Munich Cancer Registry

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ICD-10 C54: Corpus cancer

Incidence and Mortality

Year of diagnosis	1998-2020
Patients	12,169
Diseases	12,169
Creation date	12/21/2021
Database export	12/20/2021
Population (females)	2.50 m

Munich Cancer Registry
Cancer Registry Bavaria - Upper Bavaria Regional Center
at Klinikum Grosshadern/IBE
Marchioninistr. 15
Munich, 81377
Germany

https://www.tumorregister-muenchen.de/en

https://www.tumorregister-muenchen.de/en/facts/base/bC54__E-ICD-10-C54-Corpus-cancer-incidence-and-mortality.pdf

Index of figures and tables

Global Statements about the statistics on the Internet −
Baseline Statistics (grey button), **Survival** (red button)

In these analyses, the clinics and physicians of Upper Bavaria and the city and county of Landshut[#], with a total of 4.69 million inhabitants, account for the frequency of cancer diseases[##] and the achieved long term results. Additionally, the long term survival evaluated by the Munich Cancer Registry (MCR) is compared with the results of the population-based registry in the USA (SEER), which is useful for checking the consistency of the data on an international level.

In comparing several tables, inconsistent figures may be detected. This is based on the fact that different patient cohorts are included in the base calculation, for example when proportions of multiple tumors or DCO-cases[###] are concerned. In other cases the individual tumor diagnosis is the basis for calculation, for example with incidence.

The foot notes describe the currentness of the data. The baseline statistics and survival data are updated annually. This yearly analysis comprises the Annual Report of the MCR.

Clinics and physicians have access to essentially more detailed data, with which they can check, compare and in the best case optimize their own data and results.

We would be pleased to receive corrections, critique and useful suggestions. Just send an e-mail to tumor@ibe.med.uni-muenchen.de.

Munich Cancer Registry, December 2021

[#] Base data has been collected since 1998. An increase in new diseases is apparent, which is an effect of two extensions in the MCR catchment area (from a base population of 2.65 million to 4.10 in 2002, and to 4.69 million in 2007).

[##] Due to the high frequency and good prognosis of non-malignant skin cancer (C44), no systematic ascertainment is performed for this diagnosis. C44 is not designated as a primary, but rather as a secondary tumor.

[###] DCO (death certificate only) identifies a cancer case that first becomes available to the MCR through the death certificate.

ICD-10 codes (ICD-10 2015) used for specifying cancer site

Code	Description
C54.-	Malignant neoplasm of corpus uteri
C54.0	Isthmus uteri
C54.1	Endometrium
C54.2	Myometrium
C54.3	Fundus uteri
C54.8	Overlapping lesion of corpus uteri
C54.9	Corpus uteri, unspecified

INCIDENCE

Table 1

Cases with invasive cancer by year of diagnosis, proportions of DCO, further malignancies, deaths, and active follow-up (incl. DCO)

Year of diagnosis	All cases n	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	321	5	1.6	11.2	11.3	62.9	93.8
1999	318	6	1.9	10.8	11.1	62.6	95.0
2000	307	9	2.9	11.1	10.8	59.3	95.4
2001	343	17	5.0	11.3	10.6	60.6	93.6
2002	520	22	4.2	11.3	10.4	60.6	96.3 #
2003	513	12	2.3	11.1	10.2	54.8	94.9
2004	522	15	2.9	11.2	9.6	55.9	94.1
2005	541	10	1.8	11.6	9.3	55.3	93.3
2006	505	17	3.4	11.5	9.0	47.3	93.5
2007	624	31	5.0	11.5	8.8	52.7	91.8 #
2008	628	24	3.8	11.6	8.2	47.3	98.7
2009	614	17	2.8	12.0	7.7	46.1	96.7
2010	574	31	5.4	12.0	7.3	45.1	97.0
2011	606	16	2.6	12.3	6.9	41.9	96.7
2012	623	24	3.9	12.8	6.4	42.5	97.8
2013	650	21	3.2	13.1	5.8	39.8	96.9
2014	628	18	2.9	13.3	5.2	40.3	96.5
2015	596	19	3.2	13.4	4.5	31.5	93.5
2016	586	16	2.7	13.7	4.1	28.7	99.7
2017	601	13	2.2	13.8	3.3	23.3	99.0
2018	603	11	1.8	13.8	3.2	21.4	99.3
2019	500			13.9	2.2	15.2	99.4
2020	446			14.0	1.2	13.0	99.6 ##
1998-2020	12169	354	2.9	14.0	11.3	42.5	96.3

12,169 cases diagnosed 1998-2020 are related to a total of 12,169 patients. Currently, in 3,185 (26.2 %) of these 12,169 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 2,565 / 493 / 127 (21.1 % / 4.1 % / 1.0 %) patients exist having 2 / 3 / 4+ malignancies.

The increases of incident cases in 2002 and 2007 reflect the expansion to additional registry areas.

Please be aware that data of recent annual patient cohorts may not yet be fully processed. The years under evaluation can be retreived from the respective headings.

How to interpret:
In 2018, a subgroup of 603 cases has been diagnosed, of which 13.8 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 3.2 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 2

Incidence measures by year of diagnosis including DCO cases
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.94 m as of 2007, respectively)

Year of diagnosis	Cases n	Incidence raw	Incidence WS	Incidence ES	Incidence BRD-S
1998	321	27.3	14.0	20.0	24.2
1999	318	26.8	13.3	19.2	23.4
2000	307	25.6	12.8	18.4	22.5
2001	343	28.2	14.0	20.2	24.6
2002	520	26.6	13.2	18.8	22.6
2003	513	26.0	12.9	18.6	22.2
2004	522	26.4	12.8	18.6	22.5
2005	541	27.2	13.4	19.0	22.6
2006	505	25.1	11.9	17.1	20.9
2007	624	27.0	13.2	18.9	22.7
2008	628	27.1	12.9	18.5	22.3
2009	614	26.4	12.9	18.3	21.9
2010	574	24.5	11.1	16.2	20.0
2011	606	25.9	12.0	17.3	21.0
2012	623	26.4	12.1	17.4	21.1
2013	650	27.3	12.5	18.0	21.9
2014	628	26.1	11.8	17.0	20.7
2015	596	24.5	11.5	16.5	19.7
2016	586	23.9	11.4	16.2	19.2
2017	601	24.4	11.6	16.5	19.6
2018	603	24.3	11.5	16.3	19.4
2019	500	20.1	9.3	13.3	16.1
2020	446	18.0	8.5	12.1	14.3
1998–2020	12169	25.2	12.0	17.2	20.7

The computation of the incidence measures includes all cancers, irrespective of first or subsequent malignancy.

