining incidence, mortality and survival statistics of cancer. This combination is important in order to correctly interpret (trends in) cancer rates: has real progress been made or are we looking at artefacts? Observed increases in cancer incidence for example, might be real, i.e. that there are more cancer patients because of increasing risks, or they might be due to improvements in the completeness of the cancer registry, changes in diagnostic criteria, or effects of early detection methods such as population screening (Table 1). Likewise, improving cancer survival could be due to better treatment, improvements in treatment effectiveness because of earlier diagnosis, diagnosis of patients that would otherwise have never had clinical disease (i.e. lead-time bias), or better treatment of co-morbidity.[4–6]

We observed the highest incidence of breast, prostate, testicular cancer and melanomas in Northern and Western Europe. However, cancers of the lung, cervix and stomach were more common in the South and Central parts of Europe. Within Northern Europe, for many tumours, we observed a distinction between the Scandinavian countries (excluding

Table 16a – Trends in incidence of and mortality from testicular cancer (C62) in Europe

	Country	Period	Males					
			Incidence			Mortality		
			WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)
Northern Europe	Denmark	1994–2003[1]	10.6	9.3	**−1.4** (−2.7, −0.0)	0.7	0.5	−7.5 (−15.4, 1.2)
	Finland	1994–2005	2.3	5.1	**5.4** (3.1, 7.7)	0.1	0.2	1.4 (−6.8, 10.4)
	Norway	1994–2005[2]	8.3	10.5	**2.4** (0.8, 4.1)	0.4	0.4	2.5 (−3.3, 8.7)
	Sweden	1994–2005[2]	5.3	6.2	**2.3** (0.4, 4.1)	0.2	0.2	−0.1 (−8.1, 8.6)
	Ireland	1994–2005[2]	3.6	6.9	**4.5** (2.1, 6.9)	0.4	0.1	−5.8 (−13.7, 2.9)
	UK England & Wales[a]	1995–2004[3]	5.3	6.1	**1.7** (0.1, 3.2)	0.3	0.2	**−3.3** (−5.9, −0.6)
	UK Northern Ireland	1994–2005	5.4	7.3	**3.1** (1.0, 5.3)	0.5	0.0	−26.4 (−65.8, 58.4)
	UK Scotland	1994–2004[4]	6.9	6.4	1.4 (−0.8, 3.5)	0.3	0.5	1.7 (−2.6, 6.1)
Western Europe	Austria (Tyrol)	1995–2003	7.7	8.2	−0.1 (−2.9, 2.7)	0.8	0.7	−19.2 (−87.9, 439.9)
	France	1994–2000[5]	No data			0.3	0.3	1.0 (−2.0, 4.0)
	Germany (Saarland)	1994–2005	5.3	9.3	2.4 (−1.0, 5.9)	0.1	0.5	−30.4 (−55.5, 8.8)
	Netherlands	1994–2003	4.4	6.2	**4.4** (2.8, 6.0)	0.2	0.3	2.5 (−4.7, 10.3)
	Switzerland	1993–2003[6]	9.1	9.8	1.0 (−4.5, 6.8)	0.4	0.3	−3.7 (−28.6, 30.0)
	Croatia	1994–2004	1.8	6.3	**11.5** (4.9, 18.5)	0.1	0.6	6.8 (−4.9, 20.1)
	Italy (Modena)	1994–2005	4.1	7.5	3.8 (−0.2, 8.0)	0.1	0.0	−43.1 (−80.5, 66.2)
	Malta	1994–2005[2]	No data			0.8	0.3	14.5 (−58.3, 214.4)
	Slovenia	1994–2003	5.3	9.5	**5.7** (1.7, 10.0)	0.4	0.7	0.8 (−14.0, 18.2)
	Spain	1994–2002[7]	No data			0.2	0.2	−2.9 (−11.0, 5.9)
Central Europe	Czech Republic	1994–2004	6.2	7.0	**1.7** (0.6, 2.8)	1.0	0.5	−4.2 (−8.4, 0.2)
	Lithuania	1993–2004[8]	1.6	1.9	1.7 (−4.3, 8.0)	0.6	0.5	**−3.4** (−6.0, −0.7)
	Poland	1994–2004[3]	2.9	3.9	**3.0** (1.0, 5.1)	0.7	0.6	−2.3 (−5.3, 0.8)

a Incidence only for England.
1 Mortality until 2001.
2 Mortality until 2004.
3 Mortality until 2005.
4 Mortality until 2006.
5 Mortality until 2002.
6 Only average incidence and mortality for periods 1993–1996, 1997–1999, and 2001–2003.
7 Mortality until 2003.
8 Only average incidence for periods 1993–1997, 1998–2000, 2001–2002, and 2003–2004.
* EAPC: estimated annual percentage change, calculated based on the rates during the indicated period.

Table 16b – Trends in 5-year relative survival for testicular cancer in Europe[a]

	Country	Period	5-year relative survival	Period	5-year relative survival	Trend in survival
Northern Europe	Finland	–	–	2003–2005	94.0	?
	Norway	1991–1995	95.8	1996–2000	96.0	=
	UK England & Wales	1991–1995	93.0	2000–2001	98.0	↑
	UK Northern Ireland	1993–1996	92.4	2001–2004	94.0	=
	UK Scotland[b]	1992–1996	95.1	1997–2001	97.7	↑
Western Europe	France	1992–1994	95.0	1995–1997	96.0	=
	Germany (Saarland)	–	–	2000–2002	100.0	?
	Netherlands (Amsterdam) (*non-seminoma*)	1993–1996	97.0	2001–2005	95.0	=
	Netherlands (Eindhoven) (*non-seminoma*)	1990–1994	91.0	2000–2002	94.0	↑
	Netherlands (Eindhoven) (*seminoma*)	1990–1994	98.0	2000–2002	97.0	=
	Switzerland (Geneva)	1990–1994	98.0	1994–1998	95.0	↓
Southern Europe	Italy (Modena)	1990–1997	98.0	1998–2005	97.0	=
	Italy	–	–	1995–1999	94.0	?
	Slovenia	1993–1997	96.0	1998–2002	97.0	=
Total Europe		1990–1994[c]	91.4	1995–1999[d]	93.8	↑

a Data reported by individual cancer registries or consortia of cancer registries (sources are shown in Table 1).
b Data were calculated for age group 15–74 year.
c Data reported by the EUROCARE-3 study.[8]
d Data reported by the EUROCARE-4 study.[9]

