

# Munich Cancer Registry



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## ICD-10 C45-C49: Mesoth. and soft tissue ca.

### Incidence and Mortality

Year of diagnosis	1998-2016
Patients	4,982
Diseases	5,001
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/bC4549E-ICD-10-C45-C49-Mesoth.-and-soft-tissue-ca.-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
C45.-	Mesothelioma
C46.-	Kaposi sarcoma
C47.-	Malignant neoplasm of peripheral nerves and autonomic nervous system
C48.-	Malignant neoplasm of retroperitoneum and peritoneum
C49.-	Malignant neoplasm of other connective and soft tissue

## INCIDENCE

Table 1

Cases with invasive cancer by year of diagnosis, proportions of DCO, further malignancies, deaths, and active follow-up (ALL PATIENTS) (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	156	24	15.4	11.5	8.3	84.6	98.1
1999	153	17	11.1	13.3	8.3	72.5	96.7
2000	164	37	22.6	13.7	8.1	70.7	96.3
2001	144	24	16.7	12.2	8.0	75.7	96.5
2002	226	33	14.6	12.3	8.0	77.4	98.2 #
2003	249	31	12.4	12.8	8.1	76.7	95.2
2004	260	30	11.5	12.9	8.1	70.4	96.5
2005	268	16	6.0	12.7	8.1	71.3	92.9
2006	242	19	7.9	13.5	7.8	71.1	95.0
2007	341	16	4.7	13.8	7.6	65.7	80.4 #
2008	335	16	4.8	13.8	7.1	71.3	84.5
2009	320	12	3.8	14.5	7.0	66.9	82.5
2010	343	17	5.0	15.3	6.6	64.4	79.9
2011	361	13	3.6	16.1	6.2	59.6	79.2
2012	322	15	4.7	16.4	5.8	61.5	80.1
2013	351	17	4.8	17.1	5.6	55.6	77.8
2014	321	18	5.6	17.5	4.5	51.4	81.9
2015	255	13	5.1	18.0	4.1	49.4	96.9
2016	190	10	5.3	18.5	4.3	27.4	71.1 ##
1998-2016	5001	378	7.6	18.5	8.3	64.6	86.9

5,001 cases diagnosed 1998-2016 are related to a total of 4,982 patients. Currently, in 1,309 (26.3 %) of these 4,982 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 1,050 / 187 / 72 (21.1 % / 3.8 % / 1.4 %) 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 321 cases has been diagnosed, of which 17.5 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 4.5 % 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 1a

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

Year of diagnosis	Males n	Males %	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	88	56.4	16	18.2	10.2	8.2	88.6	98.9
1999	87	56.9	10	11.5	11.4	8.2	80.5	98.9
2000	93	56.7	24	25.8	11.9	7.8	76.3	95.7
2001	72	50.0	13	18.1	11.2	7.8	79.2	95.8
2002	130	57.5	19	14.6	11.9	7.7	79.2	99.2 #
2003	126	50.6	14	11.1	12.2	7.8	77.0	96.0
2004	165	63.5	21	12.7	12.0	7.7	76.4	97.6
2005	149	55.6	8	5.4	12.0	7.7	71.8	93.3
2006	142	58.7	10	7.0	12.6	7.3	75.4	95.1
2007	185	54.3	9	4.9	12.4	6.9	69.7	82.2 #
2008	189	56.4	9	4.8	12.8	6.4	70.4	82.5
2009	175	54.7	6	3.4	13.6	6.0	70.9	84.6
2010	183	53.4	13	7.1	14.6	5.7	66.7	81.4
2011	193	53.5	5	2.6	15.4	5.2	63.7	81.3
2012	177	55.0	7	4.0	15.8	4.9	63.8	78.5
2013	207	59.0	12	5.8	16.3	4.7	54.1	78.3
2014	173	53.9	9	5.2	16.9	4.3	52.0	85.0
2015	147	57.6	8	5.4	17.5	4.1	61.2	98.0
2016	103	54.2	5	4.9	18.2	5.0	28.2	76.7 ##
1998-2016	2784	55.7	218	7.8	18.2	8.2	67.6	88.0

2,784 cases diagnosed 1998-2016 are related to a total of 2,772 patients. Currently, in 715 (25.8 %) of these 2,772 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 575 / 102 / 38 (20.7 % / 3.7 % / 1.4 %) 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 173 cases has been diagnosed, of which 16.9 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 4.3 % 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 with invasive cancer by year of diagnosis, proportions of DCO, further malignancies, deaths, and active follow-up (FEMALES) (incl. DCO)

Year of diagnosis	Females n	Females %	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	68	43.6	8	11.8	13.2	8.5	79.4	97.1
1999	66	43.1	7	10.6	15.7	8.5	62.1	93.9
2000	71	43.3	13	18.3	16.1	8.5	63.4	97.2
2001	72	50.0	11	15.3	13.4	8.3	72.2	97.2
2002	96	42.5	14	14.6	12.9	8.4	75.0	96.9 #
2003	123	49.4	17	13.8	13.5	8.4	76.4	94.3
2004	95	36.5	9	9.5	14.0	8.6	60.0	94.7
2005	119	44.4	8	6.7	13.7	8.5	70.6	92.4
2006	100	41.3	9	9.0	14.7	8.5	65.0	95.0
2007	156	45.7	7	4.5	15.4	8.4	60.9	78.2 #
2008	146	43.6	7	4.8	15.0	8.0	72.6	87.0
2009	145	45.3	6	4.1	15.7	8.2	62.1	80.0
2010	160	46.6	4	2.5	16.2	7.7	61.9	78.1
2011	168	46.5	8	4.8	16.9	7.5	54.8	76.8
2012	145	45.0	8	5.5	17.1	6.9	58.6	82.1
2013	144	41.0	5	3.5	18.0	6.9	57.6	77.1
2014	148	46.1	9	6.1	18.2	4.7	50.7	78.4
2015	108	42.4	5	4.6	18.6	4.1	33.3	95.4
2016	87	45.8	5	5.7	18.8	3.4	26.4	64.4 ##
1998-2016	2217	44.3	160	7.2	18.8	8.5	60.8	85.5

2,217 cases diagnosed 1998-2016 are related to a total of 2,210 patients. Currently, in 594 (26.9 %) of these 2,210 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 475 / 85 / 34 (21.5 % / 3.8 % / 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 148 cases has been diagnosed, of which 18.2 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 4.7 % 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 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 4.81 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	88	68	7.9	5.8	5.5	3.4	7.3	4.3	8.6	5.1
1999	87	66	7.8	5.6	5.2	3.3	7.0	4.4	8.4	5.1
2000	93	71	8.2	5.9	5.6	3.7	7.4	4.5	8.7	5.3
2001	72	72	6.2	5.9	4.2	3.5	5.8	4.6	7.0	5.4
2002	130	96	7.0	4.9	4.8	2.9	6.2	3.8	7.4	4.4
2003	126	123	6.7	6.2	4.4	3.5	5.9	4.5	7.1	5.4
2004	165	95	8.8	4.8	5.7	3.1	7.3	3.7	8.6	4.2
2005	149	119	7.9	6.0	5.5	3.7	6.8	4.5	7.7	5.3
2006	142	100	7.4	5.0	4.5	3.1	6.1	3.9	7.6	4.5
2007	185	156	8.4	6.8	5.2	3.7	6.8	4.8	8.1	5.7
2008	189	146	8.5	6.3	5.1	3.4	6.8	4.5	8.1	5.3
2009	175	145	7.8	6.2	4.3	3.3	6.0	4.6	7.7	5.4
2010	183	160	8.1	6.8	5.0	3.5	6.5	4.7	7.8	5.7
2011	193	168	8.6	7.2	4.8	3.6	6.5	4.8	8.2	5.8
2012	177	145	7.8	6.1	4.2	3.2	5.8	4.2	7.2	4.9
2013	207	144	9.0	6.0	5.4	3.1	7.0	4.1	8.5	4.9
2014	173	148	7.4	6.1	3.8	3.3	5.3	4.2	6.7	5.0
2015	147	108	6.2	4.4	2.8	2.0	4.2	2.8	5.6	3.6
2016	103	87	4.3	3.5	1.9	1.8	2.9	2.4	3.8	2.8
1998-2016	2784	2217	7.6	5.8	4.5	3.2	6.1	4.1	7.4	4.9