Table 3

Age distribution parameters by year of diagnosis
(incl. DCO)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	321	67.7	11.3	28.8	92.1	53.1	59.8	67.8	75.3	82.9
1999	318	68.5	11.0	33.6	96.9	54.5	60.4	68.5	76.5	83.3
2000	307	67.4	11.1	27.2	93.1	53.6	60.1	66.9	75.9	80.8
2001	343	68.6	11.5	26.3	95.5	54.0	61.1	69.0	76.6	83.2
2002	520	68.2	11.5	31.8	96.0	54.3	61.4	67.6	76.6	82.8
2003	513	68.0	11.3	31.2	93.4	53.4	60.4	67.4	76.2	83.0
2004	522	68.2	11.2	32.3	95.3	53.8	60.5	68.1	76.7	82.6
2005	541	67.9	11.4	30.2	98.0	53.1	61.5	67.7	74.9	83.4
2006	505	69.0	11.8	31.9	98.3	53.7	61.8	69.0	77.7	84.3
2007	624	68.1	11.4	36.5	99.2	53.1	60.4	68.2	76.5	82.6
2008	628	68.4	11.5	34.3	97.1	52.5	60.4	69.1	75.8	84.0
2009	614	68.0	11.8	38.1	102	52.6	60.8	68.6	75.1	83.3
2010	574	69.4	11.8	28.5	98.7	53.2	61.5	70.3	77.4	84.4
2011	606	68.6	12.1	29.5	95.5	52.2	60.4	69.9	77.0	84.1
2012	623	69.0	12.0	0.3	97.8	53.3	60.9	70.1	76.9	84.3
2013	650	68.8	12.4	30.6	99.7	53.4	60.2	70.1	77.7	84.7
2014	628	68.9	12.5	27.8	99.0	51.7	59.8	70.6	77.9	84.4
2015	596	68.1	11.9	37.9	102	52.5	59.5	68.8	76.5	83.0
2016	586	67.6	12.4	26.1	96.7	51.9	59.2	67.7	77.1	83.4
2017	601	67.8	11.6	29.4	96.6	52.9	59.5	68.2	76.5	82.4
2018	603	67.7	12.3	29.8	97.8	50.9	59.2	68.0	77.3	82.6
2019	500	67.7	12.0	27.6	95.5	51.6	58.6	69.2	77.7	81.7
2020	446	67.4	12.4	33.3	96.1	52.2	58.2	67.1	77.7	83.3
1998–2020	12169	68.2	11.8	0.3	102	52.8	60.2	68.8	76.8	83.4

Table 4

Age distribution by 5-year age group for period 2007-2020
(incl. DCO)

Age at diagnosis Years	Cases n	%	Cum.%
0-4	1	0.0	0.0
5-9	0	0.0	0.0
10-14	0	0.0	0.0
15-19	0	0.0	0.0
20-24	0	0.0	0.0
25-29	10	0.1	0.1
30-34	29	0.4	0.5
35-39	66	0.8	1.3
40-44	157	1.9	3.2
45-49	310	3.7	6.9
50-54	625	7.5	14.5
55-59	917	11.1	25.5
60-64	1050	12.7	38.2
65-69	1212	14.6	52.9
70-74	1365	16.5	69.4
75-79	1158	14.0	83.3
80-84	738	8.9	92.3
85+	641	7.7	100.0
All ages	8279	100.0	

Table 5

Age-specific incidence, DCO rate and proportion of all cancers for period 2007–2020

Age at diagnosis Years	Cases n	Age-spec. incidence	DCO rate n=241 %	Prop. all cancers n=155051 %
0- 4	1	0.1	100.0	0.6
5- 9		0.0		
10–14		0.0		
15–19		0.0		
20–24		0.0		
25–29	10	0.4		0.8
30–34	29	1.3		1.4
35–39	66	2.9		1.9
40–44	157	6.5	0.6	2.6
45–49	310	11.9	0.6	3.3
50–54	625	24.9	0.2	5.0
55–59	917	42.1	0.4	6.9
60–64	1050	55.3	0.6	6.7
65–69	1212	66.8	0.9	6.4
70–74	1365	79.4	1.1	6.9
75–79	1158	77.1	2.0	5.9
80–84	738	69.3	6.0	4.8
85+	641	61.5	20.7	3.9
All ages	8279		2.9	5.3
Incidence				
Raw		24.6		
WS		11.6		
ES		16.6		
BRD-S		19.9		

The age-specific incidence characterizes the disease risk in a particular age group. The age distribution depends on the patient population frequency in each age group and reflects the tangible clinical picture of everyday patients care (see following chart).