Table 16c – Overview of recent trends in incidence of, survival for and mortality from testicular cancer in Europe

Incidence	Survival	Mortality	Countries
			Males
↑	↑	↓	UK-England & Wales
↑	=	=	Norway, UK-Northern Ireland, Netherlands, Slovenia
↑	?	=	Finland, Sweden, Croatia, Poland
↑	?	=	Czech Republic
=	↑	=	UK-Scotland
=	=	=	Italy
=	↓	=	Switzerland
=	?	=	Austria, Germany
=	?	↓	Lithuania
↓	?	=	Denmark
?	=	=	France
?	?	=	Malta, Spain

Denmark), and the United Kingdom and Denmark, with higher rates for most cancers in the latter two countries.

During the past decade, many changes in the occurrence, survival and mortality of cancer have occurred. Some of the cancer types included in this study showed very mixed patterns for incidence, such as corpus uteri and kidney cancers. Rates for colorectal cancer were either stabilising or increasing, presumably due to changing dietary habits, increasing obesity and decreasing physical activity levels. Prostate, testicular cancer, and melanomas, female lung and breast cancer showed persistently increasing trends in incidence throughout Europe, the latter two due to the increasing prevalence of smoking females and changing reproductive patterns. Incidence trends of pancreatic, laryngeal, ovarian and bladder cancer were stabilising or decreasing. The most consistent decreases in incidence were observed for gastric, cervical, and male lung cancer due to improved food preservation methods, screening and decreased male smoking rates.

Improvements of cancer survival were observed for oral cavity and pharyngeal, stomach, lung, corpus uteri, ovarian and kidney cancer and for Hodgkin's disease throughout Europe. For colorectal, melanoma, breast and prostate cancer improvements were seen in all countries, with the exception for Austrian melanoma patients. For Austria, this is probably due to problems with the data quality. Over time, the survival rates for patients with a cervical cancer have decreased in most countries. This is likely due to a worsening case-mix, leading to decreasing survival.[51] Conversely, survival improved in Poland where rates were historically very low

Table 17a – Trends in incidence of and mortality from kidney cancer (C64-66, C68) in Europe by gender