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)  
(incl. DCO)

Year of diagnosis	Cases n	Std.		Median						
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	156	61.4	20.0	0.4	93.2	33.1	53.1	64.9	75.6	85.0
1999	153	62.0	15.6	3.5	97.4	40.1	52.9	64.2	73.0	78.9
2000	164	60.4	21.9	0.2	97.1	28.9	51.4	62.6	78.0	85.6
2001	144	61.4	16.3	11.8	95.4	40.6	50.9	62.4	73.1	82.0
2002	226	61.2	20.0	0.0	93.0	32.8	51.1	65.1	75.3	82.9
2003	249	63.0	19.3	2.6	92.5	32.4	56.2	66.9	77.0	83.4
2004	260	61.8	19.3	0.0	96.1	35.4	54.4	66.5	73.9	82.1
2005	268	60.4	20.4	0.2	92.0	31.7	51.1	65.2	74.0	82.0
2006	242	62.8	19.2	0.3	103	36.7	55.1	66.0	77.2	82.5
2007	341	63.6	18.3	0.1	96.4	40.3	58.0	67.7	75.3	81.1
2008	335	64.8	18.1	0.0	101	39.5	57.1	68.9	76.1	84.0
2009	320	66.1	16.5	0.2	97.3	42.8	58.8	68.7	77.9	83.6
2010	343	64.0	18.6	0.1	97.3	36.5	55.7	68.8	76.5	82.8
2011	361	66.1	17.4	0.0	96.8	41.9	58.0	70.3	77.9	84.0
2012	322	66.7	18.0	0.4	98.4	44.5	59.9	71.1	78.3	84.7
2013	351	64.7	19.1	0.0	96.7	37.9	55.8	69.6	76.8	84.1
2014	321	66.6	18.0	0.2	97.1	42.7	59.2	71.6	78.4	84.5
2015	255	70.2	14.9	0.9	96.2	49.7	64.3	73.2	78.9	85.4
2016	190	69.1	15.4	0.0	93.1	48.3	61.9	73.2	78.7	85.6
1998-2016	5001	64.3	18.4	0.0	103	39.1	56.3	68.3	76.8	83.5

Table 3a

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

Year of diagnosis	Cases n	Std.		Median						
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	88	59.8	19.0	0.4	90.8	33.0	51.6	63.5	71.7	82.5
1999	87	62.0	15.6	3.5	97.4	39.6	54.5	64.2	72.1	78.4
2000	93	60.0	20.9	0.2	92.9	31.2	53.1	61.5	77.0	85.3
2001	72	62.1	16.8	11.8	95.4	43.0	51.7	64.0	73.6	81.4
2002	130	60.1	20.8	0.1	92.4	30.8	48.6	64.9	74.7	82.4
2003	126	61.4	19.3	7.6	90.3	31.0	55.4	66.2	74.8	82.7
2004	165	62.1	18.1	0.0	90.7	39.0	56.0	66.7	72.6	79.5
2005	149	59.0	20.1	0.2	90.9	34.9	50.5	64.0	71.7	80.8
2006	142	63.5	18.0	0.3	90.3	38.9	56.2	67.3	76.8	81.9
2007	185	63.0	18.9	0.1	96.4	37.3	58.2	68.1	74.5	79.5
2008	189	64.7	17.5	0.0	95.2	41.8	59.9	68.4	74.4	82.3
2009	175	66.9	17.6	0.2	97.3	41.4	61.6	69.9	79.2	83.8
2010	183	62.8	19.3	0.1	92.7	35.1	54.4	67.6	75.6	82.5
2011	193	65.7	17.4	0.0	95.3	38.6	57.7	70.5	76.7	83.7
2012	177	66.7	17.5	0.4	95.5	44.8	62.4	71.2	76.5	84.1
2013	207	63.8	19.6	0.0	95.9	35.0	54.6	69.3	77.2	82.6
2014	173	67.5	16.4	0.2	88.0	50.8	59.9	72.4	77.7	83.8
2015	147	71.7	14.7	0.9	94.3	56.6	67.2	74.4	79.8	87.3
2016	103	71.6	13.4	29.9	93.1	52.7	65.1	74.6	80.5	85.7
1998-2016	2784	64.2	18.4	0.0	97.4	38.6	56.9	68.3	76.2	82.9



Table 3b

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.		Max.		Median		
				10%	25%	50%	75%	90%		
1998	68	63.5	21.1	3.4	93.2	33.1	54.6	68.2	77.9	85.2
1999	66	62.0	15.7	17.4	88.4	40.1	49.6	63.9	74.1	81.3
2000	71	60.9	23.2	0.4	97.1	28.1	46.9	65.2	78.9	86.3
2001	72	60.7	15.8	21.1	85.9	39.8	49.5	61.3	72.9	82.3
2002	96	62.7	18.7	0.0	93.0	39.0	53.4	65.8	75.8	83.4
2003	123	64.7	19.1	2.6	92.5	38.2	56.2	67.6	78.7	83.6
2004	95	61.2	21.3	0.2	96.1	30.8	51.1	66.1	76.6	84.4
2005	119	62.3	20.7	1.1	92.0	28.7	52.8	67.8	77.6	82.4
2006	100	61.7	20.9	1.6	103	34.0	54.1	64.4	78.1	83.7
2007	156	64.2	17.6	0.3	89.4	42.4	57.6	67.5	76.8	82.2
2008	146	64.8	18.9	4.4	101	35.6	54.8	69.4	79.3	86.2
2009	145	65.2	15.0	2.2	94.3	45.8	57.9	66.7	76.2	83.2
2010	160	65.3	17.9	0.9	97.3	38.3	56.4	70.0	77.3	83.0
2011	168	66.6	17.4	0.0	96.8	42.5	58.5	70.1	78.7	85.2
2012	145	66.7	18.7	0.4	98.4	43.1	59.4	70.8	80.6	85.6
2013	144	66.1	18.4	0.0	96.7	43.6	56.5	70.9	76.7	86.7
2014	148	65.6	19.7	1.7	97.1	37.9	56.0	70.4	79.6	85.7
2015	108	68.2	14.8	22.0	96.2	47.3	58.4	71.8	78.6	84.6
2016	87	66.2	17.1	0.0	91.3	43.4	55.5	71.2	77.1	85.3
1998-2016	2217	64.5	18.6	0.0	103	39.4	55.4	68.5	77.6	84.1

Table 4

Age distribution by 5-year age group and sex for period 2007-2016  
(incl. DCO)

Age at diagnosis Years	Cases n	Males			Females				
		%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4	47	1.5	1.5	31	1.8	1.8	16	1.1	1.1
5-9	10	0.3	1.8	5	0.3	2.1	5	0.4	1.5
10-14	13	0.4	2.2	9	0.5	2.6	4	0.3	1.8
15-19	20	0.6	2.9	10	0.6	3.2	10	0.7	2.5
20-24	23	0.7	3.6	11	0.6	3.8	12	0.9	3.3
25-29	36	1.1	4.7	16	0.9	4.7	20	1.4	4.8
30-34	55	1.8	6.5	33	1.9	6.6	22	1.6	6.3
35-39	79	2.5	9.0	50	2.9	9.5	29	2.1	8.4
40-44	100	3.2	12.2	44	2.5	12.1	56	4.0	12.4
45-49	109	3.5	15.7	48	2.8	14.8	61	4.3	16.7
50-54	157	5.0	20.7	82	4.7	19.6	75	5.3	22.0
55-59	218	6.9	27.6	107	6.2	25.8	111	7.9	29.9
60-64	260	8.3	35.9	145	8.4	34.1	115	8.2	38.1
65-69	442	14.1	50.0	256	14.8	48.9	186	13.2	51.3
70-74	544	17.3	67.3	326	18.8	67.7	218	15.5	66.8
75-79	441	14.0	81.4	258	14.9	82.6	183	13.0	79.8
80-84	323	10.3	91.7	170	9.8	92.4	153	10.9	90.7
85+	262	8.3	100.0	131	7.6	100.0	131	9.3	100.0
All ages	3139	100.0		1732	100.0		1407	100.0	

