Munich Cancer Registry

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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

C43: Malignant melanoma

Year of diagnosis	1998-2013
Patients	14,153
Diseases	14,770
Creation date	05/19/2015
Export date	12/30/2014
Population	4.64 m

http://www.tumorregister-muenchen.de/en/facts/base/base_C43__E.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
C43.-	Malignant melanoma of skin
C43.0	Malignant melanoma of lip
C43.1	Malignant melanoma of eyelid, including canthus
C43.2	Malignant melanoma of ear and external auricular canal
C43.3	Malignant melanoma of other and unspecified parts of face
C43.4	Malignant melanoma of scalp and neck
C43.5	Malignant melanoma of trunk
C43.6	Malignant melanoma of upper limb, including shoulder
C43.7	Malignant melanoma of lower limb, including hip
C43.8	Overlapping malignant melanoma of skin
C43.9	Malignant melanoma of skin, unspecified

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	474	10	2.1	32.9	39.0	97.5	
1999	460	9	2.0	33.9	33.3	96.7	
2000	513	7	1.4	33.5	35.5	97.9	
2001	520	8	1.5	34.0	35.4	97.9	
2002	875	14	1.6	30.7	31.5	97.1	#
2003	800	17	2.1	27.5	31.4	96.0	
2004	894	23	2.6	30.5	32.9	96.9	
2005	890	12	1.3	30.1	29.2	94.5	
2006	911	15	1.6	31.2	28.6	89.5	
2007	1039	16	1.5	29.8	23.8	68.4	# ##
2008	1190	21	1.8	32.9	24.1	54.3	
2009	1170	22	1.9	33.8	20.8	50.3	
2010	1356	19	1.4	32.2	18.1	48.4	
2011	1480	21	1.4	31.2	13.4	44.2	
2012	1307	23	1.8	29.5	10.1	45.2	
2013	891	21	2.4	31.3	6.3	98.3	###
1998-2013	14770	258	1.7	31.4	23.4	73.0	

\# 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	474	239	235	50.4
1999	460	215	245	46.7
2000	513	280	233	54.6
2001	520	266	254	51.2
2002	875	462	413	52.8
2003	800	394	406	49.3
2004	894	448	446	50.1
2005	890	469	421	52.7
2006	911	465	446	51.0
2007	1039	529	510	50.9
2008	1190	637	553	53.5
2009	1170	641	529	54.8
2010	1356	724	632	53.4
2011	1480	767	713	51.8
2012	1307	690	617	52.8
2013	891	514	377	57.7
1998-2013	14770	7740	7030	52.4

Table 2

Incidence measures by year of diagnosis and gender including DCO cases
(with respect to registry area expansion from 2.51 to 3.96 m as of 2002,
and from 3.96 to 4.64 m as of 2007, respectively)

Year of diagnosis	Males n	Females n	Males Inc. raw	Fem. Inc. raw	Males Inc. WS	Fem. Inc. WS	Males Inc. ES	Fem. Inc. ES	Males Inc. BRD-S	Fem. Inc. BRD-S
1998	239	235	21.6	20.0	14.8	12.1	19.4	15.8	22.5	17.9
1999	215	245	19.2	20.6	13.1	13.3	17.1	16.8	19.8	19.0
2000	280	233	24.6	19.4	16.0	13.0	21.5	16.0	25.0	18.1
2001	266	254	23.0	20.9	14.6	13.3	19.8	17.0	23.3	19.0
2002	462	413	24.8	21.1	15.7	13.6	21.3	17.0	24.5	19.0
2003	394	406	21.0	20.6	13.2	13.2	17.7	16.6	20.9	18.3
2004	448	446	23.8	22.6	14.6	14.0	19.8	17.9	24.0	20.2
2005	469	421	24.8	21.2	15.2	13.1	20.7	17.0	24.2	19.0
2006	465	446	24.3	22.2	14.5	13.2	19.9	17.1	23.8	19.5
2007	529	510	23.9	22.1	14.1	13.4	19.5	17.3	23.3	19.5
2008	637	553	28.6	23.8	16.8	13.9	22.9	18.2	26.8	20.5
2009	641	529	28.7	22.7	15.9	13.2	22.2	17.2	26.8	19.7
2010	724	632	32.1	27.0	18.3	16.3	25.1	21.0	30.3	23.6
2011	767	713	33.6	30.2	19.3	18.6	26.4	23.5	31.5	26.4
2012	690	617	30.2	26.1	16.5	15.7	23.1	20.3	28.0	23.0
2013	514	377	22.5	16.0	12.6	9.6	17.4	12.3	21.1	14.0
1998-2013	7740	7030	26.0	22.6	15.6	13.9	21.3	17.8	25.4	20.1