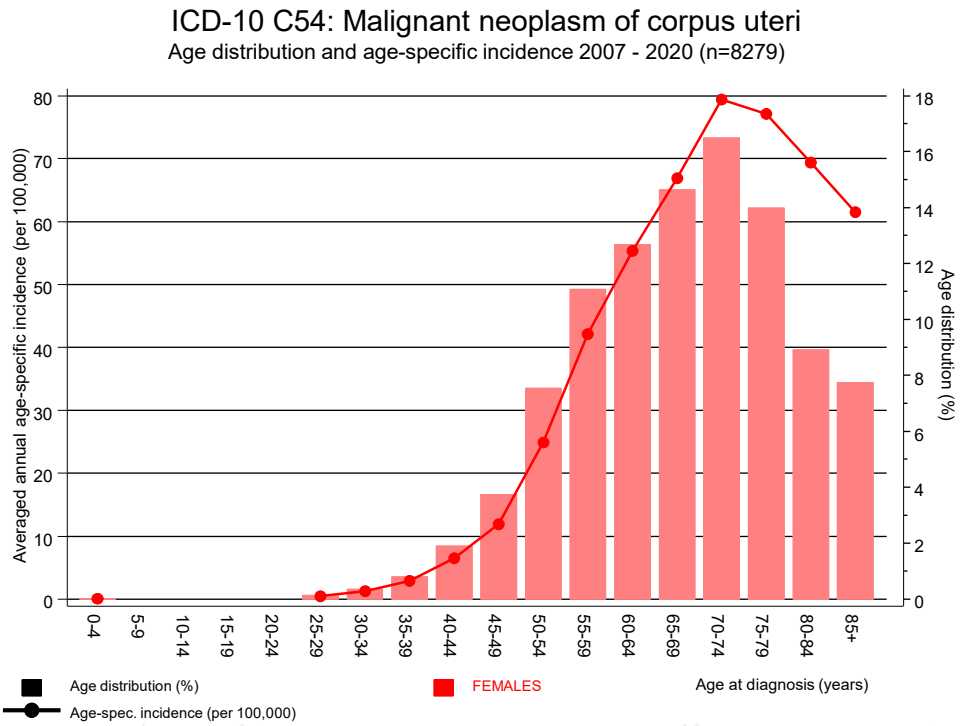

Figure 6. Age distribution (mean=68.3 yrs, median=69.1 yrs) and age-specific incidence.

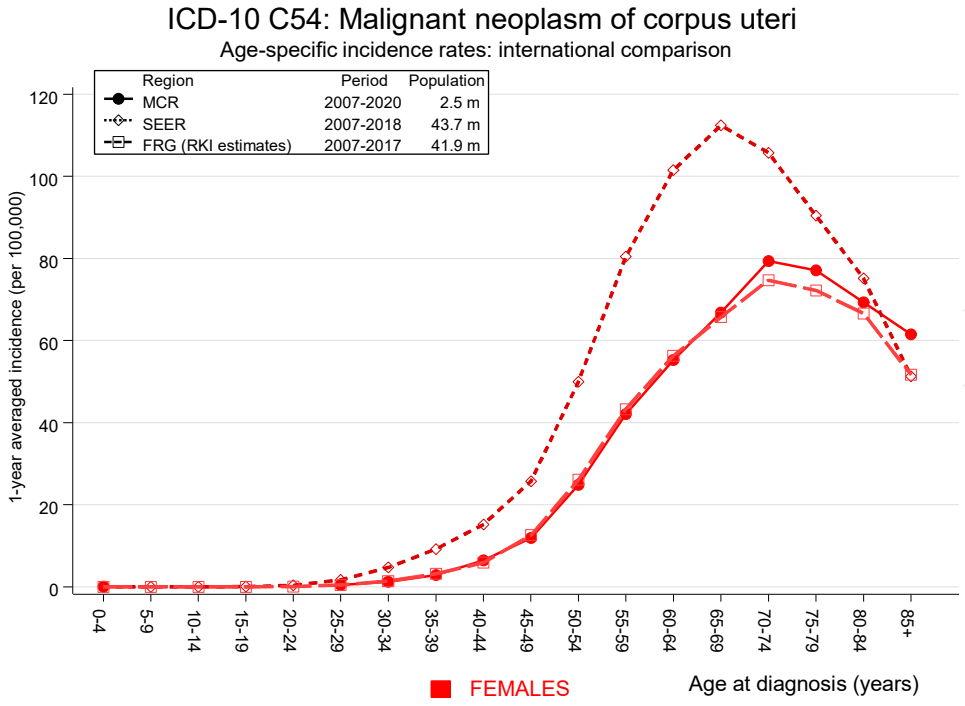

Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, RKI estimates) and SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

Estimated age-specific patient population of Germany, latest update: 16 March 2021. German Centre for Cancer Registry Data, Robert Koch Institute (RKI), based on data of the population based cancer registries. http://www.krebsdaten.de. Last access: 08/17/2021
Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 21 Regs Research Data, released April 2021, based on the November 2020 submission. http://www.seer.cancer.gov.

Table 7

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of further malignancies for period 1998–2020

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C03–C06	Oral cavity	4	3.3	1.2	0.3	3.1		0.1	
C09–C10	Oropharynx	5	2.3	2.2	0.7	5.1		0.6	
C15	Oesophagus	7	3.8	1.8	0.7	3.7		0.7	14.3
C16	Stomach	36	20.1	1.8	1.3	2.5	#	3.3	13.9
C17	Small intestine	13	3.1	4.2	2.2	7.2	#	2.1	
C18	Colon	153	57.9	2.6	2.2	3.1	#	19.7	9.8
C19–C20	Rectum	33	23.4	1.4	1.0	2.0		2.0	9.1
C21	Anus/canal	3	3.2	0.9	0.2	2.8		−0.0	
C22	Liver	12	7.4	1.6	0.8	2.8		1.0	8.3
C23–C24	Bile	23	8.5	2.7	1.7	4.1	#	3.0	13.0
C25	Pancreas	56	27.9	2.0	1.5	2.6	#	5.8	19.6
C26	GI cancer	4	1.0	4.0	1.1	10.3	#	0.6	50.0
C33–C34	Lung	120	44.0	2.7	2.3	3.3	#	15.8	13.3
C38,C45	Mesothelioma	3	1.1	2.7	0.6	7.9		0.4	
C43	Malign. melanoma	37	21.5	1.7	1.2	2.4	#	3.2	
C46,C49	Soft tissue	11	3.3	3.3	1.7	5.9	#	1.6	
C48	Peritoneal	25	2.4	10.4	6.7	15.3	#	4.7	
C50	Breast	470	173.4	2.7	2.5	3.0	#	61.5	2.8
C51	Vulva	16	6.3	2.6	1.5	4.1	#	2.0	6.3
C52	Vagina	9	1.1	8.1	3.7	15.4	#	1.6	
C53	Cervix uteri	39	6.7	5.8	4.1	8.0	#	6.7	30.8
C55,C57	Fem. genitals un	12	1.3	9.6	4.9	16.7	#	2.2	91.7
C56	Ovary	300	23.3	12.9	11.5	14.4	#	57.4	8.3
C64	Kidney	35	14.0	2.5	1.7	3.5	#	4.4	11.4
C65	Renal pelvis	5	1.9	2.6	0.9	6.1		0.6	
C66	Ureter	5	1.0	4.9	1.6	11.4	#	0.8	
C67	Bladder	27	11.7	2.3	1.5	3.3	#	3.2	7.4
C70–C72	CNS cancer	16	7.5	2.1	1.2	3.5	#	1.8	25.0
C73	Thyroid	16	8.3	1.9	1.1	3.1	#	1.6	
C74–C80	Cancer others	3	2.1	1.5	0.3	4.2		0.2	
C76–C79	CUP	22	10.7	2.0	1.3	3.1	#	2.3	4.5
C81	Hodgkin lymphoma	4	1.0	4.1	1.1	10.5	#	0.6	
C82–C85	NHL	43	23.2	1.9	1.3	2.5	#	4.1	4.7
C90	Mult. myeloma	8	7.4	1.1	0.5	2.1		0.1	12.5
C91–C96	Leukaemia	23	8.6	2.7	1.7	4.0	#	3.0	17.4
Others, specified		9	3.9	2.3	1.0	4.3	#	1.1	
Not observed		0	35.4	0.0	0.0	0.1	#	−7.3	
All further malignancies		1607	583.1	2.8	2.6	2.9	#	212.4	8.5

