

# Munich Cancer Registry



- ▶ Survival
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- ▶ *Deutsch*

## ICD-10 D32: Meninges neoplasm

### Incidence and Mortality

Year of diagnosis	1998-2016
Patients	2,594
Diseases	2,596
Creation date	08/21/2018
Export date	08/09/2018
Population	4.81 m



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

[https://www.tumorregister-muenchen.de/en/facts/base/bD32\\_\\_E-ICD-10-D32-Meninges-neoplasm-incidence-and-mortality.pdf](https://www.tumorregister-muenchen.de/en/facts/base/bD32__E-ICD-10-D32-Meninges-neoplasm-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, August 2018

<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
D32.-	Benign neoplasm of meninges
D32.0	Benign neoplasm of cerebral meninges
D32.1	Benign neoplasm of spinal meninges
D32.9	Benign neoplasm of meninges, unspecified

## INCIDENCE

Table 1

Cases by year of diagnosis, proportions of further malignancies, deaths, and active follow-up (ALL PATIENTS)

Year of diagnosis	All cases n	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	21	14.3	14.9	38.1	95.2
1999	27	18.8	14.7	40.7	85.2
2000	47	13.7	14.5	29.8	87.2
2001	85	12.8	14.4	34.1	94.1
2002	141	12.5	14.2	34.0	91.5 #
2003	134	12.3	13.9	29.9	90.3
2004	123	12.3	13.5	25.2	93.5
2005	145	12.9	13.3	24.1	90.3
2006	161	12.6	13.0	18.6	86.3
2007	208	14.1	13.2	22.1	62.0 #
2008	230	15.4	13.0	23.5	53.9
2009	221	15.9	12.6	22.6	52.5
2010	176	16.8	12.2	27.3	51.7
2011	260	17.5	11.0	18.1	48.1
2012	228	17.9	11.5	17.5	54.4
2013	159	18.9	14.3	18.2	51.6
2014	147	19.5	16.2	20.4	57.1
2015	50	20.2	20.5	26.0	94.0
2016	33	20.8	21.9	24.2	60.6 ##
1998-2016	2596	20.8	14.9	23.5	67.1

2,596 cases diagnosed 1998-2016 are related to a total of 2,594 patients. Currently, in 870 (33.5 %) of these 2,594 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 647 / 171 / 52 (24.9 % / 6.6 % / 2.0 %) 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 2014, a subgroup of 147 cases has been diagnosed, of which 19.5 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 16.2 % 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 1a

Cases by year of diagnosis, proportions of further malignancies, deaths, and active follow-up (MALES)

Year of diagnosis	Males n	Males %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	2	9.5	0.0	16.8	50.0	100.0
1999	4	14.8	16.7	16.9	25.0	100.0
2000	8	17.0	7.1	16.8	37.5	87.5
2001	21	24.7	8.6	16.7	42.9	90.5
2002	31	22.0	13.6	16.6	48.4	96.8 #
2003	43	32.1	14.7	16.0	34.9	88.4
2004	28	22.8	15.3	14.9	17.9	89.3
2005	38	26.2	14.9	14.9	23.7	86.8
2006	46	28.6	15.8	14.2	19.6	84.8
2007	58	27.9	16.5	14.5	27.6	74.1 #
2008	64	27.8	18.4	14.0	25.0	60.9
2009	56	25.3	17.8	12.7	33.9	57.1
2010	44	25.0	18.5	11.5	29.5	56.8
2011	76	29.2	19.5	10.6	19.7	55.3
2012	54	23.7	20.1	11.3	24.1	57.4
2013	44	27.7	20.9	16.5	22.7	56.8
2014	38	25.9	21.7	18.5	31.6	52.6
2015	12	24.0	21.9	29.4	41.7	91.7
2016	5	15.2	22.2	20.0	40.0	80.0 ##
1998-2016	672	25.9	22.2	16.8	28.0	69.8

672 cases diagnosed 1998-2016 are related to a total of 672 patients. Currently, in 249 (37.1 %) of these 672 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 178 / 56 / 15 (26.5 % / 8.3 % / 2.2 %) 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 2014, a subgroup of 38 cases has been diagnosed, of which 21.7 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 18.5 % 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 1b

Cases by year of diagnosis, proportions of further malignancies, deaths, and active follow-up (FEMALES)

Year of diagnosis	Females n	Females %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	19	90.5	15.8	14.2	36.8	94.7
1999	23	85.2	19.0	13.9	43.5	82.6
2000	39	83.0	14.8	13.7	28.2	87.2
2001	64	75.3	13.8	13.6	31.3	95.3
2002	110	78.0	12.2	13.3	30.0	90.0 #
2003	91	67.9	11.6	13.1	27.5	91.2
2004	95	77.2	11.3	13.0	27.4	94.7
2005	107	73.8	12.2	12.7	24.3	91.6
2006	115	71.4	11.5	12.5	18.3	87.0
2007	150	72.1	13.3	12.7	20.0	57.3 #
2008	166	72.2	14.4	12.7	22.9	51.2
2009	165	74.7	15.3	12.6	18.8	50.9
2010	132	75.0	16.2	12.5	26.5	50.0
2011	184	70.8	16.8	11.1	17.4	45.1
2012	174	76.3	17.2	11.6	15.5	53.4
2013	115	72.3	18.2	13.6	16.5	49.6
2014	109	74.1	18.8	15.5	16.5	58.7
2015	38	76.0	19.6	18.0	21.1	94.7
2016	28	84.8	20.4	22.2	21.4	57.1 ##
1998-2016	1924	74.1	20.4	14.2	22.0	66.1

1,924 cases diagnosed 1998-2016 are related to a total of 1,922 patients. Currently, in 621 (32.3 %) of these 1,922 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 469 / 115 / 37 (24.4 % / 6.0 % / 1.9 %) 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 2014, a subgroup of 109 cases has been diagnosed, of which 18.8 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 15.5 % 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  
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,  
and from 4.10 to 4.81 m as of 2007, respectively)

