

Munich Cancer Registry



- ▶ Survival
- ▶ Selection Matrix
- ▶ Homepage
- ▶ *Deutsch*

ICD-10 D33: CNS neoplasm

Incidence and Mortality

Year of diagnosis	1998-2016
Patients	1,393
Diseases	1,397
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/bD33__E-ICD-10-D33-CNS-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[#], 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, August 2018

[#] 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
D33.-	Benign neoplasm of brain and other parts of central nervous system
D33.0	Benign neoplasm of brain, supratentorial
D33.1	Benign neoplasm of brain, infratentorial
D33.2	Benign neoplasm of brain, unspecified
D33.3	Benign neoplasm of cranial nerves
D33.4	Benign neoplasm of spinal cord
D33.7	Benign neoplasm of other specified parts of central nervous system
D33.9	Benign neoplasm of central nervous system, 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	13	15.4	12.7	15.4	100.0
1999	17	10.0	12.7	41.2	94.1
2000	34	9.4	12.3	29.4	94.1
2001	96	11.3	12.0	29.2	91.7
2002	133	9.9	12.2	16.5	88.0 #
2003	124	11.5	11.5	24.2	88.7
2004	109	11.0	11.1	11.0	83.5
2005	101	10.7	10.7	15.8	85.1
2006	88	10.8	10.5	14.8	87.5
2007	130	10.3	9.6	11.5	60.0 #
2008	92	10.9	10.1	14.1	40.2
2009	102	11.5	10.8	16.7	44.1
2010	61	11.9	10.5	11.5	47.5
2011	86	12.1	9.9	4.7	37.2
2012	107	12.3	8.7	5.6	41.1
2013	32	12.2	10.9	6.3	40.6
2014	59	12.5	15.7	11.9	50.8
2015	9	13.0	33.3	22.2	100.0
2016	4	13.2	25.0 ##		
1998-2016	1397	13.2	12.7	15.2	67.8

1,397 cases diagnosed 1998-2016 are related to a total of 1,393 patients. Currently, in 337 (24.2 %) of these 1,393 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 273 / 51 / 13 (19.6 % / 3.7 % / 0.9 %) 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 59 cases has been diagnosed, of which 12.5 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 15.7 % 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	4	30.8	25.0	13.7		100.0
1999	8	47.1	8.3	13.8	37.5	100.0
2000	13	38.2	8.0	13.3	15.4	92.3
2001	41	42.7	12.1	13.3	34.1	87.8
2002	56	42.1	10.7	13.5	21.4	92.9 #
2003	55	44.4	12.4	13.0	25.5	90.9
2004	45	41.3	12.6	12.6	13.3	84.4
2005	45	44.6	12.0	11.2	22.2	86.7
2006	43	48.9	11.9	10.9	11.6	86.0
2007	47	36.2	10.9	9.8	10.6	55.3 #
2008	38	41.3	11.1	10.9	15.8	50.0
2009	45	44.1	11.4	11.8	13.3	48.9
2010	21	34.4	11.3	10.8	23.8	61.9
2011	36	41.9	11.7	8.2	5.6	44.4
2012	62	57.9	12.0	7.2	8.1	45.2
2013	15	46.9	11.7	4.1		46.7
2014	30	50.8	11.4	5.9	6.7	50.0
2015	4	44.4	12.0	25.0	50.0	100.0
2016	1	25.0	12.0	100.0 ##		
1998-2016	609	43.6	12.0	13.7	16.3	70.0

609 cases diagnosed 1998-2016 are related to a total of 607 patients. Currently, in 144 (23.7 %) of these 607 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 124 / 11 / 9 (20.4 % / 1.8 % / 1.5 %) 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 30 cases has been diagnosed, of which 11.4 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 5.9 % 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	9	69.2	11.1	11.9	22.2	100.0
1999	9	52.9	11.1	11.8	44.4	88.9
2000	21	61.8	10.3	11.6	38.1	95.2
2001	55	57.3	10.6	11.1	25.5	94.5
2002	77	57.9	9.4	11.1	13.0	84.4 #
2003	69	55.6	10.8	10.3	23.2	87.0
2004	64	58.7	9.9	10.0	9.4	82.8
2005	56	55.4	9.7	10.3	10.7	83.9
2006	45	51.1	9.9	10.1	17.8	88.9
2007	83	63.8	9.8	9.5	12.0	62.7 #
2008	54	58.7	10.7	9.5	13.0	33.3
2009	57	55.9	11.5	9.8	19.3	40.4
2010	40	65.6	12.4	10.2	5.0	40.0
2011	50	58.1	12.3	11.6	4.0	32.0
2012	45	42.1	12.5	10.3	2.2	35.6
2013	17	53.1	12.6	17.3	11.8	35.3
2014	29	49.2	13.3	25.0	17.2	51.7
2015	5	55.6	13.8	37.5		100.0
2016	3	75.0	14.1	0.0 ##		
1998-2016	788	56.4	14.1	11.9	14.5	66.1

788 cases diagnosed 1998-2016 are related to a total of 786 patients. Currently, in 193 (24.6 %) of these 786 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 149 / 40 / 4 (19.0 % / 5.1 % / 0.5 %) 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 29 cases has been diagnosed, of which 13.3 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 25.0 % 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
(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	4	9	0.4	0.8	0.4	0.7	0.4	0.8	0.4	0.8
1999	8	9	0.7	0.8	0.6	0.5	0.6	0.6	0.7	0.8
2000	13	21	1.1	1.7	0.9	1.1	1.1	1.4	1.2	1.5
2001	41	55	3.5	4.5	2.4	3.0	3.1	3.8	3.6	4.2
2002	56	77	3.0	3.9	2.3	2.7	2.7	3.4	2.9	3.7
2003	55	69	2.9	3.5	2.1	2.2	2.6	2.9	2.9	3.2
2004	45	64	2.4	3.2	1.7	2.2	2.1	2.8	2.3	3.0
2005	45	56	2.4	2.8	1.7	1.9	2.1	2.4	2.3	2.6
2006	43	45	2.2	2.2	1.6	1.6	2.0	1.9	2.2	2.1
2007	47	83	2.1	3.6	1.5	2.4	1.8	3.1	2.0	3.4
2008	38	54	1.7	2.3	1.1	1.6	1.4	1.9	1.6	2.2
2009	45	57	2.0	2.5	1.3	1.7	1.7	2.0	1.8	2.2
2010	21	40	0.9	1.7	0.6	1.0	0.7	1.3	0.8	1.6
2011	36	50	1.6	2.1	1.3	1.5	1.5	1.9	1.5	2.0
2012	62	45	2.7	1.9	1.8	1.3	2.3	1.6	2.5	1.8
2013	15	17	0.7	0.7	0.6	0.5	0.6	0.6	0.6	0.6
2014	30	29	1.3	1.2	1.0	0.8	1.2	0.9	1.3	1.1
2015	4	5	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2
2016	1	3	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.1
1998-2016	609	788	1.7	2.1	1.2	1.4	1.4	1.7	1.6	1.9