Patients	11834
Median age at next malignancy (years)	72.6
Person-years	48207
Mean observation time (years)	4.1
Median observation time (years)	2.2

The occurrence of further specified malignancy is statistically significant.

Further observed malignancies with count 1 to 2 are pooled in category “Others, specified”.

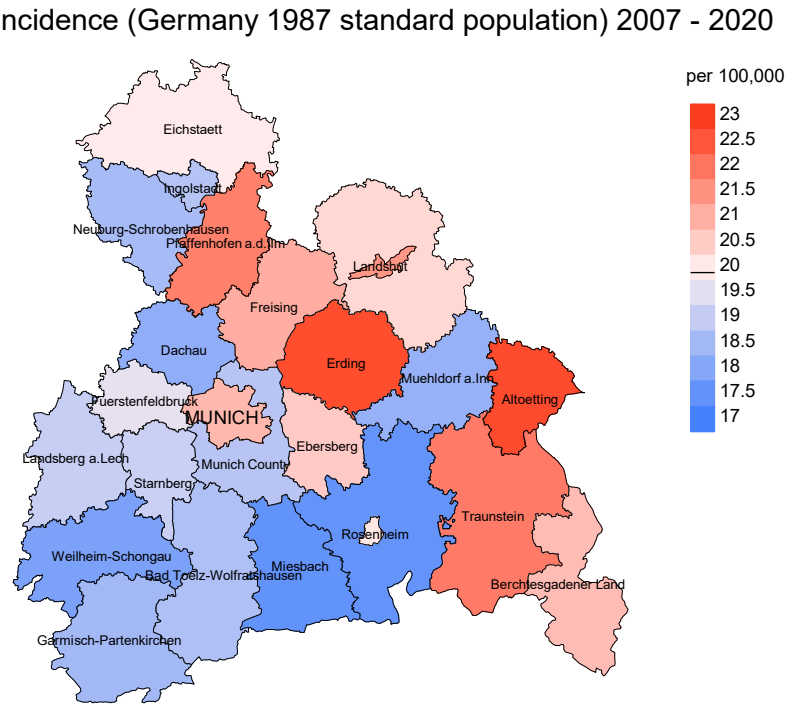

Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (19.9/100,000 WS N=8,279).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,727 female residents (averaged) in the period from 2007 to 2020 a total of 234 women were identified with newly diagnosed corpus cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 20.5/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 17.2 and 24.3/100,000.

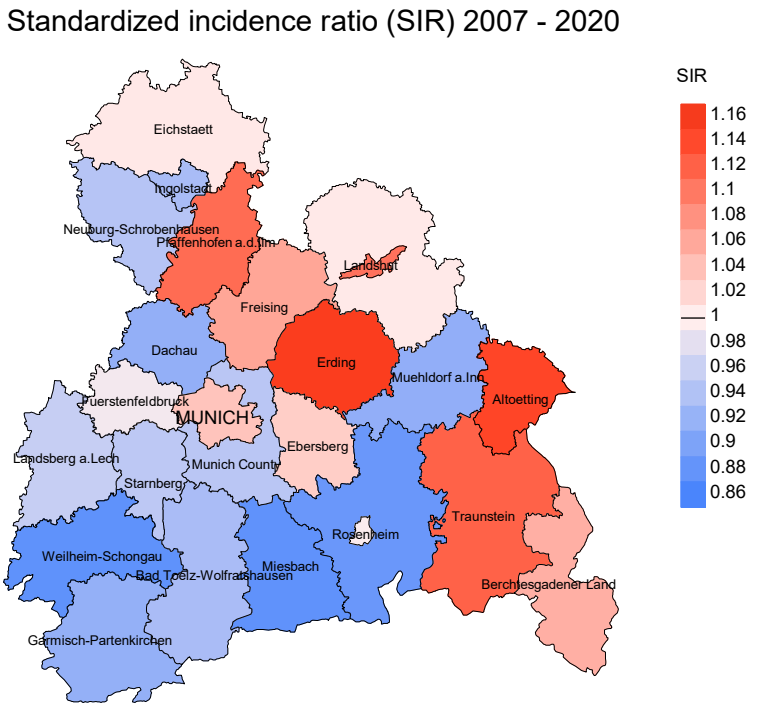

Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (N=8,279).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2020 a total of 234 women were identified with newly diagnosed corpus cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.03. Though, the value of this parameter may vary with an underlying probability of 99% between 0.86 and 1.21, and is therefore not statistically striking.

