Munich Cancer Registry

- Survival
- Selection Matrix
- Homepage
- *Deutsch*

Munich Cancer Registry at Munich Cancer Center
Marchioninistr. 15
Munich, 81377
Germany

http://www.tumorregister-muenchen.de/en

Cancer statistics: Baseline statistics

C81-C96: Systemic neoplasms

Year of diagnosis	1998-2013
Patients	22,423
Diseases	22,787
Creation date	05/19/2015
Export date	12/30/2014
Population	4.64 m

http://www.tumorregister-muenchen.de/en/facts/base/base_C8196E.pdf

Global Statements about the statistics on the Internet −
Baseline Statistics (grey button), **Survival** (red button)

In these analyses, the clinics and physicians of Upper Bavaria and the city and county of Landshut[#], with a total of 4.64 million inhabitants, account for the frequency of cancer diseases[##] and the achieved long term results. Additionally, the long term survival evaluated by the Munich Cancer Registry (MCR) is compared with the results of the population-based registry in the USA (SEER), which is useful for checking the consistency of the data on an international level.

In comparing several tables, inconsistent figures may be detected. This is based on the fact that different patient cohorts are included in the base calculation, for example when proportions of multiple tumors or DCO-cases[###] are concerned. In other cases the individual tumor diagnosis is the basis for calculation, for example with incidence.

The foot notes describe the currentness of the data. The baseline statistics and survival data are updated annually. This yearly analysis comprises the Annual Report of the MCR. The time-delayed acquisition of data and the occasionally high DCO-rates indicate optimizing reserves, among others, because of current financial and legal conditions that hinder the analyses.

Clinics and physicians have access to essentially more detailed data, with which they can check, compare and in the best case optimize their own data and results.

We would be pleased to receive corrections, critique and useful suggestions. Just send an e-mail to tumor@ibe.med.uni-muenchen.de.

Munich Cancer Registry, May 2015

[#] 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 2.51 million to 3.96 in 2002, and to 4.52 million in 2007). Death certificates from 2014 are incorporated into these analyses.

[##] Due to the high frequency and good prognosis of non-malignant skin cancer (C44), no systematic ascertainment is performed for this diagnosis. C44 is not designated as a primary, but rather as a secondary tumor.

[###] DCO (death certificate only) identifies a cancer case that first becomes available to the MCR through the death certificate. A high proportion of DCO cases (≥5%) in particular cancer types indicate insufficient participation of specific cancer specializations.

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

Patient cohorts by year of diagnosis including DCO cases and multiple primaries, and with proportion of deaths and active follow-up

Year of diagnosis	Cases n	DCO cases n	Prop. DCO %	Prop. mult. primaries %	Prop. deaths %	Prop. actively followed %	
1998	853	159	18.6	19.5	73.6	98.1	
1999	859	168	19.6	20.3	72.8	98.0	
2000	830	180	21.7	21.6	72.2	98.2	
2001	892	206	23.1	24.3	70.7	97.8	
2002	1487	378	25.4	24.1	70.3	97.0	#
2003	1516	323	21.3	23.8	65.4	97.2	
2004	1593	321	20.2	25.5	61.5	96.7	
2005	1518	287	18.9	27.0	61.3	95.7	
2006	1576	268	17.0	28.4	62.2	95.7	
2007	1801	297	16.5	25.5	58.9	86.9	# ##
2008	1778	269	15.1	26.5	54.6	71.8	
2009	1775	247	13.9	26.1	51.8	72.5	
2010	1800	259	14.4	27.2	49.6	72.0	
2011	1774	265	14.9	26.9	47.0	72.4	
2012	1703	261	15.3	28.5	41.7	75.2	
2013	1032	259	25.1	32.6	45.3	98.7	###
1998-2013	22787	4147	18.2	25.9	58.2	86.8	

\# The increases of incident cases in 2002 and 2007 reflect the expansion to additional registry areas.

Since 2007 the percentage of actively followed patients sharply declined compared to the previous years. This is a consequence of ambiguous data protection rules that currently forbid cancer registries in Bavaria to obtain the essential life status informations from competent registration offices.

Please be aware that data of recent annual patient cohorts may not yet be fully processed. Therefore, the presented figures and tables are potentially related to different time periods as pointed out in the respective headlines or legends.

Table 1a

Patient cohorts by year of diagnosis and gender
including DCO cases

Year of diagnosis	All n	Males n	Females n	Prop. males %
1998	853	467	386	54.7
1999	859	448	411	52.2
2000	830	449	381	54.1
2001	892	451	441	50.6
2002	1487	794	693	53.4
2003	1516	813	703	53.6
2004	1593	837	756	52.5
2005	1518	823	695	54.2
2006	1576	897	679	56.9
2007	1801	983	818	54.6
2008	1778	985	793	55.4
2009	1775	954	821	53.7
2010	1800	985	815	54.7
2011	1774	977	797	55.1
2012	1703	931	772	54.7
2013	1032	582	450	56.4
1998-2013	22787	12376	10411	54.3

Table 2

Incidence measures by year of diagnosis and gender including DCO cases
(with respect to registry area expansion from 2.51 to 3.96 m as of 2002,
and from 3.96 to 4.64 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	467	386	42.1	32.8	29.0	18.8	39.0	24.3	48.0	29.1
1999	448	411	40.0	34.6	27.0	19.6	36.7	25.3	45.8	30.6
2000	449	381	39.4	31.7	26.4	17.9	36.0	23.5	45.4	28.3
2001	451	441	38.9	36.3	25.8	19.1	35.1	25.7	43.4	31.3
2002	794	693	42.6	35.4	27.1	17.4	36.9	23.9	45.7	29.6
2003	813	703	43.4	35.7	27.3	19.7	37.3	25.7	46.4	30.8
2004	837	756	44.5	38.2	28.6	20.1	38.2	26.5	46.2	32.3
2005	823	695	43.4	34.9	27.7	18.4	36.5	24.1	45.8	29.7
2006	897	679	46.8	33.8	28.4	17.0	38.6	22.6	47.8	28.1
2007	983	818	44.4	35.4	26.5	18.1	36.1	24.1	45.5	29.4
2008	985	793	44.3	34.2	26.6	17.0	35.1	22.8	43.7	28.2
2009	954	821	42.7	35.3	24.2	17.3	33.1	23.1	41.2	28.4
2010	985	815	43.7	34.8	25.1	17.4	34.0	23.0	42.5	28.3
2011	977	797	42.8	33.8	24.6	16.8	32.9	22.2	40.7	26.8
2012	931	772	40.7	32.7	22.7	17.2	30.7	22.1	39.2	26.7
2013	582	450	25.5	19.1	13.2	8.4	18.7	11.8	24.6	15.1
1998-2013	12376	10411	41.6	33.5	25.3	17.3	34.2	22.8	42.6	27.9

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

Table 3

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	853	62.3	19.7	0.9	100	33.4	53.3	65.0	76.8	84.9
1999	859	63.3	19.4	0.3	104	35.3	55.0	66.1	77.3	84.4
2000	830	63.4	18.9	0.4	97.6	35.7	55.0	67.1	77.0	84.5
2001	892	63.9	18.1	1.4	98.7	38.0	56.1	66.6	77.0	84.0
2002	1487	65.4	18.1	1.0	99.3	39.9	57.8	68.5	78.5	85.1
2003	1516	64.1	18.6	0.3	99.0	37.8	55.3	67.2	77.6	83.7
2004	1593	64.4	18.5	0.4	98.6	38.3	56.1	67.3	77.8	84.0
2005	1518	64.5	19.6	0.0	102	36.4	56.5	68.8	78.2	84.2
2006	1576	65.8	18.5	0.6	98.5	40.4	58.9	69.6	78.3	84.8
2007	1801	65.6	18.3	0.1	101	40.1	57.3	69.4	78.7	84.5
2008	1778	65.8	18.9	0.4	98.1	39.6	58.8	69.8	78.7	84.6
2009	1775	66.4	17.6	1.3	100	42.7	58.5	69.8	78.8	85.5
2010	1800	66.5	18.6	0.1	101	41.4	58.5	70.7	79.4	86.1
2011	1774	66.0	18.8	0.3	101	41.3	56.5	70.8	78.8	85.5
2012	1703	65.9	19.4	0.0	102	38.8	57.0	71.3	79.4	85.1
2013	1032	69.3	17.2	0.5	100	46.9	62.6	73.4	80.9	86.6
1998-2013	22787	65.4	18.7	0.0	104	39.3	57.0	69.4	78.4	84.9