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	474	57.6	16.8	17.2	96.2	33.5	47.0	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	513	56.7	17.1	15.6	98.4	33.4	43.2	58.4	69.3	78.9
2001	520	57.7	16.8	21.1	94.3	33.6	44.2	59.5	69.7	79.6
2002	875	58.3	17.3	7.6	99.0	34.1	44.6	60.5	71.3	80.5
2003	800	58.5	16.6	8.1	97.6	36.1	45.5	60.8	70.5	80.3
2004	894	59.4	16.5	15.6	95.6	36.5	46.3	61.6	72.3	80.4
2005	890	59.9	16.2	11.4	96.6	36.9	48.6	62.1	71.0	79.9
2006	911	61.3	16.5	3.1	102	38.4	48.9	64.0	73.3	82.4
2007	1039	60.8	16.7	14.6	99.9	37.7	48.2	63.3	73.1	81.7
2008	1190	61.4	16.0	14.1	99.3	39.3	49.7	64.7	72.7	80.5
2009	1170	62.5	15.6	13.9	101	40.6	50.1	65.6	73.8	81.6
2010	1356	61.4	16.4	4.9	98.5	38.5	49.4	64.6	73.4	81.7
2011	1480	60.7	16.7	4.9	98.3	37.7	48.1	62.7	73.4	81.4
2012	1307	62.0	15.8	0.2	98.2	40.5	50.1	64.5	74.1	81.2
2013	891	61.7	16.1	18.4	103	39.7	49.9	63.8	74.0	81.2
1998-2013	14770	60.3	16.5	0.2	103	37.0	48.1	62.6	72.7	80.8

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	239	56.7	16.0	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	280	58.4	15.3	15.6	92.3	34.7	51.1	59.9	69.2	77.0
2001	266	58.6	15.6	23.6	92.1	34.6	46.9	60.8	68.6	79.2
2002	462	60.0	15.3	7.6	98.4	37.0	50.4	63.2	70.8	77.1
2003	394	60.0	15.2	11.9	91.5	37.6	50.2	62.8	71.1	78.1
2004	448	60.7	15.7	15.6	94.1	38.1	49.9	63.2	73.5	80.5
2005	469	61.0	15.1	17.4	96.6	38.6	52.0	63.2	71.1	78.6
2006	465	62.4	15.3	3.1	95.4	39.7	52.3	65.0	73.1	79.8
2007	529	62.0	15.4	14.6	98.8	40.2	50.4	64.3	73.2	81.3
2008	637	62.2	14.5	14.1	93.5	41.9	53.0	65.5	72.0	78.4
2009	641	63.9	14.2	17.8	96.0	42.8	53.7	67.0	74.1	80.4
2010	724	63.6	15.3	4.9	98.5	41.7	54.1	66.6	74.4	81.5
2011	767	62.9	15.0	15.4	96.9	40.6	53.4	66.3	73.8	80.5
2012	690	64.2	14.1	19.7	93.8	44.6	54.0	67.5	74.5	81.0
2013	514	63.5	15.2	19.6	103	42.3	52.2	66.3	74.7	81.6
1998-2013	7740	61.8	15.2	3.1	103	39.6	51.7	64.3	72.9	79.8

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	235	58.5	17.5	18.0	96.2	33.7	46.8	58.8	72.0	81.7
1999	245	56.4	18.4	19.9	93.5	32.0	40.6	56.7	71.3	79.9
2000	233	54.6	19.0	18.3	98.4	30.8	38.4	52.3	70.4	81.5
2001	254	56.8	18.0	21.1	94.3	33.0	41.8	57.5	71.1	80.9
2002	413	56.5	19.2	17.4	99.0	31.8	39.3	55.9	72.2	83.9
2003	406	57.1	17.8	8.1	97.6	35.1	41.8	58.4	70.0	81.7
2004	446	58.0	17.2	18.8	95.6	36.2	43.8	59.5	71.8	80.2
2005	421	58.6	17.2	11.4	96.1	34.9	45.0	59.0	70.8	81.6
2006	446	60.3	17.6	14.1	102	35.7	46.8	62.0	73.8	83.7
2007	510	59.6	18.0	14.9	99.9	34.9	45.6	61.8	72.6	83.1
2008	553	60.5	17.5	14.5	99.3	37.4	45.8	63.4	73.3	83.2
2009	529	60.9	17.1	13.9	101	38.4	47.2	63.3	73.6	83.1
2010	632	58.9	17.3	15.1	94.1	36.1	45.0	60.2	72.2	81.8
2011	713	58.4	18.1	4.9	98.3	33.5	44.9	58.2	73.0	81.8
2012	617	59.7	17.2	0.2	98.2	37.9	47.4	59.8	73.3	82.0
2013	377	59.3	16.9	18.4	94.2	34.4	46.8	60.9	72.5	79.7
1998-2013	7030	58.7	17.7	0.2	102	34.7	44.9	59.5	72.4	82.2