Year of diagnosis	Males n	Females n	Males Inc. raw	Fem. Inc. raw	Males Inc. WS	Fem. Inc. WS	Males Inc. ES	Fem. Inc. ES	Males Inc. BRD-S	Fem. Inc. BRD-S
1998	2	19	0.2	1.6	0.1	1.0	0.1	1.3	0.1	1.5
1999	4	23	0.4	1.9	0.2	1.2	0.3	1.6	0.3	1.7
2000	8	39	0.7	3.2	0.4	2.0	0.6	2.7	0.6	2.9
2001	21	64	1.8	5.3	1.3	3.1	1.7	4.2	1.8	4.8
2002	31	110	1.7	5.6	1.0	3.3	1.4	4.6	1.5	5.2
2003	43	91	2.3	4.6	1.5	2.9	2.0	3.8	2.3	4.2
2004	28	95	1.5	4.8	1.0	2.9	1.3	3.9	1.5	4.3
2005	38	107	2.0	5.4	1.3	3.1	1.7	4.4	2.0	4.9
2006	46	115	2.4	5.7	1.5	3.3	2.0	4.5	2.3	5.0
2007	58	150	2.6	6.5	1.6	3.8	2.2	5.2	2.5	5.8
2008	64	166	2.9	7.2	1.7	4.0	2.3	5.5	2.8	6.3
2009	56	165	2.5	7.1	1.5	4.2	2.0	5.6	2.4	6.3
2010	44	132	2.0	5.6	1.1	2.9	1.5	4.0	1.9	4.6
2011	76	184	3.4	7.9	2.0	4.3	2.7	6.0	3.1	6.9
2012	54	174	2.4	7.4	1.5	3.9	1.9	5.3	2.2	6.2
2013	44	115	1.9	4.8	0.9	2.6	1.3	3.5	1.7	4.0
2014	38	109	1.6	4.5	0.9	2.4	1.2	3.2	1.5	3.8
2015	12	38	0.5	1.6	0.2	0.8	0.3	1.1	0.5	1.3
2016	5	28	0.2	1.1	0.1	0.5	0.1	0.8	0.2	0.9
1998-2016	672	1924	1.8	5.0	1.1	2.8	1.5	3.8	1.7	4.4

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

Table 3

Age distribution parameters by year of diagnosis (ALL PATIENTS)

Year of diagnosis	Cases n	Std.		Median						
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	21	56.6	15.3	30.1	83.3	37.9	43.4	55.7	65.3	81.0
1999	27	60.0	10.9	35.6	79.5	43.4	52.3	60.9	66.8	78.8
2000	47	59.1	12.5	33.3	87.3	41.6	51.6	59.5	65.4	76.8
2001	85	59.1	14.6	24.5	89.2	35.7	48.5	62.3	72.2	75.3
2002	141	62.3	12.0	21.1	88.8	45.2	55.7	62.4	71.3	77.3
2003	134	58.1	14.0	24.3	88.7	40.1	47.5	58.7	68.2	77.7
2004	123	59.7	14.0	24.6	87.8	40.0	51.4	62.4	69.5	75.7
2005	145	61.5	11.8	29.8	84.8	47.1	53.1	62.7	69.8	77.1
2006	161	60.7	14.6	13.2	89.7	40.4	50.6	61.8	71.3	78.5
2007	208	61.5	12.6	28.3	87.4	43.7	53.7	62.2	70.8	78.7
2008	230	63.4	14.0	20.9	90.1	43.8	54.2	64.1	73.4	81.1
2009	221	60.6	14.7	14.9	90.4	41.6	49.8	61.9	71.3	79.8
2010	176	65.1	14.0	18.9	90.8	45.5	56.3	67.5	74.1	83.2
2011	260	62.9	12.8	23.5	89.4	44.8	54.6	63.7	72.8	78.8
2012	228	62.6	14.9	5.5	101	43.1	50.5	65.2	73.8	81.0
2013	159	65.8	13.1	24.9	94.5	47.0	56.1	67.3	74.2	80.8
2014	147	63.8	15.9	7.6	96.4	39.2	51.7	67.7	76.2	81.7
2015	50	67.8	12.4	46.2	88.7	49.1	58.3	70.1	77.1	84.6
2016	33	68.2	12.7	34.8	94.4	51.3	58.2	69.1	77.3	82.7
1998–2016	2596	62.2	13.9	5.5	101	43.1	52.4	63.5	72.8	79.0

Table 3a

Age distribution parameters by year of diagnosis (MALES)

Year of diagnosis	Cases n	Std.		Median						
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	2	46.8	12.6	37.9	55.7	37.9	37.9	46.8	55.7	55.7
1999	4	60.8	8.2	52.3	70.9	52.3	54.3	59.9	67.2	70.9
2000	8	52.0	12.1	33.3	65.1	33.3	41.0	55.5	62.4	65.1
2001	21	54.8	15.3	24.5	78.9	36.5	44.8	51.1	67.7	72.3
2002	31	62.0	12.9	34.3	88.8	42.5	54.5	63.4	70.0	74.4
2003	43	57.1	13.7	26.0	83.3	40.7	46.1	58.5	68.6	76.1
2004	28	57.0	13.7	24.6	80.6	39.5	49.3	56.3	64.3	77.2
2005	38	61.2	12.0	29.8	82.3	47.1	53.1	62.8	69.7	76.2
2006	46	60.6	14.4	13.2	87.1	40.5	50.8	63.7	71.2	77.2
2007	58	61.7	11.8	35.5	86.3	45.0	52.3	62.9	70.3	78.5
2008	64	63.4	13.8	24.4	84.3	42.2	54.6	66.0	73.7	80.3
2009	56	60.1	16.6	28.0	90.4	39.4	44.7	63.0	71.2	80.1
2010	44	64.4	15.0	28.4	90.8	44.9	54.0	64.7	76.3	83.7
2011	76	63.1	10.8	38.7	84.4	46.9	57.1	63.6	71.2	76.7
2012	54	61.0	17.6	5.5	86.3	34.7	50.4	65.4	74.6	77.1
2013	44	69.5	11.6	37.5	88.5	51.7	63.2	72.6	77.7	82.8
2014	38	64.2	17.1	7.6	84.4	35.9	51.7	71.1	76.5	81.3
2015	12	73.4	11.4	51.5	86.4	60.0	62.4	77.6	81.6	86.0
2016	5	79.3	10.3	66.4	94.4	66.4	75.9	77.4	82.7	94.4
1998–2016	672	62.1	14.3	5.5	94.4	42.2	52.4	63.9	72.8	79.1



Table 3b

Age distribution parameters by year of diagnosis (FEMALES)

