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Survival for oesophageal, stomach and small intestine cancers: results from EUROCARE-5

Corresponding author details: Dr Lesley Anderson, Centre for Public Health, Queen's University Belfast, Institute for Clinical Sciences Block B, Grosvenor Road, Belfast, BT12 6BJ, Tel: ++44 (0)28 9063 2315, Fax: ++44 (0)28 9023 5900, l.anderson@qub.ac.uk.

[14]**EUROCARE-5 Working Group: Austria**: M. Hackl, N. Zielonke (*Austrian CR*); W. Oberaigner (*Tyrol CR*); **Belgium**: E. Van Eycken, K. Henau (*Belgian CR*); **Bulgaria**: Z. Valerianova, N. Dimitrova (*Bulgarian CR*); **Croatia**: M. Sekerija (*Croatian CR*); **Czech Republic**: M. Zvolský, L. Dušek (*Czech National CR*); **Denmark**: H. Storm, G. Engholm (*Danish Cancer Society*); **Estonia**: M. Mägi (*Estonian CR*); T. Aareleid (*National Institute for Health Development, Tallinn*); **Finland**: N. Malila, K. Seppä (*Finnish CR*); **France**: M. Velten (*Bas Rhin CR*); X. Troussard (*Basse Normandie Haematological malignancies CR*); V. Bouvier, G. Launoy (*Calvados Digestive Tract Registry*); A. V. Guizard (*Calvados, General CR*); J. Faivre*, A. M. Bouvier (*Côte d'Or Digestive Tract Registry, Burgundy*); P. Arveux (*Côte d'Or Gynaecologic CR*); M. Maynadié (*Côte d'Or Haematological Malignancies CR*); A. S. Woronoff (*Doubs CR*); M. Robaszkiewicz (*Finistère Digestive Tract Registry*); I. Baldi (*Gironde CNS CR*); A. Monnereau (*Gironde Haematological Malignancies CR*); B. Tretarre (*Hérault CR*); N. Bossard* (*Hospices Civils de Lyon*); A. Belot (*Hospices Civils de Lyon, FRANCIM*); M. Colonna* (*Isère CR*); F. Molinié (*Loire-Atlantique CR*); S. Bara (*Manche CR*); C. Schvartz (*Marne & Ardennes, Thyroid CR*); B. Lapôtre-Ledoux (*Somme CR*); P. Grosclaude (*Tarn CR*); **Germany**: M. Meyer (*Bavaria CR*); R. Stabenow (*Berlin CR; Brandenburg CR; Mecklenburg-West Pomerania CR; Saxony CR; Saxony-Anhalt CR; Thüringen CR*); S. Luttmann, A. Eberle (*Bremen CR, Leibniz Institute for Prevention Research and Epidemiology*); H. Brenner (*German Cancer Research Center*); A. Nennecke (*Hamburg CR*); J. Engel, G. Schubert-Fritschle (*Munich CR*); J. Kieschke (*Niedersachsen CR*); J. Heidrich (*North Rhine-Westphalia CR*); B. Holleczek (*Saarland CR*); A. Katalinic* (*Schleswig-Holstein CR*); **Iceland**: J. G. Jónasson, L. 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W. Huws, C. White (*Welsh Cancer Intelligence and Surveillance Unit*); R. Otter*.

*EUROCARE Steering Committee

L. A. Anderson[a], **A. Tavilla**[b], **H. Brenner**[c,d], **S. Luttmann**[e], **C. Navarro**[f,g,h], **A.T. Gavin**[a,i], **B. Holleczek**[j], **B.T. Johnston**[k], **M.B. Cook**[l], **F. Bannon**[a], **M. Sant**[m], and **the EUROCARE-5 Working Group**[14]

[a]Centre for Public Health, School of Medicine, Dentistry and Biomedical Science, Queen's University Belfast, Northern Ireland [b]National Center of Epidemiology, Italian National Institute of Health, Rome, Italy [c]Division of Clinical Epidemiology and Aging Research and Division of Preventive Oncology, German Cancer Research Center (DKFZ), Heidelberg, Germany [d]German Cancer Consortium (DKTK), German Cancer Research Center (DKFZ), Heidelberg, Germany [e]Bremen Cancer Registry, Leibniz-Institute for Prevention Research and Epidemiology – BIPS, Bremen, Germany [f]Department of Epidemiology, Murcia Regional Health Council, IMIB-Arrixaca, Murcia, Spain [g]CIBER Epidemiología y Salud Pública (CIBERESP), Spain [h]Department of Health and Social Sciences, Universidad de Murcia, Murcia, Spain [i]Northern Ireland Cancer Registry, Queen's University Belfast, Northern Ireland [j]Saarland Cancer Registry, Präsident Baltz Straße 5, 66119 Saarbrücken, Germany [k]Belfast Health and Social Care Trust, Belfast, Northern Ireland [l]Division of Cancer Epidemiology and Genetics, National Cancer Institute, National Institutes of Health, Maryland, USA [m]Analytical Epidemiology and Health Impact Unit. Department of Preventive and Predictive Medicine, Fondazione IRCCS Istituto Nazionale dei TumoriVia Venezian 1, 20133, Milan, Italy

Abstract

Background—European regional variation in cancer survival was reported in the EUROCARE-4 study for patients diagnosed in 1995–1999. Relative survival (RS) estimates are here updated for patients diagnosed with cancer of the oesophagus, stomach, and small intestine from 2000 to 2007. Trends in RS from 1999–2001 to 2005–2007 are presented to monitor and discuss improvements in patient survival in Europe.

Materials and Methods—EUROCARE-5 data from 29 countries (87 cancer registries) were used to investigate 1-and 5-year RS. Using registry-specific life-tables stratified by age, gender, and calendar year, age-standardised 'complete analysis' RS estimates by country and region were calculated for Northern, Southern, Eastern and Central Europe, and for Ireland and United Kingdom (UK). Survival trends of patients in periods 1999–2001, 2002–2004, and 2005–2007 were investigated using the 'period' RS approach. We computed the 5-year RS conditional on surviving the first year (5-year conditional survival), as the ratio of age-standardised 5-year RS to 1-year RS.

Results—Oesophageal cancer 1- and 5-year RS (40% and 12%, respectively) remained poor in Europe. Patient survival was worst in Eastern (8%), Northern (11%), and Southern Europe (10%). Europe-wide, there was a 3% improvement in oesophageal cancer 5-year survival by 2005–2007, with Ireland and the UK (3%), and Central Europe (4%) showing large improvements.

Europe-wide, stomach cancer 5-year RS was 25%. Ireland and UK (17%) and Eastern Europe (19%) had the poorest 5-year patient survival. Southern Europe had the best 5-year survival (30%), though only showing an improvement of 2% by 2005–2007.

Small intestine cancer 5-year RS for Europe was 48%, with Central Europe having the best (54%), and Ireland and UK the poorest (37%). Five-year patient survival improvement for Europe was 8% by 2005–2007, with Central, Southern, and Eastern Europe showing the greatest increases (≥9%).

Conclusions—Survival for these cancer sites, particularly oesophageal cancer, remains poor in Europe with wide variation. Further investigation into the wide variation, including analysis by histology and anatomical sub-site, will yield insight to better monitor and explain the improvements in survival observed over time.

Keywords

oesophageal; stomach; small intestine; survival; Europe

Introduction

This article focuses on European relative survival (RS) estimates and trends for oesophageal, stomach and small intestine cancer patients, diagnosed up to 2007, with follow-up to December 31st 2008, as part of EUROCARE-5. Regional variation in RS estimates throughout Europe has been consistently reported for cancer patients, including upper gastrointestinal tract cancers, diagnosed in 1990–1994 [1], 1995–1999 [2] and 1999–2007 [3].

Oesophageal cancer ranks as the eighth most common cancer worldwide with approximately 5 cases per 100,000 diagnosed in Europe annually [4]. Two main histological subtypes, adenocarcinoma (OAC) and squamous cell carcinoma (OSCC), display regional variation in incidence across Europe [5]. Stomach cancer is the third most common cause of cancer death globally [6]. Wide variation in stomach cancer incidence across Europe has been reported with recent declines in most European countries as a result of lifestyle changes, *Helicobacter pylori* detection and cancer treatment. Incidence of non-cardia tumors is high in Southern Europe [7] which, correspondingly, has the best 5-year patient survival [3]. While the small intestine comprises 90% of the length of the bowel, small intestine cancers are rare with an age-standardised incidence rate of 2 per 100,000 person-years in the USA [8] with lower incidence rates reported within Europe [9]. Small intestine cancers exhibit a diverse histology with adenocarcinomas, carcinoid (now classified as neuroendocrine), lymphomas and sarcomas most common [10]. Incidence of small intestine cancers, particularly neuroendocrine malignancies, have increased in the USA [11,12] and Sweden [13], likely as a result of improved detection and classification. Neuroendocrine small intestine cancers are the most common histological subtype and confer superior prognosis compared to other small intestine entities [12]. Incidence of epithelial small intestine cancers is reportedly highest in Northern and lowest in Eastern Europe [14]; possibly due to geographic differences in diagnostic testing and variable capture by cancer registries.

Methods

Methods used for the analysis of EUROCARE-5 data are described in a dedicated paper in this EJC issue [15]. Briefly, survival data were obtained from 29 countries, 21 with 100%

national coverage, from 87 cancer registries. Countries were grouped into Northern, Central, Southern and Eastern Europe and Ireland and UK.