Table 4

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

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	4	0.0	0.0	2	0.0	0.0	2	0.0	0.0
5-9	6	0.0	0.1	3	0.0	0.1	3	0.0	0.1
10-14	10	0.1	0.1	5	0.1	0.1	5	0.1	0.1
15-19	60	0.4	0.5	28	0.4	0.5	32	0.5	0.6
20-24	176	1.2	1.7	67	0.9	1.4	109	1.6	2.1
25-29	368	2.5	4.2	116	1.5	2.9	252	3.6	5.7
30-34	557	3.8	8.0	231	3.0	5.8	326	4.6	10.4
35-39	818	5.5	13.5	349	4.5	10.3	469	6.7	17.0
40-44	996	6.7	20.3	423	5.5	15.8	573	8.2	25.2
45-49	1145	7.8	28.0	531	6.9	22.7	614	8.7	33.9
50-54	1151	7.8	35.8	558	7.2	29.9	593	8.4	42.4
55-59	1327	9.0	44.8	745	9.6	39.5	582	8.3	50.6
60-64	1592	10.8	55.6	948	12.2	51.8	644	9.2	59.8
65-69	1904	12.9	68.5	1172	15.1	66.9	732	10.4	70.2
70-74	1759	11.9	80.4	1082	14.0	80.9	677	9.6	79.8
75-79	1251	8.5	88.9	728	9.4	90.3	523	7.4	87.3
80-84	901	6.1	95.0	470	6.1	96.4	431	6.1	93.4
85+	745	5.0	100.0	282	3.6	100.0	463	6.6	100.0
All ages	14770	100.0		7740	100.0		7030	100.0	

Included in the statistics are 48.0% multiple primaries in males and 31.8% 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=118 %	Females DCO rate n=140 %	Males Prop.all cancers n=158258 %	Females Prop.all cancers n=153136 %
0- 4	2	2	0.1	0.1			0.6	0.8
5- 9	3	3	0.2	0.2			1.7	2.4
10-14	5	5	0.3	0.3			3.0	2.9
15-19	28	32	1.8	2.2			7.9	11.0
20-24	66	109	3.7	6.1			10.7	20.6
25-29	114	245	5.7	12.0	0.9		11.8	22.1
30-34	229	324	10.1	14.6			15.3	15.7
35-39	343	466	13.8	19.7	0.3	0.4	15.3	12.5
40-44	418	566	15.9	22.7	0.2	0.2	13.1	9.1
45-49	526	607	22.3	26.3	0.8	0.2	9.8	6.9
50-54	544	581	26.9	28.3	0.4	0.2	6.3	5.3
55-59	727	574	39.6	29.9	0.4	0.5	5.0	4.2
60-64	926	634	52.2	33.8	0.4	0.8	4.3	3.7
65-69	1134	722	71.8	41.8	1.1	0.6	4.1	3.8
70-74	1044	670	81.5	44.1	1.7	1.3	3.9	3.6
75-79	691	518	83.6	43.6	2.2	3.1	3.3	2.9
80-84	451	426	90.1	45.7	7.1	5.9	3.3	2.7
85+	273	457	80.1	51.1	8.8	16.0	2.7	2.7
All ages	7524	6941			1.6	2.0	4.8	4.5
Incidence								
Raw			25.3	22.3				
WS			15.2	13.7				
ES			20.7	17.6				
BRD-S			24.7	19.8				

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

Table 6a

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

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C03-C06	Oral cavity	7	2.9	2.4	1.0	5.0		1.8	14.3
C09-C10	Oropharynx	4	3.5	1.1	0.3	2.9		0.2	
C15	Oesophagus	6	5.7	1.0	0.4	2.3		0.1	
C16	Stomach	18	13.0	1.4	0.8	2.2		2.2	11.1
C17	Small intestine	3	1.6	1.9	0.4	5.5		0.6	
C18	Colon	53	31.1	1.7	1.3	2.2	#	9.6	5.7
C19-C20	Rectum	26	17.7	1.5	1.0	2.1		3.6	
C22	Liver	9	8.7	1.0	0.5	2.0		0.1	33.3
C25	Pancreas	29	11.4	2.5	1.7	3.7	#	7.7	6.9
C32	Larynx	3	3.4	0.9	0.2	2.6		-0.2	
C33-C34	Lung	52	37.3	1.4	1.0	1.8	#	6.5	9.6
C38,C45	Mesothelioma	6	2.1	2.9	1.1	6.3	#	1.7	
C43	Malign. melanoma	308	13.2	23.3	20.8	26.1	#	129.4	
C46,C49	Soft tissue	7	1.8	4.0	1.6	8.2	#	2.3	
C50	Breast	2	0.8	2.4	0.3	8.8		0.5	
C61	Prostate	177	94.2	1.9	1.6	2.2	#	36.3	4.0
C62	Testis	2	1.5	1.3	0.2	4.7		0.2	
C64	Kidney	25	11.2	2.2	1.4	3.3	#	6.0	
C67	Bladder	22	14.0	1.6	1.0	2.4		3.5	
C69	Eye carcinoma	2	0.1	18.2	2.2	65.6	#	0.8	
C69	Eye melanoma	3	0.3	8.8	1.8	25.8	#	1.2	
C70-C72	CNS cancer	10	4.4	2.3	1.1	4.2	#	2.5	30.0
C73	Thyroid	13	2.3	5.7	3.1	9.8	#	4.7	
C76-C79	CUP	9	5.4	1.7	0.8	3.2		1.6	
C82-C85	NHL	36	12.8	2.8	2.0	3.9	#	10.2	11.1
C90	Mult. myeloma	7	4.1	1.7	0.7	3.6		1.3	28.6
C91-C96	Leukaemia	11	5.2	2.1	1.1	3.8	#	2.6	45.5
Other primaries		8	8.3	1.0	0.4	1.9		-0.1	
Not observed		0	5.4	0.0	0.0	0.7	#	-2.4	
All mult. primaries		858	323.3	2.7	2.5	2.8	#	234.7	4.3