Table 3a

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	467	60.6	19.5	0.9	95.8	33.3	50.1	63.1	74.9	83.8
1999	448	61.5	18.9	0.3	94.1	33.3	54.2	64.0	74.9	82.8
2000	449	62.7	18.6	0.4	97.6	36.1	55.1	66.0	75.4	83.0
2001	451	61.4	17.5	1.4	96.4	37.7	53.5	64.0	74.6	79.9
2002	794	63.0	17.9	1.0	98.3	37.1	55.5	66.2	75.0	81.9
2003	813	63.0	18.0	1.6	99.0	36.7	55.0	66.3	75.8	82.2
2004	837	62.4	18.4	0.4	97.8	36.9	53.9	65.2	74.9	82.5
2005	823	63.0	19.8	0.0	102	35.1	54.9	67.3	77.0	83.0
2006	897	64.3	18.3	1.0	98.5	39.7	57.0	68.2	76.6	82.2
2007	983	64.0	18.4	0.1	97.8	38.1	54.3	68.6	77.3	82.7
2008	985	64.2	19.2	0.4	98.1	37.6	57.1	68.9	76.7	82.9
2009	954	64.9	17.0	2.2	97.0	42.2	56.2	69.0	76.4	83.2
2010	985	65.6	18.5	0.1	101	41.5	56.5	70.1	78.1	85.1
2011	977	64.8	18.4	2.5	101	40.5	55.5	69.6	77.3	83.7
2012	931	65.4	18.8	1.5	96.0	38.6	56.1	71.1	78.5	83.9
2013	582	68.8	17.6	0.5	100	46.0	62.6	73.1	79.8	85.8
1998-2013	12376	64.0	18.5	0.0	102	38.2	55.4	68.2	76.9	83.2

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 50%	75%	90%
1998	386	64.4	19.7	1.3	100	33.4	55.6	67.9	78.7	85.8
1999	411	65.2	19.9	1.5	104	39.1	56.1	70.3	78.8	86.9
2000	381	64.2	19.3	2.1	95.1	35.1	54.7	68.7	77.7	85.4
2001	441	66.5	18.4	2.8	98.7	39.4	58.0	70.4	79.6	86.8
2002	693	68.2	17.9	2.9	99.3	43.0	59.9	71.8	80.9	87.9
2003	703	65.4	19.3	0.3	98.9	38.8	55.6	68.5	80.0	85.6
2004	756	66.7	18.4	0.7	98.6	41.0	59.5	69.9	79.9	85.1
2005	695	66.4	19.1	0.6	98.4	39.1	59.0	70.1	79.6	85.2
2006	679	67.8	18.5	0.6	95.8	41.0	61.2	71.8	80.6	86.0
2007	818	67.4	18.1	1.0	101	44.1	60.0	71.1	80.2	86.0
2008	793	67.8	18.3	1.4	97.4	42.3	60.4	70.9	80.8	86.4
2009	821	68.2	18.1	1.3	100	43.2	60.6	71.4	81.3	87.0
2010	815	67.5	18.7	0.8	98.7	41.3	59.7	71.5	80.7	87.0
2011	797	67.6	19.1	0.3	99.2	42.9	57.9	72.3	80.7	87.8
2012	772	66.6	20.0	0.0	102	38.9	57.6	71.9	81.0	87.0
2013	450	70.1	16.6	3.2	97.9	47.6	62.6	73.9	81.9	87.6
1998-2013	10411	67.0	18.7	0.0	104	41.0	58.9	71.0	80.3	86.5

Table 4

Age distribution by 5-year age group and gender for period 1998-2013 (incl. DCO)

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	246	1.1	1.1	145	1.2	1.2	101	1.0	1.0
5-9	162	0.7	1.8	103	0.8	2.0	59	0.6	1.5
10-14	143	0.6	2.4	81	0.7	2.7	62	0.6	2.1
15-19	241	1.1	3.5	136	1.1	3.8	105	1.0	3.1
20-24	292	1.3	4.8	155	1.3	5.0	137	1.3	4.5
25-29	334	1.5	6.2	172	1.4	6.4	162	1.6	6.0
30-34	401	1.8	8.0	248	2.0	8.4	153	1.5	7.5
35-39	536	2.4	10.3	323	2.6	11.0	213	2.0	9.5
40-44	714	3.1	13.5	430	3.5	14.5	284	2.7	12.3
45-49	885	3.9	17.4	550	4.4	18.9	335	3.2	15.5
50-54	1169	5.1	22.5	688	5.6	24.5	481	4.6	20.1
55-59	1589	7.0	29.5	884	7.1	31.6	705	6.8	26.9
60-64	2160	9.5	38.9	1232	10.0	41.6	928	8.9	35.8
65-69	2908	12.8	51.7	1679	13.6	55.2	1229	11.8	47.6
70-74	3161	13.9	65.6	1822	14.7	69.9	1339	12.9	60.4
75-79	3098	13.6	79.2	1668	13.5	83.4	1430	13.7	74.2
80-84	2504	11.0	90.2	1182	9.6	92.9	1322	12.7	86.9
85+	2244	9.8	100.0	878	7.1	100.0	1366	13.1	100.0
All ages	22787	100.0		12376	100.0		10411	100.0	

Included in the statistics are 34.1% multiple primaries in males and 28.2% in females.

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 1998-2013

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males DCO rate n=2048 %	Females DCO rate n=2073 %	Males Prop.all cancers n=158258 %	Females Prop.all cancers n=153136 %
0- 4	145	101	9.8	7.2	0.7		44.8	41.4
5- 9	103	59	6.9	4.2	1.0		58.5	47.2
10-14	81	62	5.3	4.3			48.8	36.5
15-19	136	105	8.8	7.1	2.2	1.0	38.4	36.0
20-24	154	137	8.7	7.7	1.3	4.4	25.1	25.9
25-29	171	162	8.5	8.0	0.6	0.6	17.7	14.6
30-34	247	152	10.9	6.9	4.0	0.7	16.5	7.4
35-39	322	213	12.9	9.0	2.8	5.2	14.3	5.7
40-44	428	283	16.3	11.4	3.3	3.5	13.4	4.5
45-49	548	333	23.2	14.4	4.2	5.4	10.3	3.8
50-54	685	479	33.9	23.3	6.1	6.9	7.9	4.3
55-59	883	705	48.1	36.7	7.1	6.2	6.1	5.1
60-64	1225	925	69.1	49.3	9.1	7.8	5.6	5.4
65-69	1667	1225	105.6	71.0	12.0	11.6	6.1	6.5
70-74	1809	1331	141.2	87.7	16.7	15.0	6.7	7.2
75-79	1655	1421	200.2	119.6	22.4	22.2	8.0	8.1
80-84	1172	1309	234.2	140.3	35.7	36.0	8.6	8.3
85+	872	1361	255.7	152.3	54.6	55.0	8.8	7.9
All ages	12303	10363			16.6	20.0	7.8	6.8
Incidence								
Raw			41.4	33.4				
WS			25.1	17.2				
ES			34.0	22.8				
BRD-S			42.3	27.8				

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).

Table 6a

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of second primaries for period 1998-2013
MALES

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C03-C06	Oral cavity	9	3.4	2.6	1.2	5.0	#	2.0	
C07-C08	Salivary gland	7	0.9	8.2	3.3	16.8	#	2.2	
C09-C10	Oropharynx	6	4.2	1.4	0.5	3.1		0.6	
C12-C13	Hypopharynx	2	2.3	0.9	0.1	3.1		-0.1	
C15	Oesophagus	14	6.9	2.0	1.1	3.4	#	2.5	7.1
C16	Stomach	34	15.9	2.1	1.5	3.0	#	6.5	2.9
C17	Small intestine	3	1.9	1.6	0.3	4.6		0.4	
C18	Colon	59	38.0	1.6	1.2	2.0	#	7.5	3.4
C19-C20	Rectum	40	21.6	1.9	1.3	2.5	#	6.6	2.5
C21	Anus/canal	4	0.8	4.9	1.3	12.5	#	1.1	
C22	Liver	16	10.6	1.5	0.9	2.4		1.9	25.0
C23-C24	Bile	3	3.7	0.8	0.2	2.4		-0.3	
C25	Pancreas	22	13.7	1.6	1.0	2.4	#	3.0	9.1
C32	Larynx	5	4.1	1.2	0.4	2.9		0.3	
C33-C34	Lung	106	45.6	2.3	1.9	2.8	#	21.6	5.7
C38,C45	Mesothelioma	8	2.5	3.2	1.4	6.2	#	2.0	12.5
C40-C41	Bone	3	0.3	8.9	1.8	26.0	#	1.0	
C43	Malign. melanoma	60	15.8	3.8	2.9	4.9	#	15.8	
C46,C49	Soft tissue	13	2.1	6.2	3.3	10.6	#	3.9	
C50	Breast	3	1.0	3.0	0.6	8.9		0.7	
C60	Penis	3	0.9	3.5	0.7	10.1		0.8	
C61	Prostate	209	114.5	1.8	1.6	2.1	#	33.8	3.8
C62	Testis	2	1.8	1.1	0.1	4.1		0.1	
C64	Kidney	37	13.7	2.7	1.9	3.7	#	8.3	
C65	Renal pelvis	3	1.6	1.9	0.4	5.6		0.5	
C66	Ureter	5	0.9	5.7	1.8	13.3	#	1.5	
C67	Bladder	33	16.9	2.0	1.3	2.7	#	5.8	3.0
C68	Urethra	3	0.2	12.2	2.5	35.6	#	1.0	
C70-C72	CNS cancer	10	5.3	1.9	0.9	3.5		1.7	20.0
C73	Thyroid	8	2.7	3.0	1.3	5.8	#	1.9	
C76-C79	CUP	19	6.5	2.9	1.8	4.6	#	4.5	
C81	Hodgkin lymphoma	13	0.9	13.9	7.4	23.8	#	4.3	7.7
C82-C85	NHL	72	15.5	4.6	3.6	5.8	#	20.2	8.3
C90	Mult. myeloma	12	4.9	2.4	1.3	4.3	#	2.5	8.3
C91-C96	Leukaemia	58	6.3	9.2	7.0	11.9	#	18.5	20.7
Other primaries		7	2.7	2.6	1.1	5.4	#	1.5	14.3
Not observed		0	1.8	0.0	0.0	2.0		-0.7	
All mult. primaries		911	392.5	2.3	2.2	2.5	#	185.3	5.5

