Complete cancer prevalence in Europe in 2020 by disease duration and country (EUROCARE-6): a population-based study

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Summary

Background Cancer survivors—people living with and beyond cancer—are a growing population with different health needs depending on prognosis and time since diagnosis. Despite being increasingly necessary, complete information on cancer prevalence is not systematically available in all European countries. We aimed to fill this gap by analysing population-based cancer registry data from the EUROCARE-6 study.

Methods In this population-based study, using incidence and follow-up data up to Jan 1, 2013, from 61 cancer registries, complete and limited-duration prevalence by cancer type, sex, and age were estimated for 29 European countries and the 27 countries in the EU (EU27; represented by 22 member states that contributed registry data) using the completeness index method. We focused on 32 malignant cancers defined according to the third edition of the International Classification of Diseases for Oncology, and only the first primary tumour was considered when estimating the prevalence. Prevalence measures are expressed in terms of absolute number of prevalent cases, crude prevalence proportion (reported as percentage or cases per 100 000 resident people), and age-standardised prevalence proportion based on the European Standard Population 2013. We made projections of cancer prevalence proportions up to Jan 1, 2020, using linear regression.

Findings In 2020, 23 711 thousand (95% CI 23 565–23 857) people (5·0% of the population) were estimated to be alive after a cancer diagnosis in Europe, and 22 347 thousand (95% CI 22 210–22 483) in EU27. Cancer survivors were more frequently female (12 818 thousand [95% CI 12 720–12 917]) than male (10 892 thousand [10 785–11 000]). The five leading tumours in female survivors were breast cancer, colorectal cancer, corpus uterine cancer, skin melanoma, and thyroid cancer (crude prevalence proportion from 2270 [95%CI 2248–2292] per 100 000 to 301 [297–305] per 100 000). Prostate cancer, colorectal cancer, urinary bladder cancer, skin melanoma, and kidney cancer were the most common tumours in male survivors (from 1714 [95% CI 1686–1741] per 100 000 to 255 [249–260] per 100 000). The differences in prevalence between countries were large (from 2 to 10 times depending on cancer type), in line with the demographic structure, incidence, and survival patterns. Between 2010 and 2020, the number of prevalent cases increased by 3·5% per year (41% overall), partly due to an ageing population. In 2020, 14 850 thousand (95% CI 14 681–15 018) people were estimated to be alive more than 5 years after diagnosis and 9099 thousand (8909–9288) people were estimated to be alive more than 10 years after diagnosis, representing an increasing proportion of the cancer survivor population.

Interpretation Our findings are useful at the country level in Europe to support evidence-based policies to improve the quality of life, care, and rehabilitation of patients with cancer throughout the disease pathway. Future work includes estimating time to cure by stage at diagnosis in prevalent cases.

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Introduction

Cancer survivors (ie, any individual diagnosed with cancer who is living) are a relatively understudied population with diverse care needs depending on prognostic factors and the phase of care (first line, surveillance, or terminal care). Representative and reliable indicators quantifying cancer prevalence by disease duration over time are essential to develop follow-up guidelines, prevent late health effects, better tackle the causes of inequalities, and improve patients' quality of life.

The rapid increase in the number of cancer survivors in all ageing societies, combined with the cost of innovative therapies, poses a major challenge to the sustainability of public health systems. Detailed and comparable prevalence indicators are therefore also increasingly needed for cancer control planning and Health Technology Assessment.

Cancer prevalence in a population indicates the number (or proportion) of people living after a cancer diagnosis at a given time (ie, the index date). This

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See Online for appendix

Research in context

Evidence before this study

We searched MEDLINE on April 18 and May 9, 2023, focusing on documents published in English since Jan 1, 2002, when the EUROPREVAL project published the first complete cancer prevalence estimation in Europe using population-based cancer registry data. We combined search terms relevant to cancer ("cancer", "neoplasms") and to registries ("population-based", "registries"), with terms restricting the focus to prevalence ("prevalence", "survivors") and the European area ("Europe"). We excluded irrelevant reports (prevalence of cancer as comorbid condition and prevalence of risk factors and other conditions). We prioritised evidence from population-based studies. We identified a growing body of evidence on the health-care needs of cancer survivors in Europe, but information on their actual number and characterisation is scattered and not comprehensive. Systematic estimates of cancer prevalence by country are provided by the International Agency for Research on Cancer only for short-term follow-up (within 5 years from diagnosis). By contrast, complete prevalence, including all people living longer than 5 years after a cancer diagnosis, is not routinely available in Europe. A main reason for this is that, unlike incidence or survival, complete prevalence cannot be measured from cancer registry data, but it must be estimated using specific methods to compensate for limited follow-up.

Added value of this study

This study quantifies and characterises the total cancer prevalence by country in Europe in 2020 using, to our knowledge, the largest available population-based dataset (EUROCARE-6). The number and proportion of cancer survivors are estimated for 32 cancer entities by sex, age, disease duration, and time period in 29 European countries, including the UK and European Free Trade Association countries. The size of the population covered (61 cancer registries, 23 of which are national) strengthens the representativeness of the study. A unique data collection protocol and central quality control maximised the standardisation of individual data. The completeness index method was used to optimise the accuracy and international comparability of the estimates. The study identifies the most common cancers among prevalent cases. The demographic and case-mix characteristics of cancer survivors differ from those of incident and deceased cancer cases. The differences between countries are also remarkably greater than for cancer incidence or mortality. Cancer survivors beyond 5 years are found to be a dominant and increasing proportion of the cancer survivor population. Prevalence time trends differ by cancer with a varying effect of demographic ageing.

Implications of all the available evidence

Long-term cancer survivorship implies emerging health and social needs that require an integrated approach throughout the life course. Oncological rehabilitation should address all the needs of survivors, including psychological, cognitive, social, sexual, and nutritional symptoms. Our results allow identification of specific high-risk populations and are helpful in defining priorities for intervention and in the Health Technology Assessment domain. Our results can usefully complement studies on cancer recovery (time to cure) and quality of life conducted in representative patient cohorts. Prevalence estimates at the threshold of the COVID-19 era provide a baseline with which to compare the evidence that will emerge from population data after 2020, which is currently limited in Europe. There is an increasing need for comprehensive cancer prevalence estimates with continuity, detail, and systematicity in Europe. The joint analysis of data from European cancer registries provides immense added value to what individual countries can do and should be sustained over time.

For the **Global Cancer Observatory** see https://gco.iarc.fr/

estimate includes all people who have ever been diagnosed, regardless of the time since diagnosis or whether they are still under treatment or cured. Cancer prevalence can be measured from incidence and survival data collected by population-based cancer registries by counting incident cases alive at the index date. However, observed prevalence, unlike other registry statistics, is intrinsically incomplete because it cannot include living people diagnosed before the start of registration. A virtually complete observed prevalence is only released by registries operating for five or more decades. Commonly, registration periods are shorter than five decades and the number of cancer survivors, at any time after diagnosis, can only be estimated using statistical models.

Worldwide comparable estimates of cancer prevalence limited to 5 years after diagnosis and based on projections of cancer incidence and mortality are provided by the International Agency for Research on Cancer (IARC; see the Global Cancer Observatory) for all European countries.[1] Conversely, despite its informative potential, complete cancer prevalence is not systematically estimated in all European countries with active population-based registries.

To fill this information gap, the European Innovative Partnership for Action Against Cancer (iPAAC) Joint Action has promoted the estimation and dissemination of complete cancer prevalence indicators at the country level in Europe.[2]

We report the main results of this joint effort to estimate complete cancer prevalence in 2020 by country in Europe. Particular attention has been paid to analyse the proportion of long-term survivors. We also assessed how much of the increase in prevalence between 2010 and 2020 can be explained by demographic ageing or changes in incidence and survival.

Methods

Study design and data collection

This population-based study was based on the EUROCARE-6 study dataset.[3] This dataset includes standardised information on patients' diagnosis and life status, and on life expectancy in the general population, which was collected from European cancer registries using a unique study protocol.[4] The data were quality assured according to the European Network of Cancer Registries, Joint Research Centre,[5] and EUROCARE[6] criteria. The validity of individual records was checked to identify errors and anomalies in single variables (semantic checks) or between multiple variables (internal consistency). Missing or invalid values in compulsory variables were classified as major errors and excluded from the analyses.

The final EUROCARE-6 database contains information on more than 26 million patients diagnosed with cancer between 1978 and 2015 and followed up until Dec 31, 2016, at the latest. Overall, 109 cancer registries from 29 countries contributed data. Population coverage is national in 23 countries and partial in six countries (France, Germany, Italy, Portugal, Spain, and Switzerland). As a result, the EUROCARE-6 dataset covers 64% of the population of the 29 participating countries (478 million inhabitants; the European pool) and 52% of the population of 27 countries in the EU (EU27) represented by 22 member states (Greece, Hungary, Luxembourg, Romania, and Sweden did not contribute).

For prevalence estimation, we selected 61 general cancer registries with prevalence data available up to Jan 1, 2013—the most recent common index date for most cancer registries—and registries that had been active since at least 2003 (2004 only for the national registries of Belgium and Cyprus). The index date was Jan 1, 2013, for all registries except those of Slovakia (Jan 1, 2011) and the Canary Islands (Spain), Croatia, Ferrara (Italy), Saarland (Germany), Sassari (Italy), Tarragona (Spain), and Varese (Italy; Jan 1, 2012). These exceptions allowed greater population coverage in Europe and in Germany, Italy, and Spain, where many registries did not meet the selection requirements. Countries were grouped into five macro areas: central, eastern, northern, and southern Europe, and Ireland and the UK (appendix pp 12–14).

We focused on a list of 32 malignant cancers defined according to the third edition of the International Classification of Diseases for Oncology. Given the heterogeneous classification of behaviour between countries, brain and urinary bladder cancer are defined to also include benign, uncertain, and in situ cancers to improve comparability (appendix p 15). For each cancer site (specific site or all cancers combined), only the first primary tumour was considered (person-based prevalence). People with multiple primary cancers contribute to the prevalence counts of each specific cancer type. Therefore, cancer-specific prevalence counts do not sum to the counts for all cancers combined.

Statistical analysis

Prevalence measures are expressed in terms of absolute number of prevalent cases, crude prevalence proportion (reported as percentage or cases per 100 000 resident people), and age-standardised prevalence proportion based on the European Standard Population 2013.[7]

Registry-specific observed limited-duration prevalence was calculated by cancer, sex, and 5-year age group (attained age at the prevalence index date) with the counting method using SEER*Stat software (version 8.3.5). Observed limited-duration prevalence corresponds to the number of survivors diagnosed within the previous 1, 2, 3, … L years from the index date, where L is the maximum length of registration period. Individuals lost to follow-up who were estimated to be alive are counted using registry-specific life-tables stratified by cancer, sex, age group, and 10-year period of diagnosis (appendix p 5).

For **SEER*Stat software** see https://seer.cancer.gov/seerstat/

Registry-specific complete prevalence was estimated from observed prevalence data with the completeness index method[8,9] using COMPREV software (version 3.0.9). This method involves adjusting the registry-specific observed prevalence by a correction factor, known as the completeness index, which quantifies the theoretical completeness of observed prevalence as a function of the registration time length (appendix p 5). This adjustment enables supplementation of the prevalence observable at the maximum duration with the unobservable part—ie, accounting for individuals diagnosed before the start of registration.

For **COMPREV software** see https://surveillance.cancer.gov/comprev/

European completeness indexes (or R-indexes) were estimated by modelling cancer-specific trends of incidence and relative survival observed by the registries with at least 30 years of observation (appendix pp 6–8, 26, 27).[3] Country-specific complete prevalence estimates for countries with local registration systems were obtained by pooling registry-specific estimates and applying age-specific pooled estimates to the national resident population stratified by age group (0–54, 55–64, 65–74, and ≥75 years). Country-specific complete prevalence estimates were derived for the latest index date and in the previous 5 years to extrapolate projections on the basis of the latest prevalence observations. Country-specific prevalence estimates were projected to Jan 1, 2020, with linear regression by extrapolating the prevalence time trend over the last three available index dates. A sensitivity analysis was conducted using linear and logistic regression and alternative basis for projections (prevalence in the last three, four, or five index dates). For each sensitivity scenario, the regression was applied to prevalence estimates smoothed with 3-year moving averages and stratified by sex and age (0–54, 55–64, 65–74, and ≥75 years). Validation against published observed prevalence data for 2014–16 in Nordic

	Population (thousands)				Number of prevalent cases (thousands)					Crude prevalence per 100 000			Age-standardised prevalence per 100 000		
	Total population	Proportion of European pool	Females	Males	Total population	Proportion of European pool	Females	Males	Female-to-male ratio	Total population	Females	Males	Total population	Females	Males
Northern Europe	17 080	3·6%	8561	8519	868 (860–875)	3·7%	473 (466–479)	395 (390–400)	1·2	5080 (5034–5126)	5520 (5447–5594)	4637 (4582–4693)	5065 (5020–5110)	5204 (5133–5274)	5015 (4960–5070)
Denmark	5823	1·2%	2926	2897	312 (306–318)	1·3%	175 (169–180)	137 (134–140)	1·3	5354 (5250–5459)	5975 (5791–6159)	4727 (4628–4826)	5312 (5209–5415)	5669 (5491–5847)	4985 (4886–5084)
Finland	5525	1·2%	2797	2728	277 (272–281)	1·2%	155 (153–158)	121 (118–125)	1·3	5004 (4928–5081)	5548 (5458–5638)	4447 (4324–4570)	4598 (4529–4668)	4779 (4701–4857)	4540 (4425–4655)
Iceland	364	0·1%	177	187	15 (15–16)	0·1%	8 (8–9)	7 (6–7)	1·1	4164 (3996–4333)	4760 (4440–5079)	3 600 (3475–3725)	5 108 (4 903–5 313)	5 463 (5 086–5 840)	4 840 (4 698–4 981)
Norway	5368	1·1%	2661	2707	264 (262–267)	1·1%	134 (132–136)	130 (128–132)	1·0	4922 (4874–4970)	5041 (4968–5115)	4804 (4743–4866)	5348 (5297–5399)	5176 (5100–5251)	5640 (5574–5707)
Central Europe	196 924	41·2%	100 377	96 547	11 029 (10 911–11 148)	46·5%	5842 (5765–5918)	5188 (5097–5279)	1·1	5601 (5541–5661)	5820 (5743–5896)	5374 (5280–5467)	5288 (5230–5346)	5216 (5143–5290)	5514 (5423–5605)
Austria	8901	1·9%	4522	4379	408 (402–414)	1·7%	214 (211–217)	194 (189–199)	1·1	4583 (4521–4646)	4732 (4671–4793)	4429 (4319–4540)	4531 (4466–4596)	4397 (4335–4459)	4810 (4689–4931)
Belgium	11 522	2·4%	5841	5681	657 (650–664)	2·8%	368 (365–372)	289 (283–294)	1·3	5701 (5641–5761)	6305 (6242–6369)	5080 (4977–5183)	5705 (5644–5766)	5954 (5896–6013)	5574 (5466–5682)
France	67 320	14·1%	34 788	32 533	3772 (3716–3828)	15·9%	1998 (1974–2022)	1774 (1723–1825)	1·1	5603 (5519–5686)	5744 (5676–5812)	5452 (5296–5609)	5439 (5358–5519)	5266 (5204–5327)	5822 (5657–5987)
Germany	83 167	17·4%	42 129	41 038	4874 (4771–4978)	20·6%	2538 (2466–2611)	2336 (2262–2410)	1·1	5861 (5736–5986)	6025 (5853–6197)	5692 (5512–5873)	5290 (5171–5409)	5180 (5013–5348)	5554 (5387–5720)
Netherlands	17 408	3·6%	8760	8648	875 (865–884)	3·7%	489 (483–494)	386 (378–394)	1·3	5026 (4970–5081)	5581 (5519–5642)	4463 (4372–4555)	5006 (4951–5061)	5321 (5261–5382)	4757 (4660–4855)
Switzerland	8606	1·8%	4337	4269	444 (437–450)	1·9%	234 (229–239)	210 (205–214)	1·1	5154 (5077–5231)	5395 (5287–5503)	4910 (4801–5018)	5223 (5147–5300)	5156 (5061–5251)	5402 (5281–5 522)
Eastern Europe	67 092	14·0%	34 597	32 495	2332 (2315–2349)	9·8%	1371 (1358–1385)	961 (951–971)	1·4	3476 (3451–3502)	3963 (3924–4002)	2958 (2927–2990)	3538 (3513–3562)	3656 (3620–3691)	3560 (3526–3593)
Bulgaria	6951	1·5%	3582	3370	215 (212–219)	0·9%	135 (132–139)	80 (78–82)	1·7	3099 (3043–3154)	3783 (3685–3880)	2372 (2321–2422)	2905 (2850–2960)	3295 (3209–3381)	2526 (2470–2583)
Czechia	10 694	2·2%	5422	5272	498 (495–500)	2·1%	270 (268–272)	228 (227–229)	1·2	4656 (4632–4680)	4977 (4934–5020)	4326 (4306–4347)	4683 (4659–4707)	4584 (4541–4627)	4957 (4933–4981)
Estonia	1329	0·3%	700	629	56 (55–57)	0·2%	31 (30–32)	25 (24–26)	1·2	4214 (4129–4300)	4433 (4299–4566)	3971 (3868–4075)	4109 (4027–4192)	3823 (3724–3922)	4912 (4788–5035)

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	Population (thousands)				Number of prevalent cases (thousands)					Crude prevalence per 100 000			Age-standardised prevalence per 100 000		
	Total population	Proportion of European pool	Females	Males	Total population	Proportion of European pool	Females	Males	Female-to-male ratio	Total population	Females	Males	Total population	Females	Males
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Latvia	1908	0·4%	1027	881	78 (77–79)	0·3%	48 (47–49)	30 (30–31)	1·6	4097 (4033–4160)	4652 (4554–4750)	3449 (3374–3524)	3884 (3826–3942)	3925 (3853–3996)	4145 (4065–4225)
Lithuania	2794	0·6%	1490	1304	130 (128–133)	0·5%	72 (70–73)	58 (56–61)	1·2	4659 (4567–4751)	4821 (4729–4913)	4475 (4309–4641)	4462 (4377–4547)	4176 (4094–4258)	5342 (5175–5509)
Poland	37 958	7·9%	19 585	18 373	1149 (1133–1164)	4·8%	698 (685–710)	451 (441–460)	1·5	3026 (2985–3067)	3562 (3499–3626)	2454 (2403–2506)	3138 (3098–3177)	3341 (3283–3398)	3032 (2978–3087)
Slovakia	5458	1·1%	2793	2665	206 (203–210)	0·9%	117 (115–120)	89 (86–91)	1·3	3775 (3710–3840)	4208 (4117–4298)	3322 (3229–3414)	4183 (4111–4256)	4178 (4086–4270)	4411 (4300–4521)
Southern Europe	124 827	26·1%	63 994	60 832	6489 (6424–6554)	27·4%	3472 (3419–3524)	3017 (2979–3056)	1·2	5198 (5146–5250)	5425 (5343–5507)	4960 (4897–5023)	4795 (4746–4843)	4778 (4706–4851)	4955 (4892–5017)
Croatia	4058	0·8%	2087	1972	186 (182–191)	0·8%	105 (102–109)	81 (79–83)	1·3	4593 (4482–4704)	5050 (4865–5236)	4108 (3992–4225)	4298 (4193–4403)	4365 (4223–4508)	4369 (4236–4502)
Cyprus	888	0·2%	454	434	36 (35–37)	0·2%	20 (19–20)	16 (16–17)	1·3	4067 (3981–4154)	4386 (4258–4514)	3735 (3619–3850)	4608 (4511–4705)	4733 (4593–4872)	4559 (4424–4695)
Italy	59 641	12·5%	30 591	29 050	3514 (3453–3574)	14·8%	1939 (1890–1988)	1575 (1540–1610)	1·2	5891 (5790–5993)	6338 (6177–6498)	5421 (5301–5542)	5184 (5095–5273)	5375 (5239–5511)	5102 (4990–5214)
Malta	515	0·1%	249	266	19 (19–20)	0·1%	11 (11–12)	8 (8–8)	1·4	3789 (3639–3938)	4564 (4287–4841)	3063 (2934–3192)	3998 (3849–4147)	4458 (4191–4724)	3613 (3475–3750)
Portugal	10 296	2·2%	5436	4860	477 (472–483)	2·0%	265 (261–268)	212 (208–216)	1·3	4635 (4582–4687)	4870 (4803–4937)	4371 (4289–4454)	4229 (4182–4277)	4262 (4198–4325)	4321 (4236–4405)
Slovenia	2096	0·4%	1045	1051	99 (98–100)	0·4%	52 (51–53)	47 (46–48)	1·1	4711 (4654–4768)	4936 (4844–5028)	4487 (4419–4555)	4518 (4464–4572)	4403 (4322–4484)	4802 (4734–4869)
Spain	47 333	9·9%	24 133	23 199	2157 (2135–2180)	9·1%	1080 (1063–1097)	1078 (1062–1093)	1·0	4558 (4510–4606)	4475 (4404–4546)	4645 (4579–4710)	4471 (4421–4520)	4153 (4083–4224)	4988 (4915–5060)
Ireland and the UK	71 990	15·1%	36 444	35 546	2992 (2940–3044)	12·6%	1662 (1632–1692)	1331 (1288–1373)	1·2	4156 (4084–4228)	4559 (4477–4642)	3743 (3625–3862)	4377 (4301–4453)	4578 (4493–4663)	4218 (4080–4356)
England	56 481	11·8%	28 560	27 921	2296 (2245–2348)	9·7%	1280 (1250–1310)	1017 (975–1059)	1·3	4066 (3974–4157)	4481 (4376–4585)	3641 (3491–3791)	4262 (4166–4358)	4480 (4372–4587)	4085 (3911–4258)
Ireland	4964	1·0%	2507	2458	215 (213–217)	0·9%	109 (108–110)	106 (104–108)	1·0	4333 (4289–4376)	4343 (4294–4392)	4322 (4250–4394)	5343 (5285–5400)	5090 (5025–5154)	5676 (5581–5770)

(Table 1 continues on next page)

	Population (thousands)				Number of prevalent cases (thousands)					Crude prevalence per 100 000			Age-standardised prevalence per 100 000		
	Total population	Proportion of European pool	Females	Males	Total population	Proportion of European pool	Females	Males	Female-to-male ratio	Total population	Females	Males	Total population	Females	Males
(Continued from previous page)															
Northern Ireland	1901	0·4%	965	936	80 (79–82)	0·3%	45 (44–46)	35 (34–37)	1·3	4232 (4142–4323)	4687 (4598–4776)	3764 (3605–3923)	4721 (4614–4827)	4947 (4852–5042)	4550 (4326–4773)
Scotland	5481	1·1%	2810	2671	250 (247–254)	1·1%	145 (143–147)	105 (103–108)	1·4	4562 (4498–4625)	5157 (5074–5240)	3936 (3840–4032)	4607 (4544–4670)	4957 (4877–5038)	4276 (4178–4374)
Wales	3163	0·7%	1603	1559	150 (148–153)	0·6%	83 (81–85)	67 (66–69)	1·2	4756 (4681–4830)	5178 (5077–5279)	4322 (4212–4432)	4546 (4475–4616)	4752 (4660–4844)	4380 (4266–4495)
European pool	477 913	100%	243 974	233 939	23 711 (23 565–23 857)	100%	12 818 (12 720–12 917)	10 892 (10 785–11 000)	1·2	4961 (4931–4992)	5254 (5213–5295)	4656 (4610–4702)	4783 (4754–4813)	4785 (4747–4823)	4918 (4872–4965)
EU27*	447 320	..	228 764	218 556	22 347 (22 210–22 483)	..	12 077 (11 982–12 171)	10 270 (10 171–10 369)	1·2	4996 (4965–5026)	5279 (5238–5320)	4699 (4654–4744)	4767 (4737–4796)	4747 (4708–4784)	4941 (4896–4986)

Number of prevalent cases (thousands), crude and age-standardised (European Standard Population 2013) prevalence proportions per 100 000 inhabitants with 95% CIs in parentheses. *27 countries in the EU represented by 22 member states (Greece, Hungary, Luxembourg, Romania, and Sweden did not contribute so values for these countries were estimated from the corresponding macro region prevalence).

Table 1: **Population (thousands) and estimated complete cancer prevalence in Europe (European pool of 29 countries in EUROCARE-6 and EU27) by country and sex as of Jan 1, 2020**

registries[10] allowed us to choose the linear model with 3-year basis for projections (data not shown). Complete (and limited-duration) prevalence was then projected annually from Jan 1, 2014, to Jan 1, 2020, through the final estimated model parameters. Projected versus observed prevalence estimates in the Nordic registries 2014–20[10] are shown in the appendix (pp 28–29).