Patients	4551
Median age at second malignancy (years)	70.8
Person-years	22783
Mean observation time (years)	5.0
Median observation time (years)	4.2

The occurrence of second malignancy is statistically significant.

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

Table 6b

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

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C15	Oesophagus	3	1.1	2.7	0.6	7.8		0.8	
C16	Stomach	7	7.0	1.0	0.4	2.1		-0.0	14.3
C17	Small intestine	3	0.9	3.2	0.7	9.5		0.9	
C18	Colon	43	19.2	2.2	1.6	3.0	#	10.5	4.7
C19-C20	Rectum	10	8.4	1.2	0.6	2.2		0.7	10.0
C21	Anus/canal	2	1.1	1.9	0.2	6.7		0.4	50.0
C22	Liver	5	2.2	2.3	0.7	5.4		1.2	20.0
C23-C24	Bile	3	2.8	1.1	0.2	3.2		0.1	33.3
C25	Pancreas	15	8.3	1.8	1.0	3.0	#	3.0	20.0
C33-C34	Lung	23	13.7	1.7	1.1	2.5	#	4.1	17.4
C43	Malign. melanoma	141	7.9	17.9	15.1	21.1	#	58.9	
C46,C49	Soft tissue	5	1.2	4.3	1.4	10.1	#	1.7	20.0
C50	Breast	138	63.5	2.2	1.8	2.6	#	33.0	2.9
C53	Cervix uteri	6	3.4	1.8	0.6	3.8		1.1	33.3
C54	Corpus uteri	17	10.8	1.6	0.9	2.5		2.7	5.9
C56	Ovary	9	8.2	1.1	0.5	2.1		0.4	
C64	Kidney	8	4.8	1.7	0.7	3.3		1.4	12.5
C67	Bladder	6	3.6	1.7	0.6	3.6		1.1	
C69	Eye melanoma	2	0.3	7.6	0.9	27.6		0.8	
C70-C72	CNS cancer	12	2.8	4.3	2.2	7.5	#	4.1	16.7
C73	Thyroid	16	4.4	3.6	2.1	5.9	#	5.1	6.3
C76-C79	CUP	6	3.4	1.7	0.6	3.8		1.1	
C82-C85	NHL	16	7.4	2.2	1.2	3.5	#	3.8	12.5
C90	Mult. myeloma	3	2.3	1.3	0.3	3.8		0.3	33.3
C91-C96	Leukaemia	9	3.1	2.9	1.3	5.5	#	2.6	22.2
Other primaries		7	5.5	1.3	0.5	2.6		0.7	28.6
Not observed		0	4.9	0.0	0.0	0.8	#	-2.2	
All mult. primaries		515	202.1	2.5	2.3	2.8	#	138.4	6.4

Patients	4300
Median age at second malignancy (years)	69.2
Person-years	22610
Mean observation time (years)	5.3
Median observation time (years)	4.5

The occurrence of second malignancy is statistically significant.