Patients	7313
Median age at second malignancy (years)	71.0
Person-years	27982
Mean observation time (years)	3.8
Median observation time (years)	2.7

The occurrence of second malignancy is statistically significant.

Observed second primaries with count 1 are pooled in category "Other primaries".

Table 6b

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of second primaries for period 1998-2013
FEMALES

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C00	Lip	3	0.2	18.9	3.9	55.1	#	1.2	
C03-C06	Oral cavity	2	1.4	1.4	0.2	5.1		0.2	
C07-C08	Salivary gland	2	0.4	5.1	0.6	18.6		0.7	50.0
C09-C10	Oropharynx	6	1.0	6.3	2.3	13.6	#	2.1	
C15	Oesophagus	2	1.4	1.5	0.2	5.3		0.3	
C16	Stomach	18	8.7	2.1	1.2	3.3	#	3.9	5.6
C17	Small intestine	2	1.1	1.8	0.2	6.5		0.4	
C18	Colon	42	24.1	1.7	1.3	2.4	#	7.6	9.5
C19-C20	Rectum	13	10.5	1.2	0.7	2.1		1.1	7.7
C21	Anus/canal	5	1.2	4.0	1.3	9.4	#	1.6	
C22	Liver	9	2.8	3.3	1.5	6.2	#	2.6	22.2
C23-C24	Bile	7	3.5	2.0	0.8	4.1		1.5	
C25	Pancreas	16	10.5	1.5	0.9	2.5		2.3	18.8
C33-C34	Lung	49	16.9	2.9	2.1	3.8	#	13.5	4.1
C38,C45	Mesothelioma	2	0.4	4.5	0.5	16.2		0.7	
C43	Malign. melanoma	23	8.7	2.7	1.7	4.0	#	6.0	
C46,C49	Soft tissue	4	1.4	2.9	0.8	7.5		1.1	
C48	Peritoneal	2	0.9	2.3	0.3	8.2		0.5	
C50	Breast	134	72.5	1.8	1.5	2.2	#	25.9	2.2
C51	Vulva	4	2.3	1.7	0.5	4.4		0.7	
C53	Cervix uteri	9	3.3	2.7	1.2	5.1	#	2.4	33.3
C54	Corpus uteri	21	13.5	1.6	1.0	2.4		3.2	
C56	Ovary	15	10.0	1.5	0.8	2.5		2.1	13.3
C64	Kidney	8	6.1	1.3	0.6	2.6		0.8	12.5
C65	Renal pelvis	2	0.7	2.7	0.3	9.9		0.5	
C67	Bladder	4	4.5	0.9	0.2	2.3		-0.2	
C69	Eye lymphoma	3	0.1	34.4	7.1	100.7	#	1.2	
C70-C72	CNS cancer	2	3.4	0.6	0.1	2.1		-0.6	50.0
C73	Thyroid	14	4.4	3.2	1.7	5.3	#	4.0	7.1
C76-C79	CUP	9	4.2	2.2	1.0	4.1		2.0	
C82-C85	NHL	55	9.3	5.9	4.5	7.7	#	19.3	9.1
C90	Mult. myeloma	7	3.0	2.3	0.9	4.8		1.7	14.3
C91-C96	Leukaemia	30	3.9	7.8	5.3	11.1	#	11.0	16.7
Other primaries		8	3.7	2.1	0.9	4.2		1.8	12.5
Not observed		0	1.6	0.0	0.0	2.3		-0.7	
All mult. primaries		532	241.3	2.2	2.0	2.4	#	122.5	7.0

Patients	6027
Median age at second malignancy (years)	72.4
Person-years	23740
Mean observation time (years)	3.9
Median observation time (years)	2.8

The occurrence of second malignancy is statistically significant.

Observed second primaries with count 1 are pooled in category "Other primaries".

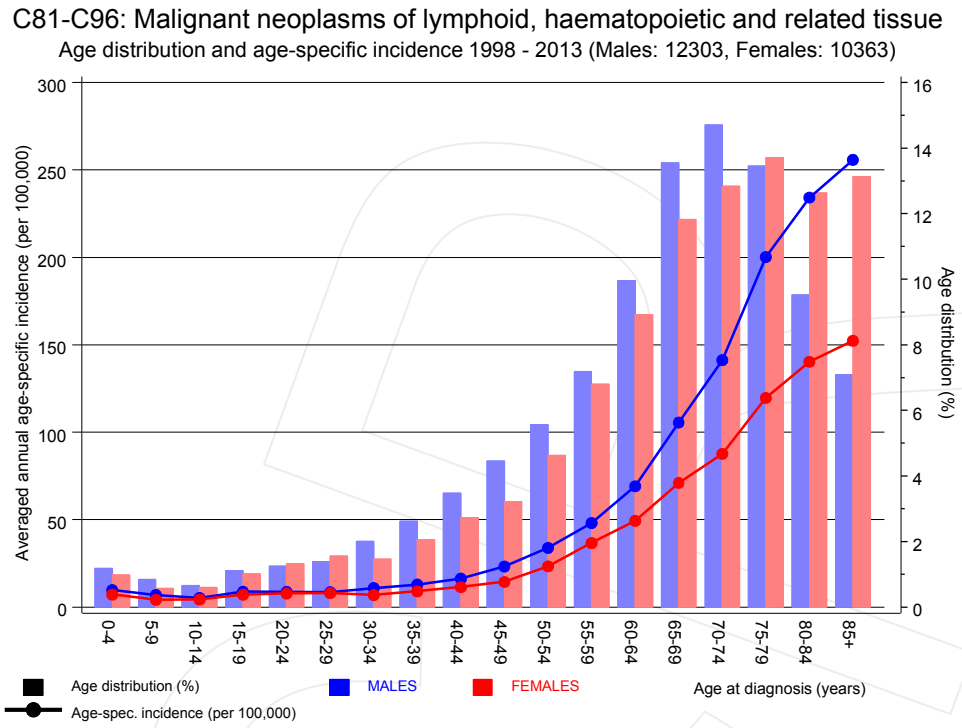


Figure 7. Age distribution and age-specific incidence

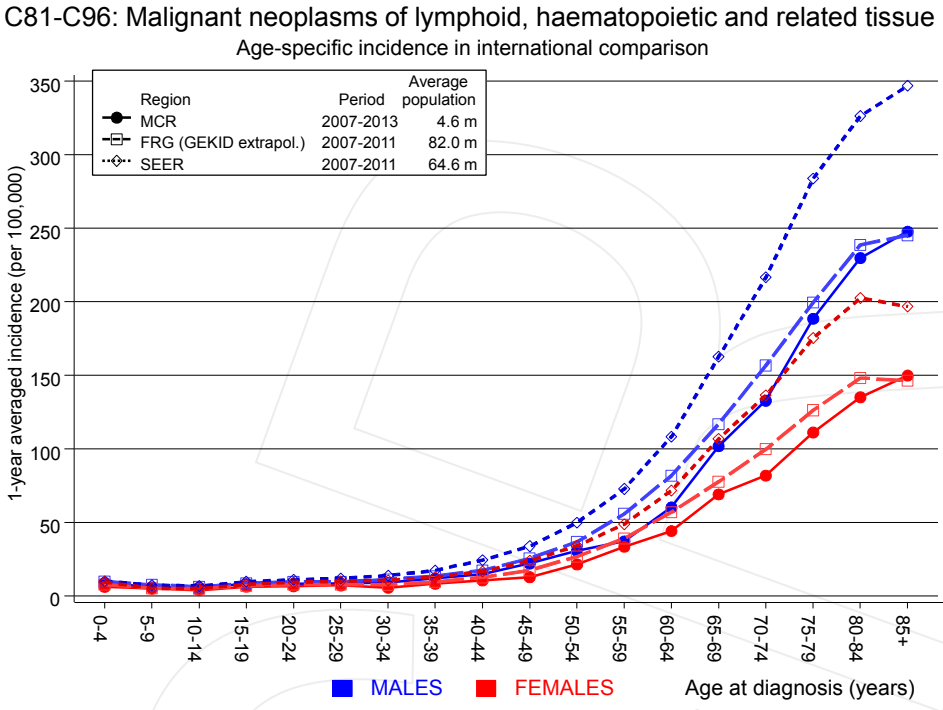


Figure 7a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).