Estimates at the European level are provided for the 29 participating countries (European pool) and for EU27, assuming prevalence equal to the respective macro area for the five EU27 countries not participating in EUROCARE-6.

Complete prevalence difference between Jan 1, 2010, and Jan 1, 2020, was decomposed by determinant to quantify the effect of incidence and survival changes compared with demographic changes. The prevalence change due to ageing is the difference in population between Jan 1, 2020, and Jan 1, 2010, applied to prevalence estimates in 2010. The prevalence change due to incidence and survival dynamics is the difference in prevalence between Jan 1, 2020, and Jan 1, 2010, applied to population in 2020.

The delta method was used to compute the SE of prevalence estimates up to 2013 (from the known variance of the observed prevalence and completeness indices) and the SE of prevalence projections (from the variance of the linear slope parameter). For all indicators, 95% CIs were estimated from SEs assuming a normal distribution. Further methodological details are provided in the appendix (pp 4–10). Statistical analyses were performed with SAS (version 9.4).

Role of the funding source

The funder of the study had no role in study design, data collection, data analysis, data interpretation, or writing of the report.

Results

A total of 19 538 317 primary cancer cases across the 61 cancer registries were confirmed to be eligible and included in the analysis. The duration of observation at the index date ranged from 9 years to 35 years (median length 20 years [IQR 16–28]). The proportion of records excluded due to major errors was 0·9% overall and never exceeded 3% for any one registry. Proportion of cases censored alive before the index date (ie, lost to follow-up) was 0·6% overall (37 575 of 6 412 099 individuals alive at the index date) and was below 3·0% for most registries (appendix p 3). Recording of non-malignant cases of urinary bladder and brain cancer was not consistent across Europe and was missing in some registries or countries (appendix pp 12–14).

Overall, in the 29 European countries covered by the study (477 913 thousand inhabitants), 23 711 thousand (95% CI 23 565–23 857) people with a previous cancer diagnosis were estimated to be alive on Jan 1, 2020, irrespective of when they were diagnosed. They represent

	Crude prevalence per 100 000					Number of prevalent cases (thousands)					Proportion of prevalent cases	
	Age 0–54 years	Age 55–64 years	Age 65–74 years	Age ≥75 years	All ages	Age 0–54 years	Age 55–64 years	Age 65–74 years	Age ≥75 years	All ages	Age 0–54 years	Age ≥75 years
Females												
All cancers	1480 (1464–1496)	7773 (7630–7915)	12 892 (12 604–13 179)	16 144 (16 033–16 254)	5254 (5213–5295)	2316 (2291–2341)	2548 (2501–2594)	3482 (3404–3559)	4473 (4442–4504)	12 818 (12 720–12 917)	18%	35%
Breast cancer	560 (551–568)	3638 (3575–3702)	6163 (5996–6329)	6518 (6466–6570)	2270 (2248–2292)	876 (863–889)	1193 (1172–1213)	1664 (1619–1709)	1806 (1791–1820)	5539 (5486–5592)	16%	33%
Colorectal cancer	59 (58–60)	586 (559–613)	1290 (1238–1342)	2685 (2652–2717)	564 (557–572)	92 (91–94)	192 (183–201)	348 (334–362)	744 (735–753)	1377 (1358–1396)	7%	54%
Corpus uterine cancer	34 (33–35)	481 (454–508)	1067 (1039–1094)	1563 (1533–1593)	382 (376–388)	54 (52–55)	158 (149–167)	288 (281–295)	433 (425–441)	932 (918–947)	6%	46%
Skin melanoma	146 (144–149)	443 (430–456)	692 (669–715)	786 (774–799)	319 (315–323)	229 (225–233)	145 (141–149)	187 (181–193)	218 (214–221)	779 (770–788)	29%	28%
Thyroid cancer	167 (164–170)	520 (499–541)	660 (642–678)	447 (430–464)	301 (297–305)	261 (257–266)	170 (164–177)	178 (173–183)	124 (119–128)	734 (724–744)	36%	17%
Cervical uterine cancer	102 (100–104)	465 (439–491)	484 (458–510)	657 (620–695)	256 (250–263)	160 (157–163)	152 (144–161)	131 (124–138)	182 (172–192)	625 (610–641)	26%	29%
Non-Hodgkin lymphoma	50 (45–54)	250 (240–261)	436 (427–446)	564 (557–572)	178 (175–181)	78 (71–84)	82 (79–86)	118 (115–120)	156 (154–158)	434 (426–442)	18%	36%
Ovarian cancer	45 (43–46)	260 (250–271)	425 (408–442)	455 (443–468)	162 (160–165)	70 (68–72)	85 (82–89)	115 (110–119)	126 (123–130)	396 (389–403)	18%	32%
Kidney cancer	30 (29–31)	190 (177–202)	348 (334–361)	615 (607–623)	153 (150–155)	46 (45–48)	62 (58–66)	94 (90–98)	170 (168–173)	373 (367–379)	12%	46%
Lung cancer	21 (20–22)	250 (239–262)	403 (394–411)	364 (355–373)	133 (131–135)	33 (31–35)	82 (78–86)	109 (106–111)	101 (98–103)	325 (319–330)	10%	31%
Urinary bladder cancer	12 (11–13)	124 (115–133)	274 (268–279)	601 (591–610)	123 (121–125)	19 (17–20)	41 (38–44)	74 (72–75)	16 (164–169)	300 (295–304)	6%	55%
Stomach cancer	9 (8–9)	70 (65–75)	136 (128–144)	327 (297–357)	67 (64–71)	14 (13–15)	23 (21–25)	37 (34–39)	91 (82–99)	164 (155–173)	9%	55%
Hodgkin lymphoma	58 (57–60)	79 (72–87)	72 (66–77)	52 (47–57)	62 (60–64)	91 (89–94)	26 (23–28)	19 (18–21)	14 (13–16)	151 (147–155)	60%	9%
Head and neck cancer	14 (13–15)	115 (108–122)	150 (146–154)	138 (131–145)	57 (55–58)	22 (20–23)	38 (36–40)	41 (40–42)	38 (36–40)	138 (135–142)	16%	28%
Chronic lymphocytic leukaemia or small lymphocytic lymphoma	4 (3–4)	54 (49–59)	134 (126–141)	230 (219–242)	51 (49–52)	6 (5–7)	18 (16–19)	36 (34–38)	64 (61–67)	124 (120–128)	5%	52%

(Table 2 continues on next page)

	Crude prevalence per 100 000					Number of prevalent cases (thousands)					Proportion of prevalent cases	
	Age 0–54 years	Age 55–64 years	Age 65–74 years	Age ≥75 years	All ages	Age 0–54 years	Age 55–64 years	Age 65–74 years	Age ≥75 years	All ages	Age 0–54 years	Age ≥75 years
											(Continues from previous page)	
Males												
All cancers	887 (877–897)	5999 (5765–6233)	14 150 (13 890–14 410)	23 103 (22 851–23 356)	4656 (4610–4702)	1425 (1409–1441)	1877 (1804–1951)	3358 (3296–3420)	4232 (4186–4278)	10 892 (10 785–11 000)	13%	39%
Prostate cancer	34 (32–36)	1617 (1498–1735)	6212 (6046–6379)	10 776 (10 591–10 961)	1714 (1686–1741)	54 (51–58)	506 (469–543)	1474 (1435–1514)	1974 (1940–2008)	4008 (3944–4072)	1%	49%
Colorectal cancer	60 (59–62)	804 (764–844)	2070 (2024–2117)	4233 (4169–4297)	691 (682–699)	97 (94–100)	252 (239–264)	491 (480–502)	775 (764–787)	1615 (1595–1636)	6%	48%
Urinary bladder cancer	32 (30–34)	469 (445–493)	1293 (1251–1335)	2851 (2822–2880)	439 (433–445)	52 (48–55)	147 (139–154)	307 (297–317)	522 (517–528)	1027 (1013–1042)	5%	51%
Skin melanoma	87 (86–89)	363 (349–376)	709 (675–744)	1036 (1026–1046)	262 (257–266)	140 (138–142)	113 (109–118)	168 (160–176)	190 (188–192)	612 (602–621)	23%	31%
Kidney cancer	45 (44–46)	372 (338–406)	763 (745–781)	1232 (1203–1261)	255 (249–260)	72 (71–74)	116 (106–127)	181 (177–185)	226 (220–231)	595 (583–608)	12%	38%
Lung cancer	19 (18–19)	342 (321–362)	781 (754–807)	1075 (1032–1118)	222 (217–227)	30 (29–31)	107 (101–113)	185 (179–192)	197 (189–205)	519 (507–531)	6%	38%
Testicular cancer	193 (190–195)	336 (330–343)	210 (187–233)	153 (142–164)	211 (207–214)	310 (306–314)	105 (103–107)	50 (44–55)	28 (26–30)	493 (485–500)	63%	6%
Non-Hodgkin lymphoma	68 (67–70)	325 (321–328)	540 (533–547)	763 (736–789)	205 (202–207)	110 (107–112)	102 (100–103)	128 (126–130)	140 (135–145)	479 (473–485)	23%	29%
Head and neck cancer	29 (26–32)	347 (332–362)	405 (391–420)	302 (290–314)	131 (128–135)	47 (43–51)	109 (104–113)	96 (93–100)	55 (53–58)	307 (300–315)	15%	18%
Stomach cancer	10 (10–11)	112 (102–121)	252 (238–265)	552 (522–583)	91 (88–94)	16 (15–18)	35 (32–38)	60 (56–63)	101 (96–107)	212 (205–219)	8%	48%
Laryngeal cancer	7 (6–8)	163 (155–171)	312 (295–329)	391 (369–412)	89 (86–91)	11 (9–13)	51 (48–53)	74 (70–78)	72 (68–76)	207 (201–214)	5%	35%
Thyroid cancer	43 (42–44)	149 (142–156)	202 (195–208)	174 (167–181)	84 (82–85)	69 (67–71)	47 (45–49)	48 (46–49)	32 (31–33)	196 (192–199)	35%	16%
Chronic lymphocytic leukaemia or small lymphocytic lymphoma	8 (7–8)	89 (86–92)	222 (209–235)	411 (374–448)	72 (69–75)	12 (11–13)	28 (27–29)	53 (50–56)	75 (68–82)	168 (161–176)	7%	45%
Hodgkin lymphoma	61 (59–63)	108 (103–112)	93 (84–102)	63 (57–69)	71 (69–72)	98 (94–101)	34 (32–35)	22 (20–24)	12 (10–13)	165 (160–170)	59%	7%
Brain cancer	45 (44–47)	78 (73–82)	78 (63–93)	64 (50–78)	54 (52–57)	73 (70–75)	24 (23–26)	18 (15–22)	12 (9–14)	127 (122–133)	57%	9%

Crude prevalence proportion per 100 000 inhabitants and number of prevalent cases (thousands), with 95% CIs in parentheses. Percentage proportion of young (0–54 years) and older (75 years or older) prevalent cases. Data shown for cancers that had a prevalence higher than 50 per 100 000.

Table 2: **Estimated complete cancer prevalence in Europe (European pool of 29 countries in EUROCARE-6) as of Jan 1, 2020, by cancer entity and age at prevalence date**

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5·0% of the resident population (4961 [95% CI 4931–4992] per 100 000 population; table 1). The same proportion and a slightly lower number (22 347 thousand [95% CI 22 210–22 483]) were estimated for EU27 (447 320 thousand inhabitants).

Cancer survivors were more frequently female than male (in the European pool: 12 818 thousand [95% CI 12 720–12 917] *vs* 10 892 thousand [10 785–11 000]; 5·3% [95% CI 5·2–5·3] *vs* 4·7% [4·6–4·7]) in terms of crude proportions, although the estimated ratio of female to male cases varied between countries from 1·0 to 1·7 because of differences in cancer case-mix and demographic structure (table 1). Estimated crude proportion of cancer prevalence was higher in central Europe (5601 [95% CI 5541–5661] per 100 000), southern Europe (5198 [5146–5250] per 100 000), and northern Europe (5080 [5034–5126] per 100 000); intermediate in Ireland and the UK (4156 [4084–4228] per 100 000); and lowest in eastern Europe (3476 [3451–3502] per 100 000). Between-country differences in crude prevalence were estimated to be even wider, ranging from 3562 (95% CI 3499–3626) per 100 000 in Poland to 6338 (6177–6498) per 100 000 in Italy for females, and from 2372 (2321–2422) per 100 000 in Bulgaria to 5692 (5512–5873) per 100 000 in Germany for males. When comparing age-standardised prevalence estimates, heterogeneity was reduced and some countries ranked differently, as in the case of Italy and Germany, both of which have a high proportion of people aged 65 years or older.

Leading cancer types among survivors differed remarkably by sex, reflecting different incidence and survival profiles (table 2). Breast and prostate cancers were estimated to account for approximately 40% of all cancer survivors: 43·2% in females (5539 thousand [95% CI 5486–5592]) and 36·8% in males (4008 thousand [3944–4072]), respectively. Colorectal cancer was the second most common tumour in both sexes, with a higher crude prevalence in males (691 [95% CI 682–699] per 100 000) than in females (564 [557–572] per 100 000). Corpus uterine cancer (932 thousand [95% CI 918–947]), cervical uterine cancer (625 thousand [610–641]), ovarian cancer (396 thousand [389–403]), skin melanoma (779 thousand [770–788]), thyroid cancer (734 thousand [724–744]), and non-Hodgkin lymphomas (434 thousand [426–442]) accounted for a further third of prevalent cases among female survivors. In male survivors, a third of prevalent cases were diagnosed with urinary bladder cancer (1027 thousand [95% CI 1013–1042]), kidney cancer (595 thousand [583–608]), skin melanoma (612 thousand [602–621]), lung cancer (519 thousand [507–531]), and testicular cancer (493 thousand [485–500]).

The majority of cancer survivors in Europe were estimated to be 65 years or older: 7955 thousand (62·1%) of 12 818 thousand female survivors and 7590 thousand (69·7%) of 10 892 thousand male survivors (table 2). People aged 75 years or older comprised a substantial proportion of those living after a diagnosis of colorectal, corpus uterine, prostate, urinary bladder, stomach, and female kidney cancer, and chronic lymphocytic leukaemia or small lymphocytic lymphoma. An estimated 3741 thousand (95% CI 3701–3781) cancer survivors were younger than 55 years and comprised 15·8% of all prevalent cases (2316 thousand [18·1%; 95% CI 2291–2341] were female and 1425 thousand [13·1%; 1409–1441] were male). The majority of diagnoses (about 60%) in this age group were for early-onset cancers that have a good prognosis, such as Hodgkin lymphoma or testicular cancer. The distribution by age and sex for cancer sites with lower prevalence is shown in the appendix (p 24).

The complete cancer prevalence estimates differed substantially between countries. In female survivors, crude prevalence proportion was more than two times higher in the highest prevalence country versus the lowest prevalence country for all the top eight cancers: eg, breast (crude prevalences ranging from 1268 [95% CI 1246–1289] per 100 000 in Poland to 2924 [2846–3002] per 100 000 in Belgium), colorectal (339 [325–353] per 100 000 in Poland to 744 [722–766] per 100 000 in Italy), and corpus uterine cancer (249 [232–266] per 100 000 in Ireland to 609 [591–626] per 100 000 in Lithuania; figure 1; appendix pp 16–19). The differences between countries were even greater for tumours with substantial incidence dynamics and geographical variability, such as thyroid cancer (<130 cases per 100 000 in Denmark and the Netherlands, and in all countries in the Ireland and UK macro region, and >700 per 100 000 in Italy and Cyprus), skin melanoma (83 per 100 000 in Bulgaria and 700 per 100 000 in Denmark), and cervical uterine cancer (from <100 per 100 000 in Malta and Finland to >550 per 100 000 in Bulgaria and Lithuania).

Substantial differences (4–5 times) across countries were also estimated for male prevalence of prostate cancer (from 487 [95% CI 396–577] per 100 000 in Bulgaria to 2424 [2291–2556] per 100 000 in France) and urinary bladder cancer (from 156 [145–168] per 100 000 in England to 783 [751–815] per 100 000 in Italy; figure 1; appendix pp 20–23). As for female survivors, striking differences were estimated for skin melanoma in males (from 60 [95% CI 57–62] per 100 000 in Bulgaria to 505 [500–511] per 100 000 in Denmark). Differences in cancer prevalence between countries largely reflect differences in incidence risk, as shown by the high goodness of fit of the linear correlation between country-specific prevalence profiles in 2020 and crude incidence rates in previous years for the top eight cancers (appendix pp 30–31).

Cancer prognosis, median age at onset, and previous incidence time trends (decreasing *vs* increasing) were the main factors influencing prevalence patterns by disease duration. In 2020, 14 850 thousand (95% CI 14 681–15 018) people were estimated to be alive more than 5 years after diagnosis and 9099 thousand (8909–9288) people were estimated to be alive more

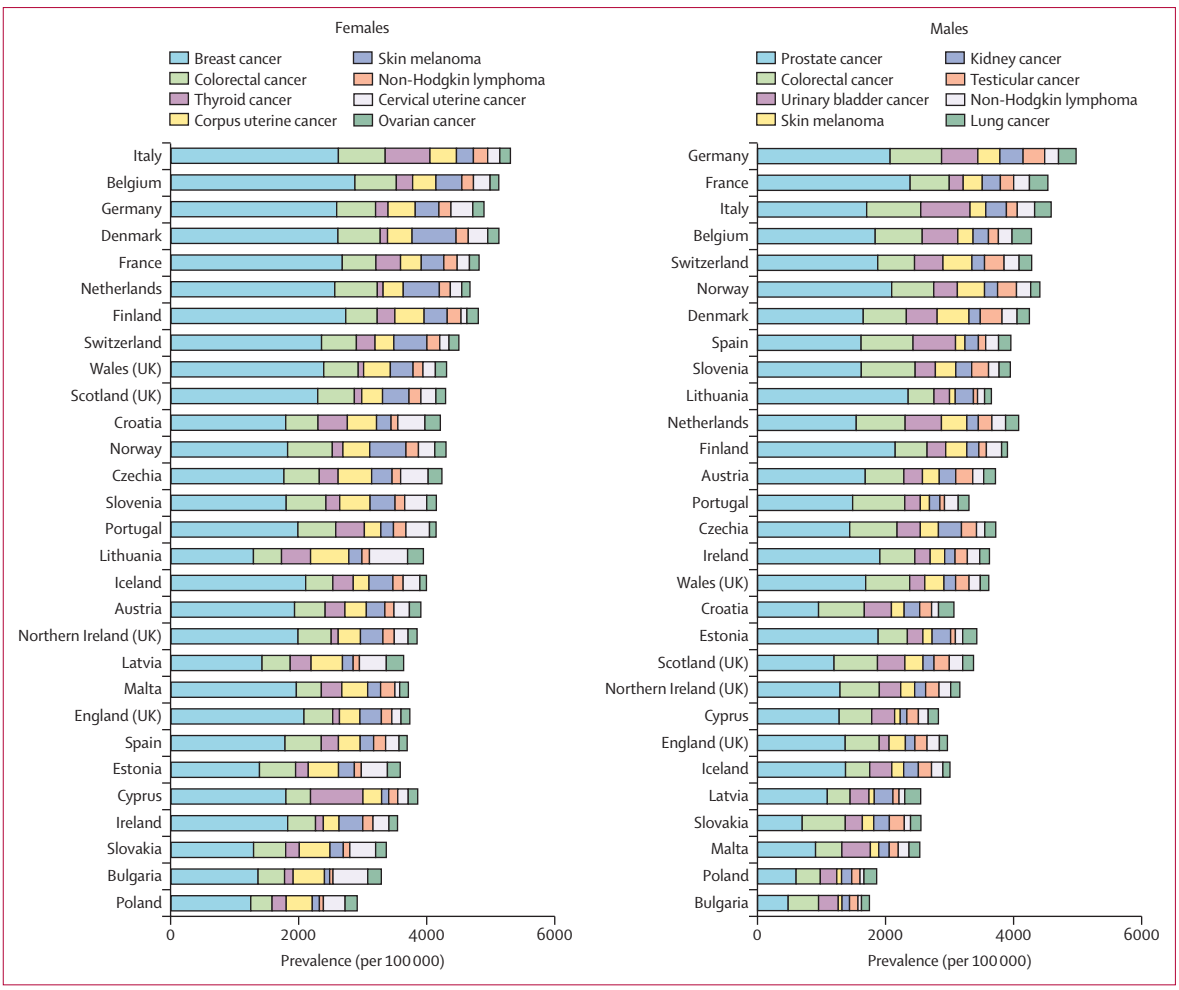

Figure 1: **Estimated complete prevalence proportion as of Jan 1, 2020, by sex and country**
Data are shown for the eight cancers with the highest crude prevalence. Countries in the EUROCARE-6 dataset are ranked by complete cancer prevalence for all cancers.

than 10 years after diagnosis, representing an increasing proportion of the cancer survivor population. Overall, in early 2020, the number of female survivors in the European pool diagnosed with cancer within the past 2 years was estimated to be 2037 thousand (95% CI 1971–2104) or within the past 2–5 years was 2412 thousand (2330–2494; figure 2). Long-term survivors (ie, living with cancer for more than 5 years) accounted for 8368 thousand (65·3%) of 12 818 thousand prevalent female cases, of whom 2757 thousand (21·5%; 95% CI 2682–2832) are estimated to have been living with a diagnosis for more than 5 years to 10 years, 3233 thousand (25·2%; 3132–3334) for more than 10 years to 20 years, and 2378 thousand (18·5%; 2249–2507) for a duration longer than 20 years. Similar distributions are estimated for females diagnosed with breast cancer, colorectal cancer, corpus uterine cancer, thyroid cancer, kidney cancer, urinary bladder cancer, non-Hodgkin lymphoma, and skin melanoma. 5611 thousand (43·8%; 95% CI 5497–5726) of 12 818 thousand females were very long-term survivors (more than 10 years since diagnosis). The proportion of very long-term survivors was highest for cervical uterine cancer (447 345 [71·5%] of 625 179) and Hodgkin lymphoma (97 166 [64·3%] of 151 166), and lowest for lung cancer (60 188 [18·5%] of 324 729).

Overall, in early 2020, in the European pool, the number of males living for up to 2 years after a cancer diagnosis was 2071 thousand (95% CI 2015–2127) and 2–5 years after a cancer diagnosis was 2340 thousand (2252–2428; figure 2). Males surviving more than 5 years after diagnosis represented 59·5% of all prevalent male cases (6481 thousand [95% CI 6353–6608] of 10 892 thousand). Among the latter, 2994 thousand (27·5%; 95% CI 2868–3119) were estimated to have been living with a cancer diagnosis for more than 5 years to 10 years, 2312 thousand (21·2%; 2169–2454) for more than 10 years to 20 years, and 1175 (10·8%; 1032–1319) for a duration longer than 20 years. Similar proportions were estimated for the tumours with the

highest prevalence in men (prostate, colorectal, urinary bladder, skin melanoma, kidney, and non-Hodgkin lymphoma). The proportion of males surviving more than 10 years was 32·0% (3487 thousand [95% CI 3336–3638] of 10 892 thousand). The latter proportion for males diagnosed with Hodgkin lymphoma and testicular cancer was more than 60% (103 thousand of 165 thousand and 312 thousand of 493 thousand, respectively), whereas it was less than 25% (119 thousand of 519 thousand and 955 thousand of 4008 thousand, respectively) for those diagnosed with lung and prostate cancer.

The estimated total number of cancer survivors in the European pool has increased on average by 3·5% per year from 2010 to 2020, from 16 805 thousand (95% CI 16 798–16 813) on Jan 1, 2010, to 23 710 thousand (23 565–23 857) on Jan 1, 2020, a relative change of 41% (figure 3). A similar increase (37%) is estimated for the crude prevalence (from 3615 cases [95% CI 3613–3617] per 100 000 to 4961 [4931–4992] per 100 000). The age-standardised prevalence is estimated to have increased less steeply (24%, from 3864 [95% CI 3862–3866] per 100 000 to 4783 [4754–4813] per 100 000), because it is not affected by demographic changes.

The prevalence of cases living within 5 years after a diagnosis is estimated to have increased by 28% between 2010 (6932 thousand [95% CI 6927–6937]) and 2020 (8861 thousand [95% CI 8835–8887]). Conversely, the number of people living for more than 10 years after diagnosis is estimated to have increased by 50% over the same period (from 6047 thousand [95% CI 6037–6057] to 9099 thousand [8909–9288]) and is expected to become an increasingly important proportion of all cancer survivors in the near future.

