Munich Cancer Registry

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

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

Cancer statistics: Baseline statistics

C00-C97: All cancers (excl. C44)

Year of diagnosis	1998-2012
Patients	273,426
Diseases	298,229
Creation date	03/20/2014
Export date	02/12/2014
Population	4.5 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 4.5 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, March 2014

[#] 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 2013 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.

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	12212	1330	10.9	23.3	69.3	98.0	
1999	12154	1255	10.3	23.4	66.7	97.9	
2000	12153	1401	11.5	23.8	64.7	98.2	
2001	12591	1407	11.2	24.2	62.4	97.6	
2002	21684	3154	14.5	24.3	63.4	97.8	#
2003	21189	2638	12.4	24.0	60.4	97.4	#
2004	21376	2439	11.4	24.1	57.6	97.1	#
2005	21319	2149	10.1	24.7	55.3	96.2	#
2006	21394	1867	8.7	24.7	52.7	94.2	#
2007	24645	2269	9.2	23.5	50.7	83.7	# ##
2008	24937	2103	8.4	24.1	47.8	69.8	
2009	24468	1966	8.0	24.4	44.9	69.2	
2010	24035	2012	8.4	24.4	41.7	68.7	
2011	23820	1934	8.1	23.8	36.9	72.8	
2012	20252	1888	9.3	24.0	28.5	97.1	###
1998-2012	298229	29812	10.0	24.1	51.7	87.1	

\# 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	12212	6038	6174	49.4
1999	12154	6024	6130	49.6
2000	12153	6168	5985	50.8
2001	12591	6353	6238	50.5
2002	21684	11252	10432	51.9
2003	21189	11040	10149	52.1
2004	21376	11076	10300	51.8
2005	21319	10946	10373	51.3
2006	21394	11076	10318	51.8
2007	24645	12886	11759	52.3
2008	24937	12668	12269	50.8
2009	24468	12327	12141	50.4
2010	24035	11989	12046	49.9
2011	23820	12043	11777	50.6
2012	20252	9881	10371	48.8
1998-2012	298229	151767	146462	50.9

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 4.52 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	6038	6174	545.0	524.8	340.2	272.7	495.6	380.9	635.0	458.5
1999	6024	6130	538.2	516.6	330.3	268.9	482.2	374.4	612.6	450.0
2000	6168	5985	541.6	498.2	329.8	258.6	482.0	360.9	613.7	433.0
2001	6353	6238	548.2	512.8	331.6	266.6	483.0	372.6	609.9	445.9
2002	11252	10432	604.0	532.8	350.2	264.7	512.5	372.8	652.2	452.3
2003	11040	10149	588.9	515.2	337.5	258.5	492.4	361.6	623.9	435.2
2004	11076	10300	588.7	521.1	332.4	264.1	482.0	366.3	610.3	439.5
2005	10946	10373	577.9	521.3	322.9	259.7	465.0	362.1	587.2	435.2
2006	11076	10318	578.4	513.6	316.7	256.6	459.2	357.0	580.9	427.3
2007	12886	11759	581.7	509.2	319.0	254.6	459.6	354.4	579.3	423.6
2008	12668	12269	569.2	528.7	304.4	263.9	439.8	366.4	554.8	438.0
2009	12327	12141	552.3	522.0	290.9	260.1	420.7	361.4	529.5	431.1
2010	11989	12046	531.9	514.7	279.6	252.2	402.6	350.8	505.3	419.4
2011	12043	11777	527.1	499.1	272.1	245.5	392.2	339.7	494.1	404.8
2012	9881	10371	432.5	439.5	220.9	215.5	320.4	299.7	407.2	358.8
1998-2012	151767	146462	552.9	510.3	305.1	255.5	441.8	355.8	557.8	426.4

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	12212	65.9	14.8	0.1	107	47.4	57.0	67.0	76.8	84.4
1999	12154	66.0	14.6	0.3	104	47.6	57.5	67.0	76.7	84.3
2000	12153	66.1	14.7	0.2	103	47.4	57.7	66.8	76.9	84.4
2001	12591	66.0	14.4	0.1	103	47.6	57.9	66.6	76.3	83.5
2002	21684	67.3	14.3	0.0	104	48.4	59.4	68.2	77.6	84.3
2003	21189	67.0	14.4	0.2	105	48.6	59.3	67.9	77.3	83.7
2004	21376	66.8	14.5	0.0	103	47.6	59.1	67.6	77.1	83.9
2005	21319	67.0	14.5	0.0	103	48.2	59.4	68.0	77.2	84.1
2006	21394	67.1	14.2	0.2	103	48.2	59.3	68.1	77.1	84.2
2007	24645	66.9	14.5	0.0	103	47.5	59.1	68.3	77.2	84.3
2008	24937	67.2	14.3	0.0	109	47.9	59.4	68.7	77.2	84.1
2009	24468	67.2	14.2	0.2	109	48.0	59.1	68.8	77.2	84.2
2010	24035	67.4	14.5	0.0	105	48.0	59.1	69.2	77.5	84.7
2011	23820	67.4	14.6	0.0	109	47.8	59.0	69.6	77.4	84.7
2012	20252	67.7	14.3	0.0	102	48.4	59.4	69.8	77.4	84.3
1998-2012	298229	67.0	14.4	0.0	109	47.9	58.9	68.4	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	6038	65.7	14.0	0.4	99.8	49.1	57.9	66.8	75.4	82.7
1999	6024	66.0	13.5	0.3	99.5	50.5	58.6	66.9	74.9	82.2
2000	6168	66.2	13.6	0.2	99.7	50.4	59.0	67.0	75.5	82.2
2001	6353	66.0	13.2	0.1	102	50.3	59.3	66.6	75.0	81.4
2002	11252	67.1	13.3	0.1	102	51.2	60.6	68.0	75.8	82.2
2003	11040	67.0	13.1	0.3	101	51.6	60.6	67.9	75.6	82.2
2004	11076	66.9	13.3	0.0	101	50.6	60.6	67.7	75.9	82.2
2005	10946	67.0	13.4	0.0	102	50.9	60.9	67.9	75.8	82.4
2006	11076	67.3	13.0	0.2	102	51.7	61.1	68.3	76.0	82.2
2007	12886	67.1	13.5	0.0	101	50.1	60.6	68.4	76.1	82.2
2008	12668	67.6	13.1	0.0	105	51.5	61.4	69.1	76.2	82.5
2009	12327	67.6	13.0	0.2	105	50.6	61.0	69.3	76.2	82.6
2010	11989	67.7	13.5	0.0	102	50.7	60.9	69.5	76.5	83.1
2011	12043	68.1	13.4	0.0	109	50.7	61.4	70.1	76.6	83.2
2012	9881	68.5	13.0	0.0	101	52.3	62.1	70.4	77.0	83.2
1998-2012	151767	67.2	13.3	0.0	109	50.9	60.5	68.6	76.0	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	6174	66.2	15.6	0.1	107	46.1	56.0	67.2	77.9	85.5
1999	6130	66.0	15.7	0.7	104	45.2	56.2	67.1	77.9	85.6
2000	5985	65.9	15.8	0.4	103	44.5	55.9	66.7	78.3	85.8
2001	6238	66.1	15.5	0.5	103	45.2	56.4	66.6	78.0	85.9
2002	10432	67.5	15.4	0.0	104	46.6	58.0	68.5	79.4	86.6
2003	10149	67.1	15.6	0.2	105	45.8	57.3	67.9	79.2	85.8
2004	10300	66.6	15.6	0.0	103	45.6	57.0	67.5	78.7	85.0
2005	10373	67.1	15.5	0.3	103	45.9	57.6	68.0	79.1	85.5
2006	10318	66.9	15.5	0.2	103	45.3	57.2	67.8	78.8	85.5
2007	11759	66.8	15.6	0.2	103	45.3	57.0	68.2	78.8	85.7
2008	12269	66.7	15.4	0.1	109	45.5	57.0	68.2	78.6	85.8
2009	12141	66.7	15.3	0.2	109	45.8	56.7	68.2	78.4	85.8
2010	12046	67.0	15.4	0.2	105	45.9	56.8	68.8	78.7	86.1
2011	11777	66.8	15.7	0.0	102	45.8	56.3	69.0	78.4	86.2
2012	10371	66.9	15.3	0.0	102	46.3	56.6	68.9	77.8	85.6
1998-2012	146462	66.8	15.5	0.0	109	45.7	56.9	68.1	78.6	85.7

