

# Munich Cancer Registry



- ▶ Survival
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## ICD-10 C54: Corpus cancer

### Incidence and Mortality

Year of diagnosis	1998-2019
Patients	11,650
Diseases	11,651
Creation date	01/25/2021
Database export	01/07/2021
Population (females)	2.48 m





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

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**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<sup>#</sup>, with a total of 4.69 million inhabitants, account for the frequency of cancer diseases<sup>##</sup> 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<sup>###</sup> 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](mailto:tumor@ibe.med.uni-muenchen.de).

Munich Cancer Registry, January 2021

<sup>#</sup> 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).

<sup>##</sup> 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.

<sup>###</sup> 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	11.0	61.4	93.5
1999	318	6	1.9	10.8	10.7	58.2	95.0
2000	306	9	2.9	11.1	10.4	56.5	95.1
2001	342	17	5.0	11.3	10.3	60.2	93.6
2002	520	22	4.2	11.3	10.1	56.2	95.0 #
2003	513	12	2.3	11.1	9.8	52.0	94.5
2004	522	15	2.9	11.2	9.2	53.6	93.9
2005	541	10	1.8	11.5	8.8	51.2	93.2
2006	505	17	3.4	11.4	8.5	44.4	92.7
2007	623	31	5.0	11.5	8.3	49.4	91.3 #
2008	627	24	3.8	11.6	7.6	45.0	98.4
2009	614	17	2.8	11.9	7.2	43.2	96.1
2010	574	31	5.4	12.0	6.8	41.6	97.0
2011	603	16	2.7	12.3	6.4	38.8	96.0
2012	620	24	3.9	12.8	5.9	40.6	97.7
2013	651	22	3.4	13.1	5.2	36.9	96.6
2014	621	18	2.9	13.3	4.6	34.9	96.1
2015	596	19	3.2	13.3	4.0	26.3	93.0
2016	579	16	2.8	13.7	3.7	24.9	99.7
2017	599	13	2.2	13.7	3.0	20.2	99.0
2018	577	7	1.2	13.8	2.9	14.6	99.5
2019	479			13.9	1.9	9.2	65.3 ##
1998-2019	11651	351	3.0	13.9	11.0	40.2	94.5

11,651 cases diagnosed 1998-2019 are related to a total of 11,650 patients. Currently, in 3,004 (25.8 %) of these 11,650 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 2,433 / 455 / 116 (20.9 % / 3.9 % / 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 retrieved from the respective headings.

How to interpret:

In 2017, a subgroup of 599 cases has been diagnosed, of which 13.7 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 3.0 % 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 4.92 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	306	25.5	12.7	18.4	22.4
2001	342	28.1	13.9	20.1	24.5
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	623	27.0	13.1	18.9	22.7
2008	627	27.0	12.9	18.5	22.2
2009	614	26.4	12.9	18.3	21.9
2010	574	24.5	11.1	16.2	20.0
2011	603	25.8	11.9	17.2	20.9
2012	620	26.3	12.0	17.3	21.0
2013	651	27.3	12.5	18.0	22.0
2014	621	25.8	11.6	16.8	20.5
2015	596	24.5	11.6	16.5	19.7
2016	579	23.6	11.3	16.0	19.0
2017	599	24.3	11.5	16.4	19.5
2018	577	23.2	11.1	15.7	18.7
2019	479	19.3	8.9	12.7	15.4
1998-2019	11651	25.4	12.1	17.4	20.9

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	Std.		Median						
		Mean	dev.	Min.	Max.	10%	25%	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	306	67.4	11.1	27.2	93.1	53.6	60.1	67.1	75.9	80.8
2001	342	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	623	68.1	11.4	36.5	99.2	53.1	60.4	68.2	76.5	82.6
2008	627	68.4	11.5	34.3	97.1	52.5	60.4	69.1	75.9	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	603	68.6	12.1	29.5	95.5	52.2	60.4	69.9	77.1	84.1
2012	620	69.1	12.0	0.3	97.8	53.4	61.1	70.2	76.9	84.3
2013	651	68.8	12.4	30.6	99.7	53.4	60.2	70.1	77.7	84.6
2014	621	68.9	12.4	27.8	99.0	52.2	59.9	70.7	77.9	84.3
2015	596	68.1	12.0	34.4	102	52.4	59.5	68.8	76.4	83.0
2016	579	67.7	12.4	26.1	96.7	51.9	59.2	67.7	77.1	83.5
2017	599	67.8	11.6	29.4	96.6	52.9	59.5	68.2	76.6	82.5
2018	577	67.3	12.2	29.8	92.3	50.7	59.1	67.7	76.8	82.2
2019	479	67.8	12.2	27.6	94.4	51.4	58.6	69.2	77.9	81.8
1998-2019	11651	68.3	11.8	0.3	102	52.9	60.3	68.8	76.8	83.4