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

Table 3

Age distribution parameters by year of diagnosis (ALL PATIENTS)

Year of diagnosis	Cases n	Std. dev.		Min. Max.		10% 25%		Median		
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	13	43.0	21.4	1.0	74.0	18.3	23.9	50.6	59.6	60.9
1999	17	53.6	19.6	20.0	83.4	23.6	41.6	55.9	62.7	78.0
2000	34	56.8	15.1	13.9	88.3	41.9	48.5	56.4	64.7	74.0
2001	96	55.7	17.0	9.1	90.5	33.8	44.4	57.1	69.3	76.9
2002	133	54.4	16.4	3.0	82.8	33.6	44.8	58.3	65.2	71.6
2003	124	56.4	15.4	10.2	88.5	35.5	44.1	58.8	67.6	75.9
2004	109	55.1	15.2	12.6	88.4	37.9	44.1	57.3	66.4	74.6
2005	101	54.3	16.4	2.2	88.3	35.2	43.1	55.3	66.4	74.7
2006	88	54.7	15.6	9.8	82.5	29.6	44.5	55.9	66.5	72.4
2007	130	54.6	16.6	1.9	85.5	34.1	43.3	54.1	66.2	77.2
2008	92	57.0	16.7	13.9	84.8	38.4	45.9	59.1	69.7	77.4
2009	102	55.5	16.3	12.1	82.1	33.4	41.9	57.7	68.9	77.2
2010	61	58.3	17.2	14.1	85.7	37.6	44.6	57.4	72.6	78.3
2011	86	53.7	18.6	0.7	86.5	26.3	43.7	58.0	67.6	73.0
2012	107	55.8	15.1	10.4	84.2	34.8	45.4	56.4	67.8	73.9
2013	32	49.0	18.1	3.1	85.7	32.5	40.4	49.9	56.1	73.9
2014	59	53.4	18.6	15.8	85.7	25.3	42.1	55.9	68.6	77.8
2015	9	49.7	12.9	33.7	69.8	33.7	41.3	44.4	61.5	69.8
2016	4	67.1	12.4	55.2	79.7	55.2	56.5	66.8	77.7	79.7
1998-2016	1397	55.0	16.5	0.7	90.5	33.4	43.9	56.6	67.6	75.5

Table 3a

Age distribution parameters by year of diagnosis (MALES)

Year of diagnosis	Cases n	Std. dev.		Min. Max.		10% 25%		Median		
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	4	33.0	19.0	18.3	59.6	18.3	19.3	27.0	46.6	59.6
1999	8	48.6	18.4	23.6	77.3	23.6	33.9	49.9	60.4	77.3
2000	13	51.9	18.2	13.9	88.3	29.1	45.2	54.0	56.3	73.3
2001	41	56.5	17.4	9.1	84.7	34.0	46.2	61.1	68.9	74.8
2002	56	53.5	17.9	3.0	80.4	26.7	45.6	58.6	64.3	71.3
2003	55	53.1	15.2	22.8	87.1	30.9	41.7	53.9	63.3	75.0
2004	45	55.0	16.2	12.6	76.7	33.4	44.1	57.2	67.8	73.7
2005	45	53.4	18.1	2.2	81.6	32.0	42.4	54.8	66.7	74.7
2006	43	53.5	14.9	19.5	81.1	29.7	43.8	55.8	64.7	70.8
2007	47	51.4	16.9	1.9	80.9	32.7	39.7	50.1	65.4	76.4
2008	38	57.4	15.8	19.2	84.8	35.2	46.4	59.6	69.9	76.0
2009	45	56.0	15.8	27.5	81.5	32.8	42.7	58.3	69.0	76.7
2010	21	57.4	18.5	14.1	82.4	38.5	40.8	58.9	72.6	77.7
2011	36	51.2	19.6	0.7	80.7	21.3	42.6	55.1	65.1	71.4
2012	62	57.2	14.5	10.4	79.0	36.3	46.6	60.1	68.6	71.9
2013	15	44.5	18.4	3.1	74.9	8.1	38.4	50.0	55.6	56.3
2014	30	47.6	16.7	19.8	73.0	24.3	32.5	48.4	61.6	70.5
2015	4	47.0	15.8	33.7	69.8	33.7	36.9	42.2	57.1	69.8
2016	1	79.7		79.7	79.7	79.7	79.7	79.7	79.7	79.7
1998-2016	609	53.7	16.9	0.7	88.3	31.7	42.5	55.9	66.9	73.3

Table 3b

Age distribution parameters by year of diagnosis (FEMALES)

Year of diagnosis	Cases n	Std. dev.		Min. Max.		Median				
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	9	47.4	22.0	1.0	74.0	1.0	48.4	51.7	59.7	74.0
1999	9	57.9	20.8	20.0	83.4	20.0	50.0	59.7	77.7	83.4
2000	21	59.8	12.3	36.5	78.6	42.3	51.9	62.8	67.1	74.0
2001	55	55.1	16.8	12.1	90.5	33.8	43.5	51.2	69.3	76.9
2002	77	55.0	15.4	19.8	82.8	33.6	44.2	57.8	66.2	74.3
2003	69	59.1	15.2	10.2	88.5	39.0	49.9	60.2	70.5	79.1
2004	64	55.2	14.6	17.9	88.4	38.1	43.9	57.6	63.6	75.3
2005	56	55.1	15.1	14.8	88.3	36.5	43.7	55.4	64.3	74.7
2006	45	55.8	16.3	9.8	82.5	28.0	48.2	56.6	69.9	72.4
2007	83	56.5	16.2	3.5	85.5	37.0	45.3	56.7	68.4	77.4
2008	54	56.8	17.4	13.9	82.3	38.4	45.8	59.1	69.2	79.6
2009	57	55.1	16.8	12.1	82.1	33.4	41.9	56.0	66.8	79.7
2010	40	58.8	16.7	25.3	85.7	33.0	46.9	57.2	72.6	78.5
2011	50	55.4	17.9	12.5	86.5	27.4	48.6	58.4	68.2	74.6
2012	45	53.8	15.8	23.2	84.2	33.0	42.9	53.5	66.5	74.5
2013	17	52.9	17.4	24.2	85.7	32.5	43.4	49.8	66.0	80.3
2014	29	59.4	18.8	15.8	85.7	26.9	48.0	60.4	76.5	81.8
2015	5	51.8	11.5	41.3	66.5	41.3	42.3	47.4	61.5	66.5
2016	3	62.9	11.1	55.2	75.7	55.2	55.2	57.9	75.7	75.7
1998-2016	788	56.1	16.2	1.0	90.5	34.8	44.7	57.6	68.3	76.6