Year of diagnosis	Cases n	Mean	Std. dev.	Std.		Median		75%	90%	
				Min.	Max.	10%	25%			50%
1998	19	57.7	15.5	30.1	83.3	35.1	43.4	59.6	69.2	81.6
1999	23	59.8	11.4	35.6	79.5	43.4	51.3	60.9	66.8	78.8
2000	39	60.6	12.2	37.4	87.3	47.1	51.6	60.6	69.1	77.1
2001	64	60.5	14.3	28.1	89.2	35.7	53.6	62.8	73.0	75.3
2002	110	62.4	11.8	21.1	86.8	45.8	55.7	62.3	71.9	77.3
2003	91	58.5	14.1	24.3	88.7	39.6	48.2	59.0	68.2	78.7
2004	95	60.5	14.0	24.8	87.8	40.8	51.5	64.4	69.8	75.4
2005	107	61.6	11.8	33.6	84.8	45.8	52.6	62.7	70.3	77.5
2006	115	60.8	14.7	29.5	89.7	39.7	50.4	60.5	71.4	79.8
2007	150	61.4	12.9	28.3	87.4	43.4	53.9	61.6	71.0	78.9
2008	166	63.3	14.1	20.9	90.1	44.4	53.8	62.8	73.2	82.7
2009	165	60.7	14.1	14.9	89.6	43.2	50.6	60.4	71.6	79.8
2010	132	65.4	13.7	18.9	90.2	47.3	58.0	68.4	73.7	81.9
2011	184	62.8	13.6	23.5	89.4	44.4	54.3	63.7	73.8	79.5
2012	174	63.2	14.0	32.1	101	45.4	50.5	64.4	73.5	81.0
2013	115	64.4	13.4	24.9	94.5	46.1	53.9	65.6	73.9	78.7
2014	109	63.7	15.5	28.0	96.4	39.2	52.1	66.8	75.8	81.8
2015	38	66.0	12.3	46.2	88.7	48.4	55.1	69.1	74.0	84.5
2016	28	66.2	12.2	34.8	84.8	50.8	55.2	68.7	76.5	79.8
1998-2016	1924	62.3	13.7	14.9	101	43.4	52.4	63.2	72.7	79.0

Table 4

Age distribution by 5-year age group and sex for period 2007-2016

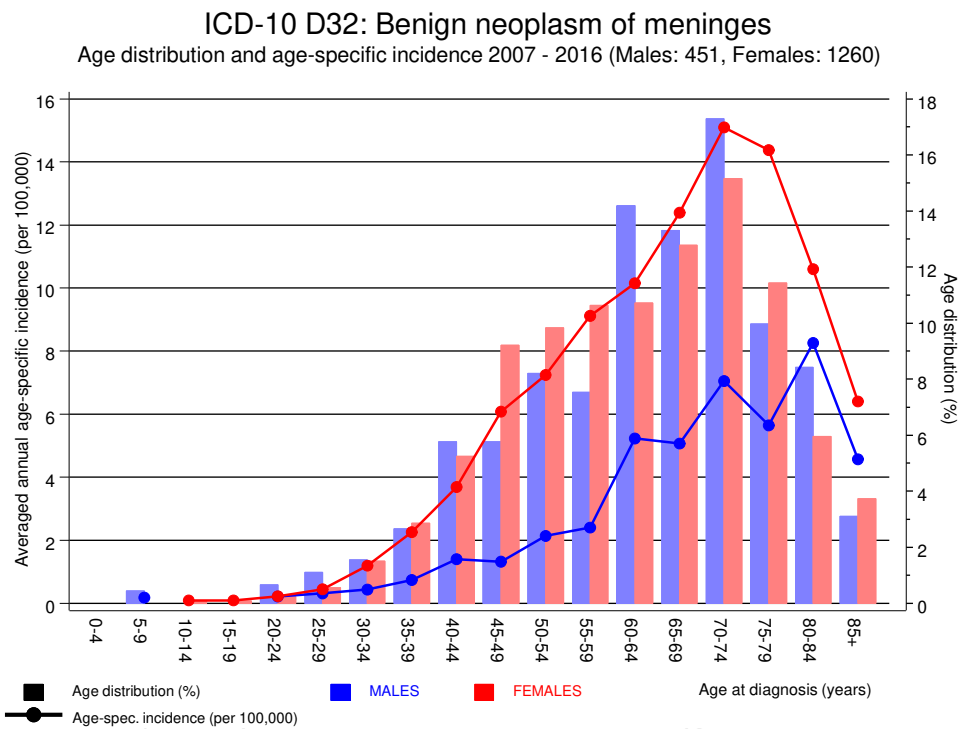
Age at diagnosis Years	Cases n	Males			Females				
		%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4									
5-9	2	0.1	0.1	2	0.4	0.4			0.0
10-14	1	0.1	0.2			0.4	1	0.1	0.1
15-19	1	0.1	0.2			0.4	1	0.1	0.2
20-24	6	0.4	0.6	3	0.7	1.1	3	0.2	0.4
25-29	12	0.7	1.3	5	1.1	2.2	7	0.6	1.0
30-34	26	1.5	2.8	7	1.6	3.8	19	1.5	2.5
35-39	48	2.8	5.6	12	2.7	6.4	36	2.9	5.3
40-44	92	5.4	11.0	26	5.8	12.2	66	5.2	10.5
45-49	142	8.3	19.3	26	5.8	18.0	116	9.2	19.7
50-54	161	9.4	28.7	37	8.2	26.2	124	9.8	29.6
55-59	168	9.8	38.5	34	7.5	33.7	134	10.6	40.2
60-64	199	11.6	50.1	64	14.2	47.9	135	10.7	50.9
65-69	221	12.9	63.0	60	13.3	61.2	161	12.8	63.7
70-74	270	15.8	78.8	78	17.3	78.5	192	15.2	78.9
75-79	189	11.0	89.8	45	10.0	88.5	144	11.4	90.3
80-84	113	6.6	96.4	38	8.4	96.9	75	5.9	96.3
85+	61	3.6	100.0	14	3.1	100.0	47	3.7	100.0
All ages	1712	100.0		451	100.0		1261	100.0	

Table 5

Age-specific incidence  
for period 2007-2016

Age at diagnosis Years	Males n	Females n	Males Age- spec. incid.	Females Age- spec. incid.
0- 4				
5- 9	2		0.2	
10-14		1		0.1
15-19		1		0.1
20-24	3	3	0.2	0.2
25-29	5	7	0.3	0.4
30-34	7	19	0.4	1.2
35-39	12	36	0.7	2.3
40-44	26	66	1.4	3.7
45-49	26	116	1.3	6.1
50-54	37	124	2.1	7.2
55-59	34	134	2.4	9.1
60-64	64	135	5.2	10.2
65-69	60	161	5.1	12.4
70-74	78	191	7.1	15.1
75-79	45	144	5.6	14.4
80-84	38	75	8.3	10.6
85+	14	47	4.6	6.4
All ages	451	1260		
Incidence				
Raw			2.0	5.3
WS			1.1	2.9
ES			1.5	4.0
BRD-S			1.8	4.6

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 (males: mean=63.7 yrs, median=66.1 yrs; females: mean=63.1 yrs, median=64.6 yrs) and age-specific incidence.