Table 4

Age distribution by 5-year age group for period 2007-2019  
(incl. DCO)

Age at diagnosis Years	Cases		Cum.%
	n	%	
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	27	0.3	0.5
35-39	62	0.8	1.3
40-44	145	1.9	3.2
45-49	293	3.8	6.9
50-54	578	7.4	14.4
55-59	842	10.8	25.2
60-64	985	12.7	37.9
65-69	1135	14.6	52.5
70-74	1303	16.8	69.3
75-79	1099	14.2	83.5
80-84	682	8.8	92.3
85+	601	7.7	100.0
All ages	7763	100.0	

Table 5

Age-specific incidence, DCO rate and proportion of all cancers  
for period 2007–2019

Age at diagnosis Years	Cases n	Age-spec. incidence	DCO rate n=238 %	Prop. all cancers n=144724 %
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	0.5		0.9
30–34	27	1.3		1.4
35–39	62	2.9		1.9
40–44	144	6.4	0.7	2.5
45–49	293	12.0	0.7	3.3
50–54	578	25.0	0.2	5.0
55–59	842	42.1	0.5	6.8
60–64	985	56.1	0.6	6.8
65–69	1135	67.4	1.0	6.4
70–74	1303	81.1	1.2	7.0
75–79	1099	79.8	2.2	6.1
80–84	682	70.1	6.5	4.8
85+	601	62.3	21.5	3.9
All ages	7762		3.1	5.4
Incidence				
Raw		25.0		
WS		11.7		
ES		16.8		
BRD-S		20.2		

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).



ICD-10 C54: Malignant neoplasm of corpus uteri  
Age distribution and age-specific incidence 2007 - 2019 (n=7762)

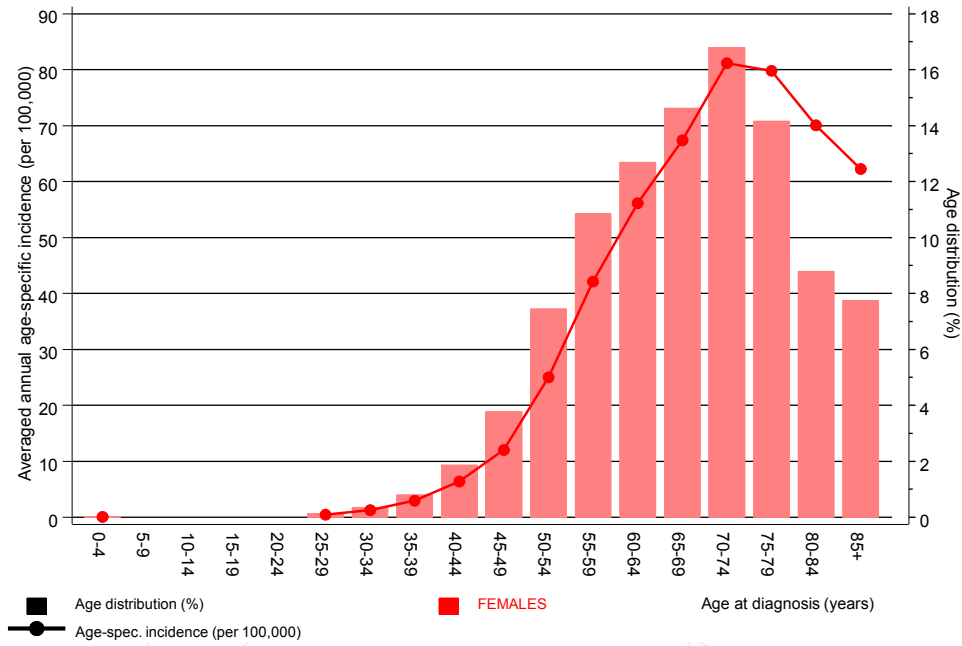
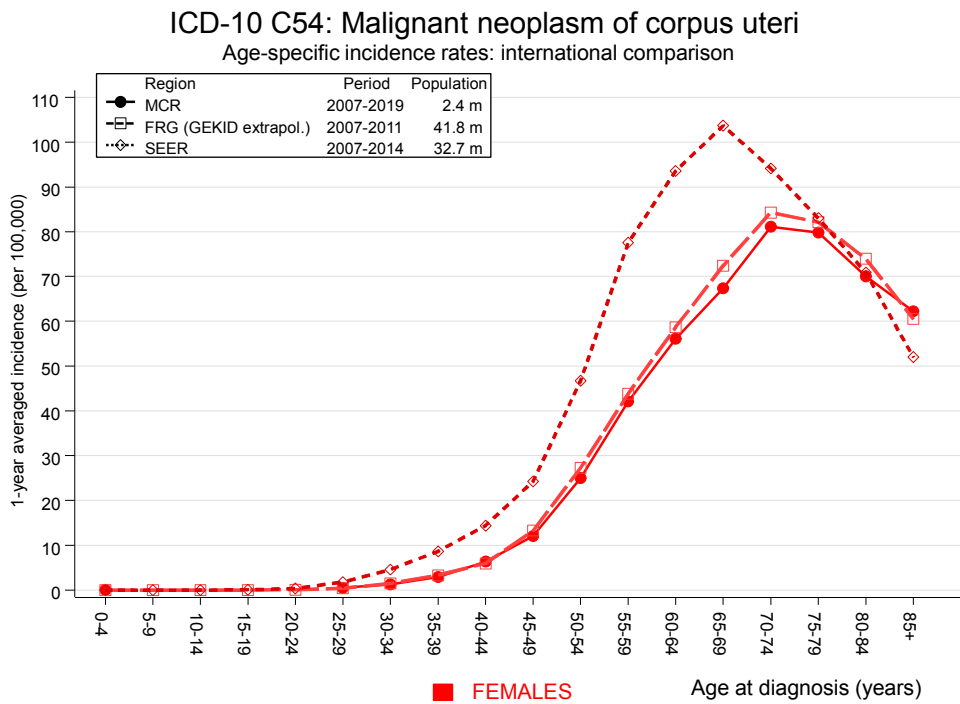


