

# Munich Cancer Registry



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## ICD-10 C81-C96: Systemic neoplasms

### Incidence and Mortality

Year of diagnosis	1998-2016
Patients	27,444
Diseases	27,975
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/bC8196E-ICD-10-C81-C96-Systemic-neoplasms-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
C81.-	Hodgkin lymphoma
C82.-	Follicular lymphoma
C83.-	Non-follicular lymphoma
C84.-	Mature T/NK-cell lymphomas
C85.-	Other and unspecified types of non-Hodgkin lymphoma
C86.-	Other specified types of T/NK-cell Lymphoma
C88.-	Malignant immunoproliferative diseases
C90.-	Multiple myeloma and malignant plasma cell neoplasms
C91.-	Lymphoid leukaemia
C92.-	Myeloid leukaemia
C93.-	Monocytic leukaemia
C94.-	Other leukaemias of specified cell type
C95.-	Leukaemia of unspecified cell type
C96.-	Other and unspecified malignant neoplasms of lymphoid, haematopoietic and related tissue

## INCIDENCE

Table 1

Cases 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	864	167	19.3	9.1	10.4	75.2	96.5
1999	874	176	20.1	10.1	10.4	75.3	97.4
2000	848	189	22.3	10.2	10.3	73.5	96.6
2001	913	215	23.5	10.7	10.2	71.6	94.9
2002	1488	379	25.5	11.6	10.1	72.6	95.4 #
2003	1530	323	21.1	12.0	9.9	68.5	94.8
2004	1607	324	20.2	12.5	9.8	65.2	93.5
2005	1548	287	18.5	13.1	9.5	63.7	91.3
2006	1601	269	16.8	13.8	9.1	66.0	91.5
2007	1843	298	16.2	14.1	8.7	63.2	79.9 #
2008	1828	273	14.9	14.6	8.3	59.2	73.5
2009	1831	250	13.7	15.0	7.8	56.6	73.6
2010	1873	263	14.0	15.6	7.3	56.3	74.1
2011	1887	270	14.3	16.2	6.9	53.8	72.9
2012	1877	265	14.1	16.8	6.5	51.4	70.6
2013	1812	264	14.6	17.4	5.9	48.9	72.8
2014	1686	272	16.1	17.9	5.2	46.7	75.3
2015	1193	247	20.7	18.2	4.8	53.4	97.9
2016	872	241	27.6	18.4	3.9	47.0	81.7 ##
1998-2016	27975	4972	17.8	18.4	10.4	60.2	83.4

27,975 cases diagnosed 1998-2016 are related to a total of 27,444 patients. Currently, in 7,344 (26.8 %) of these 27,444 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 5,701 / 1,244 / 399 (20.8 % / 4.5 % / 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 1,686 cases has been diagnosed, of which 17.9 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 5.2 % 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 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	475	55.0	85	17.9	9.7	11.6	75.4	97.1
1999	458	52.4	86	18.8	10.3	11.5	77.7	98.5
2000	457	53.9	104	22.8	10.5	11.5	76.1	96.3
2001	464	50.8	97	20.9	10.8	11.4	71.3	95.0
2002	793	53.3	173	21.8	12.0	11.2	71.9	95.5 #
2003	821	53.7	160	19.5	12.5	11.0	68.5	93.7
2004	846	52.6	151	17.8	12.8	10.8	64.1	93.5
2005	835	53.9	142	17.0	13.6	10.4	64.4	91.7
2006	907	56.7	138	15.2	14.3	10.1	65.8	92.0
2007	1011	54.9	154	15.2	14.6	9.6	62.6	79.2 #
2008	1013	55.4	148	14.6	15.2	9.1	59.1	73.8
2009	979	53.5	123	12.6	15.7	8.4	54.4	73.2
2010	1026	54.8	142	13.8	16.3	7.9	58.1	74.1
2011	1033	54.7	116	11.2	16.9	7.3	53.3	72.8
2012	1023	54.5	129	12.6	17.5	6.8	50.3	70.4
2013	1017	56.1	147	14.5	18.2	6.3	49.6	73.5
2014	970	57.5	141	14.5	18.6	5.9	44.6	74.8
2015	641	53.7	125	19.5	18.9	4.8	54.1	97.8
2016	514	58.9	129	25.1	19.2	3.2	45.7	80.7 ##
1998-2016	15283	54.6	2490	16.3	19.2	11.6	59.9	83.2

15,283 cases diagnosed 1998-2016 are related to a total of 14,976 patients. Currently, in 4,272 (28.5 %) of these 14,976 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 3,273 / 741 / 258 (21.9 % / 4.9 % / 1.7 %) 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 970 cases has been diagnosed, of which 18.6 % 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 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	389	45.0	82	21.1	8.5	9.0	75.1	95.9
1999	416	47.6	90	21.6	9.9	9.0	72.6	96.2
2000	391	46.1	85	21.7	9.8	8.8	70.3	96.9
2001	449	49.2	118	26.3	10.6	8.8	71.9	94.7
2002	695	46.7	206	29.6	11.1	8.7	73.5	95.4 #
2003	709	46.3	163	23.0	11.6	8.6	68.5	96.2
2004	761	47.4	173	22.7	12.2	8.6	66.5	93.4
2005	713	46.1	145	20.3	12.6	8.3	62.8	90.9
2006	694	43.3	131	18.9	13.1	8.0	66.3	90.9
2007	832	45.1	144	17.3	13.5	7.7	63.9	80.8 #
2008	815	44.6	125	15.3	13.9	7.4	59.3	73.1
2009	852	46.5	127	14.9	14.3	7.0	59.0	74.1
2010	847	45.2	121	14.3	14.8	6.7	54.1	74.1
2011	854	45.3	154	18.0	15.3	6.5	54.3	73.0
2012	854	45.5	136	15.9	16.0	6.0	52.7	71.0
2013	795	43.9	117	14.7	16.4	5.4	48.1	71.9
2014	716	42.5	131	18.3	16.9	4.4	49.6	75.8
2015	552	46.3	122	22.1	17.4	4.8	52.5	98.0
2016	358	41.1	112	31.3	17.5	4.8	48.9	83.0 ##
1998-2016	12692	45.4	2482	19.6	17.5	9.0	60.6	83.7

12,692 cases diagnosed 1998-2016 are related to a total of 12,468 patients. Currently, in 3,072 (24.6 %) of these 12,468 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 2,428 / 503 / 141 (19.5 % / 4.0 % / 1.1 %) 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 716 cases has been diagnosed, of which 16.9 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 4.4 % 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	475	389	42.9	33.1	29.5	18.9	39.7	24.4	48.9	29.2
1999	458	416	40.9	35.1	27.5	19.9	37.5	25.6	47.1	31.0
2000	457	391	40.1	32.6	27.0	18.5	36.8	24.2	46.4	29.1
2001	464	449	40.0	36.9	26.4	19.5	36.1	26.2	44.7	31.9
2002	793	695	42.6	35.5	27.0	17.5	36.8	24.0	45.7	29.7
2003	821	709	43.8	36.0	27.6	19.9	37.6	26.0	46.9	31.1
2004	846	761	45.0	38.5	28.8	20.3	38.5	26.7	46.7	32.6
2005	835	713	44.1	35.8	28.1	18.9	37.0	24.8	46.3	30.5
2006	907	694	47.4	34.5	28.7	17.4	39.0	23.1	48.3	28.8
2007	1011	832	45.6	36.0	27.4	18.6	37.2	24.6	46.7	30.0
2008	1013	815	45.5	35.1	27.4	17.6	36.2	23.5	44.9	29.1
2009	979	852	43.9	36.6	24.8	17.9	33.9	24.0	42.2	29.5
2010	1026	847	45.5	36.2	26.2	18.3	35.6	24.1	44.3	29.4
2011	1033	854	46.2	36.5	26.2	18.1	35.4	24.0	43.8	29.1
2012	1023	854	45.1	36.2	24.6	18.9	33.3	24.3	42.7	29.4
2013	1017	795	44.2	33.3	24.4	16.6	32.9	22.0	41.6	27.0
2014	970	716	41.6	29.7	21.8	13.5	30.6	18.6	38.3	23.3
2015	641	552	26.9	22.7	12.9	8.9	18.8	13.1	24.7	17.1
2016	514	358	21.4	14.6	10.1	5.7	14.7	8.2	19.4	10.7
1998-2016	15283	12692	41.5	33.1	24.5	16.7	33.2	22.2	41.4	27.2