All patients diagnosed with a primary and malignant oesophageal, stomach or small intestine cancer, as identified by topography codes C15, C16 (cardia C16.0 and non-cardia C16.1–C16.6) and C17, respectively, of the International Classification of Diseases for Oncology, 3rd edition (ICD-O-3), diagnosed from 2000–2007 were included. Patients with morphology codes 9590-9989 (ICD-O-3), or who were diagnosed by death certificate only (DCO), autopsy only, or censored with null survival time, were excluded. Patients were not excluded if they had a previous primary tumour. All the registries with less than 13% of DCO (for all cancers combined) were included in the analysis.

One-year RS, 5-year RS and 5-year RS conditional on surviving the first year after diagnosis (5-year conditional) were estimated using the 'complete' cohort approach for patients diagnosed 2000–2007 (with follow-up to 2008) stratified by gender and age-group (i.e. 15–44, 45–54, 55–64, 65–74, 75 years or older) as previously described [15]. Age standardised survival [16] and European average estimates [15] are also provided. Survival trends were estimated for countries with cases diagnosed between 1999 and 2007 (n=24 countries) with follow-up to 2008, using the 'period' approach [17] to reliably predict 5-year survival in the years, 1999–2001, 2002–2004, and 2005–2007.

Results

Oesophageal, stomach and small intestine cancers were more common in men than women, Table 1. Some countries in Eastern Europe had a high percentage of DCO cases. Elsewhere in Europe the highest DCO rates were reported in Germany. Mean age at diagnosis for oesophageal, stomach and small intestine cancers ranged from 60.7–71.6, 66.8–73.1 and 60.5–68.9 years, respectively, Table 1.

Oesophageal cancer

European average 1-year age-standardised RS was 39.9%, with 12.4% of patients surviving 5-years, Figure 1. Patients in the Central Europe region, particularly Belgium, had the best survival in Europe while survival was poorest in Eastern Europe. Lithuania and Bulgaria had the lowest 5-year RS estimates. Conditional 5-year survival displayed less heterogeneity across Europe, Figure 1.

Survival, at all follow-up time points investigated, decreased with increasing age, Figure 1. One-, 3- and 5-year age-standardised RS was higher in women than men across all follow-up time points, Figure 1.

Overall oesophageal cancer 5-year age-standardised patient survival improved from 9.9% to 12.6% between 1999–2001 and 2005–2007. Graphs of 5-year RS by region and Europe overall are presented in Supplement 1. The largest regional improvements in 5-year RS were observed in Ireland and UK and Central Europe with limited improvements observed in Eastern or Southern Europe, (Table 2 and Supplement 1). Similar improvements in patient

survival were noted between 1999–2001 and 2002–2004, and between 2002–2004 and 2005–2007 for most regions.

Stomach Cancer

One-year age-standardised RS for stomach cancer patients reached almost 50% with substantial regional variation, see Figure 2. While the Eastern Europe region had the poorest 1-year RS (38.4%), the 5-year RS was lowest in Ireland and UK (17.2%) region, with similar survival across all UK countries. Southern Europe had the best 5-year patient survival (29.6%) in Europe. While Eastern Europe had low 1- and 5-year RS, 5-year conditional survival was better than in Northern Europe, and Ireland and UK. Wide variation among countries was identified in 5-year RS estimates from 11.9% in Bulgaria to 34.5% in Iceland. Survival, at all follow-up time points investigated, decreased with increasing age, and women appeared to fare better than men.

Overall 5-year patient survival increased absolutely by less than 2% points across Europe between 1999–2001 and 2005–2007 (Table 3 and Supplement 2). The most marked improvement in patient survival was in Slovenia from 1999–2001 (RS 20.8%) to 2002–2004 (RS 27.1%), Table 3. Although no change was observed in 5-year RS in Northern Europe, improved patient survival was evident in Denmark and Sweden with a decrease in 5-year RS observed in Finland. The Netherlands had low RS compared to the rest of Central Europe across all periods.

Southern and Central Europe had better patient survival for cardia and non-cardia cancers than other regions, Table 4. Survival for non-cardia cancer patients was significantly higher than for cardia cancer patients, Table 4. In Eastern Europe, as in Southern and Central Europe, patients with non-cardia cancer predominated, Table 4.

Small Intestine Cancer

Small intestine cancer 1- and 5-year RS was 67.9% and 47.9%, respectively, see Figure 3. Ireland and UK was the region with the worst 1-year patient survival at 58.8%. Croatia was the country with the poorest 1-year RS (53.3%). The Central Europe region had the best 5-year RS for small intestine cancer (53.9%) with the poorest in the Ireland and UK region (36.9%). Wide country variation was identified in 5-year RS from 23.5% in Malta to 58.6% in Switzerland. Five-year conditional survival in patients in Ireland and UK remained significantly below the European average, Figure 3.

European patient survival declined with increasing age. Overall 1-, 3- and 5-year age-standardised RS were slightly higher in women compared to men; particularly evident in younger patients, Figure 3.

Overall 5-year RS increased from 40.5% to 48.7% from 1999–2001 until 2005–2007 (Table 5 and supplement 3). The largest improvements (>10% points) in patient survival were observed in Italy, Austria, Czech Republic and Finland. All regions, except Ireland and UK, showed a significant increase in survival from 1999–2001 to 2005–2007.

Discussion

European wide variation in patient survival was observed for all three cancer sites investigated between regions. Country-specific patient survival also displayed wide variation with several countries showing inconsistent estimates to their region, including Denmark, the Netherlands, Bulgaria and Croatia. Survival of patients improved modestly from 1999–2001 until 2005–2007 for all cancer sites. Oesophageal and stomach cancer 5-year RS for Europe remained very poor. Small intestine cancer had the best overall 5-year RS in Europe and displayed the largest improvement in patient survival.

Oesophageal cancer

European 1- and 5-year RS for oesophageal cancer patients remained poor (35.8% and 10.6%, respectively). With the exception of Central Europe, which maintained the highest patient survival compared with other European regions as reported in EUROCARE-4 [18], RS in other European regions remained below that reported in the USA [19]. Eastern Europe, where OSCC predominates, continued to have the worst RS. Geographical differences in the proportion of oesophageal cancer patients with histology ‘not otherwise specified’ between regions may account for some of these disparities (data not shown). Additionally, differences in diagnostic accuracy may also account for regional variation with potential misclassification of gastro-oesophageal tumours [20,21]. Cancer stage is a major predictor of cancer patient survival and differences in stage distribution between countries and regions, as a result of early detection and/or diagnostic practices, could also account for some of the observed disparity seen in Eastern Europe [22,23].

Five-year RS for oesophageal cancer patients, for Europe as a whole, increased marginally from 9.8% in 1999–2001 to 12.6% in 2005–2007. Central Europe and Ireland and UK demonstrated the most marked improvement. This may be explained by improvements in surgical techniques, adjuvant therapy, earlier diagnosis and/or centralisation of treatment. The trends in Europe in mortality [24] and incidence [25] in oesophageal cancer vary markedly across the countries in the study, but generally there is tight correlation between them, suggesting that improvements in survival are not due to over-diagnosis arising from increased surveillance. Variation in incidence trends may be caused by regional changes in the risk-factor prevalence [26]. Obesity may be increasing the incidence of OAC particularly in northern and western Europe, while reduction in tobacco and alcohol consumption is reducing the incidence of OSCC [26]. The generally better prognosis of patients diagnosed with EAC is not consistent across Europe [18].

Centralisation of treatment has produced a marked improvement in oesophageal cancer patient survival with many European countries introducing such strategies in recent years. Ireland and UK demonstrated comparatively better patient survival improvements for oesophageal cancer than most Northern European countries in both time frames investigated and in line with the centralisation of cancer services for oesophagogastric cancer surgery implemented in the UK in 2001. While hospitals performing more than 40 oesophagectomies annually had lower 30-day postoperative mortality, this may not fully explain regional differences in oesophageal or gastric cancer patient survival [27]. Other factors, as highlighted by the International Benchmarking Partnership, may be important

such as late diagnosis, differences in public awareness of cancer symptoms, cancer stage, morphology and topography, presence of co-morbidities, lifestyle factors such as cigarette smoking, and access to optimum care [28]. Body mass index has also been shown to be a prognostic marker for OSCC [29]. The fact that 5-year conditional patient survival is rather similar across Europe indicates relevant differences in short term mortality and points towards early diagnosis and access to care as important areas to consider with regards to improvement of oesophageal cancer patient treatment and standardisation of care.

Stomach cancer

One- and 5-year RS for stomach cancer patients remained low particularly in comparison to 5-year survival of around 69% achieved in Asia [30]. Compared to Europe, stomach cancer incidence in Asia is high, with a predominance of non-cardia tumours which have better patient survival [31]. Screening programs and more aggressive treatment undoubtedly contribute to the superior survival of patients seen in Asia but similar strategies are unlikely to be cost-effective in comparatively low incidence countries within Europe. Histological and staging variability across Europe may account for some of the differences in stomach cancer patient survival observed between countries. Patient survival improved overall in Europe from 1999–2001 to 2005–2007 particularly in Denmark and the Czech Republic. Both mortality [20] and incidence [32] rates for stomach cancer continue to fall for most countries during the period of this study, suggesting no appreciable surveillance-driven over-diagnosis that could compromise estimated survival improvement. A recent report using data from the World Health Organisation reported lower stomach cancer mortality from 2000 onwards in the UK, the USA, Japan and several European countries [33]. Centralisation of treatment for gastric cancer was implemented in several European countries, including the UK, Denmark and the Netherlands, in recent years despite reports of no survival benefit [27,34] for patients. While 5-year RS was worst in Ireland and UK, improvements in the most recent time period were observed particularly in Wales and England. While delayed diagnosis, first line treatment, or post-operative mortality could explain the patient survival disadvantage in Ireland and UK, other factors appear to be important given the poor 5-year conditional patient survival. Lifestyle differences such as smoking behaviour, co-morbidities, cancer stage and/or subtype could explain the variability observed across countries.