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	0.7	0.7	4	1.3	1.3	1	0.3	0.3
5-9	1	0.1	0.9	1	0.3	1.7			0.3
10-14	5	0.7	1.6	2	0.7	2.3	3	0.8	1.0
15-19	9	1.3	2.9	3	1.0	3.3	6	1.6	2.6
20-24	10	1.5	4.4	4	1.3	4.7	6	1.6	4.2
25-29	25	3.7	8.1	9	3.0	7.7	16	4.2	8.4
30-34	26	3.8	11.9	16	5.4	13.0	10	2.6	11.0
35-39	40	5.9	17.7	21	7.0	20.1	19	5.0	15.9
40-44	71	10.4	28.2	31	10.4	30.4	40	10.4	26.4
45-49	64	9.4	37.5	32	10.7	41.1	32	8.4	34.7
50-54	68	10.0	47.5	27	9.0	50.2	41	10.7	45.4
55-59	75	11.0	58.5	29	9.7	59.9	46	12.0	57.4
60-64	61	8.9	67.4	21	7.0	66.9	40	10.4	67.9
65-69	74	10.9	78.3	45	15.1	81.9	29	7.6	75.5
70-74	64	9.4	87.7	30	10.0	92.0	34	8.9	84.3
75-79	49	7.2	94.9	15	5.0	97.0	34	8.9	93.2
80-84	30	4.4	99.3	9	3.0	100.0	21	5.5	98.7
85+	5	0.7	100.0			100.0	5	1.3	100.0
All ages	682	100.0		299	100.0		383	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	4	1	0.4	0.1
5- 9	1		0.1	
10-14	2	3	0.2	0.3
15-19	3	5	0.2	0.4
20-24	4	6	0.3	0.4
25-29	9	16	0.6	1.0
30-34	16	10	1.0	0.6
35-39	21	19	1.3	1.2
40-44	31	40	1.7	2.2
45-49	32	32	1.6	1.7
50-54	27	41	1.6	2.4
55-59	29	46	2.0	3.1
60-64	21	40	1.7	3.0
65-69	45	29	3.8	2.2
70-74	30	34	2.7	2.7
75-79	15	34	1.9	3.4
80-84	9	21	2.0	3.0
85+		5		0.7
All ages	299	382		
Incidence				
Raw			1.3	1.6
WS			0.9	1.1
ES			1.1	1.3
BRD-S			1.2	1.5

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 D33: Benign neoplasm of brain and other parts of central nervous system

Age distribution and age-specific incidence 2007 - 2016 (Males: 299, Females: 382)

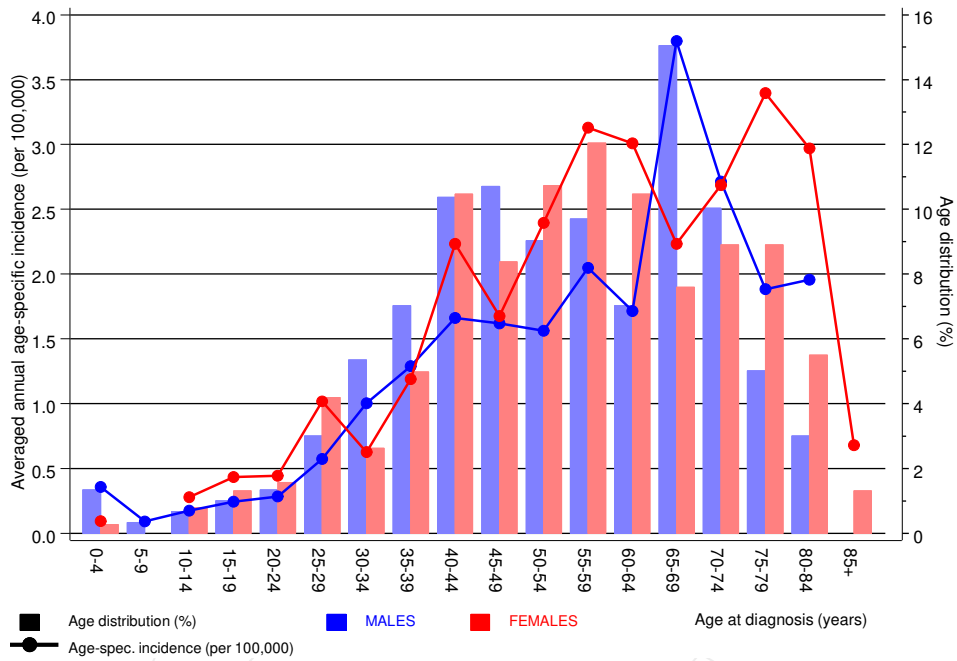


Figure 6. Age distribution (males: mean=53.8 yrs, median=54.5 yrs; females: mean=56.3 yrs, median=56.9 yrs) and age-specific incidence.