The impact of demographic ageing on the changes of cancer prevalence in 2010–20, compared with the dynamics of incidence and survival, is shown in figure 4 (details in the appendix p 25). The number of survivors from all cancers is predicted to increase by 45·9% in males, of which 26·9% is attributable to incidence and survival changes and 19·0% to ageing. The relative percentage increase is predicted to be lower in females (37·3%) than in males, with a smaller effect of ageing (12·2%), because of the different case-mix and lower average age at onset. The cancers with increasing incidence and survival showed the steepest relative percentage increase in the number of prevalent cases: skin melanoma (77·9% in males and 55·3% in females), female lung cancer (84·4%), thyroid cancer (76·8% in males and 63·6% in females), and prostate cancer (70·9%). For these cancer sites, incidence and survival changes had a much greater impact (2–7 times) than the ageing of the population between 2010 and 2020. For smoking-related cancers (lung, head and neck, and larynx), the increase in prevalence is estimated to be more substantial in females, in line with less favourable incidence trends in females than in males. Prevalence

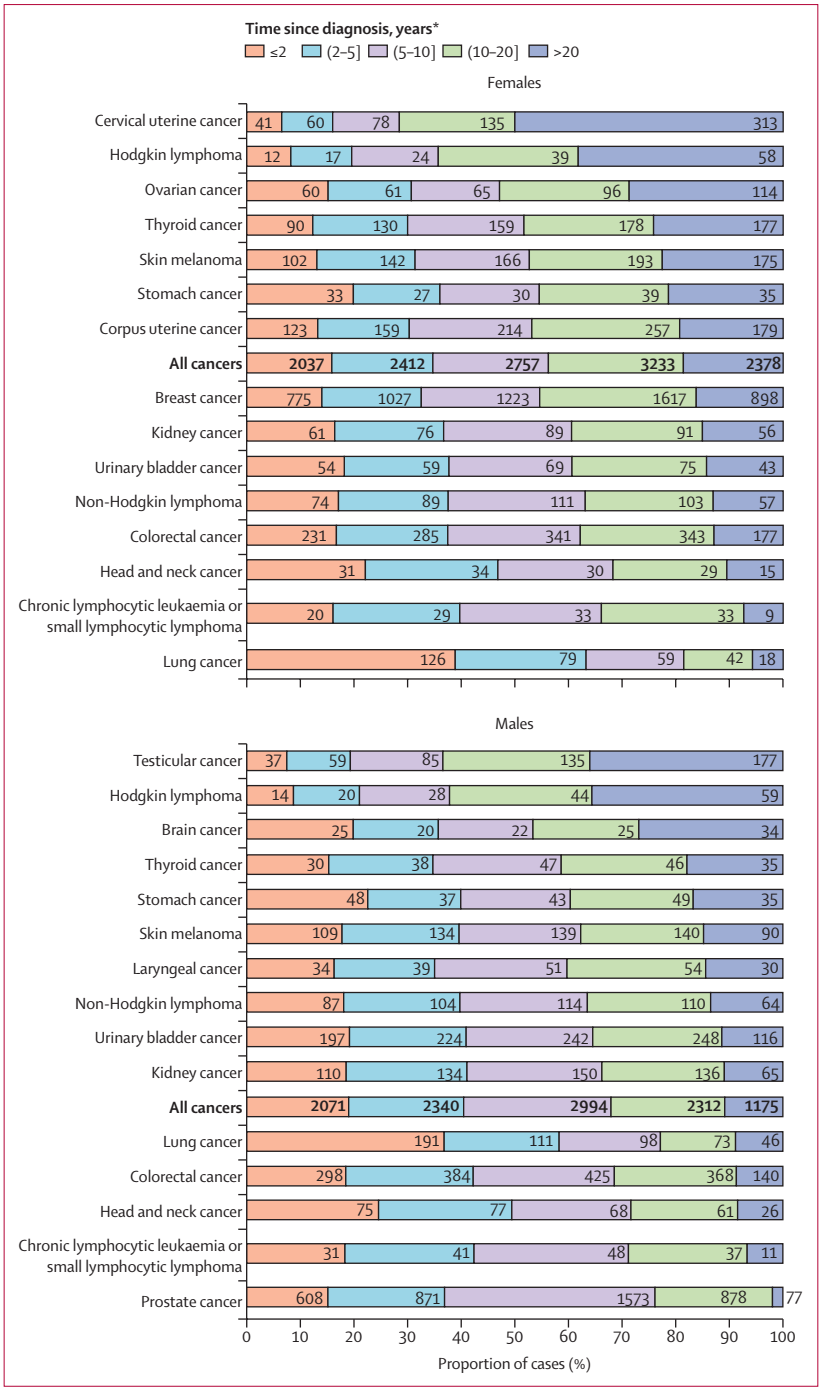

Figure 2: **Complete number of prevalent cancer cases (in thousands) by sex and disease duration in Europe (European pool of 29 countries in EUROCARE-6) as of Jan 1, 2020**
Cancer sites with crude prevalence proportion higher than 50 per 100 000 are shown. Values ordered by decreasing proportion of cases surviving 20 years or more after diagnosis. *Round brackets indicate excluded endpoints, whereas square brackets indicate included endpoints.

was estimated to decrease for cervical uterine cancer only (–0·3%), but the increase was also limited for other tumours with declining incidence, such as stomach cancer (10·6% for males and 11·9% for females) and

male laryngeal cancer (2·9%). In the absence of demographic ageing, the prevalence of these cancers would decrease. Demographic changes have a minimal effect on the prevalence increase for juvenile cancers, such as testicular cancer, brain cancer, or Hodgkin lymphoma (1–4%).

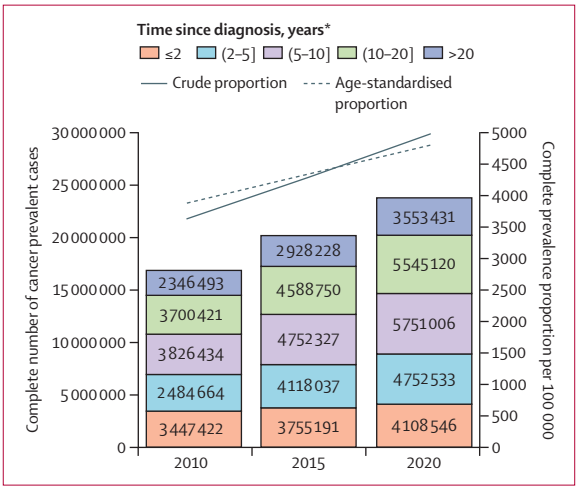

Figure 3: **Change in estimated complete cancer prevalence between Jan 1, 2010, and Jan 1, 2020, in Europe (European pool of 29 countries in EUROCARE-6)**

Overall number of prevalent cases by disease duration in years and complete crude and age-standardised proportions per 100 000 (European Standard Population 2013). *Round brackets indicate excluded endpoints, whereas square brackets indicate included endpoints.

Discussion

We estimated that, in early 2020, an average of 5% of the European population had a recent or distant history of cancer. Most were female, older than 65 years, and living more than 5 years after a cancer diagnosis. Overall, 38% of all prevalent cases in Europe were living more than 10 years after a cancer diagnosis (44% female and 32% male). These proportions are lower than those estimated in the USA in Jan 1, 2020 (47% overall, 50% in women, and 44% in males)[11] using the same methodology and similar population-based data sources. A lower long-term cancer prevalence in European populations is consistent with the better prognosis generally reported for patients in the USA than in Europe.[12]

Breast (in females), prostate (in males), and colorectal cancers (in both sexes combined) alone account for 53% of all cancer survivors. Less common tumours that occur at younger ages (skin melanoma, thyroid cancer, testicular cancer, and cervical cancer) are more frequent in cancer survivors than common fatal tumours diagnosed in older people (pancreatic, oesophageal, and liver), which did not reach crude prevalence estimates of 0·05%.

Our study also highlights the large differences between countries in cancer prevalence, which are much greater than those of cancer incidence or mortality. Incidence is by far the most important determinant of geographical variation, followed by differences in survival and demographics, the latter partly inflating the crude proportions in countries with an older population.[13]

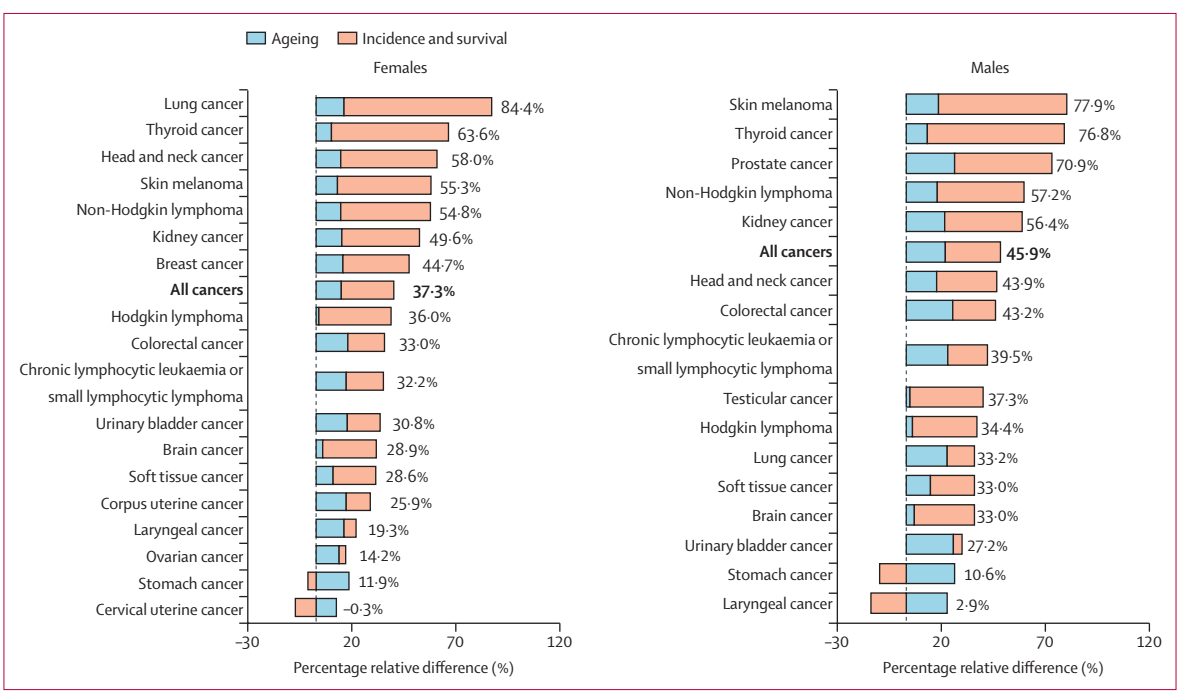

Figure 4: **Estimated percentage relative difference for the period 2010–20 in complete prevalence counts, by cancer and sex, in Europe (European pool of 29 countries in EUROCARE-6)**

Percentage difference is decomposed by determinant: demographic ageing or incidence and survival dynamics. Cancer sites with prevalence higher than 50 per 100 000 for both sexes combined, or in males and females separately for sex-specific cancers.

Variations between countries reflect both real differences in incidence risk (as in the case of cutaneous melanoma or lung cancer) and different levels of diagnostic intensity, screening, and overdiagnosis, as in the case of thyroid cancer[14] or prostate cancer.[15] Country-specific estimates of complete prevalence are consistent with limited-duration prevalence estimates available in some countries (same order of magnitude and higher values). Estimates for urinary bladder and brain cancers are not fully comparable across Europe because of missing non-malignant cases for some registries. These missing data explain, for example, the particularly low estimates for male urinary bladder cancer in France and England. The selected population coverage in countries with regional registration (from 10% in France to a maximum of 20% in Switzerland) might limit the representativeness of our estimates at country level. To contain this limitation in Italy, where within-country heterogeneity is particularly relevant, the national estimate was obtained by combining separate estimates for registries in the centre-north and south.

Projections to 2020 by country relied on prevalence time trends over the latest 3-year period available (2011–13). Validation against NORDCAN observations[10] guided the choice of time base for projections and confirmed the validity of assuming linear trends. Trends in cancer prevalence are, indeed, rather smooth over time, because the number of alive incident cases is cumulated year after year. However, deviations from linearity can occur when incidence changes sharply, as was the case with prostate cancer,[15] which peaked in some European countries around 2013 and then levelled off.

We have estimated a remarkable increase in the number of cancer survivors in the decade 2010–20, reflecting an increase for all cancers except those with a more frequent declining incidence risk (stomach, cervical uteri, and male larynx). This is probably not due to an increase in the general population, which grew by only 3% over the same period, but is partly due to the ageing of the population, with the number of people aged 65 years or older in Europe increasing by 20% between 2010 and 2020. However, we found that trends in incidence and survival had a greater or equal effect on prevalence growth than demographic changes. The number of cancer survivors increased faster in males than in females, largely due to the increase in incidence of prostate cancer, which was observed at different rates in all countries.

Survivorship care services are increasingly being advocated to improve cancer care throughout the life course. We have extended the estimation of cancer prevalence beyond the traditional 5-year prevalence and found that long-term survivors are an increasing population that should be focused on. They include people who are cured and those who will die from the disease. Among people who are cured, some will have no further sequelae, whereas others will still need to be monitored for late sequelae due to toxicity and long-term complications of cancer therapy or increased risk of secondary malignancies.

Whenever a cure with no further sequelae is possible, the time to cure—after which the risk of death of patients reaches that of the general population without cancer—can be estimated according to key prognostic factors to complement and better qualify complete cancer prevalence statistics.[16]

Estimates on complete cancer prevalence tell us how prevalent cases are distributed by disease duration and what their demographic characteristics are. They are useful for quantifying the target population for interventions aimed at specific subpopulations of survivors, but not for deriving information on their actual health status as a function of the time since diagnosis.

European prevalence completeness indexes were computed using incidence and relative survival observations from a pool of selected long-standing registries. This approach ensured robust estimates over the long term. A larger pool would have increased the population coverage at the cost of reduced follow-up. All European areas are represented in the selected pool used to derive European R-indexes, and their performance has been positively validated against registry-specific observed prevalence in Europe and against alternative indexes (US R-indexes).[3]

Projections to 2020 assume a constant linear trend in prevalence from 2013 onwards. This assumption cannot capture deviations from linearity occurring after 2013 due to epidemiological trends or changes in cancer control strategies. Validation in the Nordic countries showed these limits for cancers with declining prevalence (cervix and stomach) and, to a lesser extent, for lung and colon cancers.

Our projections are up to Jan 1, 2020, and represent a pre-COVID-19 baseline. Changes in cancer incidence (reduced diagnostic capacity), outcome (delayed referral), and population age structure (high mortality among older people) that occurred during the COVID-19 pandemic emergency do not allow a priori assumptions of a stable prevalence trend after 2020. More recent data and new assessments will be needed to draw more firm conclusions.

The broad population coverage, including the EU27, the UK, and the European Free Trade Association countries, and the projections to early 2020 are major strengths. Complete cancer prevalence is indeed not routinely calculated in all countries, and the available estimates in Europe are not up to date[17] or are limited to specific countries.[18–20]

To optimise the accuracy and comparability of our estimates, we used the completeness index method,[8,9] one of the most validated methods for calculating complete and limited-duration prevalence using maximum available information observed by cancer registries. The method is systematically applied in the USA, where complete prevalence statistics are published

annually,[11] and specific software (COMPREV) for implementing the method is distributed. Compared with international cancer prevalence estimates[1,21] (including those available on the Global Cancer Observatory), the completeness index method is more firmly based on observations. Estimates are registry-specific and derived from observed prevalence at the maximum available duration. For example, 5-year prevalence estimates are fully observed until 2013 and then projected. In addition, the completeness correction decreases with increasing registration length. This feature ensures the highest possible adherence of estimates to observations.

The distribution by short, long, and very long disease duration is an additional strength of our study. Although there is a growing body of evidence on the problems and unmet needs of cancer survivors,[22] little is known about their actual numbers and characterisation, especially in the long term. Research on the quality of life of long-term survivors after cancer, often based on representative samples from cancer registry data,[23,24] highlights a wide range of issues that point to integrated models of care, with an increasing role for patient-centred care and community medicine.[25] Information on cancer prevalence by disease duration is crucial not only at the health-care level to plan patient care and rehabilitation, but also at the societal level, to assess the impact of policies to mitigate the socioeconomic consequences of the disease, such as employment discrimination or financial toxicity.[26,27]

For the **European Cancer Information System website** see https://ecis.jrc.ec.europa.eu

The large and growing burden of cancer on the European population confirms the need to strengthen cancer prevention measures, as envisaged in Europe's Beating Cancer Plan and related action plans. Primary prevention and early diagnosis are the most effective tools to reduce in the coming years the burden of cancer and improve the quality of life of patients.

People living after a juvenile cancer have been shown to be an important component of long-term cancer survivors. Addressing the health and socioeconomic impact of cancer on this vulnerable subpopulation is particularly valuable. Initiatives such as the survivorship passport or the legislation on the right to be forgotten[26] should be pursued in all countries.

Complete information on cancer prevalence at country level is needed in Europe to develop evidence-based policies on cancer survivorship. This information should be systematically integrated into the European Cancer Information System. Our study shows that an effective way to ensure accurate and comparable estimates of complete cancer prevalence at national level is to jointly analyse data from European registries. Continuity in these collaborative studies with high added value for Europe is essential to make prevalence estimates available on a regular and systematic basis. Future developments in this area should incorporate the analysis of cured cancer survivors and time to cure, to provide robust epidemiological evidence useful for responsibly optimising follow-up care guidelines and recommendations.

For more on the **European Cancer Information System** see https://ecis.jrc.ec.europa.eu

Contributors

RDA drafted the manuscript and designed and coordinated the study. ED carried out the study and analysed the prevalence data. SR coordinated the data quality checks and the preparation of the study database. PB, SR, and MS prepared the registry-specific life tables. SR and MS implemented the procedures to check the raw data and to generate the SEER*Stat study database. ED, SR, and LV estimated and validated the European prevalence completeness indexes. LDM, SG, AK, MG, KP, and KI contributed to validate country-specific prevalence estimates. XT, AK, MDCL, KI, MBl, KP, RG, MG, GR, MBe, LB, LDM, SG, and SR provided advice and revised the results. RDA, ED, SR, LV, PB, and MS accessed and verified the underlying study data. The EUROCARE-6 Working Group collected, prepared, and transmitted raw data for the study database, corrected data after quality controls, checked the results of the analyses, and revised the final draft of the manuscript. All authors interpreted results, contributed to writing the manuscript, reviewed, and approved the final version. All authors had full access to all the data in the study and had final responsibility for the decision to submit for publication.

Declaration of interests

We declare no competing interests.

Data sharing

The detailed results on cancer prevalence by cancer site, country, age, and disease duration will be available on the European Cancer Information System website with publication. The European completeness indexes of cancer prevalence estimated for this Article can be shared upon reasonable request to the corresponding author.

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Supplementary appendix

This appendix formed part of the original submission and has been peer reviewed. We post it as supplied by the authors.

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Dataset characteristics and quality checks

A unique data collection protocol was used to collect standardised information on diagnosis and life status of cancer cases, as well as on life expectancy of the general population.[1,2]
Data provided by the European cancer registries (CRs) were quality-checked in accordance with ENCR-JRC check procedures[3] integrated with EUROCARE criteria specifically developed for the analysis of survival data.[4]
Quality controls were aimed to verify the compliance of individual data records to the study protocol requirements and to identify systematic or sparse errors in one or more variables.
Checks consisted in verifying the valid range of values of *each variable* (*vertical checks*) and the consistency between different variables (*horizontal checks*). These checks allowed to evaluate the validity of the individual records and to identify errors and anomalies regarding compulsory or optional variables.
Records with systematic errors in one or more variables were returned to registries for correction.
Compulsory fields regarded sex, dates of birth, diagnosis and last ascertainment of vital status, vital status, codes indicating cancer topography, morphology and behaviour, basis of diagnosis and whether the diagnosis was microscopically verified. Information on stage at diagnosis and treatment were also requested but were not compulsory since they were not always available to all CRs.
Missing or invalid values and inconsistencies between "compulsory" variables in a patient's record impair the use of the record and were classified as *major errors.* Major errors were always excluded from the analyses.

Cases known by death certificate only (DCO) or incidentally discovered at autopsy were also excluded. They often represent cancer cases with poor prognosis and high proportions of these cases may bias survival estimates. However, they have no effect on the prevalence estimates because they rely only on alive patients.

In prevalence estimates patients diagnosed with more than one primary tumour (multiple tumours) were included in each of the cancer-specific counts. The general principle of counting is to include patients rather than tumours, therefore only the first primary tumour for each cancer entity was considered.
A patient with multiple primary cancers contributes to separate prevalence estimates of different primary tumours. Only the first primary cancer is instead included when estimating the prevalence of all cancers combined. Consequently, cancer-specific counts do not sum up to counts of all cancers combined.

Cancer behaviour registration criteria for brain and urinary bladder are not homogeneous across Europe. Non-malignant (benign, uncertain and in situ) tumours of these entities were included to improve the international comparability of prevalence estimates.

The quality of follow-up information was assessed by checking the proportion of alive cases that were censored before the prevalence index date, the so-called cases "lost to follow-up".
The index date was Jan 1, 2013 for all registries except Slovakia (Jan 1, 2011), Croatia, Saarland, Ferrara, Sassari, Varese, Canary Islands and Tarragona (Jan 1, 2012). Cases lost to follow-up before the index date are recaptured in the calculation of limited duration prevalence by means of registry-specific life tables. Each case lost to follow-up is assigned the survival probability estimated in the cohort of patients with complete follow-up and similar characteristics (sex, age at diagnosis, cancer site, period of diagnosis). The number of cases lost to follow-up estimated alive is obtained as the sum of the estimated survival probabilities for each lost case.

Table A.1 reports the characteristics of the dataset used for the EUROCARE-6 prevalence estimates and the results of data quality checks for the 61 European Cancer Registries (CRs) included in the study.
Overall, 23 registries cover the whole countries, whereas six countries are represented by regional registries (France, Germany, Italy, Portugal, Spain, Switzerland). The maximum duration of registration length is the difference between the prevalence index date and the first year of incidence data available in the dataset. The maximum duration ranged from minimum 9 years (Belgium and Cyprus national CRs started registration in 2004) to 35 years (all registries providing data from 1978).
Overall, the number of cancer cases included in the EUROCARE-6 dataset used for prevalence estimations was about 20.4 million.
The proportion of records with major errors was generally below 1% and does not exceed 3%.
The proportion of DCO cases and incidentally detected at autopsy cases ranged between 0% and 10.7%, depending on the specific operating conditions of the registries. Information on death certificates was not used to initiate cancer registration in Belgium, France, Denmark, and the Netherlands.

The proportion of multiple primary cancers was 6% on average. The proportion of multiple diagnoses depends on the length of registration period and on cancer survival, therefore higher values are generally reported for long-standing registries.
The proportion of non-malignant cancers was quite variable across European registries and higher values were registered for urinary bladder (up to 54.7%) than for brain cancers (up to 25.2%). This information is helpful to interpret the geographical differences in the prevalence patterns for these two neoplasms.
The proportion of lost to follow-up cases was generally very low, below 3% in most CRs. Higher proportions were registered for the Swiss registries (10% on average), especially for Geneva CR (17.8%).

Methods

Complete cancer prevalence was estimated by adjusting registry-specific prevalence observations using the so-called completeness indexes.[5-6] The same method was also used to estimate limited duration prevalence for disease durations longer than the maximum follow up time available in each registry.

Further methodological details on cancer prevalence estimation are provided in the following.

1. Basic definitions

Prevalent cases are new and pre-existing cancer cases alive on a certain date (index date), in contrast to incidence which reflects new cases diagnosed during a given time interval. Cancer prevalence can be measured as **count** (absolute number of cases alive at the index date) or as **proportion** of the reference population (percent proportions or proportions per 100,000 inhabitants of cases alive at the index date). Crude prevalence proportions reflect the real burden of the disease in a population and are relevant for health care programming. Age-standardised prevalence proportions allow comparisons over time or between populations, which are adjusted for varying age-structure of the population. In this study we applied a direct standardisation using the European Standard Population 2013, the latest EUROSTAT revision of the standard population.

- *Limited-duration prevalence at x years* represents the number or proportion of people alive on a certain date who had a cancer diagnosis within the past x year
- *Complete prevalence* represents the number or proportion of people alive on a certain date who had a cancer diagnosis, *regardless of how long before the diagnosis was or if the patient is still under treatment or is considered cured*.
- *Observed prevalence at L years is* the maximum limited-duration prevalence that can be measured by a registry in operation since L years (L is the maximum registration time). For example, a registry collecting incidence and life status data from 1990 through 2020 can measure an observed prevalence of maximum 31-years, i.e. the prevalence of people diagnosed in the previous 31 years and alive at Dec 31, 2020. Observed prevalence is calculated from incidence and life status data by counting the number of all patients who are known to be alive at the index date**.** For cases that were censored alive before the index date (*lost to follow up*) the vital status is unknown at the index date. These cases – usually a small proportion – can be accounted for by estimating their *overall survival probability* between the censoring date and the index date. The survival probability of patients with complete follow up and similar characteristics (age, sex, period of diagnosis, type of cancer) is used to estimate the number of *lost cases estimated alive*. Lost to follow-up cases estimated to be alive at the index date are hence added to the observed prevalence (*counting method*). Unless the registration period is long enough to capture all patients alive at the index date, observed prevalence obtained with the counting method underestimates the total number of cancer survivors (complete prevalence) because it doesn't include alive cases that were diagnosed before the start of registration. Higher underestimations occur for short registration time lengths (less than 10-15 years) and for cancers with better prognosis and earlier onset.
- *Completeness index method* [5,6] is a method to estimate complete prevalence from limited-duration prevalence. This method consists in estimating adjusting factors, known as "*completeness indexes*", which quantify the theoretical completeness of the observed prevalence measured at a given registration time length L. Such indices are cancer, sex, age and time specific and are estimated by regressing incidence and relative survival models on representative pools of cancer registries data. Complete prevalence is obtained by simply dividing the observed prevalence at L years by the corresponding completeness index at L years.