	Country	Period	Incidence						Mortality					
			Males			Females			Males			Females		
			WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)
Northern Europe	Denmark[a]	1994–2003[1]	7.7	7.4	0.0 (−1.1, 1.2)	4.8	3.6	−1.7 (−4.5, 1.2)	4.6	4.6	−0.4 (−3.7, 3.0)	2.4	2.8	1.2 (−1.1, 3.4)
	Finland[a]	1994–2005	11.1	8.8	**−2.1** (−3.1, −1.0)	6.3	5.7	**−1.1** (−1.9, −0.2)	5.2	3.5	**−2.4** (−3.8, −1.1)	2.1	2.1	−0.3 (−2.0, 1.4)
	Norway[a]	1996–2005[2]	8.0	9.3	**2.3** (1.1, 3.5)	4.8	5.3	0.4 (−1.1, 1.9)	3.7	3.7	−1.8 (−4.1, 0.4)	2.1	1.8	−2.0 (−4.3, 0.3)
	Sweden[a]	1994–2005[2]	8.2	6.2	**−1.6** (−2.6, −0.5)	4.9	3.9	−1.3 (−2.5, 0.0)	4.6	3.9	−1.1 (−2.6, 0.3)	2.3	2.3	−1.2 (−2.7, 0.3)
	Ireland	1994–2005[2]	7.6	9.0	**2.8** (1.4, 4.2)	3.9	5.8	**3.7** (2.4, 5.0)	3.3	4.9	**4.1** (1.8, 6.5)	1.7	1.5	−0.3 (−3.1, 2.5)
	UK England & Wales[b]	1995–2004[3]	7.4	8.7	**1.6** (1.0, 2.3)	3.6	4.6	**2.0** (1.1, 3.0)	3.9	3.9	−0.2 (−0.8, 0.4)	1.9	1.7	−0.5 (−1.8, 0.7)
	UK Northern Ireland	1994–2005	11.1	8.0	−1.0 (−2.7, 0.7)	3.5	4.8	1.5 (−1.1, 4.0)	3.8	3.8	1.3 (−1.2, 3.9)	1.7	2.2	3.2 (−2.0, 8.6)
	UK Scotland[c]	1994–2004[4]	8.5	9.2	0.5 (−0.5, 1.4)	4.9	4.8	0.0 (−1.3, 1.4)	4.3	3.5	−1.1 (−2.5, 0.4)	2.1	2.1	0.7 (−1.0, 2.5)
Western Europe	Austria (Tyrol)	1995–2003	14.0	12.0	−1.6 (−6.2, 3.3)	7.1	6.5	−0.8 (−5.1, 3.7)	5.0	4.0	**−2.9** (−5.0, −0.7)	2.5	1.9	−2.2 (−6.6, 2.3)
	France	1994–2000[5]	10.5	12.2	**2.5** (2.4, 2.6)	4.7	5.7	**3.3** (3.0, 3.6)	4.7	4.4	**−0.7** (−1.1, −0.4)	1.9	1.7	−1.1 (−2.4, 0.1)
	Germany (Saarland)	1994–2005	15.4	13.3	−0.6 (−2.7, 1.5)	6.9	6.2	−2.1 (−4.5, 0.4)	6.4	4.1	−1.9 (−5.4, 1.7)	2.4	1.4	−2.3 (−6.7, 2.2)
	Netherlands	1994–2003	10.1	9.5	**−0.8** (−1.4, −0.1)	5.7	5.0	−0.9 (−2.2, 0.4)	5.1	5.1	−0.7 (−1.7, 0.3)	2.8	2.3	**−1.5** (−2.6, −0.3)
	Switzerland	1993–2003[6]	10.4	10.2	−0.3 (−5.7, 5.5)	5.1	4.5	−1.7 (−8.4, 5.6)	4.3	3.8	−1.7 (−12.1, 10.1)	3.0	3.0	−0.0 (−6.4, 6.8)
Southern Europe	Croatia	1994–2004	7.7	9.8	**4.2** (0.8, 7.6)	4.4	5.0	2.5 (−0.8, 5.8)	3.9	5.0	2.1 (−0.2, 4.5)	1.7	2.3	1.5 (−2.1, 5.3)
	Italy (Modena)	1994–2005	14.9	13.8	−0.2 (−2.6, 2.4)	6.6	5.5	0.6 (−3.8, 5.1)	5.7	4.6	−0.9 (−6.2, 4.8)	3.4	1.2	−5.6 (−11.9, 1.1)
	Malta[a]	1994–2005[4]	6.7	5.7	0.7 (−4.0, 5.6)	3.2	3.2	**−5.7** (−11.0, −0.0)	3.5	5.6	−1.0 (−6.3, 4.7)	0.3	3.5	8.5 (−1.3, 19.3)
	Slovenia	1994–2003	9.5	9.3	0.5 (−1.1, 2.1)	4.1	4.3	−2.3 (−6.7, 2.4)	3.9	5.6	**3.6** (0.2, 7.1)	2.4	1.6	−4.5 (−11.3, 2.8)
	Spain[d]	1994–2002[7]	7.4	8.4	2.3 (−2.1, 7.0)	3.1	3.9	3.8 (−5.3, 13.7)	3.2	3.2	−0.6 (−1.8, 0.7)	1.0	1.2	0.0 (−2.1, 2.2)
Central Europe	Czech Republic	1994–2004	21.8	23.2	0.5 (−0.5, 1.6)	11.9	11.5	−0.6 (−1.6, 0.4)	10.9	9.8	**−0.9** (−1.8, −0.0)	5.1	4.3	**−1.9** (−2.7, −1.0)
	Lithuania	1993–2004[8]	12.8	17.1	**3.3** (0.5, 6.3)	6.6	7.4	3.5 (−28.2, 49.2)	7.6	7.2	−0.7 (−2.3, 1.1)	3.5	3.0	−0.6 (−2.4, 1.3)
	Poland	1994–2004[9]	11.4	9.3	**−2.6** (−3.6, −1.5)	5.8	4.8	**−2.9** (−4.5, −1.2)	6.0	6.0	−0.1 (−1.5, 1.3)	2.4	2.2	−1.4 (−3.7, 1.0)

a Data only valid for C64.
b Incidence only for England.
c Data only valid for C64-65.
d Incidence data only valid for C64-65.
1 Mortality until 2001.
2 Mortality until 2004.
3 Mortality until 2005.
4 Mortality until 2006.
5 Mortality until 2002.
6 Only average incidence and mortality for periods 1993–1996, 1997–1999, and 2001–2003.
7 Mortality until 2003.
8 Only average incidence for periods 1993–1997, 1998–2000, 2001–2002, and 2003–2004.
9 Mortality for 1999–2005.
* EAPC: estimated annual percentage change, calculated based on the rates during the indicated period.

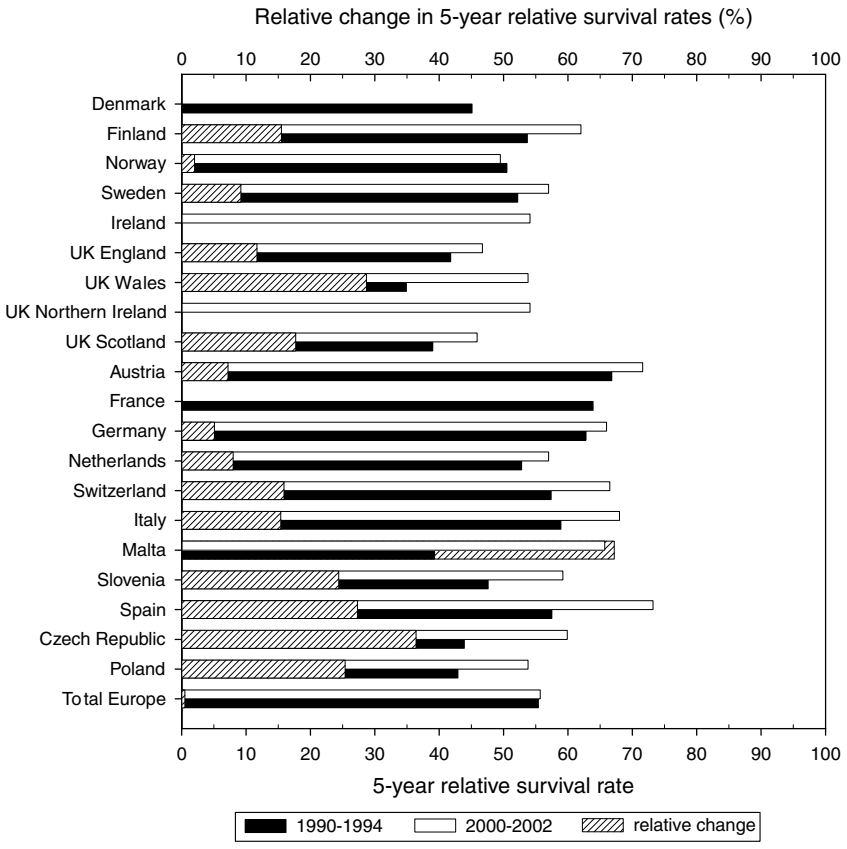

Fig. 11 – Trends in 5-year age-adjusted relative survival for kidney cancer in Europe Sources: EUROCARE-3[7] and EUROCARE-4.[3]

