

Munich Cancer Registry



- ▶ Survival
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Munich Cancer Registry at Munich Cancer Center
Marchioninstr. 15
Munich, 81377
Germany

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

Cancer statistics: Baseline statistics

C00-C97: All cancers (excl. C44)

Year of diagnosis	1998-2013
Patients	293,650
Diseases	321,356
Creation date	05/19/2015
Export date	12/30/2014
Population	4.64 m



http://www.tumorregister-muenchen.de/en/facts/base/base_C0097E.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
C00-C97	Malignant neoplasms Excl.: C44.- Other malignant neoplasms of skin

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	12223	1331	10.9	23.5	70.4	98.1
1999	12164	1257	10.3	23.8	67.8	97.9
2000	12170	1404	11.5	24.1	65.9	98.2
2001	12608	1407	11.2	24.6	63.7	97.6
2002	21718	3156	14.5	24.8	64.6	97.8 #
2003	21244	2634	12.4	24.5	61.8	97.5
2004	21425	2439	11.4	24.6	58.9	97.3
2005	21374	2148	10.0	25.2	56.8	96.3
2006	21466	1870	8.7	25.3	54.3	94.4
2007	24752	2267	9.2	24.2	52.6	84.4 # ##
2008	25093	2095	8.3	24.9	49.7	70.3
2009	24668	1965	8.0	25.2	47.3	69.7
2010	24397	2008	8.2	25.2	44.6	68.7
2011	24441	1924	7.9	24.7	41.1	68.4
2012	24014	1852	7.7	23.8	34.4	71.3
2013	17599	1823	10.4	24.2	26.8	98.5 ###
1998-2013	321356	31580	9.8	24.6	52.1	85.7

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	12223	6044	6179	49.4
1999	12164	6027	6137	49.5
2000	12170	6179	5991	50.8
2001	12608	6362	6246	50.5
2002	21718	11271	10447	51.9
2003	21244	11080	10164	52.2
2004	21425	11109	10316	51.9
2005	21374	10992	10382	51.4
2006	21466	11120	10346	51.8
2007	24752	12964	11788	52.4
2008	25093	12772	12321	50.9
2009	24668	12472	12196	50.6
2010	24397	12236	12161	50.2
2011	24441	12412	12029	50.8
2012	24014	12177	11837	50.7
2013	17599	8505	9094	48.3
1998-2013	321356	163722	157634	50.9

Table 2

Incidence measures by year of diagnosis and gender including DC0 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	6044	6179	545.5	525.3	340.6	273.0	496.2	381.2	635.6	458.9
1999	6027	6137	538.5	517.2	330.5	269.2	482.4	374.8	612.8	450.6
2000	6179	5991	542.6	498.7	330.5	258.7	482.8	361.1	614.8	433.3
2001	6362	6246	549.0	513.5	332.1	267.1	483.7	373.1	610.8	446.5
2002	11271	10447	605.0	533.6	350.7	265.3	513.3	373.6	653.3	453.1
2003	11080	10164	591.1	516.0	338.8	258.8	494.2	362.1	626.6	435.8
2004	11109	10316	590.5	521.9	333.4	264.4	483.4	366.8	612.1	440.2
2005	10992	10382	580.3	521.7	324.2	260.0	467.0	362.5	589.7	435.6
2006	11120	10346	580.7	515.0	318.0	257.2	461.1	357.8	583.2	428.5
2007	12964	11788	585.2	510.5	320.7	255.4	462.3	355.4	582.9	424.8
2008	12772	12321	573.8	531.0	306.9	265.1	443.5	368.1	559.4	440.0
2009	12472	12196	558.8	524.4	294.2	261.2	425.5	362.9	535.8	433.2
2010	12236	12161	542.9	519.6	285.7	254.5	411.1	354.0	515.6	423.4
2011	12412	12029	543.3	509.8	280.3	251.0	404.0	347.3	509.4	413.6
2012	12177	11837	533.0	501.6	274.6	248.5	396.3	343.6	501.9	410.6
2013	8505	9094	372.3	385.4	189.3	190.2	275.8	264.3	351.2	315.5
1998-2013	163722	157634	550.6	507.5	302.3	254.0	437.6	353.5	552.5	423.5

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	12223	65.9	14.8	0.1	107	47.4	57.0	67.0	76.7	84.4
1999	12164	66.0	14.7	0.3	104	47.5	57.5	67.0	76.7	84.3
2000	12170	66.1	14.7	0.2	103	47.4	57.8	66.9	76.9	84.4
2001	12608	66.0	14.4	0.1	103	47.6	57.9	66.6	76.3	83.5
2002	21718	67.3	14.4	0.0	104	48.4	59.4	68.2	77.6	84.3
2003	21244	67.0	14.4	0.2	105	48.6	59.3	67.9	77.3	83.7
2004	21425	66.8	14.4	0.0	103	47.6	59.1	67.6	77.1	83.9
2005	21374	67.0	14.5	0.0	103	48.2	59.4	68.0	77.2	84.0
2006	21466	67.1	14.2	0.2	103	48.2	59.3	68.1	77.1	84.2
2007	24752	66.9	14.5	0.0	103	47.5	59.1	68.3	77.2	84.2
2008	25093	67.2	14.3	0.0	109	47.9	59.4	68.7	77.2	84.1
2009	24668	67.2	14.2	0.2	109	48.0	59.1	68.8	77.2	84.2
2010	24397	67.3	14.5	0.0	105	47.9	59.1	69.2	77.5	84.7
2011	24441	67.4	14.6	0.0	109	47.7	59.0	69.6	77.3	84.7
2012	24014	67.4	14.4	0.0	103	48.3	59.3	69.7	77.2	84.1
2013	17599	67.5	14.4	0.0	108	48.0	58.7	69.8	77.4	84.6
1998-2013	321356	67.0	14.5	0.0	109	47.9	58.9	68.5	77.2	84.2

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	6044	65.7	14.0	0.4	99.8	49.0	57.9	66.8	75.4	82.7
1999	6027	66.0	13.5	0.3	99.5	50.5	58.6	66.9	74.9	82.2
2000	6179	66.2	13.7	0.2	99.7	50.2	59.0	67.0	75.5	82.1
2001	6362	66.0	13.2	0.1	102	50.4	59.3	66.6	75.0	81.4
2002	11271	67.1	13.3	0.1	102	51.2	60.6	68.0	75.8	82.2
2003	11080	67.0	13.1	0.3	101	51.6	60.6	67.9	75.7	82.2
2004	11109	66.9	13.2	0.0	101	50.6	60.6	67.6	75.9	82.2
2005	10992	67.0	13.4	0.0	102	50.9	60.9	68.0	75.8	82.3
2006	11120	67.3	13.0	0.2	102	51.7	61.1	68.3	76.0	82.2
2007	12964	67.1	13.5	0.0	101	50.1	60.7	68.4	76.1	82.2
2008	12772	67.6	13.1	0.0	105	51.5	61.4	69.1	76.2	82.5
2009	12472	67.7	13.0	0.2	105	50.6	61.0	69.3	76.2	82.6
2010	12236	67.7	13.5	0.0	102	50.7	60.8	69.5	76.5	83.1
2011	12412	68.0	13.4	0.0	109	50.7	61.5	70.1	76.6	83.2
2012	12177	68.2	13.2	0.0	103	51.9	61.8	70.3	76.8	83.0
2013	8505	68.5	13.3	0.0	103	51.2	61.6	70.8	77.1	83.4
1998-2013	163722	67.3	13.3	0.0	109	50.9	60.6	68.7	76.1	82.5