MORTALITY

Table 9a

Annual cohorts: Incident cancers, follow-up status, proportion of DCO, deaths among the annual cohorts and proportion of available death certificates (with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.94 m as of 2007, respectively)

Year of diagnosis	Incident cases n	Prop. actively followed %	Prop. DCO %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	321	93.8	1.6	202	62.9	89.6
1999	318	95.0	1.9	199	62.6	90.5
2000	307	95.4	2.9	182	59.3	91.2
2001	343	93.6	5.0	208	60.6	96.2
2002	520	96.3	4.2	315	60.6	93.7
2003	513	94.9	2.3	281	54.8	93.2
2004	522	94.1	2.9	292	55.9	93.5
2005	541	93.3	1.8	299	55.3	92.3
2006	505	93.5	3.4	239	47.3	94.6
2007	624	91.8	5.0	329	52.7	93.6
2008	628	98.7	3.8	297	47.3	93.6
2009	614	96.7	2.8	283	46.1	94.0
2010	574	97.0	5.4	259	45.1	94.2
2011	606	96.7	2.6	254	41.9	96.5
2012	623	97.8	3.9	265	42.5	93.2
2013	650	96.9	3.2	259	39.8	90.0
2014	628	96.5	2.9	253	40.3	91.3
2015	596	93.5	3.2	188	31.5	86.7
2016	586	99.7	2.7	168	28.7	85.7
2017	601	99.0	2.2	140	23.3	76.4
2018	603	99.3	1.8	129	21.4	73.6
2019	500	99.4		76	15.2	82.9
2020	446	99.6		58	13.0	86.2
1998-2020	12169	96.3	2.9	5175	42.5	91.5

Table 9b

Annual cohorts of incident cancers and deaths, proportion of death certificates and cases deceased within the same year of being diagnosed with cancer (incl. DCO)
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.94 m as of 2007, respectively)

Year of diagnosis/ death	Incident cases n	Deaths n	Prop. deaths with death certific. %	Deaths in same year n	Prop. deaths in same year %
1998	321	128	91.4	21	6.5
1999	318	135	93.3	15	4.7
2000	307	160	93.8	27	8.8
2001	343	152	92.1	26	7.6
2002	520	249	96.4	43	8.3
2003	513	286	96.9	36	7.0
2004	522	248	96.8	36	6.9
2005	541	273	94.5	33	6.1
2006	505	270	96.7	35	6.9
2007	624	332	97.9	59	9.5
2008	628	317	99.1	43	6.8
2009	614	339	99.1	42	6.8
2010	574	351	98.6	48	8.4
2011	606	391	96.7	47	7.8
2012	623	375	99.2	57	9.1
2013	650	420	98.1	57	8.8
2014	628	403	99.0	54	8.6
2015	596	402	97.3	38	6.4
2016	586	402	98.5	47	8.0
2017	601	452	96.5	50	8.3
2018	603	340	64.4	33	5.5
2019	500	318	41.8	23	4.6
2020	446	412	83.3	33	7.4
1998–2020	12169	7155	92.4	903	7.4

Table 9c

Annual cohorts of deaths, proportion of cancer-related and non-cancer-related deaths, and cancer recorded on death certificates (incl. DCO)
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.94 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. non-cancer-related %	Prop. cancer recorded on death certificate %
1998	128	54.7	45.3	69.2
1999	135	55.6	44.4	65.1
2000	160	52.5	47.5	63.3
2001	152	43.4	56.6	65.7
2002	249	58.2	41.8	72.9
2003	286	59.8	40.2	71.1
2004	248	61.7	38.3	70.4
2005	273	59.0	41.0	68.2
2006	270	56.3	43.7	67.0
2007	332	58.4	41.6	68.0
2008	317	57.1	42.9	65.6
2009	339	56.0	44.0	63.1
2010	351	58.7	41.3	67.3
2011	391	57.0	43.0	68.3
2012	375	56.5	43.5	64.8
2013	420	56.9	43.1	64.3
2014	403	57.3	42.7	66.4
2015	402	52.2	47.8	58.6
2016	402	55.2	44.8	64.6
2017	452	51.1	48.9	58.5
2018	340	41.5	58.5	49.8
2019	318	37.4	62.6	66.9
2020	412	39.6	60.4	58.9
1998-2020	7155	53.7	46.3	64.8

Table 10

Medians of age at death according to the grouping in Table 9

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	128	80.0	75.1	83.2	77.3
1999	135	81.2	78.0	84.8	79.0
2000	160	80.1	77.8	83.1	78.2
2001	152	81.0	77.4	82.3	79.7
2002	249	80.3	76.4	84.0	78.9
2003	286	78.7	75.1	83.6	76.7
2004	248	79.5	75.2	84.2	77.4
2005	273	81.7	76.3	84.2	77.8
2006	270	81.0	76.3	85.6	76.8
2007	332	83.0	78.9	86.2	80.4
2008	317	81.3	75.6	85.9	77.3
2009	339	82.0	75.9	86.1	77.0
2010	351	82.9	77.8	86.1	80.0
2011	391	82.2	76.9	85.7	78.2
2012	375	82.2	77.8	87.5	79.1
2013	420	82.7	77.8	87.1	78.3
2014	403	80.7	77.0	86.5	77.9
2015	402	81.9	78.0	87.4	78.5
2016	402	81.0	77.3	86.5	78.4
2017	452	81.8	78.4	86.6	78.6
2018	340	82.3	77.0	85.1	78.8
2019	318	81.2	77.1	85.0	79.3
2020	412	82.9	79.5	84.8	80.4
1998–2020	7155	81.6	77.1	85.7	78.4

By 2018, Bavarians' life expectancy at birth is estimated at 79.3 years for boys and 83.8 years for girls.

Deaths of patients are considered to be cancer-related, in case that fact was recorded on the death certificate, or patients had suffered from metastasis or recurrence.

Table 11

Mortality measures (cancer-related death) and mortality-incidence-index by year of death