Figure 6. Age distribution (mean=68.3 yrs, median=69.2 yrs) and age-specific incidence.



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

Reference:

Extrapolated age-specific patient population of Germany, data status middle of 2010. Association of Population-based Cancer Registries in Germany (GEKID e.V.). Berlin, 2014. <http://www.gekid.de>. Last access: 02/11/2015  
 Surveillance, Epidemiology, and End Results (SEER) Program SEER\*Stat Database: Incidence - SEER 18 Regs Research Data, released April 2019, based on the November 2018 submission. <http://www.seer.cancer.gov>.

Table 7

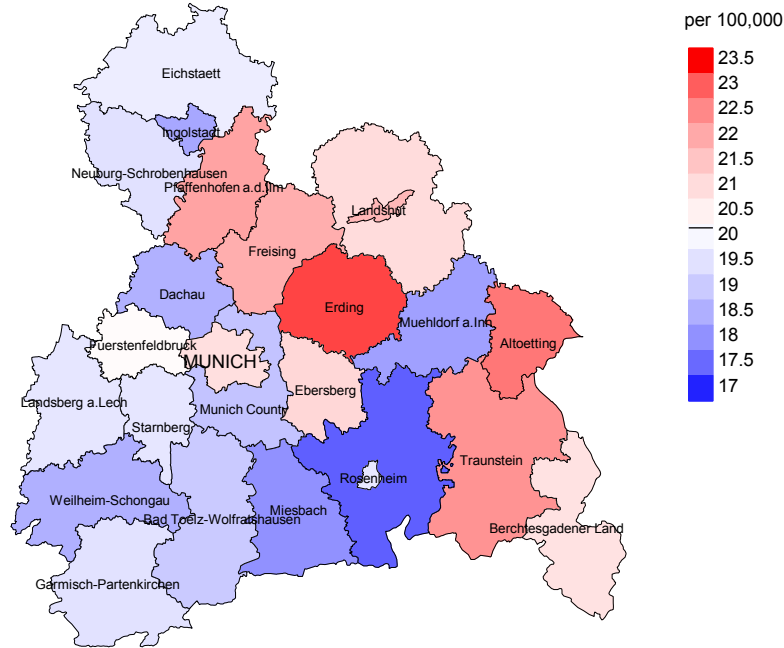
Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of further malignancies for period 1998–2019