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.		Min.	Max.	10%	25%	Median		
		Mean	dev.					50%	75%	90%
1998	864	62.4	19.7	0.9	100	33.4	53.4	65.0	76.9	85.2
1999	874	63.4	19.4	0.3	104	37.1	55.2	66.1	77.6	84.3
2000	848	63.4	19.2	0.4	97.6	35.6	54.6	67.2	77.1	84.5
2001	913	64.0	18.1	1.4	98.7	38.0	56.1	66.6	77.0	84.3
2002	1488	65.4	18.1	1.0	99.3	39.6	57.8	68.5	78.5	85.1
2003	1530	64.0	18.6	0.3	99.0	37.7	55.2	67.1	77.5	83.7
2004	1607	64.4	18.5	0.4	98.6	38.5	56.0	67.3	77.7	84.0
2005	1548	64.5	19.4	0.0	102	36.5	56.5	68.7	78.0	84.2
2006	1601	65.8	18.4	0.6	98.5	40.6	59.0	69.6	78.2	84.7
2007	1843	65.3	18.4	0.1	101	39.9	57.0	69.1	78.4	84.3
2008	1828	65.6	18.9	0.4	98.1	39.6	58.7	69.7	78.5	84.5
2009	1831	66.4	17.6	1.3	100	42.7	58.6	69.8	78.7	85.4
2010	1873	66.2	18.7	0.1	101	41.2	58.1	70.6	79.0	86.0
2011	1887	66.1	18.5	0.3	101	41.9	56.4	70.6	78.8	85.4
2012	1877	66.3	19.0	0.0	102	40.2	57.7	71.3	79.3	84.9
2013	1812	66.5	18.7	0.0	100	39.8	58.0	71.7	79.2	85.4
2014	1686	68.0	17.3	0.5	99.6	44.6	59.3	72.4	79.8	86.2
2015	1193	70.9	15.4	1.8	98.5	49.0	63.3	74.8	81.4	87.3
2016	872	70.8	16.1	3.2	99.9	49.6	63.2	75.1	82.0	87.2
1998-2016	27975	65.8	18.4	0.0	104	40.2	57.4	69.9	78.8	85.1

Table 3a

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

Year of diagnosis	Cases n	Std.		Min.	Max.	10%	25%	Median		
		Mean	dev.					50%	75%	90%
1998	475	60.7	19.5	0.9	95.8	33.3	50.1	63.2	75.2	83.9
1999	458	61.8	18.8	0.3	94.1	33.8	54.4	64.5	75.1	82.6
2000	457	62.7	18.9	0.4	97.6	35.9	55.1	66.1	75.5	83.0
2001	464	61.6	17.5	1.4	96.4	37.9	54.1	64.3	74.7	80.2
2002	793	63.0	17.9	1.0	98.3	37.1	55.4	66.3	75.0	81.9
2003	821	62.9	18.0	1.6	99.0	36.4	55.0	66.3	75.8	82.2
2004	846	62.4	18.4	0.4	97.8	37.0	53.9	65.2	74.9	82.4
2005	835	63.0	19.7	0.0	102	35.5	54.9	67.2	76.8	83.0
2006	907	64.4	18.2	1.0	98.5	39.9	57.4	68.2	76.6	82.2
2007	1011	63.8	18.4	0.1	97.8	37.6	53.9	68.4	77.2	82.7
2008	1013	64.0	19.2	0.4	98.1	37.6	56.8	68.8	76.5	82.8
2009	979	64.9	17.0	2.2	97.0	42.2	56.2	69.0	76.3	83.0
2010	1026	65.3	18.6	0.1	101	41.1	55.9	69.9	77.9	84.9
2011	1033	64.9	18.2	2.5	101	40.7	55.5	69.6	77.3	83.6
2012	1023	65.9	18.5	1.5	96.0	41.6	57.4	71.1	78.7	83.9
2013	1017	65.9	18.7	0.5	100	39.2	57.1	71.4	78.6	84.7
2014	970	67.2	17.3	0.5	99.6	44.5	57.8	71.5	79.5	85.6
2015	641	70.3	15.4	1.8	96.6	49.2	63.3	73.6	80.7	86.5
2016	514	69.9	16.0	5.2	99.9	49.2	62.5	74.5	81.0	86.2
1998-2016	15283	64.6	18.3	0.0	102	39.2	56.1	68.7	77.4	83.7

Table 3b

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min. Max.		10% 25%		Median		
				Min.	Max.	10%	25%	50%	75%	90%
1998	389	64.5	19.7	1.3	100	33.4	55.6	68.0	78.7	86.3
1999	416	65.2	19.9	1.5	104	39.1	56.1	70.2	79.1	86.9
2000	391	64.2	19.5	2.1	95.1	35.1	54.6	69.0	78.2	85.4
2001	449	66.4	18.4	2.8	98.7	39.1	57.9	70.1	79.6	86.8
2002	695	68.1	17.9	2.9	99.3	42.8	59.7	71.8	80.9	87.9
2003	709	65.4	19.2	0.3	98.9	38.8	55.6	68.5	79.9	85.6
2004	761	66.6	18.4	0.7	98.6	41.1	59.4	69.9	79.9	85.0
2005	713	66.3	19.0	0.6	98.4	39.4	58.8	70.1	79.5	85.0
2006	694	67.7	18.5	0.6	95.8	41.0	61.2	71.6	80.6	86.0
2007	832	67.1	18.2	1.0	101	43.8	59.9	70.3	80.1	85.9
2008	815	67.7	18.3	1.4	97.4	41.9	60.4	70.9	80.5	86.4
2009	852	68.2	18.1	1.3	100	43.0	60.6	71.2	81.3	87.0
2010	847	67.3	18.7	0.6	98.7	41.3	59.5	71.3	80.5	87.0
2011	854	67.5	18.9	0.3	99.2	43.2	57.8	71.8	80.7	87.7
2012	854	66.7	19.5	0.0	102	39.7	57.9	71.8	80.5	86.9
2013	795	67.3	18.6	0.0	97.9	40.1	58.7	72.1	80.7	86.4
2014	716	68.9	17.2	2.7	98.4	44.6	61.3	73.6	80.6	87.0
2015	552	71.6	15.4	20.6	98.5	49.0	63.4	75.7	81.8	88.3
2016	358	72.1	16.3	3.2	96.4	49.9	63.7	76.5	83.8	88.8
1998-2016	12692	67.3	18.5	0.0	104	41.4	59.1	71.5	80.4	86.6

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	132	0.8	0.8	78	0.8	0.8	54	0.7	0.7
5-9	97	0.6	1.4	56	0.6	1.5	41	0.5	1.3
10-14	94	0.6	1.9	55	0.6	2.0	39	0.5	1.8
15-19	163	1.0	2.9	97	1.1	3.1	66	0.9	2.7
20-24	201	1.2	4.1	117	1.3	4.4	84	1.1	3.8
25-29	244	1.5	5.6	131	1.4	5.8	113	1.5	5.3
30-34	238	1.4	7.0	136	1.5	7.3	102	1.4	6.7
35-39	325	1.9	8.9	187	2.0	9.3	138	1.8	8.5
40-44	471	2.8	11.8	284	3.1	12.4	187	2.5	11.0
45-49	667	4.0	15.8	418	4.5	16.9	249	3.3	14.4
50-54	839	5.0	20.8	491	5.3	22.2	348	4.7	19.0
55-59	1020	6.1	26.9	550	6.0	28.2	470	6.3	25.3
60-64	1301	7.8	34.7	730	7.9	36.1	571	7.6	32.9
65-69	2017	12.1	46.8	1177	12.8	48.8	840	11.2	44.2
70-74	2553	15.3	62.0	1503	16.3	65.1	1050	14.0	58.2
75-79	2444	14.6	76.7	1360	14.7	79.9	1084	14.5	72.7
80-84	2021	12.1	88.8	1058	11.5	91.3	963	12.9	85.6
85+	1875	11.2	100.0	799	8.7	100.0	1076	14.4	100.0
All ages	16702	100.0		9227	100.0		7475	100.0	