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

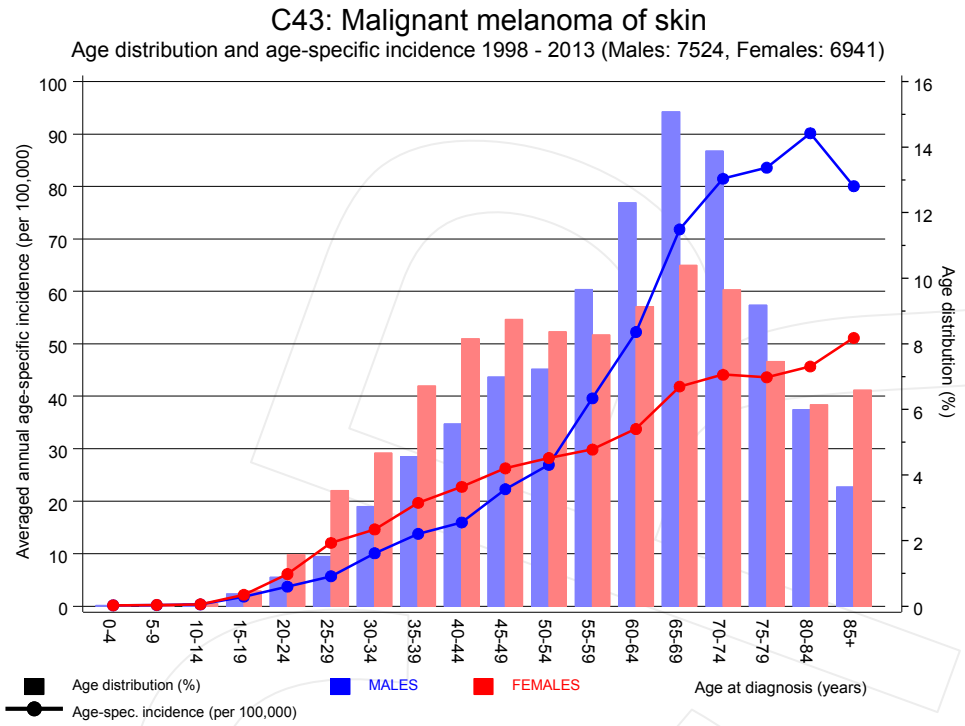


Figure 7. Age distribution and age-specific incidence

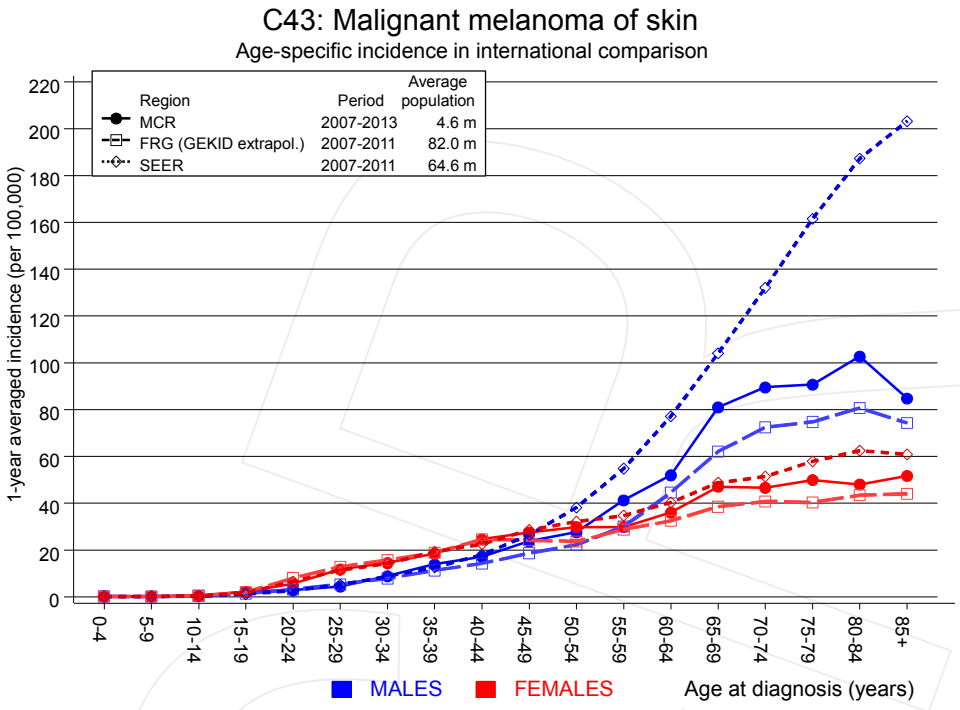


Figure 7a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

Extrapolated age-specific patient population of Germany, data status middle of 2010. Association of Population-based Cancer Registries in Germany (GEKID e.V.). Berlin, 2014. http://www.gekid.de. Last access: 02/11/2015

Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 18 Regs Research Data, released April 2014, based on the November 2013 submission. http://www.seer.cancer.gov.

