

ORIGINAL ARTICLE

## European cancer mortality predictions for the year 2024 with focus on colorectal cancer

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**Background:** We predicted cancer mortality figures for 2024 for the European Union (EU), its five most populous countries, and the UK. We focused on mortality from colorectal cancer (CRC).

**Materials and methods:** Based on cancer death certification and population data from the World Health Organization and Eurostat databases from 1970 until the most available year, we predicted deaths and age-standardized rates (ASRs) for 2024 for all cancers and the 10 most common cancer sites. We fitted a linear regression to the most recent trend segment identified by the joinpoint model. The number of avoided deaths since the peak in 1988-2024 was estimated for all cancers and CRC.

**Results:** We predicted 1 270 800 cancer deaths for 2024 in the EU, corresponding to ASRs of 123.2/100 000 men (−6.5% versus 2018) and 79.0/100 000 women (−4.3%). Since 1988, about 6.2 million cancer deaths have been avoided in the EU and 1.3 million in the UK. Pancreatic cancer displayed unfavorable predicted rates for both sexes (+1.6% in men and +4.0% in women) and lung cancer for women (+0.3%). The focus on CRC showed falls in mortality at all ages in the EU, by 4.8% for men and 9.5% for women since 2018. The largest declines in CRC mortality are predicted among those 70+ years old. In the UK, projected ASRs for CRC at all ages are favorable for men (−3.4% versus 2018) but not for women (+0.3%). Below age 50 years, CRC mortality showed unfavorable trends in Italy and the UK, in Poland and Spain for men, and in Germany for women.

**Conclusions:** Predicted cancer mortality rates remain favorable in the EU and the UK, mainly in males due to earlier smoking cessation compared to females, underlining the persisting major role of tobacco on cancer mortality in Europe. Attention should be paid to the predicted increases in CRC mortality in young adults.

**Key words:** colorectal cancer, cancer, Europe, mortality rates, prediction model, COVID-19

### INTRODUCTION

The prediction of numbers and trends for cancer mortality reflects the impact of incidence, screening, and advancement in treatments for various cancer sites and is useful for evaluating disease burden in Europe and prioritizing resources for prevention, diagnosis, and management.<sup>1</sup>

Along the lines of our previous publications since 2011,<sup>2</sup> we estimated the number of deaths and the corresponding mortality rates for all cancers combined and selected major cancer sites for 2024 in the European Union (EU) as a

whole, its five major countries, and the UK. In the past decades, trends in mortality were favorable for most cancers, with the main exceptions of pancreatic cancer, which showed no improvement in men and increased in women in the EU, and of female lung cancer, which, however, tended to level off over recent calendar years.<sup>1</sup>

We focused on colorectal cancer (CRC), due to its high incidence and mortality, and its recent unfavorable patterns among young adults in the United States and other selected high-income countries.<sup>3-5</sup>

### MATERIALS AND METHODS

We retrieved official death certifications for all cancers combined and selected cancer sites from the World Health Organization (WHO) database.<sup>6</sup> These include stomach, colorectal, pancreas, lung, breast, uterus (cervix and corpus), ovary, prostate, bladder cancer, and leukemias. The list of the corresponding International Classification of

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Diseases codes according to the 10th revision is available in [Supplementary Table S1](https://doi.org/10.1016/j.annonc.2023.12.003), available at <https://doi.org/10.1016/j.annonc.2023.12.003>. Resident population estimates were obtained from the same WHO database. Figures were derived for the EU (1970-2018), its five most populous countries, i.e. France (1970-2017), Germany (1973-2020), Italy (1970-2019), Poland (1970-2020), and Spain (1970-2021); and for the UK (1970-2020). All of these countries have good data coverage ( $\geq 90\%$ ) and high data quality (medium for Poland), as defined by the WHO.<sup>7</sup> For each cancer site and country under consideration, we calculated sex- and age-specific mortality rates for 5-year age groups, ranging from 0-4 years up to 85+ years, and for each calendar year or quinquennium. We derived age-standardized mortality rates (ASRs), using the direct method and the world standard population. For CRC, we also computed the ASR for selected age groups, i.e. 25-49, 50-69, and 70+ years. To analyze ASR trends, we fitted joinpoint regression models, allowing up to five joinpoints.<sup>8</sup> The Joinpoint program estimates six segmented linear regression models (0-5 joinpoints) and selects the best fitting one with a permutation test procedure.

To predict 2024 mortality figures, we employed a logarithmic Poisson joinpoint regression model, testing up to

five joinpoints to the number of deaths in each 5-year age group, to identify significant changes in trends. We predicted the age-specific numbers of deaths and their corresponding 95% prediction intervals (PIs) for 2024, by fitting a linear regression model to the mortality data for each age group, considering the most recent trend segment identified by the joinpoint model. For CRC and the age group 25-49 years, we fitted a log-linear model due to low death numbers. We then calculated both age-specific and ASRs, along with their related 95% PIs, using the predicted age-specific number of death counts. Population predictions were obtained from the Eurostat database.<sup>9</sup> We estimated the number of avoided deaths from all cancers and from CRC for the EU and the UK for the period 1989-2024 by comparing observed and predicted deaths to those expected based on the 1988 age-specific rates, since the peak cancer mortality in the EU was reached in 1988.