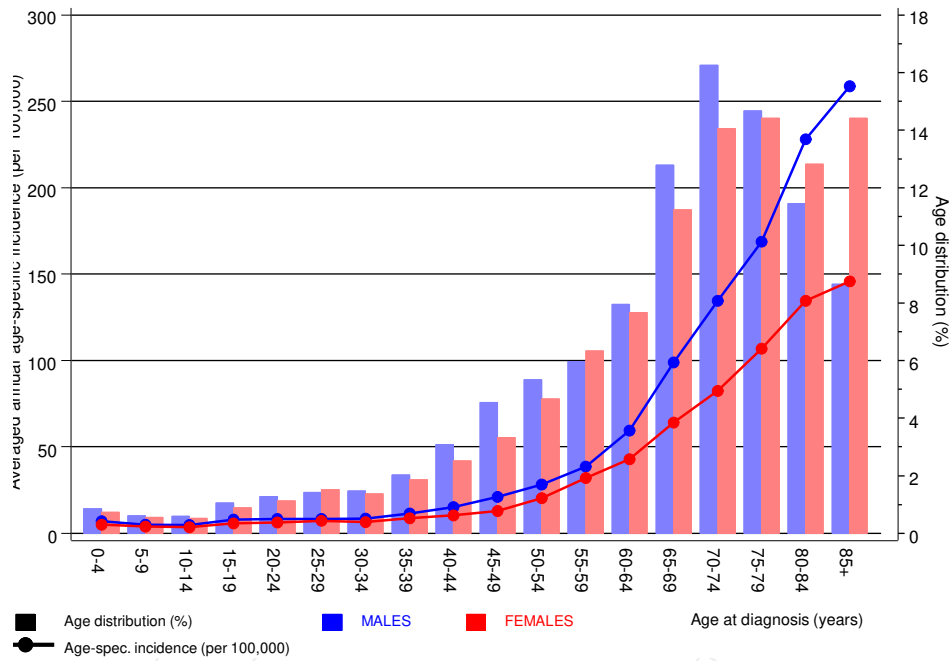
Table 5

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=1342 %	Females DCO rate n=1283 %	Males	Females
							Prop.all cancers n=113978 %	Prop.all cancers n=112253 %
0- 4	78	54	7.0	5.1	2.6	1.9	39.8	36.2
5- 9	56	41	5.1	3.9	1.8		53.8	48.8
10-14	55	39	4.8	3.6		2.6	47.8	38.6
15-19	97	66	7.9	5.7	1.0		38.3	31.9
20-24	117	84	8.3	6.2	0.9	2.4	25.4	22.3
25-29	130	113	8.3	7.2		0.9	19.0	13.5
30-34	135	102	8.5	6.4	3.0	2.0	14.2	6.9
35-39	186	138	11.4	8.6	1.6	3.6	13.5	5.5
40-44	282	187	15.1	10.4	1.4	2.1	13.0	4.1
45-49	416	247	21.1	12.9	1.9	4.0	10.6	3.6
50-54	489	347	28.3	20.3	5.1	3.2	7.9	4.0
55-59	547	470	38.6	32.0	5.3	4.3	5.9	5.0
60-64	728	569	59.4	42.8	6.9	5.3	5.5	5.0
65-69	1171	834	98.8	64.2	9.2	9.4	6.3	5.9
70-74	1489	1043	134.6	82.4	12.2	10.2	7.1	7.1
75-79	1344	1070	168.7	106.8	17.9	17.1	8.1	8.0
80-84	1049	952	228.1	134.6	28.6	29.3	9.5	8.7
85+	792	1070	258.7	145.8	48.5	51.4	10.0	8.4
All ages	9161	7426			14.6	17.3	8.0	6.6
Incidence								
Raw			40.1	31.4				
WS			22.3	15.3				
ES			30.4	20.4				
BRD-S			38.2	25.1				

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).

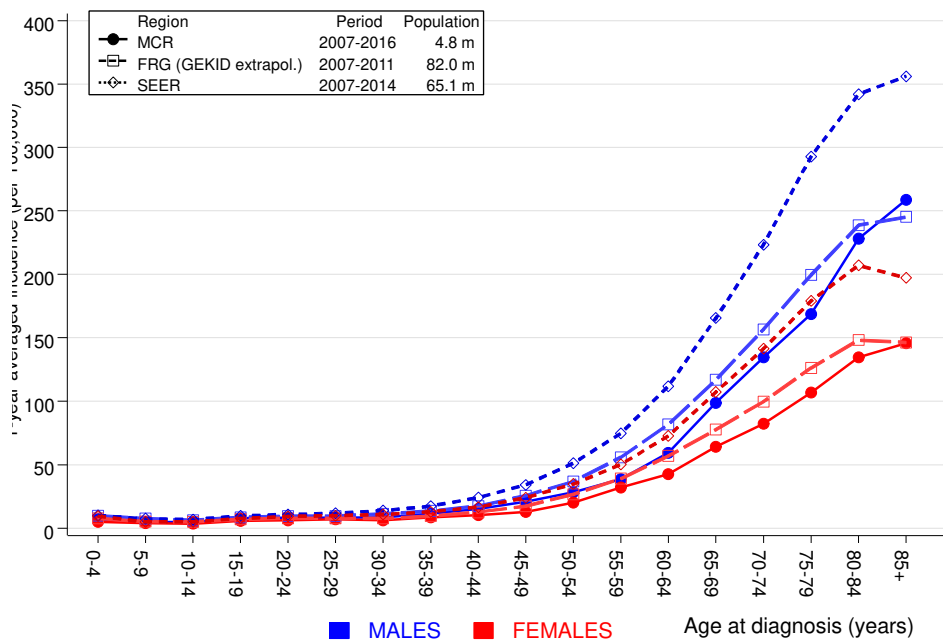
CD-10 C81-C96: Malignant neoplasms of lymphoid, haematopoietic and related tissue  
 Age distribution and age-specific incidence 2007 - 2016 (Males: 9161, Females: 7426)



**Figure 6.** Age distribution (males: mean=65.8 yrs, median=70.3 yrs; females: mean=68.0 yrs, median=72.1 yrs) and age-specific incidence.

ICD-10 C81-C96: Malignant neoplasms of lymphoid, haematopoietic and related tissue

Age-specific incidence rates: international comparison



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

Reference:

Extrapolated age-specific patient population of Germany, data status middle of 2010. Association of Population-based Cancer Registries in Germany (GEKID e.V.). Berlin, 2014. <http://www.gekid.de>. Last access: 02/11/2015  
 Surveillance, Epidemiology, and End Results (SEER) Program SEER\*Stat Database: Incidence - SEER 18 Regs Research Data, released April 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	16	5.0	3.2	1.8	5.2 #	2.7	
C07-C08 Salivary gland	9	1.4	6.6	3.0	12.6 #	1.9	
C09-C10 Oropharynx	8	6.2	1.3	0.6	2.6	0.4	
C12-C13 Hypopharynx	4	3.4	1.2	0.3	3.0	0.2	
C15 Oesophagus	22	11.0	2.0	1.3	3.0 #	2.7	9.1
C16 Stomach	56	23.5	2.4	1.8	3.1 #	7.9	1.8
C17 Small intestine	8	3.2	2.5	1.1	4.9 #	1.2	
C18 Colon	104	56.3	1.8	1.5	2.2 #	11.6	2.9
C19-C20 Rectum	59	31.5	1.9	1.4	2.4 #	6.7	1.7
C21 Anus/canal	6	1.3	4.5	1.7	9.8 #	1.1	
C22 Liver	29	16.7	1.7	1.2	2.5 #	3.0	13.8
C23-C24 Bile	10	5.8	1.7	0.8	3.2	1.0	
C25 Pancreas	41	22.0	1.9	1.3	2.5 #	4.6	7.3
C32 Larynx	12	6.1	2.0	1.0	3.4 #	1.4	16.7
C33-C34 Lung	181	69.4	2.6	2.2	3.0 #	27.1	7.2
C38,C45 Mesothelioma	12	4.0	3.0	1.5	5.2 #	1.9	8.3
C40-C41 Bone	5	0.5	9.4	3.0	21.8 #	1.1	
C43 Malign. melanoma	102	26.1	3.9	3.2	4.7 #	18.4	
C46,C49 Soft tissue	19	3.4	5.7	3.4	8.8 #	3.8	
C60 Penis	5	1.4	3.6	1.2	8.5 #	0.9	
C61 Prostate	318	168.0	1.9	1.7	2.1 #	36.4	5.3
C62 Testis	5	2.4	2.1	0.7	4.8	0.6	
C64 Kidney	66	20.6	3.2	2.5	4.1 #	11.0	1.5
C65 Renal pelvis	5	2.5	2.0	0.6	4.6	0.6	
C66 Ureter	5	1.4	3.5	1.1	8.2 #	0.9	
C67 Bladder	54	26.3	2.1	1.5	2.7 #	6.7	3.7
C70-C72 CNS cancer	21	7.9	2.7	1.7	4.1 #	3.2	23.8
C73 Thyroid	12	4.1	3.0	1.5	5.2 #	1.9	
C76-C79 CUP	25	9.9	2.5	1.6	3.7 #	3.7	
C81 Hodgkin lymphoma	21	1.5	13.8	8.5	21.1 #	4.7	4.8
C82-C85 NHL	145	24.3	6.0	5.0	7.0 #	29.3	4.8
C90 Mult. myeloma	16	7.7	2.1	1.2	3.4 #	2.0	6.3
C91-C96 Leukaemia	102	9.8	10.4	8.5	12.6 #	22.4	18.6
Others, specified	22	6.4	3.5	2.2	5.2 #	3.8	4.5
Not observed	0	2.4	0.0	0.0	1.5	-0.6	
All further malignancies	1525	593.2	2.6	2.4	2.7 #	226.1	5.5