Table 7a

Standardized incidence ratio (SIR, with 95% confidence limits),  
excess absolute risk (EAR) and DCO rate of further malignancies  
for period 1998–2016

## MALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C16	Stomach	3	1.3	2.3	0.5	6.8	6.8	
C18	Colon	8	3.2	2.5	1.1	5.0 #	19.4	
C22	Liver	3	1.0	3.0	0.6	8.7	8.0	
C25	Pancreas	3	1.3	2.3	0.5	6.8	6.8	
C33–C34	Lung	13	4.1	3.2	1.7	5.4 #	35.6	
C43	Malign. melanoma	5	1.6	3.1	1.0	7.2 #	13.5	
C61	Prostate	40	9.6	4.2	3.0	5.7 #	121.6	5.0
C64	Kidney	9	1.2	7.3	3.3	13.8 #	31.1	
C65	Renal pelvis	2	0.1	13.7	1.7	49.6 #	7.4	
C67	Bladder	6	1.5	4.1	1.5	9.0 #	18.2	16.7
C70–C72	CNS cancer	4	0.5	8.4	2.3	21.6 #	14.1	
C82–C85	NHL	5	1.4	3.5	1.2	8.3 #	14.4	
C90	Mult. myeloma	2	0.4	4.5	0.5	16.4	6.2	
Others, specified		9	4.6	2.0	0.9	3.8	17.8	
Not observed		0	2.8	0.0	0.0	1.3	-11.1	
All further malignancies		112	34.6	3.2	2.7	3.9 #	309.9	2.7
Patients			651					
Median age at next malignancy (years)			72.6					
Person-years			2499					
Mean observation time (years)			3.8					
Median observation time (years)			2.6					

# The occurrence of further malignancy listed is statistically significant.

Observed further malignancies with count 1 are pooled in category "Others, specified".

Table 7b

Standardized incidence ratio (SIR, with 95% confidence limits),  
excess absolute risk (EAR) and DCO rate of further malignancies  
for period 1998–2016

## FEMALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C15 Oesophagus	2	0.5	4.1	0.5	14.7	2.0	
C16 Stomach	9	2.3	3.9	1.8	7.5 #	9.0	11.1
C18 Colon	11	6.6	1.7	0.8	3.0	5.9	
C19–C20 Rectum	4	2.9	1.4	0.4	3.5	1.5	
C21 Anus/canal	2	0.4	4.9	0.6	17.6	2.1	
C22 Liver	2	0.9	2.3	0.3	8.3	1.5	
C23–C24 Bile	2	1.0	2.1	0.3	7.5	1.4	
C25 Pancreas	11	3.2	3.4	1.7	6.2 #	10.4	
C32 Larynx	2	0.1	13.4	1.6	48.3 #	2.5	
C33–C34 Lung	34	5.8	5.9	4.1	8.2 #	37.8	5.9
C38,C45 Mesothelioma	2	0.1	14.9	1.8	53.9 #	2.5	
C43 Malign. melanoma	15	3.0	5.0	2.8	8.2 #	16.1	
C46,C49 Soft tissue	2	0.4	4.7	0.6	16.9	2.1	50.0
C50 Breast	89	23.9	3.7	3.0	4.6 #	87.2	3.4
C51 Vulva	4	0.7	5.5	1.5	14.1 #	4.4	
C53 Cervix uteri	3	1.1	2.8	0.6	8.2	2.6	
C54 Corpus uteri	4	4.3	0.9	0.3	2.4	-0.4	
C56 Ovary	5	3.0	1.7	0.5	3.9	2.6	20.0
C64 Kidney	7	1.8	3.9	1.6	8.1 #	7.0	
C67 Bladder	3	1.3	2.4	0.5	6.9	2.3	
C70–C72 CNS cancer	13	1.0	12.7	6.8	21.7 #	16.0	
C73 Thyroid	4	1.5	2.7	0.7	7.0	3.4	
C76–C79 CUP	4	1.2	3.3	0.9	8.4	3.7	
C82–C85 NHL	12	2.8	4.2	2.2	7.4 #	12.3	
C91–C96 Leukaemia	7	1.1	6.1	2.5	12.6 #	7.8	28.6
Others, specified	5	2.1	2.3	0.8	5.4	3.8	20.0
Not observed	0	2.0	0.0	0.0	1.9	-2.7	
All further malignancies	258	75.1	3.4	3.0	3.9 #	245.0	4.3

Patients 1842

Median age at next malignancy (years) 71.2

Person-years 7467

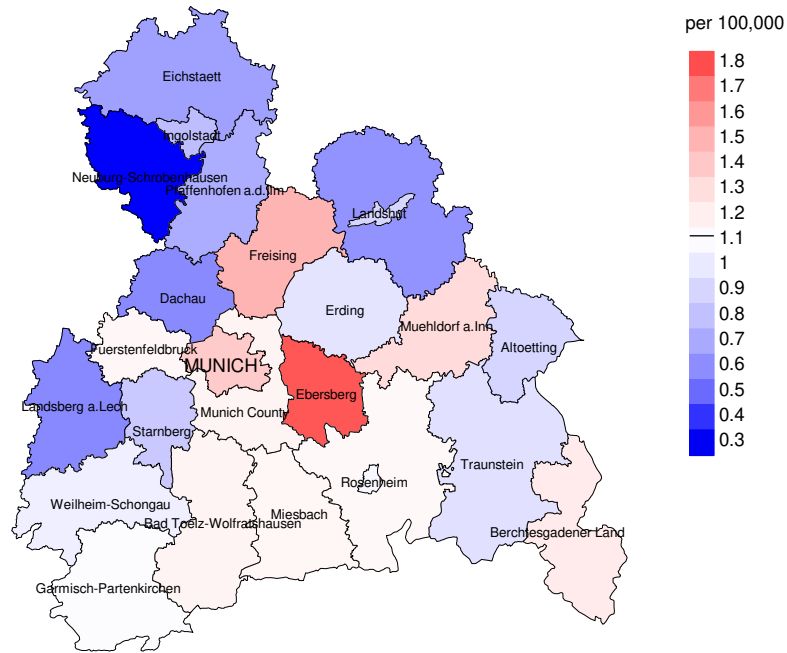
Mean observation time (years) 4.1

Median observation time (years) 2.7

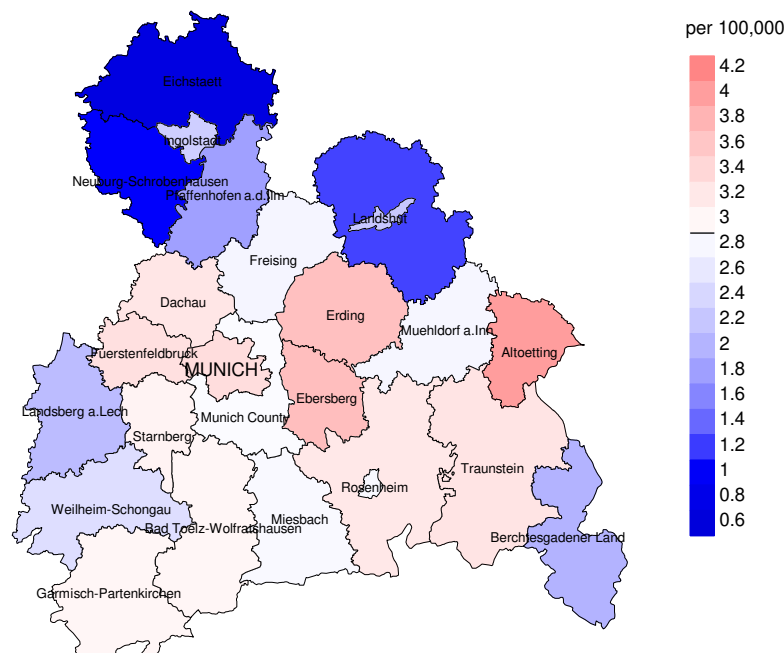
# The occurrence of further malignancy listed is statistically significant.