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	6179	66.2	15.6	0.1	107	46.1	56.0	67.2	77.9	85.5
1999	6137	66.0	15.7	0.7	104	45.2	56.2	67.1	77.9	85.6
2000	5991	65.9	15.8	0.4	103	44.5	55.9	66.7	78.3	85.8
2001	6246	66.0	15.5	0.5	103	45.2	56.4	66.6	78.0	85.8
2002	10447	67.4	15.4	0.0	104	46.5	58.0	68.5	79.4	86.6
2003	10164	67.1	15.6	0.2	105	45.8	57.4	67.9	79.2	85.8
2004	10316	66.7	15.6	0.0	103	45.6	57.0	67.5	78.8	85.0
2005	10382	67.1	15.5	0.3	103	45.9	57.6	68.0	79.1	85.5
2006	10346	66.9	15.5	0.2	103	45.3	57.2	67.9	78.8	85.5
2007	11788	66.8	15.6	0.2	103	45.3	57.0	68.2	78.7	85.7
2008	12321	66.7	15.4	0.1	109	45.5	56.9	68.2	78.6	85.8
2009	12196	66.7	15.3	0.2	109	45.8	56.7	68.2	78.4	85.8
2010	12161	67.0	15.5	0.2	105	45.9	56.8	68.8	78.7	86.1
2011	12029	66.8	15.7	0.0	102	45.7	56.2	68.9	78.4	86.2
2012	11837	66.6	15.5	0.0	102	45.9	56.4	68.8	77.8	85.5
2013	9094	66.6	15.3	0.3	108	45.9	55.8	68.5	77.8	85.5
1998-2013	157634	66.7	15.5	0.0	109	45.7	56.8	68.1	78.5	85.7

Table 4

Age distribution by 5-year age group and gender for period 1998-2013
(incl. DC0)

Age at diagnosis Years	Cases			Males			Females		
	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4	575	0.2	0.2	329	0.2	0.2	246	0.2	0.2
5-9	302	0.1	0.3	176	0.1	0.3	126	0.1	0.2
10-14	337	0.1	0.4	167	0.1	0.4	170	0.1	0.3
15-19	646	0.2	0.6	354	0.2	0.6	292	0.2	0.5
20-24	1148	0.4	0.9	619	0.4	1.0	529	0.3	0.9
25-29	2103	0.7	1.6	980	0.6	1.6	1123	0.7	1.6
30-34	3591	1.1	2.7	1512	0.9	2.5	2079	1.3	2.9
35-39	6063	1.9	4.6	2277	1.4	3.9	3786	2.4	5.3
40-44	9561	3.0	7.6	3244	2.0	5.9	6317	4.0	9.3
45-49	14408	4.5	12.1	5448	3.3	9.2	8960	5.7	15.0
50-54	20197	6.3	18.3	8856	5.4	14.6	11341	7.2	22.2
55-59	28883	9.0	27.3	14843	9.1	23.7	14040	8.9	31.1
60-64	40141	12.5	39.8	22387	13.7	37.4	17754	11.3	42.4
65-69	47993	14.9	54.8	28451	17.4	54.8	19542	12.4	54.8
70-74	46897	14.6	69.3	27911	17.0	71.8	18986	12.0	66.8
75-79	39748	12.4	81.7	21520	13.1	84.9	18228	11.6	78.4
80-84	30646	9.5	91.3	14281	8.7	93.7	16365	10.4	88.7
85+	28117	8.7	100.0	10367	6.3	100.0	17750	11.3	100.0
All ages	321356	100.0		163722	100.0		157634	100.0	

Included in the statistics are 22.5% multiple primaries in males and 19.7% 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=14439 %	Females DCO rate n=15830 %	Males Prop.all cancers n=158258 %	Females Prop.all cancers n=153136 %
0- 4	324	244	21.8	17.3	2.2	4.1	100.0	100.0
5- 9	176	125	11.8	8.8	1.7		100.0	100.0
10-14	166	170	10.8	11.7	1.8	0.6	100.0	100.0
15-19	354	292	22.9	19.8	1.4	1.4	100.0	100.0
20-24	614	529	34.7	29.7	1.3	1.5	100.0	100.0
25-29	967	1109	48.3	54.5	0.5	0.4	100.0	100.0
30-34	1498	2058	65.9	92.9	1.1	0.5	100.0	100.0
35-39	2249	3737	90.3	157.9	1.6	1.2	100.0	100.0
40-44	3203	6237	122.2	250.6	1.7	1.0	100.0	100.0
45-49	5345	8753	226.4	378.8	2.6	1.6	100.0	100.0
50-54	8624	11058	427.1	537.8	3.8	1.9	100.0	100.0
55-59	14465	13692	788.5	712.1	3.7	2.4	100.0	100.0
60-64	21746	17251	1226.9	919.6	4.3	3.0	100.0	100.0
65-69	27462	18970	1739.7	1099.6	5.1	4.2	100.0	100.0
70-74	26826	18376	2094.3	1210.4	6.8	6.9	100.0	100.0
75-79	20650	17578	2498.5	1479.9	11.4	12.0	100.0	100.0
80-84	13640	15774	2726.1	1691.0	20.1	21.4	100.0	100.0
85+	9949	17183	2917.5	1922.5	40.5	40.4	100.0	100.0
All ages	158258	153136			9.1	10.3	100.0	100.0
Incidence								
Raw			532.2	493.0				
WS			293.0	247.6				
ES			423.4	344.1				
BRD-S			533.7	411.7				

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	140	49.9	2.8	2.4	3.3 #	2.5	6.4
C07-C08 Salivary gland	30	13.8	2.2	1.5	3.1 #	0.4	10.0
C09-C10 Oropharynx	185	60.3	3.1	2.6	3.5 #	3.5	2.7
C12-C13 Hypopharynx	100	33.8	3.0	2.4	3.6 #	1.8	8.0
C15 Oesophagus	298	107.9	2.8	2.5	3.1 #	5.3	10.7
C16 Stomach	465	268.3	1.7	1.6	1.9 #	5.4	8.8
C17 Small intestine	119	30.1	4.0	3.3	4.7 #	2.5	3.4
C18 Colon	1182	638.2	1.9	1.7	2.0 #	15.1	4.9
C19-C20 Rectum	586	348.8	1.7	1.5	1.8 #	6.6	3.2
C21 Anus/canal	33	12.4	2.7	1.8	3.7 #	0.6	6.1
C22 Liver	301	172.3	1.7	1.6	2.0 #	3.6	19.3
C23-C24 Bile	99	61.7	1.6	1.3	2.0 #	1.0	17.2
C25 Pancreas	465	225.1	2.1	1.9	2.3 #	6.6	24.9
C26 GI cancer	19	8.1	2.3	1.4	3.7 #	0.3	31.6
C30-C31 Sinuses	23	10.2	2.2	1.4	3.4 #	0.4	8.7
C32 Larynx	159	62.8	2.5	2.2	3.0 #	2.7	13.8
C33-C34 Lung	1612	741.8	2.2	2.1	2.3 #	24.1	12.5
C38,C45 Mesothelioma	72	41.6	1.7	1.4	2.2 #	0.8	5.6
C40-C41 Bone	17	4.7	3.6	2.1	5.8 #	0.3	11.8
C43 Malign. melanoma	771	242.4	3.2	3.0	3.4 #	14.6	1.4
C46,C49 Soft tissue	74	33.1	2.2	1.8	2.8 #	1.1	1.4
C50 Breast	31	16.2	1.9	1.3	2.7 #	0.4	22.6
C60 Penis	25	14.2	1.8	1.1	2.6 #	0.3	
C61 Prostate	2060	1908.7	1.1	1.0	1.1 #	4.2	7.0
C62 Testis	82	16.1	5.1	4.1	6.3 #	1.8	2.4
C64 Kidney	636	218.6	2.9	2.7	3.1 #	11.6	6.4
C65 Renal pelvis	111	26.3	4.2	3.5	5.1 #	2.3	0.9
C66 Ureter	70	14.6	4.8	3.7	6.0 #	1.5	
C67 Bladder	650	287.1	2.3	2.1	2.4 #	10.0	6.6
C68 Urethra	35	3.8	9.1	6.4	12.7 #	0.9	
C70-C72 CNS cancer	149	81.2	1.8	1.6	2.2 #	1.9	16.1
C73 Thyroid	101	38.2	2.6	2.2	3.2 #	1.7	3.0
C76-C79 CUP	196	107.6	1.8	1.6	2.1 #	2.4	4.1
C81 Hodgkin lymphoma	37	12.6	2.9	2.1	4.1 #	0.7	2.7
C82-C85 NHL	518	252.5	2.1	1.9	2.2 #	7.3	6.4
C90 Mult. myeloma	152	81.5	1.9	1.6	2.2 #	2.0	12.5
C91-C96 Leukaemia	252	103.7	2.4	2.1	2.8 #	4.1	31.7
Other primaries	96	56.0	1.7	1.4	2.1 #	1.1	20.8
Not observed	0	0.6	0.0	0.0	6.1	-0.0	

Patients 94165
 Median age at second malignancy (years) 72.1
 Person-years 361218
 Mean observation time (years) 3.8
 Median observation time (years) 2.6

The occurrence of second malignancy is statistically significant.