Patients 12576  
 Median age at next malignancy (years) 71.8  
 Person-years 41211  
 Mean observation time (years) 3.3  
 Median observation time (years) 1.8

# The occurrence of further malignancy listed is statistically significant.

Observed further malignancies with count 1 to 3 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

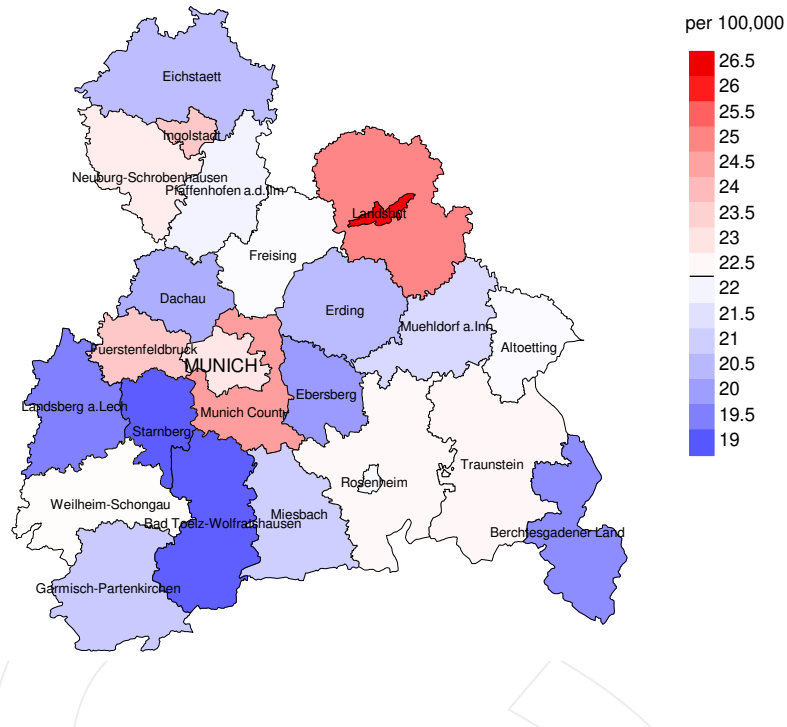
Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C00 Lip	3	0.3	11.7	2.4	34.3 #	0.8	
C03-C06 Oral cavity	3	2.1	1.4	0.3	4.2	0.3	
C07-C08 Salivary gland	4	0.6	6.8	1.9	17.4 #	1.0	25.0
C09-C10 Oropharynx	8	1.4	5.6	2.4	11.1 #	1.9	
C15 Oesophagus	5	2.2	2.2	0.7	5.2	0.8	
C16 Stomach	27	12.3	2.2	1.4	3.2 #	4.3	3.7
C17 Small intestine	6	1.8	3.4	1.2	7.3 #	1.2	
C18 Colon	71	34.5	2.1	1.6	2.6 #	10.6	9.9
C19-C20 Rectum	18	14.6	1.2	0.7	2.0	1.0	5.6
C21 Anus/canal	7	1.9	3.7	1.5	7.7 #	1.5	
C22 Liver	13	4.3	3.0	1.6	5.1 #	2.5	15.4
C23-C24 Bile	12	5.0	2.4	1.2	4.2 #	2.0	16.7
C25 Pancreas	29	16.2	1.8	1.2	2.6 #	3.7	24.1
C33-C34 Lung	80	26.4	3.0	2.4	3.8 #	15.6	3.8
C38,C45 Mesothelioma	3	0.7	4.5	0.9	13.1	0.7	
C43 Malign. melanoma	40	13.5	3.0	2.1	4.0 #	7.7	
C46,C49 Soft tissue	7	2.1	3.4	1.4	7.0 #	1.4	
C48 Peritoneal	5	1.4	3.6	1.2	8.4 #	1.0	
C50 Breast	214	106.6	2.0	1.7	2.3 #	31.2	2.3
C51 Vulva	7	3.6	1.9	0.8	4.0	1.0	
C53 Cervix uteri	12	4.7	2.5	1.3	4.5 #	2.1	25.0
C54 Corpus uteri	35	19.7	1.8	1.2	2.5 #	4.4	
C55,C57 Fem. genitals un	2	0.8	2.6	0.3	9.3	0.4	
C56 Ovary	24	14.4	1.7	1.1	2.5 #	2.8	8.3
C64 Kidney	21	8.8	2.4	1.5	3.7 #	3.5	4.8
C65 Renal pelvis	3	1.1	2.7	0.6	7.8	0.5	
C67 Bladder	12	6.7	1.8	0.9	3.1	1.5	8.3
C69 Eye lymphoma	5	0.1	43.3	14.0	101.0 #	1.4	
C70-C72 CNS cancer	7	4.9	1.4	0.6	2.9	0.6	28.6
C73 Thyroid	22	6.2	3.5	2.2	5.4 #	4.6	4.5
C76-C79 CUP	13	6.4	2.0	1.1	3.5 #	1.9	
C81 Hodgkin lymphoma	3	0.8	4.0	0.8	11.7	0.7	
C82-C85 NHL	127	13.9	9.1	7.6	10.8 #	32.8	3.9
C90 Mult. myeloma	16	4.5	3.6	2.0	5.8 #	3.3	6.3
C91-C96 Leukaemia	57	5.8	9.8	7.4	12.7 #	14.8	15.8
Others, specified	7	3.8	1.9	0.7	3.8	0.9	28.6
Not observed	0	2.4	0.0	0.0	1.5	-0.7	
All further malignancies	928	356.4	2.6	2.4	2.8 #	165.8	6.0

Patients 10155  
Median age at next malignancy (years) 73.0  
Person-years 34477  
Mean observation time (years) 3.4  
Median observation time (years) 1.8

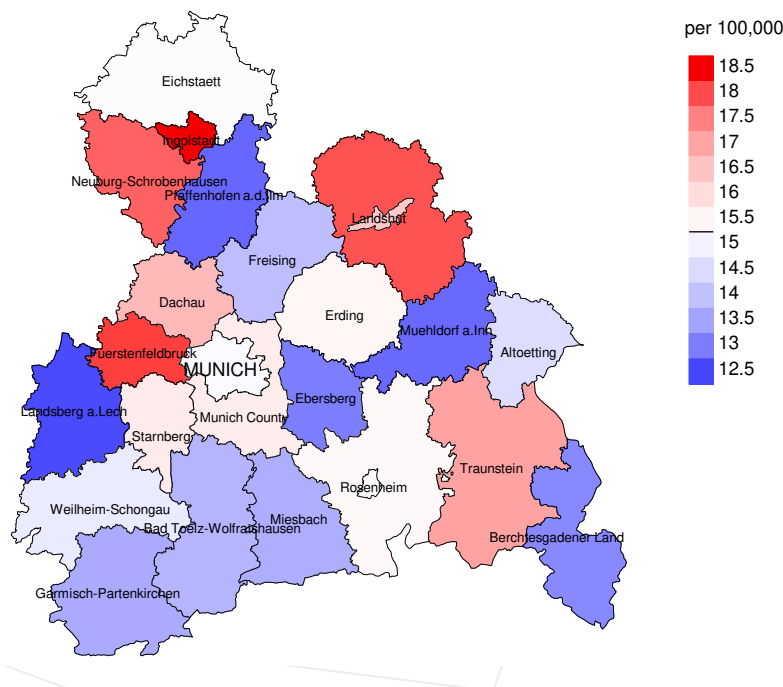
# The occurrence of further malignancy listed is statistically significant.