Observed further malignancies with count 1 are pooled in category "Others, specified".

Average incidence (world standard population) 2007 - 2016: Males



Average incidence (world standard population) 2007 - 2016: Females



**Figure 8a.** Map of cancer incidence (world standard population) by county averaged for period 2007 to 2016. 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 (males 1.1/100,000 WS N=451, females 2.9/100,000 WS N=1,260).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 45 women were identified with newly diagnosed meninges neoplasm. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 3.7/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 2.3 and 5.6/100,000.



## MORTALITY

Table 9a

Annual cohorts: Incident cancers, follow-up status,  
and deaths among the annual cohorts

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,  
and from 4.10 to 4.81 m as of 2007, respectively)

Year of diagnosis	Incident cases n	Prop. actively followed %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	21	95.2	8	38.1	100.0
1999	27	85.2	11	40.7	90.9
2000	47	87.2	14	29.8	100.0
2001	85	94.1	29	34.1	96.6
2002	141	91.5	48	34.0	97.9
2003	134	90.3	40	29.9	97.5
2004	123	93.5	31	25.2	100.0
2005	145	90.3	35	24.1	97.1
2006	161	86.3	30	18.6	86.7
2007	208	62.0	46	22.1	97.8
2008	230	53.9	54	23.5	96.3
2009	221	52.5	50	22.6	98.0
2010	176	51.7	48	27.3	95.8
2011	260	48.1	47	18.1	95.7
2012	228	54.4	40	17.5	100.0
2013	159	51.6	29	18.2	93.1
2014	147	57.1	30	20.4	96.7
2015	50	94.0	13	26.0	100.0
2016	33	60.6	8	24.2	75.0
1998-2016	2596	67.1	611	23.5	96.4



Table 9b

Annual cohorts of incident cancers and deaths,  
and cases deceased within the same year of being diagnosed with cancer

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,  
and from 4.10 to 4.81 m as of 2007, respectively)

Year of diagnosis/ death	Incident cases n	Deaths n	Deaths in same year n	Prop. deaths in same year %
1998	21	1		
1999	27	3		
2000	47	6	2	4.3
2001	85	4	2	2.4
2002	141	15	8	5.7
2003	134	9	3	2.2
2004	123	17	3	2.4
2005	145	28	6	4.1
2006	161	25	4	2.5
2007	208	25	5	2.4
2008	230	48	13	5.7
2009	221	40	10	4.5
2010	176	58	10	5.7
2011	260	64	13	5.0
2012	228	78	16	7.0
2013	159	65	10	6.3
2014	147	82	15	10.2
2015	50	67	8	16.0
2016	33	62	7	21.2
1998-2016	2596	697	135	5.2

Table 9c

Annual cohorts of deaths, and proportion of cancer-related and non-cancer-related deaths

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.81 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer- related %	Prop. non-cancer- related %	Prop. cancer recorded on death certificate %
1998	1		100.0	100.0
1999	3	33.3	66.7	100.0
2000	6	66.7	33.3	100.0
2001	4	75.0	25.0	100.0
2002	15	66.7	33.3	93.3
2003	9	88.9	11.1	100.0
2004	17	52.9	47.1	64.7
2005	28	60.7	39.3	78.6
2006	25	60.0	40.0	81.8
2007	25	72.0	28.0	80.0
2008	48	68.8	31.3	80.0
2009	40	67.5	32.5	75.0
2010	58	67.2	32.8	75.9
2011	64	67.2	32.8	79.0
2012	78	60.3	39.7	68.8
2013	65	64.6	35.4	70.3
2014	82	59.8	40.2	70.4
2015	67	58.2	41.8	70.8
2016	62	51.6	48.4	59.0
1998-2016	697	62.6	37.4	73.8

Table 10a

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

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					
1999					
2000	1	72.6		72.6	72.6
2001	1	73.9	73.9		73.9
2002	4	74.7	68.5	79.7	70.5
2003	1	77.3	77.3		77.3
2004	6	77.6	81.6	77.4	81.6
2005	7	78.4	78.4	73.5	78.5
2006	8	73.8	73.8	74.3	75.5
2007	8	77.5	77.6	76.1	77.6
2008	13	78.7	76.5	79.2	77.6
2009	18	71.6	74.9	64.2	75.4
2010	21	76.8	77.1	76.3	77.1
2011	13	72.5	69.1	82.0	70.8
2012	26	74.7	74.4	75.0	73.6
2013	27	76.3	76.4	75.6	76.3
2014	19	82.0	81.4	82.0	79.9
2015	23	76.8	71.7	77.5	76.5
2016	18	79.2	69.2	83.4	77.5
1998–2016	214	76.5	75.7	77.6	76.2

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 10b

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

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	1	54.6		54.6	54.6
1999	3	81.9	90.4	77.2	81.9
2000	5	79.4	79.8	79.4	79.4
2001	3	80.9	76.3	89.2	80.9
2002	11	74.1	71.9	78.9	74.1
2003	8	74.2	72.2	82.9	74.2
2004	11	74.6	79.6	72.5	74.6
2005	21	75.3	74.5	78.2	72.8
2006	17	73.6	70.1	77.2	75.0
2007	17	77.9	72.7	81.2	73.1
2008	35	79.1	73.2	81.1	73.2
2009	22	77.7	76.1	78.3	77.7
2010	37	74.2	72.6	79.2	72.7
2011	51	80.0	77.0	86.9	78.8
2012	52	77.8	73.1	85.8	73.8
2013	38	76.1	75.1	79.1	75.1
2014	63	80.0	79.4	81.0	78.8
2015	44	78.0	78.2	78.0	77.7
2016	44	79.3	77.3	82.7	76.3
1998–2016	483	77.8	75.6	80.7	76.0

By 2010, life expectancy at birth was 77.5 years for boys and 82.6 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 11a