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.

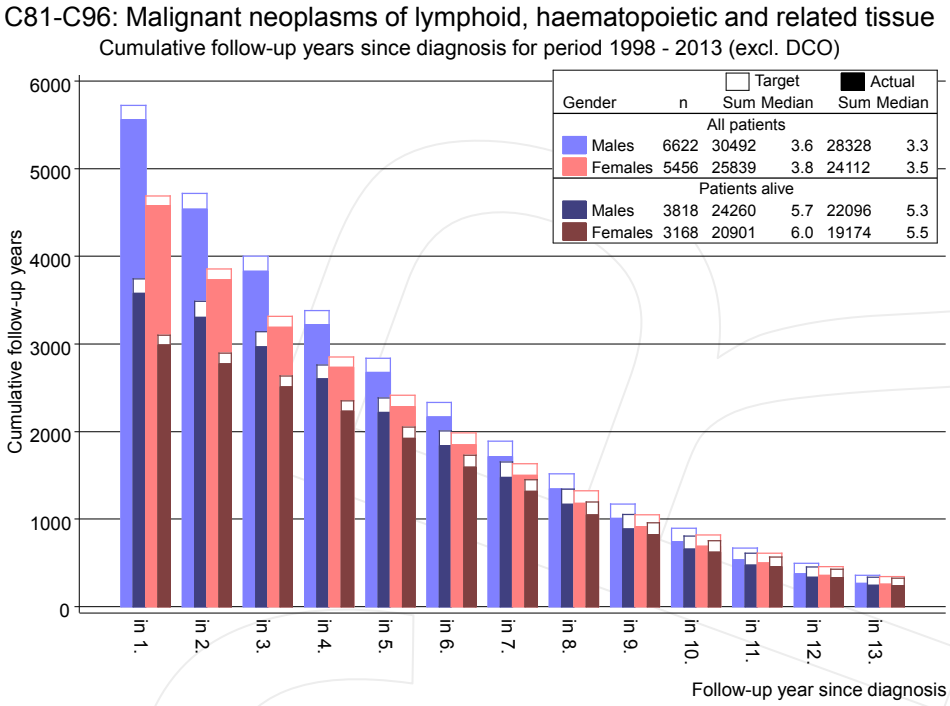
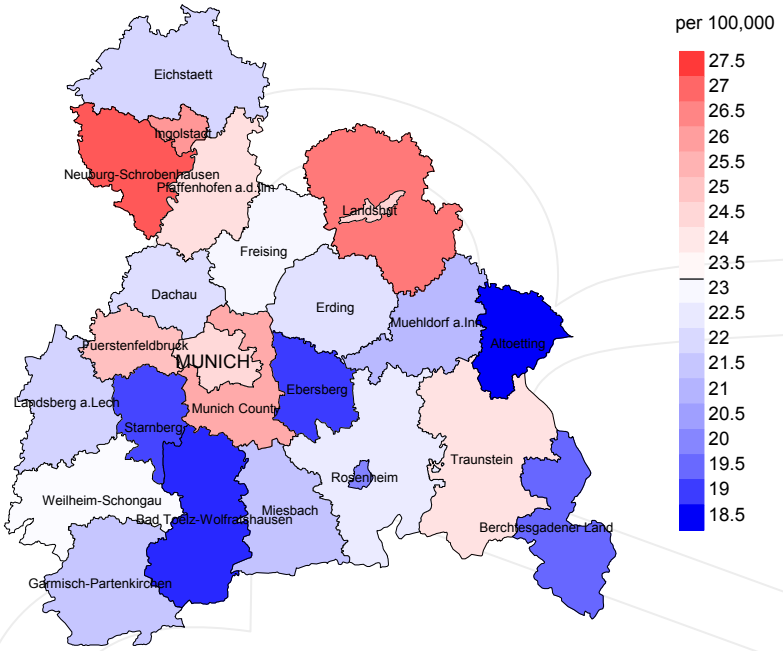


Figure 8. Cumulative follow-up years depending on time since diagnosis

The increase of the lost to follow-up rate can be interpreted as a consequence of a declining number of survivors over time.

Average incidence (world standard population) 2007 - 2013: Males



Average incidence (world standard population) 2007 - 2013: Females

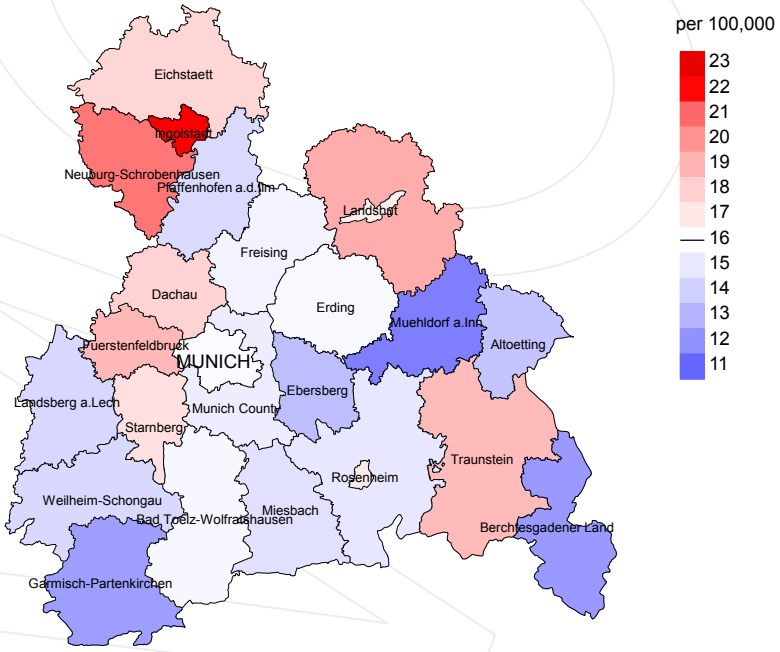
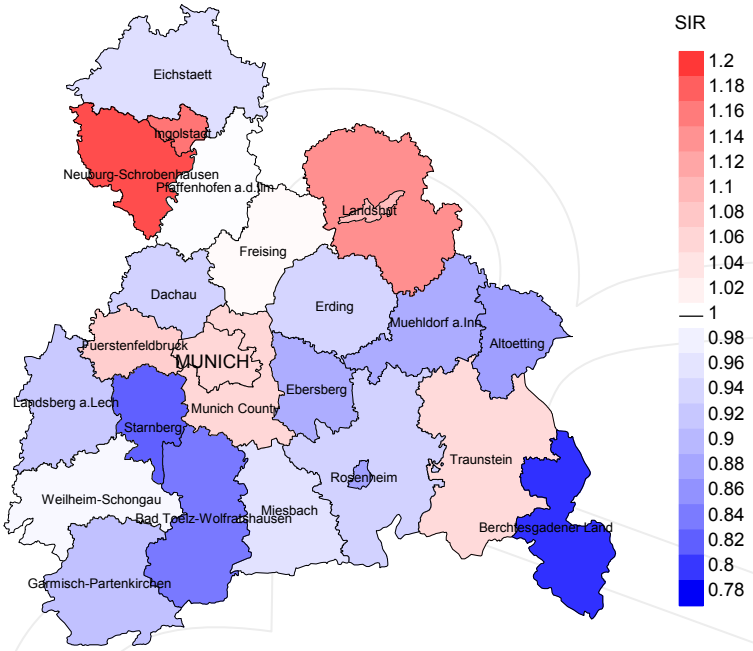


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 23.2/100,000 WS N=6,354, females 16.0/100,000 WS N=5,233).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,928 female residents (averaged) in the period from 2007 to 2013 a total of 114 women were identified with newly diagnosed systemic neoplasms. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 13.4/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 9.7 and 18.6/100,000.