Observed second primaries with count 1 to 16 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 %
C03-C06 Oral cavity	53	24.7	2.1	1.6	2.8 #	0.7	
C07-C08 Salivary gland	19	6.6	2.9	1.7	4.5 #	0.3	10.5
C09-C10 Oropharynx	70	17.1	4.1	3.2	5.2 #	1.4	
C12-C13 Hypopharynx	18	4.7	3.9	2.3	6.1 #	0.3	27.8
C15 Oesophagus	73	23.3	3.1	2.5	3.9 #	1.3	8.2
C16 Stomach	273	149.9	1.8	1.6	2.1 #	3.2	14.3
C17 Small intestine	69	19.0	3.6	2.8	4.6 #	1.3	4.3
C18 Colon	826	410.4	2.0	1.9	2.2 #	10.7	9.1
C19-C20 Rectum	306	178.7	1.7	1.5	1.9 #	3.3	7.5
C21 Anus/canal	47	21.6	2.2	1.6	2.9 #	0.7	2.1
C22 Liver	97	46.3	2.1	1.7	2.6 #	1.3	30.9
C23-C24 Bile	103	59.5	1.7	1.4	2.1 #	1.1	22.3
C25 Pancreas	337	175.9	1.9	1.7	2.1 #	4.2	24.9
C26 GI cancer	17	7.5	2.3	1.3	3.6 #	0.2	41.2
C32 Larynx	23	7.6	3.0	1.9	4.5 #	0.4	13.0
C33-C34 Lung	749	286.6	2.6	2.4	2.8 #	11.9	15.0
C38,C45 Mesothelioma	19	7.4	2.6	1.6	4.0 #	0.3	5.3
C43 Malign. melanoma	393	147.6	2.7	2.4	2.9 #	6.3	2.3
C46,C49 Soft tissue	66	23.2	2.8	2.2	3.6 #	1.1	6.1
C48 Peritoneal	33	14.4	2.3	1.6	3.2 #	0.5	9.1
C50 Breast	2906	1260.2	2.3	2.2	2.4 #	42.5	3.0
C51 Vulva	82	39.4	2.1	1.7	2.6 #	1.1	6.1
C52 Vagina	23	7.8	3.0	1.9	4.4 #	0.4	4.3
C53 Cervix uteri	119	58.5	2.0	1.7	2.4 #	1.6	19.3
C54 Corpus uteri	451	227.8	2.0	1.8	2.2 #	5.8	4.9
C55,C57 Fem. genitals un	16	10.0	1.6	0.9	2.6	0.2	56.3
C56 Ovary	458	170.2	2.7	2.5	2.9 #	7.4	18.3
C64 Kidney	268	101.4	2.6	2.3	3.0 #	4.3	10.8
C65 Renal pelvis	49	12.1	4.0	3.0	5.3 #	1.0	2.0
C66 Ureter	28	6.1	4.6	3.1	6.7 #	0.6	
C67 Bladder	173	76.3	2.3	1.9	2.6 #	2.5	10.4
C70-C72 CNS cancer	97	56.9	1.7	1.4	2.1 #	1.0	27.8
C73 Thyroid	166	76.9	2.2	1.8	2.5 #	2.3	5.4
C76-C79 CUP	89	72.2	1.2	1.0	1.5	0.4	5.6
C82-C85 NHL	323	156.7	2.1	1.8	2.3 #	4.3	7.7
C90 Mult. myeloma	77	50.0	1.5	1.2	1.9 #	0.7	22.1
C91-C96 Leukaemia	195	64.4	3.0	2.6	3.5 #	3.4	21.0
Other primaries	104	52.6	2.0	1.6	2.4 #	1.3	13.5
Not observed	0	0.0	0.0	0.0	1593	-0.0	

Patients 92120
 Median age at second malignancy (years) 70.8
 Person-years 387116
 Mean observation time (years) 4.2
 Median observation time (years) 3.1

The occurrence of second malignancy is statistically significant.

Observed second primaries with count 1 to 15 are pooled in category "Other primaries".

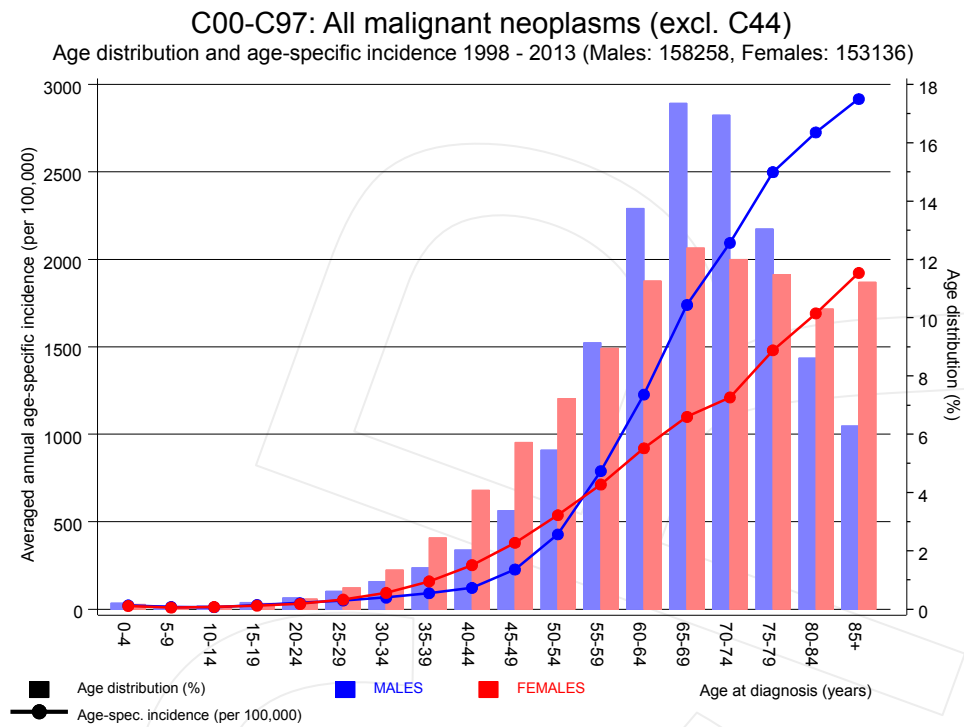


Figure 7. Age distribution and age-specific incidence

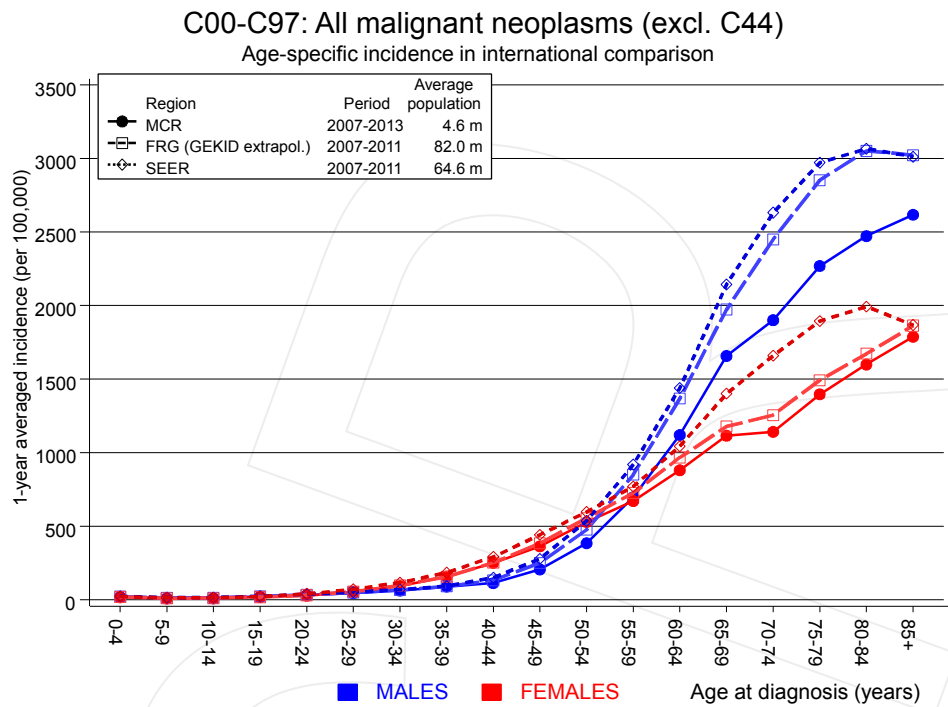


Figure 7a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).