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

MALES

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
1999									
2000									
2001	1	0.1	0.05	0.1	0.04	0.1	0.05	0.1	0.05
2002	2	0.1	0.06	0.1	0.06	0.1	0.07	0.1	0.09
2003	1	0.1	0.02	0.0	0.01	0.0	0.02	0.1	0.03
2004	2	0.1	0.07	0.0	0.05	0.1	0.07	0.1	0.09
2005	1	0.1	0.03	0.0	0.02	0.0	0.02	0.1	0.04
2006	6	0.3	0.13	0.2	0.11	0.3	0.13	0.3	0.15
2007	7	0.3	0.12	0.1	0.09	0.2	0.11	0.4	0.15
2008	9	0.4	0.14	0.2	0.11	0.3	0.13	0.4	0.16
2009	15	0.7	0.27	0.3	0.22	0.5	0.26	0.7	0.30
2010	16	0.7	0.36	0.3	0.29	0.5	0.35	0.7	0.38
2011	7	0.3	0.09	0.2	0.08	0.2	0.09	0.3	0.09
2012	16	0.7	0.30	0.3	0.19	0.4	0.24	0.7	0.31
2013	18	0.8	0.41	0.3	0.34	0.5	0.39	0.7	0.42
2014	10	0.4	0.26	0.1	0.16	0.2	0.20	0.4	0.28
2015	13	0.5	1.08	0.2	1.11	0.4	1.09	0.5	1.06
2016	6	0.2	1.20	0.1	1.79	0.2	1.51	0.2	1.27
1999-2016	130	0.4	0.20	0.2	0.15	0.3	0.18	0.4	0.22

Table 11b

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

FEMALES

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
1999	1	0.1	0.04	0.0	0.01	0.0	0.02	0.0	0.02
2000	4	0.3	0.10	0.1	0.04	0.1	0.06	0.3	0.09
2001	2	0.2	0.03	0.1	0.02	0.1	0.02	0.1	0.03
2002	8	0.4	0.07	0.2	0.07	0.3	0.07	0.4	0.07
2003	7	0.4	0.08	0.1	0.05	0.2	0.06	0.3	0.07
2004	7	0.4	0.07	0.1	0.04	0.2	0.05	0.3	0.06
2005	16	0.8	0.15	0.4	0.11	0.5	0.12	0.7	0.15
2006	9	0.4	0.08	0.2	0.06	0.3	0.06	0.4	0.07
2007	11	0.5	0.07	0.2	0.05	0.3	0.06	0.4	0.07
2008	24	1.0	0.14	0.4	0.09	0.6	0.11	0.7	0.12
2009	12	0.5	0.07	0.2	0.05	0.3	0.05	0.4	0.06
2010	23	1.0	0.17	0.4	0.14	0.6	0.15	0.7	0.16
2011	36	1.5	0.20	0.6	0.13	0.9	0.14	1.1	0.16
2012	31	1.3	0.18	0.5	0.13	0.8	0.14	1.0	0.17
2013	24	1.0	0.21	0.4	0.14	0.6	0.16	0.7	0.17
2014	39	1.6	0.36	0.5	0.21	0.8	0.25	1.1	0.30
2015	26	1.1	0.68	0.3	0.40	0.5	0.47	0.7	0.58
2016	26	1.1	0.93	0.4	0.66	0.5	0.72	0.8	0.84
1999-2016	306	0.8	0.16	0.3	0.11	0.5	0.12	0.6	0.14

Table 12

Age distribution of age at death (cancer-related) for period 2007-2016  
(incl. multiple malignancies)

Age at death Years	Cases			Males			Females		
	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4									
5-9									
10-14									
15-19									
20-24									
25-29									
30-34	1	0.3	0.3	1	0.9	0.9			0.0
35-39	1	0.3	0.5			0.9	1	0.4	0.4
40-44	2	0.5	1.1	1	0.9	1.7	1	0.4	0.8
45-49	4	1.1	2.2	2	1.7	3.4	2	0.8	1.6
50-54	11	3.0	5.1	5	4.3	7.7	6	2.4	4.0
55-59	19	5.1	10.3	7	6.0	13.7	12	4.8	8.7
60-64	34	9.2	19.5	9	7.7	21.4	25	9.9	18.7
65-69	40	10.8	30.4	12	10.3	31.6	28	11.1	29.8
70-74	65	17.6	48.0	19	16.2	47.9	46	18.3	48.0
75-79	63	17.1	65.0	26	22.2	70.1	37	14.7	62.7
80-84	65	17.6	82.7	20	17.1	87.2	45	17.9	80.6
85+	64	17.3	100.0	15	12.8	100.0	49	19.4	100.0
All ages	369	100.0		117	100.0		252	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers  
for period 2007–2016  
(incl. multiple malignancies)

Age at death Years	Males n	Females n	Males Age- spec. mortal.	MI-index	Females Age- spec. mortal.	MI-index
0- 4						
5- 9						
10-14						
15-19						
20-24						
25-29						
30-34	1		0.1	0.14		
35-39		1			0.1	0.03
40-44	1	1	0.1	0.04	0.1	0.02
45-49	2	2	0.1	0.08	0.1	0.02
50-54	5	6	0.3	0.14	0.4	0.05
55-59	7	12	0.5	0.21	0.8	0.09
60-64	9	25	0.7	0.14	1.9	0.19
65-69	12	28	1.0	0.20	2.2	0.17
70-74	19	46	1.7	0.24	3.6	0.24
75-79	26	37	3.3	0.58	3.7	0.26
80-84	20	45	4.3	0.53	6.4	0.60
85+	15	49	4.9	1.07	6.7	1.04
All ages	117	252				
Mortality						
Raw			0.5	0.26	1.1	0.20
WS			0.2	0.20	0.4	0.13
ES			0.4	0.23	0.6	0.15
BRD-S			0.5	0.27	0.8	0.17
PYLL-70						
per 100,000			1.9		3.1	
ES			1.6		2.6	
AYLL-70			10.3		8.2	

Table 14a

Further malignancies in deaths in period 1999-2016  
MALES

N=0 further malignancies in deaths were registered. Therefore, the table was not created.

Table 14b

Further malignancies in deaths in period 1999-2016  
FEMALES

N=0 further malignancies in deaths were registered. Therefore, the table was not created.