Standardized incidence ratio (SIR) 2007 - 2013: Males



Standardized incidence ratio (SIR) 2007 - 2013: Females

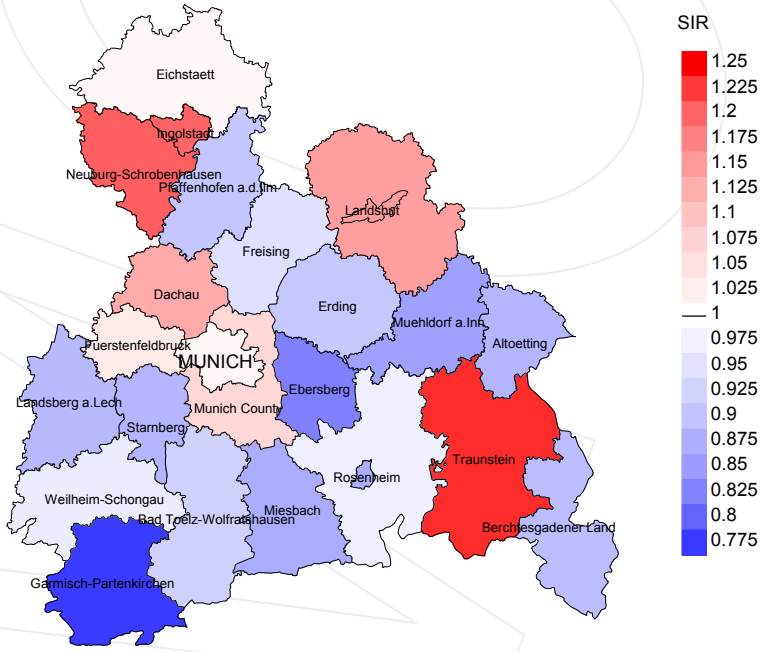


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=6,354, females N=5,233).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,642 female residents (averaged) in the period from 2007 to 2013 a total of 114 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 0.82. Though, the value of this parameter may vary with an underlying probability of 99% between 0.64 and 1.04, and is therefore not statistically striking.

MORTALITY

Table 10a

Patient cohorts of incident cancers by year of diagnosis, follow-up status, proportion of DCO, deaths among the annual cohorts, and proportion of available death certificates (with respect to registry area expansion from 2.51 to 3.96 m as of 2002, and from 3.96 to 4.64 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	853	98.1	18.6	628	73.6	95.5
1999	859	98.0	19.6	625	72.8	95.5
2000	830	98.2	21.7	599	72.2	96.8
2001	892	97.8	23.1	631	70.7	96.5
2002	1487	97.0	25.4	1045	70.3	97.1
2003	1516	97.2	21.3	991	65.4	98.2
2004	1593	96.7	20.2	979	61.5	98.1
2005	1518	95.7	18.9	930	61.3	98.8
2006	1576	95.7	17.0	981	62.2	97.5
2007	1801	86.9	16.5	1061	58.9	98.1
2008	1778	71.8	15.1	970	54.6	98.1
2009	1775	72.5	13.9	919	51.8	97.0
2010	1800	72.0	14.4	892	49.6	97.4
2011	1774	72.4	14.9	834	47.0	97.4
2012	1703	75.2	15.3	710	41.7	97.0
2013	1032	98.7	25.1	467	45.3	93.4
1998-2013	22787	86.8	18.2	13262	58.2	97.3

Table 10b

Annual cohorts of incident cancers and deaths, proportion of death certificates and cases deceased the same year of cancer diagnosis
(incl. DCO)
(with respect to registry area expansion from 2.51 to 3.96 m as of 2002, and from 3.96 to 4.64 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	853	520	95.8	228	26.7
1999	859	556	94.8	234	27.2
2000	830	541	95.7	232	28.0
2001	892	600	96.3	249	27.9
2002	1487	832	97.5	472	31.7
2003	1516	844	98.2	450	29.7
2004	1593	892	98.1	445	27.9
2005	1518	903	98.4	421	27.7
2006	1576	921	98.5	438	27.8
2007	1801	1030	97.8	482	26.8
2008	1778	1038	98.2	446	25.1
2009	1775	1066	97.9	464	26.1
2010	1800	1117	98.0	476	26.4
2011	1774	1158	98.4	455	25.6
2012	1703	1188	98.5	467	27.4
2013	1032	1110	98.8	392	38.0
1998-2013	22787	14316	97.8	6351	27.9

Table 10c

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 2.51 to 3.96 m as of 2002, and from 3.96 to 4.64 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	64.0	36.0	94.2
1999	556	72.3	27.7	94.1
2000	541	74.7	25.3	95.4
2001	600	72.7	27.3	94.8
2002	832	81.0	19.0	94.8
2003	844	80.6	19.4	94.3
2004	892	85.2	14.8	94.5
2005	903	83.2	16.8	94.9
2006	921	83.0	17.0	93.2
2007	1030	82.7	17.3	92.9
2008	1038	80.7	19.3	90.2
2009	1066	81.5	18.5	91.3
2010	1117	79.9	20.1	89.6
2011	1158	79.9	20.1	89.3
2012	1188	80.1	19.9	89.5
2013	1110	75.9	24.1	87.1
1998-2013	14316	79.4	20.6	92.0

Table 11a

Medians of age at death according to the grouping in Table 10
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	68.1	76.7	71.9
1999	309	71.7	69.9	79.2	71.7
2000	301	71.3	70.2	75.0	71.6
2001	283	71.9	71.2	75.5	71.8
2002	428	73.0	72.5	74.8	73.1
2003	448	71.7	70.8	74.5	71.6
2004	468	73.9	73.5	77.8	74.1
2005	486	74.6	74.1	76.8	74.4
2006	510	73.3	72.4	77.4	73.0
2007	551	73.1	72.8	78.0	72.9
2008	573	73.3	72.9	77.3	73.1
2009	577	74.8	74.0	79.7	74.3
2010	616	75.1	74.0	78.3	74.8
2011	641	75.2	74.4	78.8	75.0
2012	660	75.8	75.0	78.1	75.4
2013	647	76.6	75.6	79.3	76.3
1998-2013	7759	74.0	73.2	77.7	73.8

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 11b

Medians of age at death according to the grouping in Table 10
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	72.9	81.8	77.4
1999	247	77.4	76.2	83.2	77.3
2000	240	77.3	75.9	83.9	76.8
2001	317	77.5	76.2	81.3	77.1
2002	404	77.7	75.0	83.3	77.7
2003	396	76.9	75.2	82.8	76.2
2004	424	77.0	76.1	82.4	77.0
2005	417	77.9	75.9	84.9	77.5
2006	411	77.6	77.2	81.3	77.2
2007	479	77.9	76.6	82.1	77.5
2008	465	78.4	76.4	84.2	77.2
2009	489	78.4	77.4	83.1	78.0
2010	501	78.6	77.5	83.5	78.3
2011	517	77.6	75.7	83.6	76.6
2012	528	78.0	77.1	82.0	77.4
2013	463	78.8	77.4	82.5	78.0
1998-2013	6557	77.9	76.4	83.0	77.4

By 2010, life expectancy for a newborn male in Germany is 77.5 years compared with 82.6 years for his female counterpart.

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 12a

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	174	15.7	0.37	10.4	0.36	14.6	0.38	18.7	0.39
1999	224	20.0	0.50	12.7	0.47	18.3	0.50	23.4	0.51
2000	224	19.7	0.50	12.1	0.46	17.8	0.49	23.9	0.53
2001	214	18.5	0.47	10.8	0.42	16.3	0.47	22.2	0.51
2002	351	18.8	0.44	10.4	0.39	16.1	0.44	21.9	0.48
2003	370	19.7	0.46	10.9	0.40	16.4	0.44	22.0	0.48
2004	397	21.1	0.48	11.0	0.39	17.1	0.45	23.6	0.51
2005	405	21.4	0.50	10.7	0.39	16.8	0.46	23.5	0.52
2006	419	21.9	0.47	10.9	0.39	16.8	0.44	22.9	0.48
2007	462	20.9	0.47	10.7	0.40	16.1	0.45	22.0	0.48
2008	475	21.3	0.49	10.4	0.39	15.9	0.46	21.5	0.50
2009	465	20.8	0.49	9.7	0.40	15.0	0.45	20.8	0.51
2010	490	21.7	0.50	9.8	0.39	15.2	0.45	21.2	0.50
2011	521	22.8	0.54	10.4	0.43	15.9	0.49	22.1	0.55
2012	510	22.3	0.55	9.9	0.43	15.3	0.50	21.5	0.55
2013	482	21.1	0.84	8.8	0.68	14.2	0.77	20.4	0.84
1998-2013	6183	20.8	0.50	10.5	0.42	16.0	0.47	22.0	0.52