Data analyses were carried out using the software R version 4.3.2 (R Development Core Team, 2022), SAS version 9.4 (SAS Institute Inc., Cary, NC), and Joinpoint Regression Program version 5.0.2 (Statistical Methodology and Applications Branch, Surveillance Research Program, National Cancer Institute).

**Table 1. Number of predicted deaths and mortality rates for the year 2024 and comparison figures for 2018, for the EU and for the UK, with 95% PIs and the percentage differences between 2018 and 2024**

Sex	Cancer	Observed number of deaths 2018	Predicted number of deaths 2024 (95% PI)	Observed ASR 2018	Predicted ASR 2024 (95% PI)	% Difference 2024 versus 2018	
EU	Men	Stomach	30 449	28 891 (28 090-29 692)	6.01	5.17 (5.01-5.33)	-13.88
		Colorectum	82 895	86 509 (84 757-88 260)	15.48	14.74 (14.43-15.05)	-4.78
		Pancreas	40 797	45 687 (45 138-46 237)	8.21	8.35 (8.23-8.46)	1.59
		Lung	159 410	153 032 (150 074-155 990)	32.82	27.97 (27.32-28.61)	-14.79
		Prostate	66 690	72 059 (70 839-73 280)	10.13	9.70 (9.52-9.87)	-4.33
		Bladder	28 143	29 316 (28 164-30 467)	4.69	4.28 (4.14-4.43)	-8.78
		Leukemias	21 745	22 963 (22 423-23 502)	4.18	3.66 (3.47-3.85)	-12.51
		All cancers	675 265	705 127 (693 796-716 457)	131.78	123.17 (120.81-125.53)	-6.54
		Women	Stomach	19 544	16 457 (15 786-17 128)	2.83	2.23 (2.14-2.33)
	Colorectum		66 901	66 069 (64 960-67 179)	8.88	8.04 (7.90-8.17)	-9.45
	Pancreas		40 077	45 225 (44 504-45 946)	5.66	5.89 (5.76-6.02)	4.04
	Lung		76 041	84 402 (82 706-86 099)	13.55	13.59 (13.22-13.96)	0.31
	Breast		84 817	89 280 (87 850-90 709)	14.32	13.48 (13.22-13.74)	-5.88
	Uterus		27 217	28 462 (27 882-29 042)	4.88	4.62 (4.51-4.73)	-5.29
	Ovary		26 471	26 707 (26 080-27 335)	4.61	4.23 (4.10-4.36)	-8.38
	Bladder		9386	9949 (9456-10 442)	1.10	1.10 (1.05-1.14)	-0.38
	Leukemias		17 506	18 130 (17 712-18 549)	2.53	2.17 (2.07-2.28)	-13.99
	All cancers	535 291	565 657 (558 453-572 861)	82.58	79.01 (78.07-79.95)	-4.32	
UK	Men	Stomach	2696	2294 (2165-2424)	3.62	2.78 (2.59-2.97)	-23.17
		Colorectum	11 238	12 208 (11 912-12 504)	14.98	14.47 (14.09-14.85)	-3.39
		Pancreas	4954	5322 (5107-5537)	6.90	6.42 (6.08-6.75)	-6.94
		Lung	18 587	16 998 (16 607-17 389)	24.92	19.45 (18.91-19.99)	-21.93
		Prostate	11 886	12 646 (12 095-13 198)	12.52	11.19 (10.73-11.65)	-10.61
		Bladder	3697	4024 (3881-4166)	4.09	3.73 (3.56-3.90)	-8.70
		Leukemias	2747	2759 (2603-2914)	3.75	3.03 (2.81-3.26)	-19.09
		All cancers	91 059	92 047 (90 614-93 480)	120.26	103.67 (101.56-105.79)	-13.80
		Women	Stomach	1524	1224 (1102-1346)	1.67	1.37 (1.23-1.51)
	Colorectum		9647	10 443 (10 126-10 760)	10.16	10.19 (9.86-10.52)	0.25
	Pancreas		4618	5053 (4858-5248)	5.10	4.99 (4.73-5.25)	-2.14
	Lung		16 012	15 567 (15 094-16 041)	18.80	15.63 (15.11-16.15)	-16.86
	Breast		11 516	11 445 (11 082-11 808)	15.07	13.43 (12.91-13.94)	-10.87
	Uterus		3351	3666 (3532-3799)	4.41	4.37 (4.15-4.58)	-1.08
	Ovary		4223	4158 (3973-4342)	5.46	4.77 (4.50-5.04)	-12.56
	Bladder		1760	1856 (1753-1959)	1.55	1.52 (1.42-1.61)	-2.38
	Leukemias		1951	1886 (1757-2015)	2.20	1.78 (1.59-1.98)	-18.80
	All cancers	79 631	80 882 (79 502-82 262)	92.55	83.39 (81.69-85.10)	-9.89	

ASR, age-standardized rate; PI, prediction interval.