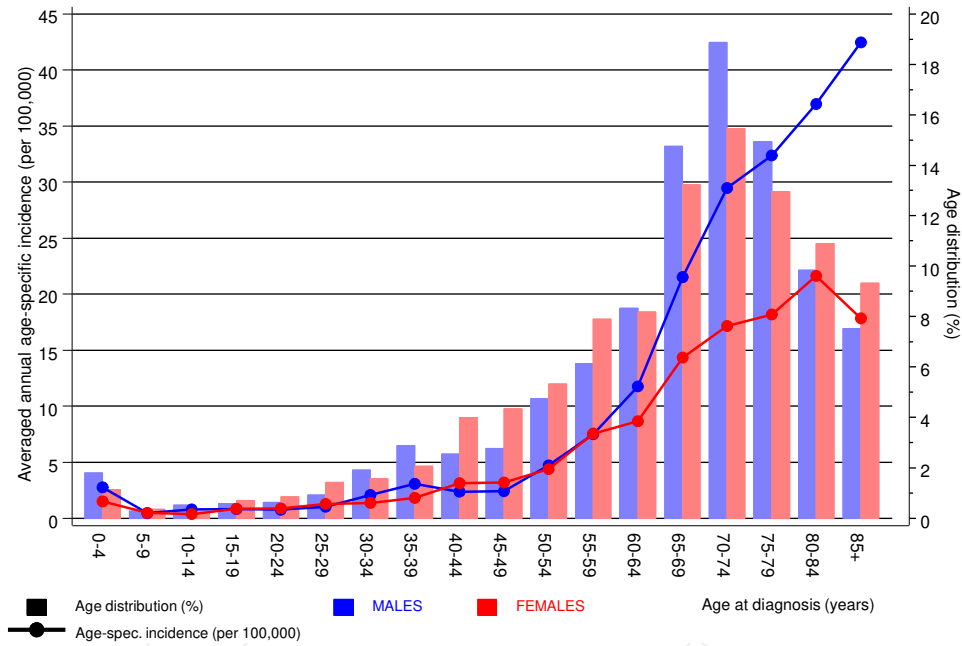
Table 5

Age-specific incidence, DCO rate and proportion of all cancers  
for period 2007-2016

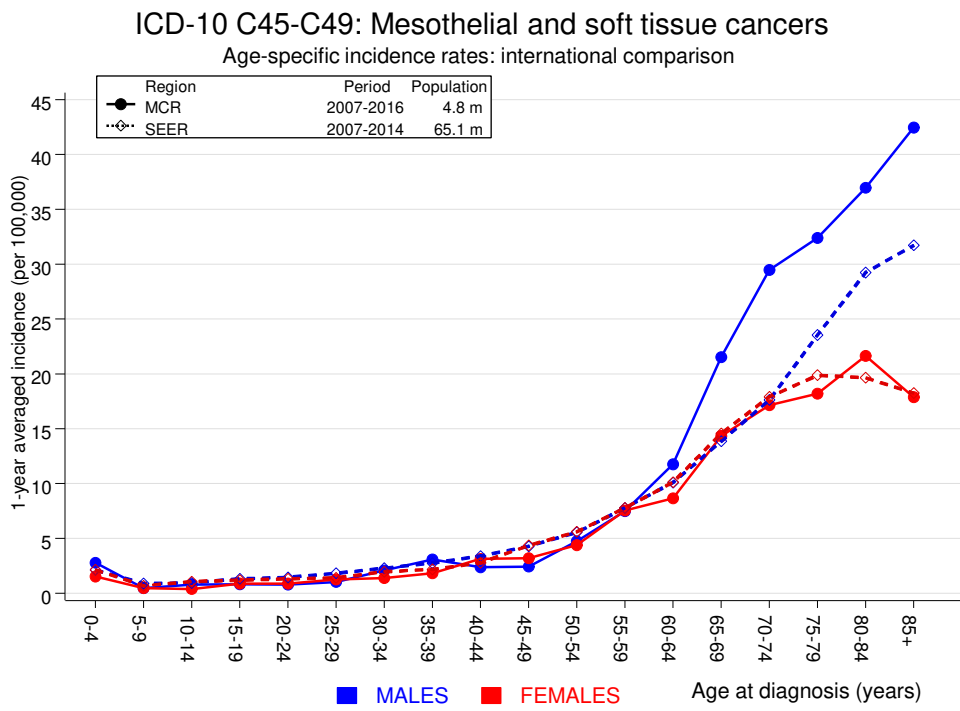
Age at diagnosis Years	Males n	Females n	Males Age- spec. incid.	Females Age- spec. incid.	Males DCO rate n=83 %	Females DCO rate n=64 %	Males	Females
							Prop.all cancers n=113978 %	Prop.all cancers n=112253 %
0- 4	31	16	2.8	1.5		6.3	15.8	10.7
5- 9	5	5	0.5	0.5			4.8	6.0
10-14	9	4	0.8	0.4			7.8	4.0
15-19	10	10	0.8	0.9			4.0	4.8
20-24	11	12	0.8	0.9			2.4	3.2
25-29	16	20	1.0	1.3			2.3	2.4
30-34	33	22	2.1	1.4			3.5	1.5
35-39	50	29	3.1	1.8	2.0	3.4	3.6	1.2
40-44	44	56	2.4	3.1		1.8	2.0	1.2
45-49	48	61	2.4	3.2	2.1	1.6	1.2	0.9
50-54	82	75	4.7	4.4	3.7		1.3	0.9
55-59	106	111	7.5	7.6	0.9	0.9	1.1	1.2
60-64	144	115	11.8	8.7	3.5	0.9	1.1	1.0
65-69	255	186	21.5	14.3	3.5		1.4	1.3
70-74	326	217	29.5	17.1	4.6	2.3	1.5	1.5
75-79	258	182	32.4	18.2	6.2	2.7	1.6	1.4
80-84	170	153	37.0	21.6	9.4	9.2	1.5	1.4
85+	130	131	42.5	17.8	12.3	26.0	1.6	1.0
All ages	1728	1405			4.8	4.6	1.5	1.3
Incidence								
Raw			7.6	5.9				
WS			4.2	3.1				
ES			5.7	4.1				
BRD-S			7.1	4.9				

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

ICD-10 C45-C49: Mesothelial and soft tissue cancers  
 Age distribution and age-specific incidence 2007 - 2016 (Males: 1728, Females: 1405)



**Figure 6.** Age distribution (males: mean=66.0 yrs, median=70.5 yrs; females: mean=65.8 yrs, median=69.6 yrs) and age-specific incidence.



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

Reference:  
 Surveillance, Epidemiology, and End Results (SEER) Program SEER\*Stat Database: Incidence - SEER 18 Regs Research Data, released April 2014, based on the November 2013 submission. <http://www.seer.cancer.gov>.

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 %
C03-C06 Oral cavity	3	0.7	4.1	0.8	11.9	3.5	
C09-C10 Oropharynx	2	0.9	2.2	0.3	8.0	1.7	
C15 Oesophagus	3	1.7	1.8	0.4	5.3	2.1	33.3
C16 Stomach	8	3.6	2.2	0.9	4.3	6.8	12.5
C17 Small intestine	4	0.5	8.2	2.2	21.1 #	5.5	
C18 Colon	12	8.7	1.4	0.7	2.4	5.2	
C19-C20 Rectum	8	4.8	1.7	0.7	3.3	5.0	
C22 Liver	3	2.5	1.2	0.2	3.4	0.7	33.3
C23-C24 Bile	2	0.9	2.2	0.3	8.1	1.7	
C25 Pancreas	4	3.4	1.2	0.3	3.0	1.0	50.0
C30-C31 Sinuses	2	0.2	12.5	1.5	45.2 #	2.9	
C33-C34 Lung	31	10.5	3.0	2.0	4.2 #	32.0	38.7
C38,C45 Mesothelioma	3	0.6	5.0	1.0	14.5 #	3.7	
C43 Malign. melanoma	16	3.9	4.1	2.3	6.6 #	18.8	6.3
C46,C49 Soft tissue	8	0.5	15.4	6.6	30.3 #	11.7	
C61 Prostate	42	25.7	1.6	1.2	2.2 #	25.4	4.8
C62 Testis	4	0.4	10.6	2.9	27.1 #	5.6	25.0
C64 Kidney	17	3.1	5.5	3.2	8.7 #	21.6	5.9
C67 Bladder	8	4.1	2.0	0.8	3.9	6.1	12.5
C70-C72 CNS cancer	2	1.2	1.7	0.2	6.1	1.3	50.0
C73 Thyroid	3	0.6	4.9	1.0	14.4 #	3.7	33.3
C76-C79 CUP	2	1.5	1.3	0.2	4.7	0.7	
C82-C85 NHL	15	3.7	4.1	2.3	6.8 #	17.7	13.3
C90 Mult. myeloma	2	1.2	1.7	0.2	6.2	1.3	50.0
C91-C96 Leukaemia	7	1.5	4.6	1.9	9.5 #	8.5	
Others, specified	7	2.0	3.6	1.4	7.4 #	7.9	
Not observed	0	2.2	0.0	0.0	1.7	-3.4	
All further malignancies	218	90.4	2.4	2.1	2.8 #	198.9	12.8

