Munich Cancer Registry

Munich Cancer Registry at Munich Cancer Center
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http://www.tumorregister-muenchen.de/en

Cancer statistics: Baseline statistics

C43: Malignant melanoma

Year of diagnosis	1998-2011
Patients	11489
Diseases	11948
Creation date	04/02/2013
Export date	01/03/2013
Population	4.5 m

**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, April 2013

[#]   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 2011 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	470	10	2.1	30.4	37.0	97.4	
1999	460	9	2.0	32.0	30.4	97.0	
2000	505	7	1.4	31.3	32.9	97.8	
2001	520	8	1.5	32.3	32.1	97.7	
2002	874	14	1.6	28.8	28.6	96.8	
2003	797	17	2.1	26.0	27.9	95.5	
2004	885	24	2.7	28.8	29.6	96.6	
2005	882	12	1.4	27.8	25.9	94.1	
2006	902	14	1.6	28.6	25.3	89.1	
2007	1013	16	1.6	27.7	19.8	65.5	##
2008	1147	21	1.8	29.4	19.7	51.9	
2009	1114	22	2.0	30.7	15.7	48.1	
2010	1230	21	1.7	27.7	11.0	94.5	
2011	1149	22	1.9	26.7	6.3	77.9	###
1998-2011	11948	217	1.8	28.8	22.1	82.5	

\#   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	470	237	233	50.4
1999	460	215	245	46.7
2000	505	275	230	54.5
2001	520	266	254	51.2
2002	874	460	414	52.6
2003	797	392	405	49.2
2004	885	443	442	50.1
2005	882	464	418	52.6
2006	902	461	441	51.1
2007	1013	516	497	50.9
2008	1147	617	530	53.8
2009	1114	616	498	55.3
2010	1230	652	578	53.0
2011	1149	616	533	53.6
1998-2011	11948	6230	5718	52.1

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	237	233	21.4	19.8	14.7	12.1	19.2	15.7	22.4	17.8
1999	215	245	19.2	20.6	13.1	13.3	17.1	16.8	19.8	19.0
2000	275	230	24.1	19.1	15.7	12.8	21.1	15.8	24.6	17.9
2001	266	254	23.0	20.9	14.6	13.3	19.8	17.0	23.3	19.0
2002	460	414	24.7	21.1	15.7	13.5	21.2	17.0	24.4	19.0
2003	392	405	20.9	20.6	13.1	13.2	17.6	16.6	20.8	18.2
2004	443	442	23.5	22.4	14.5	13.9	19.6	17.7	23.8	20.0
2005	464	418	24.5	21.0	15.1	13.0	20.5	16.9	24.0	18.9
2006	461	441	24.1	22.0	14.3	13.1	19.7	16.9	23.7	19.2
2007	516	497	23.3	21.5	13.7	13.1	19.0	16.9	22.8	19.0
2008	617	530	27.7	22.8	16.3	13.3	22.2	17.4	26.0	19.7
2009	616	498	27.6	21.4	15.3	12.4	21.3	16.2	25.7	18.5
2010	652	578	28.9	24.7	16.6	15.0	22.7	19.3	27.3	21.6
2011	616	533	27.3	22.8	15.6	14.2	21.5	17.9	25.8	20.1
1998–2011	6230	5718	24.8	21.7	15.1	13.4	20.5	17.2	24.4	19.3

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	470	57.5	16.8	17.2	96.2	33.5	46.9	58.8	70.0	78.6
1999	460	56.6	17.4	9.1	93.5	32.3	42.4	57.9	70.1	79.2
2000	505	56.6	17.2	15.6	98.4	33.3	43.0	58.4	69.3	78.9
2001	520	57.7	16.8	21.1	94.3	33.6	44.2	59.6	69.7	79.6
2002	874	58.4	17.4	7.6	99.0	34.1	44.6	60.6	71.5	80.6
2003	797	58.5	16.6	8.1	97.6	36.1	45.6	60.8	70.4	80.3
2004	885	59.4	16.6	15.6	95.6	36.5	46.3	61.6	72.3	80.5
2005	882	59.8	16.2	11.4	96.6	36.8	48.6	62.1	71.0	79.9
2006	902	61.4	16.5	3.1	102	38.5	49.1	64.0	73.3	82.2
2007	1013	60.8	16.8	14.6	99.9	37.7	48.2	63.1	73.1	81.7
2008	1147	61.5	16.0	14.1	99.3	39.3	49.5	64.5	72.8	80.6
2009	1114	62.6	15.5	17.8	101	40.6	50.4	65.6	73.8	81.0
2010	1230	61.1	16.4	4.9	98.5	38.4	49.0	63.9	73.2	81.4
2011	1149	60.7	16.5	9.1	96.9	38.2	48.0	62.5	73.3	80.6
1998-2011	11948	60.0	16.6	3.1	102	36.5	47.7	62.1	72.3	80.6