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	70	6.0	0.22	2.6	0.18	3.8	0.19	4.9	0.20
1999	75	6.3	0.24	2.3	0.17	3.6	0.19	5.1	0.22
2000	84	7.0	0.27	2.5	0.19	4.0	0.22	5.9	0.26
2001	66	5.4	0.19	2.1	0.15	3.2	0.16	4.4	0.18
2002	145	7.4	0.28	2.7	0.20	4.2	0.22	5.8	0.26
2003	171	8.7	0.33	3.2	0.25	5.1	0.27	7.0	0.32
2004	153	7.7	0.29	2.9	0.22	4.5	0.24	6.0	0.27
2005	161	8.1	0.30	2.9	0.22	4.5	0.24	6.0	0.26
2006	152	7.6	0.30	2.7	0.22	4.2	0.25	5.8	0.28
2007	194	8.4	0.31	2.8	0.21	4.4	0.23	6.1	0.27
2008	181	7.8	0.29	2.8	0.22	4.4	0.24	6.0	0.27
2009	190	8.2	0.31	2.8	0.22	4.4	0.24	6.0	0.28
2010	206	8.8	0.36	2.8	0.25	4.5	0.28	6.2	0.31
2011	223	9.5	0.37	3.2	0.26	5.0	0.29	6.8	0.32
2012	212	9.0	0.34	2.9	0.24	4.6	0.26	6.3	0.30
2013	239	10.0	0.37	3.1	0.25	5.0	0.28	7.0	0.32
2014	231	9.6	0.37	3.1	0.26	4.9	0.29	6.9	0.33
2015	210	8.6	0.35	2.8	0.24	4.4	0.27	6.1	0.31
2016	222	9.0	0.38	2.8	0.25	4.5	0.28	6.3	0.33
2017	231	9.4	0.38	2.9	0.25	4.7	0.28	6.5	0.33
2018	141	5.7	0.23	1.9	0.16	2.9	0.18	4.0	0.21
2019	119	4.8	0.24	1.6	0.18	2.5	0.19	3.5	0.22
2020	163	6.6	0.37	2.1	0.24	3.2	0.27	4.5	0.32
1998-2020	3839	8.0	0.32	2.7	0.22	4.2	0.25	5.8	0.28

Table 12

Age distribution of age at death (cancer-related) for period 2007-2020
(**incl. multiple malignancies**)

Age at death Years	Cases n	%	Cum.%
0-4			
5-9			
10-14			
15-19			
20-24			
25-29			
30-34	4	0.1	0.1
35-39	3	0.1	0.3
40-44	15	0.5	0.8
45-49	29	1.0	1.8
50-54	67	2.4	4.3
55-59	99	3.6	7.9
60-64	171	6.2	14.0
65-69	314	11.4	25.4
70-74	421	15.2	40.7
75-79	546	19.8	60.4
80-84	494	17.9	78.3
85+	599	21.7	100.0
All ages	2762	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**incl. multiple malignancies**)

Age at death Years	Cases n	Age-spec. mortality	MI-index	Prop. all cancers %
0- 4		0.0		
5- 9		0.0		
10-14		0.0		
15-19		0.0		
20-24		0.0		
25-29		0.0		
30-34	4	0.2	0.14	2.2
35-39	3	0.1	0.05	0.7
40-44	15	0.6	0.10	1.8
45-49	29	1.1	0.09	1.7
50-54	67	2.7	0.11	2.5
55-59	99	4.5	0.11	2.6
60-64	171	9.0	0.16	3.4
65-69	314	17.3	0.26	4.5
70-74	421	24.5	0.31	4.8
75-79	546	36.4	0.47	5.6
80-84	494	46.4	0.67	5.3
85+	599	57.5	0.93	5.0
All ages	2762			4.5
Mortality				
Raw		8.2	0.33	
WS		2.7	0.23	
ES		4.2	0.26	
BRD-S		5.9	0.29	
PYLL-70				
per 100,000		20.5		
ES		16.7		
AYLL-70		8.2		

Table 14

Further malignancies in deaths in period 1998–2020

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03–C06	Oral cavity	6	0.3	3	50.0			3	50.0
C09–C10	Oropharynx	6	0.3	1	16.7			5	83.3
C15	Oesophagus	10	0.5					10	100.0
C16	Stomach	53	2.6	6	11.3	1	1.9	46	86.8
C17	Small intestine	11	0.5	1	9.1	2	18.2	8	72.7
C18	Colon	180	8.9	47	26.1	15	8.3	118	65.6
C19–C20	Rectum	93	4.6	38	40.9			55	59.1
C21	Anus/canal	12	0.6	7	58.3			5	41.7
C22	Liver	18	0.9	2	11.1	1	5.6	15	83.3
C23–C24	Bile	29	1.4	2	6.9			27	93.1
C25	Pancreas	88	4.4	2	2.3	3	3.4	83	94.3
C33–C34	Lung	156	7.7	9	5.8	3	1.9	144	92.3
C38,C45	Mesothelioma	6	0.3	1	16.7			5	83.3
C43	Malign. melanoma	56	2.8	33	58.9	1	1.8	22	39.3
C44	Skin others	92	4.6	43	46.7	5	5.4	44	47.8
C46,C49	Soft tissue	12	0.6	4	33.3	1	8.3	7	58.3
C48	Peritoneal	19	0.9	1	5.3	8	42.1	10	52.6
C50	Breast	557	27.7	300	53.9	57	10.2	200	35.9
C51	Vulva	26	1.3	3	11.5	4	15.4	19	73.1
C52	Vagina	15	0.7	1	6.7	5	33.3	9	60.0
C53	Cervix uteri	48	2.4	23	47.9	7	14.6	18	37.5
C54	Corpus uteri	6	0.3			1	16.7	5	83.3
C55,C57	Fem. genitals un	22	1.1	3	13.6	3	13.6	16	72.7
C56	Ovary	187	9.3	16	8.6	122	65.2	49	26.2
C64	Kidney	35	1.7	9	25.7	4	11.4	22	62.9
C66	Ureter	6	0.3					6	100.0
C67	Bladder	59	2.9	5	8.5	8	13.6	46	78.0
C69	Eye melanoma	7	0.3	4	57.1			3	42.9
C70–C72	CNS cancer	25	1.2	6	24.0			19	76.0
C73	Thyroid	16	0.8	9	56.3			7	43.8
C76–C79	CUP	29	1.4	4	13.8	1	3.4	24	82.8
C82–C85	NHL	41	2.0	16	39.0	3	7.3	22	53.7
C90	Mult. myeloma	12	0.6	1	8.3			11	91.7
C91–C96	Leukaemia	40	2.0	9	22.5	2	5.0	29	72.5
Others, specified		36	1.8	10	27.8	2	5.6	24	66.7
All further malignancies		2014	100.0	619	30.7	259	12.9	1136	56.4

Further malignancies with number of cases 1 to 5 are pooled in category “Others, specified”.

ICD-10 C44 (Other malignant neoplasms of skin) is not systematically recorded by MCR and therefore not considered for evaluation as a particular primary but at least as a further malignancy.