2. Calculation of registry-specific observed limited-duration prevalence

For each of the 61 registries included in the study we computed the observed number of prevalent cases (N_{obs}) at the index date by cancer entity, sex, 5-year age groups, disease duration in years up to the maximum follow-up time L available in each registry (ranging from 9 to 35 years), using the counting method implemented in the Prevalence Session of the SEER*Stat Software.[7]

Further to counting prevalent cases at the index date, in the counting method adjustments are made to account for cases lost to follow-up estimated alive. Each lost to follow-up is assigned the survival probability estimated in a cohort of patients with complete follow-up and similar characteristics. Overall survival probabilities - considering all causes of death stratified by registry, cancer, sex, age at diagnosis (0-59, 60-74, 75+) and 10-year period of diagnosis (1978-1987, 1988-1997, 1998-2007, 2008-2015) are calculated with the Kaplan-Meier method. Such stratification ensures sufficiently robust survival estimates for all registries and cancer entities considered in the study, even in the long term. The number of cases lost to follow-up estimated alive at the prevalence index date is obtained as the sum of the estimated survival probabilities for each lost case.

The observed number of prevalent cases is computed summing up alive cases at the index date and lost cases estimated alive at the index date.

The most recent common index date for the eligible registries was Jan 1, 2013, except for Slovakia (Jan 1, 2011), Croatia, Saarland, Ferrara, Sassari, Varese, Canary Islands and Tarragona (Jan 1, 2012).

3. Calculation of complete prevalence with the completeness index method

Complete prevalence, which includes all people alive after a cancer diagnosis at the index date, regardless of the disease duration, was estimated by applying the completeness index method,[5-6] a method specifically designed to estimate complete cancer prevalence starting from the limited-duration prevalence measured by population-based cancer registries.

The method is implemented in the COMPREV software[8] which is distributed by the US National Cancer Institute (NCI-NIH) and is widely applied in the US in the annual reports on cancer prevalence,[9] in periodic reports on cancer prevalence in Italy[10] and by European projects like RARECAREnet, delivering prevalence indicators on rare cancers[11] or EUROPREVAL, estimating cancer prevalence in European countries for the first time.[12]

The completeness index - also called *R-index* - quantifies the theoretical completeness of the prevalence observed by a registry as a function of the registration time period. The completeness of observed prevalence increases with the duration of the registration activity and R-index approaches 1 as long as registration time grows. R-index assumes values in the interval $[0,1]$. A value equal to 1 indicates that the observed limited-duration prevalence includes all cancer cases alive at the index date, e.g. equals the complete prevalence.

The complete number of prevalent cases aged x years at the index date includes all incident cases diagnosed at age t (t<x) surviving up to age x, thus for x-t years. A cancer registry active since L years can observe only prevalent cases with disease duration lower than x-L. The expected complete prevalence N'(x) can be therefore decomposed in two components: one *observed* (durations up to x-L) and one *unobserved* (durations between x-L and x).

The completeness index for a registration time L is defined as the ratio between the expected number of observed prevalent cases in L years $N'_{obs,L}(x)$ and the expected complete number of prevalent cases $N'(x)$, that is:

$$R_L(x) = \frac{N'_{obs,L}(x)}{N'(x)} = \frac{\sum_{t=x-L}^{x} I(t)S(t,x-t)}{\sum_{t=0}^{x} I(t)S(t,x-t)} \qquad (1)$$

where $I(t)$ is the incidence of the disease at age t and $S(t,x-t)$ is the relative survival at age x for patients diagnosed with cancer at age t. The analytical details to derive equation (1) are described in the scientific paper that first proposed the methodology. [5] Both relative survival and incidence functions are estimated from cancer registries data.

The complete number of prevalent cases (N) at age x in a registry operating since L years is therefore calculated dividing the observed number of prevalent cases (N_{obs}) by the corresponding completeness index (R) according to the relation:

$$N(x) = N_{obs,L}(x)/R_L(x)$$

where x is the age of prevalent cases (age at diagnosis plus disease duration up to the index date).

4. Calculation of European prevalence completeness indices

Prevalence completeness indexes by cancer type, age, sex and registration time were derived through the COMPREV software.[8] This software provides completeness indexes computed by modelling incidence and relative survival data from pooled SEER-Program cancer registries (default values). Alternative R-index values can be computed by providing user-specific parameters of incidence and relative survival models. These parameters have to be estimated with other statistical packages and then provided in COMPREV as user-specific input data.
Since cancer profiles of the USA population might differ from the European patterns, either for incidence and survival, a systematic estimation of R-indexes by cancer site and sex from the European EUROCARE-6 dataset was carried out. The pool of the European cancer registries with at least 30 years of registration at the prevalence index date of Jan 1, 2013 was used at this purpose.

4.1 European completeness indices: estimation of incidence models

In the context of prevalence completeness index estimation parametric incidence models are used to describe the risk of being diagnosed with a specific cancer as a function of *age at diagnosis* and birth cohort, i.e. age at diagnosis is measured along the life span of each *birth cohort* present in the population at the index date.

Two different parametric models are foreseen by the COMPREV software to describe cancer incidence variations over time and age: *exponential* and *polynomial*.

- *Exponential Model*. In agreement with the multistage theory of carcinogenesis an exponential relationship with age can be assumed for the logit of incidence, as proposed in the first formulation of the completeness index method:[5]

$$I(x,k) = [1 + exp - (a_k + b \cdot log(x))]^{-1} \qquad (2)$$

where $I(x,k)$ is incidence probability at age at diagnosis x for birth cohort k.

- *Polynomial Model*. A sixth-degree polynomial on age is assumed for the logit of incidence. This model may better represent incidence trends by age for some cancers deviating from a log-linear dependency and has been first proposed in a study aimed to validate the application of prevalence completeness indexes on US-SEER cancer registries data: [6]

$$I(x,k) = \left\{1 + exp - \left[a_k + \sum_{i=1}^{6} b_i \left(\frac{x}{m} - \frac{x_0}{m}\right)^i\right]\right\} \qquad (3)$$

In both models, the birth cohort covariate (k) is included as a categorical variable to adjust for risk trends across the different birth cohorts.

The parameters of the incidence function were estimated through the *SAS Statistical Package (logistic procedure)* by fitting crude incidence rates of patients registered between 1980 and 2014 in the Pool of selected long-standing registries (30 years or more of observation at the index date of Jan 1, 2013).

Incidence data were stratified according to:

- cancer site
- sex
- 5-year age groups (0-4, 5-9, …, 80-84, 85+)
- 5-year birth cohorts (<1889, 1890-1894, …, 2010-2014)

The goodness of fit of the incidence models was assessed both analytically, by comparing the Akaike Information Criterion (AIC)[13], and by visual comparison between the estimated and observed rates.

AIC was generally lower for the polynomial model, indicating a better fit for the latter in respect to exponential models (data not shown). Graphical comparisons of observed vs predicted incidence confirm this result, since predicted values are closer to the observed values when estimated through polynomial rather than exponential models.

Some examples of the goodness of fit of incidence models are reported in **Figure A.1**. Observed and predicted incidence rates by age at diagnosis or by period of diagnosis are shown for different index tumours. Polynomial models in general proved to fit observations better than exponential models, independently of cancer site, age and period of diagnosis.

4.2 Calculation of European completeness indices: estimation of relative survival models

Relative survival expresses the net probability to survive the specific cancer (removing background mortality due to other causes) and is computed as the ratio between the overall survival observed in a group of patients and the overall survival expected in a comparable group of population free from cancer, i.e. with same age, birth cohort, sex, area of residence. Relative survival is used when the cause of death is either unknown or not sufficiently reliable, as is often the case in population-based settings.

In the context of prevalence completeness index estimation, relative survival is modelled by means of parametric *mixture cure-models*.[14] This class of models assumes cancer patients can be divided, according to outcome, in two categories: those that will be cured and those who will die from cancer. The fraction of cured patients (C) is exposed to the same mortality rates of the general population, whereas the remaining fraction (1-C) of fatal cases experiences an additional death risk due to cancer.

The COMPREV software supports parametric mixture cure models only, with the possibility to choose between exponential or Weibull time to death distribution of fatal cases. Age at diagnosis can be modelled as a *continuous variable* or as a *categorical variable*.

In the age-continuous formulation of the model of Weibull type, the cumulative relative survival probability of patients diagnosed at age *t* and year *y* after d years from diagnosis (follow-up time) is given by the following formula:

$$S(t,y,d) = [C + (1-C)exp(-\lambda d)^{\gamma}]^{exp[\beta_1(t-t_0)+\beta_2(y-y_0)]} \qquad (4)$$

where λ and γ are respectively the *scale* and *shape* parameters of the Weibull distribution of time to death for fatal cases, while the proportional hazard rate due to '*age at diagnosis*' and '*year of diagnosis*' is expressed, respectively, by the parameters β_1 and β_2 which modulate the baseline relative survival for reference age at diagnosis t_0 (64 years in our estimates) and central year of diagnosis y_0 (1997). The Weibull model incorporates the exponential model as a special case (shape parameters equal to unity).

In the age-stratified formulation of the model of Weibull type, the cumulative relative survival probability for the age group t is given by the following formula:

$$S_t(y,d) = [C_t + (1-C_t)exp(-\lambda_t d)^{\gamma_t}]^{exp[\beta_{2,t}(y-y_0)]} \qquad (5)$$

where all parameters of the baseline function (C, λ and γ) are age specific, as well as the parameters modulating the time period effect (β_2).
The relative survival observed in the pool of the long-standing cancer registries used for modelling incidence function (registries with follow up time ≥ 30 years) was considered for modelling relative survival. Observed relative survival in the pool was calculated with the Ederer II method with the SEER*Stat software[3], excluding cases based on death certificates only or incidentally detected at autopsy. Observed relative survival of cancer patients diagnosed between 1980 and 2014 was stratified by:

- cancer site
- sex
- period of diagnosis (1980-84, 1985-89, 1990-94, 1995-99, 2000-04, 2005-09, 2010-14)
- age at diagnosis groupings (depending on cancer entities).

Mixed cure model parameters of Weibull type were estimated with non-linear regression using the NLIN procedure available in the SAS Statistical Package. The goodness of fit of the modelled survival function was evaluated through regression diagnostics indicators and by visual comparison of estimated and observed relative survival curves by follow up time.

The type of model and the age-groupings providing the best fit to observations are described below.

Cancer site	Age groups	Age stratification
Larynx, Bone, Vagina and vulva, Prostate, Penis, Non-Hodgkin lymphoma, Chronic myeloid leukaemia (CML)	0-87	age-contiunuos
Soft tissue	0-39, 40-87	age-stratified
Testis	0-44, 45-54, 55-64, 65+	age-stratified
Head and neck, Oesophagus, Stomach, Colon and rectum, Liver, Gallbladder, Pancreas, Lung, Skin melanoma, Breast, Cervix uteri, Corpus uteri, Ovary, Urinary bladder, Kidney, Thyroid, Multiple myeloma	0-44,45-54, 55-64, 65-74, 75-87	age-stratified
All cancers, Brain, Hodgkin lymphoma, Chronic lymphocytic leukaemia/small lymphocytic lymphoma (CLL/SLL), Acute myeloid leukaemia (AML)	0-14, 15-44, 45-54, 55-64, 65-74, 75-87	age-stratified

Figure A.2 reports some examples of plots comparing observed vs predicted relative survival by follow up time for selected cancers. Goodness of fit of the Weibull mixture cure models was generally high: observed values lie within the 95% confidence limits estimated for predicted values.

5. Calculation of registry-specific complete prevalence estimates

Registry-specific complete prevalence estimates were derived dividing the observed limited-duration prevalence at by the corresponding completeness index according to the relation:

$$N'(x) = \frac{N_L^{obs}(x)}{R_L(x)}$$

where L is the maximum observation length of each registry and x is the age at prevalence class. The maximum length of observations ranged from 9 to 35 years at the prevalence index date (Table A.1).

Beside complete prevalence we estimated *limited-duration prevalence* at 2, 5, 10,15, 20, 25 years from diagnosis. Limited duration prevalence for durations smaller or equal to the maximum observation period simply equals the registry's observed limited duration prevalence. For durations that are longer than the maximum observation period, limited-duration prevalence can be derived from a combination of completeness indexes. Being L the maximum observation length of a registry (for example 10 years) and L* a duration greater than L (for example 15 years), prevalence at limited duration L* >L can be estimated as follows:

$$N'_{L^*}(x) = N'(x) \cdot R_{L^*}(x) = N_L^{obs}(x) \cdot \frac{R_{L^*}(x)}{R_L(x)}$$

In this way, complete and limited duration prevalence - either counts or proportions – are derived for each registry for every duration beyond the length of registration activity. The completeness index method relies as much as possible on the observed information at maximum duration and is used just to complete the unobserved component of cancer prevalence.

6. Calculation of country-specific estimates of complete prevalence

Country-specific complete prevalence estimates correspond to registry-specific complete estimates for the 23 countries with population covered by national cancer registries. For the six countries with local cancer registration systems, the complete number of prevalent cases at the country level was obtained by applying age-specific prevalence proportions estimated for the national pool of registries to the country's resident population. In Italy, due the marked geographical north to south gradient in cancer incidence and survival, data were pooled in northern-central and southern areas and the national cancer prevalence was computed as weighted average of these two macro-areas estimates, using the resident population as weight.

The same procedure was used for calculating limited-duration prevalence at country level.

7. Time projections of country-specific complete prevalence

For each country three-year moving averages of complete and limited duration prevalence proportions, stratified by sex and age at prevalence (0-54, 55-64, 65-74, 75+), were projected to Jan 1, 2020 through regression modelling. Age-specific estimates were summed up to obtain prevalence projections for all ages combined by country, sex and cancer.

Two alternative regression models (linear and logistic) were tested. Goodness of fit of these alternative models was evaluated with the Akaike Information Criterion (AIC)[13]. The regression models were applied to the prevalence time trend based on the last 3, 4 or 5 years prior to the index date. For example, to project complete prevalence based on the latest 3-year estimates, complete prevalence at country level was calculated at the index dates of Jan 1, 2013, 2012, 2011, 2010 and 2009 to obtain three-year moving averages centred respectively in 2012, 2011 and 2010. The results obtained with the alternative projection methods for the pool of the Nordic countries in the study (Denmark, Finland, Iceland and Norway) were validated against the corresponding cancer prevalence observations published by NORDCAN. [15] The Nordic registries are active since the fifties and are able to provide virtually complete observed measures, whereas incidence data available in the EUROCARE-6 study are limited to 1978 (maximum 35 years of observation). The comparison with NORDCAN therefore allowed to validate both complete prevalence estimation (up to 2013) and complete prevalence projections for the period 2014-2020.
The definition of the cancer entities in NORDCAN is based on ICD-10 Classification and slightly differs from the ICD-O-3 definition used in the study (**Table A.2**) for the following cancer entities:

- All cancers: CXX.X excl. C44, D09.0-D09.1, D30.1-D30.9 D32-D33, D35.2-D35.4, D41.1-D41.9, D42-D43, D44.3-D44.5, D45-D47
- Rectum: C19-C20
- Kidney: C64
- Urinary bladder: C65, C66, C67, C68, D09.0-1, D30.1-9, D41.1-9
- Soft tissues: C49, C46.1

The comparison against NORDCAN observations 2014-2016 (available at the time we performed the sensitivity analysis) allowed to choose linear regression models, based on the prevalence trend in the most recent 3-year period, as the final method to project complete and limited-duration cancer prevalence estimates from Jan 1, 2014 to Jan 1, 2020 (**Figures A.3 and A.4**). Resident population up to Jan 1, 2020 by country, sex and age[16] was used to derive prevalence counts in all strata. Confidence intervals of the projected prevalence proportions were derived from the confidence interval of the estimated slope of the linear trend.
The uncertainty of prevalence projections depends on the trend estimated in the three-year period used as a basis for projections. Deviations from linearity, due to epidemiological changes in cancer incidence or survival, or variability due to low numerosity (possible for some cancer entities, age groups or countries) resulted in wider confidence intervals for the estimated slope and consequently for the prevalence estimate in 2020. Furthermore, the linear regression cannot capture changes that occur in later years than those used for estimation. This is the case, for example, of stomach, lung, or colon cancers, for which estimated complete prevalence fits well observations up to 2014 and appears underestimated in subsequent years.

8. Decomposition of prevalence time trends by determinant

Time trends of cancer prevalence are determined by the dynamics of three main factors: the disease risk (incidence), the probability to die of cancer patients (survival) and the demographic changes (evolution in the size and structure of the population, such as the ageing of the population). To quantify the impact of demographic changes compared to incidence and survival changes, the difference between the number of prevalent cases estimated in 2020 and in 2010 can be divided into two separate components according to the following relation:

$$N_{2020} - N_{2010} = \left(N_{2020} - N_{2020}^{p2010}\right) + \left(N_{2020}^{p2010} - N_{2010}\right) = \Delta N_{2020-2010}^{inc/surv} + \Delta N_{2020-2010}^{pop}$$

where N_{2020}^{p2010} represents the number of prevalent cases in 2020 that is obtained by applying age-specific prevalence proportions estimated in 2010 to the population age structure observed in 2020 (i.e. implicitly assuming that only the resident population has been changing from 2010 to 2020). The two terms of the above relation provide, respectively, the contribution of incidence and survival dynamics ($\Delta N_{2020-2010}^{inc/surv}$) and of population changes ($\Delta N_{2020-2010}^{pop}$) to the overall prevalent cases difference from 2010 to 2020. The second term, indeed, being the difference between N_{2020}^{p2010} and prevalent cases number in 2010, provides an estimation of the difference 2010-2020 only due to population changes, while the first one, expressing the remainder of the overall prevalence difference 2010-2020, can only be due to the combined effect of the remaining two determinants.

9. Complete prevalence estimates in Europe and EU-27

Estimated complete and limited-duration prevalent cases by country were summed up to obtain the corresponding counts for the European areas (Southern, UK and Ireland, Central, Eastern and Southern Europe) and at the European level. Two distinct measures were considered for the European level: the European pool, representing the pool of the 29 countries contributing to the EUROCARE-6 study, and the EU-27 area. The five EU-27 countries that did not contribute to EUROCARE-6 were assumed to share the same prevalence proportion of neighbouring countries (Southern Europe for Greece, Central Europe for Luxembourg, Eastern Europe for Hungary and Romania, Northern Europe for Sweden).

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Table A.1 - Populations covered by the 61 European Cancer Registries (CRs) included in the study with percentage of national population covered.
Maximum duration of registration at the index date, number of cases diagnosed until the index date, percentage of cases excluded because of major errors (inconsistencies in dates, missing/invalid information on vital status, basis of diagnosis, topography and morphology) or because detected only by death certificate or incidentally at autopsy), number of cases included in the analyses and percentage of multiple primaries, of benign and in situ cancers among cases diagnosed with brain and urinary bladder cancers, and of cases lost to follow-up before the index date.

Area	Country	Registry population (percentage of national population covered, %)		Maximum registration length at the index date* (years)	Number of cases diagnosed to the index date*	*Excluded cases*		Number of cases included in analysis	Multiple primaries (%)	Proportion of benign, uncertain and in situ cancers (%)		Cases lost to follow-up[§] (%)
						Major Errors (%)	DCO/ Incidentally Detected at autopsy (%)			Brain	Urinary Bladder	
Northern Europe	**Denmark**	National	(100.0)	35	905,012	1.9	0.2	886,125	6.4	25.2	50.9	0.7
	Finland	National	(100.0)	35	714,871	2.6	0.1	696,079	6.9	11.3	5.9	0.0
	Iceland	National	(100.0)	35	35,591	0.0	2.4	34,731	10.0	21.4	4.9	0.0
	Norway	National	(100.0)	35	706,397	1.5	0.7	691,336	9.7	20.6	4.6	0.0
Central Europe	**Austria**	National	(100.0)	30	1,047,788	0.0	10.7	936,173	6.3	0.0	0.0	0.0
	Belgium	National	(100.0)	9	575,829	0.4	0.0	573,206	6.3	14.5	49.1	0.8
	France	Bas Rhin	(1.7)	23	117,020	0.2	0.0	116,791	9.3	0.0	0.0	1.1
		Doubs	(1.1)	23	58,706	0.1	0.0	58,645	7.7	0.0	0.0	0.4
		Haut-Rhin	(1.2)	23	79,774	0.6	0.0	79,286	8.3	0.0	0.0	3.1
		Herault	(1.7)	18	91,105	0.5	0.0	90,660	6.3	0.0	0.0	2.6
		Isere	(1.9)	23	116,499	0.6	0.0	115,829	7.9	0.0	0.0	1.2
		Somme	(0.9)	23	61,503	0.3	0.0	61,291	7.8	0.0	0.0	4.2
		Tarn	(0.6)	23	45,791	0.1	0.0	45,738	8.0	0.0	0.0	0.6
		7 French CRs Pool	*(9.9)*	18 - 23	570,398	0.4	0.0	568,240	8.0	0.0	0.0	1.8
	Germany	Bremen	(0.8)	13	56,280	0.1	6.9	52,313	6.5	6.8	48.2	6.5
		Common CR of 4 Federal States:Brandenburg, Mecklenburg-West Pomerania, Saxony-Anhalt, Thüringen	(12.9)	11	727,582	0.3	7.2	672,684	5.8	5.7	38.5	0.0
		Hamburg	(2.2)	15	151,352	0.8	9.3	136,039	9.6	0.0	32.5	7.9
		Saarland	(1.3)	19	116,095	0.8	5.4	108,954	6.7	11.8	52.3	0.0
		4 German CRs Pool	*(17.2)*	11 - 19	1,051,309	0.4	7.3	969,990	6.5	5.7	39.9	1.5
	Netherlands	National	(100.0)	24	1,809,356	0.7	0.4	1,789,542	8.9	5.1	48.5	0.0
	Switzerland	Geneva	(5.9)	35	69,145	0.0	2.6	67,331	10.7	13.5	46.5	17.8
		Graubünden and Glarus	(2.9)	24	25,291	0.0	0.8	25,077	8.1	8.1	41.8	6.0
		Eastern Switzerland	(6.9)	32	68,350	0.0	3.8	65,763	8.0	13.8	49.2	7.4
		Ticino	(4.3)	13	24,578	0.0	1.7	24,160	7.4	0.0	6.2	3.8
		4 Swiss CRs Pool	*(20)*	13 - 35	187,364	0.0	2.7	182,331	8.9	11.4	43.3	10.2