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	237	56.6	16.1	17.2	93.0	32.6	47.0	58.8	68.3	76.2
1999	215	56.9	16.3	9.1	89.6	33.4	44.5	58.6	68.5	78.4
2000	275	58.3	15.4	15.6	92.3	34.7	50.2	59.8	69.2	77.3
2001	266	58.7	15.6	23.6	92.1	34.6	46.9	60.8	68.6	79.2
2002	460	60.0	15.4	7.6	98.4	37.0	50.0	63.2	70.8	77.2
2003	392	59.9	15.2	11.9	91.5	37.6	49.9	62.8	71.1	78.1
2004	443	60.7	15.7	15.6	94.1	38.1	49.8	63.2	73.5	80.5
2005	464	61.0	15.1	17.4	96.6	38.6	50.8	63.2	71.1	78.6
2006	461	62.5	15.4	3.1	95.4	39.8	52.5	65.2	73.2	79.8
2007	516	62.0	15.4	14.6	98.8	40.2	50.3	64.3	73.3	81.3
2008	617	62.3	14.5	14.1	93.5	41.9	53.1	65.4	72.0	78.5
2009	616	63.9	14.1	17.8	96.0	42.9	53.8	67.0	74.0	80.3
2010	652	63.3	15.4	4.9	98.5	41.4	53.2	66.3	74.1	80.9
2011	616	63.1	14.9	17.6	96.9	41.4	53.6	66.3	73.7	80.6
1998-2011	6230	61.4	15.3	3.1	98.8	39.0	51.3	63.9	72.3	79.5

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	233	58.5	17.5	18.0	96.2	33.7	46.8	58.8	71.3	81.7
1999	245	56.4	18.4	19.9	93.5	32.0	40.6	56.7	71.3	79.9
2000	230	54.5	19.0	18.3	98.4	30.4	37.9	52.1	70.4	81.9
2001	254	56.8	18.0	21.1	94.3	33.0	41.8	57.5	71.1	80.9
2002	414	56.7	19.3	17.4	99.0	31.8	39.3	56.4	72.4	84.2
2003	405	57.1	17.8	8.1	97.6	35.1	41.8	58.4	69.6	81.7
2004	442	58.0	17.3	18.8	95.6	36.2	43.7	59.6	71.8	80.2
2005	418	58.6	17.2	11.4	96.1	34.9	45.2	59.0	70.8	81.6
2006	441	60.2	17.6	14.1	102	36.1	47.0	62.0	73.5	83.7
2007	497	59.5	18.0	14.9	99.9	34.6	45.4	61.1	72.9	83.3
2008	530	60.5	17.5	14.5	99.3	37.6	45.8	63.3	73.7	83.3
2009	498	60.9	16.9	18.0	101	38.5	46.9	63.2	73.6	82.7
2010	578	58.7	17.2	15.1	94.1	36.2	45.2	59.5	72.0	81.8
2011	533	57.9	17.8	9.1	95.6	33.9	44.2	57.2	72.9	80.6
1998-2011	5718	58.5	17.8	8.1	102	34.6	44.3	59.3	72.2	82.2

Table 4

Age distribution by 5-year age group and gender for period 1998-2011
(incl. DCO)

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	2	0.0	0.0	2	0.0	0.0			0.0
5-9	5	0.0	0.1	3	0.0	0.1	2	0.0	0.0
10-14	9	0.1	0.1	5	0.1	0.2	4	0.1	0.1
15-19	51	0.4	0.6	25	0.4	0.6	26	0.5	0.6
20-24	148	1.2	1.8	57	0.9	1.5	91	1.6	2.2
25-29	302	2.5	4.3	99	1.6	3.1	203	3.6	5.7
30-34	481	4.0	8.4	202	3.2	6.3	279	4.9	10.6
35-39	718	6.0	14.4	304	4.9	11.2	414	7.2	17.8
40-44	824	6.9	21.3	345	5.5	16.7	479	8.4	26.2
45-49	889	7.4	28.7	411	6.6	23.3	478	8.4	34.6
50-54	905	7.6	36.3	439	7.0	30.4	466	8.1	42.7
55-59	1097	9.2	45.5	617	9.9	40.3	480	8.4	51.1
60-64	1341	11.2	56.7	805	12.9	53.2	536	9.4	60.5
65-69	1555	13.0	69.7	956	15.3	68.5	599	10.5	71.0
70-74	1340	11.2	80.9	828	13.3	81.8	512	9.0	79.9
75-79	968	8.1	89.0	555	8.9	90.7	413	7.2	87.1
80-84	708	5.9	94.9	355	5.7	96.4	353	6.2	93.3
85+	605	5.1	100.0	222	3.6	100.0	383	6.7	100.0
All ages	11948	100.0		6230	100.0		5718	100.0	

Included in the statistics are 42.8% multiple primaries in males and 27.9% in females.

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 1998-2011

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males DCO rate n=92 %	Females DCO rate n=125 %	Males Prop.all cancers n=132509 %	Females Prop.all cancers n=129521 %
0- 4	2		0.2	0.0			0.7	
5- 9	3	2	0.2	0.2			1.9	1.9
10-14	5	4	0.4	0.3			3.8	2.6
15-19	25	26	1.9	2.1			8.6	10.8
20-24	56	91	3.8	6.1		1.1	11.0	20.8
25-29	97	197	5.7	11.4	1.0		12.0	21.5
30-34	201	278	10.3	14.7			15.4	16.0
35-39	299	412	13.7	19.9		0.5	15.1	12.6
40-44	340	475	15.2	22.4	0.3	0.6	12.3	9.0
45-49	409	472	21.0	24.6	1.0	0.2	9.1	6.5
50-54	430	458	25.8	26.7	0.5		5.9	4.9
55-59	600	475	38.5	29.0	0.3	0.4	4.8	4.0
60-64	785	526	51.6	32.8	0.4	1.0	4.2	3.5
65-69	926	591	67.9	39.7	1.1	0.5	4.0	3.6
70-74	794	508	77.0	41.2	1.9	1.8	3.7	3.4
75-79	524	409	77.5	41.1	2.9	3.2	3.1	2.8
80-84	338	349	83.2	43.9	7.1	6.9	3.1	2.6
85+	213	380	76.8	51.2	7.0	16.3	2.6	2.6
All ages	6047	5653			1.5	2.2	4.6	4.4
Incidence								
Raw			24.1	21.5				
WS			14.7	13.2				
ES			19.9	17.0				
BRD-S			23.6	19.1				