Table 15

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**First primaries only** *)

Age at death Years	Cases n	Age-spec. mortality	MI-index	Prop. all cancers %
0- 4		0.0		
5- 9		0.0		
10-14		0.0		
15-19		0.0		
20-24		0.0		
25-29		0.0		
30-34	2	0.1	0.08	1.3
35-39	3	0.1	0.05	0.8
40-44	12	0.5	0.09	1.6
45-49	21	0.8	0.08	1.5
50-54	54	2.1	0.10	2.4
55-59	81	3.7	0.10	2.5
60-64	137	7.2	0.15	3.4
65-69	242	13.3	0.24	4.4
70-74	331	19.3	0.30	4.9
75-79	430	28.6	0.47	5.7
80-84	374	35.1	0.67	5.2
85+	479	45.9	1.00	5.1
All ages	2166			4.4
Mortality				
Raw		6.4	0.32	
WS		2.1	0.22	
ES		3.3	0.24	
BRD-S		4.6	0.28	
PYLL-70				
per 100,000		16.2		
ES		13.1		
AYLL-70		8.3		

* See corresponding tables with multiple malignancies.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**Single primaries only** *)

Age at death Years	Cases n	Age-spec. mortality	MI-index	Prop. all cancers %
0- 4		0.0		
5- 9		0.0		
10-14		0.0		
15-19		0.0		
20-24		0.0		
25-29		0.0		
30-34	2	0.1	0.08	1.3
35-39	3	0.1	0.06	0.8
40-44	11	0.5	0.09	1.5
45-49	19	0.7	0.08	1.3
50-54	50	2.0	0.10	2.3
55-59	65	3.0	0.09	2.1
60-64	115	6.1	0.14	2.9
65-69	181	10.0	0.20	3.4
70-74	234	13.6	0.24	3.6
75-79	311	20.7	0.38	4.3
80-84	235	22.1	0.45	3.4
85+	319	30.6	0.71	3.5
All ages	1545			3.3
Mortality				
Raw		4.6	0.25	
WS		1.6	0.18	
ES		2.5	0.20	
BRD-S		3.3	0.22	
PYLL-70				
per 100,000		13.8		
ES		11.3		
AYLL-70		8.8		

* See corresponding tables with multiple malignancies.

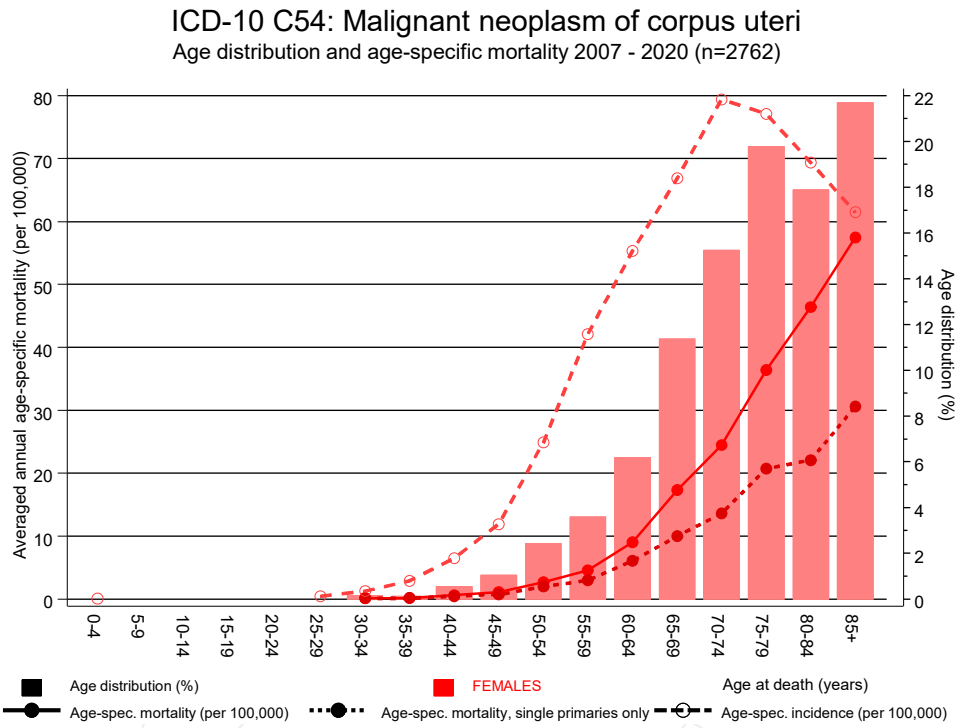

Figure 17. Distribution of age at death (bars; n=mean=70.4 yrs, median=71.6 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

The difference between age at diagnosis (Table 3) and age at corpus cancer-related death (see Table 10) should be considered.

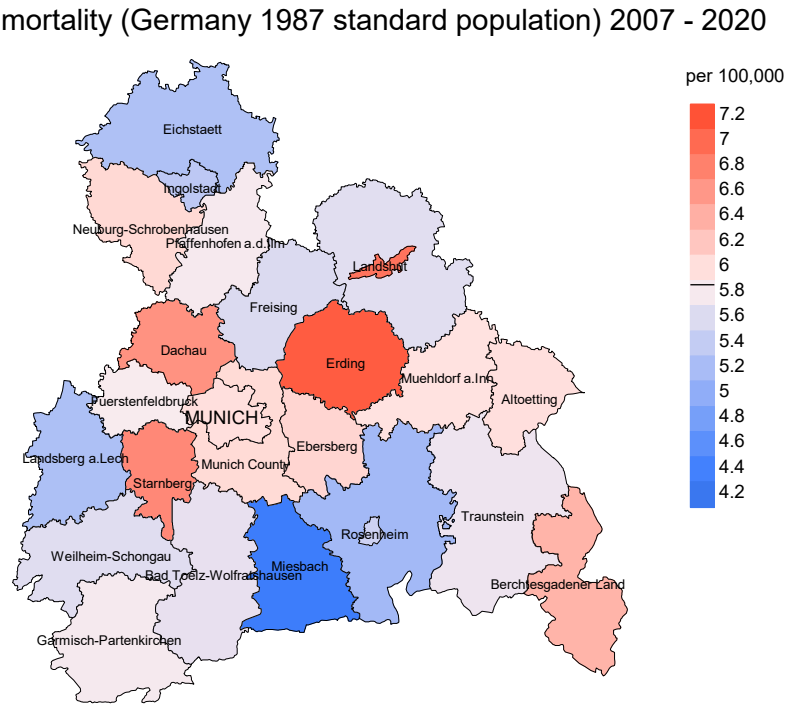

Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2020. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (5.9/100,000 WS N=2,762).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,727 female residents (averaged) in the period from 2007 to 2020 a total of 80 women died from corpus cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 6.1/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 4.4 and 8.1/100,000.