Table 12b

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	159	13.5	0.41	6.9	0.36	9.3	0.38	11.6	0.40
1999	178	15.0	0.43	6.2	0.32	9.4	0.37	12.8	0.42
2000	181	15.1	0.48	6.4	0.36	9.5	0.40	12.4	0.44
2001	222	18.2	0.51	7.6	0.40	11.5	0.45	15.6	0.50
2002	324	16.5	0.47	6.8	0.39	10.0	0.42	13.4	0.46
2003	310	15.7	0.44	6.4	0.33	9.6	0.37	12.8	0.42
2004	364	18.4	0.48	7.2	0.36	10.9	0.41	14.9	0.46
2005	347	17.4	0.50	6.8	0.37	10.2	0.43	13.6	0.46
2006	345	17.2	0.51	6.5	0.38	9.8	0.44	13.6	0.49
2007	390	16.9	0.48	6.4	0.36	9.7	0.40	13.0	0.44
2008	365	15.7	0.46	5.9	0.35	8.9	0.39	12.0	0.43
2009	404	17.4	0.49	6.3	0.36	9.6	0.41	13.0	0.46
2010	404	17.3	0.50	6.0	0.35	9.2	0.40	12.7	0.45
2011	406	17.2	0.52	6.3	0.38	9.6	0.44	12.8	0.49
2012	441	18.7	0.57	6.5	0.38	10.0	0.45	13.6	0.51
2013	362	15.3	0.81	5.3	0.63	8.1	0.69	11.3	0.75
1998-2013	5202	16.7	0.50	6.4	0.37	9.7	0.42	13.0	0.47

Table 13

Age distribution of age at death (cancer-related) for period 1998-2013
(**incl. multiple primaries**)

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	12	0.1	0.1	5	0.1	0.1	7	0.1	0.1
5-9	22	0.2	0.3	14	0.2	0.3	8	0.2	0.3
10-14	27	0.2	0.5	14	0.2	0.5	13	0.2	0.5
15-19	30	0.3	0.8	16	0.3	0.8	14	0.3	0.8
20-24	42	0.4	1.1	25	0.4	1.2	17	0.3	1.1
25-29	50	0.4	1.6	33	0.5	1.7	17	0.3	1.4
30-34	69	0.6	2.2	45	0.7	2.4	24	0.5	1.9
35-39	116	1.0	3.1	69	1.1	3.5	47	0.9	2.8
40-44	175	1.5	4.6	113	1.8	5.2	62	1.2	3.9
45-49	260	2.2	6.9	154	2.4	7.7	106	2.0	5.9
50-54	350	3.0	9.9	208	3.3	10.9	142	2.7	8.6
55-59	614	5.3	15.1	357	5.6	16.5	257	4.8	13.4
60-64	929	7.9	23.1	567	8.9	25.4	362	6.8	20.2
65-69	1455	12.4	35.5	873	13.7	39.1	582	10.9	31.2
70-74	1916	16.4	51.9	1114	17.5	56.6	802	15.1	46.3
75-79	2068	17.7	69.6	1167	18.3	74.9	901	16.9	63.2
80-84	1892	16.2	85.8	907	14.2	89.1	985	18.5	81.8
85+	1665	14.2	100.0	695	10.9	100.0	970	18.2	100.0
All ages	11692	100.0		6376	100.0		5316	100.0	

Included in the statistics are 34.1% multiple primaries in males and 28.2% in females.

Table 14

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2013
(**incl. multiple primaries**)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4	5	7	0.3	0.03	0.5	0.07	15.2	26.9
5- 9	14	8	0.9	0.14	0.6	0.14	36.8	20.0
10-14	14	13	0.9	0.17	0.9	0.21	40.0	41.9
15-19	16	14	1.0	0.12	0.9	0.13	35.6	37.8
20-24	25	17	1.4	0.16	1.0	0.12	27.8	33.3
25-29	33	17	1.6	0.19	0.8	0.10	30.6	14.8
30-34	45	24	2.0	0.18	1.1	0.16	24.2	10.6
35-39	69	47	2.8	0.21	2.0	0.22	17.3	9.1
40-44	113	62	4.3	0.26	2.5	0.22	13.2	5.5
45-49	154	106	6.5	0.28	4.6	0.32	8.5	5.3
50-54	208	142	10.3	0.30	6.9	0.30	6.3	4.6
55-59	357	257	19.5	0.40	13.4	0.36	6.0	5.4
60-64	567	362	32.0	0.46	19.3	0.39	6.4	5.6
65-69	873	582	55.3	0.52	33.7	0.47	7.3	7.0
70-74	1114	802	87.0	0.61	52.8	0.60	8.2	8.1
75-79	1167	901	141.2	0.70	75.9	0.63	8.9	8.4
80-84	907	985	181.3	0.77	105.6	0.75	8.4	8.8
85+	695	970	203.8	0.79	108.5	0.71	7.8	7.1
All ages	6376	5316					8.0	7.3
Mortality								
Raw			21.4	0.52	17.1	0.51		
WS			10.8	0.43	6.6	0.38		
ES			16.5	0.48	9.9	0.43		
BRD-S			22.7	0.53	13.3	0.48		
PYLL-70								
per 100,000			113.8		76.8			
ES			105.2		71.4			
AYLL-70			12.2		12.3			

The rates underestimate the prognosis if other synchronous cancers are prognostic unfavorable.

Table 15a

Multiple primaries in deaths in period 1998-2013
MALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03-C06	Oral cavity	22	0.8	8	36.4	4	18.2	10	45.5
C15	Oesophagus	25	0.9	3	12.0	3	12.0	19	76.0
C16	Stomach	76	2.9	27	35.5	12	15.8	37	48.7
C18	Colon	172	6.5	81	47.1	27	15.7	64	37.2
C19-C20	Rectum	106	4.0	44	41.5	16	15.1	46	43.4
C22	Liver	32	1.2	6	18.8	4	12.5	22	68.8
C25	Pancreas	47	1.8	1	2.1	7	14.9	39	83.0
C32	Larynx	21	0.8	14	66.7	3	14.3	4	19.0
C33-C34	Lung	234	8.8	38	16.2	37	15.8	159	67.9
C43	Malign. melanoma	116	4.4	64	55.2	9	7.8	43	37.1
C44	Skin others	362	13.6	76	21.0	22	6.1	264	72.9
C46,C49	Soft tissue	31	1.2	16	51.6	1	3.2	14	45.2
C61	Prostate	476	17.9	303	63.7	51	10.7	122	25.6
C64	Kidney	90	3.4	58	64.4	12	13.3	20	22.2
C67	Bladder	134	5.1	78	58.2	11	8.2	45	33.6
C70-C72	CNS cancer	50	1.9	12	24.0	12	24.0	26	52.0
C76-C79	CUP	42	1.6	5	11.9	5	11.9	32	76.2
C82-C85	NHL	132	5.0			31	23.5	101	76.5
C90	Mult. myeloma	46	1.7			6	13.0	40	87.0
C91-C96	Leukaemia	250	9.4			65	26.0	185	74.0
Other primaries		189	7.1	75	39.7	18	9.5	96	50.8
All mult. primaries		2653	100.0	909	34.3	356	13.4	1388	52.3

Multiple primaries with number of cases 1 to 19 are pooled in category "Other primaries".

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 multiple malignancy.

Table 15b

Multiple primaries in deaths in period 1998-2013
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C16	Stomach	50	2.7	16	32.0	9	18.0	25	50.0
C18	Colon	121	6.6	52	43.0	14	11.6	55	45.5
C19-C20	Rectum	53	2.9	31	58.5	5	9.4	17	32.1
C21	Anus/canal	18	1.0	8	44.4	1	5.6	9	50.0
C22	Liver	11	0.6			1	9.1	10	90.9
C23-C24	Bile	16	0.9	3	18.8	2	12.5	11	68.8
C25	Pancreas	34	1.8	1	2.9	6	17.6	27	79.4
C33-C34	Lung	97	5.3	15	15.5	10	10.3	72	74.2
C43	Malign. melanoma	61	3.3	41	67.2	1	1.6	19	31.1
C44	Skin others	168	9.1	55	32.7	9	5.4	104	61.9
C46,C49	Soft tissue	12	0.7	2	16.7	3	25.0	7	58.3
C48	Peritoneal	11	0.6	4	36.4	2	18.2	5	45.5
C50	Breast	461	25.0	319	69.2	33	7.2	109	23.6
C51	Vulva	16	0.9	9	56.3			7	43.8
C53	Cervix uteri	38	2.1	26	68.4	3	7.9	9	23.7
C54	Corpus uteri	70	3.8	54	77.1	4	5.7	12	17.1
C56	Ovary	50	2.7	18	36.0	8	16.0	24	48.0
C64	Kidney	29	1.6	14	48.3	6	20.7	9	31.0
C67	Bladder	40	2.2	20	50.0	5	12.5	15	37.5
C70-C72	CNS cancer	43	2.3	21	48.8	4	9.3	18	41.9
C73	Thyroid	29	1.6	23	79.3			6	20.7
C76-C79	CUP	27	1.5	7	25.9	2	7.4	18	66.7
C82-C85	NHL	88	4.8			12	13.6	76	86.4
C90	Mult. myeloma	40	2.2			4	10.0	36	90.0
C91-C96	Leukaemia	188	10.2			50	26.6	138	73.4
Other primaries		73	4.0	33	45.2	3	4.1	37	50.7
All mult. primaries		1844	100.0	772	41.9	197	10.7	875	47.5

Multiple primaries with number of cases 1 to 7 are pooled in category "Other primaries".