Table 4

Age distribution by 5-year age group and gender for period 1998-2012 (incl. DCO)

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	538	0.2	0.2	311	0.2	0.2	227	0.2	0.2
5-9	278	0.1	0.3	164	0.1	0.3	114	0.1	0.2
10-14	310	0.1	0.4	148	0.1	0.4	162	0.1	0.3
15-19	587	0.2	0.6	320	0.2	0.6	267	0.2	0.5
20-24	1044	0.4	0.9	558	0.4	1.0	486	0.3	0.9
25-29	1932	0.6	1.6	896	0.6	1.6	1036	0.7	1.6
30-34	3331	1.1	2.7	1424	0.9	2.5	1907	1.3	2.9
35-39	5696	1.9	4.6	2138	1.4	3.9	3558	2.4	5.3
40-44	8904	3.0	7.6	3031	2.0	5.9	5873	4.0	9.3
45-49	13202	4.4	12.0	5017	3.3	9.2	8185	5.6	14.9
50-54	18682	6.3	18.3	8231	5.4	14.7	10451	7.1	22.0
55-59	27032	9.1	27.3	13893	9.2	23.8	13139	9.0	31.0
60-64	37660	12.6	40.0	21055	13.9	37.7	16605	11.3	42.3
65-69	44890	15.1	55.0	26643	17.6	55.2	18247	12.5	54.8
70-74	42997	14.4	69.4	25532	16.8	72.1	17465	11.9	66.7
75-79	36544	12.3	81.7	19697	13.0	85.0	16847	11.5	78.2
80-84	28501	9.6	91.2	13139	8.7	93.7	15362	10.5	88.7
85+	26101	8.8	100.0	9570	6.3	100.0	16531	11.3	100.0
All ages	298229	100.0		151767	100.0		146462	100.0	

Included in the statistics are 21.9% multiple primaries in males and 19.3% in females.

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 1998-2012

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males DCO rate n=13613 %	Females DCO rate n=14953 %	Males Prop.all cancers n=146755 %	Females Prop.all cancers n=142297 %
0- 4	306	226	22.3	17.3	2.3	4.4	100.0	100.0
5- 9	164	113	11.8	8.6	1.8	0.9	100.0	100.0
10-14	147	162	10.4	12.1	2.0	0.6	100.0	100.0
15-19	320	267	22.4	19.6	1.3	1.5	100.0	100.0
20-24	553	486	34.0	29.6	1.4	1.9	100.0	100.0
25-29	886	1022	47.9	54.4	0.6	0.4	100.0	100.0
30-34	1412	1888	66.8	91.9	1.1	0.5	100.0	100.0
35-39	2114	3515	90.5	158.6	1.7	1.2	100.0	100.0
40-44	2994	5803	123.6	252.1	1.7	1.1	100.0	100.0
45-49	4927	7998	228.6	378.1	2.8	1.6	100.0	100.0
50-54	8026	10185	434.2	539.2	4.0	1.9	100.0	100.0
55-59	13538	12810	796.6	719.1	3.8	2.5	100.0	100.0
60-64	20461	16137	1241.7	927.4	4.5	3.1	100.0	100.0
65-69	25718	17720	1752.8	1104.9	5.2	4.3	100.0	100.0
70-74	24547	16900	2118.4	1225.6	6.9	7.2	100.0	100.0
75-79	18907	16256	2509.3	1486.1	11.8	12.3	100.0	100.0
80-84	12552	14802	2764.1	1714.0	20.5	21.7	100.0	100.0
85+	9183	16007	2961.0	1954.3	40.7	40.6	100.0	100.0
All ages	146755	142297			9.3	10.5	100.0	100.0
Incidence								
Raw			534.6	495.8				
WS			295.8	249.0				
ES			427.7	346.4				
BRD-S			539.0	414.5				

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

Table 6a

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of second primaries for period 1998-2012
MALES

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C03-C06	Oral cavity	131	45.6	2.9	2.4	3.4	#	2.6	7.6
C07-C08	Salivary gland	28	12.6	2.2	1.5	3.2	#	0.5	10.7
C09-C10	Oropharynx	171	55.8	3.1	2.6	3.6	#	3.5	2.9
C12-C13	Hypopharynx	97	31.7	3.1	2.5	3.7	#	2.0	8.2
C15	Oesophagus	278	98.4	2.8	2.5	3.2	#	5.4	11.5
C16	Stomach	429	249.1	1.7	1.6	1.9	#	5.4	9.3
C17	Small intestine	104	26.7	3.9	3.2	4.7	#	2.3	3.8
C18	Colon	1099	586.9	1.9	1.8	2.0	#	15.5	4.9
C19-C20	Rectum	558	323.2	1.7	1.6	1.9	#	7.1	3.4
C21	Anus/canal	30	11.2	2.7	1.8	3.8	#	0.6	6.7
C22	Liver	280	157.9	1.8	1.6	2.0	#	3.7	18.9
C23-C24	Bile	87	55.7	1.6	1.3	1.9	#	0.9	17.2
C25	Pancreas	425	203.6	2.1	1.9	2.3	#	6.7	25.2
C26	GI cancer	16	7.3	2.2	1.3	3.6	#	0.3	31.3
C30-C31	Sinuses	20	9.2	2.2	1.3	3.4	#	0.3	10.0
C32	Larynx	145	58.0	2.5	2.1	2.9	#	2.6	13.8
C33-C34	Lung	1472	682.4	2.2	2.0	2.3	#	23.8	12.5
C38,C45	Mesothelioma	65	37.9	1.7	1.3	2.2	#	0.8	6.2
C40-C41	Bone	16	4.3	3.7	2.1	6.0	#	0.4	12.5
C43	Malign. melanoma	694	215.7	3.2	3.0	3.5	#	14.4	1.3
C46,C49	Soft tissue	62	30.1	2.1	1.6	2.6	#	1.0	1.6
C50	Breast	26	14.5	1.8	1.2	2.6	#	0.3	23.1
C60	Penis	22	13.1	1.7	1.1	2.5	#	0.3	
C61	Prostate	1919	1751.2	1.1	1.0	1.1	#	5.1	7.2
C62	Testis	81	15.1	5.4	4.3	6.7	#	2.0	2.5
C64	Kidney	593	199.9	3.0	2.7	3.2	#	11.9	6.7
C65	Renal pelvis	98	23.5	4.2	3.4	5.1	#	2.2	1.0
C66	Ureter	61	13.1	4.7	3.6	6.0	#	1.4	
C67	Bladder	598	259.5	2.3	2.1	2.5	#	10.2	5.7
C68	Urethra	27	2.9	9.2	6.1	13.4	#	0.7	
C70-C72	CNS cancer	139	75.2	1.8	1.6	2.2	#	1.9	15.1
C73	Thyroid	97	35.1	2.8	2.2	3.4	#	1.9	3.1
C76-C79	CUP	178	98.9	1.8	1.5	2.1	#	2.4	4.5
C81	Hodgkin lymphoma	32	11.4	2.8	1.9	4.0	#	0.6	3.1
C82-C85	NHL	459	228.6	2.0	1.8	2.2	#	7.0	6.3
C90	Mult. myeloma	134	73.8	1.8	1.5	2.2	#	1.8	14.2
C91-C96	Leukaemia	230	93.4	2.5	2.2	2.8	#	4.1	32.6
Other primaries		90	50.3	1.8	1.4	2.2	#	1.2	21.1
Not observed		0	0.5	0.0	0.0	7.1		-0.0	
All mult. primaries		10991	5862.9	1.9	1.8	1.9	#	154.7	8.9

Patients	91005
Mean age at second malignancy (years)	71.2
Person-years	331478
Mean observation time (years)	3.6
Median observation time (years)	2.5

The occurrence of second malignancy is statistically significant.