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

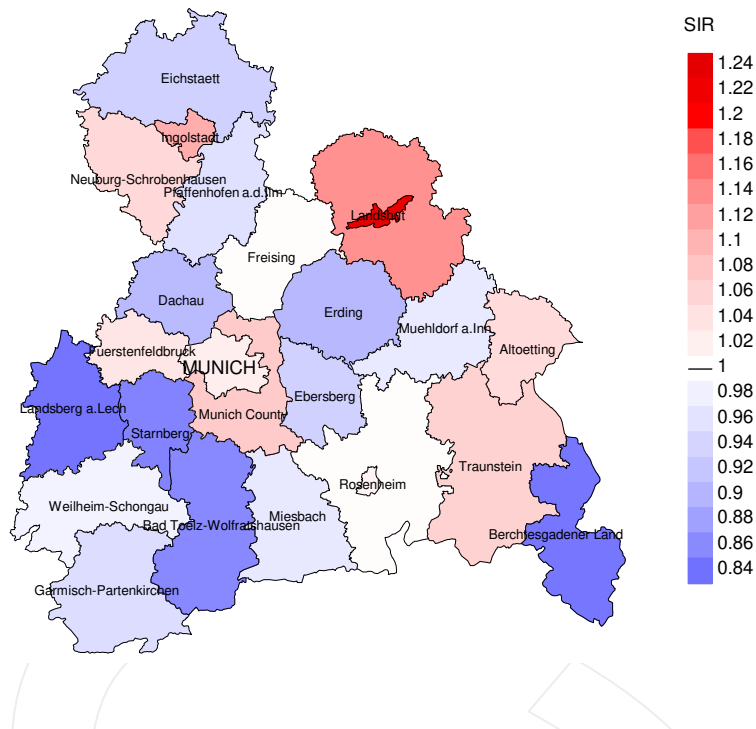


**Figure 8a.** Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 22.3/100,000 WS N=9,161, females 15.3/100,000 WS N=7,426).

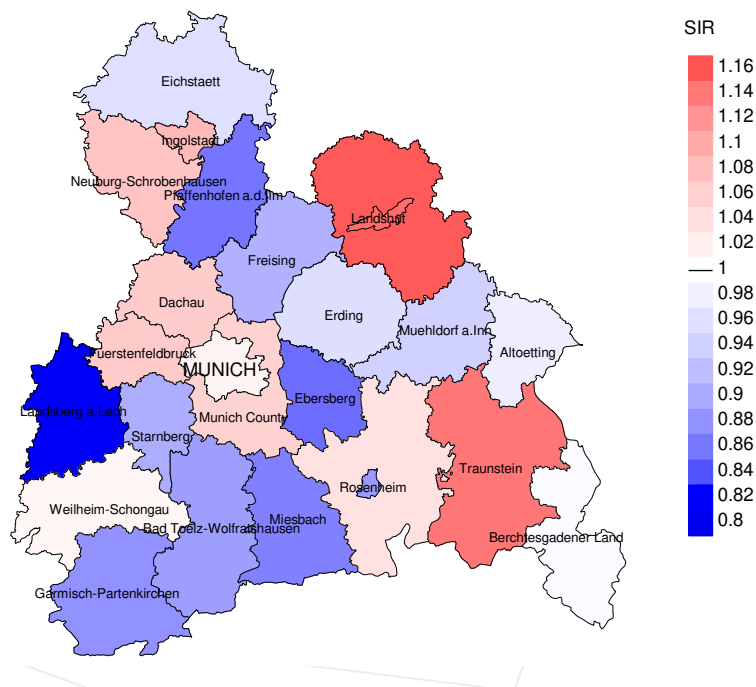
The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 171 women were identified with newly diagnosed systemic neoplasms. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 13.0/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 10.0 and 16.6/100,000.



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=9,161, females N=7,426).

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 171 women were identified with newly diagnosed systemic neoplasms. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.85. Though, the value of this parameter may vary with an underlying probability of 99% between 0.69 and 1.04, 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	864	96.5	19.3	650	75.2	95.5
1999	874	97.4	20.1	658	75.3	95.7
2000	848	96.6	22.3	623	73.5	97.3
2001	913	94.9	23.5	654	71.6	96.8
2002	1488	95.4	25.5	1081	72.6	97.5
2003	1530	94.8	21.1	1048	68.5	98.4
2004	1607	93.5	20.2	1048	65.2	98.3
2005	1548	91.3	18.5	986	63.7	98.5
2006	1601	91.5	16.8	1057	66.0	98.1
2007	1843	79.9	16.2	1165	63.2	98.0
2008	1828	73.5	14.9	1082	59.2	98.5
2009	1831	73.6	13.7	1036	56.6	98.0
2010	1873	74.1	14.0	1054	56.3	98.4
2011	1887	72.9	14.3	1015	53.8	98.0
2012	1877	70.6	14.1	965	51.4	97.4
2013	1812	72.8	14.6	886	48.9	96.3
2014	1686	75.3	16.1	788	46.7	97.6
2015	1193	97.9	20.7	637	53.4	94.3
2016	872	81.7	27.6	410	47.0	89.0
1998-2016	27975	83.4	17.8	16843	60.2	97.3

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	864	520	95.8	236	27.3
1999	874	556	94.8	243	27.8
2000	848	541	95.7	242	28.5
2001	913	602	96.3	259	28.4
2002	1488	832	97.5	472	31.7
2003	1530	844	98.2	450	29.4
2004	1607	893	98.2	445	27.7
2005	1548	904	98.3	422	27.3
2006	1601	922	98.4	438	27.4
2007	1843	1030	97.8	482	26.2
2008	1828	1038	98.2	447	24.5
2009	1831	1067	97.8	463	25.3
2010	1873	1116	98.1	476	25.4
2011	1887	1160	98.3	458	24.3
2012	1877	1195	98.2	466	24.8
2013	1812	1234	98.5	482	26.6
2014	1686	1259	98.0	496	29.4
2015	1193	1230	98.8	481	40.3
2016	872	926	98.2	366	42.0
1998-2016	27975	17869	97.9	7824	28.0

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	520	63.3	36.7	94.2
1999	556	70.0	30.0	94.1
2000	541	73.9	26.1	95.4
2001	602	71.3	28.7	94.8
2002	832	80.0	20.0	94.8
2003	844	80.2	19.8	94.3
2004	893	84.5	15.5	94.5
2005	904	82.6	17.4	94.9
2006	922	82.1	17.9	93.2
2007	1030	82.3	17.7	92.9
2008	1038	80.1	19.9	90.2
2009	1067	80.5	19.5	91.3
2010	1116	78.8	21.2	89.6
2011	1160	78.4	21.6	89.3
2012	1195	79.2	20.8	89.5
2013	1234	75.9	24.1	87.8
2014	1259	74.6	25.4	89.1
2015	1230	76.2	23.8	86.2
2016	926	71.2	28.8	86.6
1998-2016	17869	77.7	22.3	91.1

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	261	71.0	68.2	76.6	71.9
1999	309	71.7	70.0	77.2	71.7
2000	301	71.3	70.2	74.7	71.6
2001	285	71.9	71.2	75.2	71.9
2002	428	73.0	72.6	74.3	73.1
2003	448	71.7	70.9	74.5	71.6
2004	469	73.9	73.6	75.9	74.2
2005	486	74.6	74.2	76.6	74.4
2006	511	73.4	72.4	77.9	73.0
2007	551	73.1	72.8	77.6	72.9
2008	573	73.3	72.8	77.5	73.1
2009	578	74.8	74.1	78.9	74.3
2010	615	75.1	74.1	78.1	74.8
2011	643	75.2	74.5	78.0	74.9
2012	661	75.8	75.3	78.0	75.5
2013	718	76.5	75.6	79.1	76.1
2014	705	76.7	75.9	79.0	76.5
2015	672	77.3	76.3	80.9	76.6
2016	520	77.7	77.3	80.4	77.6
1998-2016	9734	74.8	73.9	78.0	74.5

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	259	77.2	73.1	81.7	77.4
1999	247	77.4	76.3	81.8	77.3
2000	240	77.3	76.0	83.6	76.8
2001	317	77.5	76.2	80.6	77.1
2002	404	77.7	75.0	83.2	77.7
2003	396	76.9	75.3	82.7	76.2
2004	424	77.0	76.1	82.4	77.0
2005	418	77.9	75.7	84.6	77.5
2006	411	77.6	77.2	80.6	77.2
2007	479	77.9	76.6	81.5	77.5
2008	465	78.4	76.3	84.1	77.2
2009	489	78.4	77.7	82.5	78.0
2010	501	78.6	77.5	83.0	78.2
2011	517	77.6	75.7	83.3	76.6
2012	534	77.9	76.9	82.1	77.3
2013	516	78.7	77.4	81.7	78.2
2014	554	78.4	77.1	82.1	78.3
2015	558	78.6	77.7	81.9	78.2
2016	406	80.4	79.8	81.4	79.9
1998–2016	8135	78.1	76.7	82.5	77.6