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 multiple malignancy.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2013
(**Singular primaries only** *)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4	4	7	0.3	0.03	0.5	0.07	14.3	29.2
5- 9	14	8	0.9	0.14	0.6	0.14	38.9	21.6
10-14	14	13	0.9	0.18	0.9	0.21	40.0	44.8
15-19	16	13	1.0	0.12	0.9	0.13	38.1	39.4
20-24	23	16	1.3	0.15	0.9	0.12	27.4	34.0
25-29	30	16	1.5	0.18	0.8	0.10	30.3	14.7
30-34	45	21	2.0	0.19	0.9	0.15	24.9	10.4
35-39	62	43	2.5	0.21	1.8	0.21	16.6	9.2
40-44	100	55	3.8	0.25	2.2	0.21	12.7	5.5
45-49	138	95	5.8	0.27	4.1	0.32	8.4	5.5
50-54	182	121	9.0	0.30	5.9	0.29	6.3	4.6
55-59	321	216	17.5	0.41	11.2	0.35	6.3	5.4
60-64	468	306	26.4	0.46	16.3	0.41	6.3	5.7
65-69	704	463	44.6	0.52	26.8	0.47	7.3	6.9
70-74	875	632	68.3	0.64	41.6	0.61	8.2	8.1
75-79	862	723	104.3	0.74	60.9	0.65	8.6	8.4
80-84	651	779	130.1	0.82	83.5	0.75	8.0	8.8
85+	491	760	144.0	0.79	85.0	0.70	7.3	6.9
All ages	5000	4287					7.8	7.3
Mortality								
Raw			16.8	0.50	13.8	0.50		
WS			8.7	0.41	5.4	0.37		
ES			13.1	0.47	8.1	0.42		
BRD-S			17.6	0.52	10.8	0.47		
PYLL-70								
per 100,000			101.5		67.7			
ES			94.3		63.6			
AYLL-70			12.8		12.9			

* See corresponding tables with multiple primaries.

Table 17

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2013
(**Single primaries only** *)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4	4	7	0.3	0.03	0.5	0.07	14.8	29.2
5- 9	13	7	0.9	0.13	0.5	0.12	37.1	19.4
10-14	14	11	0.9	0.18	0.8	0.18	40.0	40.7
15-19	16	11	1.0	0.13	0.7	0.11	38.1	39.3
20-24	20	14	1.1	0.14	0.8	0.11	25.3	31.8
25-29	27	13	1.3	0.16	0.6	0.09	29.3	12.6
30-34	42	18	1.8	0.18	0.8	0.13	24.0	9.9
35-39	56	34	2.2	0.20	1.4	0.17	15.6	8.0
40-44	86	48	3.3	0.22	1.9	0.19	11.5	5.2
45-49	117	78	5.0	0.24	3.4	0.29	7.6	5.0
50-54	148	104	7.3	0.27	5.1	0.27	5.7	4.5
55-59	273	194	14.9	0.40	10.1	0.36	5.9	5.4
60-64	385	260	21.7	0.44	13.9	0.39	5.8	5.6
65-69	568	388	36.0	0.50	22.5	0.44	6.8	6.8
70-74	718	549	56.1	0.61	36.2	0.57	8.0	8.4
75-79	708	621	85.7	0.68	52.3	0.60	8.8	8.6
80-84	544	687	108.7	0.74	73.6	0.71	8.5	9.2
85+	414	684	121.4	0.69	76.5	0.64	7.7	7.2
All ages	4153	3728					7.7	7.4
Mortality								
Raw			14.0	0.47	12.0	0.47		
WS			7.3	0.37	4.7	0.34		
ES			10.9	0.43	7.0	0.39		
BRD-S			14.6	0.48	9.4	0.44		
PYLL-70								
per 100,000			87.8		57.9			
ES			82.2		54.6			
AYLL-70			13.3		12.9			

* See corresponding tables with multiple primaries.

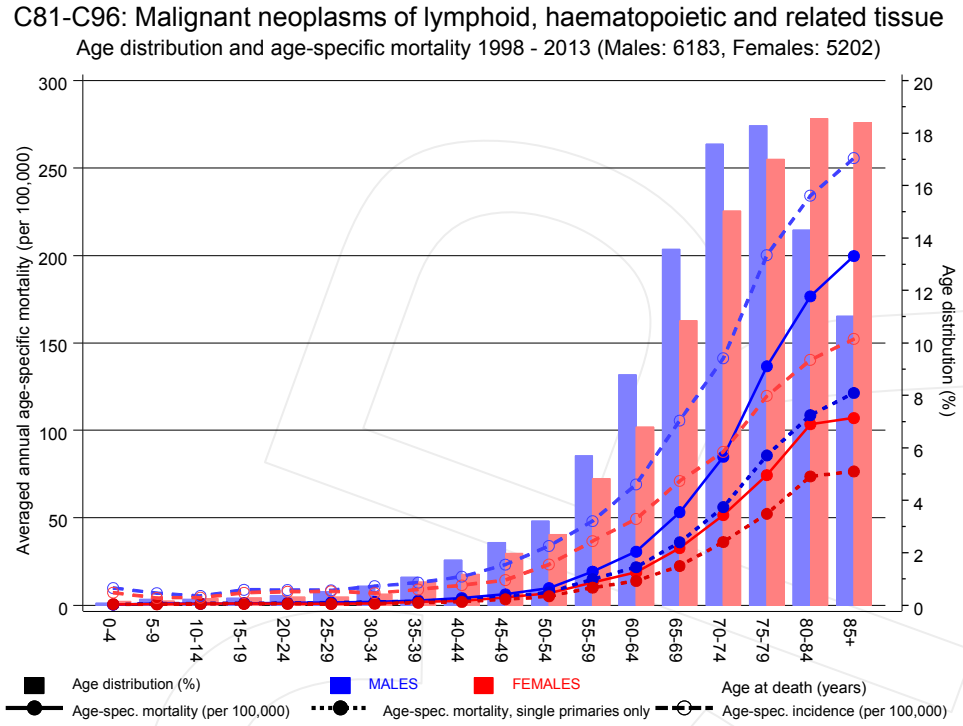
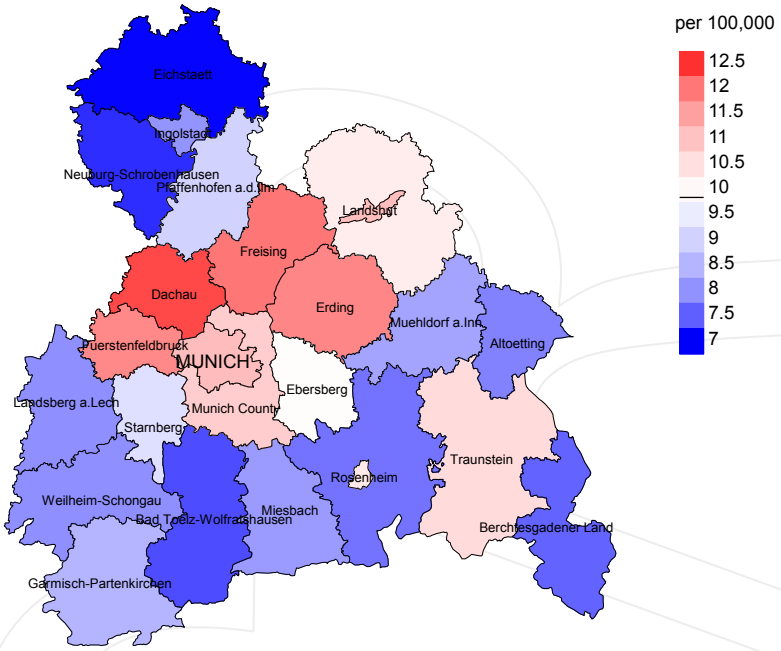