Observed second primaries with count 1 to 15 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 1998-2012
FEMALES

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C03-C06	Oral cavity	48	22.6	2.1	1.6	2.8	#	0.7	
C07-C08	Salivary gland	16	6.2	2.6	1.5	4.2	#	0.3	12.5
C09-C10	Oropharynx	67	15.9	4.2	3.3	5.3	#	1.4	
C12-C13	Hypopharynx	18	4.3	4.2	2.5	6.6	#	0.4	22.2
C15	Oesophagus	64	20.7	3.1	2.4	3.9	#	1.2	6.3
C16	Stomach	255	138.9	1.8	1.6	2.1	#	3.3	15.3
C17	Small intestine	66	17.0	3.9	3.0	4.9	#	1.4	4.5
C18	Colon	764	380.2	2.0	1.9	2.2	#	10.8	9.3
C19-C20	Rectum	288	166.6	1.7	1.5	1.9	#	3.4	7.3
C21	Anus/canal	41	19.9	2.1	1.5	2.8	#	0.6	2.4
C22	Liver	89	41.6	2.1	1.7	2.6	#	1.3	32.6
C23-C24	Bile	96	54.7	1.8	1.4	2.1	#	1.2	21.9
C25	Pancreas	301	159.8	1.9	1.7	2.1	#	4.0	26.2
C26	GI cancer	16	6.8	2.3	1.3	3.8	#	0.3	43.8
C32	Larynx	21	6.9	3.1	1.9	4.7	#	0.4	14.3
C33-C34	Lung	697	260.4	2.7	2.5	2.9	#	12.3	15.2
C38,C45	Mesothelioma	15	6.8	2.2	1.2	3.6	#	0.2	
C43	Malign. melanoma	351	133.2	2.6	2.4	2.9	#	6.1	1.7
C46,C49	Soft tissue	59	20.9	2.8	2.1	3.6	#	1.1	6.8
C48	Peritoneal	28	12.2	2.3	1.5	3.3	#	0.4	10.7
C50	Breast	2704	1155.7	2.3	2.3	2.4	#	43.7	3.1
C51	Vulva	76	35.7	2.1	1.7	2.7	#	1.1	5.3
C52	Vagina	21	7.2	2.9	1.8	4.5	#	0.4	4.8
C53	Cervix uteri	114	54.4	2.1	1.7	2.5	#	1.7	19.3
C54	Corpus uteri	429	208.4	2.1	1.9	2.3	#	6.2	4.7
C56	Ovary	434	158.1	2.7	2.5	3.0	#	7.8	18.9
C64	Kidney	249	92.5	2.7	2.4	3.0	#	4.4	11.6
C65	Renal pelvis	47	11.0	4.3	3.1	5.7	#	1.0	2.1
C66	Ureter	23	5.3	4.3	2.7	6.5	#	0.5	
C67	Bladder	154	69.3	2.2	1.9	2.6	#	2.4	11.0
C70-C72	CNS cancer	93	53.4	1.7	1.4	2.1	#	1.1	29.0
C73	Thyroid	159	71.8	2.2	1.9	2.6	#	2.5	5.7
C76-C79	CUP	78	66.3	1.2	0.9	1.5		0.3	6.4
C81	Hodgkin lymphoma	15	7.3	2.1	1.1	3.4	#	0.2	13.3
C82-C85	NHL	295	143.2	2.1	1.8	2.3	#	4.3	8.5
C90	Mult. myeloma	66	45.7	1.4	1.1	1.8	#	0.6	21.2
C91-C96	Leukaemia	186	58.7	3.2	2.7	3.7	#	3.6	22.0
Other primaries		93	50.7	1.8	1.5	2.2	#	1.2	19.4
Not observed		0	0.0	0.0	0.0	1830		-0.0	
All mult. primaries		8536	3790.6	2.3	2.2	2.3	#	133.8	9.4

Patients	89098
Mean age at second malignancy (years)	69.7
Person-years	354637
Mean observation time (years)	4.0
Median observation time (years)	2.9

The occurrence of second malignancy is statistically significant.

Observed second malignancies with count 1 to 13 are pooled in category "Other primaries".

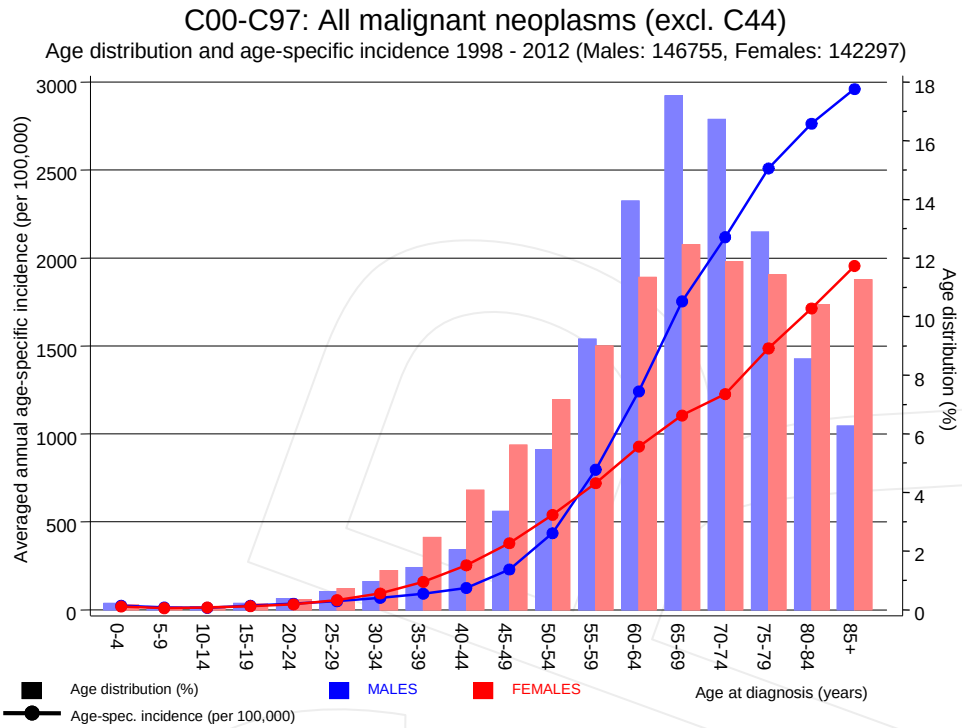


Figure 7. Age distribution and age-specific incidence

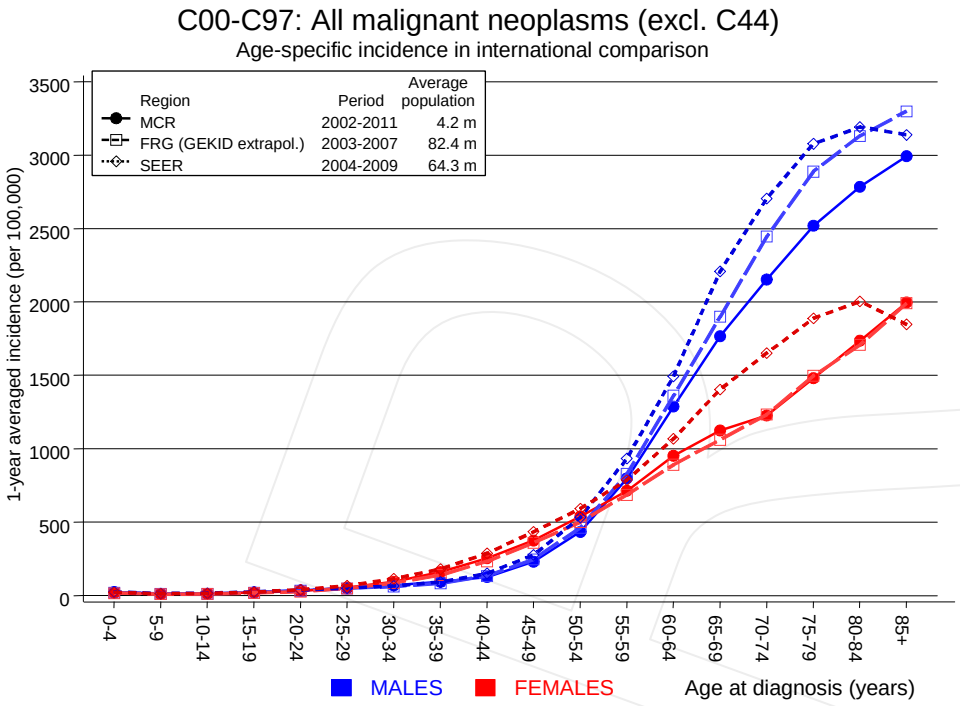


Figure 7a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).