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	173	15.6	0.37	10.3	0.35	14.5	0.37	18.6	0.38
1999	216	19.3	0.47	12.2	0.45	17.6	0.47	22.6	0.48
2000	223	19.6	0.49	12.1	0.45	17.7	0.48	23.8	0.51
2001	211	18.2	0.45	10.6	0.40	16.1	0.45	22.0	0.49
2002	346	18.6	0.44	10.3	0.38	15.9	0.43	21.6	0.48
2003	370	19.7	0.45	10.8	0.39	16.4	0.44	22.0	0.47
2004	392	20.8	0.47	10.8	0.38	16.9	0.44	23.4	0.50
2005	405	21.4	0.49	10.7	0.38	16.8	0.46	23.5	0.51
2006	415	21.7	0.46	10.8	0.38	16.6	0.43	22.6	0.47
2007	462	20.9	0.46	10.7	0.39	16.1	0.43	22.0	0.47
2008	472	21.2	0.47	10.3	0.38	15.8	0.44	21.3	0.48
2009	462	20.7	0.47	9.6	0.39	14.9	0.44	20.7	0.49
2010	485	21.5	0.47	9.7	0.37	15.1	0.43	21.0	0.48
2011	511	22.8	0.50	10.4	0.40	15.9	0.45	22.1	0.51
2012	506	22.3	0.50	9.7	0.40	15.1	0.46	21.1	0.50
2013	533	23.2	0.53	9.5	0.39	15.1	0.47	21.4	0.52
2014	534	22.9	0.56	9.4	0.43	15.0	0.49	20.7	0.55
2015	512	21.5	0.80	9.1	0.71	14.1	0.75	19.5	0.80
2016	371	15.4	0.73	6.2	0.62	9.8	0.67	13.8	0.72
1998-2016	7599	20.6	0.50	10.0	0.41	15.4	0.47	21.1	0.51

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	156	13.3	0.40	6.7	0.36	9.1	0.37	11.4	0.39
1999	173	14.6	0.42	6.0	0.30	9.1	0.35	12.4	0.40
2000	178	14.8	0.46	6.2	0.34	9.3	0.38	12.2	0.42
2001	218	17.9	0.49	7.4	0.38	11.2	0.43	15.2	0.48
2002	320	16.3	0.46	6.7	0.38	9.9	0.41	13.3	0.45
2003	307	15.6	0.43	6.3	0.32	9.5	0.36	12.6	0.41
2004	364	18.4	0.48	7.2	0.36	10.9	0.41	14.9	0.46
2005	343	17.2	0.48	6.8	0.36	10.1	0.41	13.4	0.44
2006	342	17.0	0.50	6.3	0.36	9.7	0.42	13.4	0.47
2007	386	16.7	0.47	6.4	0.34	9.6	0.39	12.8	0.43
2008	362	15.6	0.45	5.9	0.34	8.9	0.38	11.9	0.41
2009	397	17.1	0.47	6.1	0.34	9.4	0.39	12.8	0.44
2010	396	16.9	0.47	5.9	0.32	9.0	0.38	12.4	0.43
2011	399	17.1	0.47	6.3	0.35	9.5	0.40	12.8	0.44
2012	440	18.6	0.52	6.6	0.35	10.0	0.41	13.5	0.46
2013	405	17.0	0.51	5.9	0.36	9.0	0.41	12.4	0.46
2014	408	16.9	0.58	5.7	0.42	8.8	0.48	12.1	0.52
2015	426	17.5	0.78	6.0	0.68	9.2	0.71	12.6	0.74
2016	293	11.9	0.82	3.7	0.65	5.8	0.71	8.0	0.75
1998-2016	6313	16.5	0.50	6.1	0.37	9.3	0.42	12.6	0.46

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	0.1	0.1	2	0.0	0.0	3	0.1	0.1
5-9	10	0.1	0.2	6	0.1	0.2	4	0.1	0.2
10-14	21	0.2	0.4	6	0.1	0.3	15	0.4	0.6
15-19	20	0.2	0.6	14	0.3	0.6	6	0.2	0.7
20-24	21	0.2	0.9	16	0.3	0.9	5	0.1	0.8
25-29	33	0.4	1.3	22	0.5	1.4	11	0.3	1.1
30-34	36	0.4	1.7	22	0.5	1.8	14	0.4	1.5
35-39	52	0.6	2.3	30	0.6	2.4	22	0.6	2.0
40-44	94	1.1	3.3	57	1.2	3.6	37	0.9	3.0
45-49	180	2.1	5.4	111	2.3	5.9	69	1.8	4.8
50-54	259	3.0	8.3	161	3.3	9.2	98	2.5	7.3
55-59	350	4.0	12.3	188	3.9	13.1	162	4.1	11.4
60-64	546	6.2	18.6	335	6.9	20.0	211	5.4	16.8
65-69	974	11.1	29.7	577	11.9	31.9	397	10.1	26.9
70-74	1505	17.2	46.9	878	18.1	50.0	627	16.0	43.0
75-79	1652	18.9	65.7	970	20.0	70.0	682	17.4	60.4
80-84	1508	17.2	82.9	785	16.2	86.2	723	18.5	78.9
85+	1494	17.1	100.0	668	13.8	100.0	826	21.1	100.0
All ages	8760	100.0		4848	100.0		3912	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		Females		Males		Females	
	n	n	Age- spec. mortal.	MI-index	Age- spec. mortal.	MI-index	Prop.all cancers %	Prop.all cancers %
0- 4	2	3	0.2	0.03	0.3	0.06	13.3	20.0
5- 9	6	4	0.5	0.11	0.4	0.10	25.0	22.2
10-14	6	15	0.5	0.11	1.4	0.38	26.1	62.5
15-19	14	6	1.1	0.14	0.5	0.09	31.8	27.3
20-24	16	5	1.1	0.14	0.4	0.06	28.1	15.2
25-29	22	11	1.4	0.17	0.7	0.10	29.7	15.1
30-34	22	14	1.4	0.16	0.9	0.14	21.2	11.7
35-39	30	22	1.8	0.16	1.4	0.16	14.9	7.7
40-44	57	37	3.1	0.20	2.1	0.20	11.6	5.5
45-49	111	69	5.6	0.27	3.6	0.28	9.7	5.3
50-54	161	98	9.3	0.33	5.7	0.28	7.8	5.0
55-59	188	162	13.3	0.34	11.0	0.34	5.6	5.7
60-64	335	211	27.3	0.46	15.9	0.37	6.7	5.6
65-69	577	397	48.7	0.49	30.6	0.48	7.9	7.5
70-74	878	627	79.4	0.59	49.5	0.60	9.4	9.2
75-79	970	682	121.7	0.72	68.1	0.64	10.8	9.7
80-84	785	723	170.7	0.75	102.2	0.76	10.4	10.6
85+	668	826	218.2	0.84	112.5	0.77	10.2	9.0
All ages	4848	3912					9.3	8.4
Mortality								
Raw			21.2	0.53	16.5	0.53		
WS			9.4	0.42	5.8	0.38		
ES			14.6	0.48	8.9	0.44		
BRD-S			20.3	0.53	12.1	0.48		
PYLL-70								
per 100,000			90.5		62.4			
ES			82.4		57.4			
AYLL-70			11.8		11.8			