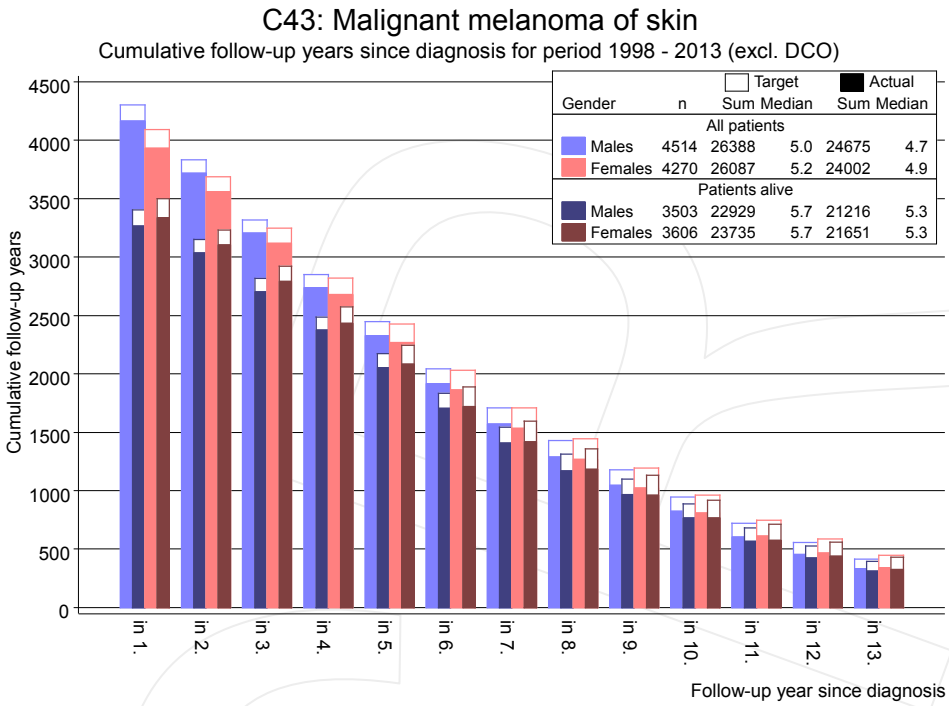
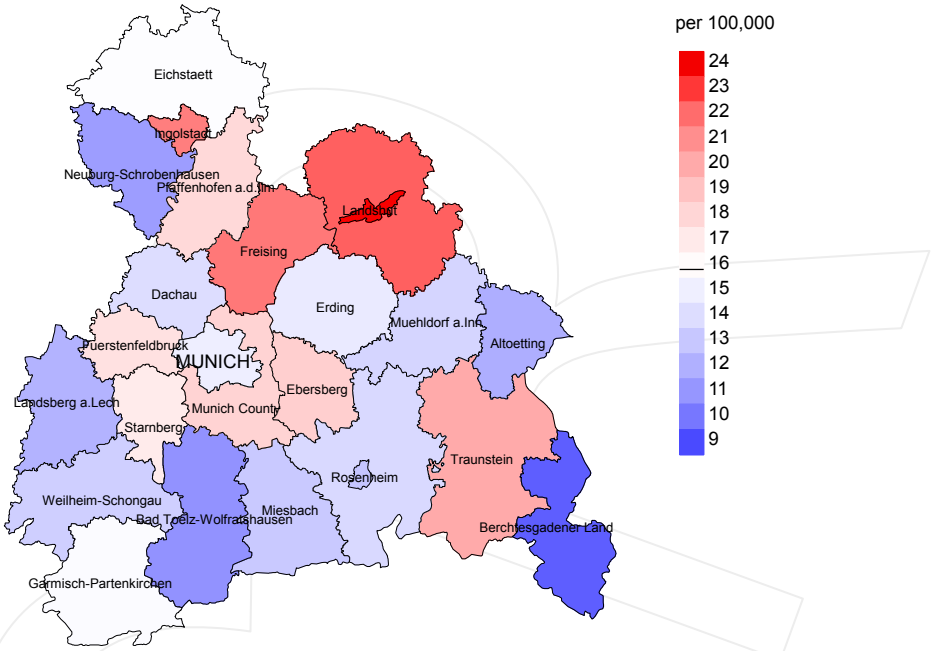


