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Cancer Mortality Trends and Predictions for 2024 in Italy

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The prediction of numbers and trends for cancer mortality is useful for evaluating disease burden and reflects the impact of incidence, screening and advancement in early diagnosis and treatments for major cancer sites. Following our recent publication on the estimation of the number of cancer deaths and the corresponding mortality rates for all cancers and selected major cancer sites for the year 2024 in the European Union and the UK [1], here we provide corresponding figures for Italy.

We retrieved official death certifications for various cancer sites from the World Health Organization database in Italy [2]. 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 over the period 1970-2019. We derived age-standardized, mortality rates (ASR), using the world standard population, and to analyze ASR trends we fitted joinpoint regression models [3, 4]. To predict 2024 mortality figures, we applied a logarithmic Poisson joinpoint regression model to the number of deaths in each 5-year age group. We estimated age-specific numbers of deaths and their corresponding 95% prediction intervals (PIs), 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. We then calculated both age-specific and age-standardized death rates, along with their related 95% PIs, using the predicted age-specific number of death counts. Population predictions were obtained from the Eurostat database [5]. In addition, the number of deaths averted for all cancers from the peak observed in 1988 to 2024 was estimated for all cancers combined.

Statistical analyses were performed using the software R version 4.3.2 (R Development Core Team, 2022) and Joinpoint Regression Program version 5.1.0 (Statistical Methodology and Applications Branch, Surveillance Research Program, National Cancer Institute).

Table 1 gives the predicted cancer deaths and rates, along with their corresponding 95% PIs for 2024, in comparison with observed figures for 2019 in Italy. For 2024, we estimated 98,700 cancer deaths in men, with corresponding ASR of 103.9/100,000 (-9.0% vs 2019), and 82,000 in women, ASR of 72.1/100,000 (-4.4% vs 2019). Overall, the predicted ASRs are favourable for all cancer sites and both sexes, except for pancreatic cancer among men (+2.7% vs 2019) and women (+1.7% vs 2019), and for lung cancer among women (+5.9% vs 2019).

Figure 1 shows the trends in cancer mortality rates over calendar periods, among men and women, from 1970-74 to 2015-19, along with the predicted ASRs for 2024 with the corresponding PIs as well as the total avoided cancer deaths for men and women between the top rate in 1988 and 2024.

Among men, stomach cancer ASR decreased over the whole period, while most other cancer sites began falling in the early 1990s. Among women, the ASRs for stomach, leukemia, and uterine cancers have exhibited a decline since 1970, while rates for breast, colorectal, and ovarian cancers started to decline during the 1990-94 quinquennium. Pancreas and lung cancer showed unfavorable trends over the whole period. Since 1988, about 1,248,100 cancer deaths have been avoided in Italy, 921,900 in men and 326,200 in women, respectively.

The 2024 predicted mortality cancer figures are favourable in Italy. Rates fell by 9.0% in men and by 4.3% in women. Pancreatic cancer is the only cancer site that has shown a lack of progress for both sexes. In Italy in 2022, pancreatic cancer ranked sixth in the number of new cases (15,710) and fourth in the number of deaths (14,903) [6], in line with the European and USA's estimates [7, 8]. Patterns of smoking prevalence, which is the main risk factor for pancreatic cancer, along with overweight, obesity, diabetes and heavy alcohol consumption can only partly explain the observed pattern. Pancreatic cancer survival is still low, with limited progress in early

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Table 1. Number of predicted deaths and mortality rate for the year 2024 and comparison figures for 2019 for Italy, with 95% prediction intervals.

Sex	Cancer	Observed number of deaths 2019	Predicted number of deaths 2024 (95% PI)	Observed ASR 2019	Predicted ASR 2024 (95% PI)	% Difference 2024 vs 2019
Men	Stomach	5,277	4803 (4567-5039)	5.99	4.80 (4.43-5.17)	-19.80
	Colorectum	12,040	12425 (12055-12795)	13.32	12.76 (12.29-13.22)	-4.22
	Pancreas	6,267	6799 (6618-6981)	7.71	7.92 (7.66-8.18)	2.73
	Lung	22,853	21356 (20706-22006)	26.73	22.75 (21.89-23.61)	-14.89
	Prostate	7,694	7938 (7657-8219)	6.69	6.39 (6.15-6.63)	-4.41
	Bladder	4,748	5060 (4749-5372)	4.55	4.52 (4.18-4.85)	-0.77
	Leukemias	3,627	3758 (3617-3900)	4.35	3.88 (3.60-4.16)	-10.77
	All cancers	99,380	98684 (96906-100463)	114.18	103.91 (101.19-106.63)	-9.00
Women	Stomach	3,708	3405 (3217-3594)	3.08	2.63 (2.40-2.86)	-14.52
	Colorectum	9,971	9791 (9468-10115)	8.06	7.46 (7.19-7.73)	-7.45
	Pancreas	6,550	7045 (6837-7254)	5.78	5.88 (5.69-6.07)	1.71
	Lung	10,162	11414 (11068-11760)	10.60	11.22 (10.81-11.64)	5.92
	Breast	12,830	13501 (13118-13884)	13.97	14.05 (13.50-14.6)	0.56
	Uterus	3,098	3235 (3091-3380)	3.50	3.61 (3.43-3.79)	3.09
	Ovary	3,410	3448 (3283-3613)	4.05	3.90 (3.68-4.13)	-3.62
	Bladder	1,341	1490 (1389-1591)	0.97	1.03 (0.95-1.11)	6.39
	Leukemias	2,721	2793 (2671-2915)	2.45	2.30 (2.07-2.52)	-6.17
	All cancers	79,918	82008 (80713-83302)	75.38	72.09 (70.48-73.71)	-4.36