The decreasing 5-year RS in Finland and Norway could be related to the marked decrease in incidence, mainly affecting distal stomach cancer [35], in these countries. Patients with distal stomach cancer have better prognosis, as presented in this report, and this cancer is more responsive to preventative measures than cancers arising in the cardia or proximal stomach. As an effect of this selective incidence decrease, patient with proximal cancers, who carry a worse prognosis, may have become relatively more frequent over time.

Small intestine cancer

European 1- and 5-year RS for patients with epithelial small bowel carcinomas diagnosed from 1978–2002 were comparatively lower than those reported here for all small intestine cancers, excluding lymphomas [14]. Incidence of epithelial small intestine cancers are similar in Ireland and UK and Northern and Southern Europe [14] despite variation in RS.

Differences in cancer stage at diagnosis and subtype throughout Europe could explain the reported variations in patient survival. The EUROCARE-5 data encompasses all small intestine cancer histologies with the exception of lymphomas. Small intestine sarcomas reportedly have worse prognosis than neuroendocrine cancers which have a more favourable outcome [8,36]. Small intestine cancers are notoriously difficult to diagnose due to their vague symptoms. Delays in diagnosis and treatment of small intestine cancer patients are associated with poorer prognosis [37]. One-year RS was lower in Ireland and UK as previously reported [14], and also in Denmark and several Eastern European countries, suggesting that delayed diagnosis, at patient, primary care or referral stages, might be an important factor. This would not however explain the poorer 5-year conditional survival estimates in Ireland and UK, Denmark and Malta for those patients who survived the first year post diagnosis.

Improved survival is reported across all European regions particularly in Northern, Central and Eastern Europe for small intestine cancer patients. Increasing trends in small intestine cancer incidence has been reported [11,12,13,38,39] but mortality rates have remained stable or slightly increasing [38,39]. Given the low incidence and mortality rates, and the heterogeneity of tumour types, it is difficult to say whether effective therapy has increased patient survival [40]. Recent improvements in treatment of small intestine sarcomas, with the use of tyrosine kinase inhibitors since 2001 [41] may have influenced patient survival. Due to the low incidence of gastrointestinal stromal tumours [42], a rare sarcoma sub-type, the effect on patient survival in large datasets like EUROCARE is difficult to measure without ad hoc analyses.

Detailed discussion of the strengths and limitations of the EUROCARE-5 data are available in the article by Rossi et al. in this issue [15]. Increasing survival trends after 5 years of follow-up were found in patients with poor prognosis cancer and aged 75 year and older for Austria, Croatia, Germany, Poland and Slovakia, and may be related to difficulties in the ascertainment of life status [43] or to DCO proportions [15]. Survival estimates from these countries should be interpreted with caution. However, comparing individual countries may provide more meaningful assessment of reasons for disparities in patient survival; this is limited, however, for cancers with low incidence estimates such as small intestine and oesophageal cancer as the standard errors become large. In addition, the % DCO statistic for each country and cancer are available in Table 1, and should inform comparisons being made between individual countries' patient survival estimates [44].

Conclusions

This article presents overall patient survival for three anatomical sub-sites: oesophagus, stomach and small intestine. They provide some indication of areas that need further investigation to determine the drivers of the variation in survival of cancer patients across Europe. More in-depth investigation by anatomic sub-site and histology could explain the variability observed and are planned using additional data from EUROCARE-5. The historic nature of these large collaborative studies means that recent developments in early detection, routes to treatment, changes to service provision and new treatment modalities for patients will have had insufficient time to have a visible effect. Continued monitoring of cancer

survival across Europe will allow further evaluation of survival differences to further promote the widespread application of effective diagnosis and treatment modalities [45]. In summary, although improvements in survival have been reported for cancers of the oesophagus, stomach and small intestine, survival remains poor with wide variation across Europe.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Highlights

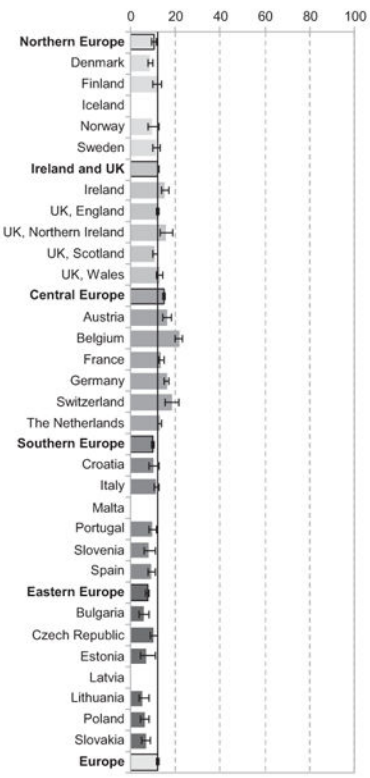
- Oesophageal cancer survival remains poor in Europe with wide variability.
- Improvements in earlier diagnosis and access to care for oesophageal cancer needed.
- Improvement in stomach cancer survival overall in Europe despite variability.
- Non-cardia stomach cancers have better survival than cardia cancers.
- Significant improvements in small intestine cancer survival observed.

Oesophagus

Age-standardised 1-year, 5-year relative survival, and 5-year relative survival conditional to surviving 1 year, with 95% confidence intervals in parentheses

	Number of cases	1-year			5-year			Conditional		
Northern Europe	**9,654**	**35.8**	**(34.8 -**	**36.9)**	**10.6**	**(9.8 -**	**11.5)**	**29.6**	**(27.5 -**	**31.9)**
Denmark	3,165	30.0	(28.4 -	31.8)	8.9	(7.7 -	10.3)	29.6	(25.8 -	33.8)
Finland	1,798	38.1	(35.6 -	40.6)	12.0	(10.1 -	14.2)	31.4	(26.8 -	36.8)
Iceland	120	43.1	(34.2 -	54.2)	-	(-	)	-	(-	)
Norway	1,442	38.4	(35.7 -	41.2)	10.0	(7.9 -	12.6)	25.9	(20.7 -	32.5)
Sweden	3,129	39.2	(37.3 -	41.2)	11.7	(10.2 -	13.3)	29.7	(26.3 -	33.5)
Ireland and UK	**63,179**	**39.8**	**(39.4 -**	**40.2)**	**12.5**	**(12.1 -**	**12.8)**	**31.4**	**(30.5 -**	**32.2)**
Ireland	2,673	41.0	(39.1 -	43.0)	15.6	(13.9 -	17.4)	37.9	(34.2 -	42.0)
UK, England	49,287	39.7	(39.2 -	40.2)	12.4	(12.0 -	12.8)	31.2	(30.3 -	32.2)
UK, Northern Ireland	1,283	39.0	(36.3 -	42.0)	16.1	(13.7 -	18.9)	41.3	(35.8 -	47.6)
UK, Scotland	6,492	40.0	(38.6 -	41.3)	11.0	(10.0 -	12.1)	27.5	(25.1 -	30.2)
UK, Wales	3,444	40.4	(38.6 -	42.2)	13.1	(11.7 -	14.8)	32.5	(29.1 -	36.3)
Central Europe	**32,860**	**45.5**	**(44.9 -**	**46.1)**	**15.3**	**(14.8 -**	**15.9)**	**33.7**	**(32.7 -**	**34.7)**
Austria	2,567	42.8	(40.8 -	44.9)	16.3	(14.5 -	18.3)	38.0	(34.3 -	42.2)
Belgium	3,936	51.8	(50.2 -	53.5)	21.8	(20.2 -	23.5)	42.0	(39.2 -	45.0)
France	4,499	46.7	(45.2 -	48.3)	13.9	(12.7 -	15.2)	29.7	(27.3 -	32.2)
Germany	9,038	46.1	(45.0 -	47.2)	16.2	(15.1 -	17.3)	35.1	(33.0 -	37.3)
Switzerland	1,190	49.6	(46.6 -	52.7)	18.4	(15.7 -	21.7)	37.2	(32.1 -	43.2)
The Netherlands	11,630	42.7	(41.8 -	43.7)	13.0	(12.2 -	13.8)	30.4	(28.7 -	32.3)
Southern Europe	**12,222**	**35.5**	**(34.6 -**	**36.4)**	**10.1**	**(9.5 -**	**10.8)**	**28.5**	**(27.0 -**	**30.2)**
Croatia	1,676	26.4	(24.2 -	28.8)	10.2	(8.3 -	12.6)	38.7	(32.0 -	46.9)
Italy	5,488	40.3	(39.0 -	41.7)	11.7	(10.7 -	12.8)	29.0	(26.7 -	31.5)
Malta	86	32.3	(24.2 -	43.2)	-	(-	)	-	(-	)
Portugal	2,530	33.5	(31.6 -	35.5)	10.0	(8.7 -	11.6)	29.9	(26.1 -	34.1)
Slovenia	712	29.6	(26.3 -	33.4)	8.3	(6.2 -	11.2)	28.1	(21.4 -	36.8)
Spain	1,730	38.2	(35.9 -	40.7)	9.3	(7.8 -	11.1)	24.5	(20.8 -	28.8)
Eastern Europe	**9,770**	**27.0**	**(26.0 -**	**28.0)**	**7.7**	**(7.0 -**	**8.6)**	**28.7**	**(26.1 -**	**31.5)**
Bulgaria	1,145	17.8	(15.4 -	20.4)	6.1	(4.3 -	8.6)	34.4	(25.0 -	47.3)
Czech Republic	3,283	31.2	(29.5 -	33.0)	10.6	(9.2 -	12.2)	34.1	(30.0 -	38.7)
Estonia	426	28.1	(23.7 -	33.3)	7.0	(4.4 -	11.2)	24.9	(16.0 -	38.7)
Latvia	809	28.4	(24.9 -	32.4)	-	(-	)	-	(-	)
Lithuania	1,121	24.0	(21.3 -	27.0)	5.7	(3.9 -	8.3)	23.7	(16.6 -	33.9)
Poland	1,328	27.2	(24.7 -	30.1)	6.5	(4.8 -	8.7)	23.8	(18.0 -	31.5)
Slovakia	1,658	25.7	(23.3 -	28.4)	6.9	(5.2 -	9.2)	26.8	(20.4 -	35.2)
Europe	**127,685**	**39.9**	**(39.4 -**	**40.4)**	**12.4**	**(12.0 -**	**12.8)**	**31.0**	**(30.1 -**	**31.9)**