Figure 8. Cumulative follow-up years depending on time since diagnosis

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

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



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

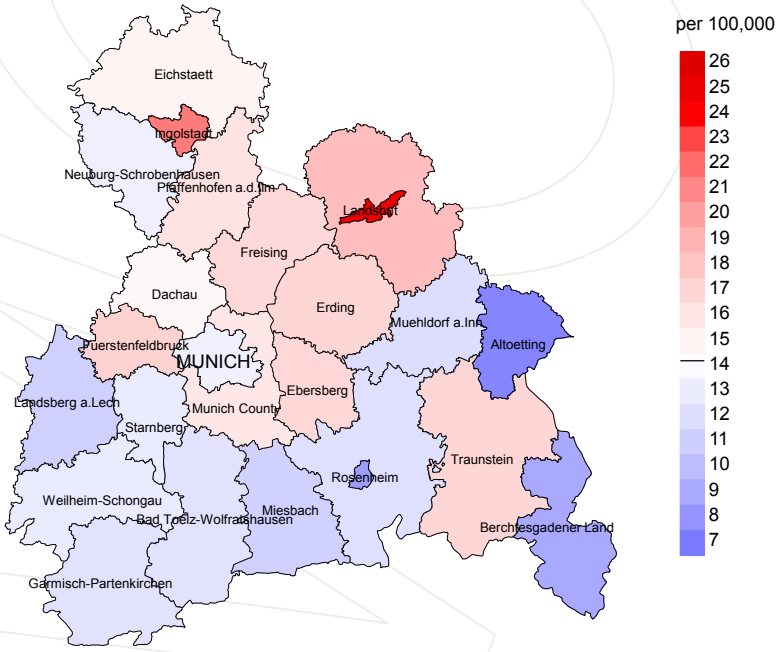
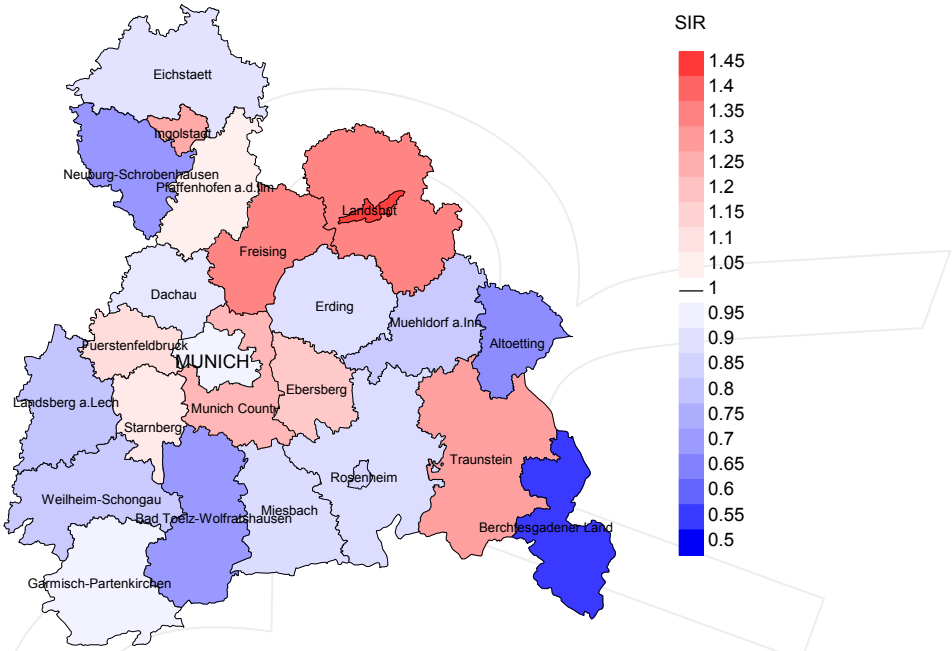


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 15.8/100,000 WS N=4,366, females 14.2/100,000 WS N=3,876).

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 125 women were identified with newly diagnosed malignant melanoma. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 16.9/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 12.8 and 22.2/100,000.

Standardized incidence ratio (SIR) 2007 - 2013: Males



Standardized incidence ratio (SIR) 2007 - 2013: Females

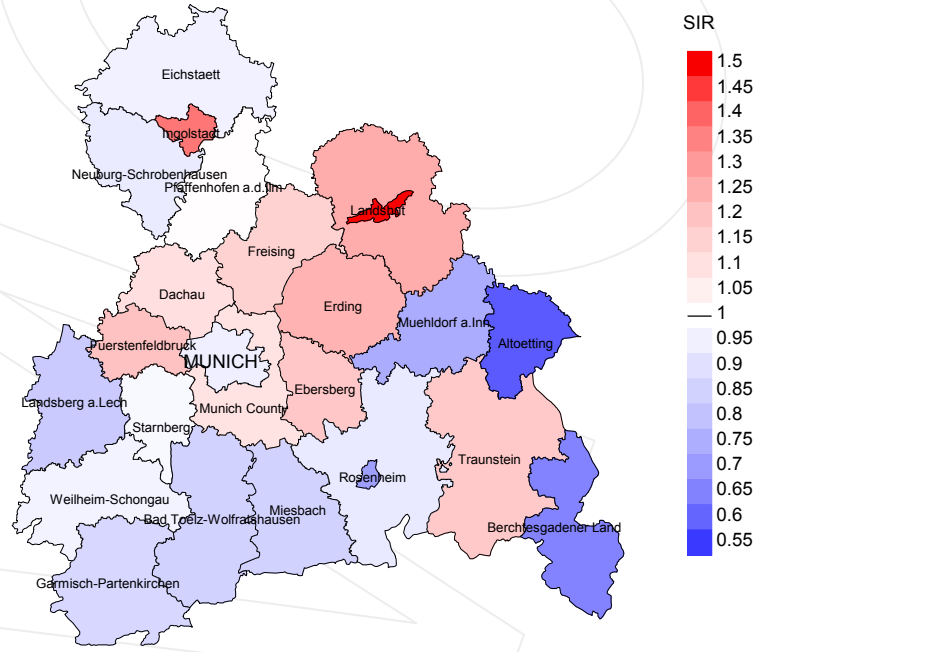


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=4,366, females N=3,876).