## RESULTS

Table 1 gives predicted cancer deaths and rates, and their corresponding 95% PIs for 2024, in comparison with observed figures for 2018 for both the EU and the UK. Figure 1 displays the corresponding information in bar plots, for the EU and the UK, according to sex and cancer site. In the EU, a fall in total cancer mortality rates is predicted, from 131.8/100 000 to 123.2/100 000 (−6.5%) in men and from 82.6/100 000 to 79.0/100 000 (−4.3%) in women. However, due to population aging, the number of deaths is predicted to rise in the EU (from 675 265 to >705 100 in men and from 535 291 to >565 700 in women). In the UK, total cancer mortality rates are predicted to decrease, from 120.3/100 000 to 103.7/100 000 (−13.8%) in men and from 92.6/100 000 to 83.4/100 000 (−9.9%) in women, although the number of deaths is expected to increase from 91 059 to 92 000 in men and from 79 631 to 80 900 in women. In the EU, our predictions are favorable for all cancer sites considered and for both sexes, except for pancreatic cancer (+1.6% for men and +4.0% for women), and among women for lung cancer (+0.3%). In the UK, favorable ASRs are predicted for all cancers considered and both sexes, except for CRC in women (ASR: 10.2/100 000, +0.3%). In the EU, lung cancer remains the first site among men in 2024 (28.0/100 000), followed by CRC (14.7/100 000) and

prostate cancer (9.7/100 000). Among women, lung cancer shows the highest 2024 predicted ASR (13.6/100 000), followed by breast cancer (13.5/100 000), although the absolute number of deaths is greater for breast (89 300 versus 84 400 for lung). The third leading cause of cancer death is CRC (8.0/100 000). The ranking was similar in the UK but lung cancer ASR is lower among males (19.5/100 000) and higher among females (15.6/100 000) than in the EU. Country-specific ASRs for 2024 according to sex and cancer site are provided in Supplementary Tables S2-S6, while Supplementary Tables S7A and S7B, available at <https://doi.org/10.1016/j.annonc.2023.12.003>, display the results from joinpoint analyses for men and women.

Figure 2 gives the trends in total cancer mortality rates over calendar periods, for men and women, spanning from 1970-1974 to 2015-2019, and the predicted ASRs for 2024 with the corresponding PIs. Among men, stomach cancer ASR decreased over the whole period, while the ASR for most other sites began declining in the early 1990s. Among women, the ASRs for stomach, colorectal, uterine cancers, and leukemias exhibited a decline since 1970, while rates for breast and ovarian cancers started to decline since 1990. Pancreas and lung cancer showed unfavorable trends over the whole period. The corresponding trend and projection for 2024 for the UK are reported in Supplementary