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

Table 6a

Standardized incidence ratio (SIR, with 95% confidence limits),
excess absolute risk (EAR) and DCO rate of second primaries
for period 1998-2011
MALES

Diagnosis	Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C03-C06 Oral cavity	7	2.3	3.1	1.2	6.3	#	2.6	14.3
C09-C10 Oropharynx	3	2.9	1.0	0.2	3.1		0.1	
C15 Oesophagus	5	4.4	1.1	0.4	2.6		0.3	
C16 Stomach	13	10.5	1.2	0.7	2.1		1.3	15.4
C18 Colon	45	24.8	1.8	1.3	2.4	#	10.9	4.4
C19-C20 Rectum	24	14.4	1.7	1.1	2.5	#	5.2	
C22 Liver	8	6.8	1.2	0.5	2.3		0.7	25.0
C25 Pancreas	23	8.7	2.6	1.7	3.9	#	7.7	8.7
C32 Larynx	2	2.7	0.7	0.1	2.7		-0.4	
C33-C34 Lung	36	29.8	1.2	0.8	1.7		3.3	5.6
C38,C45 Mesothelioma	5	1.6	3.1	1.0	7.3	#	1.8	
C43 Malign. melanoma	253	9.8	25.7	22.6	29.1	#	131.5	
C46,C49 Soft tissue	5	1.4	3.6	1.2	8.5	#	2.0	
C61 Prostate	134	72.8	1.8	1.5	2.2	#	33.1	4.5
C62 Testis	2	1.3	1.5	0.2	5.5		0.4	
C64 Kidney	23	8.8	2.6	1.7	3.9	#	7.7	
C67 Bladder	17	10.5	1.6	0.9	2.6		3.5	
C69 Eye carcinoma	2	0.1	23.7	2.9	85.5	#	1.0	
C70-C72 CNS cancer	8	3.5	2.3	1.0	4.5		2.4	37.5
C73 Thyroid	11	1.8	6.1	3.0	10.8	#	5.0	
C76-C79 CUP	9	4.3	2.1	1.0	4.0		2.6	
C82-C85 NHL	27	9.8	2.8	1.8	4.0	#	9.3	7.4
C90 Mult. myeloma	6	3.1	1.9	0.7	4.2		1.6	33.3
C91-C96 Leukaemia	9	3.8	2.3	1.1	4.4	#	2.8	44.4
Other primaries	7	7.1	1.0	0.4	2.0		-0.0	
Not observed	0	5.4	0.0	0.0	0.7	#	-2.9	
All mult. primaries	684	252.6	2.7	2.5	2.9	#	233.3	4.1

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Patients                                  4099
Mean age at second malignancy (years)     69.8
Person-years                              18489
Mean observation time (years)              4.5
Median observation time (years)            3.8
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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 1998-2011
FEMALES

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C15	Oesophagus	2	0.8	2.4	0.3	8.6		0.6	
C16	Stomach	7	5.7	1.2	0.5	2.5		0.7	14.3
C17	Small intestine	2	0.7	2.9	0.4	10.5		0.7	
C18	Colon	34	15.6	2.2	1.5	3.0	#	9.9	5.9
C19-C20	Rectum	8	6.9	1.2	0.5	2.3		0.6	12.5
C21	Anus/canal	2	0.9	2.3	0.3	8.4		0.6	50.0
C22	Liver	3	1.7	1.8	0.4	5.3		0.7	33.3
C23-C24	Bile	3	2.2	1.3	0.3	3.9		0.4	33.3
C25	Pancreas	12	6.5	1.8	1.0	3.2		3.0	25.0
C33-C34	Lung	21	10.8	1.9	1.2	3.0	#	5.5	19.0
C43	Malign. melanoma	115	6.1	18.8	15.5	22.5	#	58.5	
C46,C49	Soft tissue	4	0.9	4.4	1.2	11.2	#	1.7	25.0
C50	Breast	107	51.2	2.1	1.7	2.5	#	30.0	2.8
C53	Cervix uteri	6	2.8	2.1	0.8	4.6		1.7	33.3
C54	Corpus uteri	12	8.6	1.4	0.7	2.4		1.8	8.3
C56	Ovary	8	6.8	1.2	0.5	2.3		0.7	
C64	Kidney	6	3.8	1.6	0.6	3.4		1.2	33.3
C67	Bladder	4	2.8	1.4	0.4	3.7		0.7	
C69	Eye melanoma	2	0.2	8.5	1.0	30.8	#	0.9	
C70-C72	CNS cancer	11	2.4	4.7	2.3	8.4	#	4.6	9.1
C73	Thyroid	16	3.7	4.3	2.5	7.0	#	6.6	6.3
C76-C79	CUP	6	2.7	2.2	0.8	4.8		1.8	
C82-C85	NHL	13	5.9	2.2	1.2	3.8	#	3.8	15.4
C90	Mult. myeloma	3	1.8	1.6	0.3	4.8		0.6	33.3
C91-C96	Leukaemia	8	2.4	3.3	1.4	6.5	#	3.0	25.0
Other primaries		5	2.7	1.9	0.6	4.4		1.3	20.0
Not observed		0	5.6	0.0	0.0	0.7	#	-3.0	
All mult. primaries		420	162.3	2.6	2.3	2.8	#	138.4	7.4

Patients	3921
Mean age at second malignancy (years)	65.9
Person-years	18623
Mean observation time (years)	4.7
Median observation time (years)	4.2

The occurrence of second malignancy is statistically significant.