Table 17b – Overview of recent trends in incidence of, survival for and mortality from kidney cancer in Europe

Incidence	Survival	Mortality	Countries	
			Males	Females
↑	↑	=	UK-England & Wales	UK-England & Wales, France[a]
↑	=	=	Norway	–
↑	=	↓	France[a]	–
↑	?	↑	Ireland	–
↑	?	=	Croatia, Lithuania	Ireland
=	↑	↑	Slovenia	–
=	↑	=	UK-Northern Ireland[b]/ Scotland, Germany, Switzerland, Italy, Malta, Spain	Sweden, UK-Northern Ireland[b]/Scotland, Austria, Germany, Switzerland, Italy, Slovenia, Spain
=	=	=	–	Norway
=	?	=	Denmark	Denmark, Croatia, Lithuania
=	↑	↓	Austria, Czech Republic	Netherlands, Czech Republic
↓	↑	=	Sweden, Netherlands, Poland	Finland, Malta, Poland
↓	↑	↓	Finland	–

a Survival trend is based on a report of FRANCIM.[93]
b Survival trend of UK-Northern Ireland is based on a report of the Northern Ireland Cancer Registry.[89]

and have recently been catching up to reach levels comparable with the other European countries. Possible explanations for changes in incidence, survival and mortality are described in the results section of this paper and summarized in Table 20.

Europe is a large continent, with large variations in lifestyle patterns and healthcare systems (Zatoński et al. this issue).[6,72] Variation in healthcare systems has large influence on the possibility of the population to attend programs for early detection (i.e. active/voluntarily invitation) and access to care and treatment.

Some of the improvements in cancer survival may be due to earlier detection (breast, prostate) and/or increasing proportions of elderly patients receiving new or more aggressive treatment.[73] Cervical cancer screening, on the other hand, resulted in poorer survival rates: the effect of screening is that less cancers develop, but those which do develop are often

Table 18a – Trends in incidence of and mortality from bladder cancer (C67) in Europe by gender