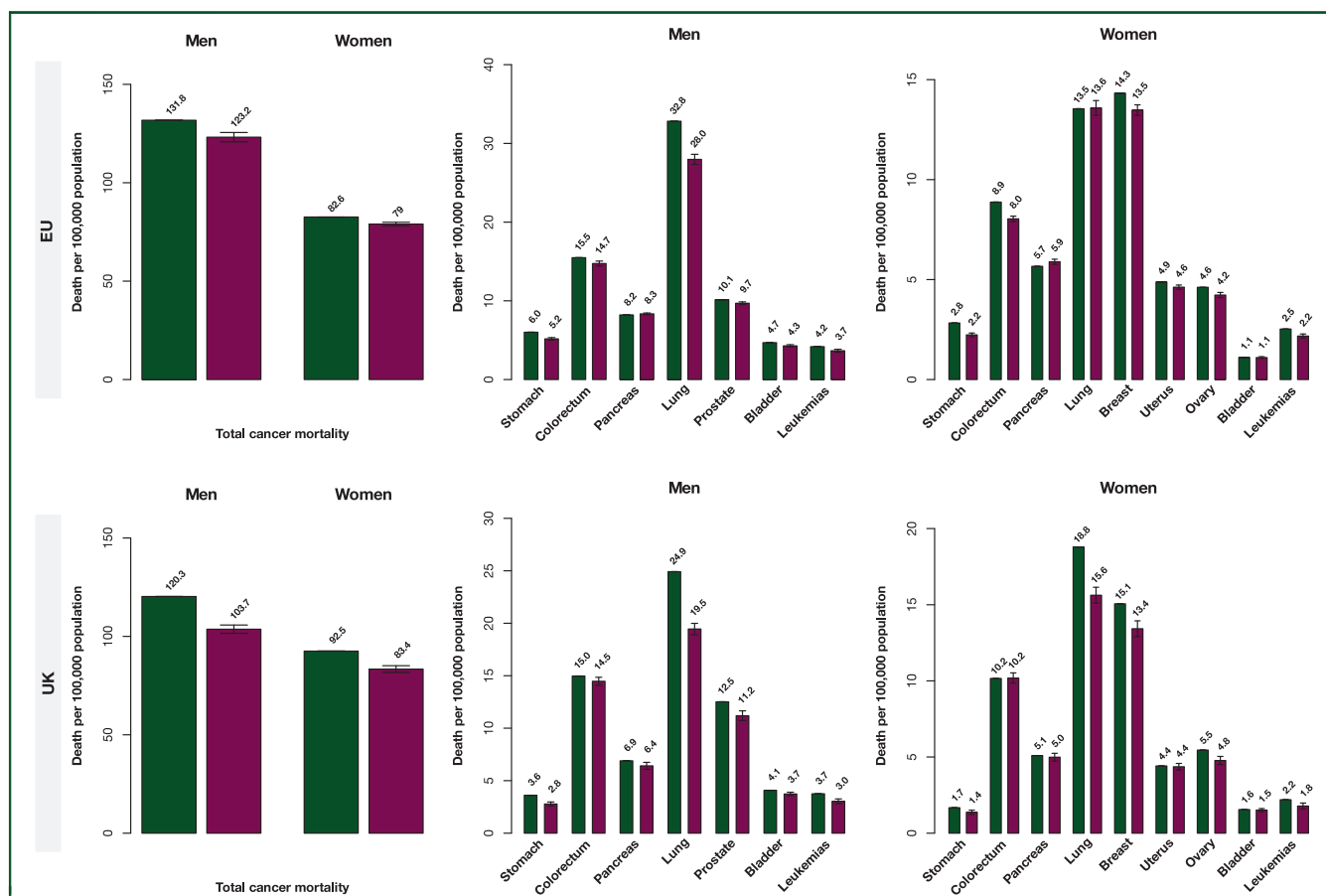
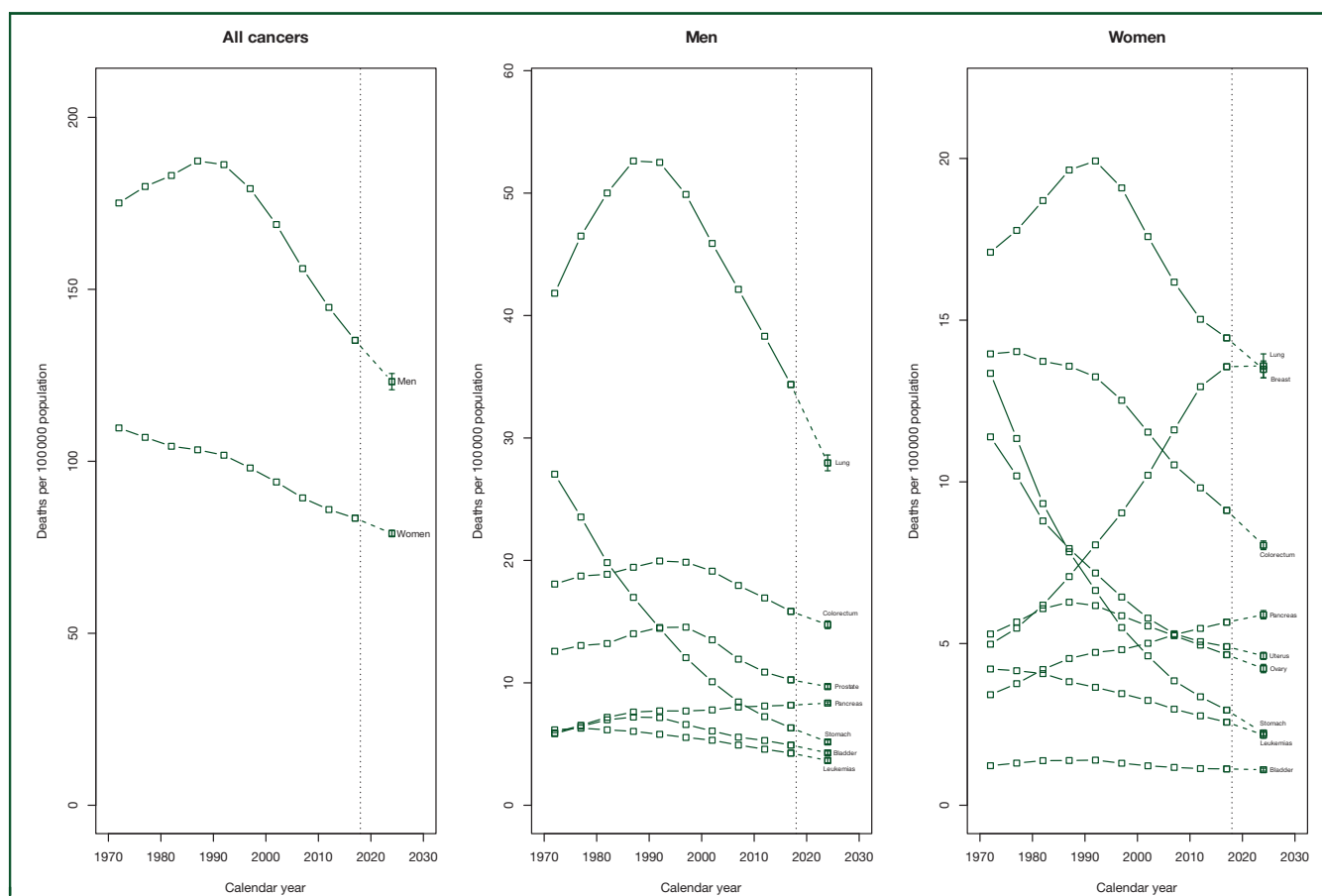


Figure 1. Bar plots of age-standardized (world population) mortality rates per 100 000 persons for the year 2018 (green) and predicted rates for 2024 (pink) with 95% prediction intervals for all cancers combined and major cancer sites according to sex in the EU (top panels) and the UK (bottom panels). EU, European Union.



**Figure 2.** Quinquennial age-standardized (world population) cancer mortality rate trends from 1970-1974 to 2015-2019 and predicted rates for 2024 with 95% prediction intervals, for all cancers combined and both sexes (left) and for major cancer sites in men (center) and women (right), in the EU.

Figure S1, while Supplementary Figures S2 and S3, available at <https://doi.org/10.1016/j.annonc.2023.12.003>, provide results for cancer-specific trends and predictions, respectively, in males and females, from the six individual EU countries considered.