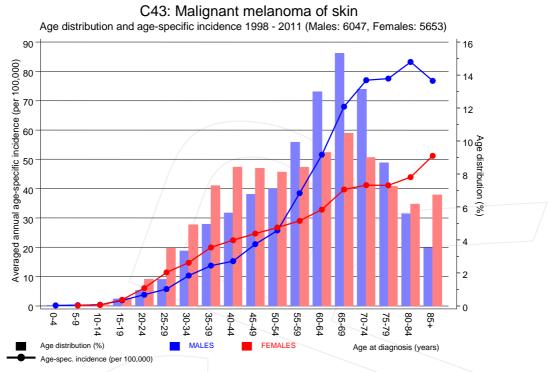Observed second malignancy with count 1 are pooled in category "Other primaries".

C43: Malignant melanoma of skin

Age distribution and age-specific incidence 1998 - 2011 (Males: 6047, Females: 5653)

Figure 7. Age distribution and age-specific incidence

C43: Malignant melanoma of skin
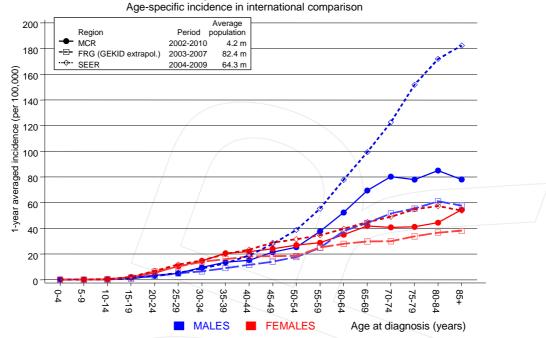### Age-specific incidence in international comparison

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.

C43: Malignant melanoma of skin
Cumulative follow-up years since diagnosis for period 1998 - 2011 (excl. DCO)

Gender	n	Target Sum	Median	Actual Sum	Median
All patients					
Males	4145	21360	4.4	20056	4.2
Females	3953	21304	4.8	19755	4.3
Patients alive					
Males	3277	18654	5.1	17351	4.8
Females	3390	19529	5.2	17979	4.8
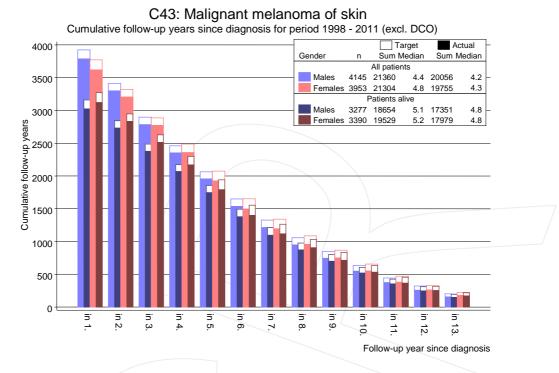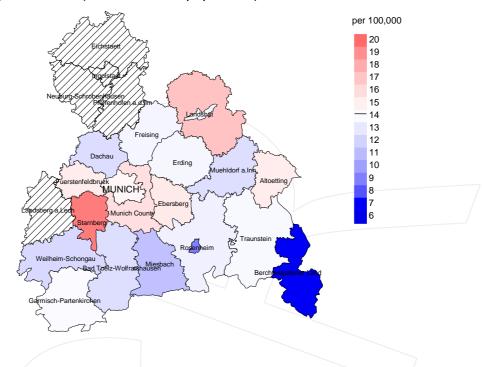
Figure 8. Cumulative follow-up years depending on time since diagnosis

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
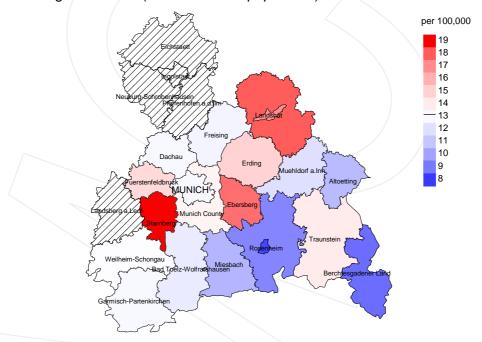
Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 14.2/100,000 WS N=2,702, females 13.2/100,000 WS N=2,609). 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 103 women were identified with newly diagnosed malignant melanoma. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 17.6/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 13.1 and 23.6/100,000.