Table 15

Age-specific mortality (cancer-related) and proportion of all cancers  
for period 2007-2016  
(First primaries only \*)

Age at death Years	Males n	Females n	Males Age- spec. mortal.	MI-index	Females Age- spec. mortal.	MI-index
0- 4						
5- 9						
10-14						
15-19						
20-24						
25-29						
30-34	1		0.1	0.14		
35-39						
40-44	1	1	0.1	0.04	0.1	0.02
45-49	1		0.1	0.05		
50-54	4	1	0.2	0.12	0.1	0.01
55-59	4	7	0.3	0.14	0.5	0.07
60-64	8	13	0.7	0.15	1.0	0.12
65-69	8	11	0.7	0.20	0.8	0.11
70-74	7	25	0.6	0.15	2.0	0.18
75-79	14	17	1.8	0.48	1.7	0.20
80-84	12	27	2.6	0.71	3.8	0.52
85+	6	28	2.0	0.75	3.8	1.00
All ages	66	130				
Mortality						
Raw			0.3	0.20	0.5	0.14
WS			0.1	0.15	0.2	0.08
ES			0.2	0.18	0.3	0.10
BRD-S			0.3	0.21	0.4	0.12
PYLL-70						
per 100,000			1.4		1.3	
ES			1.2		1.1	
AYLL-70			10.6		7.8	

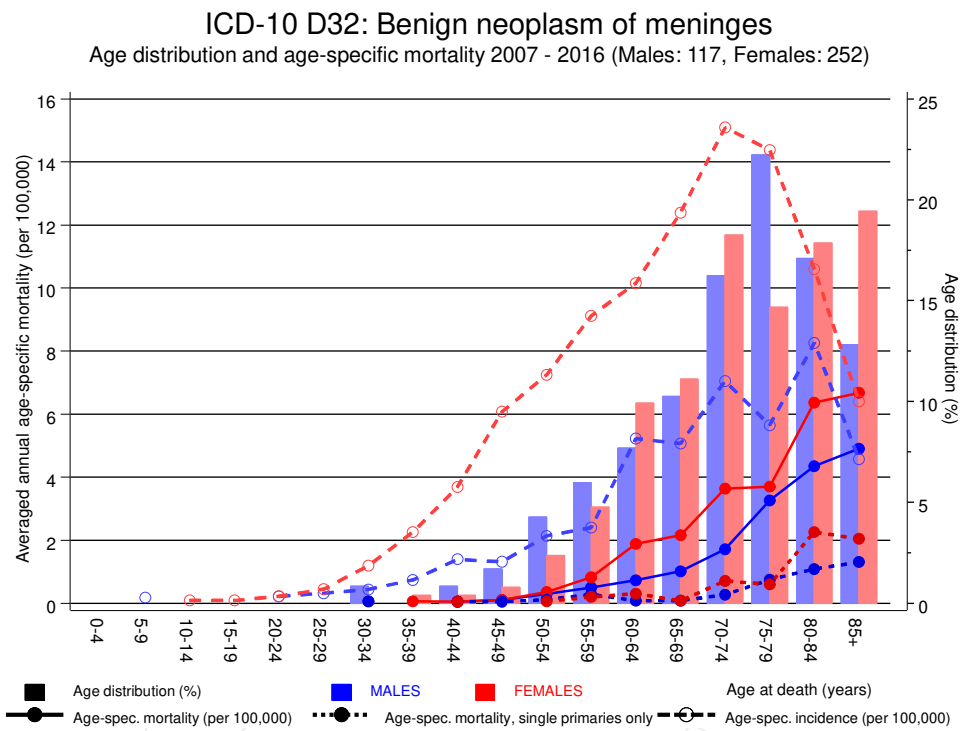
\* See corresponding tables with multiple malignancies.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers  
for period 2007-2016  
(Single primaries only \*)

Age at death Years	Males n	Females n	Males Age- spec. mortal.	MI-index	Females Age- spec. mortal.	MI-index
0- 4						
5- 9						
10-14						
15-19						
20-24						
25-29						
30-34	1		0.1	0.14		
35-39						
40-44	1	1	0.1	0.04	0.1	0.02
45-49	1		0.1	0.05		
50-54	2	1	0.1	0.07	0.1	0.01
55-59	4	3	0.3	0.16	0.2	0.03
60-64	1	4	0.1	0.02	0.3	0.04
65-69	1	1	0.1	0.03	0.1	0.01
70-74	3	9	0.3	0.08	0.7	0.08
75-79	6	6	0.8	0.27	0.6	0.08
80-84	5	16	1.1	0.42	2.3	0.38
85+	4	15	1.3	0.67	2.0	0.71
All ages	29	56				
Mortality						
Raw			0.1	0.10	0.2	0.07
WS			0.1	0.08	0.1	0.04
ES			0.1	0.09	0.1	0.04
BRD-S			0.1	0.11	0.2	0.06
PYLL-70						
per 100,000			0.9		0.6	
ES			0.8		0.5	
AYLL-70			16.6		11.5	

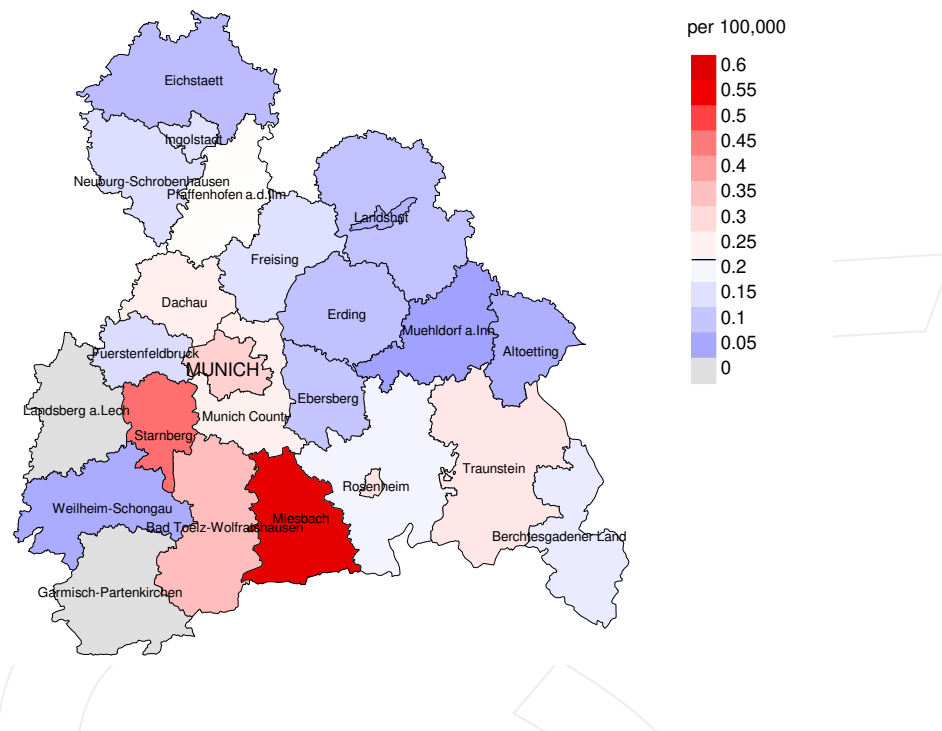
\* See corresponding tables with multiple malignancies.