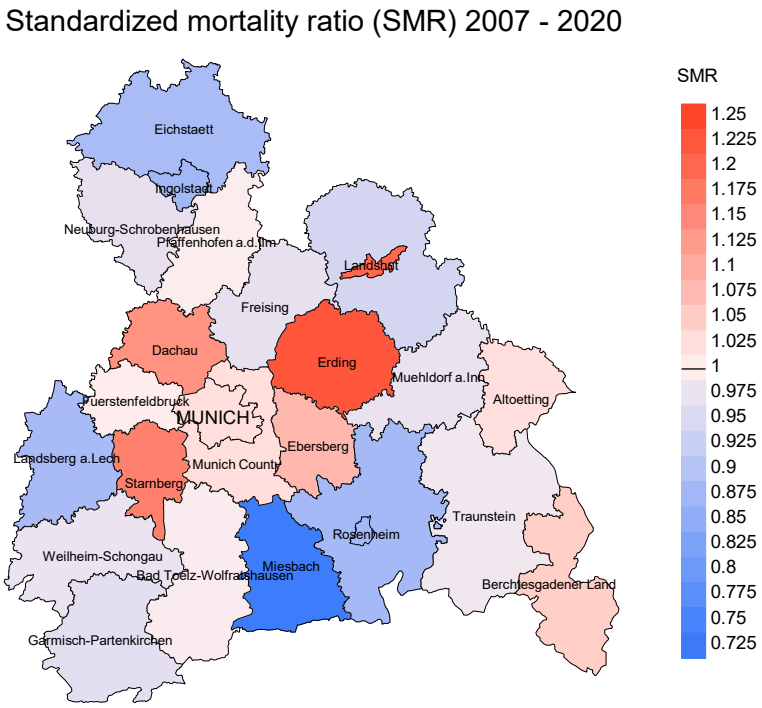

Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (N=2,762).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2020 a total of 80 women died from corpus cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.08. Though, the value of this parameter may vary with an underlying probability of 99% between 0.80 and 1.44, and is therefore not statistically striking.

Statistical Notes

In all tables and figures the respective reference values should be carefully considered. The incidence rates include diagnoses (with multiple primary), and death certificate only (DCO) cases, where applicable. For mortality statistics patients, diagnoses and progressive course of disease are presented. In the calculations, all courses of disease are considered whereby progressions occurred and/or death certificate identified progressive cancers were ascertained. Additionally there are three groups of disease course to consider:

1. **All multiple primaries included**

   The mortality statistic describes the tumor-specific death, independent of any malignancy. The patient perspective, induced secondary malignancies, and the problem of multiple malignancies from the same primary tumor all have reasons for their inclusion.

2. **First singular primary** (no information about other prior or synchronous malignancy)

   The mortality statistic describes the cancer-related death for patients who have no therapeutic restrictions due to a previous or synchronous cancer. These statistics are comparable to studies that have exclusion criteria based on a second malignancy.

3. **Single primary** (no information about other prior, syn- or metachronous malignancy)

   The mortality statistic describes the tumor-specific death that occurs without any impact through secondary primaries, earlier, synchronous, later or induced. Precisely the difference between disease group 1 and 2 highlight the magnitude of the problem of secondary malignancies.

For this reason differences appear concerning official mono-causal mortality statistics. To judge the maximum deviation, 2 further tables are presented. In the first table the distribution of secondary malignancies before, at or after the described cancer are shown, that could be an alternative cause of death. In the second table, the age-specific mortality rates for all courses of disease, without designation of secondary malignancies are shown.

A previously minimally acknowledged statistic is the **age at death**, which allows for a good assessment of the quality of classification of the apparent tumor-specific death. For assumed tumor-independent deaths, the age of death should be estimated from the age of diagnosis and the normal life expectancy, whereas tumor-dependent deaths can be estimated from the age of diagnosis plus the average tumor-specific life expectancy. The comparison of different tumors demonstrates this association, if the causes of cancer and the competing cause of death are independent of each other (e.g. breast and colon versus head&neck and lung).

The ratio of mortality and incidence (mortality-to-incidence ratio, **MIR**, **MI-Index**) is a statistical index that allows for the evaluation of the quality of data. For diseases with poor prognoses, comparable values are obtained from all age groups, because to a large extent, the numerator and denominator contain the same cases. For tumors with a good prognosis, increasing and decreasing incidence and age-specific differences in prognosis can more strongly alter the MIR. Additionally, attention should be paid to the confidence intervals where fewer cases are reported.

The complexity of problems identified here emphasizes the importance of relative survival data for the appropriate analysis of long term results.

As a measurement of the burden of disease, the number of potential life years loss due to premature deaths in a cohort can be calculated (**PYLL**, potential years of life lost, standardized per 100,000 persons or per European standard) as well as the average loss of life years per individual (**AYLL**, average years of life lost). Depending upon the analytic aim (health economy, prevention, health care research) different methods exist for the generation of these measurements. In the results presented here, the age for a premature death is considered to be before 70 years, according to the guidelines of the OECD and the WHO (as seen in the abbreviation PYLL-70 or AYLL-70).

Shortcuts

MCR	Munich Cancer Registry (Tumorregister München)
GEKID	Association of Population-based Cancer Registries in Germany (Gesellschaft der epidemiologischen Krebsregister in Deutschland e.V.)
SEER	Surveillance, Epidemiology, and End Results (USA)
DCO	Death certificate only
BRD-S	German (FRG) standard population
ES	European standard population (old)
WS	World standard population
SIR	Standardized incidence ratio
CI	Confidence interval
EAR	Excess absolute risk = excess cancer cases (O - E) per 10,000 person-years
PYLL-70	Potential years of life lost prior to age 70 given a person dies before that age
AYLL-70	Average years of life lost prior to age 70 given a person dies before that age
SMR	Standardized mortality ratio
MI-index	Ratio of mortality to incidence, MIR
FRG	Federal Republic of Germany

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