Table 2 gives the observed ASRs for CRC in the six European countries considered and the EU in 2010-2014, 2015-2019, and the predicted rates for 2024 with 95% PIs according to sex for all ages, and for the EU and UK, also by age group. Among men, all selected countries and the EU recorded favorable predicted ASRs compared to the observed ones in 2015-2019 for all ages. Poland had the highest predicted rates (20.0/100 000). France and Germany had the lowest rates (11.5/100 000 and 11.2/100 000, respectively). For women, all the selected countries and the EU had favorable predicted ASRs for all ages, except the UK (+1.4%). Poland (9.5/100 000) and the UK (10.2/100 000) had the highest predicted rates, while France, Germany, Italy, and Spain reported projected rates around 7.3-7.5/100 000. In the EU, we predicted a decline of 6.9% for men and 11.8% for women, at all ages. The age group showing the highest percent decline in ASR was 70 years or older (−11.6% for men and −15.9% for women). Detailed results for CRC according to age group, sex, and country are given in Supplementary Table S8, available at <https://doi.org/10.1016/j.annonc.2023.12.003>. CRC ASRs increased at age 25-49 years for both sexes in Italy (+1.5% in men

and +2.6% in women), among Polish (+5.9%) and Spanish men (+5.5%), and German women (+7.2%). The UK showed a marked increase for both sexes (+26.1% in men and 38.6% in women).

Figure 3 gives the joinpoint analysis for CRC at all ages, as well as for selected age groups, in the EU and the UK between 1970 and 2024. In the EU, CRC mortality decreased at all ages and for all age groups in recent decades. In particular, for both sexes and the 70+ years age group, there has been a decline starting from 2000. In the UK, CRC mortality decreased for all ages in the past decades. However, there was an increase for the 25-49 years age group since around 2000 in both sexes. Supplementary Tables S9A and S9B, available at <https://doi.org/10.1016/j.annonc.2023.12.003>, show the joinpoint analysis results for all ages and truncated age groups 25-49, 50-69, and 70+ years, according to sex.

Figure 4 gives the estimated number of avoided cancer deaths in the EU and the UK for both sexes between 1989 and 2024 assuming constant age-specific rates in 1988, for all cancers combined (top panels) and for colorectal cancer (bottom panels). During the 36 years considered, a total of 6 183 000 deaths from all cancers have been avoided in the EU (4 244 000 in men and 1 939 000 in women) and 1 325 000 in the UK (899 000 in men and 426 000 in women). The corresponding number of averted deaths for CRC was 958 300 in the EU (respectively, 308 900 in men and 649 400 in

**Table 2. Age-standardized colorectal cancer mortality rates for all ages in selected European countries, for the EU and UK at all ages, 25-49, and 70+ years in the 2010-2014 and 2015-2019 quinquennia and predicted rates for 2024, with percentage differences between 2015-2019 and 2024**

Country	Age	Men				Women			
		ASR 2010-2014	ASR 2015-2019	Predicted ASR 2024 (95% PI)	% Difference 2024 versus 2015-2019	ASR 2010-2014	ASR 2015-2019	Predicted ASR 2024 (95% PI)	% Difference 2024 versus 2015-2019
France	All ages	14.35	13.41	11.50 (11.04-11.95)	-14.28	8.42	8.06	7.41 (7.11-7.71)	-8.07
Germany		14.59	13.21	11.17 (10.68-11.67)	-15.45	8.86	8.04	7.26 (6.91-7.60)	-9.75
Italy		15.37	13.75	12.75 (12.28-13.22)	-7.28	9.35	8.46	7.46 (7.19-7.73)	-11.85
Poland		20.88	20.44	19.96 (19.21-20.71)	-2.32	11.40	10.71	9.53 (8.99-10.07)	-11.03
Spain		18.76	16.91	14.20 (13.55-14.84)	-16.07	9.32	8.40	7.31 (7.00-7.62)	-12.96
UK	All ages	15.43	14.73	14.46 (14.08-14.84)	-1.80	10.04	10.05	10.19 (9.85-10.52)	1.42
	25-49 years	3.07	3.71	4.68 (4.44-4.93)	26.12	2.71	3.30	4.58 (4.28-4.88)	38.58
	50-69 years	40.26	38.44	37.42 (35.62-39.21)	-2.68	25.45	25.48	24.76 (23.07-26.45)	-2.84
	70+ years	199.53	183.86	174.01 (168.11-179.91)	-5.36	127.10	122.24	118.51 (114.34-122.69)	-3.05
EU	All ages	16.93	15.84	14.74 (14.43-15.05)	-6.91	9.81	9.12	8.04 (7.90-8.17)	-11.84
	25-49 years	2.88	2.86	2.79 (2.70-2.89)	-2.42	2.47	2.40	2.20 (2.11-2.29)	-8.52
	50-69 years	47.10	43.84	42.86 (41.27-44.46)	-2.23	26.62	24.64	22.69 (22.02-23.36)	-7.91
	70+ years	211.23	197.15	174.28 (169.89-178.68)	-11.60	118.70	109.86	92.44 (90.55-94.33)	-15.85

ASR, age-standardized rate; PI, prediction interval.