Area	Country	Registry population (percentage of national population covered, %)		Maximum registration length at the index date* (years)	Number of cases diagnosed to the index date*	*Excluded cases*		Number of cases included in analysis	Multiple primaries (%)	Proportion of benign, uncertain and in situ cancers (%)		Cases lost to follow-up§ (%)
						Major Errors (%)	DCO/ Incidentally Detected at autopsy (%)			Brain	Urinary Bladder	
Eastern Europe	**Bulgaria**	National	(100.0)	20	544,023	0.2	10.2	487,275	2.5	1.3	0.2	0.0
	Czechia	National	(100.0)	19	960,283	0.0	6.8	894,541	6.8	0.0	6.5	0.0
	Estonia	National	(100.0)	35	180,618	0.0	4.2	173,007	5.0	13.6	1.5	3.5
	Latvia	National	(100.0)	13	119,928	0.2	7.7	110,439	3.7	0.8	0.3	0.0
	Lithuania	National	(100.0)	20	277,739	1.2	4.3	262,530	4.6	1.7	11.9	2.5
	Poland	National	(100.0)	12	1,518,096	0.2	2.8	1,474,000	2.0	0.0	3.7	0.0
	Slovakia	National	(100.0)	33	570,881	0.0	9.8	514,700	4.9	10.7	1.4	0.0
Southern Europe	**Croatia**	National	(100.0)	12	252,861	0.0	6.0	237,757	2.4	0.0	0.0	0.0
	Cyprus	National	(100.0)	9	25,932	1.9	8.6	23,226	2.5	0.0	21.3	0.0
	Italy+	Catania-Messina-Enna (S)	(3.2)	10	93,833	0.1	1.6	92,290	3.7	0.0	49.5	4.1
		Ferrara (N-C)	(0.6)	21	56,577	0.5	1.4	55,481	7.5	8.6	47.0	3.0
		Latina (N-C)	(0.9)	17	41,120	0.5	1.6	40,247	4.8	10.2	26.1	9.1
		Modena (N-C)	(1.1)	25	97,512	0.0	0.3	97,216	7.9	5.8	1.9	1.5
		Napoli 3 Sud (S)	(2)	17	50,834	0.2	1.5	49,971	3.5	10.1	47.2	1.2
		Nuoro (S)	(0.4)	10	11,471	0.0	1.5	11,300	4.0	11.1	51.7	0.0
		Palermo (S)	(2.1)	10	59,453	0.1	2.8	57,769	3.4	20.8	42.5	0.4
		Parma (N-C)	(0.7)	35	89,511	0.0	2.2	87,485	7.0	8.4	23.7	4.3
		Ragusa (S)	(1)	32	42,922	0.0	1.8	42,147	4.3	16.1	48.1	0.6
		Reggio Emilia (N-C)	(0.9)	17	51,225	0.1	0.3	51,047	6.2	12.0	47.9	2.8
		Romagna (N-C)	(2)	27	173,711	0.0	1.8	170,618	8.4	13.7	35.0	0.2
		Sassari (S)	(0.8)	20	43,169	0.0	2.8	41,940	5.0	9.0	38.7	0.1
		Siracusa (S)	(0.7)	14	24,942	0.0	2.4	24,345	3.6	0.0	54.7	3.9
		Sondrio (N-C)	(0.3)	15	17,405	0.0	0.5	17,319	6.3	13.7	52.1	0.8
		Umbria (N-C)	(1.5)	19	103,597	0.0	0.5	103,119	7.5	0.0	0.0	1.4
		Varese (N-C)	(1.5)	34	142,600	0.0	1.5	140,409	7.9	3.1	4.6	3.6
		16 Italian CRs Pool	*(19.6)*	10 - 35	1,099,882	0.1	1.5	1,082,703	6.4	8.4	30.8	2.3
	Malta	National	(100.0)	20	28,583	0.6	2.4	27,718	2.7	7.7	37.8	0.0
	Portugal	Southern Portugal	(44.5)	13	252,507	0.3	0.1	251,377	4.1	0.0	0.0	2.2
	Slovenia	National	(100.0)	30	235,957	0.0	3.5	227,618	6.2	15.3	25.9	0.5
	Spain	Balearic Islands, Mallorca	(1.9)	25	72,879	1.3	2.8	69,831	5.8	6.3	32.4	0.7
		Basque Country	(4.7)	27	271,738	0.3	2.2	264,939	6.8	10.7	22.2	0.0
		Canary Islands	(3.8)	16	93,929	0.6	2.2	91,266	5.9	4.1	26.5	0.0

Area	Country	Registry population (percentage of national population covered, %)		Maximum registration length at the index date* (years)	Number of cases diagnosed to the index date*	*Excluded cases*		Number of cases included in analysis	Multiple primaries (%)	Proportion of benign, uncertain and in situ cancers (%)		Cases lost to follow-up§ (%)
						Major Errors (%)	DCO/ Incidentally Detected at autopsy (%)			Brain	Urinary Bladder	
Southern Europe	Spain	Girona	(1.6)	19	58,820	0.2	3.2	56,827	6.5	10.8	38.5	5.3
		Granada	(2)	28	81,506	0.0	4.0	78,226	5.7	9.8	9.0	0.0
		Tarragona	(1.7)	30	78,138	0.3	4.0	74,828	7.2	4.2	8.2	0.1
		6 Spanish CRs Pool	*(15.6)*	16 - 30	657,010	0.4	2.8	635,917	6.5	8.6	22.0	0.6
UK and Ireland	**UK England**	National	(100.0)	18	4,339,233	2.2	3.0	4,110,349	6.3	2.6	0.0	0.0
	UK Northern Ireland	National	(100.0)	20	153,963	0.1	1.4	151,629	6.9	21.9	51.2	0.0
	UK Scotland	National	(100.0)	35	910,162	0.0	0.4	906,786	7.7	9.6	28.0	0.6
	UK Wales	National	(100.0)	22	355,893	0.1	4.9	338,089	7.3	6.1	6.6	0.0
	Ireland	National	(100.0)	19	307,333	0.7	1.4	300,903	6.4	11.5	19.9	0.0
POOL of 61 CRs			**(51.7)**	**9 - 35**	**20,394,799**	**0.9**	**3.3**	**19,538,317**	**6.3**	**6.7**	**20.3**	**0.6**

**The index date was Jan 1, 2013 for all registries except Slovakia (Jan 1, 2011), Croatia, Saarland, Ferrara, Sassari, Varese, Canary Islands and Tarragona (Jan 1, 2012).*

§Proportion of cases censored alive before the prevalence index date out of all cases alive at the end of follow up.

[+]For Italy, N-C and S indicate northern-central and southern regions respectively.

Table A.2 – Definition of the cancer entities analysed in the study according to the Third Revision of the International Classification of Diseases for Oncology (ICD-O-3)

Cancer entities	Detailed description	ICD-O-3 Topography	ICD-O-3 Morphology
All cancers	All malignant cancers excluding non-melanoma skin cancer	SEER Site recode (https://seer.cancer.gov/siterecode/)	
Head and neck	Tongue, gum, floor of mouth, other and unspecified mouth, oropharynx, nasopharynx, hypopharynx, other oral cavity and pharynx	C01-C06, C09-C14	excluding 9050-9055, 9140, 9590-9992
Oesophagus		C15	excluding 9050-9055, 9140, 9590-9992
Stomach		C16	excluding 9050-9055, 9140, 9590-9992
Colon Rectum	Colon, rectum, rectosigmoid junction, anal canal, anus and intestine NOS	C18-C21, C260	excluding 9050-9055, 9140, 9590-9992
Liver	Liver and intrahepatic bile ducts (excluding metastatic and uncertain behaviour)	C22	excluding 9050-9055, 9140, 9590-9992
Gallbladder	Gallbladder, ampulla of Vater and extrahepatic bile ducts	C23-C24	excluding 9050-9055, 9140, 9590-9992
Pancreas		C25	excluding 9050-9055, 9140, 9590-9992
Larynx		C32	excluding 9050-9055, 9140, 9590-9992
Lung	Trachea, bronchus and lung (excluding mesotheliomas)	C339, C34	excluding 9050-9055, 9140, 9590-9992
Bone	Bones, joints and articular cartilage	C40-C41	excluding 9050-9055, 9140, 9590-9992
Soft tissue	Connective subcutaneous and other soft tissue (including heart)	C380, C47, C49	excluding 9050-9055, 9140, 9590-9992
Skin melanoma		C440-C449	8720-8790
Breast	Female breast	C500-C509	excluding 9050-9055, 9140, 9590-9992
Vagina and vulva	Vagina, vulva and other and unspecified female genital organs	C51, C529, C578, C579	excluding 9050-9055, 9140, 9590-9992
Cervix uteri		C53	excluding 9050-9055, 9140, 9590-9992
Corpus uteri	Corpus, isthmus, other	C54	excluding 9050-9055, 9140, 9590-9992
Ovary	Ovary and other uterine adnexa	C569, C570-C574, C577	excluding 9050-9055, 9140, 9590-9992
Prostate		C619	excluding 9050-9055, 9140, 9590-9992
Testis		C62	excluding 9050-9055, 9140, 9590-9992
Penis	Penis and other male genital organs	C60, C63	excluding 9050-9055, 9140, 9590-9992
Urinary bladder	Urinary bladder (including benign, uncertain and in situ neoplasms)	C67	excluding 9050-9055, 9140, 9590-9992
Kidney	Kidney and other and unspecified urinary organs (excluding bladder)	C64-C66, C68	excluding 9050-9055, 9140, 9590-9992
Brain	Excluding meningiomas and including benign and uncertain neoplasms	C71	excluding 9050-9055, 9140, 9530-9539, 9590-9992
Thyroid		C739	excluding 9050-9055, 9140, 9590-9992
Multiple myeloma	Multiple myeloma, plasma cell leukaemia, plasmacytoma NOS, plasmacytoma extramedullary		9731-9734
Hodgkin lymphoma			9650-9667
Non-Hodgkin lymphoma	Malignant lymphomas NOS or diffuse, mature B-cell lymphomas, mature T- and NK-cell lymphomas, adult T-cell leukaemia/lymphoma (HTLV-1 positive)		9590-9596, 9671, 9673, 9675, 9678-9680, 9684, 9687, 9689-9691, 9695, 9698-9702, 9705, 9708-9709, 9714-9719, 9761, 9826, 9827
Chronic lymphocytic leukaemia/small lymphocytic lymphoma (CLL/SLL)	Small B-cell lymphocytic lymphoma, B-cell chronic lymphocytic leukaemia/small lymphocytic lymphoma		9670, 9823
Acute myeloid leukaemia (AML)	Acute myeloid leukaemia		9840, 9861, 9866-9867, 9870-9874, 9891, 9895-9897, 9898, 9910, 9920, 9930-9931, 9984, 9987
Chronic myeloid leukaemia (CML)	Chronic myeloid leukaemia		9863, 9875

Table A.3a - Complete cancer prevalence in women by European country as of Jan 1, 2020. All cancers and first eight leading cancers. Number of prevalent cases with 95% confidence intervals in brackets.

Country	All cancers	Breast	Colon Rectum	Thyroid	Corpus Uteri	Skin melanoma	Non-Hodgkin L.	Cervix uteri	Ovary
Austria	214,001	88,825	21,984	14,252	15,387	13,306	6,555	11,103	8,215
	(211,259-216,743)	(87,212-90,438)	(21,346-22,623)	(13,725-14,779)	(14,764-16,010)	(13,084-13,528)	(6,269-6,840)	(10,771-11,436)	(7,624-8,806)
Belgium	368,311	170,813	38,455	15,143	21,626	24,079	10,822	15,441	8,045
	(364,592-372,029)	(166,252-175,374)	(37,835-39,075)	(14,837-15,448)	(21,127-22,124)	(23,690-24,469)	(10,507-11,137)	(13,576-17,305)	(7,413-8,678)
Bulgaria	135,492	49,567	15,104	4,890	17,825	2,958	1,904	19,795	7,739
	(132,000-138,984)	(47,937-51,196)	(14,575-15,632)	(4,569-5,210)	(17,216-18,433)	(2,905-3,010)	(1,701-2,107)	(19,210-20,380)	(7,423-8,054)
Croatia	105,376	38,053	10,706	9,749	9,680	4,818	2,243	8,987	5,115
	(101,506-109,246)	(34,630-41,476)	(9,998-11,414)	(9,280-10,218)	(9,129-10,231)	(4,376-5,261)	(2,029-2,457)	(7,482-10,491)	(4,816-5,414)
Cyprus	19,892	8,286	1,773	3,784	1,343	512	653	754	684
	(19,314-20,471)	(7,811-8,760)	(1,586-1,961)	(3,304-4,264)	(1,095-1,591)	(422-603)	(482-825)	(452-1,056)	(421-947)
Czechia	269,850	97,353	30,484	16,240	28,882	17,624	7,381	23,725	11,850
	(267,543-272,157)	(94,901-99,805)	(28,810-32,158)	(15,622-16,859)	(28,287-29,478)	(17,124-18,125)	(7,025-7,737)	(22,639-24,811)	(11,174-12,526)
Denmark	174,828	77,654	19,661	3,416	11,412	20,477	5,680	9,053	5,183
	(169,450-180,206)	(72,751-82,557)	(19,321-20,001)	(3,312-3,519)	(11,117-11,706)	(20,044-20,909)	(5,502-5,858)	(8,748-9,359)	(4,913-5,454)
Estonia	31,016	9,840	4,019	1,411	3,361	1,767	775	2,902	1,424
	(30,080-31,952)	(9,554-10,127)	(3,726-4,312)	(1,271-1,552)	(3,237-3,486)	(1,570-1,964)	(695-855)	(2,775-3,029)	(1,308-1,539)
Finland	155,180	77,713	13,992	7,860	12,997	10,291	6,136	2,610	5,063
	(152,655-157,705)	(75,537-79,888)	(13,602-14,381)	(7,481-8,238)	(12,523-13,472)	(10,035-10,547)	(6,008-6,263)	(2,385-2,836)	(4,673-5,452)
France	1,998,030	947,248	186,073	136,176	114,749	124,689	73,943	67,739	53,277
	(1,974,371-2,021,688)	(935,176-959,319)	(176,651-195,496)	(133,618-138,733)	(108,116-121,381)	(119,340-130,039)	(71,051-76,835)	(61,491-73,986)	(49,073-57,481)
Germany	2,538,373	1,109,602	260,742	83,400	182,353	158,538	80,677	146,233	75,004
	(2,465,800-2,610,946)	(1,069,206-1,149,997)	(250,297-271,187)	(78,243-88,557)	(172,121-192,585)	(152,617-164,460)	(74,235-87,120)	(134,507-157,958)	(71,703-78,304)
Iceland	8,434	3,793	765	576	442	675	288	471	185
	(7,867-9,000)	(3,600-3,987)	(643-887)	(522-630)	(371-514)	(566-784)	(238-338)	(428-514)	(106-263)
Ireland	108,875	46,491	11,097	3,127	6,244	9,473	4,079	6,344	3,427
	(107,652-110,099)	(45,963-47,020)	(10,875-11,320)	(2,853-3,400)	(5,813-6,676)	(9,346-9,601)	(3,887-4,272)	(5,939-6,749)	(3,248-3,607)
Italy	1,938,749	814,192	227,628	217,846	128,822	82,458	69,325	59,102	51,298
	(1,889,529-1,987,968)	(788,223-840,162)	(220,971-234,285)	(209,629-226,063)	(123,773-133,870)	(79,867-85,049)	(66,151-72,499)	(53,421-64,782)	(48,092-54,505)
Latvia	47,766	14,860	4,595	3,407	5,126	1,749	1,023	4,388	2,829
	(46,761-48,771)	(14,066-15,653)	(4,296-4,895)	(3,201-3,614)	(5,037-5,214)	(1,486-2,012)	(810-1,235)	(4,222-4,553)	(2,688-2,969)
Lithuania	71,815	19,522	6,651	6,882	9,067	3,099	1,788	9,033	3,742
	(70,444-73,187)	(18,985-20,058)	(6,402-6,899)	(6,611-7,152)	(8,806-9,327)	(3,022-3,176)	(1,626-1,950)	(8,533-9,533)	(3,450-4,034)
Malta	11,356	4,958	990	809	1,021	513	566	188	344
	(10,667-12,045)	(4,540-5,377)	(849-1,130)	(713-906)	(893-1,149)	(455-572)	(460-672)	(9-366)	(208-480)
Norway	134,152	49,328	18,916	4,498	11,341	15,330	5,283	6,914	4,745
	(132,199-136,104)	(48,284-50,373)	(18,413-19,419)	(4,384-4,612)	(10,852-11,830)	(14,957-15,703)	(5,138-5,428)	(6,788-7,040)	(4,304-5,186)
Poland	697,667	248,317	66,362	44,083	81,147	22,201	12,413	67,550	37,766
	(685,218-710,115)	(244,102-252,533)	(63,567-69,156)	(42,372-45,794)	(78,941-83,353)	(21,522-22,880)	(11,860-12,965)	(64,766-70,334)	(37,307-38,224)
Portugal	264,720	109,686	32,679	24,762	14,203	10,934	10,791	20,368	5,698
	(261,066-268,375)	(107,019-112,352)	(31,932-33,427)	(23,729-25,795)	(12,739-15,668)	(10,208-11,660)	(10,185-11,398)	(18,461-22,275)	(5,422-5,974)
Slovakia	117,498	36,654	14,251	6,061	13,615	5,924	2,888	11,459	4,731
	(114,960-120,036)	(35,368-37,940)	(13,541-14,961)	(5,631-6,492)	(12,743-14,487)	(5,598-6,250)	(2,727-3,049)	(11,118-11,800)	(4,361-5,101)
Slovenia	51,569	19,133	6,599	2,292	5,043	4,149	1,607	3,658	1,597
	(50,606-52,532)	(18,442-19,824)	(6,450-6,749)	(2,203-2,381)	(4,903-5,182)	(4,063-4,236)	(1,514-1,701)	(3,287-4,029)	(1,456-1,738)
Spain	1,079,898	437,370	139,305	65,785	83,398	51,563	46,018	51,516	31,285
	(1,062,800-1,096,996)	(428,657-446,082)	(131,452-147,159)	(64,904-66,666)	(79,863-86,932)	(49,739-53,387)	(44,654-47,383)	(48,532-54,499)	(29,353-33,216)
Switzerland	233,973	103,814	24,025	12,868	12,954	22,823	8,841	6,372	6,811
	(229,285-238,660)	(101,815-105,814)	(21,562-26,487)	(12,075-13,661)	(12,522-13,386)	(21,939-23,707)	(8,034-9,649)	(4,657-8,086)	(5,660-7,962)

Country	All cancers	Breast	Colon Rectum	Thyroid	Corpus Uteri	Skin melanoma	Non-Hodgkin L.	Cervix uteri	Ovary
Netherlands	488,842	228,090	59,276	8,044	28,056	50,304	15,296	15,865	11,473
	(483,436-494,249)	(225,345-230,835)	(57,613-60,940)	(7,751-8,337)	(27,488-28,624)	(49,558-51,050)	(14,723-15,869)	(15,079-16,652)	(11,148-11,797)
UK-England	1,279,662	603,726	130,420	30,806	92,818	97,466	47,449	41,640	40,038
	(1,249,718-1,309,605)	(589,948-617,504)	(124,658-136,183)	(30,352-31,260)	(89,998-95,639)	(95,286-99,646)	(45,763-49,135)	(39,792-43,488)	(38,628-41,449)
UK-Northern Ireland	45,206	19,475	5,089	1,078	3,412	3,443	1,743	2,115	1,380
	(44,349-46,064)	(18,895-20,054)	(4,967-5,211)	(976-1,179)	(3,240-3,585)	(3,222-3,664)	(1,665-1,821)	(1,992-2,238)	(1,257-1,503)
UK-Scotland	144,885	65,546	16,367	3,302	9,286	11,824	5,315	6,697	4,324
	(142,547-147,222)	(64,646-66,445)	(15,726-17,007)	(3,187-3,417)	(9,004-9,568)	(11,519-12,130)	(5,061-5,570)	(6,519-6,875)	(4,054-4,594)
UK-Wales	83,018	38,937	8,788	1,377	6,816	5,787	2,529	3,160	2,847
	(81,397-84,639)	(37,776-40,098)	(8,397-9,180)	(1,255-1,500)	(6,370-7,262)	(5,614-5,961)	(2,105-2,953)	(2,970-3,350)	(2,598-3,095)
European area									
Northern Europe	472,593	208,489	53,334	16,349	36,192	46,772	17,387	19,049	15,175
	(466,314-478,872)	(203,020-213,957)	(52,603-54,066)	(15,937-16,761)	(35,447-36,938)	(46,137-47,408)	(17,119-17,654)	(18,646-19,452)	(14,523-15,828)
Central Europe	5,841,529	2,648,391	590,556	269,882	375,124	393,740	196,135	262,752	162,824
	(5,764,723-5,918,335)	(2,605,819-2,690,964)	(576,150-604,961)	(264,032-275,732)	(362,884-387,365)	(385,664-401,816)	(188,991-203,279)	(249,200-276,305)	(157,279-168,369)
Eastern Europe	1,371,104	476,113	141,465	82,975	159,023	55,322	28,172	138,851	70,080
	(1,357,587-1,384,621)	(470,719-481,506)	(138,055-144,875)	(81,043-84,908)	(156,484-161,561)	(54,354-56,289)	(27,412-28,932)	(135,740-141,963)	(69,069-71,090)
Southern Europe	3,471,560	1,431,677	419,681	325,028	243,510	154,948	131,204	144,572	96,022
	(3,419,168-3,523,953)	(1,403,928-1,459,427)	(409,331-430,031)	(316,671-333,385)	(237,144-249,876)	(151,664-158,232)	(127,683-134,725)	(137,692-151,451)	(92,242-99,801)
UK and Ireland	1,661,646	774,175	171,762	39,690	118,576	127,993	61,116	59,955	52,016
	(1,631,530-1,691,761)	(760,297-788,054)	(165,945-177,579)	(39,125-40,255)	(115,670-121,483)	(125,771-130,216)	(59,347-62,885)	(58,042-61,869)	(50,543-53,490)
European Pool	12,818,432	5,538,845	1,376,798	733,925	932,425	778,776	434,013	625,179	396,116
	(12,719,572-12,917,291)	(5,485,610-5,592,081)	(1,357,808-1,395,788)	(723,519-744,330)	(918,080-946,771)	(769,705-787,846)	(425,815-442,211)	(609,543-640,816)	(389,141-403,091)
EU27	12,076,728	5,112,614	1,304,233	753,436	908,137	687,670	396,867	642,015	383,601
	(11,982,427-12,171,028)	(5,061,090-5,164,138)	(1,286,269-1,322,197)	(743,028-763,844)	(894,057-922,217)	(678,910-696,430)	(388,891-404,843)	(626,539-657,490)	(376,867-390,335)

Table A.3b - Complete cancer prevalence in women by European country as of Jan 1, 2020. All cancers and first eight leading cancers. Crude and age-standardised prevalence proportion per 100,000 with 95% confidence intervals in brackets.