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, 2011. http://www.gekid.de. Last access: 05/12/2011

Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 18 Regs Research Data, released April 2012, based on the November 2011 submission. http://www.seer.cancer.gov.

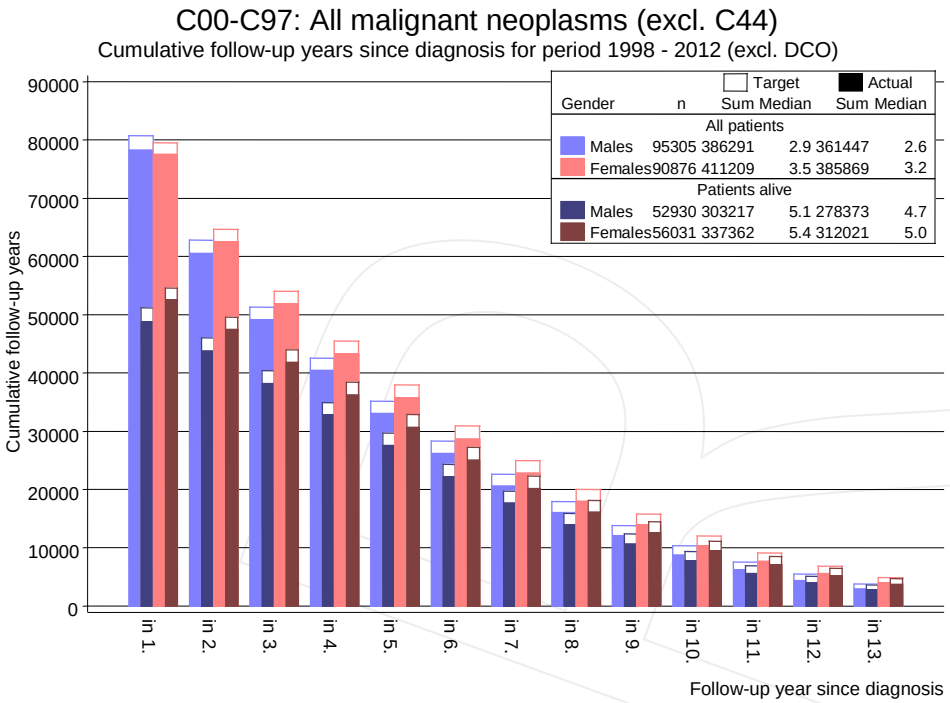
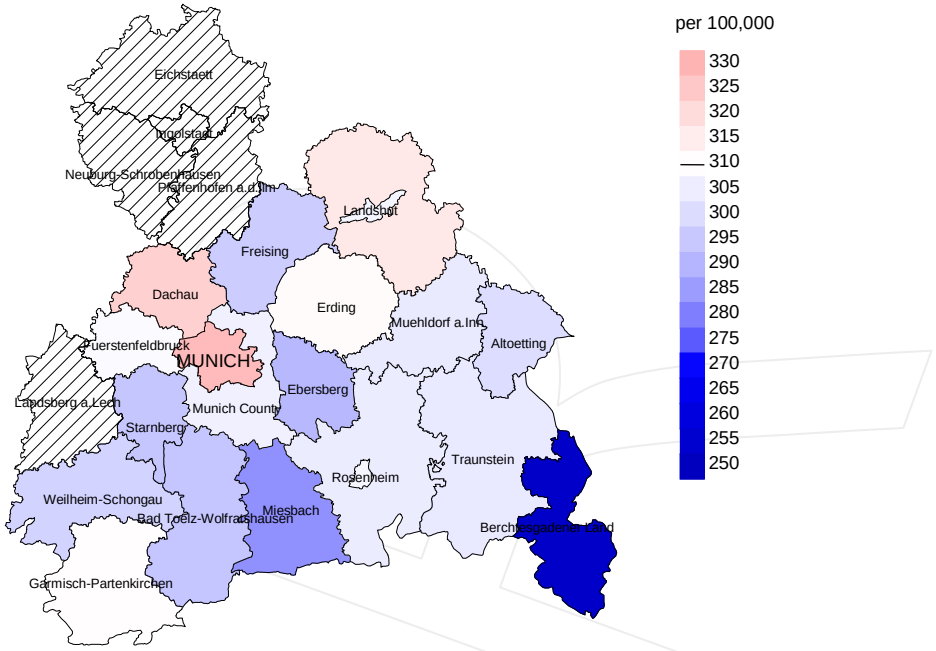


Figure 8. Cumulative follow-up years depending on time since diagnosis

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) 2003 - 2008: Males



Average incidence (world standard population) 2003 - 2008: Females

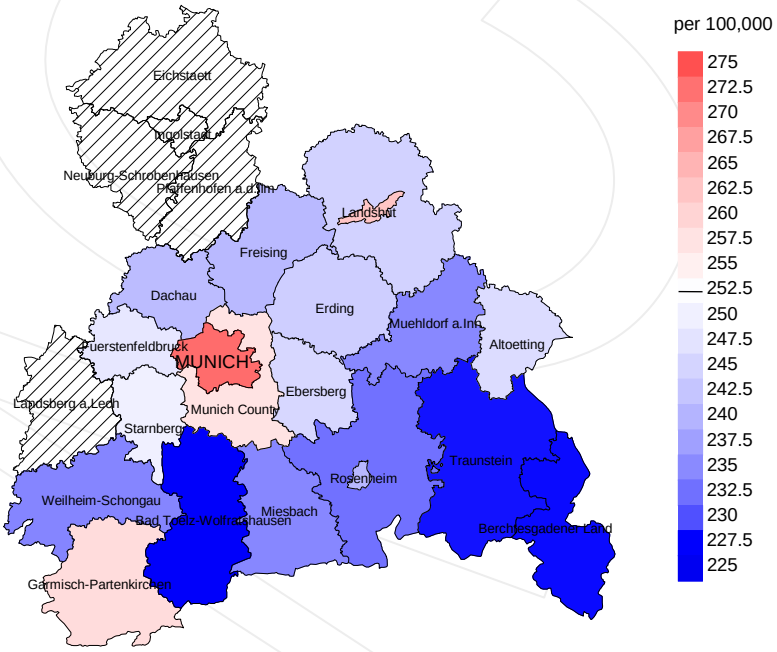
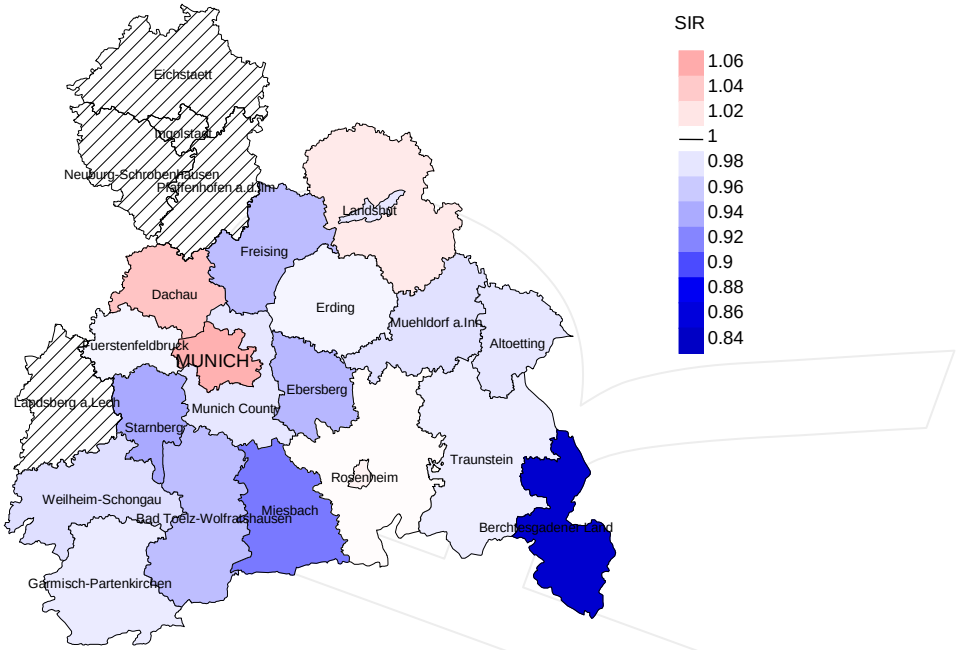


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 310.0/100,000 WS N=64,147, females 252.5/100,000 WS N=60,598). Since cancer data are not available in some counties until 2007, the local incidence rates were not calculated, and the map tiles show as shaded.