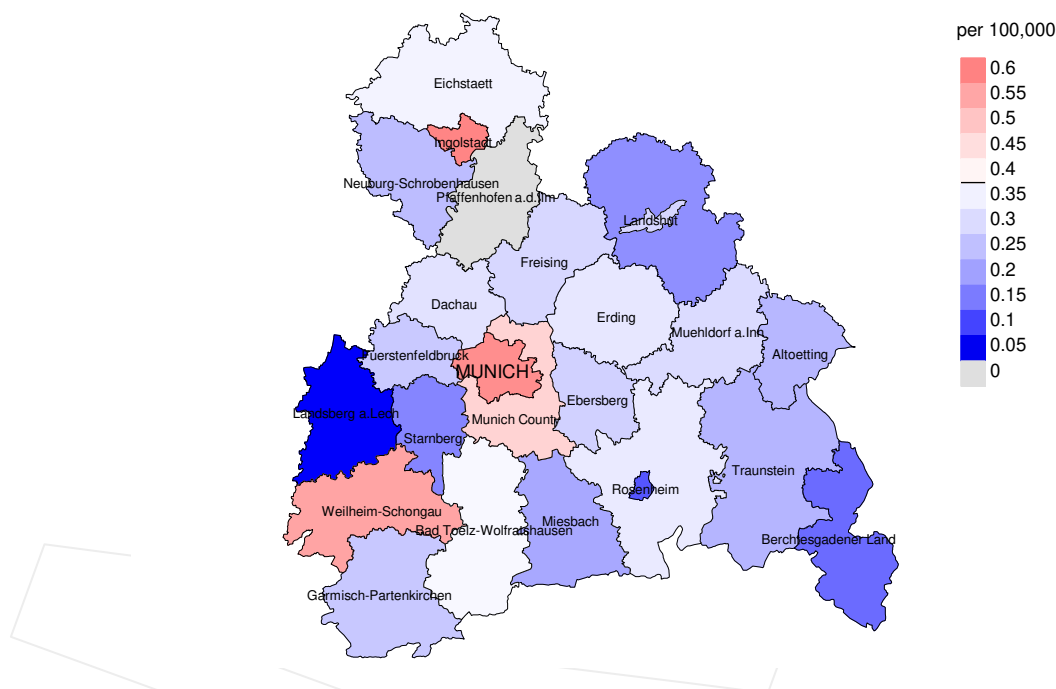
**Figure 17.** Distribution of age at death (bars; males: mean=66.5 yrs, median=70.8 yrs; females: mean=68.3 yrs, median=70.6 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

Average mortality (world standard population) 2007 - 2016: Males



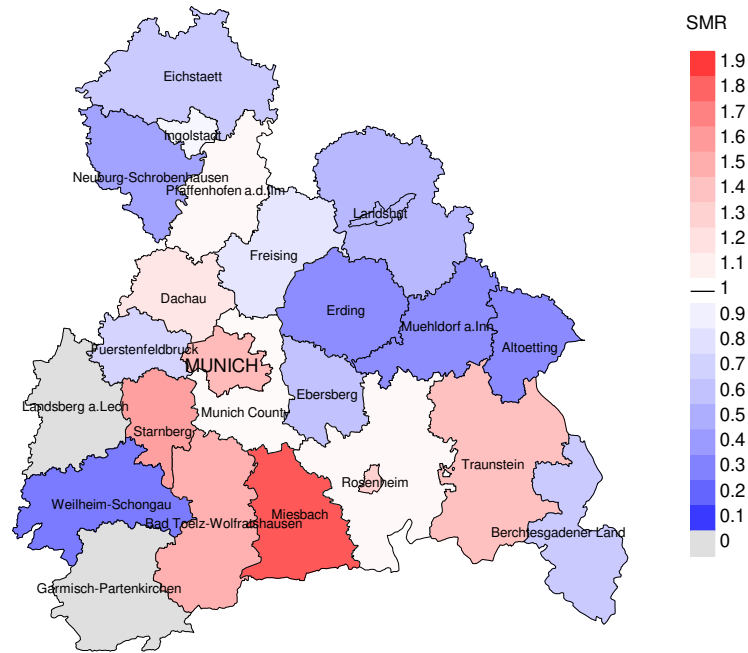
Average mortality (world standard population) 2007 - 2016: Females



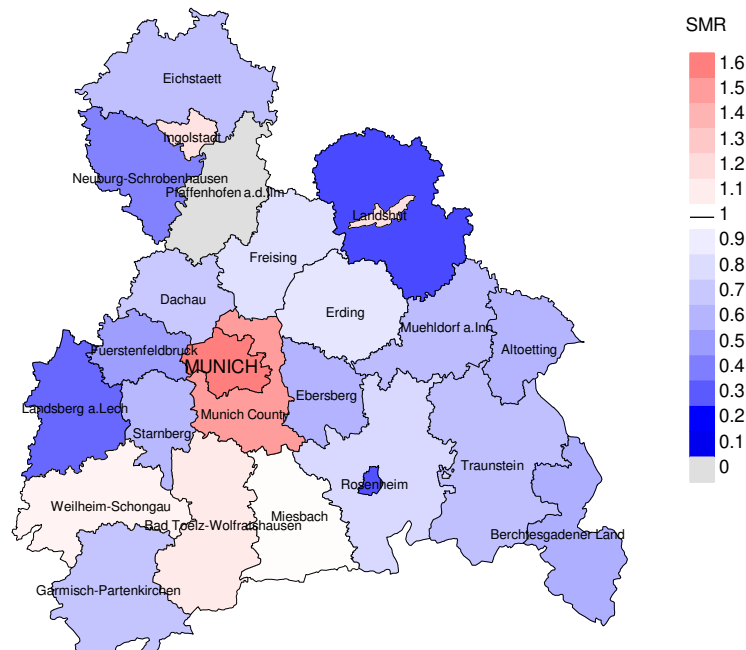
**Figure 18a.** Map of cancer mortality (world standard population) by county averaged for period 2007 to 2016. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.2/100,000 WS N=117, females 0.4/100,000 WS N=252).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 4 women died from meninges neoplasm. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.3/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.0 and 1.3/100,000.

Standardized mortality ratio (SMR) 2007 - 2016: Males



Standardized mortality ratio (SMR) 2007 - 2016: Females



**Figure 18b.** Map of standardized mortality ratio (SMR) by county averaged for period 2007 to 2016. 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 (males N=117, females N=252).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 4 women died from meninges neoplasm. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.60. Though, the value of this parameter may vary with an underlying probability of 99% between 0.10 and 1.88, 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 index from mortality and incidence (Mortality-Incidence ratio, **MI-index**) is a statistic 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 MI- index. 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 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 between mortality and incidence
FRG	Federal Republic of Germany

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