	Crude prevalence proportion per 100,000									Age-standardised Prevalence proportion per 100,000								
Country	**All cancers**	**Breast**	**Colon Rectum**	**Thyroid**	**Corpus Uteri**	**Skin melanoma**	**Non-Hodgkin L.**	**Cervix uteri**	**Ovary**	**All cancers**	**Breast**	**Colon Rectum**	**Thyroid**	**Corpus Uteri**	**Skin melanoma**	**Non-Hodgkin L.**	**Cervix uteri**	**Ovary**
Italy	6,338	2,662	744	712	421	270	227	193	168	5,375	2,248	573	665	340	245	193	164	144
	(6,177-6,498)	(2,577-2,746)	(722-766)	(685-739)	(405-438)	(261-278)	(216-237)	(175-212)	(157-178)	(5,239-5,511)	(2,174-2,322)	(556-590)	(642-689)	(327-352)	(237-252)	(183-203)	(148-179)	(134-153)
Belgium	6,305	2,924	658	259	370	412	185	264	138	5,954	2,771	602	252	338	399	174	251	130
	(6,242-6,369)	(2,846-3,002)	(648-669)	(254-264)	(362-379)	(406-419)	(180-191)	(232-296)	(127-149)	(5,896-6,013)	(2,704-2,839)	(592-612)	(247-257)	(330-346)	(392-405)	(169-179)	(222-280)	(120-140)
Germany	6,025	2,634	619	198	433	376	192	347	178	5,180	2,293	490	186	344	338	166	308	152
	(5,853-6,197)	(2,538-2,730)	(594-644)	(186-210)	(409-457)	(362-390)	(176-207)	(319-375)	(170-186)	(5,013-5,348)	(2,199-2,387)	(467-513)	(175-197)	(323-365)	(325-352)	(149-182)	(287-330)	(145-159)
Denmark	5,975	2,654	672	117	390	700	194	309	177	5,669	2,509	623	115	362	677	183	301	167
	(5,791-6,159)	(2,486-2,822)	(660-684)	(113-120)	(380-400)	(685-715)	(188-200)	(299-320)	(168-186)	(5,491-5,847)	(2,345-2,673)	(612-635)	(111-118)	(352-372)	(662-692)	(177-189)	(291-310)	(158-176)
France	5,744	2,723	535	392	330	358	213	195	153	5,266	2,491	468	375	289	339	193	181	140
	(5,676-5,812)	(2,688-2,758)	(508-562)	(384-399)	(311-349)	(343-374)	(204-221)	(177-213)	(141-165)	(5,204-5,327)	(2,460-2,522)	(444-493)	(368-382)	(273-305)	(324-353)	(185-201)	(165-197)	(129-151)
Netherlands	5,581	2,604	677	92	320	574	175	181	131	5,321	2,477	639	90	301	555	166	176	125
	(5,519-5,642)	(2,573-2,635)	(658-696)	(88-95)	(314-327)	(566-583)	(168-181)	(172-190)	(127-135)	(5,261-5,382)	(2,445-2,508)	(621-656)	(87-93)	(295-307)	(547-563)	(160-172)	(167-184)	(121-128)
Finland	5,548	2,778	500	281	465	368	219	93	181	4,779	2,372	418	256	381	325	188	89	156
	(5,458-5,638)	(2,701-2,856)	(486-514)	(267-295)	(448-482)	(359-377)	(215-224)	(85-101)	(167-195)	(4,701-4,857)	(2,306-2,437)	(406-429)	(245-267)	(368-395)	(317-333)	(184-191)	(83-96)	(144-168)
Switzerland	5,395	2,394	554	297	299	526	204	147	157	5,156	2,291	513	294	279	510	194	145	150
	(5,287-5,503)	(2,347-2,440)	(497-611)	(278-315)	(289-309)	(506-547)	(185-222)	(107-186)	(131-184)	(5,061-5,251)	(2,246-2,335)	(461-564)	(277-311)	(270-289)	(491-529)	(178-211)	(110-180)	(125-175)
UK-Wales	5,178	2,429	548	86	425	361	158	197	178	4,752	2,220	489	83	383	338	144	189	164
	(5,077-5,279)	(2,356-2,501)	(524-573)	(78-94)	(397-453)	(350-372)	(131-184)	(185-209)	(162-193)	(4,660-4,844)	(2,155-2,285)	(467-512)	(76-90)	(358-408)	(327-348)	(120-168)	(179-199)	(150-177)
UK-Scotland	5,157	2,333	583	118	331	421	189	238	154	4,957	2,240	553	116	314	409	182	233	148
	(5,074-5,240)	(2,301-2,365)	(560-605)	(113-122)	(320-341)	(410-432)	(180-198)	(232-245)	(144-164)	(4,877-5,038)	(2,208-2,271)	(531-575)	(112-119)	(305-324)	(398-420)	(173-190)	(227-239)	(139-158)
Croatia	5,050	1,824	513	467	464	231	108	431	245	4,365	1,560	423	427	387	200	95	380	215
	(4,865-5,236)	(1,660-1,988)	(479-547)	(445-490)	(438-490)	(210-252)	(97-118)	(359-503)	(231-259)	(4,223-4,508)	(1,426-1,693)	(393-453)	(408-445)	(364-409)	(183-218)	(86-103)	(324-435)	(200-230)
Norway	5,041	1,854	711	169	426	576	199	260	178	5,176	1,907	732	172	440	590	204	265	183
	(4,968-5,115)	(1,814-1,893)	(692-730)	(165-173)	(408-445)	(562-590)	(193-204)	(255-265)	(162-195)	(5,100-5,251)	(1,867-1,948)	(712-751)	(168-177)	(420-459)	(575-604)	(198-210)	(260-270)	(166-200)
Czechia	4,977	1,796	562	300	533	325	136	438	219	4,584	1,643	510	282	480	304	126	409	202
	(4,934-5,020)	(1,750-1,841)	(531-593)	(288-311)	(522-544)	(316-334)	(130-143)	(418-458)	(206-231)	(4,541-4,627)	(1,600-1,685)	(481-538)	(271-293)	(469-491)	(296-312)	(120-132)	(390-428)	(191-213)
Slovenia	4,936	1,831	632	219	483	397	154	350	153	4,403	1,627	540	209	411	363	137	324	139
	(4,844-5,028)	(1,765-1,897)	(617-646)	(211-228)	(469-496)	(389-405)	(145-163)	(315-386)	(139-166)	(4,322-4,484)	(1,566-1,688)	(528-551)	(200-217)	(399-423)	(356-370)	(128-146)	(294-354)	(127-152)
Portugal	4,870	2,018	601	456	261	201	199	375	105	4,262	1,768	490	424	214	180	175	334	92
	(4,803-4,937)	(1,969-2,067)	(587-615)	(437-475)	(234-288)	(188-215)	(187-210)	(340-410)	(100-110)	(4,198-4,325)	(1,724-1,811)	(478-502)	(408-441)	(193-235)	(170-190)	(164-187)	(304-364)	(88-96)
Lithuania	4,821	1,310	446	462	609	208	120	606	251	4,176	1,129	357	418	503	181	103	544	222
	(4,729-4,913)	(1,274-1,346)	(430-463)	(444-480)	(591-626)	(203-213)	(109-131)	(573-640)	(232-271)	(4,094-4,258)	(1,099-1,158)	(342-371)	(400-435)	(489-516)	(177-184)	(94-113)	(517-570)	(200-244)
Iceland	4,760	2,141	432	325	250	381	163	266	104	5,463	2,502	517	353	303	406	183	284	119
	(4,440-5,079)	(2,032-2,250)	(363-501)	(295-355)	(209-290)	(319-442)	(134-191)	(242-290)	(60-149)	(5,086-5,840)	(2,381-2,623)	(437-596)	(314-392)	(260-346)	(347-465)	(151-214)	(256-312)	(65-174)
Austria	4,732	1,964	486	315	340	294	145	246	182	4,397	1,833	432	305	303	279	136	229	168
	(4,671-4,793)	(1,928-2,000)	(472-500)	(304-327)	(326-354)	(289-299)	(139-151)	(238-253)	(169-195)	(4,335-4,459)	(1,796-1,869)	(420-444)	(293-316)	(291-315)	(274-284)	(129-142)	(221-237)	(155-182)
UK-Northern Ireland	4,687	2,019	528	112	354	357	181	219	143	4,947	2,147	560	116	380	371	192	224	150
	(4,598-4,776)	(1,959-2,079)	(515-540)	(101-122)	(336-372)	(334-380)	(173-189)	(206-232)	(130-156)	(4,852-5,042)	(2,087-2,208)	(547-574)	(105-126)	(360-399)	(347-395)	(183-201)	(211-237)	(136-163)
Latvia	4,652	1,447	448	332	499	170	100	427	276	3,925	1,208	349	296	402	142	90	388	243
	(4,554-4,750)	(1,370-1,525)	(418-477)	(312-352)	(491-508)	(145-196)	(79-120)	(411-443)	(262-289)	(3,853-3,996)	(1,154-1,263)	(325-372)	(280-312)	(395-409)	(123-160)	(72-108)	(372-404)	(232-254)
Malta	4,564	1,993	398	325	410	206	228	75	138	4,458	1,939	387	324	398	203	223	76	138
	(4,287-4,841)	(1,825-2,161)	(341-454)	(287-364)	(359-462)	(183-230)	(185-270)	(4-147)	(84-193)	(4,191-4,724)	(1,778-2,099)	(334-440)	(289-359)	(349-447)	(181-226)	(180-266)	(7-144)	(84-191)
UK-England	4,481	2,114	457	108	325	341	166	146	140	4,480	2,119	451	108	324	342	166	146	140
	(4,376-4,585)	(2,066-2,162)	(436-477)	(106-109)	(315-335)	(334-349)	(160-172)	(139-152)	(135-145)	(4,372-4,587)	(2,069-2,168)	(432-471)	(107-110)	(314-334)	(334-349)	(160-172)	(140-153)	(135-145)
Spain	4,475	1,812	577	273	346	214	191	214	130	4,153	1,696	514	265	312	202	177	197	122
	(4,404-4,546)	(1,776-1,848)	(545-610)	(269-276)	(331-360)	(206-221)	(185-196)	(201-226)	(122-138)	(4,083-4,224)	(1,660-1,732)	(481-547)	(262-268)	(297-326)	(196-208)	(171-183)	(186-208)	(115-129)

	Crude prevalence proportion per 100,000									Age-standardised prevalence proportion per 100,000								
Country	**All cancers**	**Breast**	**Colon Rectum**	**Thyroid**	**Corpus Uteri**	**Skin melanoma**	**Non-Hodgkin L.**	**Cervix uteri**	**Ovary**	**All cancers**	**Breast**	**Colon Rectum**	**Thyroid**	**Corpus Uteri**	**Skin melanoma**	**Non-Hodgkin L.**	**Cervix uteri**	**Ovary**
Estonia	4,433	1,406	574	202	480	253	111	415	204	3,823	1,216	454	179	397	225	98	379	180
	(4,299-4,566)	(1,365-1,447)	(532-616)	(182-222)	(463-498)	(224-281)	(99-122)	(397-433)	(187-220)	(3,724-3,922)	(1,183-1,249)	(423-485)	(163-195)	(380-414)	(203-247)	(89-106)	(363-394)	(165-195)
Cyprus	4,386	1,827	391	834	296	113	144	166	151	4,733	1,993	441	855	330	122	157	172	163
	(4,258-4,514)	(1,722-1,932)	(350-432)	(728-940)	(242-351)	(93-133)	(106-182)	(100-233)	(93-209)	(4,593-4,872)	(1,880-2,106)	(395-487)	(740-971)	(269-391)	(100-144)	(115-199)	(94-250)	(100-226)
Ireland	4,343	1,855	443	125	249	378	163	253	137	5,090	2,178	550	132	305	439	194	278	162
	(4,294-4,392)	(1,834-1,876)	(434-452)	(114-136)	(232-266)	(373-383)	(155-170)	(237-269)	(130-144)	(5,025-5,154)	(2,152-2,203)	(540-560)	(121-143)	(283-327)	(433-446)	(186-202)	(259-297)	(152-170)
Slovakia	4,208	1,313	510	217	488	212	103	410	169	4,178	1,297	515	213	484	211	103	407	167
	(4,117-4,298)	(1,267-1,359)	(485-536)	(202-232)	(456-519)	(200-224)	(98-109)	(398-423)	(156-183)	(4,086-4,270)	(1,250-1,343)	(489-541)	(198-228)	(455-513)	(198-224)	(97-109)	(396-419)	(153-180)
Bulgaria	3,783	1,384	422	137	498	83	53	553	216	3,295	1,196	348	127	414	73	47	490	193
	(3,685-3,880)	(1,338-1,429)	(407-436)	(128-145)	(481-515)	(81-84)	(48-59)	(536-569)	(207-225)	(3,209-3,381)	(1,157-1,235)	(336-359)	(119-136)	(399-429)	(71-74)	(41-53)	(476-505)	(184-203)
Poland	3,562	1,268	339	225	414	113	63	345	193	3,341	1,181	318	215	384	108	60	319	181
	(3,499-3,626)	(1,246-1,289)	(325-353)	(216-234)	(403-426)	(110-117)	(61-66)	(331-359)	(190-195)	(3,283-3,398)	(1,161-1,202)	(305-330)	(206-223)	(374-395)	(105-111)	(57-63)	(305-332)	(179-184)
Dispersion by country																		
Min	*3,562*	*1,268*	*339*	*86*	*249*	*83*	*53*	*75*	*104*	*3,295*	*1,129*	*318*	*83*	*214*	*73*	*47*	*76*	*92*
Quartile 1	*4,481*	*1,812*	*448*	*137*	*330*	*212*	*136*	*195*	*140*	*4,262*	*1,627*	*432*	*132*	*312*	*202*	*126*	*181*	*140*
Median	*4,870*	*1,993*	*535*	*259*	*410*	*341*	*166*	*260*	*168*	*4,733*	*1,993*	*490*	*252*	*362*	*325*	*166*	*265*	*156*
Quartile 3	*5,395*	*2,429*	*601*	*325*	*465*	*381*	*194*	*375*	*182*	*5,176*	*2,291*	*550*	*324*	*398*	*399*	*188*	*334*	*180*
Max	*6,338*	*2,924*	*744*	*834*	*609*	*700*	*228*	*606*	*276*	*5,954*	*2,771*	*732*	*855*	*503*	*677*	*223*	*544*	*243*
Ratio Max/Min	1·8	2·3	2·2	9·7	2·4	8·5	4·3	8·0	2·6	1·8	2·5	2·3	10·3	2·3	9·3	4·7	7·2	2·6
European area																		
Northern Europe	5,520	2,435	623	191	423	546	203	223	177	5,204	2,289	576	185	390	523	191	216	167
	(5,447-5,594)	(2,371-2,499)	(614-632)	(186-196)	(414-431)	(539-554)	(200-206)	(218-227)	(170-185)	(5,133-5,274)	(2,227-2,351)	(568-584)	(180-189)	(382-398)	(515-530)	(188-194)	(212-221)	(160-174)
Central Europe	5,820	2,639	588	269	374	392	195	262	162	5,216	2,373	498	256	317	364	174	240	145
	(5,743-5,896)	(2,596-2,681)	(574-603)	(263-275)	(362-386)	(384-400)	(188-203)	(248-275)	(157-168)	(5,143-5,290)	(2,332-2,414)	(484-511)	(250-261)	(307-328)	(357-372)	(167-181)	(228-251)	(140-150)
Eastern Europe	3,963	1,376	409	240	460	160	81	401	203	3,656	1,262	372	227	416	149	76	370	188
	(3,924-4,002)	(1,361-1,392)	(399-419)	(234-245)	(452-467)	(157-163)	(79-84)	(392-410)	(200-205)	(3,620-3,691)	(1,247-1,277)	(363-380)	(221-232)	(409-423)	(147-152)	(74-78)	(362-378)	(185-191)
Southern Europe	5,425	2,237	656	508	381	242	205	226	150	4,778	1,973	539	481	321	222	181	200	134
	(5,343-5,507)	(2,194-2,281)	(640-672)	(495-521)	(371-390)	(237-247)	(200-211)	(215-237)	(144-156)	(4,706-4,851)	(1,934-2,012)	(524-553)	(470-493)	(313-330)	(217-226)	(176-187)	(190-209)	(128-139)
UK and Ireland	4,559	2,124	471	109	325	351	168	165	143	4,578	2,138	469	110	327	353	168	165	143
	(4,477-4,642)	(2,086-2,162)	(455-487)	(107-110)	(317-333)	(345-357)	(163-173)	(159-170)	(139-147)	(4,493-4,663)	(2,099-2,177)	(454-485)	(108-111)	(318-335)	(346-359)	(163-173)	(160-171)	(139-147)
European Pool	5,254	2,270	564	301	382	319	178	256	162	4,785	2,069	491	288	336	298	162	238	149
	(5,213-5,295)	(2,248-2,292)	(557-572)	(297-305)	(376-388)	(315-323)	(175-181)	(250-263)	(160-165)	(4,747-4,823)	(2,049-2,090)	(483-498)	(284-292)	(331-341)	(295-302)	(158-165)	(232-243)	(146-151)
EU27	5,279	2,235	570	329	397	301	174	281	168	4,747	2,010	487	313	343	278	156	256	152
	(5,238-5,320)	(2,212-2,257)	(562-578)	(325-334)	(391-403)	(297-304)	(170-177)	(274-287)	(165-171)	(4,708-4,784)	(1,989-2,031)	(480-494)	(309-317)	(338-349)	(275-282)	(152-159)	(251-262)	(149-154)

Table A.4a – Complete cancer prevalence in men by European country as of Jan 1, 2020. All cancers and first eight leading cancers. Number of prevalent cases with 95% confidence intervals in brackets.

Country	All cancers	Prostate	Colon Rectum	Urinary bladder	Skin melanoma	Kidney	Testis	Non-Hodgkin L.	Lung
Austria	193,952	74,915	26,851	12,943	11,685	11,445	11,819	7,615	8,198
	(189,112 - 198,791)	(71,533 - 78,297)	(25,758 - 27,944)	(11,949 - 13,938)	(11,371 - 11,999)	(10,803 - 12,087)	(11,363 - 12,275)	(7,532 - 7,699)	(7,843 - 8,554)
Belgium	288,620	106,190	42,433	32,091	13,776	13,888	8,962	12,302	17,523
	(282,772 - 294,467)	(102,397 - 109,983)	(41,481 - 43,385)	(30,628 - 33,555)	(12,522 - 15,030)	(13,645 - 14,130)	(8,451 - 9,474)	(11,734 - 12,869)	(16,522 - 18,524)
Bulgaria	79,911	16,400	16,269	10,543	2,010	4,017	4,523	1,875	4,252
	(78,224 - 81,599)	(13,357 - 19,444)	(15,816 - 16,722)	(10,175 - 10,912)	(1,937 - 2,083)	(3,622 - 4,411)	(4,169 - 4,877)	(1,729 - 2,021)	(3,915 - 4,589)
Croatia	81,004	19,109	14,336	8,486	3,982	4,868	3,726	2,164	4,825
	(78,702 - 83,305)	(18,564 - 19,654)	(12,700 - 15,971)	(7,489 - 9,484)	(3,437 - 4,528)	(4,657 - 5,080)	(3,147 - 4,305)	(1,906 - 2,422)	(3,711 - 5,938)
Cyprus	16,226	5,634	2,244	1,582	389	454	798	676	702
	(15,723 - 16,728)	(5,490 - 5,779)	(2,123 - 2,365)	(1,348 - 1,816)	(237 - 541)	(345 - 564)	(533 - 1,063)	(546 - 806)	(479 - 925)
Czechia	228,088	77,188	39,640	19,495	15,158	19,275	12,619	6,890	9,180
	(227,002 - 229,174)	(76,507 - 77,868)	(39,091 - 40,189)	(18,854 - 20,135)	(14,344 - 15,972)	(18,767 - 19,783)	(12,166 - 13,073)	(6,844 - 6,935)	(8,696 - 9,664)
Denmark	136,939	48,643	19,829	14,181	14,633	5,208	10,004	6,922	5,673
	(134,066 - 139,812)	(46,071 - 51,214)	(19,229 - 20,429)	(13,522 - 14,839)	(14,476 - 14,790)	(5,007 - 5,410)	(9,783 - 10,225)	(6,608 - 7,237)	(5,493 - 5,852)
Estonia	24,991	12,056	2,923	1,549	920	1,850	479	728	1,409
	(24,342 - 25,640)	(11,933 - 12,179)	(2,679 - 3,166)	(1,455 - 1,643)	(851 - 989)	(1,734 - 1,965)	(446 - 511)	(630 - 826)	(1,307 - 1,512)
Finland	121,325	59,657	13,806	8,075	9,158	5,197	3,284	6,584	2,533
	(117,957 - 124,694)	(57,160 - 62,154)	(13,299 - 14,314)	(7,625 - 8,526)	(8,716 - 9,599)	(4,740 - 5,655)	(3,212 - 3,356)	(6,360 - 6,808)	(2,150 - 2,917)
France	1,773,782	788,471	202,108	72,134	98,535	93,602	68,655	81,491	95,124
	(1,722,854 - 1,824,710)	(745,299 - 831,643)	(193,256 - 210,959)	(68,948 - 75,320)	(96,554 - 100,516)	(90,146 - 97,059)	(64,006 - 73,303)	(80,796 - 82,187)	(91,404 - 98,844)
Germany	2,336,036	864,119	335,488	236,383	143,691	151,283	140,769	90,060	114,526
	(2,262,077 - 2,409,996)	(828,426 - 899,811)	(325,650 - 345,326)	(229,010 - 243,756)	(135,143 - 152,239)	(140,507 - 162,059)	(137,038 - 144,500)	(85,695 - 94,424)	(107,054 - 121,997)
Iceland	6,730	2,613	719	655	353	437	391	336	211
	(6,497 - 6,964)	(2,444 - 2,781)	(621 - 817)	(589 - 720)	(290 - 416)	(370 - 503)	(317 - 464)	(258 - 414)	(111 - 311)
Ireland	106,214	47,751	13,652	5,992	5,655	4,049	4,806	4,820	3,800
	(104,446 - 107,982)	(47,138 - 48,365)	(13,408 - 13,895)	(5,677 - 6,307)	(5,332 - 5,977)	(3,842 - 4,256)	(4,452 - 5,160)	(4,384 - 5,255)	(3,410 - 4,189)
Italy	1,574,923	503,430	249,626	227,521	72,521	95,247	50,273	79,833	76,322
	(1,539,994 - 1,609,852)	(488,129 - 518,731)	(237,430 - 261,823)	(218,300 - 236,742)	(70,122 - 74,920)	(90,664 - 99,831)	(47,560 - 52,985)	(77,964 - 81,701)	(69,163 - 83,480)
Latvia	30,383	9,767	3,186	2,641	744	2,610	850	802	2,229
	(29,721 - 31,045)	(9,605 - 9,929)	(2,925 - 3,447)	(2,477 - 2,806)	(629 - 858)	(2,449 - 2,771)	(711 - 988)	(611 - 993)	(2,090 - 2,367)
Lithuania	58,370	31,208	5,347	3,215	1,193	3,764	856	1,454	1,410
	(56,201 - 60,539)	(29,137 - 33,280)	(5,124 - 5,571)	(3,013 - 3,418)	(1,124 - 1,261)	(3,437 - 4,091)	(785 - 928)	(1,371 - 1,536)	(1,304 - 1,516)
Malta	8,139	2,449	1,111	1,204	353	443	382	453	455
	(7,796 - 8,482)	(2,148 - 2,751)	(908 - 1,313)	(1,088 - 1,319)	(269 - 437)	(371 - 515)	(350 - 413)	(384 - 522)	(380 - 530)
Norway	130,033	57,666	18,092	10,158	11,663	5,615	8,132	6,086	3,950
	(128,360 - 131,706)	(56,036 - 59,297)	(17,346 - 18,838)	(9,975 - 10,342)	(10,982 - 12,344)	(5,241 - 5,988)	(7,932 - 8,332)	(5,581 - 6,590)	(3,758 - 4,142)
Poland	450,957	112,534	70,641	48,060	13,974	29,657	24,242	11,444	37,037
	(441,495 - 460,419)	(106,937 - 118,131)	(69,109 - 72,173)	(46,663 - 49,457)	(13,722 - 14,226)	(28,161 - 31,154)	(22,525 - 25,959)	(10,611 - 12,276)	(36,283 - 37,791)
Portugal	212,446	73,411	40,247	12,003	7,054	8,063	3,542	10,592	8,298
	(208,423 - 216,469)	(70,964 - 75,859)	(38,493 - 42,001)	(11,056 - 12,950)	(6,653 - 7,455)	(7,042 - 9,085)	(3,212 - 3,873)	(9,810 - 11,374)	(7,872 - 8,724)
Slovakia	88,538	18,920	18,231	7,226	4,821	6,615	6,325	2,637	4,393
	(86,076 - 91,000)	(17,858 - 19,982)	(17,632 - 18,830)	(6,945 - 7,507)	(4,667 - 4,975)	(6,388 - 6,842)	(6,198 - 6,452)	(2,352 - 2,922)	(4,072 - 4,714)
Slovenia	47,163	17,324	8,988	3,382	3,404	2,653	2,816	1,759	1,878
	(46,448 - 47,878)	(16,681 - 17,966)	(8,855 - 9,120)	(3,173 - 3,590)	(3,295 - 3,514)	(2,479 - 2,826)	(2,674 - 2,958)	(1,719 - 1,798)	(1,697 - 2,059)
Spain	1,077,537	381,584	191,427	156,537	34,718	49,551	26,891	47,426	45,306
	(1,062,412 - 1,092,661)	(368,485 - 394,684)	(186,230 - 196,625)	(151,894 - 161,180)	(33,739 - 35,698)	(47,557 - 51,544)	(24,564 - 29,218)	(45,241 - 49,612)	(42,190 - 48,422)
Switzerland	209,582	81,515	24,944	19,284	19,620	8,554	13,241	10,191	8,512
	(204,950 - 214,215)	(76,540 - 86,490)	(24,238 - 25,651)	(17,463 - 21,104)	(19,016 - 20,224)	(7,749 - 9,358)	(12,609 - 13,874)	(8,817 - 11,565)	(6,590 - 10,434)

Country	All cancers	Prostate	Colon Rectum	Urinary bladder	Skin melanoma	Kidney	Testis	Non-Hodgkin L.	Lung
Netherlands	385,973	135,578	67,147	49,904	34,860	15,813	18,605	18,810	17,930
	(378,063 - 393,882)	(132,185 - 138,971)	(65,010 - 69,285)	(47,972 - 51,836)	(33,946 - 35,774)	(15,201 - 16,424)	(18,156 - 19,053)	(18,424 - 19,195)	(16,153 - 19,707)
UK-England	1,016,568	388,816	150,830	43,664	72,365	42,130	53,896	54,784	35,500
	(974,618 - 1,058,518)	(368,458 - 409,174)	(143,611 - 158,049)	(40,432 - 46,896)	(70,269 - 74,461)	(40,700 - 43,561)	(52,681 - 55,111)	(53,436 - 56,131)	(33,773 - 37,228)
UK-Northern Ireland	35,231	12,263	5,846	3,177	2,071	1,634	1,989	1,733	1,360
	(33,744 - 36,719)	(11,310 - 13,217)	(5,457 - 6,236)	(2,841 - 3,513)	(2,007 - 2,136)	(1,489 - 1,778)	(1,898 - 2,080)	(1,627 - 1,839)	(1,277 - 1,443)
UK-Scotland	105,153	32,460	18,436	11,635	7,691	4,667	6,487	5,669	4,598
	(102,584 - 107,722)	(31,063 - 33,857)	(17,911 - 18,961)	(11,249 - 12,021)	(7,458 - 7,923)	(4,421 - 4,914)	(6,287 - 6,687)	(5,475 - 5,863)	(4,078 - 5,119)
UK-Wales	67,390	26,788	10,896	3,743	4,743	2,886	3,337	2,778	2,095
	(65,675 - 69,106)	(25,415 - 28,161)	(10,713 - 11,078)	(3,694 - 3,792)	(4,490 - 4,996)	(2,566 - 3,206)	(3,127 - 3,548)	(2,347 - 3,210)	(1,898 - 2,293)
European area									
Northern Europe	395,028	168,578	52,446	33,069	35,806	16,457	21,810	19,928	12,366
	(390,290 - 399,767)	(164,637 - 172,520)	(51,358 - 53,534)	(32,248 - 33,891)	(34,977 - 36,635)	(15,829 - 17,085)	(21,495 - 22,126)	(19,288 - 20,568)	(11,891 - 12,842)
Central Europe	5,187,944	2,050,787	698,971	422,739	322,167	294,585	262,051	220,469	261,813
	(5,097,362 - 5,278,527)	(1,994,220 - 2,107,355)	(685,469 - 712,473)	(414,097 - 431,382)	(313,230 - 331,103)	(283,202 - 305,967)	(256,001 - 268,101)	(215,789 - 225,148)	(253,001 - 270,624)
Eastern Europe	961,238	278,074	156,237	92,730	38,819	67,789	49,894	25,828	59,910
	(950,982 - 971,495)	(271,253 - 284,894)	(154,395 - 158,078)	(91,101 - 94,359)	(37,937 - 39,701)	(66,100 - 69,477)	(48,071 - 51,716)	(24,906 - 26,750)	(58,880 - 60,940)
Southern Europe	3,017,437	1,002,942	507,979	410,714	122,423	161,279	88,428	142,903	137,785
	(2,979,081 - 3,055,793)	(982,631 - 1,023,252)	(494,503 - 521,455)	(400,294 - 421,135)	(119,736 - 125,109)	(156,169 - 166,390)	(84,780 - 92,076)	(139,908 - 145,897)	(129,881 - 145,688)
UK and Ireland	1,330,556	508,078	199,660	68,211	92,525	55,366	70,515	69,784	47,354
	(1,288,429 - 1,372,683)	(487,595 - 528,562)	(192,405 - 206,915)	(64,923 - 71,498)	(90,375 - 94,674)	(53,858 - 56,874)	(69,214 - 71,817)	(68,287 - 71,281)	(45,495 - 49,212)
European Pool	10,892,204	4,008,460	1,615,293	1,027,464	611,739	595,476	492,698	478,912	519,227
	(10,784,600 - 10,999,809)	(3,944,475 - 4,072,444)	(1,594,772 - 1,635,814)	(1,013,413 - 1,041,514)	(602,087 - 621,392)	(582,779 - 608,172)	(485,280 - 500,115)	(473,050 - 484,773)	(507,192 - 531,263)
EU27	10,269,805	3,730,824	1,535,209	1,035,252	543,960	584,144	448,367	433,822	509,564
	(10,170,750 - 10,368,860)	(3,670,316 - 3,791,332)	(1,515,983 - 1,554,435)	(1,021,663 - 1,048,842)	(534,566 - 553,354)	(571,542 - 596,746)	(441,055 - 455,680)	(428,299 - 439,344)	(497,795 - 521,333)

Table A.4b - Complete cancer prevalence in men by European country as of Jan 1, 2020. All cancers and first eight leading cancers. Crude and age-standardised prevalence proportion with 95% confidence intervals in brackets.