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 63,131 female residents (averaged) in the period from 2003 to 2008 a total of 1,721 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 245.6/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 228.9 and 263.6/100,000.

Standardized incidence ratio (SIR) 2003 - 2008: Males



Standardized incidence ratio (SIR) 2003 - 2008: Females

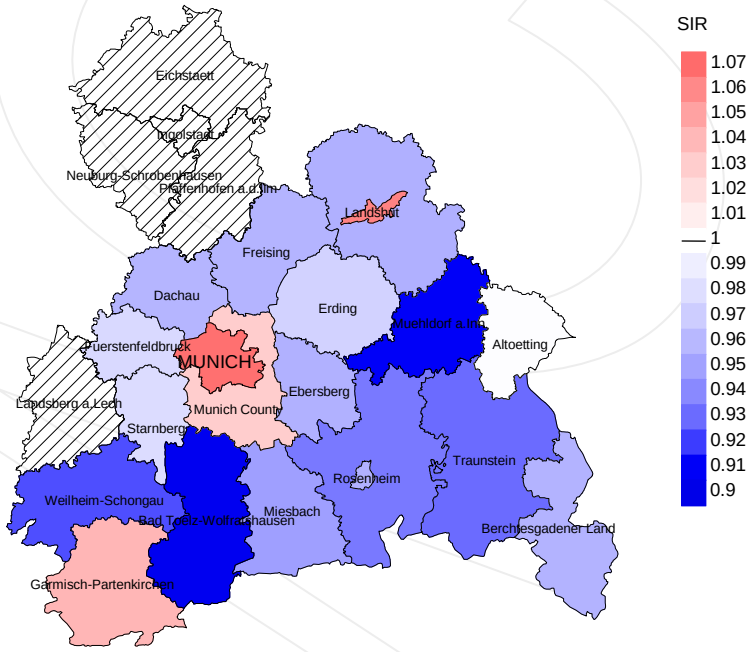


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=64,147, females N=60,598). Since cancer data are not available in some counties until 2007, the local SIR values were not calculated, and the map tiles show as shaded.

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 63,131 female residents (averaged) in the period from 2003 to 2008 a total of 1,721 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 0.96. Though, the value of this parameter may vary with an underlying probability of 99% between 0.90 and 1.02, 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 4.52 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	12212	98.0	10.9	8461	69.3	93.9
1999	12154	97.9	10.3	8112	66.7	94.7
2000	12153	98.2	11.5	7857	64.7	95.8
2001	12591	97.6	11.2	7860	62.4	96.0
2002	21684	97.8	14.5	13753	63.4	97.4
2003	21189	97.4	12.4	12807	60.4	97.6
2004	21376	97.1	11.4	12323	57.6	97.9
2005	21319	96.2	10.1	11788	55.3	98.2
2006	21394	94.2	8.7	11266	52.7	98.6
2007	24645	83.7	9.2	12487	50.7	98.5
2008	24937	69.8	8.4	11911	47.8	98.6
2009	24468	69.2	8.0	10975	44.9	98.6
2010	24035	68.7	8.4	10024	41.7	98.4
2011	23820	72.8	8.1	8789	36.9	97.9
2012	20252	97.1	9.3	5764	28.5	96.4
1998-2012	298229	87.1	10.0	154177	51.7	97.4

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 4.52 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	12212	6514	92.0	2680	21.9
1999	12154	6604	92.1	2569	21.1
2000	12153	6603	94.1	2521	20.7
2001	12591	6800	93.9	2598	20.6
2002	21684	9824	97.1	5205	24.0
2003	21189	10378	97.2	4716	22.3
2004	21376	10575	97.5	4511	21.1
2005	21319	10778	97.0	4371	20.5
2006	21394	11144	97.4	4263	19.9
2007	24645	12224	98.0	4901	19.9
2008	24937	12558	98.6	4893	19.6
2009	24468	12820	98.6	4666	19.1
2010	24035	13260	98.7	4801	20.0
2011	23820	13503	98.9	4866	20.4
2012	20252	13045	98.9	4331	21.4
1998-2012	298229	156630	97.2	61892	20.8

Table 10c

Annual cohorts of deaths, proportion of cancer-related and not 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 4.52 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. not cancer-related %	Prop. cancer recorded on death certificate %
1998	6514	72.6	27.4	89.0
1999	6604	76.7	23.3	89.2
2000	6603	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	10575	80.1	19.9	88.2
2005	10778	78.5	21.5	86.5
2006	11144	78.0	22.0	86.4
2007	12224	78.1	21.9	86.0
2008	12558	77.5	22.5	84.6
2009	12820	76.5	23.5	84.3
2010	13260	76.3	23.7	84.2
2011	13503	75.1	24.9	83.2
2012	13045	74.2	25.8	82.2
1998-2012	156630	77.0	23.0	86.0

Table 11a

Means 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 (not cancer-related) Years	Age at death (according to death certificate) Years
1998	3270	71.1	69.2	76.1	70.7
1999	3401	71.0	69.3	76.5	70.4
2000	3351	71.4	69.7	77.2	70.8
2001	3453	71.0	69.3	76.5	70.5
2002	5024	71.6	70.1	77.2	70.8
2003	5345	71.7	70.2	77.8	70.9
2004	5392	72.1	70.4	78.7	71.2
2005	5530	72.3	70.5	79.1	71.2
2006	5838	72.4	70.7	78.3	71.5
2007	6450	72.6	71.0	78.5	71.7
2008	6622	73.1	71.2	79.9	71.8
2009	6791	73.3	71.3	79.7	72.0
2010	6978	73.5	71.7	79.5	72.4
2011	7149	73.8	71.9	79.8	72.6
2012	6893	74.3	72.3	80.2	73.0
1998-2012	81487	72.6	70.8	78.7	71.6

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

Means 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 (not cancer-related) Years	Age at death (according to death certificate) Years
1998	3244	74.3	72.1	80.2	74.4
1999	3203	74.5	72.5	80.8	74.3
2000	3252	74.2	72.1	81.6	73.5
2001	3347	74.9	72.3	82.3	74.1
2002	4800	74.7	72.5	82.8	73.8
2003	5033	74.5	72.1	82.8	73.3
2004	5183	74.8	72.7	82.9	73.7
2005	5248	75.0	72.5	83.8	73.5
2006	5306	75.4	73.1	83.1	74.0
2007	5774	75.3	72.9	83.5	73.9
2008	5936	75.6	72.9	84.3	74.0
2009	6029	75.5	72.7	84.3	73.8
2010	6282	75.8	73.2	84.3	74.2
2011	6354	76.0	73.2	84.2	74.2
2012	6152	76.3	73.4	84.6	74.3
1998-2012	75143	75.2	72.8	83.3	73.9