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 %
C09-C10 Oropharynx	3	0.4	7.5	1.5	21.8 #	9.2	
C16 Stomach	3	1.1	2.7	0.6	7.8	6.6	
C18 Colon	3	2.7	1.1	0.2	3.2	1.0	
C19-C20 Rectum	4	1.7	2.4	0.6	6.1	8.1	
C22 Liver	3	0.9	3.5	0.7	10.1	7.5	66.7
C33-C34 Lung	5	3.6	1.4	0.4	3.2	4.9	
C43 Malign. melanoma	2	1.4	1.4	0.2	5.0	2.0	
C61 Prostate	21	8.7	2.4	1.5	3.7 #	43.5	
C64 Kidney	4	1.1	3.6	1.0	9.1	10.1	25.0
C70-C72 CNS cancer	3	0.4	6.7	1.4	19.6 #	9.0	
C76-C79 CUP	2	0.5	4.1	0.5	14.7	5.3	50.0
C82-C85 NHL	5	1.2	4.1	1.3	9.5 #	13.3	
Others, specified	12	2.9	4.2	2.1	7.3 #	32.1	8.3
Not observed	0	4.1	0.0	0.0	0.9 #	-14.3	
All further malignancies	70	30.8	2.3	1.8	2.9 #	138.3	7.1

Patients 590
 Median age at next malignancy (years) 67.1
 Person-years 2837
 Mean observation time (years) 4.8
 Median observation time (years) 3.8

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

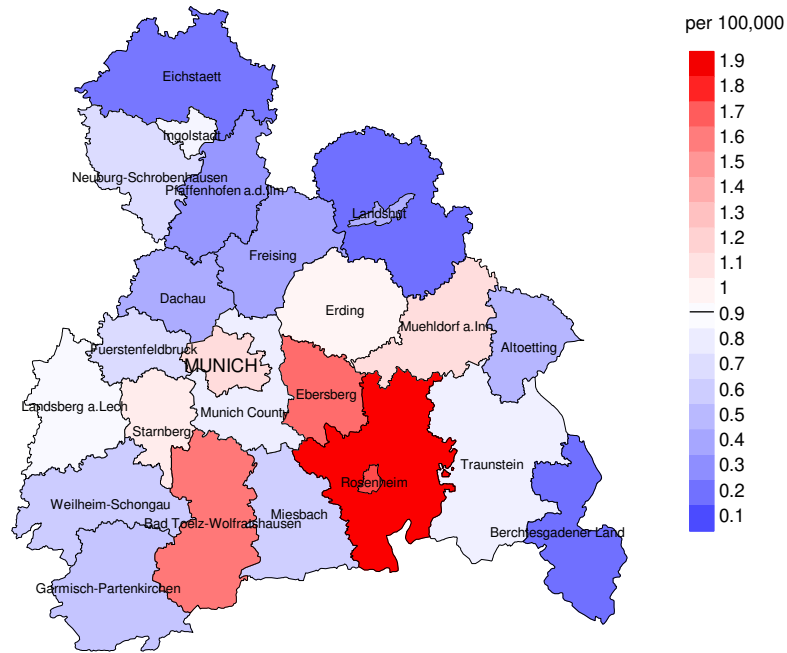
Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C16 Stomach	4	1.0	4.0	1.1	10.3 #	8.0	
C18 Colon	5	2.8	1.8	0.6	4.1	5.8	
C19–C20 Rectum	3	1.3	2.3	0.5	6.9	4.6	33.3
C21 Anus/canal	2	0.2	11.1	1.3	40.0 #	4.8	
C22 Liver	2	0.4	5.6	0.7	20.1	4.3	50.0
C25 Pancreas	2	1.3	1.5	0.2	5.6	1.9	50.0
C33–C34 Lung	8	2.5	3.2	1.4	6.4 #	14.7	
C43 Malign. melanoma	11	1.4	8.1	4.0	14.4 #	25.5	
C50 Breast	18	10.8	1.7	1.0	2.6	19.2	5.6
C54 Corpus uteri	4	1.8	2.2	0.6	5.6	5.7	
C56 Ovary	2	1.3	1.5	0.2	5.4	1.7	
C70–C72 CNS cancer	4	0.5	8.7	2.4	22.3 #	9.4	
C73 Thyroid	4	0.8	5.3	1.4	13.6 #	8.6	
C76–C79 CUP	2	0.5	3.9	0.5	14.0	3.9	
Others, specified	10	2.8	3.5	1.7	6.5 #	19.0	30.0
Not observed	0	3.7	0.0	0.0	1.0 #	-9.9	
All further malignancies	81	33.0	2.5	1.9	3.0 #	127.2	8.6

Patients 768
 Median age at next malignancy (years) 69.8
 Person-years 3772
 Mean observation time (years) 4.9
 Median observation time (years) 3.7

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

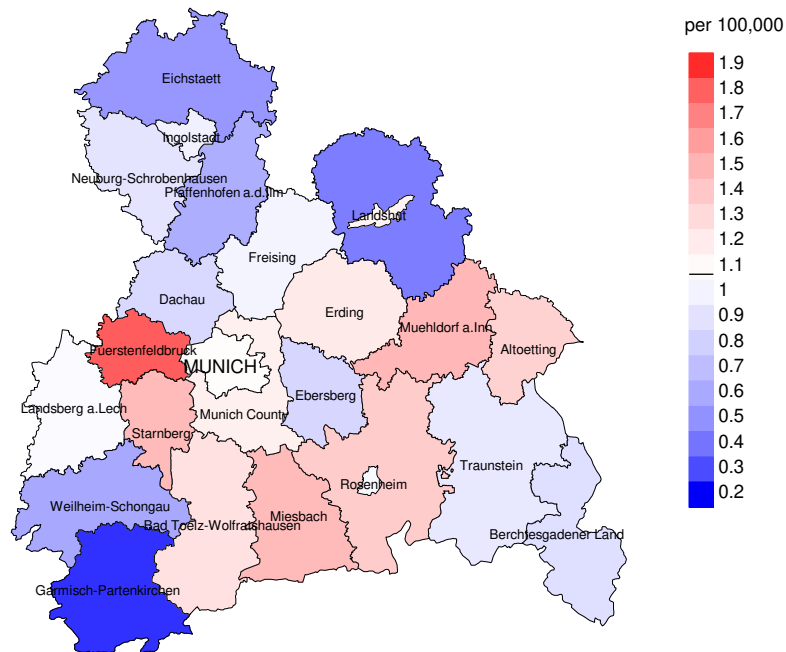
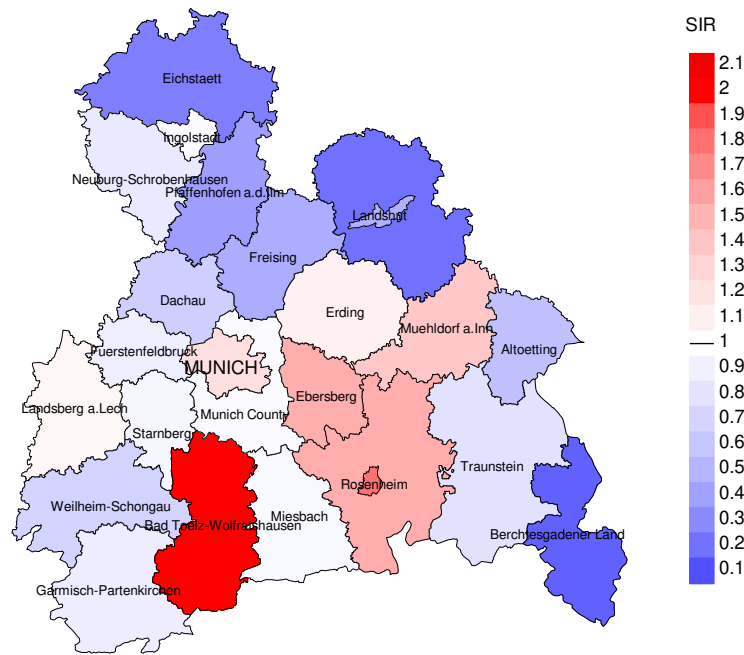