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C03-C06 Oral cavity	3	3.0	1.0	0.2	2.9	0.0	
C09-C10 Oropharynx	3	2.0	1.5	0.3	4.3	0.2	
C15 Oesophagus	6	3.4	1.8	0.7	3.9	0.6	
C16 Stomach	33	18.4	1.8	1.2	2.5 #	3.4	15.2
C17 Small intestine	12	2.7	4.4	2.3	7.6 #	2.1	
C18 Colon	142	52.3	2.7	2.3	3.2 #	20.8	10.6
C19-C20 Rectum	28	21.5	1.3	0.9	1.9	1.5	10.7
C21 Anus/canal	2	2.8	0.7	0.1	2.6	-0.2	
C22 Liver	12	6.6	1.8	0.9	3.2	1.3	8.3
C23-C24 Bile	22	7.7	2.8	1.8	4.3 #	3.3	13.6
C25 Pancreas	54	25.0	2.2	1.6	2.8 #	6.7	20.4
C26 GI cancer	4	0.9	4.3	1.2	11.0 #	0.7	50.0
C33-C34 Lung	109	39.4	2.8	2.3	3.3 #	16.1	11.9
C38,C45 Mesothelioma	3	1.0	3.0	0.6	8.7	0.5	
C43 Malign. melanoma	35	18.9	1.9	1.3	2.6 #	3.7	
C46,C49 Soft tissue	11	3.0	3.7	1.9	6.6 #	1.9	
C48 Peritoneal	21	2.1	10.0	6.2	15.3 #	4.4	
C50 Breast	440	155.9	2.8	2.6	3.1 #	65.8	3.0
C51 Vulva	15	5.6	2.7	1.5	4.4 #	2.2	6.7
C52 Vagina	9	1.0	9.0	4.1	17.2 #	1.9	
C53 Cervix uteri	38	6.1	6.2	4.4	8.5 #	7.4	31.6
C55,C57 Fem. genitals un	8	1.2	6.9	3.0	13.7 #	1.6	87.5
C56 Ovary	279	21.2	13.2	11.7	14.8 #	59.7	9.7
C64 Kidney	34	12.8	2.7	1.8	3.7 #	4.9	11.8
C65 Renal pelvis	5	1.7	2.9	0.9	6.8	0.8	
C66 Ureter	4	0.9	4.4	1.2	11.4 #	0.7	
C67 Bladder	25	10.5	2.4	1.5	3.5 #	3.4	8.0
C69 Eye melanoma	2	0.7	3.0	0.4	10.8	0.3	
C70-C72 CNS cancer	15	6.9	2.2	1.2	3.6 #	1.9	26.7
C73 Thyroid	16	7.7	2.1	1.2	3.4 #	1.9	
C74-C80 Cancer others	3	1.9	1.6	0.3	4.5	0.2	
C76-C79 CUP	21	9.8	2.1	1.3	3.3 #	2.6	4.8
C81 Hodgkin lymphoma	4	0.9	4.5	1.2	11.4 #	0.7	
C82-C85 NHL	37	21.0	1.8	1.2	2.4 #	3.7	2.7
C90 Mult. myeloma	7	6.8	1.0	0.4	2.1	0.1	14.3
C91-C96 Leukaemia	21	7.8	2.7	1.7	4.1 #	3.1	19.0
Others, specified	6	2.9	2.1	0.8	4.5	0.7	
Not observed	0	32.0	0.0	0.0	0.1 #	-7.4	
All further malignancies	1489	526.0	2.8	2.7	3.0 #	223.1	8.7
Patients		11088					
Median age at next malignancy (years)		72.7					
Person-years		43168					
Mean observation time (years)		3.9					
Median observation time (years)		2.1					

# The occurrence of further specified malignancy is statistically significant.

Further observed malignancies with count 1 are pooled in category "Others, specified".