	Crude prevalence proportion per 100,000									Age-standardised prevalence proportion per 100,000								
	All cancers	Prostate	Colon Rectum	Urinary bladder	Skin melanoma	Kidney	Testis	Non-Hodgkin L.	Lung	All cancers	Prostate	Colon Rectum	Urinary bladder	Skin melanoma	Kidney	Testis	Non-Hodgkin L.	Lung
Germany	5,692	2,106	818	576	350	369	343	220	279	5,554	2,065	794	559	344	358	339	214	271
	(5,512-5,873)	(2,019-2,193)	(794-841)	(558-594)	(329-371)	(342-395)	(334-352)	(209-230)	(261-297)	(5,387-5,720)	(1,985-2,146)	(770-817)	(543-576)	(323-366)	(335-380)	(329-348)	(204-224)	(255-288)
France	5,452	2,424	621	222	303	288	211	251	292	5,822	2,637	676	242	316	306	211	264	308
	(5,296-5,609)	(2,291-2,556)	(594-648)	(212-232)	(297-309)	(277-298)	(197-225)	(248-253)	(281-304)	(5,657-5,987)	(2,501-2,773)	(645-707)	(232-252)	(310-322)	(295-317)	(197-225)	(262-266)	(296-320)
Italy	5,421	1,733	859	783	250	328	173	275	263	5,102	1,610	801	730	239	308	172	261	245
	(5,301-5,542)	(1,680-1,786)	(817-901)	(751-815)	(241-258)	(312-344)	(164-182)	(268-281)	(238-287)	(4,990-5,214)	(1,562-1,658)	(762-838)	(700-760)	(231-247)	(293-322)	(163-182)	(255-267)	(222-268)
Belgium	5,080	1,869	747	565	243	245	158	217	308	5,574	2,109	834	640	256	268	156	233	341
	(4,977-5,183)	(1,802-1,936)	(730-764)	(539-591)	(220-265)	(240-249)	(149-167)	(207-227)	(291-326)	(5,466-5,682)	(2,039-2,180)	(816-851)	(613-666)	(234-277)	(264-273)	(147-165)	(223-243)	(321-360)
Switzerland	4,910	1,910	584	452	460	200	310	239	199	5,402	2,171	655	512	499	221	312	257	218
	(4,801-5,018)	(1,793-2,026)	(568-601)	(409-494)	(445-474)	(182-219)	(295-325)	(207-271)	(154-244)	(5,281-5,522)	(2,040-2,302)	(635-675)	(462-561)	(483-514)	(203-239)	(298-326)	(219-295)	(167-268)
Norway	4,804	2,131	669	375	431	208	300	225	146	5,640	2,580	825	470	498	240	302	256	174
	(4,743-4,866)	(2,070-2,191)	(641-696)	(369-382)	(406-456)	(194-221)	(293-308)	(206-243)	(139-153)	(5,574-5,707)	(2,501-2,659)	(788-862)	(461-478)	(465-531)	(223-257)	(294-311)	(231-281)	(166-181)
Denmark	4,727	1,679	685	490	505	180	345	239	196	4,985	1,804	740	533	525	187	345	249	209
	(4,628-4,826)	(1,590-1,768)	(664-705)	(467-512)	(500-511)	(173-187)	(338-353)	(228-250)	(190-202)	(4,886-5,084)	(1,714-1,894)	(718-763)	(510-556)	(519-531)	(179-195)	(338-353)	(237-261)	(203-216)
Spain	4,645	1,645	825	675	150	214	116	204	195	4,988	1,805	894	734	158	228	115	212	209
	(4,579-4,710)	(1,588-1,701)	(803-848)	(655-695)	(145-154)	(205-222)	(106-126)	(195-214)	(182-209)	(4,915-5,060)	(1,743-1,868)	(869-918)	(714-753)	(153-162)	(219-237)	(105-126)	(203-222)	(196-221)
Slovenia	4,487	1,648	855	322	324	252	268	167	179	4,802	1,810	932	357	344	268	265	176	185
	(4,419-4,555)	(1,587-1,709)	(843-868)	(302-342)	(313-334)	(236-269)	(254-281)	(164-171)	(161-196)	(4,734-4,869)	(1,750-1,870)	(918-945)	(336-378)	(333-354)	(251-286)	(252-279)	(172-179)	(167-204)
Lithuania	4,475	2,393	410	247	91	289	66	112	108	5,342	2,957	508	311	104	333	64	124	124
	(4,309-4,641)	(2,234-2,551)	(393-427)	(231-262)	(86-97)	(264-314)	(60-71)	(105-118)	(100-116)	(5,175-5,509)	(2,786-3,128)	(489-527)	(292-330)	(97-110)	(300-367)	(58-71)	(116-131)	(112-135)
Netherlands	4,463	1,568	777	577	403	183	215	218	207	4,757	1,714	849	640	416	194	214	225	226
	(4,372-4,555)	(1,528-1,607)	(752-801)	(555-599)	(393-414)	(176-190)	(210-220)	(213-222)	(187-228)	(4,660-4,855)	(1,677-1,751)	(819-879)	(612-667)	(403-428)	(186-202)	(209-219)	(220-230)	(201-250)
Finland	4,447	2,187	506	296	336	191	120	241	93	4,540	2,269	525	307	339	192	120	240	89
	(4,324-4,570)	(2,095-2,278)	(487-525)	(279-312)	(319-352)	(174-207)	(118-123)	(233-250)	(79-107)	(4,425-4,655)	(2,182-2,356)	(508-542)	(290-324)	(321-357)	(173-210)	(117-122)	(232-247)	(77-102)
Austria	4,429	1,711	613	296	267	261	270	174	187	4,810	1,915	680	328	284	285	266	183	203
	(4,319-4,540)	(1,634-1,788)	(588-638)	(273-318)	(260-274)	(247-276)	(259-280)	(172-176)	(179-195)	(4,689-4,931)	(1,830-2,000)	(652-709)	(302-354)	(276-292)	(268-301)	(256-276)	(181-185)	(195-211)
Portugal	4,371	1,511	828	247	145	166	73	218	171	4,321	1,498	821	245	143	164	73	215	168
	(4,289-4,454)	(1,460-1,561)	(792-864)	(227-266)	(137-153)	(145-187)	(66-80)	(202-234)	(162-180)	(4,236-4,405)	(1,447-1,548)	(785-858)	(225-265)	(135-151)	(143-184)	(67-80)	(199-231)	(159-176)
Czechia	4,326	1,464	752	370	288	366	239	131	174	4,957	1,723	903	451	331	418	238	143	201
	(4,306-4,347)	(1,451-1,477)	(741-762)	(358-382)	(272-303)	(356-375)	(231-248)	(130-132)	(165-183)	(4,933-4,981)	(1,710-1,736)	(892-914)	(435-468)	(315-348)	(406-430)	(229-247)	(142-144)	(192-211)
Ireland	4,322	1,943	556	244	230	165	196	196	155	5,676	2,671	779	345	292	210	195	243	210
	(4,250-4,394)	(1,918-1,968)	(546-565)	(231-257)	(217-243)	(156-173)	(181-210)	(178-214)	(139-170)	(5,581-5,770)	(2,636-2,706)	(767-791)	(325-365)	(274-310)	(200-219)	(179-211)	(224-261)	(186-234)
UK-Wales	4,322	1,718	699	240	304	185	214	178	134	4,380	1,752	712	249	308	188	213	179	137
	(4,212-4,432)	(1,630-1,806)	(687-710)	(237-243)	(288-320)	(165-206)	(201-228)	(150-206)	(122-147)	(4,266-4,495)	(1,661-1,843)	(700-724)	(246-252)	(292-324)	(165-210)	(200-226)	(151-207)	(123-150)
Croatia	4,108	969	727	430	202	247	189	110	245	4,369	1,064	794	473	212	259	191	113	262
	(3,992-4,225)	(942-997)	(644-810)	(380-481)	(174-230)	(236-258)	(160-218)	(97-123)	(188-301)	(4,236-4,502)	(1,033-1,095)	(713-875)	(421-526)	(182-242)	(248-269)	(162-221)	(98-127)	(205-320)
Estonia	3,971	1,916	464	246	146	294	76	116	224	4,912	2,432	619	313	173	366	73	131	278
	(3,868-4,075)	(1,896-1,935)	(426-503)	(231-261)	(135-157)	(276-312)	(71-81)	(100-131)	(208-240)	(4,788-5,035)	(2,403-2,462)	(574-663)	(293-334)	(161-184)	(345-387)	(68-79)	(113-149)	(257-299)
UK-Scotland	3,936	1,215	690	436	288	175	243	212	172	4,276	1,360	770	497	309	186	241	225	192
	(3,840-4,032)	(1,163-1,267)	(670-710)	(421-450)	(279-297)	(165-184)	(235-250)	(205-219)	(153-192)	(4,178-4,374)	(1,305-1,415)	(750-791)	(482-511)	(299-319)	(177-196)	(234-249)	(216-233)	(170-213)
UK-Northern Ireland	3,764	1,310	625	339	221	175	213	185	145	4,550	1,659	783	430	263	211	214	218	179
	(3,605-3,923)	(1,208-1,412)	(583-666)	(303-375)	(214-228)	(159-190)	(203-222)	(174-197)	(136-154)	(4,326-4,773)	(1,520-1,798)	(726-839)	(381-478)	(254-272)	(190-232)	(203-224)	(204-233)	(168-190)
Cyprus	3,735	1,297	517	364	90	105	184	156	162	4,559	1,686	650	458	102	125	192	177	203
	(3,619-3,850)	(1,264-1,330)	(489-544)	(310-418)	(55-125)	(79-130)	(123-245)	(126-185)	(110-213)	(4,424-4,695)	(1,642-1,730)	(619-682)	(387-529)	(55-149)	(97-153)	(116-268)	(143-210)	(138-267)
UK-England	3,641	1,393	540	156	259	151	193	196	127	4,085	1,611	619	183	285	168	195	215	145
	(3,491-3,791)	(1,320-1,465)	(514-566)	(145-168)	(252-267)	(146-156)	(189-197)	(191-201)	(121-133)	(3,911-4,258)	(1,527-1,695)	(589-650)	(169-198)	(277-293)	(162-174)	(191-200)	(209-220)	(138-152)

	Crude prevalence proportion per 100,000									Age-standardised prevalence proportion per 100,000								
Country	**All cancers**	**Prostate**	**Colon Rectum**	**Urinary bladder**	**Skin melanoma**	**Kidney**	**Testis**	**Non Hodgkin L.**	**Lung**	**All cancers**	**Prostate**	**Colon Rectum**	**Urinary bladder**	**Skin melanoma**	**Kidney**	**Testis**	**Non Hodgkin L.**	**Lung**
Iceland	3,600	1,398	385	350	189	234	209	180	113	4,840	2,060	549	504	229	315	227	229	145
	(3,475-3,725)	(1,308-1,488)	(332-437)	(315-385)	(155-223)	(198-269)	(169-248)	(138-221)	(59-166)	(4,698-4,981)	(1,942-2,179)	(468-631)	(464-545)	(184-273)	(258-371)	(188-266)	(184-273)	(58-232)
Latvia	3,449	1,109	362	300	84	296	96	91	253	4,145	1,411	460	374	97	347	94	98	309
	(3,374-3,524)	(1,090-1,127)	(332-391)	(281-318)	(71-97)	(278-315)	(81-112)	(69-113)	(237-269)	(4,065-4,225)	(1,384-1,437)	(422-498)	(350-399)	(80-115)	(323-370)	(75-112)	(77-119)	(290-328)
Slovakia	3,322	710	684	271	181	248	237	99	165	4,411	1,042	967	392	232	314	231	118	238
	(3,229-3,414)	(670-750)	(662-706)	(261-282)	(175-187)	(240-257)	(233-242)	(88-110)	(153-177)	(4,300-4,521)	(991-1,093)	(945-989)	(372-413)	(225-239)	(305-322)	(226-236)	(101-136)	(221-255)
Malta	3,063	922	418	453	133	167	144	170	171	3,613	1,163	513	556	147	190	146	196	221
	(2,934-3,192)	(808-1,035)	(342-494)	(409-496)	(101-164)	(140-194)	(132-155)	(144-196)	(143-199)	(3,475-3,750)	(1,048-1,278)	(425-601)	(509-602)	(112-183)	(157-222)	(134-159)	(171-221)	(188-253)
Poland	2,454	613	385	262	76	161	132	62	202	3,032	824	507	345	90	194	130	71	249
	(2,403-2,506)	(582-643)	(376-393)	(254-269)	(75-77)	(153-170)	(123-141)	(58-67)	(197-206)	(2,978-3,087)	(791-857)	(494-519)	(337-354)	(89-92)	(186-202)	(120-140)	(66-76)	(244-253)
Bulgaria	2,372	487	483	313	60	119	134	56	126	2,526	549	530	336	63	122	134	57	128
	(2,321-2,422)	(396-577)	(469-496)	(302-324)	(57-62)	(107-131)	(124-145)	(51-60)	(116-136)	(2,470-2,583)	(449-649)	(517-543)	(325-348)	(60-65)	(111-134)	(121-147)	(52-61)	(117-140)
Dispersion by country																		
Min	*2,372*	*487*	*362*	*156*	*60*	*105*	*66*	*56*	*93*	*2,526*	*549*	*460*	*183*	*63*	*122*	*64*	*57*	*89*
Quartile 1	*3,735*	*1,297*	*506*	*262*	*146*	*175*	*134*	*131*	*146*	*4,369*	*1,498*	*619*	*328*	*158*	*190*	*134*	*143*	*174*
Median	*4,326*	*1,645*	*625*	*339*	*243*	*208*	*196*	*185*	*174*	*4,802*	*1,752*	*740*	*430*	*263*	*228*	*195*	*214*	*209*
Quartile 3	*4,645*	*1,910*	*747*	*452*	*304*	*261*	*239*	*218*	*207*	*5,102*	*2,109*	*821*	*512*	*331*	*308*	*238*	*233*	*245*
Max	*5,692*	*2,424*	*859*	*783*	*505*	*369*	*345*	*275*	*308*	*5,822*	*2,957*	*967*	*734*	*525*	*418*	*345*	*264*	*341*
Ratio Max/Min	2·4	5·0	2·4	5·0	8·5	3·5	5·3	4·9	3·3	2·3	5·4	2·1	4·0	8·4	3·4	5·4	4·7	3·8
European area																		
Northern Europe	4,637	1,979	616	388	420	193	256	234	145	5,015	2,189	687	437	447	206	256	247	157
	(4,582-4,693)	(1,933-2,025)	(603-628)	(379-398)	(411-430)	(186-201)	(252-260)	(226-241)	(140-151)	(4,960-5,070)	(2,140-2,238)	(672-701)	(426-447)	(436-459)	(198-215)	(252-260)	(238-256)	(151-162)
Central Europe	5,374	2,124	724	438	334	305	271	228	271	5,514	2,211	749	455	340	313	268	232	277
	(5,280-5,467)	(2,066-2,183)	(710-738)	(429-447)	(324-343)	(293-317)	(265-278)	(224-233)	(262-280)	(5,423-5,605)	(2,152-2,269)	(735-763)	(446-464)	(330-349)	(302-324)	(262-275)	(227-237)	(268-286)
Eastern Europe	2,958	856	481	285	120	209	154	80	184	3,560	1,094	612	364	141	246	152	89	222
	(2,927-2,990)	(835-877)	(475-486)	(280-290)	(117-122)	(203-214)	(148-159)	(77-82)	(181-188)	(3,526-3,593)	(1,070-1,117)	(605-620)	(358-370)	(138-144)	(240-251)	(146-158)	(86-92)	(218-225)
Southern Europe	4,960	1,649	835	675	201	265	145	235	227	4,955	1,656	836	677	200	264	145	233	226
	(4,897-5,023)	(1,615-1,682)	(813-857)	(658-692)	(197-206)	(257-274)	(139-151)	(230-240)	(214-239)	(4,892-5,017)	(1,622-1,689)	(814-857)	(659-693)	(196-205)	(256-272)	(139-151)	(228-238)	(213-239)
UK and Ireland	3,743	1,429	562	192	260	156	198	196	133	4,218	1,662	648	226	287	174	200	215	153
	(3,625-3,862)	(1,372-1,487)	(541-582)	(183-201)	(254-266)	(152-160)	(195-202)	(192-201)	(128-138)	(4,080-4,356)	(1,595-1,729)	(624-672)	(215-238)	(281-294)	(169-179)	(197-204)	(211-220)	(147-159)
European Pool	4,656	1,714	691	439	262	255	211	205	222	4,918	1,847	740	473	272	268	209	212	234
	(4,610-4,702)	(1,686-1,741)	(682-699)	(433-445)	(257-266)	(249-260)	(207-214)	(202-207)	(217-227)	(4,872-4,965)	(1,819-1,876)	(731-749)	(467-479)	(268-277)	(263-273)	(206-212)	(209-215)	(229-240)
EU27	4,699	1,707	702	474	249	267	205	199	233	4,941	1,830	749	507	258	280	204	205	245
	(4,654-4,744)	(1,679-1,735)	(694-711)	(467-480)	(245-253)	(262-273)	(202-208)	(196-201)	(228-239)	(4,896-4,986)	(1,802-1,859)	(740-758)	(501-513)	(254-263)	(274-286)	(200-207)	(202-208)	(239-250)

Table A.5 - Complete cancer prevalence in Europe (EUROCARE-6 Pool) as of Jan1, 2020 by cancer entity and age at prevalence date. Crude prevalence proportions per 100,000 inhabitants and number of prevalent cases (thousands) with 95% confidence intervals in brackets and percent proportion of young (0-54 years) and elderly (75 years or more) prevalent cases. Cancer entities with prevalence proportion lower than 50 per 100,000.

	Crude prevalence proportion per 100,000					Number of prevalent cases (thousands)					% Prevalent cases aged 0-54 and 75+	
Cancer site	**0-54**	**55-64**	**65-74**	**75+**	**All ages**	**0-54**	**55-64**	**65-74**	**75+**	**All ages**	**0-54**	**75+**
WOMEN												
Vagina and vulva	10	60	88	193	46	16	20	24	53	113	14	47
	(10-11)	(57-62)	(81-94)	(179-205)	(44-48)	(15-17)	(19-20)	(22-25)	(50-57)	(108-117)		
Brain	36	59	58	49	43	56	19	16	14	105	53	13
	(35-37)	(55-63)	(53-64)	(41-58)	(42-44)	(54-57)	(18-21)	(14-17)	(11-16)	(101-108)		
Multiple myeloma	5	54	115	147	40	8	18	31	41	97	8	42
	(4-6)	(48-60)	(107-123)	(138-155)	(38-41)	(7-9)	(16-20)	(29-33)	(38-43)	(93-101)		
Soft tissue	20	47	78	81	37	31	15	21	22	90	34	24
	(19-21)	(43-51)	(73-83)	(71-90)	(35-38)	(30-32)	(14-17)	(20-22)	(20-25)	(86-93)		
Pancreas	5	36	79	90	27	8	12	21	25	66	12	38
	(5-6)	(33-39)	(73-84)	(82-98)	(26-28)	(7-9)	(11-13)	(20-23)	(23-27)	(63-69)		
AML	14	38	38	38	23	23	12	10	11	56	41	20
	(14-15)	(34-42)	(33-42)	(33-43)	(22-24)	(22-23)	(11-14)	(9-11)	(9-12)	(53-58)		
Liver	3	20	42	64	17	5	6	11	18	41	12	44
	(3-4)	(17-23)	(36-48)	(56-72)	(15-18)	(4-6)	(5-7)	(10-13)	(16-20)	(38-44)		
Gallbladder	1	18	43	68	16	2	6	12	19	39	5	49
	(1-2)	(16-21)	(38-49)	(65-70)	(15-17)	(2-3)	(5-7)	(10-13)	(18-19)	(37-41)		
Bones	13	17	24	19	16	20	6	6	5	38	53	13
	(12-14)	(14-21)	(17-30)	(13-25)	(14-17)	(19-21)	(5-7)	(5-8)	(4-7)	(35-41)		
CML	6	20	33	19	12	9	7	9	5	30	30	17
	(6-6)	(18-22)	(31-36)	(15-23)	(12-13)	(9-10)	(6-7)	(8-10)	(4-6)	(29-32)		
Larynx	2	27	36	30	12	3	9	10	8	30	10	27
	(2-2)	(23-31)	(33-40)	(25-35)	(11-13)	(2-4)	(8-10)	(9-11)	(7-10)	(28-32)		
Oesophagus	1	18	29	35	11	2	6	8	10	26	8	38
	(1-2)	(16-20)	(27-32)	(32-38)	(10-11)	(2-2)	(5-7)	(7-9)	(9-11)	(24-27)		
MEN												
Multiple myeloma	7	76	161	235	50	11	24	38	43	116	9	37
	(6-7)	(73-80)	(152-171)	(219-251)	(48-51)	(10-11)	(23-25)	(36-40)	(40-46)	(112-120)		
Liver	7	82	135	186	44	12	26	32	34	103	12	33
	(6-8)	(78-85)	(125-144)	(174-199)	(43-46)	(10-13)	(25-27)	(30-34)	(32-36)	(100-107)		
Soft tissue	20	61	92	142	43	33	19	22	26	99	33	26
	(19-21)	(58-65)	(85-98)	(132-152)	(41-44)	(31-34)	(18-20)	(20-23)	(24-28)	(96-103)		
Pancreas	6	57	100	142	33	9	18	24	26	76	12	34
	(5-6)	(54-61)	(92-107)	(128-155)	(31-34)	(8-10)	(17-19)	(22-25)	(23-28)	(73-80)		
Oesophagus	4	61	109	130	32	7	19	26	24	76	9	32
	(4-5)	(55-67)	(99-118)	(123-137)	(31-34)	(6-8)	(17-21)	(23-28)	(22-25)	(72-79)		
AML	13	39	53	49	24	21	12	12	9	55	38	16
	(13-14)	(37-41)	(48-57)	(44-55)	(23-24)	(21-22)	(12-13)	(11-14)	(8-10)	(53-57)		
Penis	4	30	63	103	21	7	9	15	19	50	14	38
	(4-4)	(28-31)	(59-66)	(93-114)	(20-22)	(6-7)	(9-10)	(14-16)	(17-21)	(48-52)		
Bones	14	29	25	29	18	22	9	6	5	43	51	12
	(13-15)	(24-35)	(19-32)	(25-32)	(17-19)	(21-24)	(7-11)	(4-8)	(5-6)	(40-45)		
CML	9	29	33	42	17	14	9	8	8	39	36	21
	(8-9)	(27-31)	(29-37)	(39-46)	(16-17)	(13-15)	(8-10)	(7-9)	(7-8)	(37-40)		
Gallbladder	2	19	49	89	16	2	6	12	16	36	6	44
	(1-2)	(16-23)	(42-55)	(73-106)	(14-17)	(2-3)	(5-7)	(10-13)	(13-19)	(33-40)		

Table A.6 - Time trends from Jan 1, 2010 to Jan 1, 2020 of complete cancer prevalence in Europe (EUROCARE-6 Pool) by cancer type and sex. Overall number of prevalent cases (thousands) and percent relative difference 2010-2020: total, due to population ageing, due to incidence and survival changes (Inc&Surv). Cancer entities with prevalence proportion higher than 50 per 100,000.