Standardized incidence ratio (SIR) 2003 - 2008: Males

Standardized incidence ratio (SIR) 2003 - 2008: Females
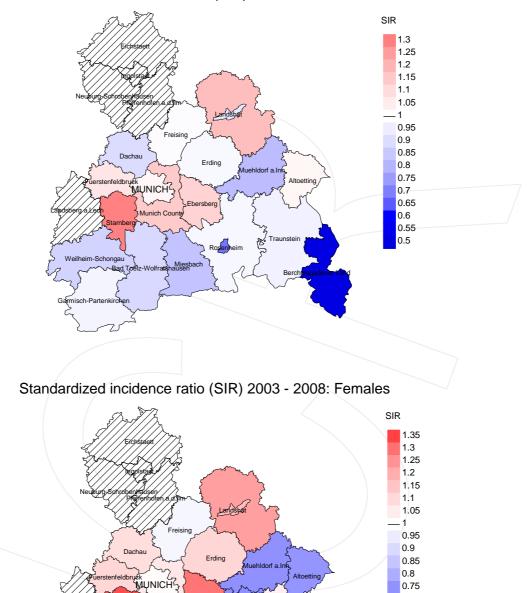
Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=2,702, females N=2,609). 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 103 women were identified with newly diagnosed malignant melanoma. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.29. Though, the value of this parameter may vary with an underlying probability of 99% between 0.99 and 1.66, 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	470	97.4	2.1	174	37.0	91.4
1999	460	97.0	2.0	140	30.4	94.3
2000	505	97.8	1.4	166	32.9	89.2
2001	520	97.7	1.5	167	32.1	97.0
2002	874	96.8	1.6	250	28.6	95.2
2003	797	95.5	2.1	222	27.9	96.8
2004	885	96.6	2.7	262	29.6	96.6
2005	882	94.1	1.4	228	25.9	96.1
2006	902	89.1	1.6	228	25.3	98.2
2007	1013	65.5	1.6	201	19.8	97.5
2008	1147	51.9	1.8	226	19.7	96.5
2009	1114	48.1	2.0	175	15.7	98.3
2010	1230	94.5	1.7	135	11.0	97.8
2011	1149	77.9	1.9	72	6.3	97.2
1998-2011	11948	82.5	1.8	2646	22.1	95.9

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 4.52 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	470	127	89.8	10	2.1
1999	460	119	90.8	13	2.8
2000	505	183	90.2	17	3.4
2001	520	167	91.0	18	3.5
2002	874	239	95.4	29	3.3
2003	797	260	90.8	31	3.9
2004	885	280	96.8	52	5.9
2005	882	317	95.6	31	3.5
2006	902	298	95.3	34	3.8
2007	1013	375	98.1	36	3.6
2008	1147	404	98.0	53	4.6
2009	1114	410	97.6	48	4.3
2010	1230	375	97.9	51	4.1
2011	1149	416	98.8	53	4.6
1998-2011	11948	3970	95.8	476	4.0

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	127	59.1	40.9	67.5
1999	119	63.9	36.1	77.8
2000	183	66.7	33.3	75.2
2001	167	61.1	38.9	69.7
2002	239	63.6	36.4	68.9
2003	260	61.5	38.5	72.5
2004	280	66.4	33.6	69.7
2005	317	62.5	37.5	67.7
2006	298	59.1	40.9	65.8
2007	375	63.5	36.5	68.5
2008	404	57.9	42.1	64.4
2009	410	64.6	35.4	68.5
2010	375	65.1	34.9	71.4
2011	416	57.0	43.0	63.3
1998-2011	3970	62.1	37.9	68.4

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	75	70.9	66.4	78.9	67.3
1999	67	73.6	69.5	81.1	71.0
2000	94	71.4	66.7	81.1	68.7
2001	84	68.3	63.2	79.6	65.4
2002	131	71.4	68.4	79.5	68.5
2003	134	71.3	67.5	79.3	69.1
2004	146	72.5	70.0	79.8	70.9
2005	176	72.4	68.5	81.2	69.5
2006	158	72.8	69.1	78.9	69.8
2007	207	72.9	68.9	79.8	69.0
2008	210	75.6	71.8	82.5	71.7
2009	236	72.7	68.2	82.4	68.9
2010	200	74.3	71.7	79.7	72.5
2011	226	76.0	72.1	82.0	73.3
1998-2011	2144	73.0	69.2	80.7	70.1

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.
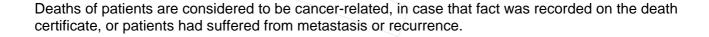
Table 11b

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	52	75.9	69.2	83.0	73.4
1999	52	74.5	72.5	78.0	73.7
2000	89	74.5	69.9	83.6	71.5
2001	83	79.0	72.5	86.3	73.5
2002	108	75.9	67.1	85.3	69.1
2003	126	76.8	69.8	85.3	71.4
2004	134	77.9	72.6	85.2	72.6
2005	141	79.6	74.7	85.1	75.0
2006	140	79.2	74.0	85.8	74.1
2007	168	76.1	70.7	85.7	71.6
2008	194	79.2	72.4	86.3	74.5
2009	174	78.2	72.8	86.1	73.8
2010	175	78.3	73.6	85.9	74.7
2011	190	78.7	72.2	86.1	73.3
1998-2011	1826	77.8	72.0	85.4	73.1

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	48	4.3	0.21	2.7	0.19	4.0	0.21	5.3	0.24
1999	43	3.8	0.20	2.3	0.18	3.5	0.21	4.5	0.23
2000	63	5.5	0.24	3.3	0.22	5.0	0.24	6.4	0.27
2001	59	5.1	0.22	3.1	0.21	4.5	0.23	5.9	0.25
2002	96	5.2	0.21	2.9	0.19	4.4	0.21	5.8	0.24
2003	91	4.9	0.24	2.8	0.21	4.2	0.24	5.2	0.26
2004	108	5.7	0.25	3.0	0.22	4.6	0.24	6.2	0.27
2005	123	6.5	0.27	3.4	0.23	5.1	0.26	6.8	0.29
2006	98	5.1	0.22	2.6	0.19	4.0	0.21	5.3	0.23
2007	131	5.9	0.26	3.0	0.23	4.6	0.25	6.1	0.28
2008	135	6.1	0.23	2.9	0.18	4.5	0.21	6.4	0.25
2009	162	7.3	0.28	3.8	0.26	5.5	0.27	7.1	0.29
2010	136	6.0	0.21	2.8	0.17	4.3	0.20	5.9	0.22
2011	136	6.0	0.23	2.7	0.18	4.2	0.20	5.9	0.24
1998-2011	1429	5.7	0.24	3.0	0.20	4.5	0.23	6.0	0.25