Figure 8a. Map of cancer incidence (world standard population) by county averaged for period 2007 to 2016. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.9/100,000 WS N=299, females 1.1/100,000 WS N=382).

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 8 women were identified with newly diagnosed CNS neoplasm. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 0.8/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.2 and 2.2/100,000.

Standardized incidence ratio (SIR) 2007 - 2016: Males



Standardized incidence ratio (SIR) 2007 - 2016: Females

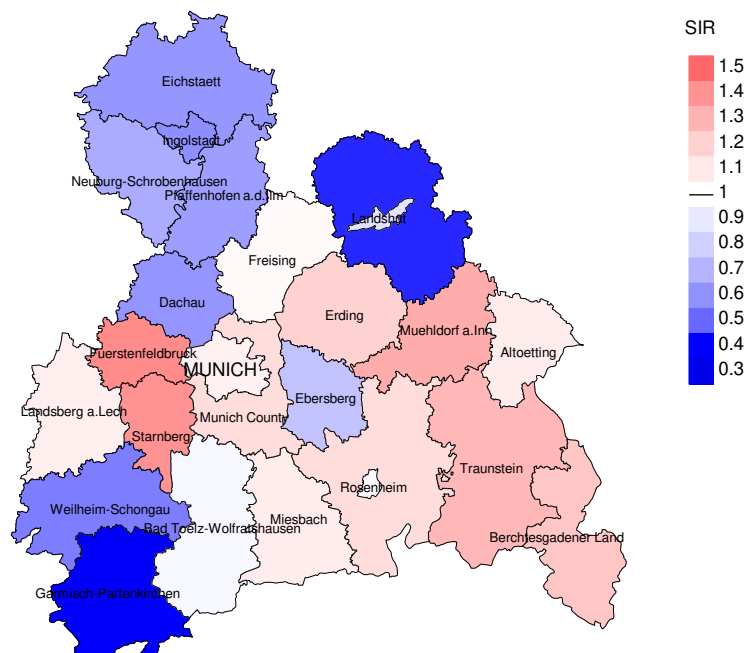


Figure 8b. Map of standardized incidence ratio (SIR) by county averaged for period 2007 to 2016. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=299, females N=382).

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 8 women were identified with newly diagnosed CNS neoplasm. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.75. Though, the value of this parameter may vary with an underlying probability of 99% between 0.24 and 1.74, and is therefore not statistically striking.

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	13	100.0	2	15.4	100.0
1999	17	94.1	7	41.2	85.7
2000	34	94.1	10	29.4	100.0
2001	96	91.7	28	29.2	92.9
2002	133	88.0	22	16.5	100.0
2003	124	88.7	30	24.2	96.7
2004	109	83.5	12	11.0	100.0
2005	101	85.1	16	15.8	100.0
2006	88	87.5	13	14.8	100.0
2007	130	60.0	15	11.5	86.7
2008	92	40.2	13	14.1	100.0
2009	102	44.1	17	16.7	94.1
2010	61	47.5	7	11.5	85.7
2011	86	37.2	4	4.7	100.0
2012	107	41.1	6	5.6	100.0
2013	32	40.6	2	6.3	100.0
2014	59	50.8	7	11.9	100.0
2015	9	100.0	2	22.2	100.0
2016	4				
1998-2016	1397	67.8	213	15.2	96.2

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	13			
1999	17	1	1	5.9
2000	34	1	1	2.9
2001	96	7	5	5.2
2002	133	7	2	1.5
2003	124	18	6	4.8
2004	109	5	2	1.8
2005	101	14	4	4.0
2006	88	16		
2007	130	7		
2008	92	16	1	1.1
2009	102	16	3	2.9
2010	61	25		
2011	86	17	1	1.2
2012	107	23	2	1.9
2013	32	17		
2014	59	25	3	5.1
2015	9	25	1	11.1
2016	4	30		
1998-2016	1397	270	32	2.3

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 %
1999	1	100.0		100.0
2000	1	100.0		100.0
2001	7	28.6	71.4	66.7
2002	7	71.4	28.6	85.7
2003	18	44.4	55.6	82.4
2004	5	60.0	40.0	60.0
2005	14	71.4	28.6	85.7
2006	16	75.0	25.0	80.0
2007	7	42.9	57.1	42.9
2008	16	37.5	62.5	60.0
2009	16	68.8	31.3	68.8
2010	25	56.0	44.0	60.0
2011	17	41.2	58.8	62.5
2012	23	56.5	43.5	57.1
2013	17	41.2	58.8	43.8
2014	25	68.0	32.0	76.0
2015	25	52.0	48.0	56.0
2016	30	33.3	66.7	46.7
1999-2016	270	53.0	47.0	63.7

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
1999					
2000	1	73.7	73.7		73.7
2001	4	77.0	84.9	74.6	79.4
2002	6	71.6	72.6	71.6	68.5
2003	5	67.6	70.7	67.6	78.5
2004	2	72.4	68.7	76.2	68.7
2005	7	74.7	74.7	75.3	73.8
2006	5	78.3	83.9	72.7	81.1
2007	3	60.3	55.6	65.5	55.6
2008	11	79.0	71.0	80.0	76.8
2009	5	75.4	75.4	73.1	70.0
2010	11	81.8	78.5	81.8	82.1
2011	9	72.8	68.0	74.7	72.3
2012	14	74.6	74.0	75.1	75.1
2013	12	82.3	82.8	81.8	82.3
2014	13	80.2	77.7	81.5	80.2
2015	14	72.8	72.8	74.7	69.8
2016	6	74.3	69.6	78.4	70.4
1999-2016	128	75.0	74.4	77.9	74.7