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>.

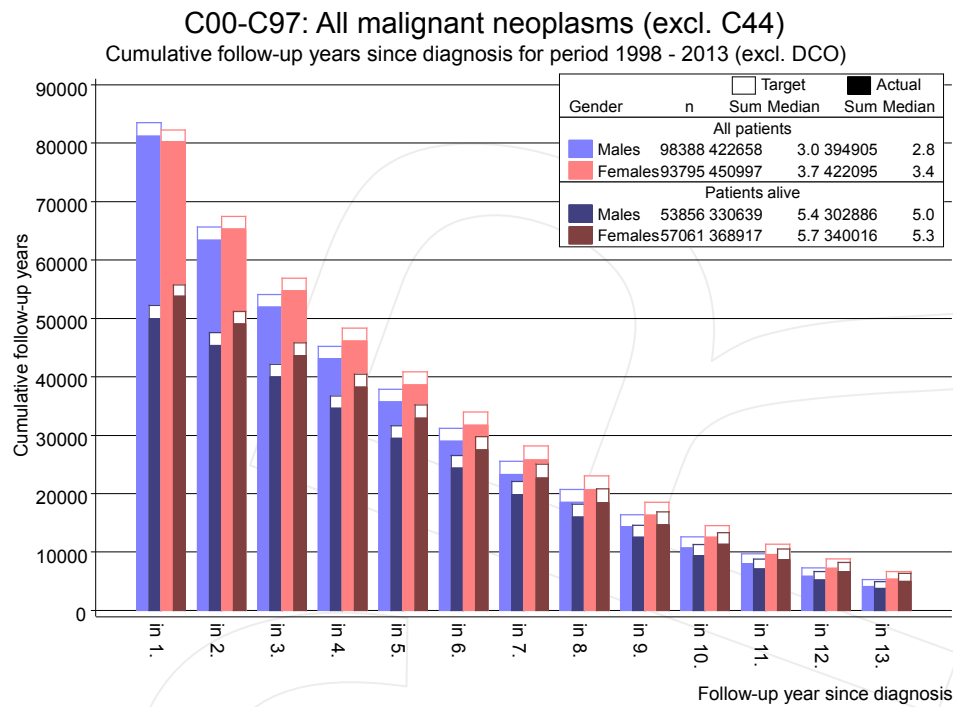
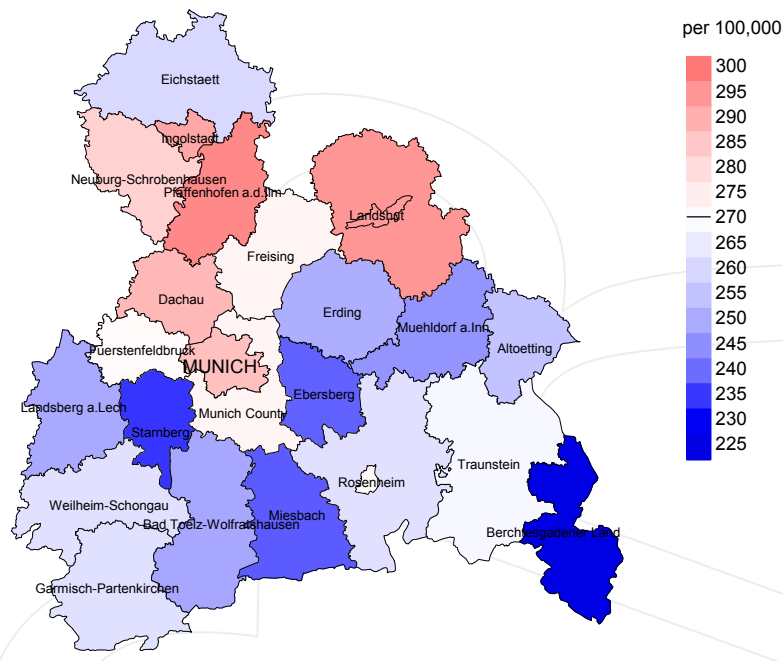


Figure 8. Cumulative follow-up years depending on time since diagnosis

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

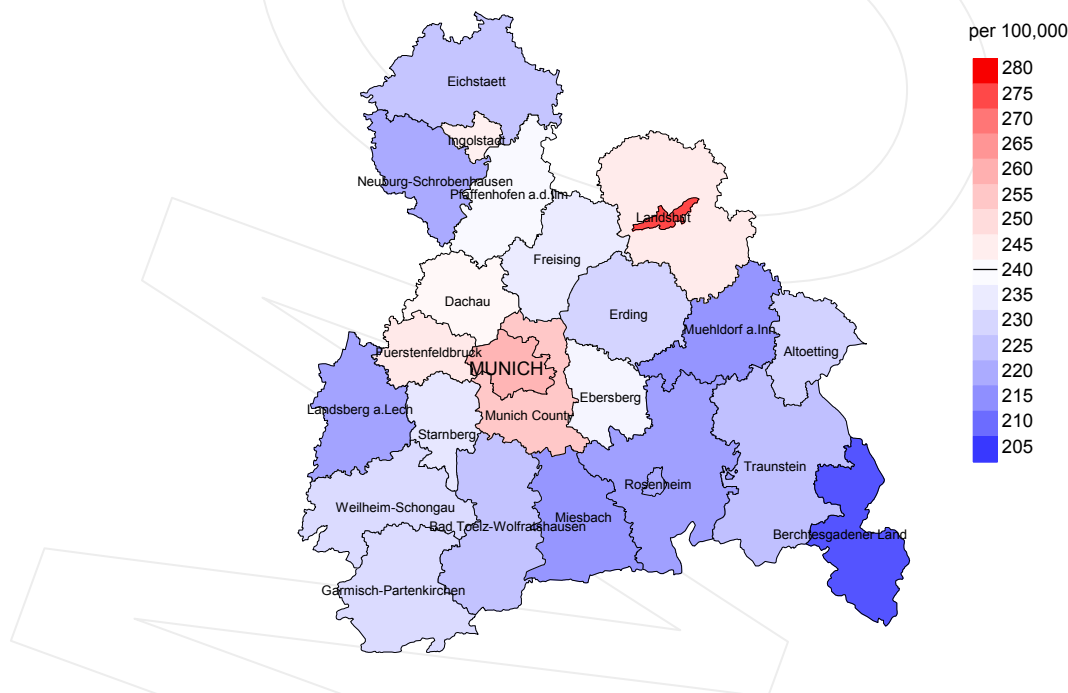
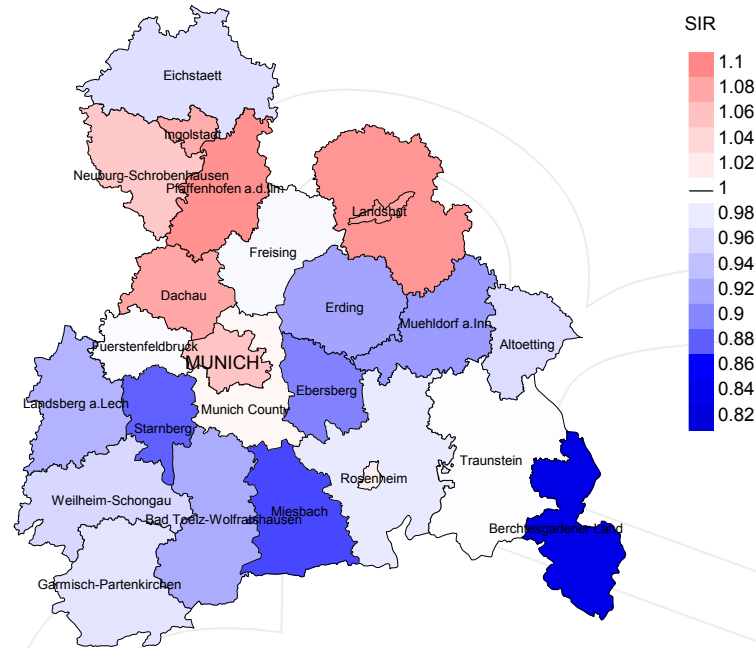


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 270.7/100,000 WS N=80,558, females 240.6/100,000 WS N=78,994).