	Country	Period	Incidence						Mortality					
			Males			Females			Males			Females		
			WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)
Northern Europe	Denmark[a]	1994–2003[1]	31.2	28.9	**−1.2** (−2.3, −0.0)	10.0	8.4	−0.6 (−2.1, 0.9)	9.6	7.6	−2.6 (−5.2, 0.1)	3.0	2.9	0.4 (−1.7, 2.6)
	Finland[a]	1994–2005	16.5	14.4	**−1.9** (−2.6, −1.2)	3.7	3.3	**−1.7** (−3.4, −0.0)	4.0	3.8	−0.8 (−1.8, 0.1)	1.3	0.9	−1.1 (−4.0, 1.9)
	Norway[a]	1996–2005[2]	23.8	21.3	−0.3 (−1.2, 0.5)	5.7	6.7	1.1 (0.2, 2.0)	6.0	6.0	−1.0 (−2.2, 0.2)	1.9	1.8	0.0 (−2.7, 2.8)
	Sweden[a]	1994–2005[2]	20.0	18.3	−0.2 (−0.9, 0.4)	5.2	5.1	0.4 (−0.6, 1.3)	4.5	4.3	0.2 (−0.9, 1.4)	1.6	1.6	1.1 (−0.2, 2.4)
	Ireland	1994–2005[2]	14.8	12.1	**−2.3** (−3.2, −1.4)	5.8	4.7	−0.5 (−2.9, 1.8)	4.6	3.3	**−2.4** (−4.6, −0.2)	1.8	1.3	−2.0 (−4.8, 1.0)
	UK England & Wales[b]	1995–2004[3]	19.4	11.9	**−5.6** (−6.7, −4.6)	5.4	3.5	**−5.3** (−6.7, −3.9)	6.7	4.8	**−2.8** (−3.3, −2.3)	2.0	1.7	**−1.0** (−1.6, −0.4)
	UK Northern Ireland	1994–2005	12.3	9.8	−2.1 (−4.3, 0.1)	2.9	2.9	−2.0 (−6.4, 2.6)	4.1	3.7	−2.2 (−5.3, 1.1)	1.5	1.4	−3.2 (−7.8, 1.7)
	UK Scotland	1994–2004[4]	24.9	11.9	**−8.6** (−11.0, −6.1)	7.3	4.3	**−7.9** (−11.2, −4.5)	6.9	5.3	**−2.8** (−3.6, −2.0)	2.5	1.8	**−2.9** (−4.2, −1.6)
Western Europe	Austria (Tyrol)[c]	1995–2003	29.1	29.5	1.7 (−4.8, 8.5)	6.8	5.6	3.8 (−4.7, 13.0)	5.3	4.2	−2.0 (−4.5, 0.6)	1.7	1.4	−2.1 (−10.5, 7.1)
	France	1994–2000[5]	17.8	18.3	**0.5** (0.4, 0.7)	2.4	2.3	**−0.9** (−1.5, −0.3)	6.6	5.9	**−1.4** (−2.7, −0.0)	1.1	1.0	−1.4 (−3.0, 0.3)
	Germany (Saarland)	1994–2005	14.3	14.1	0.4 (−1.7, 2.6)	4.0	3.9	0.1 (−2.6, 3.0)	6.2	3.4	**−5.7** (−9.1, −2.3)	1.3	0.9	−2.6 (−7.1, 2.0)
	Netherlands	1994–2003	15.1	13.5	**−1.1** (−1.9, −0.3)	3.1	3.2	0.9 (−0.7, 2.5)	6.3	5.6	**−1.3** (−2.3, −0.3)	1.6	1.7	1.0 (−0.9, 2.9)
	Switzerland	1993–2003[6]	13.2	12.6	−0.6 (−2.4, 1.3)	3.2	3.0	**−0.9** (−1.4, −0.3)	5.3	4.4	**−2.4** (−4.4, −0.4)	1.5	1.4	−1.5 (−4.3, 1.5)
Southern Europe	Croatia	1994–2004	14.3	14.4	2.3 (−1.5, 6.3)	2.4	3.2	**4.6** (1.0, 8.4)	6.3	6.1	0.1 (−1.7, 1.9)	1.0	1.2	3.1 (−0.7, 6.9)
	Italy (Modena)	1994–2005	32.3	28.9	−0.8 (−2.1, 0.5)	6.7	6.9	0.1 (−5.5, 6.0)	9.8	5.0	**−5.7** (−9.3, −1.8)	2.0	2.2	−3.0 (−13.5, 8.7)
	Malta	1994–2005[4]	30.5	19.4	**−6.2** (−9.5, −2.9)	7.5	3.4	−5.6 (−11.6, 0.9)	10.2	7.9	−3.3 (−8.7, 2.3)	4.2	1.1	−10.1 (−48.4, 56.5)
	Slovenia	1994–2003	10.4	10.6	−1.9 (−5.1, 1.5)	2.7	2.9	−2.2 (−7.6, 3.4)	6.7	6.0	−0.0 (−2.4, 2.5)	1.3	1.8	−0.4 (−6.9, 6.5)
	Spain[d]	1994–2002[7]	29.7	29.4	−0.2 (−3.9, 3.7)	3.7	3.8	0.0 (−4.5, 4.8)	8.7	8.4	−0.2 (−0.9, 0.5)	1.2	1.1	−0.1 (−1.8, 1.6)
Central Europe	Czech Republic	1994–2004	18.0	21.5	**1.2** (0.6, 1.8)	4.3	6.1	**2.4** (1.4, 3.5)	7.5	6.8	−1.1 (−2.5, 0.2)	1.5	1.8	1.1 (−0.6, 2.8)
	Lithuania	1993–2004[8]	12.7	15.7	3.1 (−3.5, 10.1)	2.2	3.1	5.0 (−25.0, 47.0)	8.6	6.9	**−1.6** (−3.0, −0.2)	1.1	1.0	−0.3 (−2.9, 2.4)
	Poland	1994–2004[3]	15.6	16.0	−0.5 (−1.5, 0.5)	2.8	3.0	−0.2 (−2.0, 1.7)	8.3	8.0	0.2 (−0.6, 0.9)	1.1	1.3	**1.1** (0.3, 1.9)

a Data valid for C65-68 + D09.0 + D41.4.
b Incidence only for England.
c Inclusive in situ carcinomas.
d Incidence data valid for C66-68.
1 Mortality until 2001.
2 Mortality until 2004.
3 Mortality until 2005.
4 Mortality until 2006.
5 Mortality until 2002.
6 Only average incidence for periods 1993–1996, 1997–1999, and 2001–2003 and mortality for 1995–2004.
7 Mortality until 2003.
8 Only average incidence for periods 1993–1997, 1998–2000, 2001–2002, and 2003–2004.
* EAPC: estimated annual percentage change, calculated based on the rates during the indicated period.

Table 18b – Trends in 5-year relative survival for bladder cancer in Europe[a]

	Country	Period	5-year relative survival		Period	5-year relative survival		Trend in survival
			Males	Females		Males	Females	
Northern Europe	Finland[b]	–	–	–	2003–2005	73.0	73.0	?
	Norway[b]	1991–1995	73.7	63.5	1996–2000	73.3	65.6	=/↑
	UK England & Wales[c]	1991–1995	64.0	59.0	2000–2001	66.0	57.0	=
	UK Northern Ireland[c]	1993–1996	57.5	41.5	2001–2004	59.3	47.2	=/↑
	UK Scotland[c]	1992–1996	70.0	61.0	1997–2001	73.3	62.8	↑/=
Western Europe	France[d]	1992–1994	56.0	55.0	1995–1997	57.0	54.0	=
	Germany (Saarland)	–	–		2000–2002	58.2		?
	Netherlands (Amsterdam)[e]	1993–1996	56.0		2001–2005	55.0		=
	Netherlands (Eindhoven)[d]	1990–1994	38.0		2000–2002	33.0		↓
	Switzerland (Geneva)[c]	1990–1994	58.0	58.0	1994–1998	58.0	51.0	=/↓
Southern Europe	Italy (Modena)[c]	1990–1997	77.0	69.0	1998–2005	78.0	80.0	= /↑
	Italy[c]				1995–1999	72.0	69.0	?
	Slovenia[c]	1993–1997	50.0	50.0	1998–2002	48.0	49.0	=
Northern Europe	Czech Republic[c]	–	–	–	1995–1999	73.0	–	?
Total Europe		1990–1994[f]	69.0		1995–1999[g]	65.8		↓

a Data reported by individual cancer registries or consortia of cancer registries (sources are shown in Table 1).
b Data valid for C66-68.
c Data valid for C67.
d Data valid for invasive bladder cancer (C67).
e Data valid for C67, exclusive Ta/Tis.
f Data reported by the EUROCARE-3 study.[117]
g Data reported by the EUROCARE-4 study.[9]