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	27	2.3	0.12	1.0	0.09	1.5	0.10	1.8	0.10
1999	33	2.8	0.14	1.1	0.08	1.7	0.10	2.3	0.12
2000	59	4.9	0.26	2.2	0.17	3.2	0.20	4.2	0.23
2001	44	3.6	0.17	1.4	0.11	2.2	0.13	2.8	0.15
2002	56	2.9	0.14	1.4	0.10	1.9	0.11	2.3	0.12
2003	69	3.5	0.17	1.6	0.12	2.3	0.14	2.8	0.16
2004	78	3.9	0.18	1.7	0.12	2.5	0.14	3.1	0.16
2005	75	3.8	0.18	1.4	0.11	2.1	0.13	2.9	0.15
2006	78	3.9	0.18	1.5	0.11	2.3	0.14	3.1	0.16
2007	107	4.6	0.22	2.0	0.15	3.0	0.18	3.8	0.20
2008	99	4.3	0.19	1.7	0.13	2.6	0.15	3.3	0.17
2009	105	4.5	0.21	1.8	0.14	2.6	0.16	3.4	0.19
2010	108	4.6	0.19	1.7	0.12	2.6	0.14	3.3	0.16
2011	101	4.3	0.19	1.7	0.12	2.6	0.15	3.3	0.16
1998-2011	1039	3.9	0.18	1.6	0.12	2.4	0.14	3.1	0.16

Table 13

Age distribution of age at death (cancer-related) for period 1998-2011
(**incl. multiple primaries**)

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
15-19	2	0.1	0.1	2	0.1	0.1			0.0
20-24	4	0.2	0.2	3	0.2	0.3	1	0.1	0.1
25-29	10	0.4	0.6	6	0.4	0.7	4	0.4	0.5
30-34	27	1.0	1.7	17	1.1	1.9	10	0.9	1.4
35-39	47	1.8	3.5	30	2.0	3.8	17	1.6	3.0
40-44	65	2.5	6.0	40	2.7	6.5	25	2.3	5.3
45-49	104	4.0	10.0	56	3.7	10.2	48	4.4	9.7
50-54	110	4.2	14.2	57	3.8	14.0	53	4.9	14.6
55-59	179	6.9	21.2	108	7.2	21.2	71	6.5	21.1
60-64	239	9.2	30.4	155	10.3	31.5	84	7.7	28.9
65-69	329	12.7	43.1	212	14.1	45.5	117	10.8	39.7
70-74	373	14.4	57.5	245	16.3	61.8	128	11.8	51.5
75-79	373	14.4	71.9	231	15.3	77.1	142	13.1	64.6
80-84	363	14.0	85.9	196	13.0	90.1	167	15.4	80.0
85+	366	14.1	100.0	149	9.9	100.0	217	20.0	100.0
All ages	2591	100.0		1507	100.0		1084	100.0	

Included in the statistics are 42.8% multiple primaries in males and 27.9% in females.

Table 14

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2011
(**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			0.0		0.0			
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19	2		0.2	0.08	0.0		5.3	
20-24	3	1	0.2	0.05	0.1	0.01	3.8	2.3
25-29	6	4	0.4	0.06	0.2	0.02	6.9	3.9
30-34	17	10	0.9	0.08	0.5	0.04	10.1	4.9
35-39	30	17	1.4	0.10	0.8	0.04	8.2	3.7
40-44	40	25	1.8	0.12	1.2	0.05	5.3	2.5
45-49	56	48	2.9	0.14	2.5	0.10	3.6	2.8
50-54	57	53	3.4	0.13	3.1	0.11	2.0	2.0
55-59	108	71	6.9	0.18	4.3	0.15	2.1	1.7
60-64	155	84	10.2	0.19	5.2	0.16	2.0	1.5
65-69	212	117	15.6	0.22	7.9	0.20	2.0	1.7
70-74	245	128	23.8	0.30	10.4	0.25	2.2	1.6
75-79	231	142	34.2	0.42	14.3	0.34	2.1	1.6
80-84	196	167	48.3	0.55	21.0	0.47	2.2	1.7
85+	149	217	53.7	0.67	29.2	0.57	2.1	1.9
All ages	1507	1084					2.2	1.8
Mortality								
Raw			6.0	0.24	4.1	0.19		
WS			3.1	0.21	1.7	0.13		
ES			4.7	0.23	2.5	0.15		
BRD-S			6.3	0.26	3.2	0.17		
PYLL-70								
per 100,000			37.4		25.1			
ES			32.7		21.7			
AYLL-70			12.4		13.1			