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	267.9	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	0.38	188.9	0.40	252.3	0.42
2004	4329	230.1	0.40	121.6	0.38	187.2	0.40	251.6	0.43
2005	4382	231.3	0.41	119.1	0.38	182.4	0.41	246.7	0.44
2006	4583	239.3	0.43	121.8	0.40	186.8	0.42	249.7	0.45
2007	5117	231.0	0.41	115.3	0.37	177.7	0.40	239.4	0.43
2008	5203	233.8	0.43	114.5	0.39	176.0	0.41	236.9	0.44
2009	5223	234.0	0.44	112.7	0.40	172.5	0.42	230.1	0.45
2010	5339	236.9	0.46	111.3	0.41	170.9	0.44	229.5	0.47
2011	5440	238.1	0.47	110.6	0.42	169.9	0.45	226.7	0.48
2012	5119	224.1	0.54	102.8	0.48	158.5	0.51	213.8	0.55
1998-2012	63221	230.3	0.43	117.3	0.40	180.2	0.42	241.3	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	2372	201.6	0.39	86.7	0.33	129.6	0.35	168.4	0.38
1999	2449	206.4	0.41	86.8	0.33	130.7	0.36	171.7	0.39
2000	2547	212.0	0.44	90.0	0.36	134.9	0.38	174.4	0.41
2001	2467	202.8	0.41	86.2	0.33	129.4	0.36	168.0	0.39
2002	3765	192.3	0.37	79.9	0.31	119.6	0.33	154.9	0.35
2003	3893	197.6	0.39	83.6	0.33	124.9	0.35	160.4	0.38
2004	4152	210.0	0.42	85.6	0.33	128.3	0.36	167.2	0.39
2005	4094	205.7	0.41	84.6	0.34	126.2	0.36	162.1	0.38
2006	4123	205.2	0.41	81.6	0.33	122.8	0.35	160.8	0.39
2007	4458	193.1	0.39	77.5	0.31	116.3	0.34	150.8	0.37
2008	4547	195.9	0.38	77.9	0.30	116.7	0.33	151.1	0.36
2009	4598	197.7	0.39	78.7	0.31	117.5	0.33	151.6	0.36
2010	4793	204.8	0.41	79.3	0.32	118.8	0.35	154.7	0.38
2011	4726	200.3	0.41	77.8	0.33	116.2	0.35	150.1	0.38
2012	4574	193.8	0.46	74.6	0.36	112.2	0.39	145.3	0.42
1998-2012	57558	200.6	0.40	81.0	0.33	121.3	0.35	157.2	0.38

Table 13

Age distribution of age at death (cancer-related) for period 1998-2012
(**incl. multiple primaries**)

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	54	0.0	0.0	31	0.0	0.0	23	0.0	0.0
5-9	74	0.1	0.1	35	0.0	0.1	39	0.1	0.1
10-14	61	0.0	0.1	33	0.0	0.1	28	0.0	0.1
15-19	76	0.1	0.2	42	0.1	0.2	34	0.1	0.2
20-24	130	0.1	0.3	83	0.1	0.3	47	0.1	0.3
25-29	205	0.1	0.4	96	0.1	0.4	109	0.2	0.4
30-34	389	0.3	0.7	176	0.2	0.7	213	0.3	0.7
35-39	881	0.6	1.3	384	0.5	1.2	497	0.7	1.5
40-44	1881	1.3	2.7	810	1.1	2.3	1071	1.6	3.1
45-49	3574	2.5	5.2	1695	2.3	4.6	1879	2.8	5.9
50-54	5946	4.2	9.4	3069	4.1	8.7	2877	4.3	10.2
55-59	9988	7.1	16.5	5541	7.5	16.2	4447	6.6	16.8
60-64	14385	10.2	26.7	8341	11.3	27.5	6044	9.0	25.9
65-69	18931	13.4	40.2	11242	15.2	42.7	7689	11.5	37.4
70-74	21360	15.2	55.3	12363	16.7	59.4	8997	13.4	50.8
75-79	21966	15.6	70.9	12099	16.4	75.8	9867	14.7	65.6
80-84	20355	14.4	85.4	9903	13.4	89.1	10452	15.6	81.2
85+	20615	14.6	100.0	8028	10.9	100.0	12587	18.8	100.0
All ages	140871	100.0		73971	100.0		66900	100.0	

Included in the statistics are 21.9% multiple primaries in males and 19.3% in females.

Table 14

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2012
(**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	31	23	2.3	0.10	1.8	0.10	100.0	100.0
5- 9	35	39	2.5	0.21	3.0	0.34	100.0	100.0
10-14	33	28	2.3	0.22	2.1	0.17	100.0	100.0
15-19	42	34	2.9	0.13	2.5	0.13	100.0	100.0
20-24	83	47	5.1	0.15	2.9	0.10	100.0	100.0
25-29	96	109	5.2	0.11	5.8	0.11	100.0	100.0
30-34	176	213	8.3	0.12	10.4	0.11	100.0	100.0
35-39	384	497	16.4	0.18	22.4	0.14	100.0	100.0
40-44	810	1071	33.4	0.27	46.5	0.18	100.0	100.0
45-49	1695	1879	78.7	0.34	88.8	0.23	100.0	100.0
50-54	3069	2877	166.0	0.37	152.3	0.28	100.0	100.0
55-59	5541	4447	326.0	0.40	249.6	0.34	100.0	100.0
60-64	8341	6044	506.2	0.40	347.3	0.36	100.0	100.0
65-69	11242	7689	766.2	0.42	479.4	0.42	100.0	100.0
70-74	12363	8997	1066.9	0.48	652.5	0.52	100.0	100.0
75-79	12099	9867	1605.8	0.61	902.0	0.59	100.0	100.0
80-84	9903	10452	2180.8	0.75	1210.3	0.68	100.0	100.0
85+	8028	12587	2588.6	0.84	1536.7	0.76	100.0	100.0
All ages	73971	66900					100.0	100.0
Mortality								
Raw			269.5	0.49	233.1	0.46		
WS			135.9	0.45	93.4	0.37		
ES			210.0	0.48	140.3	0.39		
BRD-S			283.7	0.51	182.5	0.43		
PYLL-70								
per 100,000			1249.5		1143.3			
ES			1115.8		996.3			
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 1998-2012
MALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03-C06 Oral cavity	199	1.3			11	5.5	188	94.5
C09-C10 Oropharynx	227	1.5			30	13.2	197	86.8
C12-C13 Hypopharynx	151	1.0			22	14.6	129	85.4
C15 Oesophagus	385	2.5			32	8.3	353	91.7
C16 Stomach	598	3.8			54	9.0	544	91.0
C18 Colon	1168	7.5			182	15.6	986	84.4
C19-C20 Rectum	642	4.1			127	19.8	515	80.2
C22 Liver	443	2.8			50	11.3	393	88.7
C23-C24 Bile	153	1.0			13	8.5	140	91.5
C25 Pancreas	677	4.3			58	8.6	619	91.4
C32 Larynx	190	1.2			20	10.5	170	89.5
C33-C34 Lung	2557	16.4			251	9.8	2306	90.2
C38,C45 Mesothelioma	108	0.7			4	3.7	104	96.3
C43 Malign. melanoma	431	2.8			48	11.1	383	88.9
C44 Skin others	1336	8.6	487	36.5	121	9.1	728	54.5
C61 Prostate	1732	11.1			280	16.2	1452	83.8
C64 Kidney	502	3.2			117	23.3	385	76.7
C65 Renal pelvis	170	1.1			18	10.6	152	89.4
C66 Ureter	119	0.8			21	17.6	98	82.4
C67 Bladder	1135	7.3			226	19.9	909	80.1
C70-C72 CNS cancer	313	2.0			33	10.5	280	89.5
C76-C79 CUP	318	2.0			48	15.1	270	84.9
C82-C85 NHL	559	3.6			125	22.4	434	77.6
C90 Mult. myeloma	233	1.5			35	15.0	198	85.0
C91-C96 Leukaemia	582	3.7			96	16.5	486	83.5
Other primaries	670	4.3			65	9.7	605	90.3
All mult. primaries	15598	100.0	487	3.1	2087	13.4	13024	83.5