Table 18c – Overview of recent trends in incidence of, survival for and mortality from bladder cancer in Europe

Incidence	Survival	Mortality	Countries	
			Males	Females
↑	=	↓	France	–
↑	?	=	Czech Republic	Croatia, Czech Republic
=	↑	=	–	Norway, UK-Northern Ireland, Italy
=	=	=	Norway, UK-Northern Ireland, Slovenia	Slovenia
=	=	↓	Switzerland, Italy	–
=	↓/=	=	–	Netherlands
=	?	↑	–	Poland
=	?	=	Sweden, Austria, Croatia, Spain, Poland	Denmark, Sweden, Ireland, Austria, Germany, Malta, Spain, Lithuania
=	?	↓	Germany, Lithuania	–
↓	↑	↓	UK-Scotland	–
↓	=	=	–	France
↓	=	↓	UK-England & Wales	UK-England & Wales/Scotland
↓	↓	=	–	Switzerland
↓	↓/=	↓	Netherlands	–
↓	?	=	Denmark, Finland, Malta	Finland
↓	?	↓	Ireland	–

more aggressive. For some tumours, such as rectal tumours and Hodgkin's disease, staging procedures have improved treatment efficacy and survival rates. In many countries, cancer care has been regionalised, resulting in more specialised oncologists and, possibly, more optimal care for cancer patients and an improved survival.

As presented in Table 2, the results in this paper are based on many sources of information, national or (combinations of) regional data, different time periods, and different population sizes. Some registries cover relatively small populations, causing fluctuating numbers of cancer patients and rates. Some registries seemed to have faced temporary problems with the completeness of the registry; in Lithuania for example, in the period 1998–2000 there seems to be an under-registration among females in comparison with the period(s) before and after these years (see on-line tables). In Croatia, it is known that the marked increase in incidence of most sites in 1999 was due to the introduction of a new (improved)

Table 19a – Trends in incidence of and mortality from Hodgkin's disease (C81) in Europe by gender

	Country	Period	Incidence						Mortality					
			Males			Females			Males			Females		
			WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)	WSR start	WSR end	EAPC* (95% CI)
Northern Europe	Denmark	1994–2003[1]	2.5	2.9	1.0 (−2.4, 4.6)	1.7	1.8	1.5 (−2.3, 5.3)	0.5	0.2	**−16.4** (−28.5, −2.4)	0.3	0.2	−6.7 (−15.1, 2.5)
	Finland	1994–2005	3.0	2.4	−0.4 (−2.3, 1.4)	1.8	2.6	1.7 (−1.7, 5.2)	0.3	0.3	−3.2 (−9.6,	0.3	0.2	−2.3 (−6.6, 2.1)
	Norway	1994–2005[2]	1.8	2.7	**3.1** (0.5, 5.8)	1.7	2.0	3.0 (−1.5, 7.8)	0.4	0.3	−4.9 (−9.9, 0.5)	0.2	0.1	**−10.8** (−16.2, −5.0)
	Sweden	1994–2005[2]	2.2	1.8	**−1.6** (−2.7, −0.5)	1.4	1.8	1.6 (−0.4, 3.6)	0.4	0.3	−2.5 (−6.0, 1.1)	0.2	0.1	−4.5 (−10.1, 1.5)
	Ireland	1994–2005[2]	2.6	2.2	0.5 (−1.9, 3.0)	1.9	1.9	1.1 (−1.6, 3.8)	0.8	0.3	**−7.7** (−12.3, −3.0)	0.4	0.2	−6.9 (−16.2, 3.3)
	UK England & Wales[a]	1995–2004[3]	2.3	2.5	1.3 (−0.6, 3.3)	1.7	2.0	**1.3** (0.3, 2.4)	0.5	0.3	**−3.1** (−4.9, −1.2)	0.3	0.3	−1.5 (−5.5, 2.7)
	UK Northern Ireland	1994–2005	2.4	3.1	−0.1 (−6.2, 6.4)	1.8	1.8	2.7 (−0.5, 6.0)	0.6	0.4	−3.2 (−9.3, 3.3)	0.4	0.5	−2.9 (−15.4, 11.5)
	UK Scotland	1994–2004[4]	2.4	2.9	0.7 (−2.0, 3.4)	2.1	2.4	2.1 (−0.3, 4.5)	0.7	0.6	−2.4 (−8.6, 4.2)	0.5	0.4	−4.8 (−11.8, 2.7)
Western Europe	Austria (Tyrol)	1995–2003	1.7	1.6	0.2 (−12.3, 14.5)	1.3	1.1	−9.1 (−19.3, 2.4)	0.8	0.0	−68.1 (−92.0, 26.3)	0.0	0.4	**340.0** (57.7, 1129.4)
	France	1994–2000[5]	2.4	2.2	**−1.4** (−2.1, −0.7)	2.0	2.0	0.0 (−0.0, 0.0)	0.4	0.4	−1.1 (−3.3, 1.1)	0.3	0.2	−2.0 (−8.0, 4.4)
	Germany (Saarland)	1994–2005	3.0	2.7	−0.1 (−4.1, 4.2)	0.9	1.5	1.4 (−5.3, 8.6)	0.7	0.6	−1.4 (−13.7, 12.5)	0.0	0.2	4.1 (−33.0, 61.9)
	Netherlands	1994–2003	2.1	2.9	**3.2** (1.6, 4.8)	1.7	1.9	1.1 (−0.3, 2.5)	0.5	0.3	−3.0 (−8.2, 2.5)	0.4	0.1	**−9.1** (−16.0, −1.7)
	Switzerland	1993–2003[6]	2.8	2.7	−0.5 (−17.2, 19.5)	2.2	2.3	0.6 (−3.4, 4.8)	0.5	0.2	**−11.5** (−15.3, −7.6)	0.3	0.2	−5.4 (−34.6, 36.9)
Southern Europe	Croatia	1994–2004	1.2	2.6	**11.3** (3.4, 19.9)	1.3	2.0	**8.6** (0.0, 18.0)	0.7	0.3	−6.6 (−13.8, 1.1)	0.5	0.4	−3.0 (−14.9, 10.6)
	Italy (Modena)	1994–2005	1.8	2.8	3.5 (−4.3, 12.0)	2.4	3.4	**7.4** (1.6, 13.5)	0.9	0.3	−11.4 (−22.6, 1.6)	0.1	0.1	−17.8 (−64.4, 89.4)
	Malta	1994–2005[4]	5.1	2.7	−0.4 (−6.8, 6.4)	3.9	1.1	−1.5 (−13.7, 12.4)	0.5	1.0	−19.3 (−51.5, 34.4)	1.2	0.4	−1.2 (−56.2, 123.3)
	Slovenia	1994–2003	1.7	3.1	**5.0** (0.9, 9.2)	2.0	1.9	2.9 (−5.6, 12.2)	1.6	0.6	−8.6 (−22.6, 8.0)	0.2	0.2	−2.3 (−12.4, 9.0)
	Spain	1994–2002[7]	No data			No data			0.6	0.5	**−3.4** (−6.1, −0.7)	0.3	0.2	−2.9 (−7.2, 1.7)
Central Europe	Czech Republic	1994–2004	No data			No data			1.1	0.6	**−7.3** (−9.5, −5.1)	0.9	0.6	**−5.9** (−10.3, −1.2)
	Lithuania	1993–2004[8]	2.8	2.0	**−4.1** (−7.0, −1.2)	2.5	1.9	−1.4 (−32.0, 43.0)	1.3	0.9	**−6.7** (−10.3, −2.9)	1.0	0.4	**−7.3** (−12.4, −1.9)
	Poland	1994–2004[3]	2.2	2.0	−0.3 (−2.0, 1.4)	1.9	1.9	0.1 (−2.0, 2.1)	1.3	0.7	**−6.0** (−8.0, −4.0)	0.7	0.4	**−5.9** (−7.8, −4.0)