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 ←%
C15 Oesophagus	40	1.3	7	17.5	3	7.5	30	75.0
C16 Stomach	89	3.0	32	36.0	13	14.6	44	49.4
C18 Colon	216	7.2	107	49.5	31	14.4	78	36.1
C19–C20 Rectum	124	4.1	57	46.0	14	11.3	53	42.7
C22 Liver	43	1.4	8	18.6	5	11.6	30	69.8
C25 Pancreas	67	2.2	4	6.0	11	16.4	52	77.6
C32 Larynx	32	1.1	21	65.6	4	12.5	7	21.9
C33–C34 Lung	301	10.0	53	17.6	42	14.0	206	68.4
C43 Malign. melanoma	128	4.3	66	51.6	9	7.0	53	41.4
C44 Skin others	498	16.6	132	26.5	36	7.2	330	66.3
C46,C49 Soft tissue	37	1.2	18	48.6	2	5.4	17	45.9
C61 Prostate	626	20.8	415	66.3	59	9.4	152	24.3
C64 Kidney	105	3.5	68	64.8	12	11.4	25	23.8
C67 Bladder	97	3.2	46	47.4	9	9.3	42	43.3
C70–C72 CNS cancer	34	1.1	4	11.8	6	17.6	24	70.6
C76–C79 CUP	47	1.6	6	12.8	5	10.6	36	76.6
C82–C85 NHL	154	5.1			20	13.0	134	87.0
C91–C96 Leukaemia	107	3.6			17	15.9	90	84.1
Others, specified	262	8.7	91	34.7	25	9.5	146	55.7
All further malignancies	3007	100.0	1135	37.7	323	10.7	1549	51.5

Further malignancies with number of cases 1 to 25 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	60	3.0	19	31.7	10	16.7	31	51.7
C18 Colon	148	7.5	62	41.9	18	12.2	68	45.9
C19-C20 Rectum	65	3.3	37	56.9	9	13.8	19	29.2
C21 Anus/canal	18	0.9	9	50.0			9	50.0
C22 Liver	15	0.8			1	6.7	14	93.3
C23-C24 Bile	17	0.9	3	17.6	1	5.9	13	76.5
C25 Pancreas	45	2.3	1	2.2	9	20.0	35	77.8
C33-C34 Lung	126	6.4	17	13.5	15	11.9	94	74.6
C43 Malign. melanoma	72	3.6	44	61.1	1	1.4	27	37.5
C44 Skin others	190	9.6	72	37.9	10	5.3	108	56.8
C46,C49 Soft tissue	14	0.7	3	21.4	3	21.4	8	57.1
C48 Peritoneal	12	0.6	5	41.7	2	16.7	5	41.7
C50 Breast	536	27.1	365	68.1	40	7.5	131	24.4
C51 Vulva	17	0.9	10	58.8			7	41.2
C53 Cervix uteri	38	1.9	29	76.3	3	7.9	6	15.8
C54 Corpus uteri	88	4.4	67	76.1	4	4.5	17	19.3
C56 Ovary	55	2.8	21	38.2	8	14.5	26	47.3
C64 Kidney	45	2.3	21	46.7	9	20.0	15	33.3
C67 Bladder	26	1.3	12	46.2	2	7.7	12	46.2
C70-C72 CNS cancer	30	1.5	11	36.7	4	13.3	15	50.0
C73 Thyroid	39	2.0	31	79.5	1	2.6	7	17.9
C76-C79 CUP	36	1.8	10	27.8	4	11.1	22	61.1
C82-C85 NHL	116	5.9			9	7.8	107	92.2
C90 Mult. myeloma	13	0.7			2	15.4	11	84.6
C91-C96 Leukaemia	67	3.4			6	9.0	61	91.0
Others, specified	90	4.6	42	46.7	4	4.4	44	48.9
All further malignancies	1978	100.0	891	45.0	175	8.8	912	46.1

Further malignancies with number of cases 1 to 9 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	1	3	0.1	0.01	0.3	0.06	7.1	20.0
5- 9	6	4	0.5	0.11	0.4	0.10	26.1	22.2
10-14	6	13	0.5	0.11	1.2	0.34	26.1	61.9
15-19	14	5	1.1	0.15	0.4	0.08	33.3	25.0
20-24	14	4	1.0	0.12	0.3	0.05	27.5	12.9
25-29	21	9	1.3	0.16	0.6	0.08	31.3	13.4
30-34	22	13	1.4	0.17	0.8	0.13	21.6	12.3
35-39	27	21	1.7	0.15	1.3	0.16	14.3	8.2
40-44	48	31	2.6	0.18	1.7	0.18	10.5	5.2
45-49	102	57	5.2	0.27	3.0	0.27	9.7	5.0
50-54	136	78	7.9	0.31	4.6	0.27	7.5	4.7
55-59	161	131	11.4	0.34	8.9	0.34	5.5	5.5
60-64	264	167	21.6	0.46	12.6	0.38	6.3	5.4
65-69	440	285	37.1	0.49	21.9	0.45	7.5	6.7
70-74	648	464	58.6	0.60	36.7	0.61	9.0	8.7
75-79	708	508	88.9	0.79	50.7	0.65	10.7	9.4
80-84	555	565	120.7	0.82	79.9	0.79	10.1	10.6
85+	429	638	140.1	0.84	86.9	0.76	9.0	8.7
All ages	3602	2996					8.8	8.1
Mortality								
Raw			15.8	0.51	12.7	0.51		
WS			7.2	0.40	4.5	0.36		
ES			11.0	0.46	6.8	0.41		
BRD-S			15.1	0.51	9.3	0.46		
PYLL-70								
per 100,000			78.6		51.6			
ES			72.0		48.0			
AYLL-70			12.6		12.6			

\* See corresponding tables with multiple malignancies.

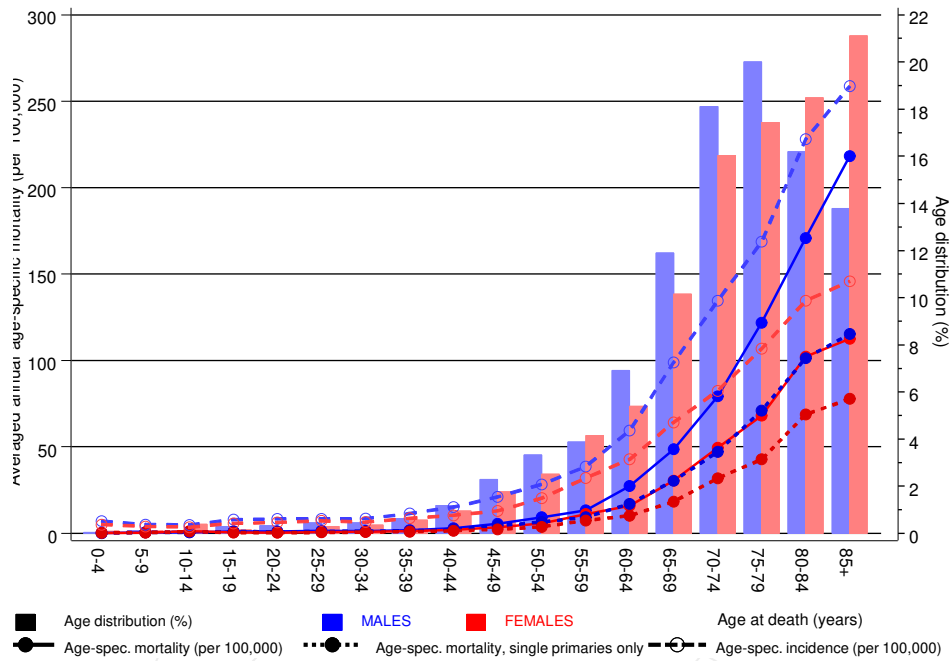
Table 16

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	1	3	0.1	0.01	0.3	0.06	7.1	20.0
5- 9	6	4	0.5	0.11	0.4	0.10	26.1	22.2
10-14	6	12	0.5	0.12	1.1	0.32	26.1	57.1
15-19	14	4	1.1	0.15	0.3	0.06	33.3	21.1
20-24	13	4	0.9	0.12	0.3	0.05	25.5	12.9
25-29	18	8	1.1	0.14	0.5	0.08	26.9	12.3
30-34	21	12	1.3	0.16	0.8	0.13	20.6	11.5
35-39	24	16	1.5	0.14	1.0	0.13	12.8	6.3
40-44	43	26	2.3	0.17	1.5	0.16	9.5	4.4
45-49	87	44	4.4	0.24	2.3	0.22	8.4	3.9
50-54	112	64	6.5	0.28	3.7	0.24	6.3	3.9
55-59	131	109	9.3	0.30	7.4	0.31	4.5	4.6
60-64	209	136	17.1	0.40	10.2	0.35	5.1	4.5
65-69	360	238	30.4	0.48	18.3	0.42	6.3	5.8
70-74	521	403	47.1	0.56	31.8	0.59	7.5	7.8
75-79	566	429	71.0	0.71	42.8	0.60	8.9	8.1
80-84	466	487	101.3	0.77	68.8	0.73	9.0	9.5
85+	353	571	115.3	0.72	77.8	0.71	8.0	8.1
All ages	2951	2570					7.5	7.1
Mortality								
Raw			12.9	0.46	10.9	0.47		
WS			6.0	0.35	3.8	0.32		
ES			9.0	0.41	5.8	0.38		
BRD-S			12.4	0.47	7.9	0.43		
PYLL-70								
per 100,000			67.8		43.3			
ES			62.5		40.8			
AYLL-70			13.1		12.7			

\* See corresponding tables with multiple malignancies.