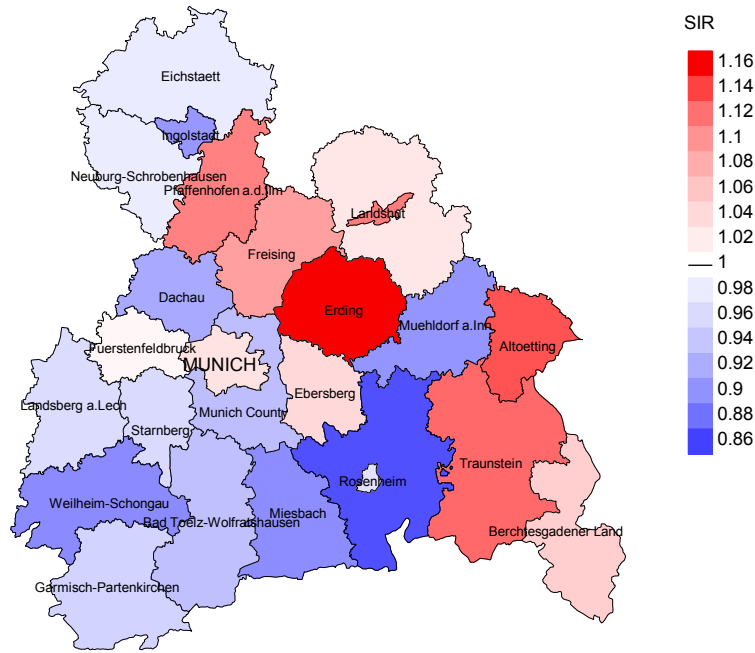
Average incidence (Germany 1987 standard population) 2007 - 2019



**Figure 8a.** Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2019. 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 (20.2/100,000 WS N=7,762).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,462 female residents (averaged) in the period from 2007 to 2019 a total of 222 women were identified with newly diagnosed corpus cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 21.1/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 17.6 and 25.1/100,000.

Standardized incidence ratio (SIR) 2007 - 2019



**Figure 8b.** Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2019. 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=7,762).

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 2019 a total of 222 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 1.04. Though, the value of this parameter may vary with an underlying probability of 99% between 0.87 and 1.23, 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 4.92 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	93.5	1.6	197	61.4	90.9
1999	318	95.0	1.9	185	58.2	93.5
2000	306	95.1	2.9	173	56.5	93.1
2001	342	93.6	5.0	206	60.2	96.1
2002	520	95.0	4.2	292	56.2	95.2
2003	513	94.5	2.3	267	52.0	94.4
2004	522	93.9	2.9	280	53.6	92.5
2005	541	93.2	1.8	277	51.2	91.0
2006	505	92.7	3.4	224	44.4	93.3
2007	623	91.3	5.0	308	49.4	93.8
2008	627	98.4	3.8	282	45.0	93.6
2009	614	96.1	2.8	265	43.2	91.7
2010	574	97.0	5.4	239	41.6	93.3
2011	603	96.0	2.7	234	38.8	94.9
2012	620	97.7	3.9	252	40.6	94.0
2013	651	96.6	3.4	240	36.9	87.1
2014	621	96.1	2.9	217	34.9	89.9
2015	596	93.0	3.2	157	26.3	86.6
2016	579	99.7	2.8	144	24.9	80.6
2017	599	99.0	2.2	121	20.2	71.9
2018	577	99.5	1.2	84	14.6	56.0
2019	479	65.3		44	9.2	77.3
1998-2019	11651	94.5	3.0	4688	40.2	90.9

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 4.92 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	306	160	93.8	27	8.8
2001	342	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	623	332	97.9	59	9.5
2008	627	317	99.1	43	6.9
2009	614	338	99.1	42	6.8
2010	574	351	98.6	48	8.4
2011	603	391	96.7	47	7.8
2012	620	373	99.2	57	9.2
2013	651	421	98.1	58	8.9
2014	621	404	99.0	54	8.7
2015	596	402	97.3	38	6.4
2016	579	401	98.3	46	7.9
2017	599	451	96.2	50	8.3
2018	577	290	29.3	26	4.5
2019	479	266	49.6	22	4.6
1998–2019	11651	6638	92.3	862	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 4.92 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	338	56.2	43.8	63.3
2010	351	58.7	41.3	67.3
2011	391	57.0	43.0	68.3
2012	373	56.3	43.7	64.6
2013	421	57.0	43.0	64.4
2014	404	57.2	42.8	66.3
2015	402	52.2	47.8	58.6
2016	401	54.9	45.1	64.5
2017	451	50.8	49.2	58.5
2018	290	32.8	67.2	48.2
2019	266	40.6	59.4	67.4
1998–2019	6638	54.4	45.6	65.4