Patients 2527  
 Median age at next malignancy (years) 71.3  
 Person-years 6415  
 Mean observation time (years) 2.5  
 Median observation time (years) 1.2

# 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

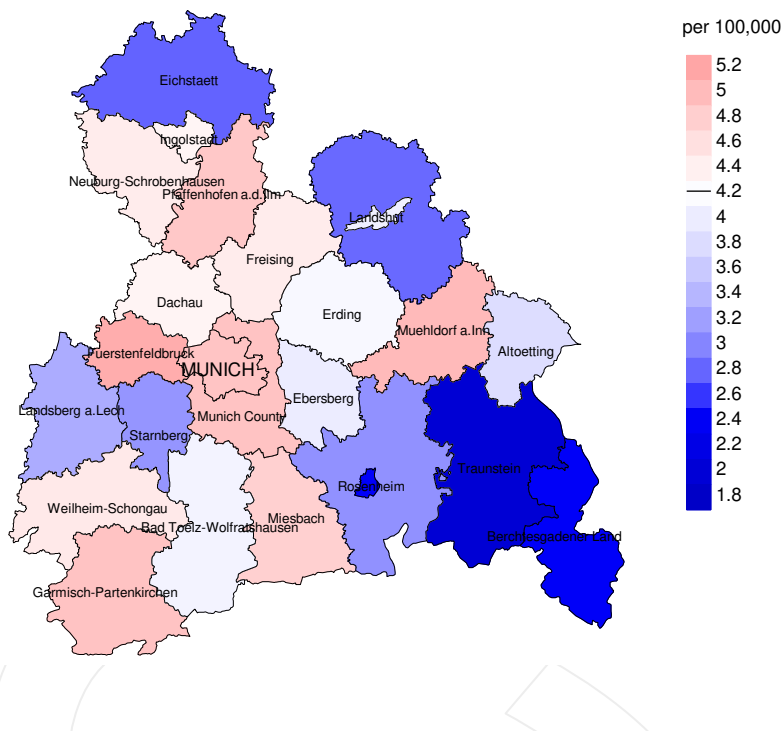
Diagnosis	Observed	Expected	SIR	CI		EAR	DCO %
	n	n		95%	95%		
C16 Stomach	5	1.9	2.6	0.8	6.1	5.3	20.0
C17 Small intestine	2	0.3	7.0	0.8	25.2	2.9	
C18 Colon	9	5.3	1.7	0.8	3.2	6.3	22.2
C19–C20 Rectum	6	2.3	2.7	1.0	5.8	6.4	
C23–C24 Bile	2	0.8	2.6	0.3	9.4	2.1	50.0
C25 Pancreas	5	2.5	2.0	0.6	4.7	4.3	40.0
C33–C34 Lung	9	4.2	2.1	1.0	4.0	8.1	22.2
C43 Malign. melanoma	6	2.2	2.7	1.0	5.9	6.5	16.7
C46,C49 Soft tissue	6	0.3	18.0	6.6	39.1 #	9.6	16.7
C50 Breast	32	17.3	1.8	1.3	2.6 #	25.0	9.4
C53 Cervix uteri	4	0.8	5.0	1.4	12.7 #	5.4	
C54 Corpus uteri	11	3.1	3.6	1.8	6.4 #	13.4	
C56 Ovary	55	2.3	24.0	18.1	31.3 #	89.7	81.8
C64 Kidney	8	1.4	5.9	2.5	11.6 #	11.3	12.5
C70–C72 CNS cancer	2	0.8	2.6	0.3	9.3	2.1	
C73 Thyroid	4	1.1	3.8	1.0	9.7 #	5.0	
C82–C85 NHL	9	2.2	4.2	1.9	7.9 #	11.6	
C91–C96 Leukaemia	6	0.9	6.6	2.4	14.4 #	8.7	16.7
Others, specified	12	4.4	2.8	1.4	4.8 #	13.0	25.0
Not observed	0	2.7	0.0	0.0	1.4	-4.6	
All further malignancies	193	56.7	3.4	2.9	3.9 #	232.0	32.6

Patients	1995
Median age at next malignancy (years)	73.7
Person-years	5877
Mean observation time (years)	2.9
Median observation time (years)	1.6

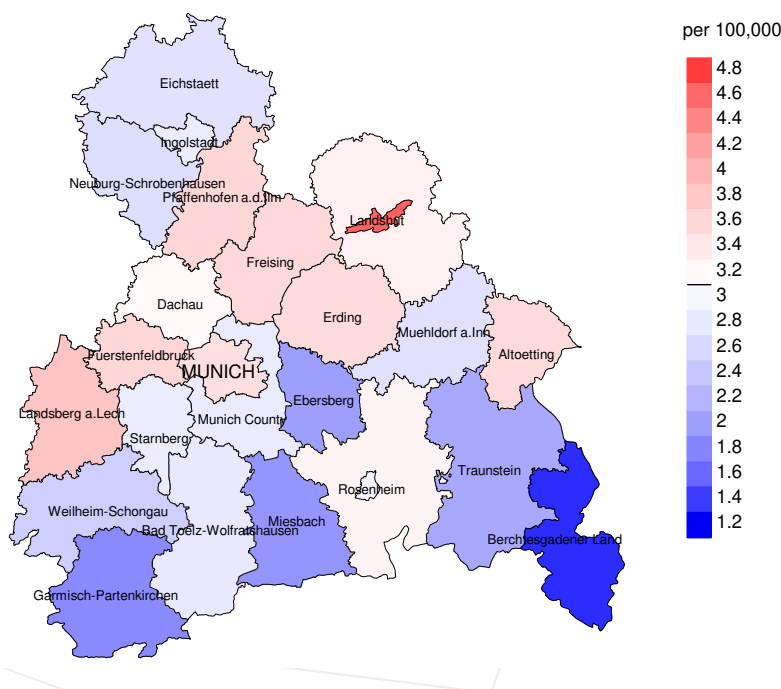
# The occurrence of further malignancy listed is statistically significant.

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

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



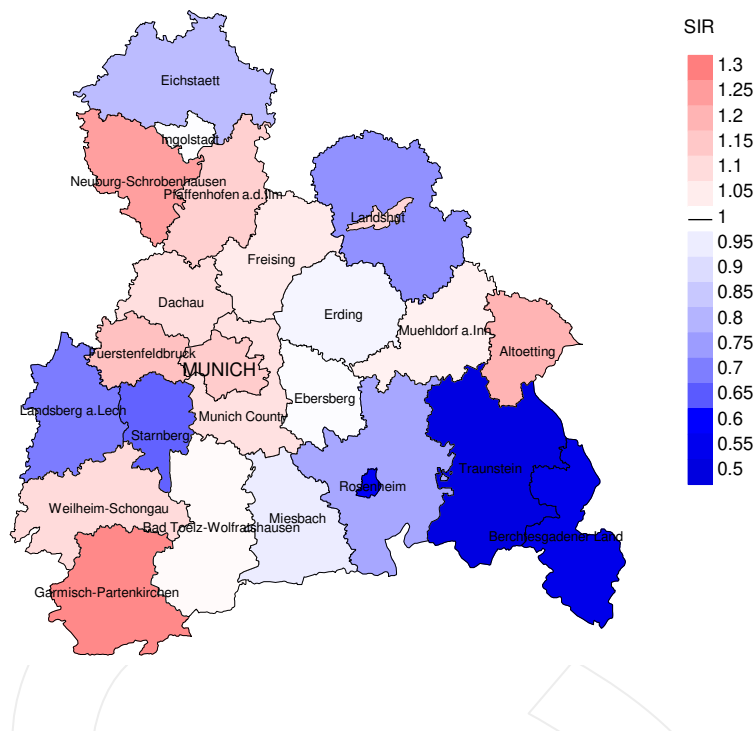
Average incidence (world standard population) 2007 - 2016: Females