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

Table 15a

Multiple primaries in deaths in period 1998-2011
MALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03-C06 Oral cavity	9	1.0	3	33.3			6	66.7
C16 Stomach	30	3.2	8	26.7			22	73.3
C18 Colon	62	6.7	22	35.5	2	3.2	38	61.3
C19-C20 Rectum	46	5.0	17	37.0			29	63.0
C22 Liver	17	1.8	3	17.6			14	82.4
C25 Pancreas	30	3.2	2	6.7	1	3.3	27	90.0
C33-C34 Lung	78	8.4	4	5.1	8	10.3	66	84.6
C38,C45 Mesothelioma	11	1.2	2	18.2			9	81.8
C43 Malign. melanoma	122	13.2			33	27.0	89	73.0
C44 Skin others	105	11.4	22	21.0	25	23.8	58	55.2
C46,C49 Soft tissue	11	1.2	4	36.4	1	9.1	6	54.5
C61 Prostate	167	18.1	73	43.7	5	3.0	89	53.3
C64 Kidney	27	2.9	10	37.0	2	7.4	15	55.6
C67 Bladder	43	4.6	18	41.9	1	2.3	24	55.8
C70-C72 CNS cancer	22	2.4	6	27.3			16	72.7
C76-C79 CUP	15	1.6	1	6.7	1	6.7	13	86.7
C82-C85 NHL	38	4.1	17	44.7	3	7.9	18	47.4
C90 Mult. myeloma	13	1.4	3	23.1	1	7.7	9	69.2
C91-C96 Leukaemia	21	2.3	3	14.3	1	4.8	17	81.0
Other primaries	58	6.3	21	36.2	3	5.2	34	58.6
All mult. primaries	925	100.0	239	25.8	87	9.4	599	64.8

Multiple primaries with number of cases n<9 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 1998-2011
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C16	Stomach	17	2.7	2	11.8			15	88.2
C18	Colon	38	6.1	9	23.7	2	5.3	27	71.1
C19-C20	Rectum	18	2.9	8	44.4	1	5.6	9	50.0
C23-C24	Bile	11	1.8	1	9.1			10	90.9
C25	Pancreas	31	4.9			1	3.2	30	96.8
C33-C34	Lung	42	6.7	3	7.1	1	2.4	38	90.5
C43	Malign. melanoma	67	10.7			10	14.9	57	85.1
C44	Skin others	42	6.7	12	28.6	7	16.7	23	54.8
C46,C49	Soft tissue	7	1.1	1	14.3	1	14.3	5	71.4
C50	Breast	142	22.6	65	45.8	9	6.3	68	47.9
C51	Vulva	8	1.3	5	62.5	1	12.5	2	25.0
C53	Cervix uteri	19	3.0	11	57.9			8	42.1
C54	Corpus uteri	21	3.3	8	38.1			13	61.9
C56	Ovary	27	4.3	9	33.3	1	3.7	17	63.0
C64	Kidney	10	1.6	5	50.0	1	10.0	4	40.0
C67	Bladder	10	1.6	2	20.0			8	80.0
C69	Eye melanoma	11	1.8	10	90.9			1	9.1
C70-C72	CNS cancer	15	2.4	1	6.7	1	6.7	13	86.7
C73	Thyroid	8	1.3	4	50.0			4	50.0
C76-C79	CUP	11	1.8	2	18.2	1	9.1	8	72.7
C82-C85	NHL	26	4.1	10	38.5	1	3.8	15	57.7
C90	Mult. myeloma	6	1.0	2	33.3			4	66.7
C91-C96	Leukaemia	12	1.9					12	100.0
Other primaries		29	4.6	12	41.4	1	3.4	16	55.2
All mult. primaries		628	100.0	182	29.0	39	6.2	407	64.8

Multiple primaries with number of cases n<6 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 1998-2011
(**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			0.0		0.0			
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19	1		0.1	0.04	0.0		2.9	
20-24	2	1	0.1	0.04	0.1	0.01	2.7	2.6
25-29	5	4	0.3	0.05	0.2	0.02	6.2	4.2
30-34	16	10	0.8	0.08	0.5	0.04	9.8	5.6
35-39	28	16	1.3	0.10	0.8	0.04	8.2	3.8
40-44	38	22	1.7	0.12	1.0	0.05	5.4	2.5
45-49	53	37	2.7	0.14	1.9	0.09	3.8	2.4
50-54	51	45	3.1	0.13	2.6	0.11	2.1	2.0
55-59	95	64	6.1	0.18	3.9	0.15	2.1	1.9
60-64	126	70	8.3	0.20	4.4	0.16	1.9	1.5
65-69	165	89	12.1	0.24	6.0	0.19	2.0	1.6
70-74	183	103	17.7	0.34	8.3	0.27	2.1	1.6
75-79	159	100	23.5	0.48	10.1	0.31	1.9	1.4
80-84	144	120	35.5	0.69	15.1	0.45	2.2	1.6
85+	94	164	33.9	0.73	22.1	0.58	1.7	1.8
All ages	1160	845					2.1	1.7
Mortality								
Raw			4.6	0.24	3.2	0.18		
WS			2.5	0.21	1.4	0.12		
ES			3.7	0.23	2.0	0.14		
BRD-S			4.8	0.26	2.5	0.15		
PYLL-70								
per 100,000			33.2		21.7			
ES			28.9		18.8			
AYLL-70			13.0		13.6			

* See corresponding tables with multiple primaries.