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 2,084 women were identified with newly diagnosed all cancers (excl. C44). Therefore, the mean incidence rate for this cancer type in this area can be calculated at 237.8/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 223.0 and 253.8/100,000.

Standardized incidence ratio (SIR) 2007 - 2013: Males



Standardized incidence ratio (SIR) 2007 - 2013: Females

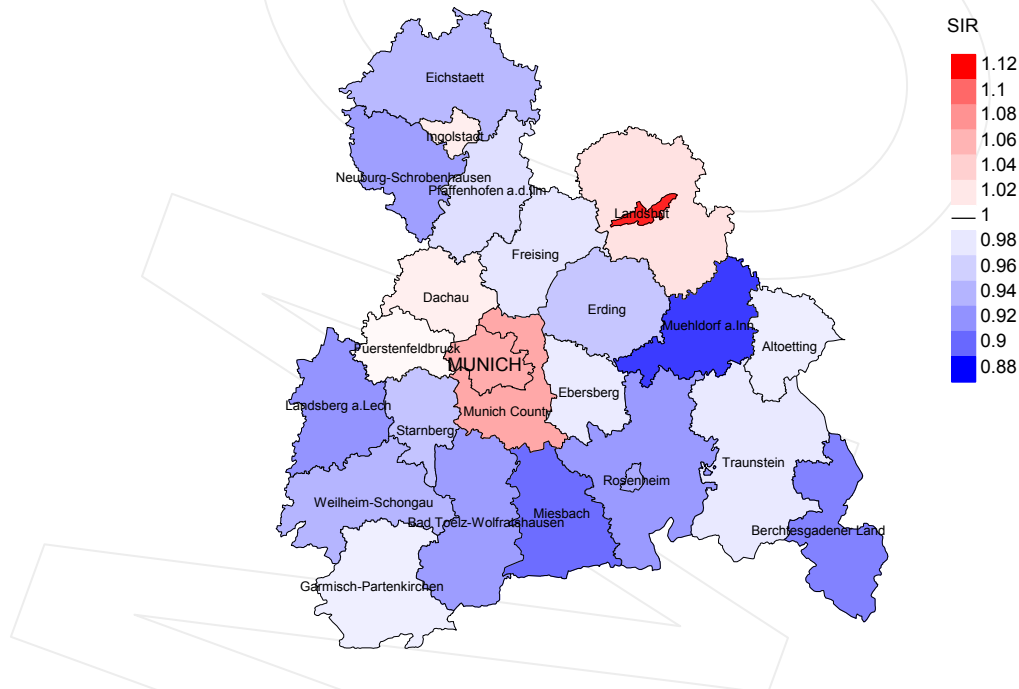


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=80,558, females N=78,994).

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 2,084 women were identified with newly diagnosed all cancers (excl. C44). Therefore, the mean standardized incidence ratio (SIR) 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 0.93 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	12223	98.1	10.9	8599	70.4	93.7
1999	12164	97.9	10.3	8252	67.8	94.5
2000	12170	98.2	11.5	8015	65.9	95.7
2001	12608	97.6	11.2	8031	63.7	95.9
2002	21718	97.8	14.5	14027	64.6	97.3
2003	21244	97.5	12.4	13134	61.8	97.5
2004	21425	97.3	11.4	12628	58.9	97.6
2005	21374	96.3	10.0	12139	56.8	97.9
2006	21466	94.4	8.7	11657	54.3	98.3
2007	24752	84.4	9.2	13015	52.6	98.0
2008	25093	70.3	8.3	12481	49.7	98.2
2009	24668	69.7	8.0	11669	47.3	98.0
2010	24397	68.7	8.2	10886	44.6	97.8
2011	24441	68.4	7.9	10053	41.1	97.1
2012	24014	71.3	7.7	8251	34.4	95.7
2013	17599	98.5	10.4	4720	26.8	91.9
1998-2013	321356	85.7	9.8	167557	52.1	96.9

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	12223	6514	92.0	2680	21.9
1999	12164	6607	92.0	2570	21.1
2000	12170	6605	94.1	2523	20.7
2001	12608	6800	93.9	2597	20.6
2002	21718	9824	97.1	5205	24.0
2003	21244	10378	97.2	4713	22.2
2004	21425	10576	97.5	4510	21.1
2005	21374	10778	97.0	4372	20.5
2006	21466	11147	97.3	4262	19.9
2007	24752	12230	97.9	4897	19.8
2008	25093	12561	98.6	4891	19.5
2009	24668	12824	98.6	4666	18.9
2010	24397	13279	98.6	4805	19.7
2011	24441	13563	98.5	4882	20.0
2012	24014	13589	98.3	4758	19.8
2013	17599	12735	98.6	3703	21.0
1998-2013	321356	170010	97.2	66034	20.5

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	6514	72.5	27.5	89.0
1999	6607	76.6	23.4	89.2
2000	6605	77.8	22.2	88.6
2001	6800	74.9	25.1	88.4
2002	9824	78.8	21.2	89.1
2003	10378	78.5	21.5	88.3
2004	10576	80.0	20.0	88.2
2005	10778	78.5	21.5	86.5
2006	11147	78.0	22.0	86.4
2007	12230	78.1	21.9	86.0
2008	12561	77.5	22.5	84.6
2009	12824	76.5	23.5	84.3
2010	13279	76.3	23.7	84.2
2011	13563	75.1	24.9	83.2
2012	13589	74.6	25.4	82.6
2013	12735	71.3	28.7	79.7
1998-2013	170010	76.6	23.4	85.6

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	3270	72.4	70.0	78.0	71.8
1999	3403	72.1	70.3	78.4	71.4
2000	3352	72.5	70.3	79.2	71.5
2001	3453	72.0	69.9	78.8	71.3
2002	5024	72.5	70.7	79.0	71.6
2003	5345	72.6	70.8	79.0	71.7
2004	5393	73.3	71.3	80.2	72.3
2005	5529	73.5	71.2	80.5	72.0
2006	5841	73.1	71.3	79.7	72.0
2007	6455	73.5	71.9	80.0	72.5
2008	6624	74.1	72.0	80.9	72.6
2009	6791	74.2	72.1	81.0	72.8
2010	6989	74.5	72.6	81.1	73.3
2011	7186	74.9	72.7	81.5	73.3
2012	7195	75.4	73.4	81.5	73.9
2013	6598	76.2	73.7	82.5	74.4
1998-2013	88448	73.9	71.9	80.5	72.7

Deaths of patients are considered to be cancer-related, in case that fact was recorded on the death certificate, or patients had suffered from metastasis or recurrence.

Table 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	3244	76.8	74.3	83.0	76.7
1999	3204	77.1	75.0	84.0	76.8
2000	3253	77.1	74.9	84.0	76.2
2001	3347	77.6	74.6	84.1	76.5
2002	4800	77.6	75.1	84.5	76.5
2003	5033	77.1	74.2	84.2	75.6
2004	5183	77.4	75.0	84.1	76.2
2005	5249	77.8	74.3	84.7	75.7
2006	5306	77.9	75.1	84.9	76.2
2007	5775	77.9	74.3	85.6	75.8
2008	5937	78.2	74.6	85.9	75.8
2009	6033	78.0	74.1	85.9	75.4
2010	6290	78.2	74.7	85.9	75.9
2011	6377	78.0	74.4	86.3	75.6
2012	6394	77.9	74.7	86.7	75.8
2013	6137	78.6	74.7	86.7	76.2
1998-2013	81562	77.8	74.6	85.3	76.0