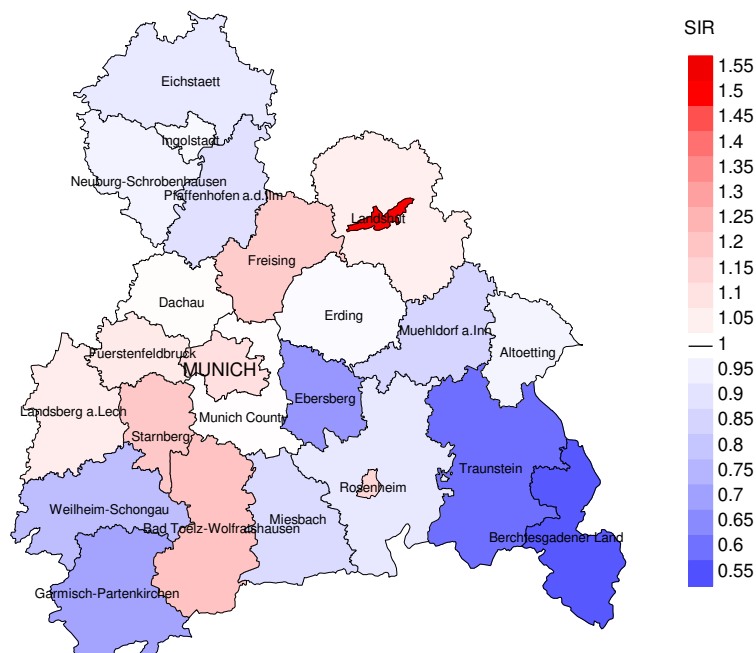
**Figure 8a.** Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 4.2/100,000 WS N=1,728, females 3.1/100,000 WS N=1,405).

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 26 women were identified with newly diagnosed mesoth. and soft tissue ca.. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 2.0/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.9 and 3.7/100,000.

Standardized incidence ratio (SIR) 2007 - 2016: Males



Standardized incidence ratio (SIR) 2007 - 2016: Females



**Figure 8b.** Map of standardized incidence ratio (SIR, incl. DCO cases) 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=1,728, females N=1,405).

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 26 women were identified with newly diagnosed mesoth. and soft tissue ca.. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.68. Though, the value of this parameter may vary with an underlying probability of 99% between 0.38 and 1.10, 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 4.81 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	156	98.1	15.4	132	84.6	94.7
1999	153	96.7	11.1	111	72.5	93.7
2000	164	96.3	22.6	116	70.7	97.4
2001	144	96.5	16.7	109	75.7	95.4
2002	226	98.2	14.6	175	77.4	95.4
2003	249	95.2	12.4	191	76.7	95.3
2004	260	96.5	11.5	183	70.4	98.4
2005	268	92.9	6.0	191	71.3	97.9
2006	242	95.0	7.9	172	71.1	98.3
2007	341	80.4	4.7	224	65.7	98.2
2008	335	84.5	4.8	239	71.3	98.3
2009	320	82.5	3.8	214	66.9	96.7
2010	343	79.9	5.0	221	64.4	98.2
2011	361	79.2	3.6	215	59.6	97.2
2012	322	80.1	4.7	198	61.5	97.5
2013	351	77.8	4.8	195	55.6	97.9
2014	321	81.9	5.6	165	51.4	92.7
2015	255	96.9	5.1	126	49.4	94.4
2016	190	71.1	5.3	52	27.4	75.0
1998-2016	5001	86.9	7.6	3229	64.6	96.4

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 4.81 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	156	114	94.7	47	30.1
1999	153	94	91.5	31	20.3
2000	164	110	94.5	42	25.6
2001	144	104	94.2	41	28.5
2002	226	147	96.6	63	27.9
2003	249	136	93.4	63	25.3
2004	260	172	96.5	59	22.7
2005	268	178	97.8	55	20.5
2006	242	179	96.6	50	20.7
2007	341	201	97.5	59	17.3
2008	335	199	98.5	67	20.0
2009	320	229	97.8	60	18.8
2010	343	239	98.3	63	18.4
2011	361	244	98.8	77	21.3
2012	322	249	99.2	64	19.9
2013	351	244	97.1	72	20.5
2014	321	241	97.9	65	20.2
2015	255	246	99.2	67	26.3
2016	190	207	99.5	39	20.5
1998-2016	5001	3533	97.4	1084	21.7

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 4.81 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer- related %	Prop. non-cancer- related %	Prop. cancer recorded on death certificate %
1998	114	76.3	23.7	93.5
1999	94	83.0	17.0	95.3
2000	110	87.3	12.7	96.2
2001	104	90.4	9.6	98.0
2002	147	85.0	15.0	93.7
2003	136	88.2	11.8	91.3
2004	172	87.2	12.8	92.8
2005	178	89.9	10.1	92.5
2006	179	88.3	11.7	91.3
2007	201	88.1	11.9	94.9
2008	199	90.5	9.5	92.9
2009	229	86.9	13.1	90.6
2010	239	88.7	11.3	91.5
2011	244	87.3	12.7	91.7
2012	249	86.3	13.7	92.3
2013	244	89.8	10.2	94.1
2014	241	83.4	16.6	86.9
2015	246	85.4	14.6	87.3
2016	207	83.1	16.9	89.8
1998-2016	3533	86.8	13.2	91.9

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	69	69.1	69.1	69.2	69.2
1999	61	68.3	66.5	75.9	68.1
2000	63	66.8	66.3	78.8	66.3
2001	56	65.1	64.6	77.7	65.6
2002	89	68.3	67.7	79.0	67.7
2003	74	69.6	66.9	88.3	67.2
2004	100	70.7	69.8	82.2	70.7
2005	108	69.1	69.1	69.6	69.1
2006	102	71.5	72.1	71.1	72.2
2007	132	69.6	69.4	73.7	69.5
2008	121	71.6	71.3	79.7	71.1
2009	133	72.1	71.1	79.8	71.4
2010	137	74.1	73.3	76.6	73.8
2011	140	75.0	74.3	80.7	74.4
2012	140	74.0	73.2	80.4	73.5
2013	136	74.0	73.5	85.0	73.7
2014	133	74.9	73.9	83.8	74.4
2015	138	76.0	75.0	87.3	75.2
2016	122	76.9	76.0	80.7	76.1
1998-2016	2054	72.4	71.6	80.2	71.9

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	45	75.5	71.2	85.4	74.5
1999	33	67.7	67.6	70.2	70.6
2000	47	77.2	78.1	76.2	78.1
2001	48	69.9	70.1	60.9	70.5
2002	58	67.7	64.9	80.3	67.6
2003	62	74.0	69.9	82.6	72.2
2004	72	73.2	71.3	84.3	71.9
2005	70	73.3	71.9	77.5	72.5
2006	77	75.1	74.2	83.0	75.0
2007	69	73.7	72.5	79.0	72.5
2008	78	76.5	71.9	89.3	72.2
2009	96	74.0	72.9	86.2	73.7
2010	102	74.8	72.8	88.9	72.8
2011	104	77.3	75.8	84.9	76.0
2012	109	77.4	75.4	85.0	75.8
2013	108	75.9	73.2	93.3	74.2
2014	108	74.9	74.4	86.5	74.3
2015	108	75.4	73.7	91.5	73.9
2016	85	76.8	75.8	84.6	76.5
1998-2016	1479	75.0	73.3	84.9	74.2