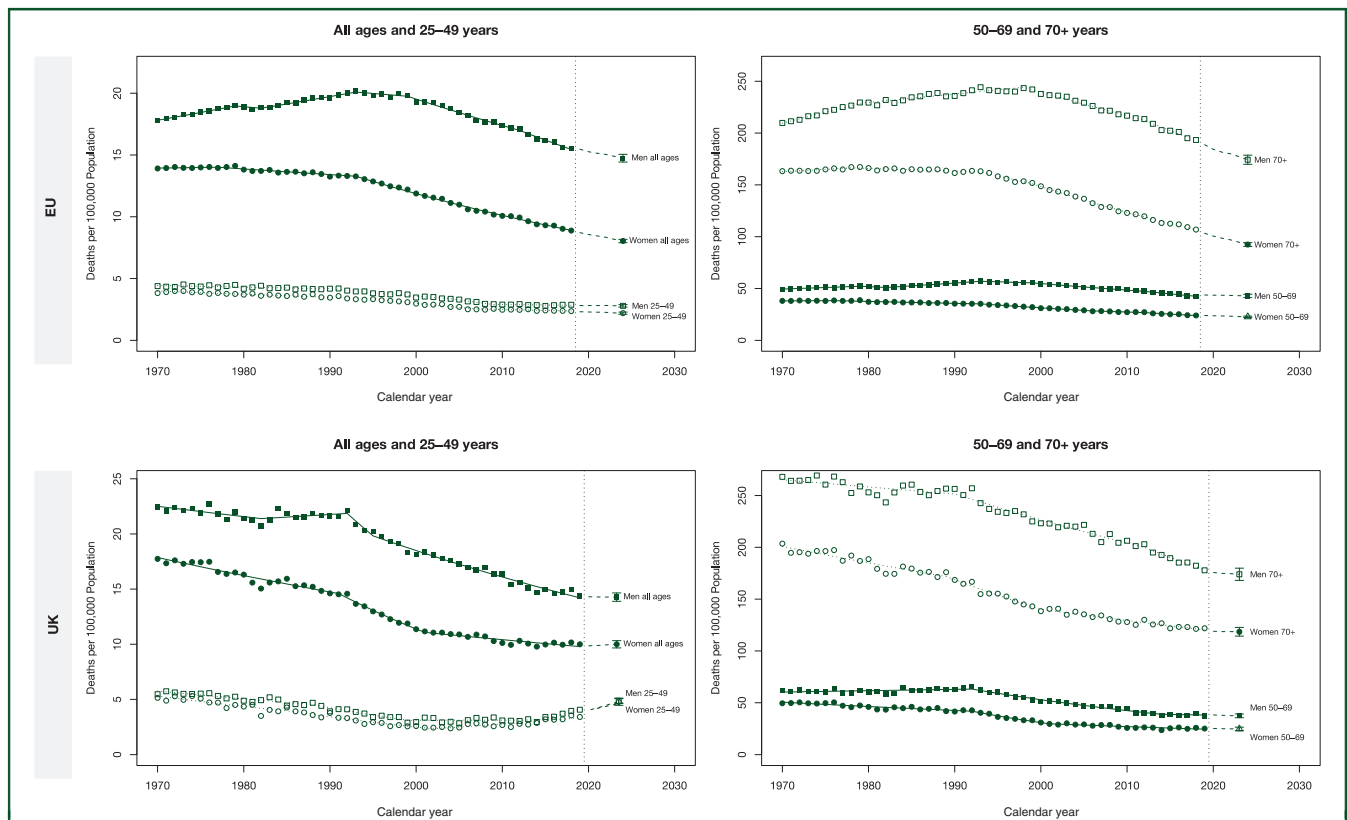
women) and 205 100 (100 500 in men and 104 600 in women) in the UK.

**DISCUSSION**

The 2024 predicted mortality cancer figures remain favorable in the EU, in its five most populous countries, as well as in the UK. Rates fell by 6.5% in men and by 4.3% in women in the EU. However, the number of deaths is still rising, with a total of 1 270 800 predicted deaths in 2024 in the EU and 172 900 in the UK, due to population growth and aging.