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	338	82.0	75.9	86.0	77.0
2010	351	82.9	77.8	86.1	80.0
2011	391	82.2	76.9	85.7	78.2
2012	373	82.2	77.8	87.5	79.1
2013	421	82.6	77.8	87.1	78.3
2014	404	80.5	77.0	86.4	77.9
2015	402	81.9	78.0	87.4	78.5
2016	401	81.0	77.2	86.5	78.3
2017	451	81.7	78.4	86.6	78.6
2018	290	81.5	75.9	84.3	79.2
2019	266	81.3	77.3	85.4	79.5
1998-2019	6638	81.4	77.0	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	0.33
2012	210	8.9	0.34	2.8	0.24	4.5	0.26	6.3	0.30
2013	240	10.1	0.37	3.2	0.25	5.0	0.28	7.0	0.32
2014	231	9.6	0.37	3.1	0.27	4.9	0.29	6.9	0.34
2015	210	8.6	0.35	2.8	0.24	4.4	0.26	6.1	0.31
2016	220	9.0	0.38	2.8	0.25	4.5	0.28	6.3	0.33
2017	229	9.3	0.38	2.9	0.25	4.6	0.28	6.4	0.33
2018	95	3.8	0.16	1.3	0.12	2.1	0.13	2.8	0.15
2019	108	4.4	0.23	1.5	0.17	2.3	0.18	3.1	0.20
1998-2019	3614	7.9	0.31	2.7	0.22	4.2	0.24	5.8	0.28

Table 12

Age distribution of age at death (cancer-related) for period 2007-2019  
(incl. multiple malignancies)

Age at death Years	Cases		Cum.%
	n	%	
0-4			
5-9			
10-14			
15-19			
20-24			
25-29			
30-34	4	0.2	0.2
35-39	3	0.1	0.3
40-44	15	0.6	0.9
45-49	26	1.0	1.9
50-54	64	2.5	4.4
55-59	88	3.5	7.9
60-64	155	6.1	14.0
65-69	289	11.4	25.4
70-74	393	15.5	40.9
75-79	512	20.2	61.1
80-84	440	17.3	78.4
85+	548	21.6	100.0
All ages	2537	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers  
for period 2007-2019  
(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	0.15	2.5
35-39	3	0.1	0.05	0.8
40-44	15	0.7	0.10	1.9
45-49	26	1.1	0.09	1.6
50-54	64	2.8	0.11	2.6
55-59	88	4.4	0.10	2.5
60-64	155	8.8	0.16	3.4
65-69	289	17.2	0.25	4.5
70-74	393	24.5	0.30	4.8
75-79	512	37.2	0.47	5.7
80-84	440	45.2	0.65	5.2
85+	548	56.8	0.91	5.0
All ages	2537			4.5
Mortality				
Raw		8.2	0.33	
WS		2.7	0.23	
ES		4.2	0.25	
BRD-S		5.8	0.29	
PYLL-70				
per 100,000		20.4		
ES		16.7		
AYLL-70		8.3		

Table 14

Further malignancies in deaths in period 1998-2019

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	7	0.4					7	100.0
C16 Stomach	51	2.7	6	11.8	1	2.0	44	86.3
C17 Small intestine	10	0.5	1	10.0	2	20.0	7	70.0
C18 Colon	173	9.1	45	26.0	15	8.7	113	65.3
C19-C20 Rectum	90	4.7	35	38.9			55	61.1
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	28	1.5	2	7.1			26	92.9
C25 Pancreas	86	4.5	2	2.3	3	3.5	81	94.2
C26 GI cancer	5	0.3					5	100.0
C33-C34 Lung	147	7.7	8	5.4	3	2.0	136	92.5
C38,C45 Mesothelioma	6	0.3	1	16.7			5	83.3
C43 Malign. melanoma	46	2.4	29	63.0	1	2.2	16	34.8
C44 Skin others	83	4.4	40	48.2	5	6.0	38	45.8
C46,C49 Soft tissue	12	0.6	4	33.3	1	8.3	7	58.3
C48 Peritoneal	17	0.9	1	5.9	7	41.2	9	52.9
C50 Breast	524	27.5	279	53.2	52	9.9	193	36.8
C51 Vulva	24	1.3	2	8.3	4	16.7	18	75.0
C52 Vagina	15	0.8	1	6.7	5	33.3	9	60.0
C53 Cervix uteri	46	2.4	22	47.8	6	13.0	18	39.1
C54 Corpus uteri	6	0.3			1	16.7	5	83.3
C55,C57 Fem. genitals un	18	0.9	3	16.7	2	11.1	13	72.2
C56 Ovary	185	9.7	17	9.2	117	63.2	51	27.6
C64 Kidney	34	1.8	9	26.5	3	8.8	22	64.7
C67 Bladder	53	2.8	4	7.5	8	15.1	41	77.4
C69 Eye melanoma	7	0.4	4	57.1			3	42.9
C70-C72 CNS cancer	24	1.3	6	25.0			18	75.0
C73 Thyroid	15	0.8	8	53.3			7	46.7
C74-C80 Cancer others	5	0.3					5	100.0
C76-C79 CUP	29	1.5	4	13.8	1	3.4	24	82.8
C82-C85 NHL	40	2.1	15	37.5	3	7.5	22	55.0
C90 Mult. myeloma	11	0.6	1	9.1			10	90.9
C91-C96 Leukaemia	39	2.0	8	20.5	2	5.1	29	74.4
Others, specified	27	1.4	10	37.0	1	3.7	16	59.3
All further malignancies	1905	100.0	580	30.4	244	12.8	1081	56.7