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
1998	53	4.8	0.60	3.1	0.55	4.4	0.60	5.3	0.61
1999	52	4.6	0.60	3.1	0.61	4.3	0.61	5.1	0.61
2000	55	4.8	0.59	3.1	0.55	4.3	0.58	5.2	0.60
2001	49	4.2	0.68	2.8	0.65	3.7	0.64	4.4	0.64
2002	74	4.0	0.57	2.3	0.48	3.4	0.54	4.2	0.57
2003	65	3.5	0.52	2.0	0.46	2.9	0.49	3.7	0.53
2004	87	4.6	0.53	2.8	0.49	3.8	0.52	5.0	0.58
2005	97	5.1	0.65	3.0	0.54	4.1	0.60	5.2	0.67
2006	91	4.8	0.64	2.5	0.56	3.7	0.61	4.9	0.64
2007	118	5.3	0.64	2.9	0.56	4.2	0.62	5.3	0.66
2008	110	4.9	0.58	2.5	0.49	3.7	0.55	4.9	0.61
2009	112	5.0	0.64	2.4	0.56	3.6	0.60	4.7	0.61
2010	117	5.2	0.64	2.4	0.47	3.6	0.56	5.0	0.65
2011	122	5.5	0.64	2.6	0.54	3.9	0.59	5.3	0.65
2012	124	5.5	0.70	2.6	0.61	3.8	0.66	5.2	0.72
2013	121	5.3	0.59	2.6	0.48	3.7	0.53	4.8	0.58
2014	114	4.9	0.66	2.3	0.59	3.3	0.62	4.5	0.67
2015	114	4.8	0.78	2.1	0.76	3.2	0.77	4.3	0.78
2016	102	4.2	0.99	1.9	1.03	2.8	0.98	3.8	1.00
1998-2016	1777	4.8	0.64	2.5	0.56	3.7	0.61	4.8	0.65

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
1998	34	2.9	0.50	1.6	0.46	2.1	0.49	2.6	0.51
1999	26	2.2	0.39	1.4	0.40	1.7	0.38	2.0	0.39
2000	41	3.4	0.58	1.3	0.36	2.0	0.45	2.8	0.53
2001	45	3.7	0.63	2.0	0.56	2.6	0.56	3.2	0.60
2002	51	2.6	0.53	1.5	0.52	1.9	0.52	2.3	0.53
2003	55	2.8	0.45	1.5	0.42	1.9	0.41	2.3	0.42
2004	63	3.2	0.66	1.5	0.49	2.2	0.59	2.8	0.66
2005	63	3.2	0.53	1.4	0.38	2.0	0.45	2.6	0.49
2006	67	3.3	0.67	1.5	0.48	2.1	0.55	2.8	0.63
2007	59	2.6	0.38	1.0	0.28	1.6	0.32	2.1	0.37
2008	70	3.0	0.48	1.2	0.36	1.8	0.40	2.3	0.43
2009	87	3.7	0.60	1.6	0.48	2.3	0.50	3.0	0.55
2010	95	4.1	0.59	1.8	0.50	2.5	0.54	3.3	0.58
2011	91	3.9	0.54	1.4	0.39	2.2	0.45	3.0	0.51
2012	91	3.9	0.63	1.6	0.49	2.3	0.55	3.0	0.61
2013	98	4.1	0.68	1.7	0.53	2.4	0.59	3.1	0.64
2014	87	3.6	0.59	1.4	0.43	2.1	0.49	2.6	0.53
2015	96	3.9	0.89	1.6	0.80	2.3	0.82	3.0	0.85
2016	70	2.9	0.80	1.2	0.67	1.6	0.69	2.1	0.76
1998-2016	1289	3.4	0.58	1.5	0.46	2.1	0.51	2.7	0.55

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	0.3	0.3	4	0.3	0.3	1	0.1	0.1
5-9	5	0.3	0.5	3	0.3	0.6	2	0.2	0.4
10-14	2	0.1	0.6			0.6	2	0.2	0.6
15-19	7	0.4	1.0	4	0.3	1.0	3	0.4	0.9
20-24	13	0.7	1.6	8	0.7	1.6	5	0.6	1.5
25-29	11	0.6	2.2	7	0.6	2.3	4	0.5	2.0
30-34	14	0.7	2.9	10	0.9	3.1	4	0.5	2.5
35-39	14	0.7	3.6	9	0.8	3.9	5	0.6	3.1
40-44	27	1.4	4.9	13	1.1	5.0	14	1.7	4.7
45-49	46	2.3	7.2	27	2.3	7.4	19	2.3	7.0
50-54	62	3.1	10.3	40	3.5	10.8	22	2.6	9.6
55-59	101	5.1	15.4	51	4.4	15.3	50	5.9	15.5
60-64	151	7.6	22.9	87	7.5	22.8	64	7.6	23.1
65-69	291	14.6	37.5	183	15.9	38.6	108	12.8	35.9
70-74	371	18.6	56.1	228	19.8	58.4	143	16.9	52.8
75-79	356	17.8	73.9	204	17.7	76.1	152	18.0	70.9
80-84	277	13.9	87.7	157	13.6	89.7	120	14.2	85.1
85+	245	12.3	100.0	119	10.3	100.0	126	14.9	100.0
All ages	1998	100.0		1154	100.0		844	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		Males		Females		Females	
	n	n	Age- spec. mortal.	MI-index	Age- spec. mortal.	MI-index	Prop.all cancers %	Prop.all cancers %
0- 4	4	1	0.4	0.13	0.1	0.06	26.7	6.7
5- 9	3	2	0.3	0.60	0.2	0.40	12.5	11.1
10-14		2			0.2	0.50		8.3
15-19	4	3	0.3	0.40	0.3	0.30	9.1	13.6
20-24	8	5	0.6	0.73	0.4	0.42	14.0	15.2
25-29	7	4	0.4	0.44	0.3	0.20	9.5	5.5
30-34	10	4	0.6	0.30	0.3	0.18	9.6	3.3
35-39	9	5	0.6	0.18	0.3	0.17	4.5	1.8
40-44	13	14	0.7	0.30	0.8	0.25	2.6	2.1
45-49	27	19	1.4	0.56	1.0	0.31	2.3	1.5
50-54	40	22	2.3	0.49	1.3	0.29	1.9	1.1
55-59	51	50	3.6	0.48	3.4	0.45	1.5	1.8
60-64	87	64	7.1	0.60	4.8	0.56	1.7	1.7
65-69	183	108	15.4	0.72	8.3	0.58	2.5	2.0
70-74	228	143	20.6	0.70	11.3	0.66	2.4	2.1
75-79	204	152	25.6	0.79	15.2	0.84	2.3	2.2
80-84	157	120	34.1	0.92	17.0	0.78	2.1	1.8
85+	119	126	38.9	0.92	17.2	0.96	1.8	1.4
All ages	1154	844					2.2	1.8
Mortality								
Raw			5.1	0.67	3.6	0.60		
WS			2.4	0.57	1.5	0.47		
ES			3.6	0.62	2.1	0.52		
BRD-S			4.8	0.67	2.8	0.56		
PYLL-70								
per 100,000			26.9		18.8			
ES			25.5		17.5			
AYLL-70			12.2		12.4			



Table 14a

Further malignancies in deaths in period 1998–2016  
MALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C09–C10 Oropharynx	7	1.3	4	57.1			3	42.9
C15 Oesophagus	6	1.1	1	16.7			5	83.3
C16 Stomach	15	2.7	9	60.0	1	6.7	5	33.3
C18 Colon	39	7.0	30	76.9	3	7.7	6	15.4
C19–C20 Rectum	24	4.3	17	70.8	2	8.3	5	20.8
C25 Pancreas	9	1.6	2	22.2	4	44.4	3	33.3
C33–C34 Lung	43	7.7	10	23.3	9	20.9	24	55.8
C43 Malign. melanoma	44	7.9	31	70.5	3	6.8	10	22.7
C44 Skin others	68	12.1	42	61.8	2	2.9	24	35.3
C46,C49 Soft tissue	6	1.1			2	33.3	4	66.7
C61 Prostate	125	22.3	101	80.8	5	4.0	19	15.2
C62 Testis	8	1.4	5	62.5	1	12.5	2	25.0
C64 Kidney	27	4.8	17	63.0	3	11.1	7	25.9
C67 Bladder	18	3.2	9	50.0	2	11.1	7	38.9
C73 Thyroid	6	1.1	4	66.7			2	33.3
C76–C79 CUP	9	1.6	4	44.4	2	22.2	3	33.3
C82–C85 NHL	40	7.1	20	50.0	5	12.5	15	37.5
C90 Mult. myeloma	6	1.1	5	83.3	1	16.7		
C91–C96 Leukaemia	11	2.0	4	36.4	1	9.1	6	54.5
Others, specified	49	8.8	21	42.9	4	8.2	24	49.0
All further malignancies	560	100.0	336	60.0	50	8.9	174	31.1