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	2364	213.4	0.40	127.7	0.38	195.4	0.40	261.7	0.42
1999	2628	234.8	0.45	138.4	0.43	212.8	0.45	285.4	0.48
2000	2605	228.7	0.43	132.9	0.41	205.1	0.44	274.4	0.46
2001	2639	227.7	0.43	131.7	0.41	202.5	0.43	268.0	0.45
2002	3985	213.9	0.37	118.5	0.35	181.9	0.37	241.4	0.38
2003	4265	227.5	0.40	123.1	0.37	188.9	0.39	252.3	0.42
2004	4329	230.1	0.40	121.5	0.38	187.2	0.40	251.7	0.43
2005	4382	231.3	0.41	119.1	0.38	182.4	0.40	246.7	0.43
2006	4587	239.5	0.43	121.9	0.40	186.9	0.42	249.9	0.44
2007	5122	231.2	0.41	115.4	0.37	177.9	0.40	239.6	0.42
2008	5204	233.8	0.42	114.6	0.39	176.1	0.41	237.0	0.44
2009	5223	234.0	0.43	112.7	0.40	172.5	0.42	230.1	0.44
2010	5347	237.2	0.45	111.5	0.40	171.2	0.43	229.8	0.46
2011	5474	239.6	0.46	111.4	0.41	171.0	0.44	228.2	0.46
2012	5372	235.1	0.46	107.8	0.41	166.2	0.43	224.2	0.46
2013	4758	208.3	0.58	94.8	0.52	147.2	0.55	198.8	0.59
1998-2013	68284	229.7	0.43	116.0	0.40	178.3	0.42	238.8	0.45

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	2369	201.4	0.39	86.6	0.32	129.5	0.35	168.2	0.38
1999	2444	206.0	0.41	86.7	0.33	130.5	0.36	171.4	0.39
2000	2545	211.9	0.44	89.9	0.36	134.8	0.38	174.2	0.41
2001	2467	202.8	0.41	86.2	0.33	129.4	0.35	168.0	0.39
2002	3762	192.1	0.37	79.9	0.31	119.6	0.33	154.8	0.35
2003	3892	197.6	0.39	83.6	0.33	124.9	0.35	160.4	0.38
2004	4148	209.8	0.41	85.5	0.33	128.2	0.36	167.0	0.39
2005	4095	205.8	0.41	84.6	0.33	126.2	0.36	162.1	0.38
2006	4121	205.1	0.41	81.6	0.33	122.8	0.35	160.7	0.39
2007	4456	193.0	0.39	77.4	0.31	116.3	0.34	150.8	0.36
2008	4548	196.0	0.38	77.9	0.30	116.7	0.33	151.1	0.35
2009	4602	197.9	0.39	78.7	0.31	117.6	0.33	151.7	0.36
2010	4799	205.0	0.41	79.4	0.32	119.0	0.35	154.9	0.38
2011	4738	200.8	0.41	78.1	0.32	116.6	0.35	150.6	0.38
2012	4784	202.7	0.42	77.8	0.32	117.1	0.35	151.9	0.38
2013	4354	184.5	0.49	71.0	0.38	106.7	0.42	138.6	0.45
1998-2013	62124	200.0	0.41	80.4	0.32	120.5	0.35	156.2	0.38

Table 13

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

Age at death Years	Cases			Males			Females		
	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4	59	0.0	0.0	33	0.0	0.0	26	0.0	0.0
5-9	78	0.1	0.1	38	0.0	0.1	40	0.1	0.1
10-14	66	0.0	0.1	35	0.0	0.1	31	0.0	0.1
15-19	82	0.1	0.2	45	0.1	0.2	37	0.1	0.2
20-24	141	0.1	0.3	90	0.1	0.3	51	0.1	0.3
25-29	223	0.1	0.4	108	0.1	0.4	115	0.2	0.4
30-34	413	0.3	0.7	186	0.2	0.7	227	0.3	0.7
35-39	916	0.6	1.3	399	0.5	1.2	517	0.7	1.4
40-44	1993	1.3	2.6	856	1.1	2.2	1137	1.6	3.0
45-49	3823	2.5	5.1	1807	2.3	4.5	2016	2.8	5.8
50-54	6401	4.2	9.3	3298	4.1	8.6	3103	4.3	10.1
55-59	10662	7.0	16.3	5912	7.4	16.0	4750	6.6	16.6
60-64	15417	10.1	26.4	8897	11.1	27.1	6520	9.0	25.7
65-69	20265	13.3	39.7	11951	14.9	42.0	8314	11.5	37.1
70-74	23480	15.4	55.1	13597	17.0	58.9	9883	13.7	50.8
75-79	23905	15.7	70.7	13183	16.4	75.4	10722	14.8	65.6
80-84	22062	14.5	85.2	10850	13.5	88.9	11212	15.5	81.1
85+	22558	14.8	100.0	8886	11.1	100.0	13672	18.9	100.0
All ages	152544	100.0		80171	100.0		72373	100.0	

Included in the statistics are 22.5% multiple primaries in males and 19.7% 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	33	26	2.2	0.10	1.8	0.11	100.0	100.0
5- 9	38	40	2.5	0.22	2.8	0.32	100.0	100.0
10-14	35	31	2.3	0.21	2.1	0.18	100.0	100.0
15-19	45	37	2.9	0.13	2.5	0.13	100.0	100.0
20-24	90	51	5.1	0.15	2.9	0.10	100.0	100.0
25-29	108	115	5.4	0.11	5.7	0.10	100.0	100.0
30-34	186	227	8.2	0.12	10.2	0.11	100.0	100.0
35-39	399	517	16.0	0.18	21.8	0.14	100.0	100.0
40-44	856	1137	32.7	0.26	45.7	0.18	100.0	100.0
45-49	1807	2016	76.5	0.33	87.2	0.23	100.0	100.0
50-54	3298	3103	163.3	0.37	150.9	0.27	100.0	100.0
55-59	5912	4750	322.3	0.40	247.0	0.34	100.0	100.0
60-64	8897	6520	502.0	0.40	347.6	0.37	100.0	100.0
65-69	11951	8314	757.1	0.42	481.9	0.43	100.0	100.0
70-74	13597	9883	1061.5	0.49	651.0	0.52	100.0	100.0
75-79	13183	10722	1595.0	0.61	902.7	0.59	100.0	100.0
80-84	10850	11212	2168.5	0.76	1201.9	0.69	100.0	100.0
85+	8886	13672	2605.8	0.86	1529.7	0.77	100.0	100.0
All ages	80171	72373					100.0	100.0
Mortality								
Raw			269.6	0.49	233.0	0.46		
WS			134.7	0.45	93.0	0.37		
ES			208.4	0.48	139.8	0.40		
BRD-S			281.7	0.51	181.9	0.43		
PYLL-70								
per 100,000			1232.8		1133.2			
ES			1100.0		986.1			
AYLL-70			9.8		11.2			

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	213	1.2			14	6.6	199	93.4
C09-C10 Oropharynx	253	1.4			38	15.0	215	85.0
C12-C13 Hypopharynx	161	0.9			23	14.3	138	85.7
C15 Oesophagus	420	2.4			34	8.1	386	91.9
C16 Stomach	660	3.8			59	8.9	601	91.1
C18 Colon	1294	7.4			203	15.7	1091	84.3
C19-C20 Rectum	704	4.0			143	20.3	561	79.7
C22 Liver	498	2.8			53	10.6	445	89.4
C23-C24 Bile	172	1.0			17	9.9	155	90.1
C25 Pancreas	759	4.3			62	8.2	697	91.8
C32 Larynx	213	1.2			23	10.8	190	89.2
C33-C34 Lung	2834	16.2			263	9.3	2571	90.7
C38,C45 Mesothelioma	117	0.7			4	3.4	113	96.6
C43 Malign. melanoma	491	2.8			59	12.0	432	88.0
C44 Skin others	1600	9.1	570	35.6	159	9.9	871	54.4
C61 Prostate	1897	10.8			301	15.9	1596	84.1
C64 Kidney	547	3.1			128	23.4	419	76.6
C65 Renal pelvis	190	1.1			19	10.0	171	90.0
C66 Ureter	140	0.8			24	17.1	116	82.9
C67 Bladder	1268	7.3			252	19.9	1016	80.1
C70-C72 CNS cancer	355	2.0			37	10.4	318	89.6
C76-C79 CUP	343	2.0			48	14.0	295	86.0
C82-C85 NHL	645	3.7			136	21.1	509	78.9
C90 Mult. myeloma	278	1.6			36	12.9	242	87.1
C91-C96 Leukaemia	664	3.8			104	15.7	560	84.3
Other primaries	772	4.4			72	9.3	700	90.7
All mult. primaries	17488	100.0	570	3.3	2311	13.2	14607	83.5