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
1999	1	83.4	83.4		83.4
2000					
2001	3	75.8	67.3	83.1	67.3
2002	1	79.1	79.1		79.1
2003	13	70.4	66.9	77.8	69.7
2004	3	74.4	65.6	88.6	65.6
2005	7	78.4	78.4	74.1	79.3
2006	11	78.0	78.0	75.8	76.7
2007	4	70.7	58.5	82.9	58.5
2008	5	75.5	87.4	74.2	72.9
2009	11	75.1	73.6	75.1	71.4
2010	14	85.4	84.5	85.6	84.5
2011	8	77.0	76.1	86.0	76.5
2012	9	87.6	80.9	89.4	80.9
2013	5	83.9	78.0	83.9	84.4
2014	12	77.5	76.7	85.8	77.5
2015	11	76.3	67.4	85.2	76.3
2016	24	80.5	79.4	82.7	80.1
1999-2016	142	79.5	76.7	81.5	77.8

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	1	0.1	0.08	0.1	0.06	0.1	0.07	0.1	0.09
2001	1	0.1	0.02	0.0	0.01	0.1	0.02	0.2	0.04
2002	4	0.2	0.07	0.1	0.05	0.2	0.06	0.3	0.09
2003	2	0.1	0.04	0.1	0.03	0.1	0.03	0.1	0.04
2004	1	0.1	0.02	0.0	0.02	0.0	0.02	0.0	0.02
2005	5	0.3	0.11	0.1	0.07	0.2	0.09	0.3	0.12
2006	3	0.2	0.07	0.1	0.04	0.1	0.06	0.2	0.08
2007	2	0.1	0.04	0.1	0.05	0.1	0.05	0.1	0.05
2008	5	0.2	0.13	0.2	0.15	0.2	0.13	0.2	0.13
2009	3	0.1	0.07	0.1	0.05	0.1	0.06	0.2	0.09
2010	8	0.4	0.38	0.1	0.22	0.2	0.29	0.3	0.38
2011	3	0.1	0.08	0.1	0.06	0.1	0.07	0.1	0.07
2012	7	0.3	0.11	0.1	0.08	0.2	0.10	0.3	0.12
2013	5	0.2	0.33	0.1	0.16	0.1	0.23	0.2	0.36
2014	8	0.3	0.27	0.1	0.12	0.2	0.17	0.3	0.26
2015	6	0.3	1.50	0.1	0.79	0.2	1.03	0.2	1.43
2016	4	0.2	4.00	0.1	8.42	0.1	6.33	0.1	4.23
1999-2016	68	0.2	0.12	0.1	0.08	0.1	0.10	0.2	0.13

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	0.11	0.0	0.04	0.0	0.06	0.1	0.11
2000									
2001	1	0.1	0.02	0.1	0.02	0.1	0.02	0.1	0.02
2002	1	0.1	0.01	0.0	0.00	0.0	0.01	0.0	0.01
2003	6	0.3	0.09	0.2	0.07	0.2	0.08	0.2	0.08
2004	2	0.1	0.03	0.1	0.03	0.1	0.03	0.1	0.03
2005	5	0.3	0.09	0.1	0.06	0.2	0.07	0.2	0.08
2006	9	0.4	0.20	0.1	0.09	0.2	0.12	0.4	0.18
2007	1	0.0	0.01	0.0	0.01	0.0	0.01	0.0	0.01
2008	1	0.0	0.02	0.0	0.00	0.0	0.01	0.0	0.01
2009	8	0.3	0.14	0.1	0.08	0.2	0.10	0.3	0.12
2010	6	0.3	0.15	0.0	0.04	0.1	0.07	0.2	0.10
2011	4	0.2	0.08	0.1	0.04	0.1	0.06	0.2	0.08
2012	6	0.3	0.13	0.1	0.04	0.1	0.06	0.2	0.10
2013	2	0.1	0.12	0.0	0.05	0.0	0.06	0.1	0.10
2014	9	0.4	0.31	0.1	0.17	0.2	0.21	0.3	0.25
2015	7	0.3	1.40	0.1	0.78	0.2	0.94	0.2	1.13
2016	6	0.2	2.00	0.1	1.15	0.1	1.21	0.2	1.71
1999-2016	75	0.2	0.10	0.1	0.05	0.1	0.07	0.2	0.08

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	1	1.0	1.0	1	2.0	2.0			0.0
10-14	0	0.0	1.0			2.0			0.0
15-19	0	0.0	1.0			2.0			0.0
20-24	0	0.0	1.0			2.0			0.0
25-29	0	0.0	1.0			2.0			0.0
30-34	0	0.0	1.0			2.0			0.0
35-39	0	0.0	1.0			2.0			0.0
40-44	0	0.0	1.0			2.0			0.0
45-49	4	4.0	5.0	4	7.8	9.8			0.0
50-54	2	2.0	6.9	1	2.0	11.8	1	2.0	2.0
55-59	8	7.9	14.9	5	9.8	21.6	3	6.0	8.0
60-64	7	6.9	21.8	3	5.9	27.5	4	8.0	16.0
65-69	9	8.9	30.7	5	9.8	37.3	4	8.0	24.0
70-74	14	13.9	44.6	10	19.6	56.9	4	8.0	32.0
75-79	23	22.8	67.3	8	15.7	72.5	15	30.0	62.0
80-84	18	17.8	85.1	10	19.6	92.2	8	16.0	78.0
85+	15	14.9	100.0	4	7.8	100.0	11	22.0	100.0
All ages	101	100.0		51	100.0		50	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	1		0.1	1.00		
10-14						
15-19						
20-24						
25-29						
30-34						
35-39						
40-44						
45-49	4		0.2	0.13		
50-54	1	1	0.1	0.04	0.1	0.02
55-59	5	3	0.4	0.17	0.2	0.07
60-64	3	4	0.2	0.14	0.3	0.10
65-69	5	4	0.4	0.11	0.3	0.14
70-74	10	4	0.9	0.33	0.3	0.12
75-79	8	15	1.0	0.53	1.5	0.44
80-84	10	8	2.2	1.11	1.1	0.38
85+	4	11	1.3	1.00	1.5	2.20
All ages	51	50				
Mortality						
Raw			0.2	0.17	0.2	0.13
WS			0.1	0.12	0.1	0.06
ES			0.2	0.14	0.1	0.08
BRD-S			0.2	0.18	0.2	0.11
PYLL-70						
per 100,000			1.3		0.5	
ES			1.3		0.4	
AYLL-70			14.1		7.9	