Age-standardised 5-year relative survival (%)



European age-specific and age-standardised observed (obs, %) and relative (rel, %) survival

Age group	Number of cases		1-year	3-year	5-year
15-44	2,995	obs	51.1	26.8	20.9
		rel	51.2	27.0	21.1
45-54	14,298	obs	46.6	19.4	14.4
		rel	46.9	19.7	14.8
55-64	30,054	obs	45.2	18.6	13.5
		rel	45.6	19.2	14.3
65-74	36,782	obs	39.3	16.1	11.2
		rel	40.3	17.5	12.9
75+	43,556	obs	27.0	8.3	4.7
		rel	29.2	10.5	7.2
All cases	127,685	obs	38.8	15.6	10.9
		rel	39.9	16.8	12.4
Men (71%)					
15-44	2,401	obs	49.9	25.7	19.7
		rel	50.0	25.9	19.9
45-54	11,784	obs	46.0	18.6	13.6
		rel	46.2	18.9	14.0
55-64	24,050	obs	44.3	17.9	12.7
		rel	44.8	18.6	13.6
65-74	27,393	obs	39.1	15.5	10.5
		rel	40.2	16.9	12.3
75+	24,766	obs	27.4	8.1	4.6
		rel	29.9	10.5	7.2
All cases	90,394	obs	38.5	15.0	10.3
		rel	39.7	16.3	11.9
Women (29%)					
15-44	594	obs	56.6	32.2	27.6
		rel	56.7	32.3	27.8
45-54	2,514	obs	50.6	24.6	20.8
		rel	50.7	24.8	21.1
55-64	6,004	obs	50.6	23.1	18.8
		rel	50.9	23.5	19.4
65-74	9,389	obs	40.0	19.0	14.1
		rel	40.6	19.8	15.4
75+	18,790	obs	26.4	8.6	5.0
		rel	28.4	10.6	7.1
All cases	37,291	obs	40.9	18.5	14.3
		rel	41.8	19.5	15.5

Figure 1.

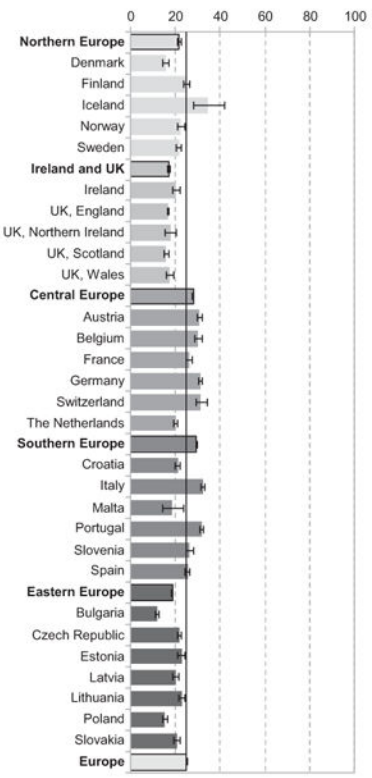
Age-specific and age-standardised relative survival for adult oesophageal cancers diagnosed in 2000–2007, by European region, country, gender, and overall.

Stomach

Age-standardised 1-year, 5-year relative survival, and 5-year relative survival conditional to surviving 1 year, with 95% confidence intervals in parentheses

	Number of cases	1-year			5-year			Conditional		
Northern Europe	**22,186**	**46.9**	**(46.2 -**	**47.6)**	**21.9**	**(21.2 -**	**22.6)**	**46.6**	**(45.3 -**	**47.9)**
Denmark	4,188	39.4	(37.9 -	41.0)	16.0	(14.7 -	17.5)	40.6	(37.6 -	43.9)
Finland	5,616	49.1	(47.8 -	50.5)	25.3	(23.9 -	26.7)	51.4	(49.0 -	54.0)
Iceland	275	54.5	(48.5 -	61.3)	34.5	(28.3 -	42.1)	63.3	(53.9 -	74.2)
Norway	4,452	49.0	(47.4 -	50.7)	22.7	(21.1 -	24.4)	46.3	(43.4 -	49.3)
Sweden	7,655	48.3	(47.1 -	49.6)	21.7	(20.5 -	22.9)	44.9	(42.7 -	47.2)
Ireland and UK	**70,341**	**42.1**	**(41.7 -**	**42.5)**	**17.2**	**(16.8 -**	**17.5)**	**40.8**	**(40.0 -**	**41.6)**
Ireland	3,616	42.3	(40.6 -	44.0)	20.3	(18.7 -	22.1)	48.1	(44.7 -	51.6)
UK, England	53,998	42.3	(41.8 -	42.8)	17.0	(16.6 -	17.4)	40.2	(39.3 -	41.2)
UK, Northern Ireland	1,854	41.5	(39.0 -	44.0)	18.1	(15.9 -	20.5)	43.6	(38.9 -	48.8)
UK, Scotland	6,713	40.4	(39.1 -	41.7)	16.1	(15.0 -	17.3)	39.9	(37.3 -	42.6)
UK, Wales	4,160	42.3	(40.6 -	44.1)	17.8	(16.2 -	19.5)	42.0	(38.7 -	45.7)
Central Europe	**68,234**	**53.3**	**(52.9 -**	**53.7)**	**28.1**	**(27.6 -**	**28.5)**	**52.7**	**(52.0 -**	**53.4)**
Austria	10,569	54.8	(53.8 -	55.8)	31.0	(29.9 -	32.2)	56.6	(54.9 -	58.5)
Belgium	6,650	56.2	(54.9 -	57.5)	30.5	(29.1 -	32.0)	54.4	(52.2 -	56.7)
France	6,084	54.8	(53.5 -	56.2)	26.3	(25.0 -	27.7)	47.9	(45.8 -	50.1)
Germany	26,662	56.3	(55.7 -	56.9)	31.3	(30.6 -	32.0)	55.6	(54.5 -	56.7)
Switzerland	2,146	57.7	(55.5 -	59.9)	31.6	(29.3 -	34.2)	54.9	(51.3 -	58.7)
The Netherlands	16,123	45.2	(44.4 -	46.0)	20.4	(19.7 -	21.3)	45.3	(43.7 -	46.8)
Southern Europe	**68,213**	**52.2**	**(51.9 -**	**52.6)**	**29.6**	**(29.2 -**	**30.0)**	**56.7**	**(56.0 -**	**57.4)**
Croatia	8,397	38.4	(37.3 -	39.5)	21.3	(20.2 -	22.5)	55.6	(53.2 -	58.1)
Italy	35,428	56.6	(56.0 -	57.2)	32.4	(31.7 -	33.0)	57.2	(56.2 -	58.1)
Malta	340	41.0	(35.7 -	47.1)	18.7	(14.5 -	24.0)	45.5	(36.9 -	56.2)
Portugal	14,127	53.9	(53.0 -	54.7)	31.8	(30.9 -	32.7)	59.0	(57.6 -	60.5)
Slovenia	3,617	46.0	(44.3 -	47.7)	26.6	(24.9 -	28.5)	57.9	(54.7 -	61.2)
Spain	6,304	49.4	(48.1 -	50.7)	25.6	(24.3 -	26.9)	51.8	(49.7 -	54.0)
Eastern Europe	**50,775**	**38.4**	**(38.0 -**	**38.9)**	**18.8**	**(18.4 -**	**19.2)**	**48.9**	**(48.0 -**	**49.9)**
Bulgaria	11,614	28.8	(27.9 -	29.6)	11.9	(11.2 -	12.7)	41.4	(39.1 -	43.9)
Czech Republic	12,354	41.8	(40.9 -	42.8)	22.0	(21.1 -	23.0)	52.7	(50.8 -	54.6)
Estonia	3,242	44.4	(42.7 -	46.2)	22.8	(21.0 -	24.8)	51.4	(47.9 -	55.2)
Latvia	4,842	38.3	(36.9 -	39.7)	20.2	(18.8 -	21.7)	52.7	(49.5 -	56.1)
Lithuania	6,741	42.5	(41.3 -	43.7)	23.1	(21.9 -	24.4)	54.3	(51.9 -	56.9)
Poland	6,112	38.1	(36.8 -	39.4)	15.6	(14.4 -	16.8)	40.8	(38.2 -	43.7)
Slovakia	5,870	43.5	(42.2 -	44.8)	20.9	(19.6 -	22.2)	48.0	(45.5 -	50.6)
Europe	**279,749**	**49.7**	**(49.4 -**	**50.0)**	**25.1**	**(24.8 -**	**25.4)**	**50.6**	**(50.1 -**	**51.1)**

Age-standardised 5-year relative survival (%)



European age-specific and age-standardised observed (obs, %) and relative (rel, %) survival