Multiple primaries with number of cases 1 to 100 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 ←%
C15	Oesophagus	144	1.0			5	3.5	139	96.5
C16	Stomach	513	3.7			41	8.0	472	92.0
C18	Colon	1102	7.8			130	11.8	972	88.2
C19-C20	Rectum	473	3.4			76	16.1	397	83.9
C22	Liver	175	1.2			15	8.6	160	91.4
C23-C24	Bile	200	1.4			18	9.0	182	91.0
C25	Pancreas	705	5.0			51	7.2	654	92.8
C33-C34	Lung	1392	9.9			90	6.5	1302	93.5
C43	Malign. melanoma	316	2.2			30	9.5	286	90.5
C44	Skin others	734	5.2	281	38.3	76	10.4	377	51.4
C50	Breast	3071	21.9			737	24.0	2334	76.0
C51	Vulva	120	0.9			10	8.3	110	91.7
C53	Cervix uteri	191	1.4			36	18.8	155	81.2
C54	Corpus uteri	429	3.1			59	13.8	370	86.2
C56	Ovary	807	5.7			176	21.8	631	78.2
C64	Kidney	276	2.0			69	25.0	207	75.0
C67	Bladder	459	3.3			43	9.4	416	90.6
C70-C72	CNS cancer	343	2.4			48	14.0	295	86.0
C73	Thyroid	109	0.8			6	5.5	103	94.5
C76-C79	CUP	244	1.7			33	13.5	211	86.5
C82-C85	NHL	436	3.1			70	16.1	366	83.9
C90	Mult. myeloma	216	1.5			21	9.7	195	90.3
C91-C96	Leukaemia	551	3.9			77	14.0	474	86.0
Other primaries		1040	7.4			137	13.2	903	86.8
All mult. primaries		14046	100.0	281	2.0	2054	14.6	11711	83.4

Multiple primaries with number of cases 1 to 100 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	28	24	1.9	0.09	1.7	0.10	100.0	100.0
5- 9	36	37	2.4	0.21	2.6	0.30	100.0	100.0
10-14	35	29	2.3	0.22	2.0	0.18	100.0	100.0
15-19	42	33	2.7	0.12	2.2	0.12	100.0	100.0
20-24	84	47	4.7	0.14	2.6	0.09	100.0	100.0
25-29	99	109	4.9	0.11	5.4	0.10	100.0	100.0
30-34	181	201	8.0	0.13	9.1	0.10	100.0	100.0
35-39	374	466	15.0	0.18	19.7	0.13	100.0	100.0
40-44	789	994	30.1	0.26	39.9	0.17	100.0	100.0
45-49	1637	1731	69.3	0.33	74.9	0.22	100.0	100.0
50-54	2877	2606	142.5	0.37	126.7	0.27	100.0	100.0
55-59	5105	4005	278.3	0.39	208.3	0.34	100.0	100.0
60-64	7465	5330	421.2	0.39	284.1	0.36	100.0	100.0
65-69	9683	6709	613.4	0.41	388.9	0.42	100.0	100.0
70-74	10692	7826	834.7	0.49	515.5	0.52	100.0	100.0
75-79	9972	8570	1206.5	0.62	721.5	0.60	100.0	100.0
80-84	8095	8875	1617.9	0.78	951.4	0.69	100.0	100.0
85+	6721	11016	1970.9	0.87	1232.5	0.77	100.0	100.0
All ages	63915	58608					100.0	100.0
Mortality								
Raw			215.0	0.48	188.7	0.45		
WS			109.2	0.43	76.2	0.35		
ES			167.2	0.46	114.1	0.38		
BRD-S			223.0	0.50	147.7	0.42		
PYLL-70								
per 100,000			1076.7		963.5			
ES			962.5		840.9			
AYLL-70			10.1		11.5			

* 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	27	24	1.8	0.09	1.7	0.10	100.0	100.0
5- 9	35	36	2.3	0.20	2.5	0.30	100.0	100.0
10-14	35	27	2.3	0.22	1.9	0.17	100.0	100.0
15-19	42	28	2.7	0.13	1.9	0.10	100.0	100.0
20-24	79	44	4.5	0.14	2.5	0.09	100.0	100.0
25-29	92	103	4.6	0.10	5.1	0.10	100.0	100.0
30-34	175	182	7.7	0.13	8.2	0.10	100.0	100.0
35-39	358	426	14.4	0.17	18.0	0.13	100.0	100.0
40-44	747	915	28.5	0.26	36.8	0.17	100.0	100.0
45-49	1535	1551	65.0	0.33	67.1	0.21	100.0	100.0
50-54	2607	2337	129.1	0.36	113.7	0.26	100.0	100.0
55-59	4626	3565	252.2	0.39	185.4	0.33	100.0	100.0
60-64	6584	4638	371.5	0.38	247.2	0.35	100.0	100.0
65-69	8365	5686	529.9	0.40	329.6	0.39	100.0	100.0
70-74	8924	6567	696.7	0.46	432.5	0.48	100.0	100.0
75-79	8010	7199	969.1	0.56	606.1	0.55	100.0	100.0
80-84	6390	7433	1277.1	0.68	796.8	0.61	100.0	100.0
85+	5391	9453	1580.9	0.74	1057.7	0.68	100.0	100.0
All ages	54022	50214					100.0	100.0
Mortality								
Raw			181.7	0.45	161.7	0.41		
WS			93.8	0.41	66.1	0.33		
ES			142.2	0.43	98.5	0.36		
BRD-S			187.1	0.46	126.7	0.39		
PYLL-70								
per 100,000			981.5		861.6			
ES			879.0		753.8			
AYLL-70			10.4		11.7			

* See corresponding tables with multiple primaries.

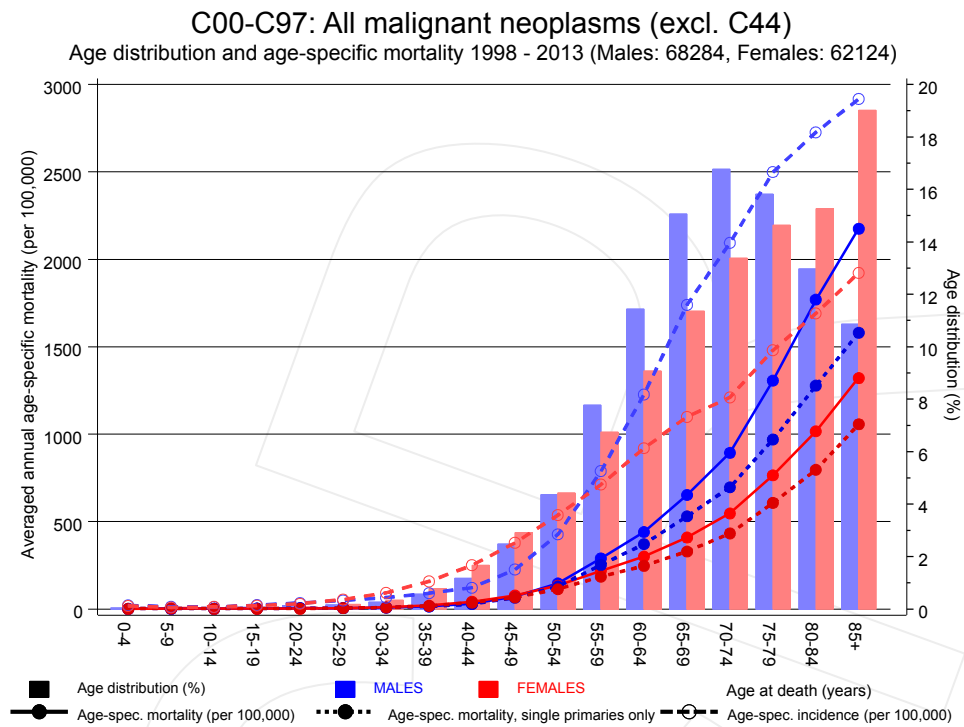
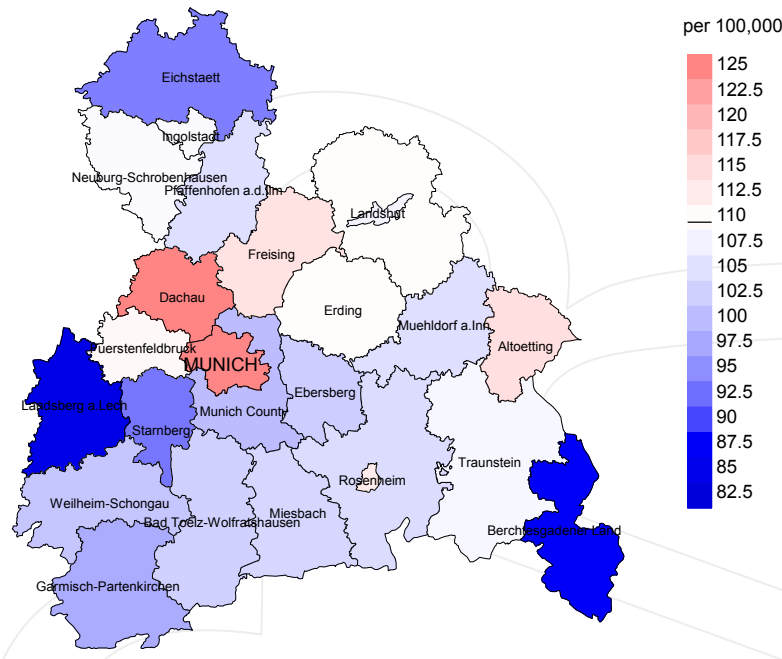


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

The difference between age at diagnosis (Table 3) and age at all cancers (excl. C44)-related death (see Table 10) should be considered.