	Men and women					Women					Men				
	Number of prevalent cases (thousands)		Relative Difference (%) 2010-2020			Number of prevalent cases (thousands)		Relative Difference (%) 2010-2020			Number of prevalent cases (thousands)		Relative Difference (%) 2010-2020		
Cancer entity	**2010**	**2020**	**Total**	**Ageing**	**Inc & Surv**	**2010**	**2020**	**Total**	**Ageing**	**Inc & Surv**	**2010**	**2020**	**Total**	**Ageing**	**Inc & Surv**
All cancers	16,805	23,711	**41**	15	26	9,339	12,818	**37**	12	25	7,466	10,892	**46**	19	27
Breast	3,828	5,539	**45**	13	32	3,828	5,539	**45**	13	32	..	..	..	..	..
Prostate	2,346	4,008	**71**	24	47	..	..	..	..	..	2,346	4,008	**71**	24	47
Colon Rectum	2,163	2,992	**38**	19	19	1,036	1,377	**33**	15	18	1,128	1,615	**43**	23	21
Skin melanoma	846	1,391	**65**	12	52	502	779	**55**	10	45	344	612	**78**	16	62
Urinary Bladder	1,037	1,327	**28**	21	7	229	300	**31**	15	16	808	1,027	**27**	23	4
Kidney	630	968	**54**	16	38	249	373	**50**	12	37	381	595	**56**	19	38
Corpus uteri	741	932	**26**	14	12	741	932	**26**	14	12	..	..	..	..	..
Thyroid	559	930	**66**	8	58	449	734	**64**	7	56	111	196	**77**	10	67
Non-Hodgkin L.	585	913	**56**	14	43	280	434	**55**	12	43	305	479	**57**	15	42
Lung	566	844	**49**	18	31	176	325	**84**	14	71	390	519	**33**	20	13
Cervix uteri	627	625	**-0**·3	9·7	-10	627	625	**-0**·3	9·7	-10	..	..	..	..	..
Testis	359	493	**37**	2	36	..	..	..	..	..	359	493	**37**	2	36
Head and Neck	301	446	**48**	14	34	88	138	**58**	12	46	213	307	**44**	15	29
Ovary	347	396	**14**	11	3	347	396	**14**	11	3	..	..	..	..	..
Stomach	338	376	**11**	20	-9	146	164	**12**	16	-4	192	212	**11**	24	-13
Hodgkin L.	234	316	**35**	2	33	111	151	**36**	1	35	123	165	**34**	3	32
CLL/SLL	214	292	**36**	18	19	94	124	**32**	15	18	120	168	**40**	20	19
Larynx	227	237	**5**	19	-15	25	30	**20**	13	7	201	207	**3**	20	-17
Brain	177	232	**31**	4	28	81	105	**29**	3	26	96	127	**33**	4	29
Soft tissue	145	189	**31**	10	21	70	90	**29**	8	20	75	99	**33**	12	21

CLL/SLL: Chronic lymphocytic leukaemia/small lymphocytic lymphoma.

Figure A.1 – Goodness of fit of incidence regression models by cancer site, sex, age, and period of diagnosis. Observed vs estimated values (exponential and polynomial models) of incidence rates (values per 100,000). Selected examples.

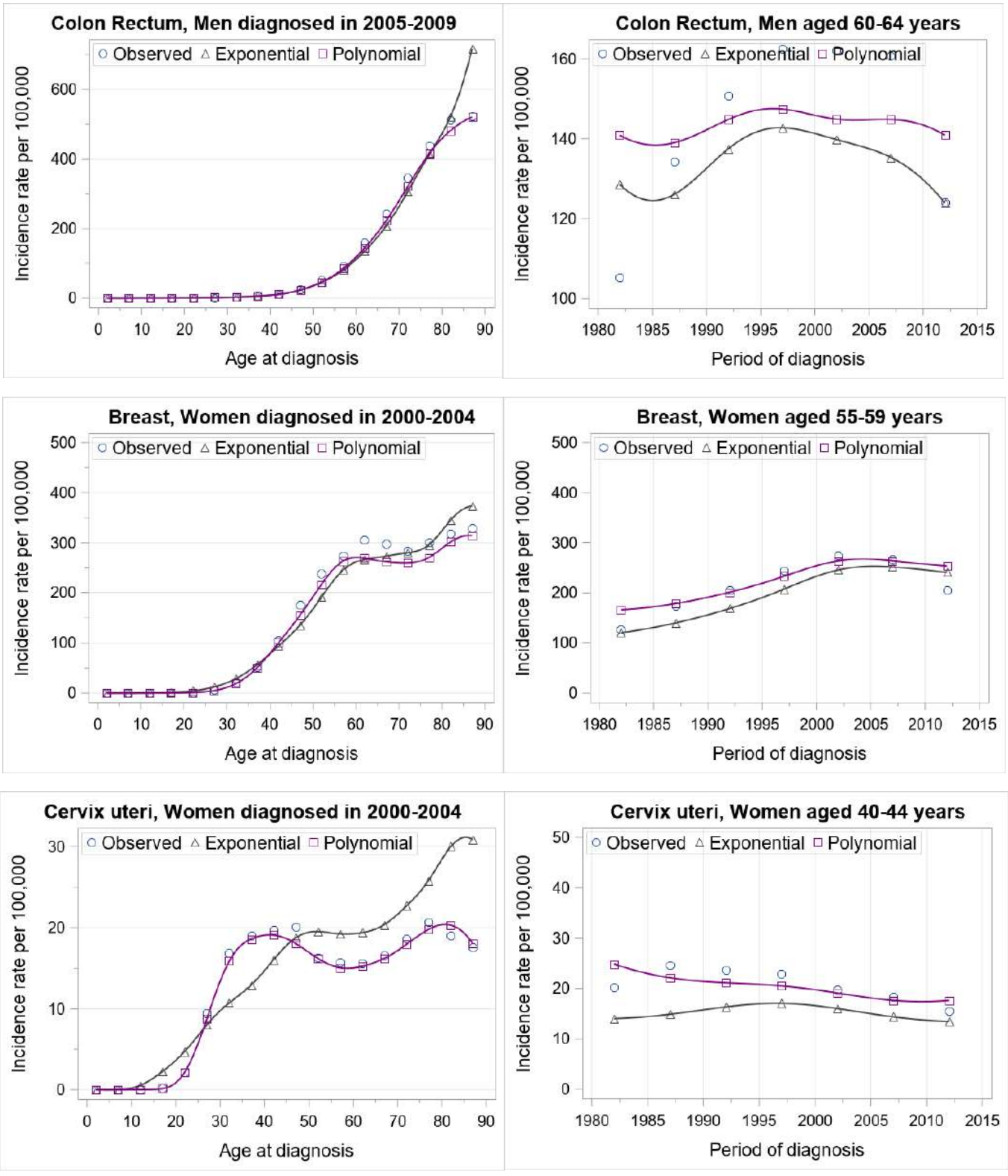


Figure A.2 – Goodness of fit of the Weibull mixture cure models by cancer site, sex, age, and period of diagnosis. Observed vs predicted relative survival ratios by follow up time. Selected examples.

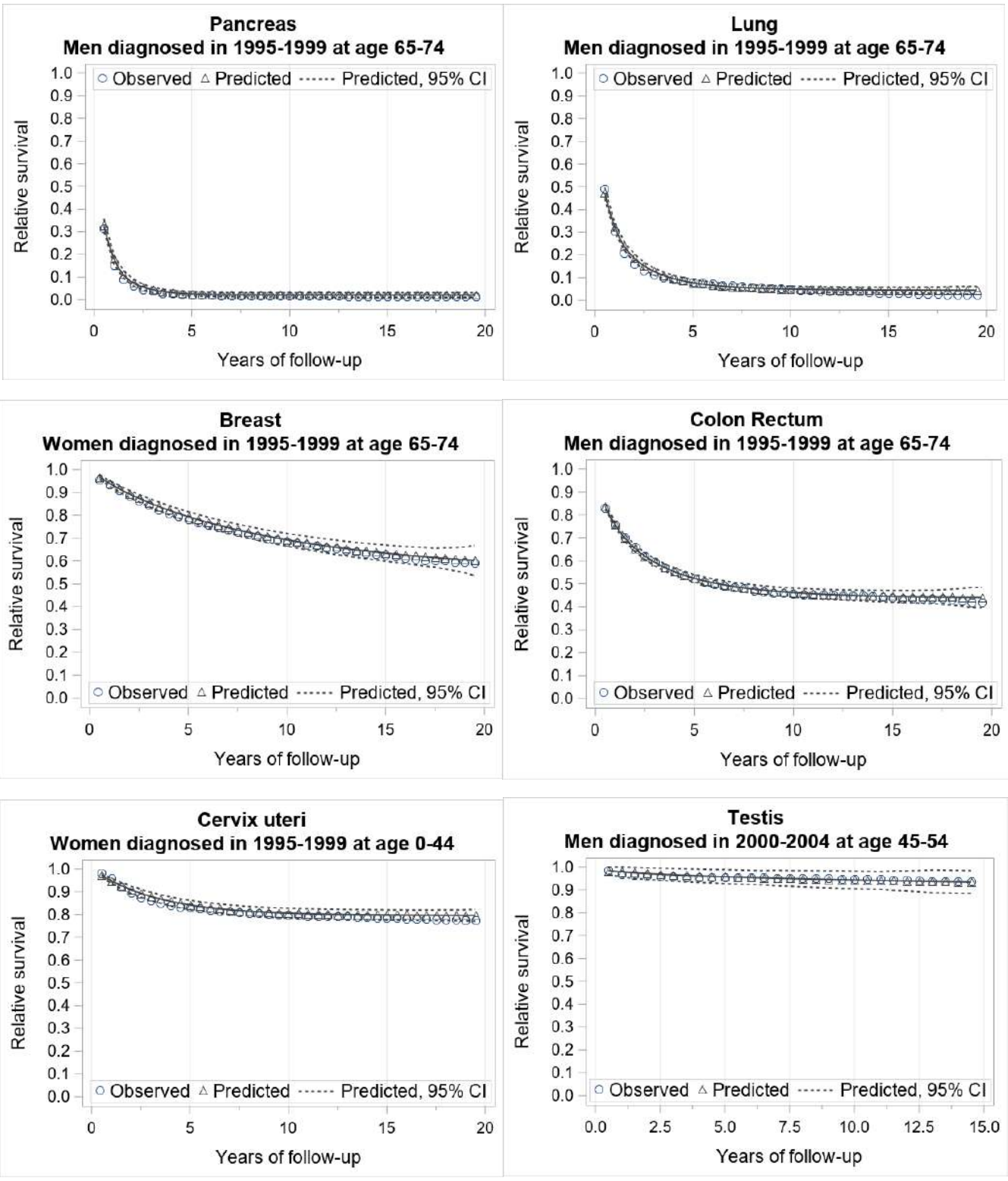
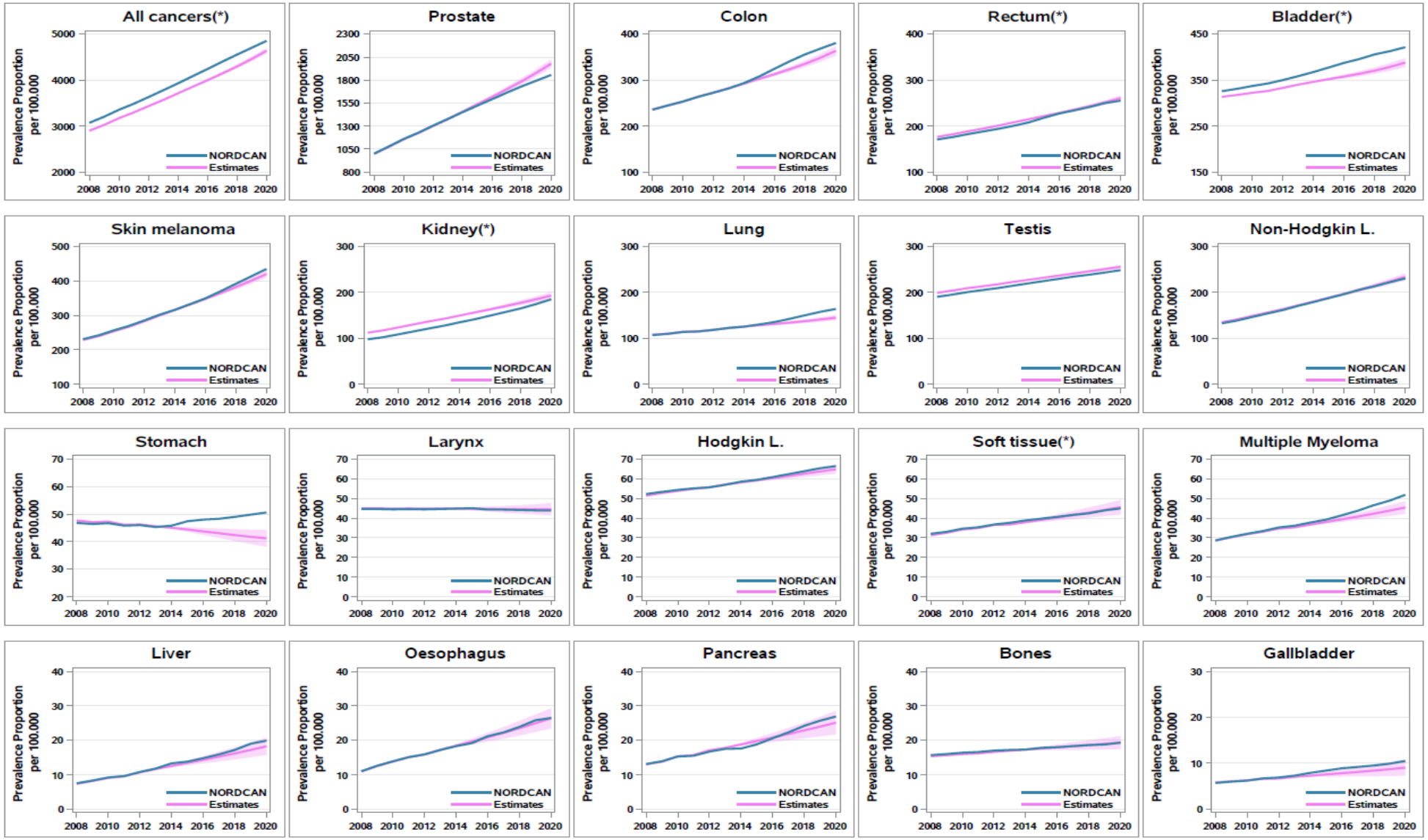
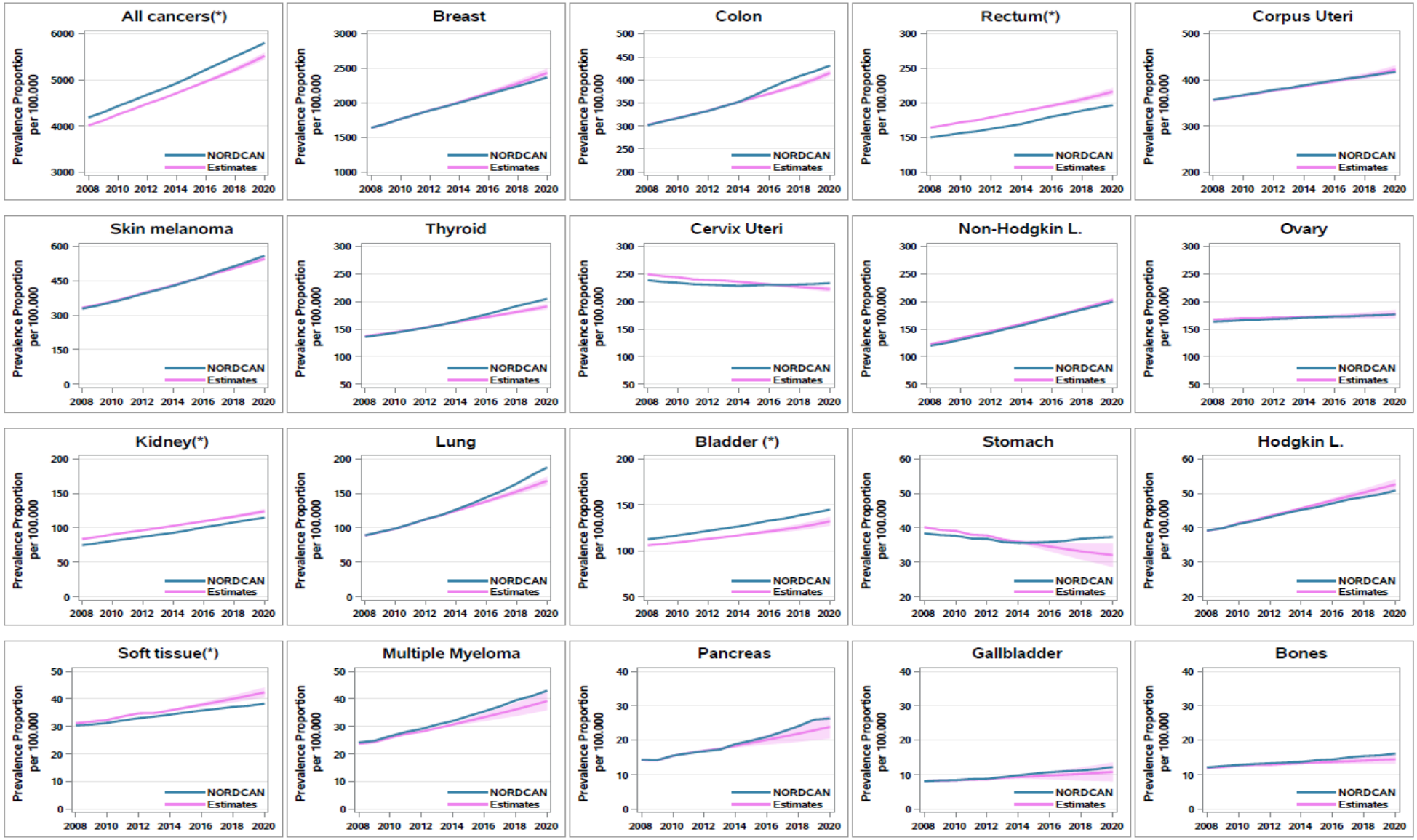


Figure A.3 – Comparison of estimated complete prevalence projections 2008-2020 (linear regression, 3-year period) against observed prevalence in Denmark, Finland, Iceland, and Norway (source NORDCAN dataset), Men. Proportions per 100,000



** Cancer sites with definition not fully comparable in NORDCAN (ICD-10, see page 8 for details) and EUROCARE-6 (Table A.2).*

Figure A.4 - Comparison of estimated complete prevalence projections 2008-2020 (linear regression, 3-year period) against observed prevalence in Denmark, Finland, Iceland, and Norway (source NORDCAN dataset), Women. Proportions per 100,000



** Cancer sites with definition not fully comparable in NORDCAN (ICD-10, see page 8 for details) and EUROCARE-6 (Table A.2)*

Figure A. 5 - Scatter plot of crude prevalence proportions as of Jan 1, 2020 vs crude incidence rates 2004-2010 in the 29 European countries included in study. Results of the linear regression of prevalence on incidence: intercept, slope, and coefficient of determination (Rsquared). Men, first eight leading cancers. Proportions and rates per 100,000

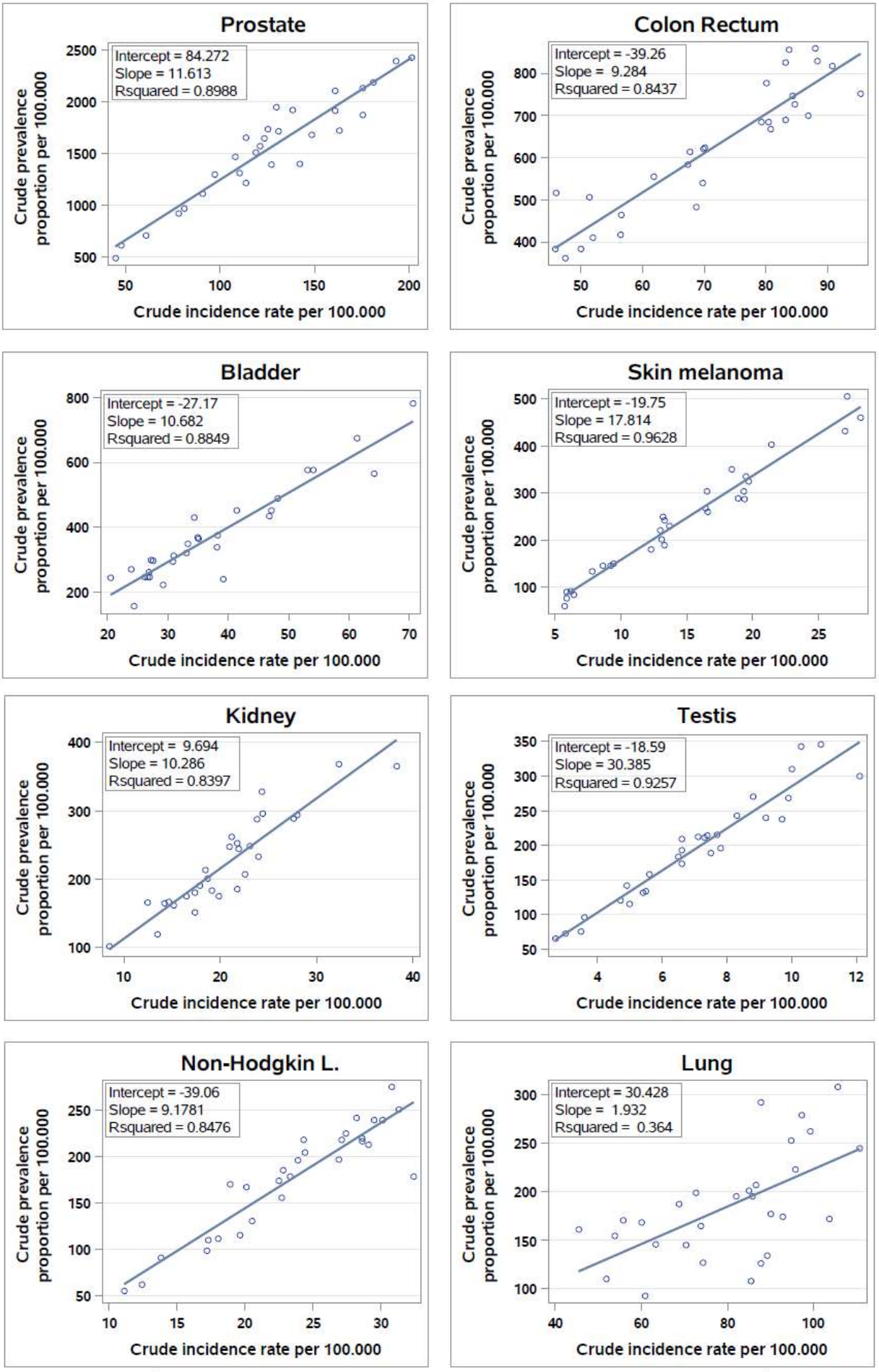


Figure A. 6 - Scatter plot of crude prevalence proportions as of Jan 1, 2020 vs crude incidence rates 2004-2010 in the 29 European countries included in study. Results of the linear regression of prevalence on incidence: intercept, slope, and coefficient of determination (Rsquared).Women, first eight leading cancers. Proportions and rates per 100,000