Age group	Number of cases		1-year	3-year	5-year
15-44	10,313	obs	60.3	37.4	32.0
		rel	60.4	37.5	32.3
45-54	22,471	obs	59.0	35.6	29.8
		rel	59.3	36.1	30.5
55-64	47,246	obs	55.8	33.6	27.5
		rel	56.4	34.7	29.1
65-74	84,324	obs	48.9	27.6	21.9
		rel	50.1	29.8	25.1
75+	115,395	obs	34.2	16.6	11.7
		rel	37.3	21.3	18.1
All cases	279,749	obs	48.3	27.4	21.9
		rel	49.7	29.8	25.1
Men (61%)					
15-44	5,712	obs	59.1	35.9	30.4
		rel	59.2	36.1	30.8
45-54	14,758	obs	58.0	34.4	28.3
		rel	58.3	35.0	29.2
55-64	32,479	obs	54.6	31.8	25.8
		rel	55.3	33.0	27.6
65-74	55,667	obs	47.9	25.7	19.9
		rel	49.4	28.2	23.4
75+	61,560	obs	33.7	15.4	10.5
		rel	36.9	20.4	17.0
All cases	170,176	obs	47.3	25.9	20.3
		rel	48.9	28.4	23.7
Women (39%)					
15-44	4,601	obs	61.9	39.3	34.1
		rel	62.0	39.4	34.2
45-54	7,713	obs	60.9	37.9	32.6
		rel	61.1	38.2	33.1
55-64	14,767	obs	58.6	37.8	31.5
		rel	58.9	38.5	32.5
65-74	28,657	obs	50.8	31.5	26.2
		rel	51.5	33.0	28.5
75+	53,835	obs	34.9	18.0	13.1
		rel	37.7	22.4	19.2
All cases	109,573	obs	50.0	30.3	24.9
		rel	51.1	32.3	27.7

Figure 2.

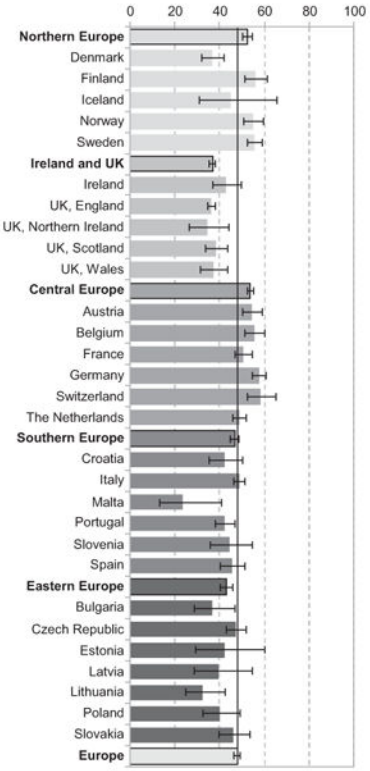
Age-specific and age-standardised relative survival for adult stomach cancers diagnosed in 2000–2007, by European region, country, gender, and overall.

Small intestine

Age-standardised 1-year, 5-year relative survival, and 5-year relative survival conditional to surviving 1 year, with 95% confidence intervals in parentheses

	Number of cases	1-year			5-year			Conditional		
Northern Europe	**3,828**	**73.5**	**72.1**	**75.0**	**52.5**	**50.5**	**54.6**	**71.5**	**69.1**	**73.9**
Denmark	600	59.8	56.0	63.7	36.8	32.4	41.9	61.6	55.1	69.0
Finland	644	76.0	72.7	79.5	56.0	51.2	61.2	73.7	68.2	79.6
Iceland	44	77.5	64.7	92.9	45.3	31.2	65.7	58.4	42.2	80.8
Norway	821	75.1	72.1	78.1	55.0	50.8	59.4	73.2	68.4	78.3
Sweden	1,719	76.2	74.2	78.3	55.7	52.7	58.9	73.0	69.5	76.7
Ireland and UK	**6,948**	**58.8**	**57.6**	**59.9**	**36.9**	**35.5**	**38.3**	**62.8**	**60.7**	**64.9**
Ireland	383	66.1	61.5	71.0	43.0	37.2	49.8	65.1	57.3	73.9
UK, England	5,361	57.5	56.2	58.9	36.4	34.9	38.1	63.3	61.0	65.7
UK, Northern Ireland	187	57.1	50.3	64.7	34.6	26.9	44.5	60.6	48.8	75.3
UK, Scotland	612	63.8	60.1	67.8	38.4	33.6	43.8	60.1	53.4	67.6
UK, Wales	405	61.7	57.1	66.6	37.3	31.7	43.8	60.4	52.4	69.6
Central Europe	**6,754**	**74.1**	**73.1**	**75.2**	**53.9**	**52.4**	**55.4**	**72.7**	**70.9**	**74.5**
Austria	889	74.7	71.8	77.7	54.6	50.6	59.0	73.1	68.4	78.1
Belgium	841	75.1	72.2	78.1	55.8	51.7	60.3	74.3	69.6	79.4
France	802	74.4	71.3	77.5	50.8	47.0	55.0	68.4	63.9	73.1
Germany	2,151	77.2	75.4	79.1	57.7	54.9	60.7	74.7	71.5	78.1
Switzerland	348	78.9	74.7	83.4	58.6	52.4	65.4	74.2	67.4	81.6
The Netherlands	1,723	68.5	66.3	70.8	48.9	46.0	52.1	71.4	67.7	75.4
Southern Europe	**3,677**	**66.2**	**64.7**	**67.7**	**46.8**	**44.9**	**48.7**	**70.6**	**68.3**	**73.1**
Croatia	286	53.3	47.9	59.4	42.3	35.4	50.6	79.4	68.8	91.5
Italy	2,206	69.7	67.8	71.6	49.0	46.7	51.6	70.4	67.5	73.4
Malta	30	68.7	51.2	92.2	23.5	13.4	40.9	34.1	21.3	54.7
Portugal	626	62.3	58.6	66.2	42.4	38.0	47.3	68.1	62.1	74.6
Slovenia	158	64.5	57.6	72.2	44.4	36.1	54.8	68.9	57.8	82.2
Spain	371	61.5	56.8	66.6	45.4	40.1	51.3	73.7	67.2	81.0
Eastern Europe	**2,071**	**61.4**	**59.2**	**63.6**	**43.0**	**40.1**	**46.0**	**70.0**	**66.1**	**74.2**
Bulgaria	262	55.5	49.1	62.8	36.6	28.5	46.8	65.9	53.1	81.7
Czech Republic	890	64.6	61.5	67.9	47.4	43.1	52.2	73.4	67.6	79.7
Estonia	87	64.4	54.6	76.0	42.2	29.7	60.1	65.5	48.0	89.6
Latvia	101	53.7	44.3	65.1	39.6	28.7	54.6	73.7	56.9	95.3
Lithuania	161	56.8	49.4	65.2	32.5	24.8	42.7	57.3	45.3	72.3
Poland	229	58.3	52.0	65.3	40.0	32.7	49.0	68.7	58.0	81.3
Slovakia	341	63.2	58.1	68.9	46.3	39.8	53.9	73.2	64.5	83.0
Europe	**23,278**	**67.9**	**67.0**	**68.9**	**47.9**	**46.7**	**49.1**	**70.5**	**69.0**	**72.0**

Age-standardised 5-year relative survival (%)



European age-specific and age-standardised observed (obs, %) and relative (rel, %) survival

Age group	Number of cases		1-year	3-year	5-year
15-44	1,490	obs	86.2	72.5	67.3
		rel	86.3	72.8	67.9
45-54	2,756	obs	82.5	67.9	59.7
		rel	82.9	68.9	61.2
55-64	5,141	obs	74.6	58.8	51.0
		rel	75.3	60.6	53.8
65-74	6,577	obs	66.5	49.2	41.0
		rel	68.0	52.8	46.6
75+	7,314	obs	47.7	28.9	23.0
		rel	51.4	36.2	34.2
All cases	23,278	obs	66.2	49.4	42.2
		rel	67.9	53.1	47.9
Men (54%)					
15-44	816	obs	84.4	68.1	63.9
		rel	84.5	68.5	64.6
45-54	1,663	obs	81.3	65.8	58.3
		rel	81.7	66.9	60.1
55-64	2,977	obs	72.5	55.9	46.8
		rel	73.3	58.1	50.0
65-74	3,729	obs	65.4	47.3	39.1
		rel	67.3	51.7	46.0
75+	3,416	obs	47.7	27.3	22.6
		rel	52.0	35.5	35.9
All cases	12,601	obs	65.1	47.1	40.1
		rel	67.2	51.5	47.0
Women (46%)					
15-44	674	obs	89.1	78.4	71.7
		rel	89.2	78.6	72.1
45-54	1,093	obs	84.5	71.3	62.4
		rel	84.7	71.9	63.3
55-64	2,164	obs	77.7	63.6	57.4
		rel	78.1	64.7	59.3
65-74	2,848	obs	67.8	51.7	43.7
		rel	68.8	54.1	47.6
75+	3,898	obs	47.8	30.1	24.3
		rel	51.0	36.5	33.9
All cases	10,677	obs	67.8	52.4	45.4
		rel	69.1	55.3	49.9

Figure 3.

Age-specific and age-standardised relative survival for adult small intestine cancers diagnosed in 2000–2007, by European region, country, gender, and overall.

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Table 1

Number of cases, percentage Death Certificate Only (DCO) cases and mean age at diagnosis (years) for oesophageal, stomach and small intestine cancers by country/region before exclusion of autopsy and DCO cases.