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 14b

Further malignancies in deaths in period 1998-2016  
FEMALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C16 Stomach	6	1.3	4	66.7	1	16.7	1	16.7
C18 Colon	26	5.7	13	50.0	5	19.2	8	30.8
C19-C20 Rectum	7	1.5	4	57.1	1	14.3	2	28.6
C25 Pancreas	6	1.3			1	16.7	5	83.3
C33-C34 Lung	14	3.1	3	21.4	2	14.3	9	64.3
C43 Malign. melanoma	24	5.3	18	75.0	2	8.3	4	16.7
C44 Skin others	20	4.4	11	55.0	4	20.0	5	25.0
C46,C49 Soft tissue	8	1.8			2	25.0	6	75.0
C50 Breast	129	28.4	99	76.7	3	2.3	27	20.9
C51 Vulva	5	1.1	2	40.0	1	20.0	2	40.0
C53 Cervix uteri	12	2.6	11	91.7			1	8.3
C54 Corpus uteri	30	6.6	18	60.0	7	23.3	5	16.7
C56 Ovary	83	18.2	16	19.3	11	13.3	56	67.5
C64 Kidney	9	2.0	3	33.3	2	22.2	4	44.4
C67 Bladder	7	1.5	4	57.1			3	42.9
C73 Thyroid	10	2.2	10	100.0				
C82-C85 NHL	18	4.0	10	55.6	5	27.8	3	16.7
C90 Mult. myeloma	6	1.3	4	66.7	1	16.7	1	16.7
C91-C96 Leukaemia	7	1.5	2	28.6			5	71.4
Others, specified	28	6.2	9	32.1	4	14.3	15	53.6
All further malignancies	455	100.0	241	53.0	52	11.4	162	35.6

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 2007-2016  
(First primaries only \*)

Age at death Years	Males		Males		Females		Females	
	n	n	Age- spec. mortal.	MI-index	Age- spec. mortal.	MI-index	Prop.all cancers %	Prop.all cancers %
0- 4	4	1	0.4	0.13	0.1	0.07	28.6	6.7
5- 9	3	2	0.3	0.60	0.2	0.40	13.0	11.1
10-14		1			0.1	0.33		4.8
15-19	4	2	0.3	0.40	0.2	0.22	9.5	10.0
20-24	7	4	0.5	0.70	0.3	0.36	13.7	12.9
25-29	6	4	0.4	0.43	0.3	0.20	9.0	6.0
30-34	9	4	0.6	0.30	0.3	0.20	8.8	3.8
35-39	8	4	0.5	0.17	0.3	0.17	4.2	1.6
40-44	12	12	0.6	0.31	0.7	0.26	2.6	2.0
45-49	25	18	1.3	0.56	0.9	0.37	2.4	1.6
50-54	33	20	1.9	0.49	1.2	0.32	1.8	1.2
55-59	45	36	3.2	0.47	2.4	0.40	1.5	1.5
60-64	71	53	5.8	0.61	4.0	0.61	1.7	1.7
65-69	151	80	12.7	0.76	6.2	0.57	2.6	1.9
70-74	174	115	15.7	0.71	9.1	0.70	2.4	2.2
75-79	143	112	17.9	0.84	11.2	0.90	2.2	2.1
80-84	116	87	25.2	0.96	12.3	0.78	2.1	1.6
85+	80	101	26.1	0.92	13.8	0.97	1.7	1.4
All ages	891	656					2.2	1.8
Mortality								
Raw			3.9	0.67	2.8	0.60		
WS			1.9	0.56	1.1	0.46		
ES			2.8	0.61	1.7	0.51		
BRD-S			3.7	0.67	2.1	0.56		
PYLL-70								
per 100,000			23.8		15.7			
ES			22.7		14.5			
AYLL-70			12.7		13.0			

\* See corresponding tables with multiple malignancies.

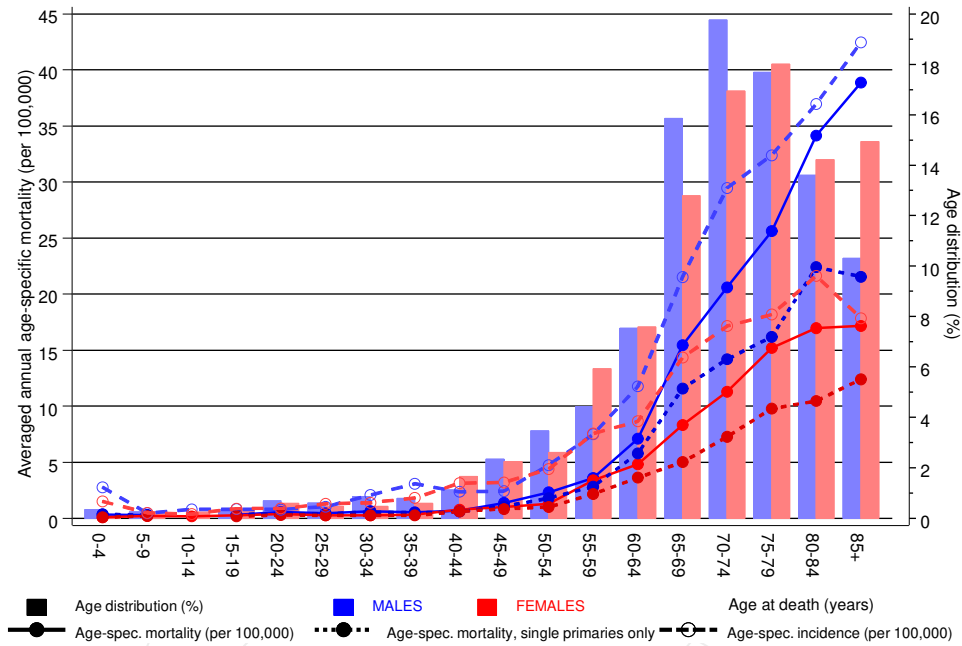
Table 16

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

Age at death Years	Males		Males		Females		Females	
	n	n	Age- spec. mortal.	MI-index	Age- spec. mortal.	MI-index	Prop.all cancers %	Prop.all cancers %
0- 4	4	1	0.4	0.13	0.1	0.07	28.6	6.7
5- 9	3	2	0.3	0.60	0.2	0.50	13.0	11.1
10-14								
15-19	4	2	0.3	0.40	0.2	0.22	9.5	10.5
20-24	6	4	0.4	0.60	0.3	0.36	11.8	12.9
25-29	6	4	0.4	0.46	0.3	0.20	9.0	6.2
30-34	9	4	0.6	0.32	0.3	0.22	8.8	3.8
35-39	8	4	0.5	0.17	0.3	0.17	4.3	1.6
40-44	11	11	0.6	0.34	0.6	0.26	2.4	1.9
45-49	21	16	1.1	0.51	0.8	0.34	2.0	1.4
50-54	31	17	1.8	0.49	1.0	0.30	1.7	1.0
55-59	40	32	2.8	0.44	2.2	0.39	1.4	1.4
60-64	71	48	5.8	0.66	3.6	0.60	1.7	1.6
65-69	137	65	11.6	0.75	5.0	0.53	2.4	1.6
70-74	157	92	14.2	0.69	7.3	0.64	2.3	1.8
75-79	129	98	16.2	0.82	9.8	0.86	2.0	1.9
80-84	103	74	22.4	0.88	10.5	0.74	2.0	1.4
85+	66	91	21.6	0.83	12.4	0.90	1.5	1.3
All ages	806	565					2.0	1.6
Mortality								
Raw			3.5	0.65	2.4	0.57		
WS			1.8	0.54	1.0	0.43		
ES			2.6	0.60	1.4	0.48		
BRD-S			3.3	0.65	1.8	0.53		
PYLL-70								
per 100,000			22.3		14.1			
ES			21.4		13.1			
AYLL-70			12.8		13.4			

\* See corresponding tables with multiple malignancies.