Multiple primaries with number of cases n<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 1998-2012
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C15	Oesophagus	126	1.0			5	4.0	121	96.0
C16	Stomach	484	3.8			37	7.6	447	92.4
C18	Colon	1014	8.0			118	11.6	896	88.4
C19-C20	Rectum	426	3.4			67	15.7	359	84.3
C22	Liver	159	1.3			15	9.4	144	90.6
C23-C24	Bile	175	1.4			15	8.6	160	91.4
C25	Pancreas	638	5.0			47	7.4	591	92.6
C33-C34	Lung	1274	10.0			79	6.2	1195	93.8
C43	Malign. melanoma	270	2.1			24	8.9	246	91.1
C44	Skin others	614	4.8	237	38.6	61	9.9	316	51.5
C50	Breast	2815	22.2			666	23.7	2149	76.3
C51	Vulva	113	0.9			9	8.0	104	92.0
C53	Cervix uteri	170	1.3			35	20.6	135	79.4
C54	Corpus uteri	382	3.0			56	14.7	326	85.3
C56	Ovary	746	5.9			164	22.0	582	78.0
C64	Kidney	257	2.0			63	24.5	194	75.5
C67	Bladder	418	3.3			36	8.6	382	91.4
C70-C72	CNS cancer	306	2.4			44	14.4	262	85.6
C76-C79	CUP	219	1.7			30	13.7	189	86.3
C82-C85	NHL	396	3.1			66	16.7	330	83.3
C90	Mult. myeloma	188	1.5			15	8.0	173	92.0
C91-C96	Leukaemia	491	3.9			75	15.3	416	84.7
Other primaries		1022	8.0			129	12.6	893	87.4
All mult. primaries		12703	100.0	237	1.9	1856	14.6	10610	83.5

Multiple primaries with number of cases n<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 1998-2012
(**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	26	23	1.9	0.09	1.8	0.10	100.0	100.0
5- 9	33	36	2.4	0.20	2.7	0.32	100.0	100.0
10-14	33	26	2.3	0.23	1.9	0.17	100.0	100.0
15-19	39	31	2.7	0.13	2.3	0.12	100.0	100.0
20-24	78	43	4.8	0.15	2.6	0.09	100.0	100.0
25-29	90	103	4.9	0.11	5.5	0.10	100.0	100.0
30-34	172	187	8.1	0.13	9.1	0.10	100.0	100.0
35-39	359	449	15.4	0.18	20.3	0.14	100.0	100.0
40-44	749	934	30.9	0.26	40.6	0.17	100.0	100.0
45-49	1534	1625	71.2	0.33	76.8	0.22	100.0	100.0
50-54	2685	2420	145.3	0.37	128.1	0.27	100.0	100.0
55-59	4798	3758	282.3	0.39	210.9	0.34	100.0	100.0
60-64	7030	4957	426.6	0.39	284.9	0.36	100.0	100.0
65-69	9112	6235	621.0	0.41	388.8	0.42	100.0	100.0
70-74	9804	7168	846.1	0.49	519.8	0.52	100.0	100.0
75-79	9225	7916	1224.3	0.62	723.6	0.60	100.0	100.0
80-84	7430	8306	1636.2	0.77	961.8	0.68	100.0	100.0
85+	6129	10178	1976.3	0.85	1242.6	0.76	100.0	100.0
All ages	59326	54395					100.0	100.0
Mortality								
Raw			216.1	0.48	189.5	0.45		
WS			110.7	0.43	76.9	0.35		
ES			169.4	0.46	115.0	0.38		
BRD-S			225.8	0.50	148.8	0.42		
PYLL-70								
per 100,000			1093.9		974.9			
ES			978.7		852.3			
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 1998-2012
(**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	25	23	1.8	0.09	1.8	0.10	100.0	100.0
5- 9	32	35	2.3	0.20	2.7	0.32	100.0	100.0
10-14	33	24	2.3	0.24	1.8	0.16	100.0	100.0
15-19	39	26	2.7	0.13	1.9	0.10	100.0	100.0
20-24	73	40	4.5	0.14	2.4	0.09	100.0	100.0
25-29	84	97	4.5	0.10	5.2	0.10	100.0	100.0
30-34	167	169	7.9	0.13	8.2	0.10	100.0	100.0
35-39	343	411	14.7	0.18	18.5	0.13	100.0	100.0
40-44	711	858	29.3	0.26	37.3	0.17	100.0	100.0
45-49	1435	1457	66.6	0.33	68.9	0.21	100.0	100.0
50-54	2442	2175	132.1	0.36	115.2	0.26	100.0	100.0
55-59	4363	3351	256.7	0.39	188.1	0.33	100.0	100.0
60-64	6213	4319	377.0	0.38	248.2	0.34	100.0	100.0
65-69	7875	5310	536.7	0.40	331.1	0.39	100.0	100.0
70-74	8223	6048	709.6	0.46	438.6	0.48	100.0	100.0
75-79	7461	6666	990.2	0.56	609.4	0.54	100.0	100.0
80-84	5909	6969	1301.2	0.67	807.0	0.61	100.0	100.0
85+	4953	8774	1597.1	0.73	1071.2	0.67	100.0	100.0
All ages	50381	46752					100.0	100.0
Mortality								
Raw			183.5	0.45	162.9	0.41		
WS			95.4	0.41	66.8	0.33		
ES			144.6	0.43	99.6	0.36		
BRD-S			190.4	0.46	128.1	0.39		
PYLL-70								
per 100,000			999.0		872.7			
ES			895.4		764.7			
AYLL-70			10.4		11.7			

* See corresponding tables with multiple primaries.

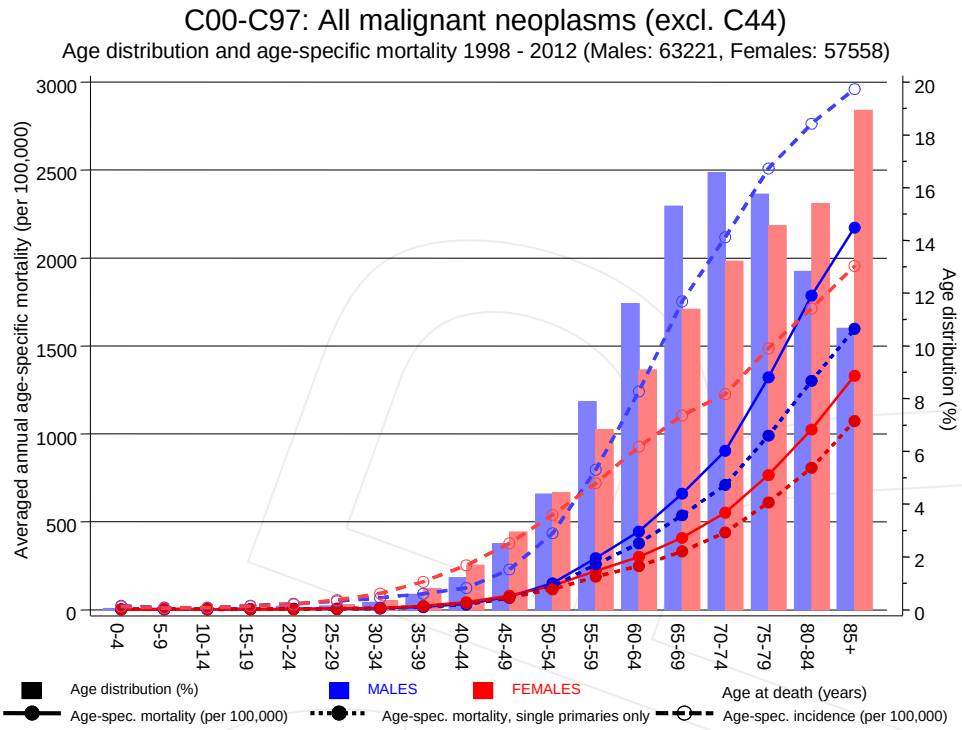
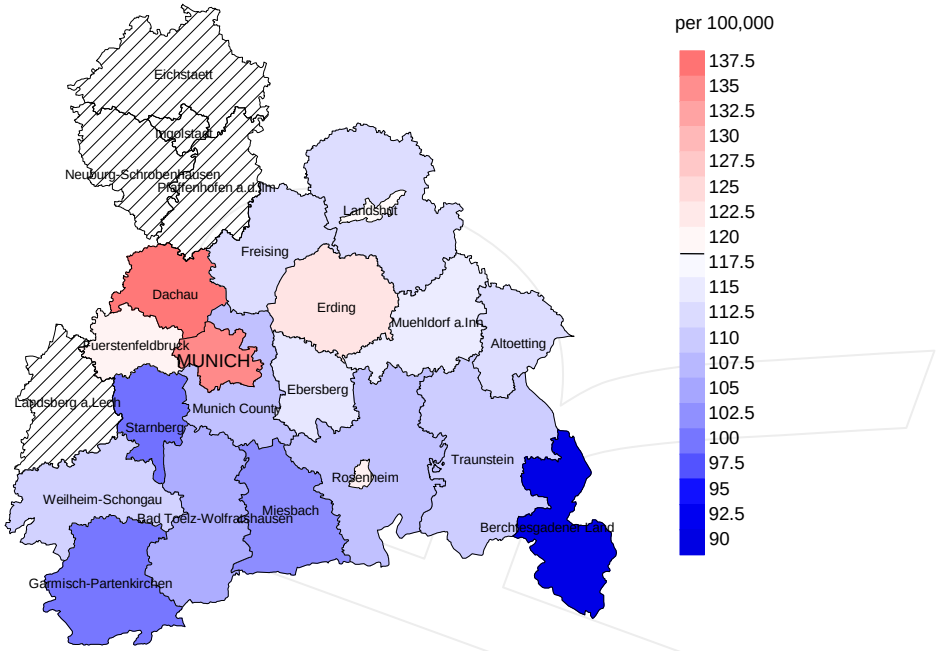