	Oesophagus					Stomach					Small Intestine				
	All cases	Men	Women	% DCO[a]	Mean age	All cases	Men	Women	% DCO[a]	Mean age	All cases	Men	Women	% DCO[a]	Mean age
Northern EU															
Denmark	3,177	2,242	935	0	68.2	4,200	2,700	1,500	0	68.7	602	303	299	0	66.7
Finland	1,859	1,218	641	1.1	69.2	5,812	3,213	2,599	0.7	70.1	691	367	324	1.4	65.3
Iceland	121	87	34	0	71.6	281	171	110	0	72.5	47	27	20	0	66.2
Norway	1,466	1,041	425	0.8	70.1	4,521	2,717	1,804	0.6	72.5	836	441	395	0.2	66.9
Sweden	3,203	2,300	903	0	70.1	7,863	4,740	3,123	0	72.1	1,819	1,012	807	0	68.9
Ireland and UK															
Ireland	2,706	1,707	999	0.8	69.7	3,701	2,297	1,404	1.6	69.8	392	228	164	1.5	65.3
UK-England	50,610	32,299	18,311	2.6	71.5	55,973	36,023	19,950	3.5	72.9	5,501	2,985	2,516	2.5	68.1
UK-Northern Ireland	1,294	817	477	0.7	69.9	1,882	1,129	753	1.3	71.5	189	109	80	1.1	65.7
UK-Scotland	6,531	4,072	2,459	0.4	70.7	6,771	4,096	2,675	0.5	72.0	615	313	302	0.2	67.5
UK-Wales	3,530	2,196	1,334	2.4	71.2	4,324	2,706	1,618	3.8	73.1	413	210	203	1.9	68.2
Central EU															
Austria	2,569	2,066	503	0	64.7	10,572	5,817	4,755	0	71.1	889	463	426	0	66.2
Belgium[b]	3,984	3,054	930	0	66.3	6,737	4,146	2,591	0	71.6	856	457	399	0	66.6
France[b]	4,531	3,817	714	0	65.9	6,194	3,961	2,233	0	71.3	822	462	360	0	66.8
Germany[b]	10,152	8,021	2,131	10.6	65.3	31,664	17,865	13,799	15.6	70.9	2,357	1,254	1,103	8.2	66.4
Switzerland[b]	1,222	936	286	1.0	68.0	2,223	1,317	906	1.7	70.3	381	213	168	0	68.1
The Netherlands	11,654	8,355	3,299	0	67.6	16,208	10,268	5,940	0	69.9	1,769	920	849	0	66.0
Southern EU															
Croatia	1,815	1,492	323	7.6	64.9	9,146	5,553	3,593	8.2	68.6	306	173	133	6.5	66.1
Italy[b]	5,600	4,178	1,422	1.5	68.9	36,113	20,960	15,153	1.6	72.6	2,248	1,259	989	1.2	68.6
Malta	94	69	25	8.5	68.2	359	216	143	5.0	70.0	31	13	18	3.2	60.5
Portugal[b]	2,619	2,201	418	0.1	63.7	14,723	8,931	5,792	0.1	67.2	641	366	275	0	66.3

	Oesophagus					Stomach					Small Intestine				
	All cases	**Men**	**Women**	**% DCO[a]**	**Mean age**	**All cases**	**Men**	**Women**	**% DCO[a]**	**Mean age**	**All cases**	**Men**	**Women**	**% DCO[a]**	**Mean age**
Slovenia	739	607	132	2.3	64.9	3,772	2,314	1,458	2.4	68.9	162	95	67	0	65.1
Spain[b]	1,782	1,541	241	2.6	65.1	6,598	4,193	2,405	3.6	70.4	378	225	153	1.3	67.2
Eastern EU															
Bulgaria	1,478	1,152	326	22.5	64.6	14,616	9,005	5,611	20.5	68.2	345	197	148	24.1	63.5
Czech Republic	3,680	3,090	590	5.1	63.6	13,760	7,996	5,764	4.6	69.3	1,019	559	460	3.9	65.4
Estonia	434	355	79	0	64.9	3,277	1,776	1,501	0.2	66.8	90	36	54	0	64.2
Latvia	881	739	142	6.5	63.8	5,324	2,948	2,376	6.6	67.0	114	52	62	11.4	65.8
Lithuania	1,180	1,022	158	4.8	63.1	7,047	4,095	2,952	4.2	67.2	176	83	93	8.5	65.8
Poland[b]	1,353	1,070	283	1.7	63.5	6,253	3,938	2,315	1.6	67.0	230	122	108	0	64.3
Slovakia	1,937	1,732	205	12.5	60.7	6,826	4,111	2,715	12.3	6\8.1	397	212	185	10.8	64.3

[a] Also includes ‘autopsy-only’ basis of diagnosis.

[b] Pooled rates as these countries did not have national coverage.

Table 2

Five-year relative survival (RS) and corresponding 95% confidence interval (CI) of oesophageal cancer in three periods (1999–2001, 2002–2004, 2005–2007) by country, European region and European average, with p-values of differences[a] between periods.

	Number of cases analysed across all time periods	1999–2001		2002–2004		2005–2007		2005–2007 vs 1999–2001	
		% RS	95% CI	% RS	95% CI	% RS	95% CI	Abs diff	*p-value*
Europe	**111006**	**9.9**	**(9.3–10.5)**	**11.7**	**(11.0–12.3)**	**12.6**	**(12.0–13.2)**	**2.7**	**<0.001**
Northern EU	**10471**	**9.1**	**(8.0–10.4)**	**11.3**	**(10.1–12.8)**	**10.8**	**(9.7–12.1)**	**1.7**	**0.023**
Denmark	3401	4.6	(3.3–6.4)	9.0	(7.0–11.5)	9.7	(7.9–11.8)	5.1	<0.001
Finland	1959	9.6	(7.2–12.7)	12.9	(9.9–16.7)	12.1	(9.5–15.2)	2.5	0.108
Iceland[b]	129	–		–	–	–	–	–	–
Norway	1572	8.4	(5.7–12.4)	12.5	(9.5–16.5)	10.9	(8.0–14.8)	2.5	0.150
Sweden	3411	13.3	(11.0–16.0)	12.3	(10.0–15.2)	10.6	(8.8–12.8)	2.7	0.052
Ireland and UK	**67862**	**10.3**	**(9.8–10.8)**	**11.9**	**(11.4–12.4)**	**13.5**	**(13.0–14.1)**	**3.2**	**<0.001**
Ireland	2816	11.9	(9.6–14.7)	15.3	(12.7–18.3)	16.7	(14.2–19.6)	4.8	0.005
England	52786	9.9	(9.4–10.6)	11.5	(10.9–12.1)	13.7	(13.1–14.3)	3.7	<0.001
Northern Ireland[b]	1389	9.6	(7.1–13.0)	14.6	(11.3–18.7)	–	–	–	–
Scotland	7142	10.0	(8.6–11.6)	11.7	(10.1–13.5)	11.1	(9.7–12.7)	1.1	0.157
Wales	3727	14.1	(11.7–17.1)	13.8	(11.6–16.4)	12.6	(10.5–15.0)	1.6	0.188
Central EU	**18139**	**10.8**	**(9.9–11.8)**	**13.9**	**(12.8–15.0)**	**15.2**	**(14.2–16.2)**	**4.3**	**<0.001**
Austria	2711	11.7	(9.4–14.6)	17.9	(15.1–21.2)	17.1	(14.6–20.0)	5.4	0.002
France	3365	13.0	(11.2–15.0)	11.2	(9.6–13.0)	–	–	–	–
Germany[b]	1804	16.1	(12.8–20.4)	13.7	(10.6–17.7)	–	–	–	–
Switzerland	1075	15.3	(11.4–20.5)	18.3	(14.3–23.4)	18.9	(14.6–24.4)	3.6	0.145
The Netherlands	11744	9.6	(8.6–10.8)	13.1	(11.9–14.5)	14.4	(13.3–15.7)	4.8	<0.001
Southern EU	**4474**	**9.7**	**(8.2–11.6)**	**10.6**	**(9.0–12.5)**	**10.9**	**(9.2–12.7)**	**1.1**	**0.186**
Italy	3278	10.7	(8.8–13.2)	12.4	(10.3–14.8)	11.0	(9.1–13.3)	0.3	0.432
Malta[b]	67	–	–	–	–	–	–	–	–
Slovenia[b]	805	7.1	(4.2–12.1)	–	–	8.6	(5.5–13.6)	1.5	0.289
Spain	1792	7.9	(6.1–10.2)	7.9	(6.1–10.2)	–	–	–	–
Eastern EU	**10063**	**7.3**	**(6.1–8.6)**	7.4	(6.3–8.6)	**8.1**	**(7.0–9.3)**	**0.8**	**0.175**

	Number of cases analysed across all time periods	1999–2001		2002–2004		2005–2007		2005–2007 vs 1999–2001	
		% RS	95% CI	% RS	95% CI	% RS	95% CI	Abs diff	*p-value*
Bulgaria[b]	1172	–	–	–	–	6.7	(4.2–10.7)	–	–
Czech Republic	3496	7.3	(5.4–9.8)	9.2	(7.0–12.2)	11.4	(9.5–13.7)	4.2	0.003
Estonia[b]	485	–	–	–	–	–	–	–	–
Lithuania[b]	1348	8.4	(5.6–12.5)	4.7	(2.9–7.5)	–	–	–	–
Poland[b]	1474	8.1	(5.3–12.4)	7.7	(5.3–11.3)	6.2	(4.0–9.7)	1.9	0.205
Slovakia[b]	111006	6.4	(3.9–10.3)	10.1	(6.4–15.6)	–	–	–	–

Abs = absolute, Diff = Difference.