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	1		0.1	1.00		
10-14						
15-19						
20-24						
25-29						
30-34						
35-39						
40-44						
45-49	4		0.2	0.13		
50-54	1	1	0.1	0.04	0.1	0.03
55-59	5	3	0.4	0.19	0.2	0.08
60-64	3	2	0.2	0.18	0.2	0.07
65-69	3	3	0.3	0.08	0.2	0.13
70-74	8	2	0.7	0.32	0.2	0.09
75-79	7	8	0.9	0.64	0.8	0.32
80-84	6	5	1.3	1.00	0.7	0.38
85+	2	9	0.7	1.00	1.2	4.50
All ages	40	33				
Mortality						
Raw			0.2	0.15	0.1	0.11
WS			0.1	0.11	0.0	0.05
ES			0.1	0.13	0.1	0.07
BRD-S			0.2	0.16	0.1	0.08
PYLL-70						
per 100,000			1.3		0.4	
ES			1.3		0.3	
AYLL-70			15.4		8.6	

* See corresponding tables with multiple malignancies.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2015
(**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						
35-39						
40-44						
45-49	1		0.1	0.03		
50-54		1			0.1	0.02
55-59	1	1	0.1	0.04	0.1	0.03
60-64						
65-69		1			0.1	0.04
70-74	2		0.2	0.09		
75-79	1	2	0.1	0.12	0.2	0.07
80-84		2			0.3	0.16
85+	1	5	0.4	1.00	0.8	2.21
All ages	6	12				
Mortality						
Raw			0.0	0.02	0.1	0.04
WS			0.0	0.01	0.0	0.02
ES			0.0	0.02	0.0	0.02
BRD-S			0.0	0.02	0.0	0.03
PYLL-70						
per 100,000			0.2		0.2	
ES			0.2		0.2	
AYLL-70			17.5		10.8	

* See corresponding tables with multiple malignancies.

ICD-10 D33: Benign neoplasm of brain and other parts of central nervous system
 Age distribution and age-specific mortality 2007 - 2015 (Males: 51, Females: 50)

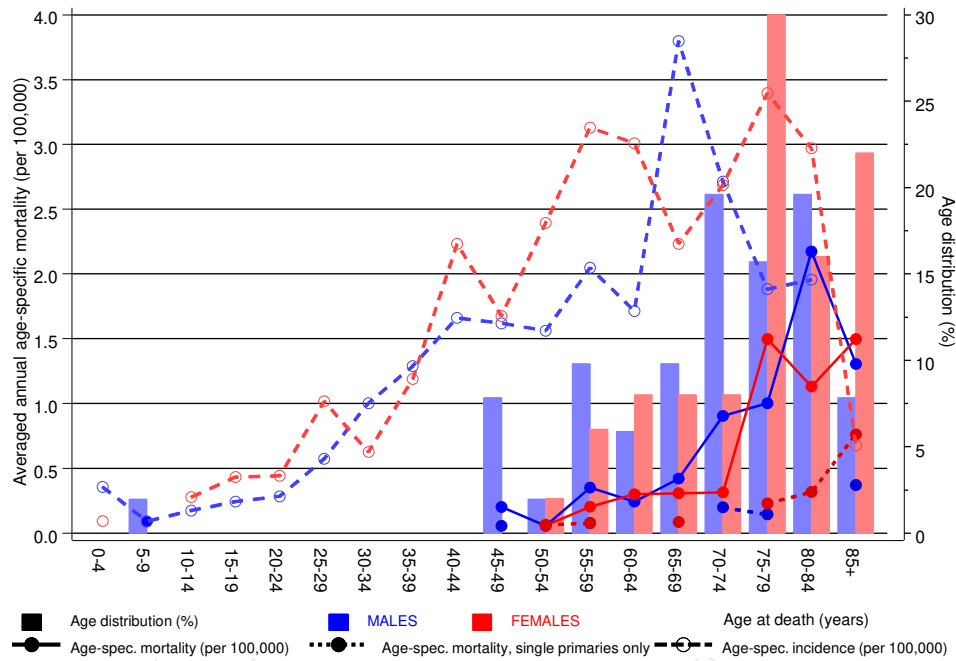
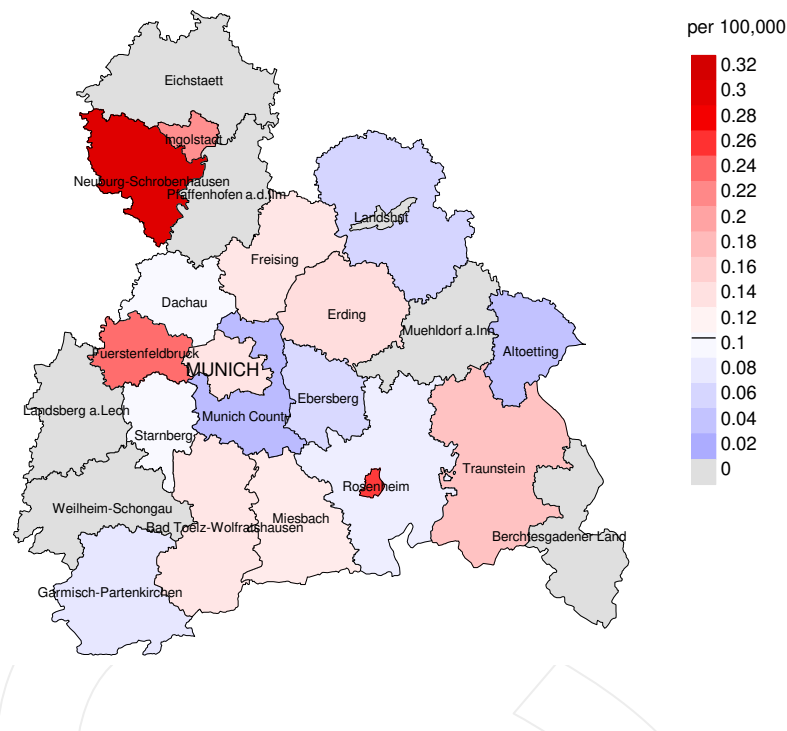