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



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

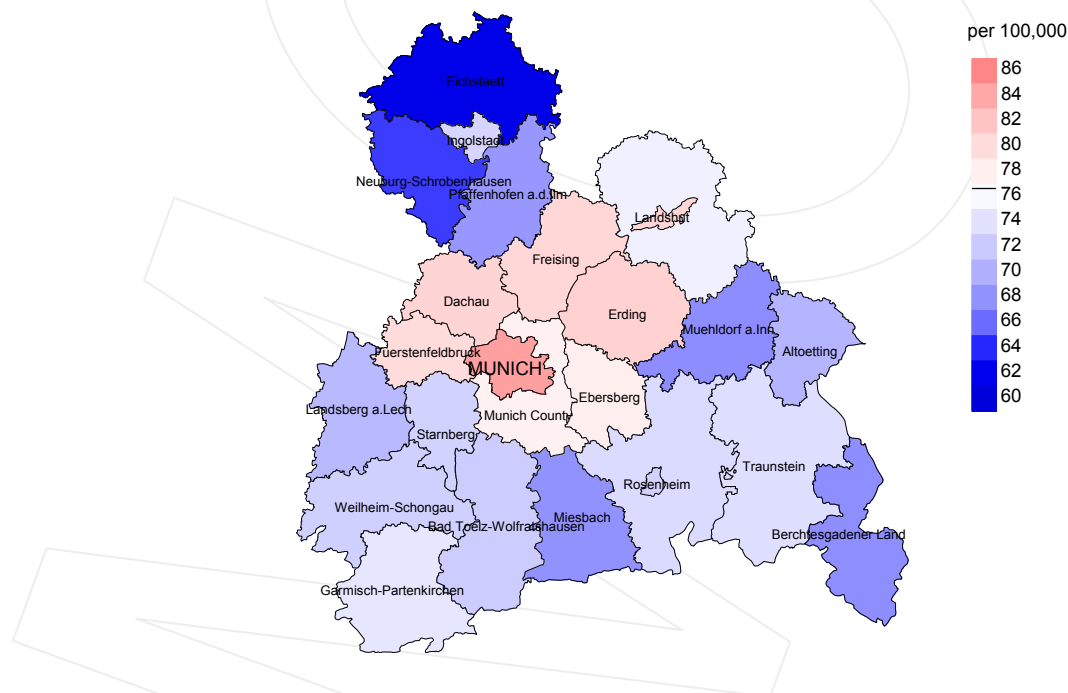
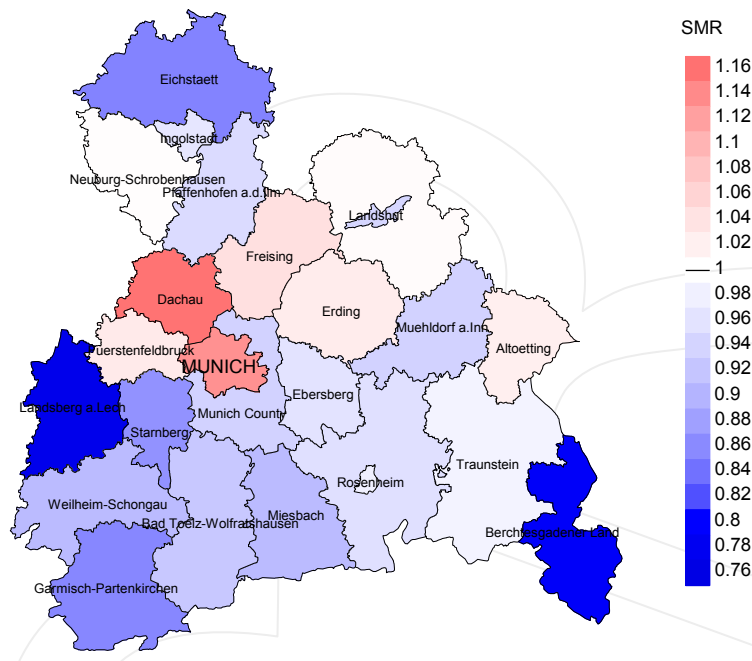


Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2013. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 109.6/100,000 WS N=36,240, females 76.7/100,000 WS N=31,985).

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 865 women died from all cancers (excl. C44). Therefore, the mean mortality rate for this cancer type in this area can be calculated at 78.2/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 70.5 and 86.9/100,000.

Standardized mortality ratio (SMR) 2007 - 2013: Males



Standardized mortality ratio (SMR) 2007 - 2013: Females

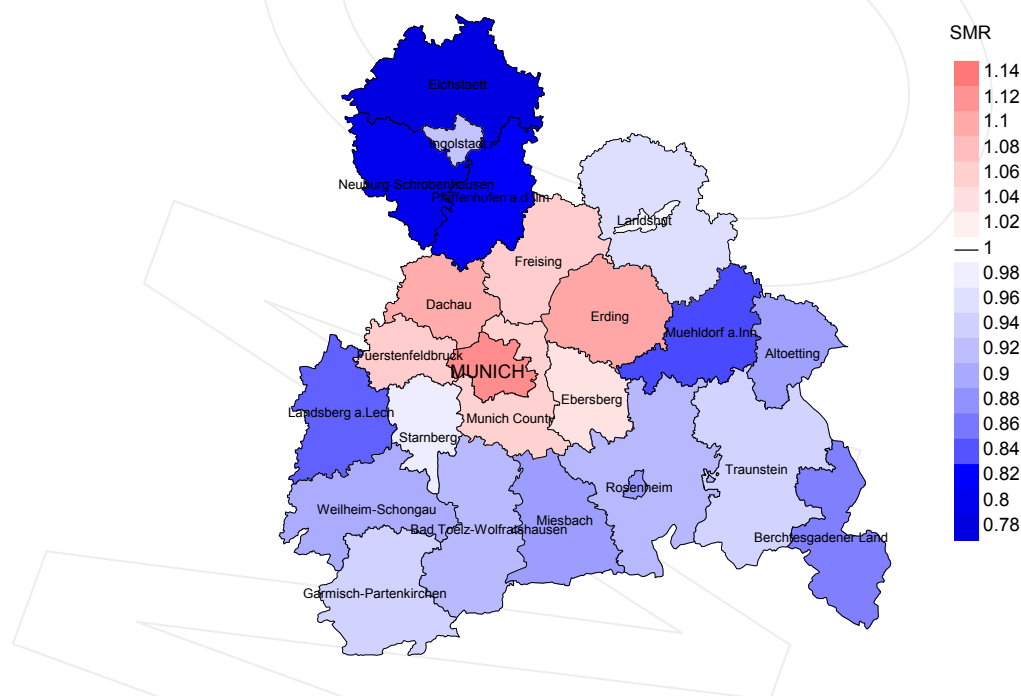


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=36,240, females N=31,985).

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 865 women died from all cancers (excl. C44). Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.04. Though, the value of this parameter may vary with an underlying probability of 99% between 0.95 and 1.13, 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 C00-C97: All cancers (excl. C44) [Internet]. 2015 [updated 2015 May 19; cited 2015 Jul 1]. Available from: http://www.tumorregister-muenchen.de/en/facts/base/base_C0097E.pdf

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