Table 17

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2011
(**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			0.0		0.0			
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19	1		0.1	0.04	0.0		2.9	
20-24	2	1	0.1	0.04	0.1	0.01	2.9	2.8
25-29	5	4	0.3	0.06	0.2	0.02	6.7	4.4
30-34	14	9	0.7	0.08	0.5	0.03	8.8	5.5
35-39	28	15	1.3	0.10	0.7	0.04	8.6	3.9
40-44	37	19	1.7	0.12	0.9	0.05	5.6	2.4
45-49	48	34	2.5	0.14	1.8	0.09	3.7	2.5
50-54	45	36	2.7	0.13	2.1	0.10	2.0	1.8
55-59	77	48	4.9	0.17	2.9	0.13	1.9	1.6
60-64	93	45	6.1	0.18	2.8	0.11	1.6	1.1
65-69	111	54	8.1	0.20	3.6	0.13	1.5	1.1
70-74	118	63	11.4	0.27	5.1	0.19	1.6	1.2
75-79	90	61	13.3	0.33	6.1	0.22	1.3	1.0
80-84	77	81	19.0	0.44	10.2	0.34	1.4	1.3
85+	44	105	15.9	0.40	14.1	0.41	1.0	1.3
All ages	790	575					1.7	1.3
Mortality								
Raw			3.1	0.19	2.2	0.13		
WS			1.8	0.17	1.0	0.09		
ES			2.5	0.18	1.4	0.11		
BRD-S			3.2	0.20	1.8	0.12		
PYLL-70								
per 100,000			29.1		17.9			
ES			25.4		15.6			
AYLL-70			14.4		15.2			

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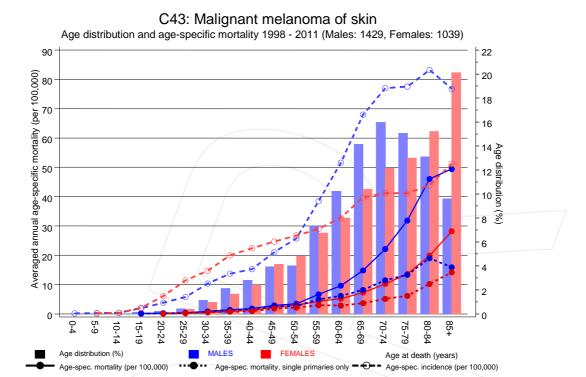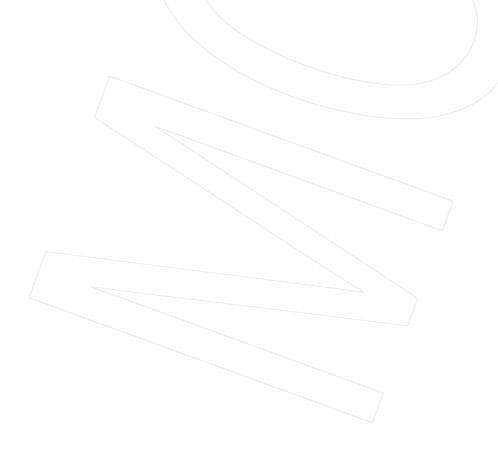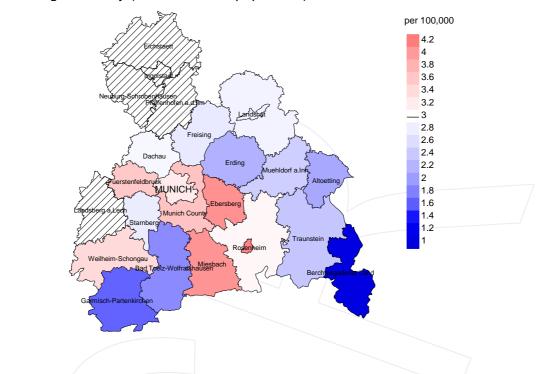
Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

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

Average mortality (world standard population) 2003 - 2008: Females
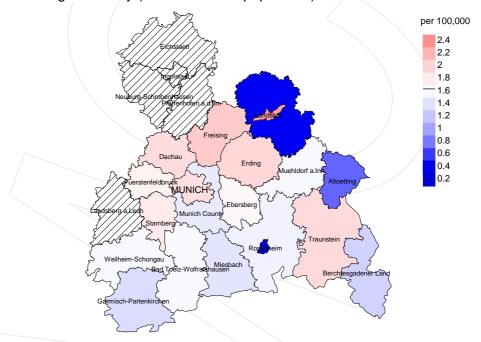
Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2003 to 2008. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 3.0/100,000 WS N=667, females 1.6/100,000 WS N=487). 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 15 women died from malignant melanoma. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 1.7/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.7 and 3.6/100,000.

Standardized mortality ratio (SMR) 2003 - 2008: Males

Standardized mortality ratio (SMR) 2003 - 2008: Females
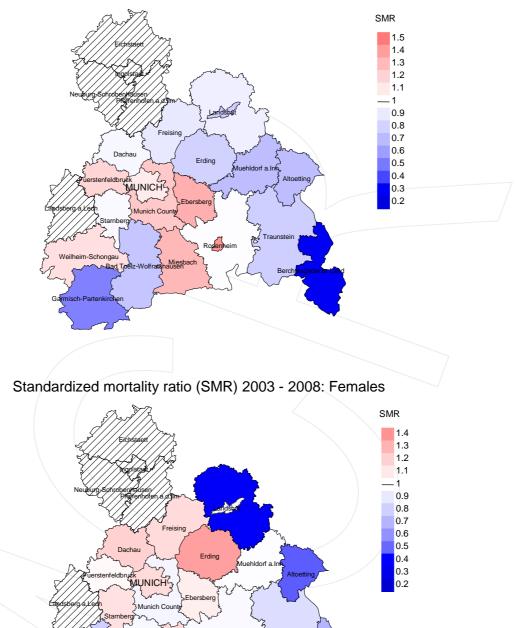
Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=667, females N=487). 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 15 women died from malignant melanoma. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.07. Though, the value of this parameter may vary with an underlying probability of 99% between 0.49 and 2.01, 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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Index of figures and tables