[a]Survival differences between periods have been assessed by the Z-test.

[b]Standardized Survival rates could not be calculated where one or more age specific rates are absent due to small number of cases.

Note: % difference is the relative difference.

Note: Empty fields of RS in France and Spain in 2007 are due to a limitation of analysis to periods 1999–2001 and 2002–2004 only.

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Table 3

Five-year relative survival (RS) and corresponding 95% confidence interval (CI) of stomach cancer in three periods (1999–2001, 2002–2004, 2005–2007) by country, European region and European average, with p-values of differences[a] between periods.

	Number of cases analysed across all time periods	1999–2001		2002–2004		2005–2007		2005–2007 vs 1999–2001	
		% RS	95% CI	% RS	95% CI	% RS	95% CI	Abs diff	*p-value*
Europe	**232452**	**23.3**	**(22.9–23.8)**	**23.8**	**(23.4–24.3)**	**25.1**	**(24.6–25.6)**	**1.8**	**<0.001**
Northern EU	**26201**	**22.4**	**(21.4–23.5)**	**21.7**	**(20.7–22.7)**	**22.7**	**(21.6–23.8)**	**0.3**	**0.360**
Denmark	4691	14.0	(12.2–16.2)	14.7	(12.7–16.9)	18.3	(16.3–20.6)	4.3	0.002
Finland	6667	28.5	(26.5–30.8)	25.0	(23.0–27.1)	25.2	(23.1–27.5)	−3.3	0.016
Iceland [b]	341	–	–	–	–	–	–	–	–
Norway	5341	23.5	(21.2–26.1)	21.8	(19.6–24.3)	23.5	(21.1–26.2)	0.0	0.499
Sweden	9152	21.4	(19.8–23.2)	22.6	(20.8–24.5)	22.5	(20.7–24.4)	1.0	0.214
Ireland and UK	**83908**	**16.1**	**(15.6–16.7)**	**16.5**	**(16.0–17.1)**	**18.2**	**(17.6–18.8)**	**2.0**	**<0.001**
Ireland	4056	19.4	(17.1–22.0)	19.4	(17.0–22.0)	21.9	(19.4–24.6)	2.5	0.086
England	64533	16.1	(15.5–16.7)	16.3	(15.7–16.9)	18.0	(17.3–18.7)	1.9	<0.001
Northern Ireland	2189	17.7	(14.7–21.4)	18.8	(15.8–22.4)	18.4	(15.0–22.5)	0.6	0.400
Scotland	7992	14.7	(13.1–16.5)	16.8	(15.1–18.7)	16.3	(14.5–18.3)	1.6	0.104
Wales	5144	16.1	(13.9–18.6)	16.5	(14.3–18.9)	20.0	(17.5–22.9)	4.0	0.015
Central EU	**39365**	**24.0**	**(23.2–24.9)**	**24.7**	**(23.9–25.6)**	**26.2**	**(25.3–27.1)**	**2.1**	**<0.001**
Austria	12740	30.7	(29.1–32.3)	29.8	(28.2–31.5)	33.6	(31.8–35.4)	2.9	0.009
France [b]	4997	25.4	(23.4–27.5)	28.1	(26.1–30.3)	–	–	–	–
Germany	4486	27.2	(24.7–30.0)	27.0	(24.5–29.7)	27.5	(24.9–30.3)	0.3	0.439
Switzerland	2019	25.0	(21.6–29.0)	29.3	(25.5–33.7)	31.4	(27.4–36.0)	6.4	0.014
The Netherlands	18808	18.9	(17.8–20.1)	20.6	(19.4–21.8)	21.1	(19.9–22.3)	2.2	0.005
Southern EU	**29234**	**30.5**	**(29.4–31.6)**	**30.4**	**(29.4–31.5)**	**32.1**	**(31.0–33.3)**	**1.6**	**0.021**
Italy pool	23784	32.7	(31.5–34.0)	31.6	(30.4–32.9)	33.8	(32.5–35.1)	1.1	0.126
Malta [b]	398	–	–	–	–	–	–	–	–
Slovenia	4116	20.8	(18.5–23.5)	27.1	(24.4–30.1)	27.9	(25.3–30.7)	7.0	<0.001
Spain	6569	25.1	(23.5–26.8)	25.9	(24.2–27.7)	–		–	–
Eastern EU	**53747**	**17.6**	**(16.9–18.2)**	**19.0**	**(18.3–19.6)**	**18.8**	**(18. 2–19.5)**	**1.3**	**0.004**
Bulgaria	12555	10.9	(9.8–12.1)	12.5	(11.3–13.8)	12.8	(11.7–14.0)	2.0	0.010

	Number of cases analysed across all time periods	1999–2001		2002–2004		2005–2007		2005–2007 vs 1999–2001	
		% RS	95% CI	% RS	95% CI	% RS	95% CI	Abs diff	*p-value*
Czech Republic	14449	18.1	(16.9–19.4)	21.3	(19.9–22.7)	22.6	(21.2–24.0)	4.4	<0.001
Estonia	3852	21.8	(19.3–24.7)	24.8	(22.0–27.8)	22.2	(19.6–25.1)	0.3	0.432
Lithuania	8614	22.0	(20.4–23.8)	23.4	(21.7–25.2)	23.7	(21.7–25.8)	1.7	0.112
Poland	7164	15.2	(13.5–17.0)	16.7	(15.0–28.5)	15.6	(14.0–17.4)	0.4	0.367
Slovakia	7186	21.2	(19.3–23.2)	20.3	(18.6–22.3)	21.1	(19.2–23.1)	−0.1	0.471

Abs = absolute, Diff = Difference.

[a] Survival differences between periods have been assessed by the Z-test.

[b] Standardized Survival rates could not be calculated where one or more age specific rates are absent due to small number of cases.

Note: % difference is the relative difference.

Note: Empty fields of RS in Spain in 2007 are due to a limitation of analysis to periods 1999–2001 and 2002–2004 only.

Table 4

Age-standardised 1-year, 5-year relative survival, and 5-year relative survival conditional on surviving 1 year, with 95% confidence intervals, for cardia and non-cardia stomach cancers.

	Cardia							Non-cardia						
	No. of cases	1-year		5-year		Conditional		No. of cases	1-year		5-year		Conditional	
		% RS	95% CI	% RS	95% CI	% RS	95% CI		% RS	95% CI	% RS	95% CI	% RS	95% CI
Europe	**48611**	**46.0**	**45.5–46.4**	**16.0**	**15.5–16.4**	**34.0**	**33.2–34.9**	**96020**	**54.6**	**54.3–54.9**	**30.5**	**30.1–30.9**	**66.3**	**65.9–66.8**
Northern EU	**5299**	**43.3**	**41.9–44.7**	**14.1**	**12.9–15.3**	**32.5**	**30.0–35.1**	**6027**	**55.2**	**53.8–56.5**	**28.6**	**27.1–30.2**	**51.9**	**49.4–54.5**
Denmark	1687	41.0	38.6–43.4	12.8	10.8–15.0	31.2	26.8–36.2	1149	48.0	44.9–51.0	25.9	22.8–29.2	53.9	48.4–60.1
Finland	936	45.9	42.5–49.2	16.0	13.2–19.1	34.9	29.5–41.4	272	57.8	51.3–63.7	–	–	–	–
Iceland	41	31.0	18.0–44.8	10.3	3.4–19.1	33.2	15.2–72.5	70	74.7	62.7–83.0	–	–	–	–
Norway	967	43.9	40.6–47.1	15.4	12.7–18.5	35.2	29.6–42.0	1831	58.0	55.4–60.5	30.0	27.2–32.9	51.8	47.7–56.2
Sweden	1668	44.2	41.7–46.6	13.6	11.6–15.7	30.7	26.6–35.5	2705	55.9	53.7–58.0	28.0	25.6–30.4	50.1	46.3–54.1
Ireland and UK	**19244**	**46.6**	**45.8–47.3**	**14.4**	**13.8–15.1**	**31.0**	**29.7–32.4**	**17457**	**48.4**	**47.5–49.3**	**23.2**	**22.3–24.0**	**47.9**	**46.3–49.5**
Ireland	986	42.2	39.0–45.3	17.0	14.1–20.0	40.2	34.3–47.1	1705	46.2	43.8–48.7	24.4	21.9–27.0	52.8	48.3–57.7
England	14510	47.4	46.5–48.2	14.8	14.1–15.5	31.2	29.8–32.70	11932	49.2	48.1–50.3	23.1	22.0–24.2	46.9	45.1–48.9
Northern Ireland	462	46.4	41.6–51.1	16.2	12.3–20.7	35.0	27.5–44.5	534	42.2	37.4–47.0	21.2	16.9–25.8	50.1	41.9–59.9
Scotland	1983	42.9	40.5–45.3	11.3	9.6–13.2	26.4	22.7–30.7	1787	47.6	44.9–50.2	23.4	20.8–26.1	49.2	44.6–54.4
Wales	1303	46.7	43.8–49.6	13.2	10.9–15.8	28.4	23.8–33.8	1499	47.3	44.2–50.4	22.3	19.4–25.4	47.2	41.9–53.1
Central EU	**13230**	**49.2**	**48.4–50.1**	**18.2**	**17.4–19.0**	**37.0**	**35.4–38.5**	**26709**	**60.9**	**60.3–61.5**	**36.0**	**35.2–36.7**	**59.1**	**58.0–60.1**
Austria	1297	50.5	47.7–53.3	22.6	19.8–25.5	44.7	39.9–50.1	1895	65.9	63.5–68.1	40.2	37.3–43.1	61.0	57.3–65.0
Belgium	1264	55.9	53.1–58.7	20.5	17.7–23.5	36.7	32.1–41.9	1504	63.0	60.3–65.7	35.6	32.3–38.8	56.4	52.0–61.2
France	1384	50.6	47.9–53.3	14.7	12.6–17.0	29.0	25.3–33.4	2949	58.6	56.6–60.6	32.8	30.6–35.0	56.0	52.9–59.2
Germany	4506	52.7	51.2–54.2	22.3	20.7–23.9	42.3	39.7–45.1	11906	64.4	63.5–65.3	40.1	39.0–41.3	62.3	60.8–63.9
Switzerland	494	52.0	47.4–56.5	–	–	–	–	1145	64.1	61.1–67.0	40.8	37.2–44.3	63.6	59.1–68.4
The Netherlands	4285	42.4	40.9–43.9	13.1	11.9–14.5	31.0	28.3–34.0	7310	53.7	52.5–54.9	28.9	27.5–30.2	53.8	51.6–56.0
Croatia	476	42.43	37.7–47.1	27.0	21.9–32.4	63.7	54.2–74.9	446	56.6	51.6–61.4	37.4	31.4–43.5	66.1	57.6–75.8
Southern EU	**5793**	**48.6**	**47.2–49.9**	**20.2**	**18.9–21.5**	**41.5**	**39.2–44.0**	**24960**	**60.1**	**59.4–60.7**	**36.2**	**35.5–36.9**	**60.2**	**59.2–61.3**
Italy	3193	52.2	50.3–54.0	20.9	19.1–22.7	40.0	37.0–43.3	15728	61.3	60.5–62.1	37.1	36.2–38.1	60.6	59.2–61.9
Malta	65	35.9	25.5–46.4	–	–	–	–	107	49.2	38.8–58.7	25.4	16.9–34.8	51.7	38.6–69.3