Further malignancies with number of cases 1 to 4 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 2007-2019  
(**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	1.4
35-39	3	0.1	0.06	0.9
40-44	12	0.5	0.10	1.7
45-49	18	0.7	0.08	1.3
50-54	51	2.2	0.10	2.5
55-59	72	3.6	0.10	2.4
60-64	124	7.1	0.15	3.3
65-69	223	13.2	0.23	4.3
70-74	308	19.2	0.29	4.9
75-79	400	29.0	0.46	5.8
80-84	336	34.5	0.65	5.1
85+	441	45.7	0.98	5.1
All ages	1990			4.4
Mortality				
Raw		6.4	0.31	
WS		2.1	0.21	
ES		3.3	0.24	
BRD-S		4.6	0.27	
PYLL-70				
per 100,000		16.0		
ES		13.1		
AYLL-70		8.3		

\* See corresponding tables with multiple malignancies.

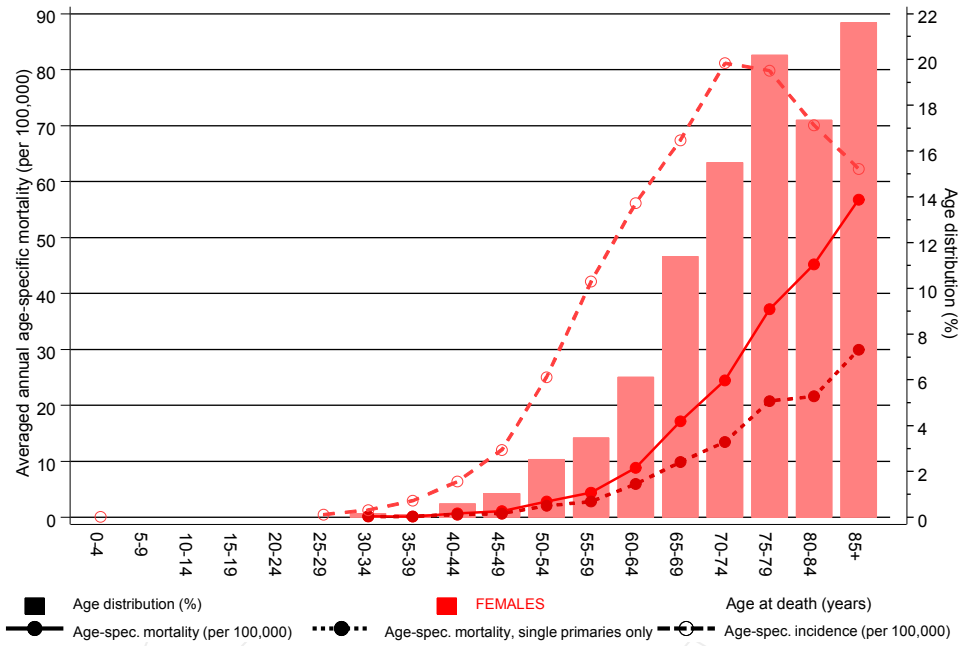
Table 16

Age-specific mortality (cancer-related) and proportion of all cancers  
for period 2007-2019  
(**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	1.5
35-39	3	0.1	0.06	0.9
40-44	11	0.5	0.09	1.6
45-49	16	0.7	0.07	1.2
50-54	47	2.0	0.10	2.3
55-59	56	2.8	0.08	1.9
60-64	104	5.9	0.13	2.8
65-69	166	9.9	0.19	3.3
70-74	216	13.4	0.23	3.5
75-79	286	20.8	0.37	4.3
80-84	210	21.6	0.43	3.3
85+	289	29.9	0.69	3.5
All ages	1406			3.2
Mortality				
Raw		4.5	0.24	
WS		1.6	0.17	
ES		2.4	0.19	
BRD-S		3.3	0.21	
PYLL-70				
per 100,000		13.6		
ES		11.1		
AYLL-70		8.8		

\* See corresponding tables with multiple malignancies.