a Incidence only for England.
1 Mortality until 2001.
2 Mortality until 2004.
3 Mortality until 2005.
4 Mortality until 2006.
5 Mortality until 2002.
6 Only average incidence and mortality for periods 1993–1996, 1997–1999, and 2001–2003.
7 Mortality until 2003.
8 Only average incidence for periods 1993–1997, 1998–2000, 2001–2002, and 2003–2004.
* EAPC: estimated annual percentage change, calculated based on the rates during the indicated period.

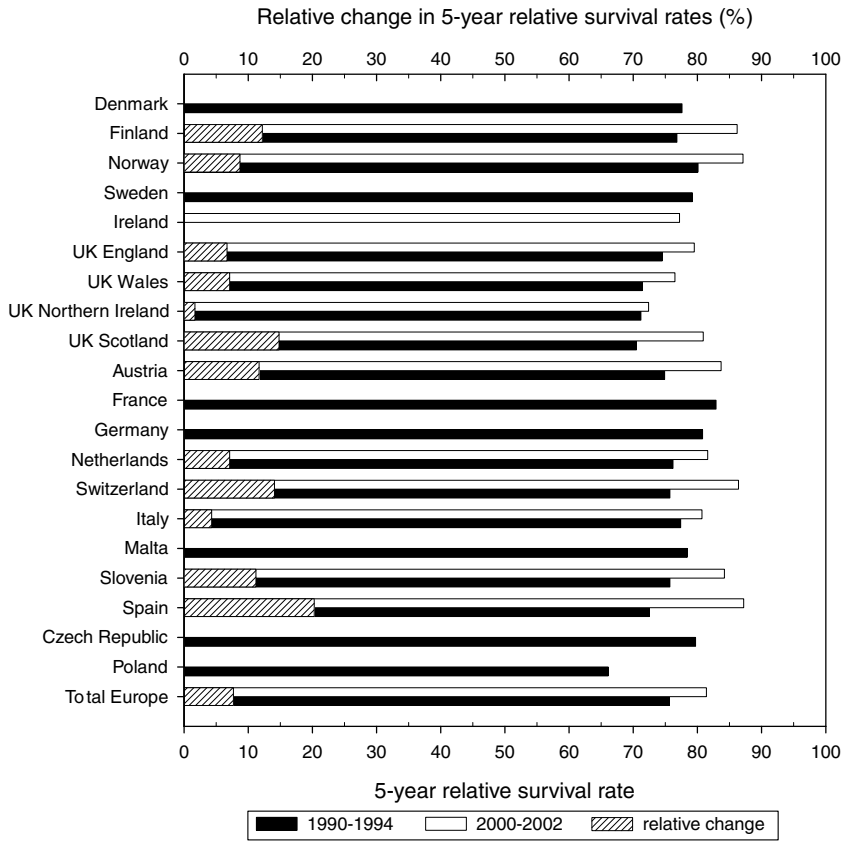

Fig. 12 – Trends in 5-year age-adjusted relative survival for Hodgkin's disease in Europe Sources: EUROCARE-3[9] and EUROCARE-4.[3]

Table 19b – Overview of recent trends in incidence of, survival for and mortality from Hodgkin's disease in Europe