	Cardia							Non-cardia						
	No. of cases	1-year		5-year		Conditional		No. of cases	1-year		5-year		Conditional	
		% RS	95% CI	% RS	95% CI	% RS	95% CI		% RS	95% CI	% RS	95% CI	% RS	95% CI
Portugal	890	45.5	42.0–48.9	20.6	17.6–23.9	45.4	39.7–51.9	4188	59.4	57.8–60.9	36.1	34.4–37.9	60.8	58.4–63.4
Slovenia	473	46.2	41.4–50.8	18.3	14.1–22.9	39.6	31.8–49.3	1424	61.2	58.6–63.8	41.0	37.8–44.2	67.0	62.8–71.5
Spain	696	44.7	40.8–48.5	16.9	13.9–20.2	37.9	32.0–44.8	3067	55.4	53.5–57.2	30.8	28.9–32.7	55.6	52.7–58.5
Eastern EU	**5045**	**36.4**	**35.1–37.8**	**13.1**	**12.0–14.4**	**36.1**	**33.2–39.2**	**20867**	**45.6**	**44.9–46.3**	**23.7**	**23.0–24.4**	**52.0**	**50.6–53.4**
Bulgaria	1273	25.3	22.9–27.8	7.6	5.8–9.9	30.2	23.5–38.7	6460	33.8	32.6–35.0	14.2	13.1–15.4	42.0	39.1–45.2
Czech Republic	1596	41.4	38.9–43.9	15.6	13.4–18.0	37.7	32.9–43.2	5927	49.5	48.2–50.9	27.5	26.0–29.0	55.5	53.0–58.1
Estonia	262	41.2	35.0–47.3	18.4	12.9–24.7	44.7	33.6–59.3	1760	50.9	48.4–53.2	29.1	26.3–31.8	57.2	52.7–62.0
Latvia	266	32.8	27.0–38.7	15.9	10.8–21.9	48.4	35.8–65.5	1012	44.1	40.9–47.3	22.8	19.4–26.3	51.7	45.2–59.0
Lithuania	312	42.2	36.3–47.9	15.4	11.2–20.3	36.6	28.0–47.6	2218	54.6	52.4–56.7	31.3	28.8–33.7	57.3	53.5–61.3
Poland	627	41.6	37.7–45.5	12.8	9.6–16.5	30.8	23.9–39.6	398	47.9	42.8–52.9	17.4	12.6–22.9	36.4	27.5–48.1
Slovakia	709	38.9	35.1–42.7	13.6	10.5–17.0	34.8	28.0–43.3	3092	53.9	52.0–55.7	28.7	26.7–30.7	53.2	50.1–56.5

Table 5

Five-year relative survival (RS) and corresponding 95% confidence interval (CI) of small intestine cancer in three periods (1999–2001, 2002–2004, 2005–2007) by country, European region and European average, with p-values of differences* between periods.

Number of cases analysed across all time periods		1999–2001		2002–2004		2005–2007		2005–2007 vs 1999–2001	
		% RS	95% CI	% RS	95% CI	% RS	95% CI	Abs diff	*p-value*
Europe	**18116**	**40.5**	**(38.5–42.7)**	**45.8**	**(43.9–47.9)**	**48.7**	**(46.9–50.5)**	**8.1**	**<0.001**
Northern EU	**4021**	**49.9**	**(46.7–53.3)**	**50.7**	**(47.7–53.9)**	**55.8**	**(53.0–58.8)**	**6.0**	**0.004**
Denmark	626	37.4	(30.3–46.1)	37.7	(30.4–46.6)	39.6	(33.2–47.1)	**2.2**	0.341
Finland	678	51.7	(43.7–61.2)	55.4	(48.8–62.9)	62.1	(54.9–70.3)	**10.4**	0.040
Iceland [b]	49	–	–	–	–	–	–	–	–
Norway	834	52.6	(45.7–60.6)	51.6	(45.4–58.6)	56.6	(50.5–63.3)	**3.9**	0.216
Sweden	1835	52.0	(47.5–57.0)	53.3	(48.9–58.1)	59.5	(55.3–64.0)	**7.5**	0.011
Ireland and UK	**7178**	**35.3**	**(33.1–37.6)**	**36.1**	**(34.1–38.3)**	**37.7**	**(35.7–39.8)**	**2.4**	**0.058**
Ireland	376	35.5	(26.2–48.1)	44.7	(36.3–55.2)	42.8	(34.7–52.9)	**7.3**	0.154
England	5539	34.4	(31.9–37.0)	35.1	(32.8–37.5)	37.7	(35.5–40.2)	**3.4**	0.027
Northern Ireland	230	37.4	(27.9–50.2)	33.9	(23.0–50.0)	43.5	(30.6–61.9)	**6.1**	0.263
Scotland	639	39.6	(32.7–48.0)	37.5	(30.1–46.7)	38.4	(31.9–46.1)	**−1.3**	0.405
Wales	401	38.9	(28.6–52.7)	38.2	(29.6–49.3)	33.3	(25.9–42.8)	**−5.6**	0.227
Central EU	**3399**	**44.1**	**(40.7–47.8)**	**47.8**	**(44.5–51.2)**	**53.0**	**(50.0–56.3)**	**9.0**	**<0.001**
Austria	899	43.6	(37.3–50.9)	52.3	(46.0–59.4)	55.7	(50.1–61.9)	**12.1**	0.004
France	572	45.3	(39.3–52.3)	48.3	(42.2–56.2)	–	–	–	–
Germany	323	42.0	(31.6–56.0)	45.6	(34.9–59.6)	50.1	(41.2–61.0)	**8.1**	0.154
Switzerland	294	54.7	(45.0–66.5)	59.9	(50.4–71.0)	55.4	(45.4–67.5)	**0.7**	0.467
The Netherlands	1737	44.5	(39.6–50.0)	43.3	(39.0–48.2)	51.5	(47.2–56.3)	**7.1**	0.022
Southern EU	**1570**	**39.5**	**(34.7–44.9)**	**49.0**	**(44.3–54.2)**	**49.7**	**(45.5–54.3)**	**10.2**	**0.001**
Italy	1338	38.7	(33.5–44.6)	48.7	(43.7–54.4)	51.1	(46.4–56.3)	**12.5**	<0.001
Malta [b]	34	–	–	–	–	–	–	–	–
Slovenia [b]	153	–	–	48.5	(33.8–69.6)	–	–	–	–
Spain	347	46.3	(38.4–56.0)	42.4	(35.9–50.1)	–	–	–	–
Eastern EU	**1951**	**34.5**	**(29.4–40.4)**	**43.4**	**(38.9–48.4)**	**43.5**	**(39.6–47.8)**	**9.1**	**0.005**
Bulgaria	248	41.9	(26.0–67.6)	35.8	(25.1–51.0)	–	–	–	–

	Number of cases analysed across all time periods	1999–2001		2002–2004		2005–2007		2005–2007 vs 1999–2001	
		% RS	95% CI	% RS	95% CI	% RS	95% CI	Abs diff	*p-value*
Czech Republic	849	35.8	(28.3–45.4)	46.1	(39.4–54.0)	46.9	(41.0–53.6)	**11.0**	0.020
Estonia [b]	95	–	–	–	–	–	–	–	–
Lithuania [b]	186	–	–	–	–	32.9	(22.0–49.4)	–	–
Poland [b]	225	–	–	–	–	44.7	(33.7–59.1)	–	–
Slovakia	368	51.4	(39.4–67.1)	42.0	(32.2–54.7)	46.2	(37.6–56.8)	**−5.2**	0.269

Abs = absolute, Diff = Difference.

[a] Survival differences between periods have been assessed by the Z-test.

[b] Standardized Survival rates could not be calculated where one or more age specific rates are absent due to small number of cases.

Note: % difference is the relative difference.

Note: Empty fields of RS in France and Spain in 2007 are due to a limitation of analysis to periods 1999–2001 and 2002–2004 only.