Figure 17. Distribution of age at death (bars; males: mean=59.0 yrs, median=61.3 yrs; females: mean=65.0 yrs, median=69.3 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

The difference between age at diagnosis (Table 3) and age at CNS 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

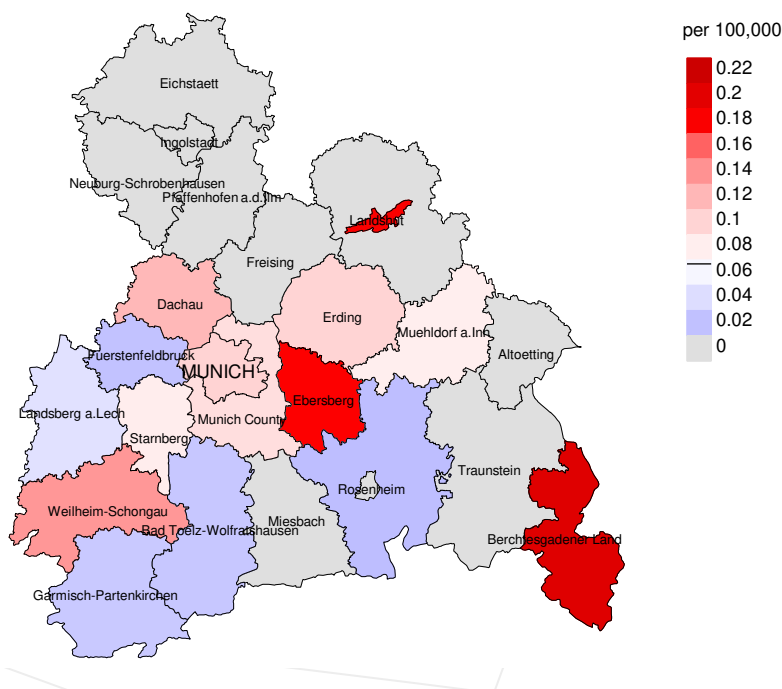
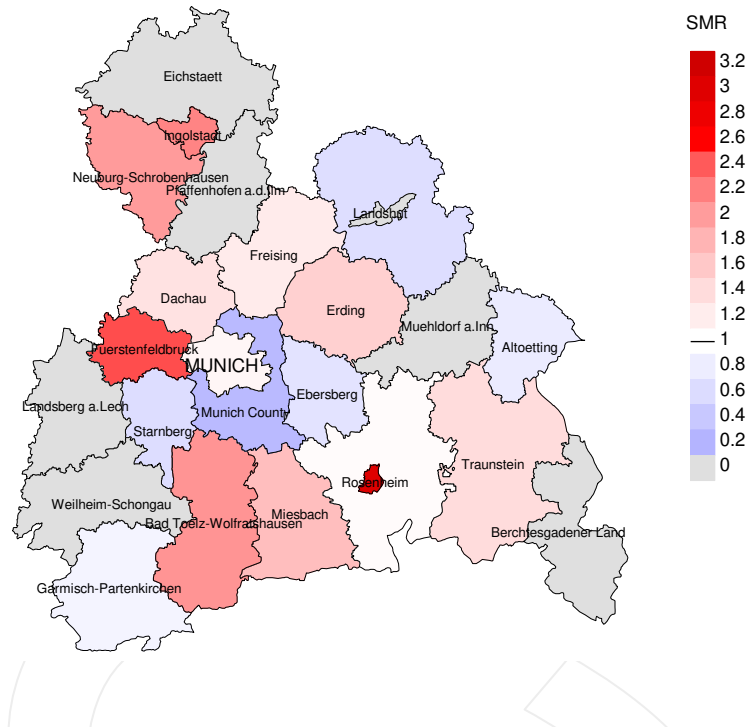


Figure 18a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2016. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.1/100,000 WS N=51, females 0.1/100,000 WS N=50).

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 3 women died from CNS neoplasm. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.2/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.0 and 1.1/100,000.

Standardized mortality ratio (SMR) 2007 - 2016: Males



Standardized mortality ratio (SMR) 2007 - 2016: Females

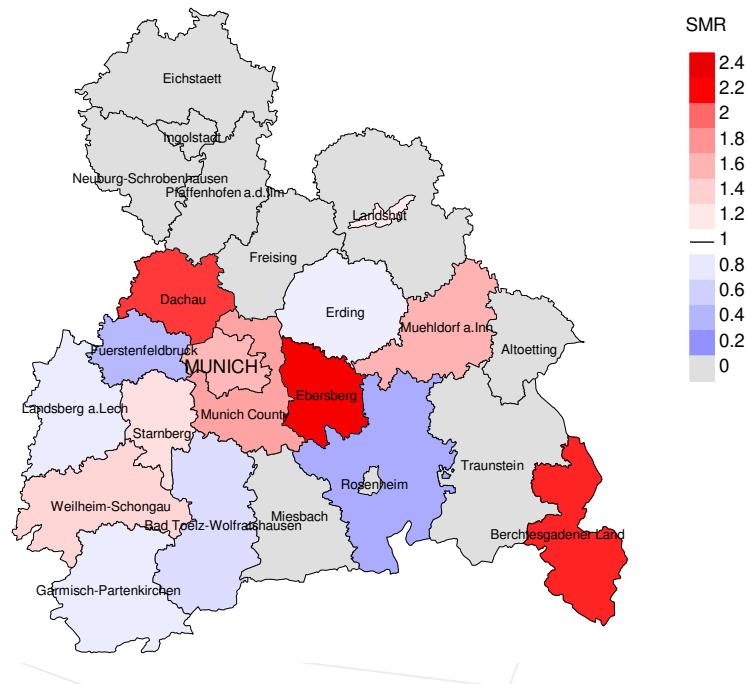


Figure 18b. Map of standardized mortality ratio (SMR) by county averaged for period 2007 to 2016. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=51, females N=50).

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 3 women died from CNS neoplasm. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 2.27. Though, the value of this parameter may vary with an underlying probability of 99% between 0.26 and 8.32, 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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