ICD-10 C54: Malignant neoplasm of corpus uteri  
 Age distribution and age-specific mortality 2007 - 2019 (n=2537)

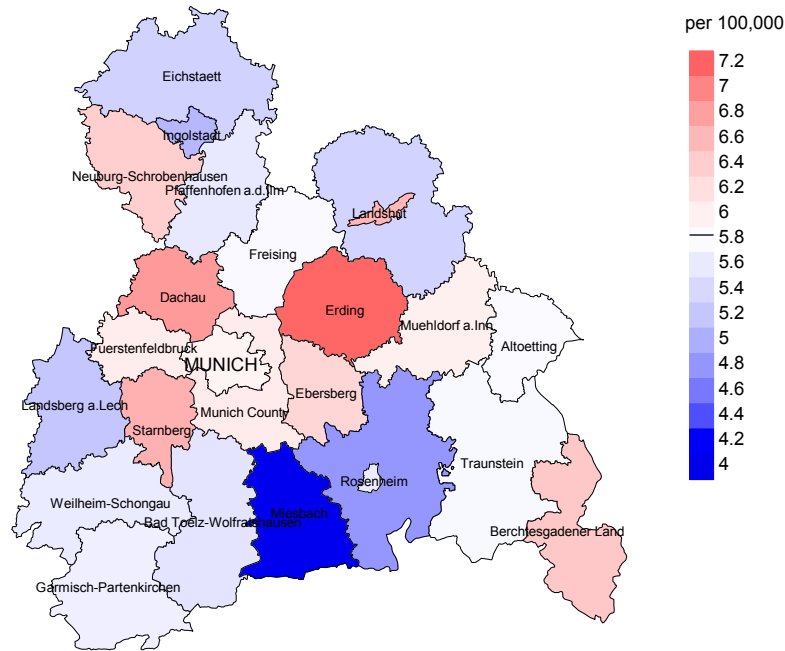


**Figure 17.** Distribution of age at death (bars; n=mean=70.3 yrs, median=71.5 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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



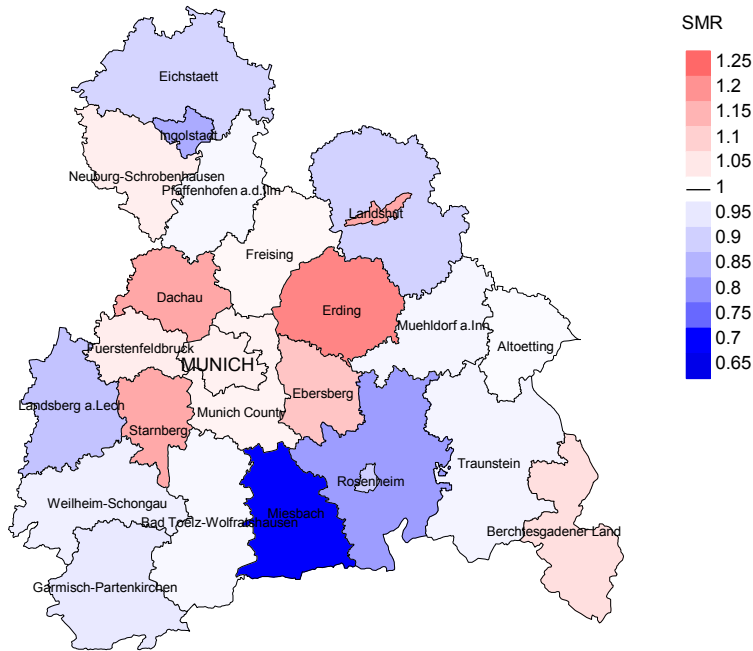
Average mortality (Germany 1987 standard population) 2007 - 2019



**Figure 18a.** Map of cancer mortality (german standard population) by county averaged for period 2007 to 2019. 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 (5.8/100,000 WS N=2,537).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,462 female residents (averaged) in the period from 2007 to 2019 a total of 76 women died from corpus cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 6.3/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 4.6 and 8.5/100,000.

Standardized mortality ratio (SMR) 2007 - 2019



**Figure 18b.** Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2019. 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=2,537).

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 2019 a total of 76 women died from corpus cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.12. Though, the value of this parameter may vary with an underlying probability of 99% between 0.82 and 1.50, 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

**Recommended Citation**

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