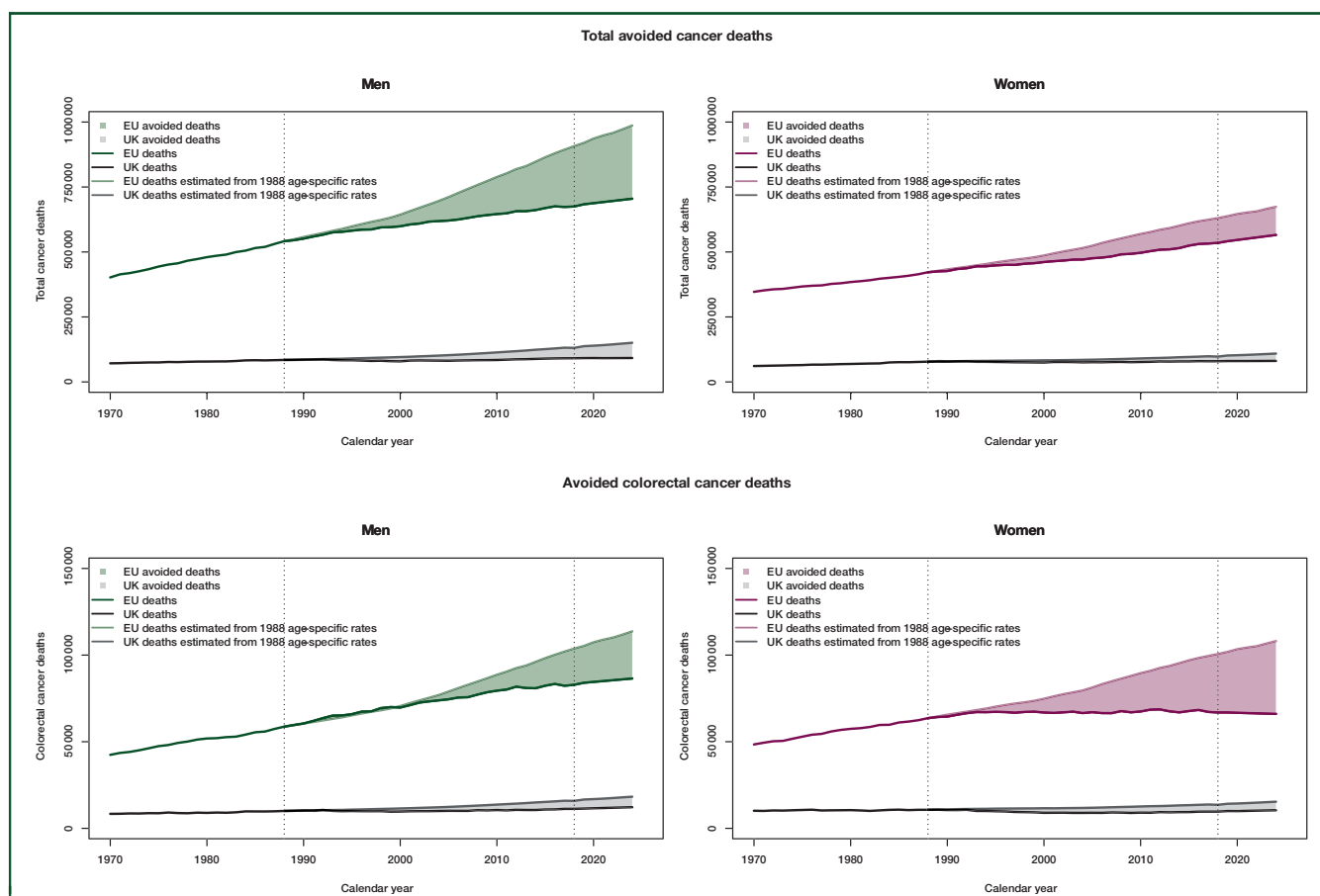
CRC is the second leading cause of cancer death and the first one in nonsmokers of both sexes combined. There have been persistent declines in mortality across all ages and both sexes in the EU and the UK, but recent upward trends among young adults aged 25-49 years.

The favorable trends can be largely explained by an improved diagnosis of colorectal lesions, the removal of adenomas and neoplastic lesions through colonoscopy, and advancement in management and therapy.<sup>10</sup> The decline in all age groups is consistent with observed trends in most



**Figure 3. Joinpoint analysis for mortality from colorectal cancer for all ages and 25-49 years (left), 50-69 years, and 70+ years age groups (right) during the period 1970-2018, the predicted rates for the year 2024 with 95% prediction intervals in the EU (top panels) and the UK (bottom panels).**





**Figure 4.** Avoided cancer deaths for EU and UK men and women from the peak in 1988–2024; observed numbers of cancer deaths from 1970 to 2018 and predicted cancer deaths from 2019 to 2024 (darker lines); estimated numbers of total cancer deaths by applying 1988 age-specific peak mortality rate (lighter lines) for all cancers combined (top panels) and for colorectal cancer (bottom panels).

high-income countries.<sup>3,11</sup> Notably, mortality rates decreased in countries with better access to screening, early diagnosis, and high levels of care.<sup>12</sup> Delayed diagnosis and adoption of modern therapy at least in part explain the higher rates in Poland and in other central and eastern EU countries. Incidence and mortality from CRC have been rising in young adults in the United States under age 50 years since the 1990s,<sup>5,13</sup> and subsequently in selected other high-income countries.<sup>3,14</sup> Lifestyle factors including overweight, obesity, consequent diabetes, lack of exercise, and dietary habits,<sup>15,16</sup> which have been related to CRC, influenced these trends. Alcohol consumption has also been linked to early-onset CRC, and countries with reduced alcohol consumption, like France and Italy, have not experienced marked rising mortality trends.<sup>17</sup> Early-onset CRC tends to be more aggressive and more frequently right-sided compared to late-onset ones.<sup>16,18</sup> This increase in incidence among young adults prompted the United States Preventive Service Task Force to recommend lowering the age to start CRC screening to 45 years.<sup>19</sup> Screening programs are heterogeneous across the European countries. Further efforts are therefore needed to develop updated population-based guidelines for screening of CRC.<sup>20</sup>

Lung cancer mortality reflects past trends in smoking, which vary by gender and economic development. Unlike