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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 - 2013: Males



Average mortality (world standard population) 2007 - 2013: Females

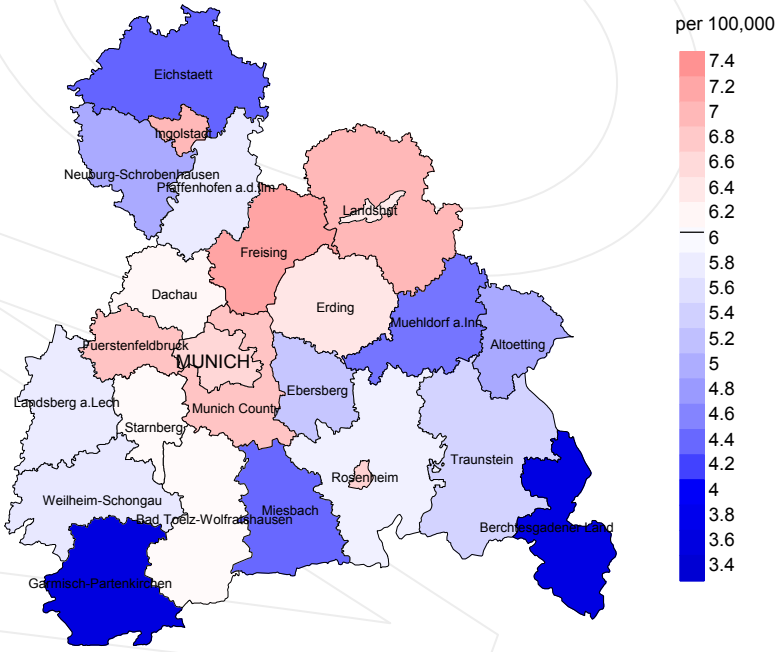


Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2013. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 9.9/100,000 WS N=3,353, females 6.1/100,000 WS N=2,737).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,928 female residents (averaged) in the period from 2007 to 2013 a total of 64 women died from systemic neoplasms. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 5.3/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 3.6 and 7.6/100,000.

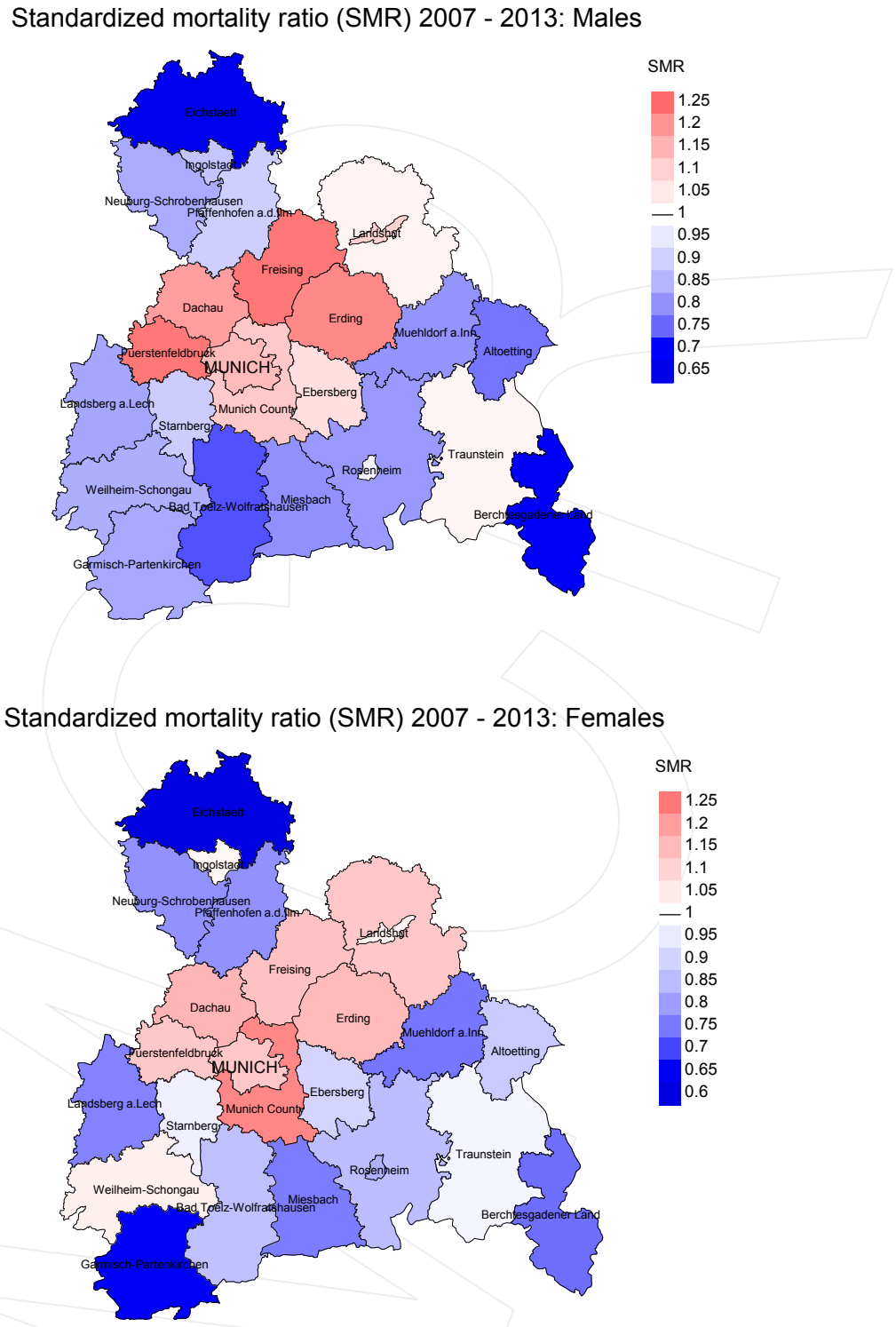


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=3,353, females N=2,737).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,642 female residents (averaged) in the period from 2007 to 2013 a total of 64 women died from systemic neoplasms. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.90. Though, the value of this parameter may vary with an underlying probability of 99% between 0.64 and 1.24, 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. 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

FRG	Federal Republic of Germany
GEKID	Association of Population-based Cancer Registries in Germany (Gesellschaft der epidemiologischen Krebsregister in Deutschland e.V.)
MCR	Munich Cancer Registry (Tumorregister München)
SEER	Surveillance, Epidemiology, and End Results (USA)
AYLL-70	Average years of life lost prior to age 70 given a person dies before that age
BRD-S	German standard population
DCO	Death certificate only
EAR	Excess absolute risk = excess cancer cases (O - E) per 10,000 person-years
ES	European standard population (old)
LCL	Lower confidence limit
MI-index	Ratio between mortality and incidence
PYLL-70	Potential years of life lost prior to age 70 given a person dies before that age
SIR	Standardized incidence ratio
SMR	Standardized mortality ratio
UCL	Upper confidence limit
WS	World standard population

Recommended Citation

Munich Cancer Registry. Baseline statistics C81-C96: Systemic neoplasms [Internet]. 2015 [updated 2015 May 19; cited 2015 Jul 1]. Available from: http://www.tumorregister-muenchen.de/en/facts/base/base_C8196E.pdf

Copyright

Disclaimer

Index of figures and tables

Fig./Tbl.		Page
1	Pts cohorts, DCO, mult. prim., follow-up / yr	4
1a	Gender distribution by year of diagnosis	5
2	Incidence by year of diagnosis	6
3	Age distribution parameters by year of diagnosis	7
4	Age distribution by 5-year age group and gender	9
5	Age-specific incidence and DCO rate	10
6	Standardized incidence ratio of second primaries	11
7	Age distribution and age-specific incidence (chart)	13
7a	Age-specific incidence internationally (chart)	14
8	Cumulative follow-up years (chart)	15
9a	Map of cancer incidence (WS) by county (chart)	16
9b	Standardized incidence ratio (SIR) by county (chart)	17
10a	Pts incident cohorts and mortality / yr	18
10b	Incidence and mortality by year of diagnosis	19
10c	Cancer-related deaths, death certification available / yr	20
11	Medians of age at death / yr	21
12	Mortality by year of death	23
13	Distribution of age at death	24
14	Age-specific mortality	25
15	Multiple primaries in deaths	26
16	Age-specific mortality (first primaries)	28
17	Age-specific mortality (single primaries)	29
18	Age distribution and age-specific mortality (chart)	30
19a	Map of cancer mortality (WS) by county (chart)	31
19b	Standardized mortality ratio (SMR) by county (chart)	32