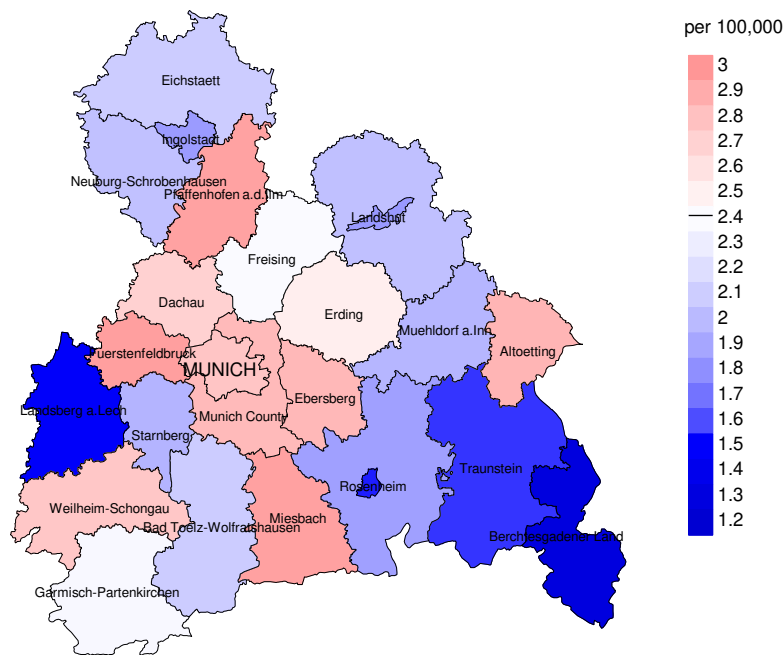
ICD-10 C45-C49: Mesothelial and soft tissue cancers  
 Age distribution and age-specific mortality 2007 - 2016 (Males: 1154, Females: 844)



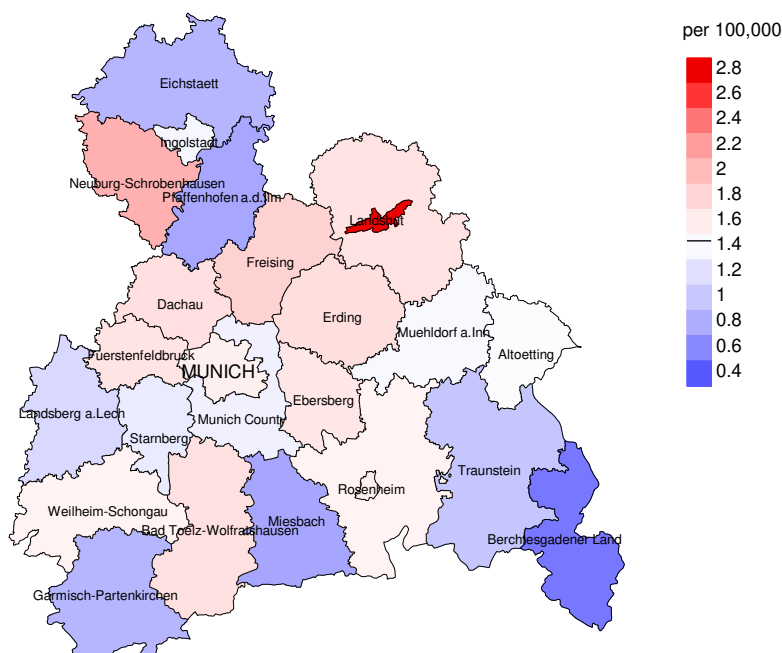
**Figure 17.** Distribution of age at death (bars; males: mean=68.2 yrs, median=70.8 yrs; females: mean=69.1 yrs, median=71.2 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

The difference between age at diagnosis (Table 3) and age at mesoth. and soft tissue ca.-related death (see Table 10) should be considered.

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



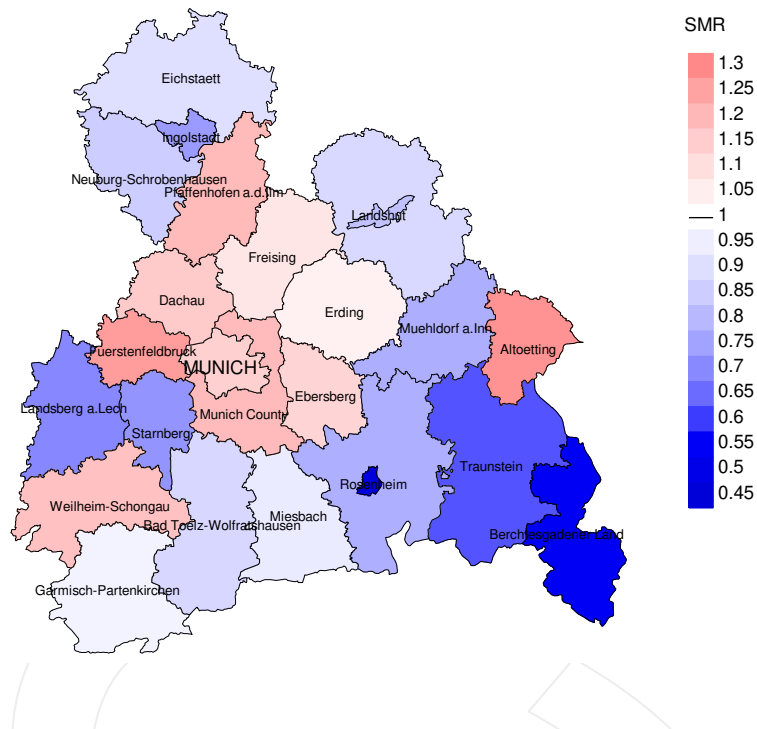
Average mortality (world standard population) 2007 - 2016: Females



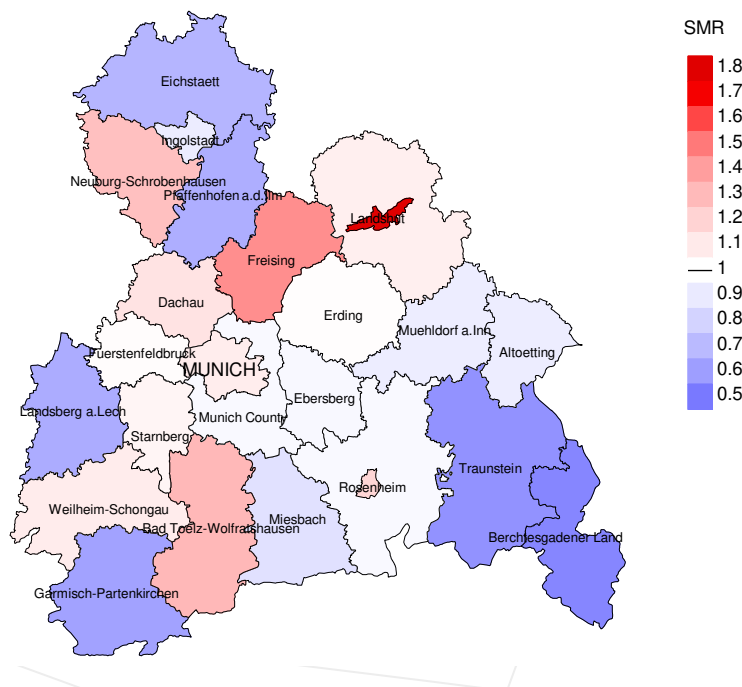
**Figure 18a.** Map of cancer mortality (world standard population) by county averaged for period 2007 to 2016. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 2.4/100,000 WS N=1,154, females 1.5/100,000 WS N=844).

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 22 women died from mesoth. and soft tissue ca.. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 1.7/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.7 and 3.4/100,000.

Standardized mortality ratio (SMR) 2007 - 2016: Males



Standardized mortality ratio (SMR) 2007 - 2016: Females



**Figure 18b.** Map of standardized mortality ratio (SMR, incl. DCO cases) 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=1,154, females N=844).

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 22 women died from mesoth. and soft tissue ca.. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.97. Though, the value of this parameter may vary with an underlying probability of 99% between 0.52 and 1.64, 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

**Recommended Citation**

Munich Cancer Registry. ICD-10 C45-C49: Mesoth. and soft tissue ca. - Incidence and Mortality [Internet]. 2018 [updated 2018 Aug 21; cited 2018 Oct 1]. Available from: <https://www.tumorregister-muenchen.de/en/facts/base/bC4549E-ICD-10-C45-C49-Mesoth.-and-soft-tissue-ca.-incidence-and-mortality.pdf>

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