Incidence	Survival	Mortality	Countries	
			Males	Females
↑	↑	=	Norway, Netherlands, Slovenia	UK-England & Wales, Italy
↑	?	=	Croatia	Croatia
=	↑	↑	–	Austria
=	↑	=	Finland, UK-Scotland, Austria, Italy	Finland, UK-Scotland, Switzerland, Slovenia
=	↑	↓	UK-England & Wales, Switzerland	Norway, Netherlands
=	=	=	UK-Northern Ireland	UK-Northern Ireland, France[a]
=	?	=	Germany, Malta	Denmark, Sweden, Ireland, Germany, Malta
=	?	↓	Denmark, Ireland, Poland	Lithuania, Poland
↓	=	=	France[a]	–
↓	?	=	Sweden	–
↓	?	↓	Lithuania	–
?	↑	=	–	Spain
?	↑	↓	Spain	–
?	?	↓	Czech Republic	Czech Republic

a Survival trend is based on a report of FRANCIM.[93]

population data source. The effects of these characteristics on cancer incidence, mortality and survival rates are extensively described elsewhere.[6]

We used world-standardised rates (WSR) because the available incidence and mortality rates are usually standardised to this population. This age-standardisation facilitates comparisons between countries, but the reader should keep in mind that the world standard population is a much younger population than the population of an average European country. The observed trends using WSRs therefore mainly represent changes in incidence and/or mortality in the middle-aged population groups. European standardised rates would better illustrate changes at older ages, although the currently used European standard population is already younger than many real European populations.

Table 20 – Summary of factors which can influence trends in incidence, survival and mortality

Tumour site	Main risk factors	Early detection & screening	Classification	Subsite/subtype	Health care/treatment
Oral cavity & pharynx	smoking, alcohol, HPV infection	–	–	oral cavity, oro-, naso-, and hypopharynx	–
Oesophagus	smoking, alcohol, obesity	–	–	squamous cell carcinoma → adenocarcinoma, proximal → distal	regionalization of surgery, preoperative chemotherapy
Stomach	food preservation, smoking, vitamine C, HP infection	endoscopy	–	non-cardia → cardia, distal → proximal	–
Colorectum	diet: sugar-rich, fiber-poor, red and processed meat	endoscopy, polypectomy, screening - also of familial HNPCC	–	ascending ↑, sigmoid ↑, rectum =	patient management, TME surgery, (pre-operative) radiotherapy
Pancreas	smoking	–	–	–	regionalization
Larynx	smoking, alcohol	–	–	supraglottis vs. glottis	regionalization
Lung	smoking	screening	–	small cell vs. non-small cell, adenocarcinoma ↑	systemic treatment of small cell
Skin melanoma	intermittent sun exposure, light skin phototype	screening, familial (FAMMM), awareness ↑, skin self- examination	–	trunk ↑, limbs ↑, superficial spreading ↑	improved staging
Breast	age at first childbirth ↑, oral contraceptive use, hormone replacement therapy, physical activity, obesity, alcohol	screening – also for familial breast cancer	–	lobular =, ductal ↑, in situ ↑,stage I ↑	improved staging & treatment
Corpus uteri	menopausal status, obesity, tamoxifen use, estrogen replacement therapy, nulliparity, oral contraceptive use	screening of breast cancer patients	–	–	–
Cervix	HPV infection, obesity, oestrogen replacement therapy, nulliparity, oral contraceptive use	screening	–	adenocarcinoma =, squamous cell ↓	–
Ovary	obesity, oestrogen replacement therapy, no oral contraceptive use, late age at last birth	–	–	–	surgery management and regionalization
Prostate	obesity	PSA testing	–	–	–
Testis	low birth weight, low birth order, maternal age ↑, maternal smoking during pregnancy, cryptorchidism	awareness ↑	–	seminoma → non-seminoma	cis-platin chemotherapy
Kidney	obesity, smoking, hypertension	echography ↑	–	parenchyma vs. pelvis	–
Bladder	smoking, occupational exposure to aromatic amines	surveillance among patients with superficial disease	changes in coding practices	–	–
Hodgkin's disease	poor immunity, EBV infection	–	–	–	better staging and treatment

The presented estimated annual percentages change were based on joinpoint modelling of the rates – not on the original population numbers, since they were not readily available for each registry. The EAPCs and their confidence intervals should therefore be interpreted with caution.

Survival rates presented for oral cavity and pharyngeal, laryngeal, oesophageal, pancreatic, ovarian, testis and bladder cancer cannot be directly compared between countries. They were not standardised for age, or encompass different time periods.

5. Conclusions

The biggest achievement in cancer surveillance over the past 10 years, seems to have been the large reductions in smoking prevalence among males, hopefully soon to be followed by females.[38] Lung cancer is still a very commonly diagnosed cancer, with a very poor survival, hence primary prevention by anti-smoking measures remains of utmost importance. Obesity, an upcoming problem, should be the target for prevention of oesophageal, breast, corpus uteri, cervical, prostate, and kidney cancer.[74] Substantial improvements in cancer survival have been achieved, mainly in Southern and Central Europe, where survival rates have been traditionally lagging behind compared to the rest of Europe.[6]

Variations in policies for (mass-) screening, other measures for early detection of cancer, access to health care, and treatment policies exist within Europe. These variations are largely reflected in the observed incidence, mortality and survival rates, which should be interpreted simultaneously in order to really understand whether increased survival is merely due to lead-time bias, improvements in treatment, changing patient and tumour characteristics, or a combination of the above.[6] In order to plan health services, policy makers of each country or region should make a choice of the options for primary and secondary prevention, treatment and health care organisation based on results, available budgets and infrastructure.[74] The results of this study may serve as a basis for these decisions.

Conflict of interest statement

None declared.

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