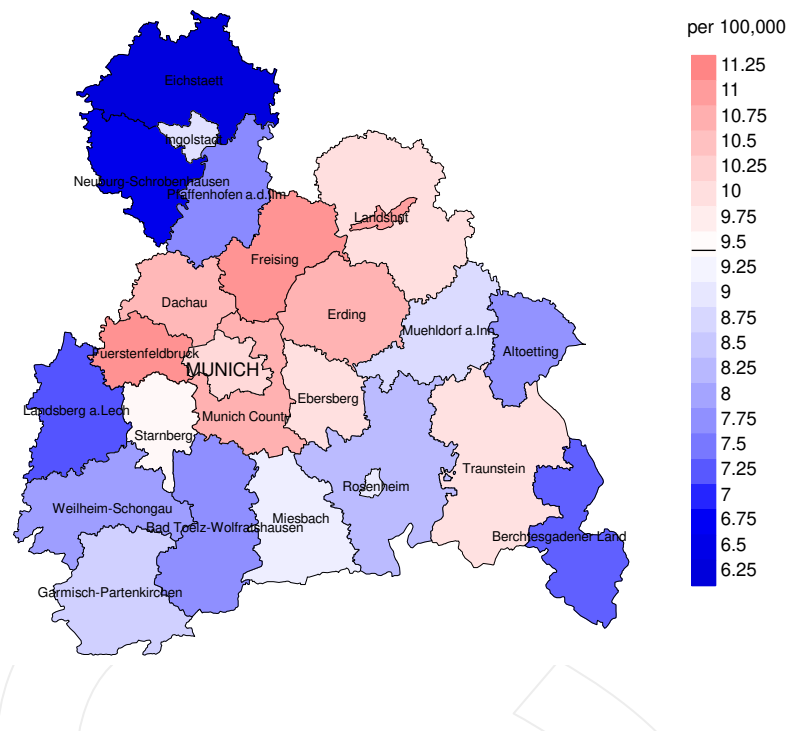
CD-10 C81-C96: Malignant neoplasms of lymphoid, haematopoietic and related tissue  
 Age distribution and age-specific mortality 2007 - 2016 (Males: 4848, Females: 3912)



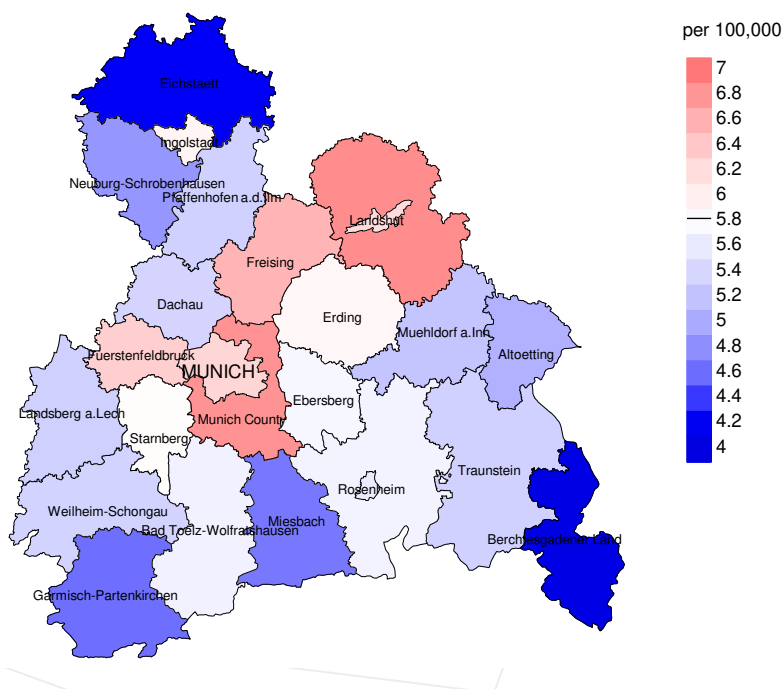
**Figure 17.** Distribution of age at death (bars; males: mean=68.8 yrs, median=71.3 yrs; females: mean=71.0 yrs, median=73.6 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

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



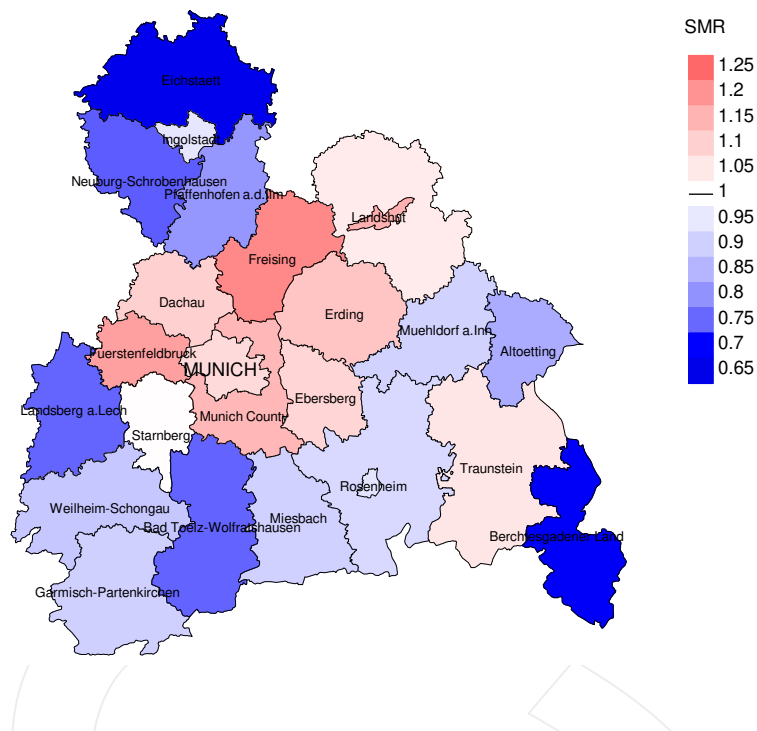
Average mortality (world standard population) 2007 - 2016: Females



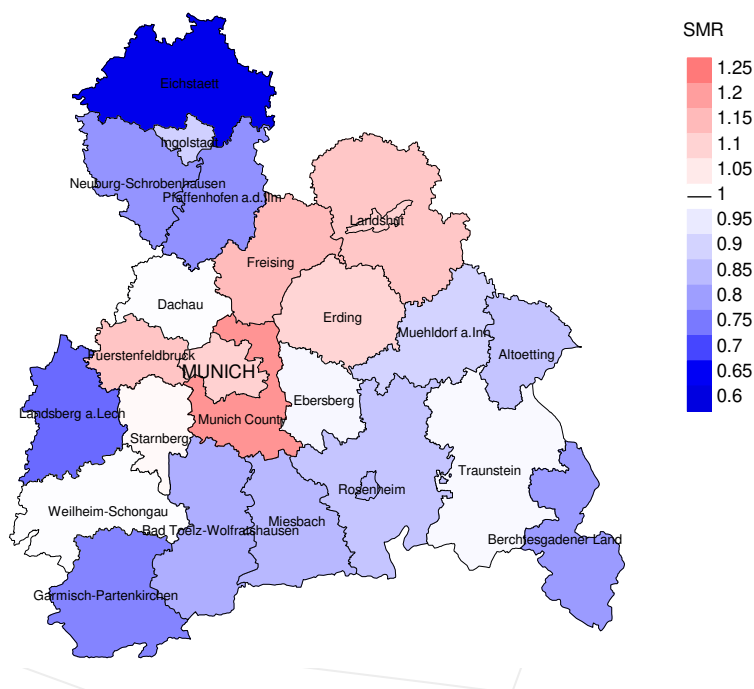
**Figure 18a.** Map of cancer mortality (world standard population) by county averaged for period 2007 to 2016. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 9.4/100,000 WS N=4,848, females 5.8/100,000 WS N=3,912).

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 102 women died from systemic neoplasms. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 5.7/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 4.2 and 7.8/100,000.

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=4,848, females N=3,912).

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 102 women died from systemic neoplasms. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.98. Though, the value of this parameter may vary with an underlying probability of 99% between 0.75 and 1.26, 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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