United States women,<sup>21</sup> whose rates have been long declining but remain higher than European ones, lung cancer rates in EU women showed moderate increases. In particular, France and Spain show large upward trends reflecting earlier cohort trends in young women.<sup>22,23</sup> Tobacco control is central to global strategies to reduce lung cancer mortality.<sup>24</sup> These remain inadequate in most EU countries, particularly in southern and central-eastern Europe. Control of occupational and environmental exposure to lung carcinogens, implementation of low-dose computed tomography screening programs, and improved treatment may have had some impact on reducing lung cancer mortality, too.<sup>25</sup>

Estimates for stomach cancer in 2024 indicate a consistent reduction in mortality for both sexes across the EU. The decline of *Helicobacter pylori* prevalence,<sup>26</sup> improved tobacco control measures, and the adoption of richer and healthier diets and food preservation methods are the major determinants of this favorable decline.<sup>27,28</sup>

Pancreatic cancer is the only considered major site showing unfavorable trends for both sexes. It accounts for >3% of new cancer diagnoses in Europe,<sup>29</sup> but for ~7% of cancer deaths, and is the fourth leading cause of cancer death. Similar trends have been observed in the United States.<sup>30</sup> Patterns of smoking prevalence, which is the main

risk factor for pancreatic cancer, can only partly explain the observed rates over time. Overweight, obesity, diabetes, and heavy alcohol consumption may also have some role. Advancements in early detection, treatment, and management of the disease are limited. Pancreatic cancer control requires innovative approaches, including earlier diagnosis and progress in innovative therapies including precision medicine in metastatic patients,<sup>31,32</sup> but their impact on national mortality rates is limited and not quantifiable now.

The predicted trends in mortality rates for breast cancer for 2024 remain favorable across Europe. These substantial declines in mortality are due to advancements in the diagnosis, but mainly in the treatment and management of breast cancer.<sup>33</sup>

As opposed to the United States where uterine (endometrial) cancer is increasing,<sup>34</sup> predicted mortality from uterine cancer (cervix and corpus combined) continues to show a favorable trend in most of Europe, reflecting early detection through regular pap screening and human papillomavirus (HPV) detection (plus some minor impact of HPV vaccines in very young women),<sup>35</sup> advances in treatment, and increased awareness and education. The persistently elevated mortality rates in Poland can be explained by inadequate screening and a high prevalence of HPV in Eastern Europe.<sup>36,37</sup> Most uterine cancer deaths among women aged <45 years are due to cervical cancer.<sup>38,39</sup> The increased prevalence of overweight and obesity, the key risk factors for endometrial cancer,<sup>40</sup> occurred later in Europe than in the United States and had a smaller impact on endometrial cancer mortality.

Ovarian cancer mortality trends are favorable across Europe, as in the United States.<sup>21</sup> The increased use of oral contraceptives in subsequent generations of European women born after 1930 together with decreased use of menopausal hormone replacement therapy and improved diagnosis and management largely account for the favorable trends.<sup>41</sup>

The main factors behind the favorable trends in prostate cancer mortality are improvements in treatment and management of the disease, in addition to early detection mainly through prostate-specific antigen testing.<sup>42-44</sup> Risk factors remain largely undefined, and can hardly be related to observed mortality trends.<sup>45</sup> Poland and other central and eastern European countries still show unfavorable trends, likely due to the later adoption of early diagnosis and modern therapeutic advancement.<sup>43</sup>

The favorable trends in bladder cancer mortality in Europe (except for Polish men) are attributable to a combination of smoking cessation in men, the effect of past control of occupational exposures, mainly to aromatic amines, and decreases in chronic urinary infections in both sexes.<sup>46-48</sup> Early diagnosis and improved treatment have increased survival rates. Preventive measures, increased awareness, and screening programs for high-risk individuals have also contributed to these trends.

Mortality projections for leukemias continue to be favorable. These results are likely due to continued advances in treatment and management, including

widespread access to high-quality specialized treatment centers.<sup>49,50</sup>

We used official death certifications from the WHO for the most populous European countries and the UK, providing high data coverage and good data quality. Still, caution should be exercised in interpreting our predictions, as they assume no changes in the determinants of recent trends. The selected prediction method is based on age-specific joinpoint models, so major changes in cohort effect trends are difficult to detect. However, our previous European cancer mortality predictions have proven to be reliable. Comparing the observed cancer deaths for 2020, with our previous prediction,<sup>51</sup> the errors were about or less than 3% for all neoplasms considered.

In addition, coronavirus disease 2019 (COVID-19) may have affected cancer mortality since 2020, due to delayed screening, diagnosis, and treatments.<sup>52,53</sup> However, available data indicate that the impact of the COVID-19 pandemic on cancer is smaller as compared to that on vascular, metabolic, and neurological diseases.<sup>54</sup>

In conclusion, the 2024 predictions for cancer mortality rates in the EU remain favorable, except for pancreatic cancer for both sexes and lung cancer for women. To maintain and improve the favorable trends in cancer mortality in Europe, it is important to continue to pursue tobacco control and eliminate smoking in the near future. In addition, increased attention to controlling overweight and obesity, improving dietary patterns, controlling alcohol intake, and implementing population screening for early diagnosis are key strategies for cancer prevention. Special attention should be paid to Central and Eastern Europe that continue to have excess cancer mortality. The predicted rise in CRC mortality in young adults in the UK and other selected European countries suggests CRC screening should be considered starting at age 45-49 years in Europe, as proposed in the United States.<sup>19</sup>

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## DISCLOSURE

The authors have declared no conflicts of interest.

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