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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) 2003 - 2008: Males



Average mortality (world standard population) 2003 - 2008: Females

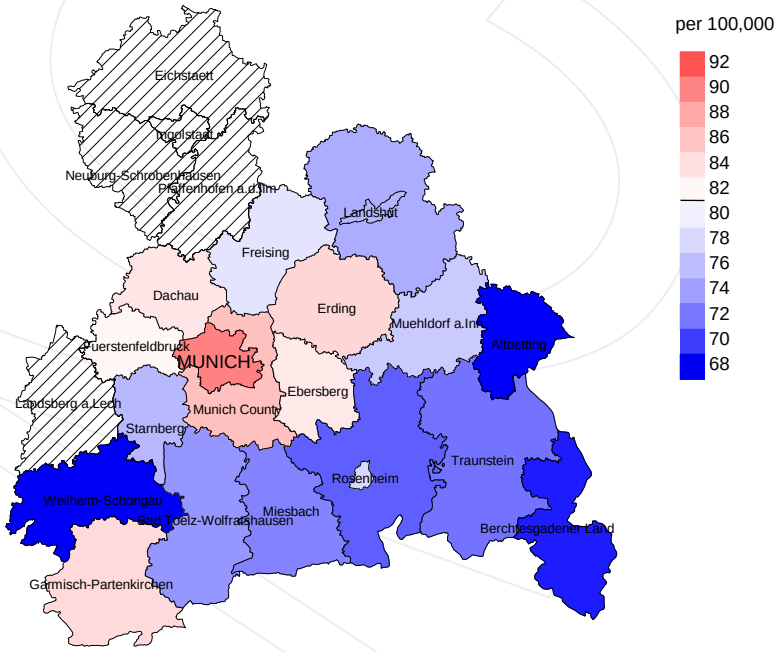
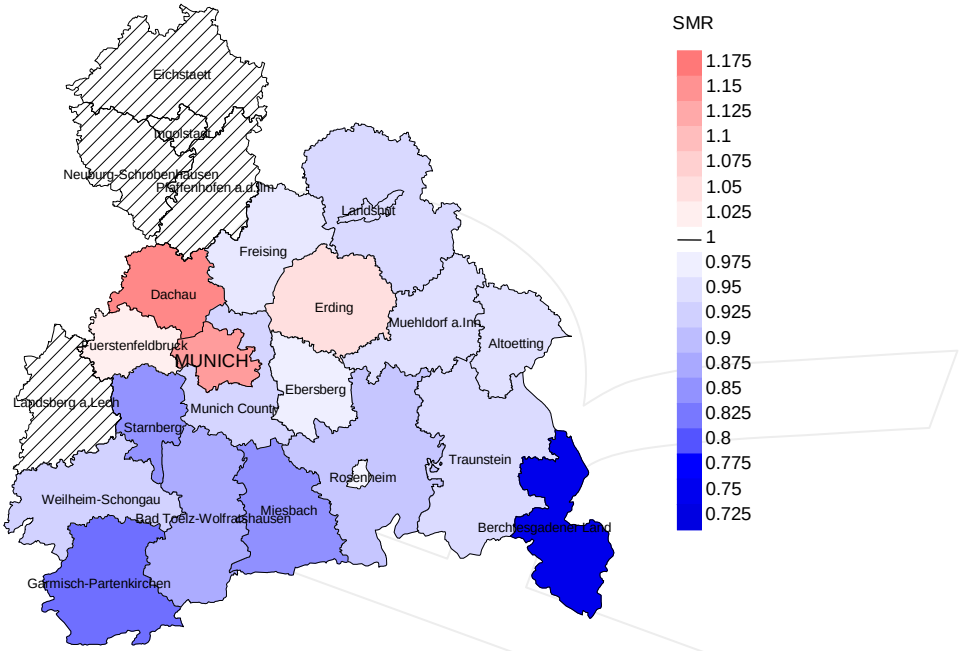


Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2003 to 2008. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 118.6/100,000 WS N=26,668, females 81.3/100,000 WS N=24,215). Since cancer data are not available in some counties until 2007, the local mortality rates were not calculated, and the map tiles show as shaded.

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 63,131 female residents (averaged) in the period from 2003 to 2008 a total of 729 women died from all cancers (excl. C44). Therefore, the mean mortality rate for this cancer type in this area can be calculated at 83.3/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 74.7 and 93.0/100,000.

Standardized mortality ratio (SMR) 2003 - 2008: Males



Standardized mortality ratio (SMR) 2003 - 2008: Females

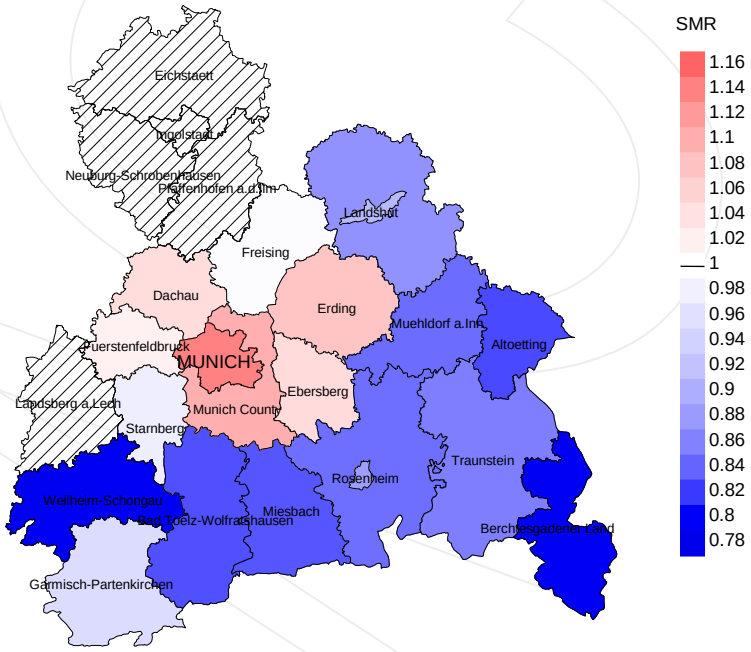


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=26,668, females N=24,215). Since cancer data are not available in some counties until 2007, the local SMR values were not calculated, and the map tiles show as shaded.

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 63,131 female residents (averaged) in the period from 2003 to 2008 a total of 729 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 1.05. Though, the value of this parameter may vary with an underlying probability of 99% between 0.95 and 1.15, 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 tumor-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

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)
FRG	Federal Republic of Germany
GEKID	Association of Population-based Cancer Registries in Germany (Gesellschaft der epidemiologischen Krebsregister in Deutschland e.V.)
LCL	Lower confidence limit
MI-index	Ratio between mortality and incidence
MCR	Munich Cancer Registry (Tumorregister München)
PYLL-70	Potential years of life lost prior to age 70 given a person dies before that age
SEER	Surveillance, Epidemiology, and End Results (USA)
SIR	Standardized incidence ratio
SMR	Standardized mortality ratio
UCL	Upper confidence limit
WS	World standard population

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