ASR, age-standardized rate; PI, prediction interval

diagnosis and treatment although the identification and targeting of specific tumour-associated antigens and mutations have been improved [9, 10].

Lung cancer among women also continues to show unfavorable trends, linked to the trends and prevalence of smoking among them. In Italy in 2022, lung cancer ranked third in the number of new cases (43,808) and first in the number of deaths (35,668) [6]. Sex-difference in mortality trends is also in line with the fact that the peak in smoking-attributable mortality among men was reached in the late 1980s in Western Europe, whereas for women it is now being reached [11].

In conclusion, projected cancer mortality rates for 2024 remain favorable in Italy, especially among men, due to smoking cessation. Lifestyle factors such as overweight, obesity, diabetes, and alcohol consumption may have contributed to the unfavorable trends in pancreatic cancer, whereas rising lung cancer trends among women likely reflect smoking patterns.

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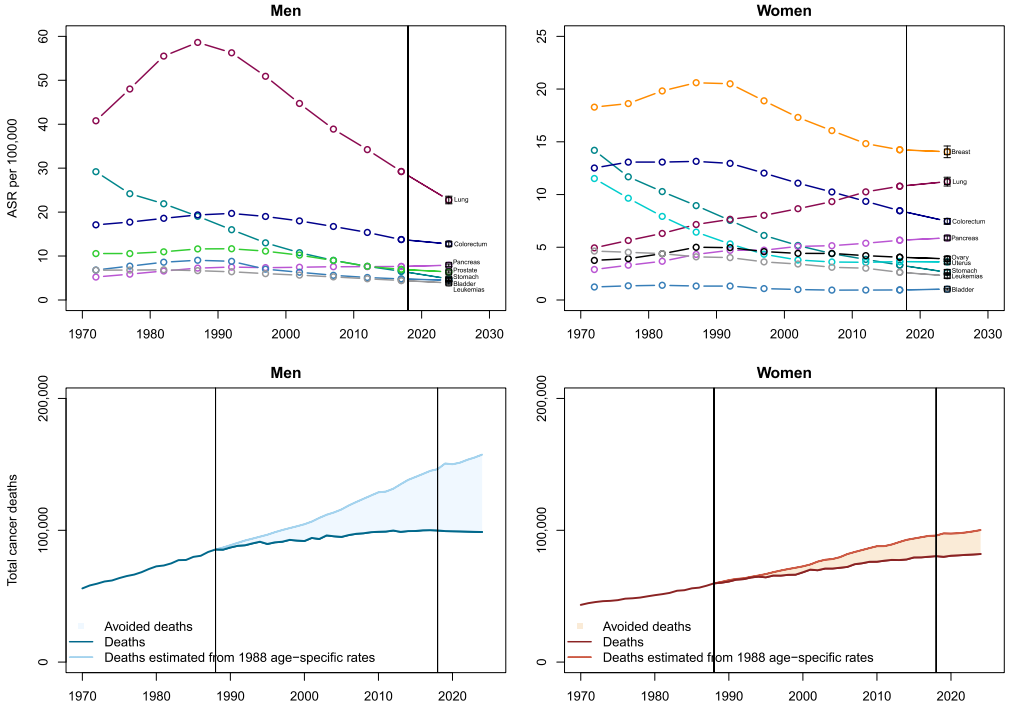
Figure 1. Age-standardized cancer mortality rate (ASR) trends from 1970-74 to 2015-19 and predicted rates for 2024 with 95% prediction intervals, for major cancer sites in men and women (top panels) and total avoided cancer deaths for men and women between the top rate in 1988 and 2024 in Italy (bottom panels).



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