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 125 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 1.18. Though, the value of this parameter may vary with an underlying probability of 99% between 0.93 and 1.48, 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	474	97.5	2.1	185	39.0	90.3
1999	460	96.7	2.0	153	33.3	94.1
2000	513	97.9	1.4	182	35.5	90.7
2001	520	97.9	1.5	184	35.4	96.7
2002	875	97.1	1.6	276	31.5	94.6
2003	800	96.0	2.1	251	31.4	96.8
2004	894	96.9	2.6	294	32.9	97.6
2005	890	94.5	1.3	260	29.2	95.8
2006	911	89.5	1.6	261	28.6	96.9
2007	1039	68.4	1.5	247	23.8	96.0
2008	1190	54.3	1.8	287	24.1	97.2
2009	1170	50.3	1.9	243	20.8	97.1
2010	1356	48.4	1.4	245	18.1	96.3
2011	1480	44.2	1.4	199	13.4	93.0
2012	1307	45.2	1.8	132	10.1	91.7
2013	891	98.3	2.4	56	6.3	92.9
1998-2013	14770	73.0	1.7	3455	23.4	95.3

Table 10b

Annual cohorts of incident cancers and deaths, proportion of death certificates and cases deceased the same year of cancer diagnosis
(incl. DCO)
(with respect to registry area expansion from 2.51 to 3.96 m as of 2002, and from 3.96 to 4.64 m as of 2007, respectively)

Year of diagnosis/ death	Incident cases n	Deaths n	Prop. deaths with death certific. %	Deaths in same year n	Prop. deaths in same year %
1998	474	127	89.8	10	2.1
1999	460	118	90.7	13	2.8
2000	513	183	90.2	17	3.3
2001	520	168	91.1	18	3.5
2002	875	239	95.4	29	3.3
2003	800	259	90.7	31	3.9
2004	894	280	96.8	52	5.8
2005	890	318	95.6	31	3.5
2006	911	298	95.3	34	3.7
2007	1039	373	98.1	36	3.5
2008	1190	402	98.0	52	4.4
2009	1170	410	97.8	47	4.0
2010	1356	376	97.9	50	3.7
2011	1480	439	98.6	63	4.3
2012	1307	469	96.6	57	4.4
2013	891	504	97.8	42	4.7
1998-2013	14770	4963	96.1	582	3.9

Table 10c

Annual cohorts of deaths, proportion of cancer-related and non-cancer-related deaths, and cancer recorded on death certificates (incl. DCO)
(with respect to registry area expansion from 2.51 to 3.96 m as of 2002, and from 3.96 to 4.64 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. non-cancer-related %	Prop. cancer recorded on death certificate %
1998	127	59.1	40.9	67.5
1999	118	63.6	36.4	77.6
2000	183	66.7	33.3	75.2
2001	168	60.7	39.3	69.3
2002	239	63.6	36.4	68.9
2003	259	61.4	38.6	72.3
2004	280	66.8	33.2	70.1
2005	318	62.6	37.4	67.8
2006	298	59.1	40.9	65.8
2007	373	63.5	36.5	68.3
2008	402	57.7	42.3	64.2
2009	410	65.1	34.9	68.8
2010	376	65.2	34.8	71.5
2011	439	57.4	42.6	63.7
2012	469	59.9	40.1	64.5
2013	504	58.7	41.3	66.5
1998-2013	4963	61.6	38.4	67.9

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	75	73.9	69.1	79.5	70.2
1999	67	74.9	69.8	85.2	71.1
2000	94	74.2	68.1	82.0	70.2
2001	85	73.1	65.1	79.3	66.2
2002	131	72.8	68.6	81.3	68.6
2003	134	73.3	70.1	79.3	71.7
2004	147	74.3	70.9	80.9	72.5
2005	176	74.8	70.9	82.3	71.0
2006	158	74.2	71.0	80.5	71.5
2007	207	75.4	70.2	81.0	70.5
2008	208	78.0	74.4	82.6	74.3
2009	235	74.6	71.0	82.7	71.2
2010	201	76.2	72.7	81.6	73.7
2011	240	78.5	74.3	84.4	75.7
2012	278	75.9	73.4	82.3	73.8
2013	273	76.6	74.4	80.9	74.4
1998-2013	2709	75.6	72.2	81.8	72.9

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	52	79.5	72.9	86.4	74.7
1999	51	78.3	75.6	79.2	78.0
2000	89	78.1	75.0	84.6	75.6
2001	83	83.4	78.9	87.6	79.6
2002	108	82.0	68.4	85.4	70.9
2003	125	80.7	70.2	88.0	73.4
2004	133	81.6	74.3	84.7	74.3
2005	142	82.2	77.5	87.2	77.0
2006	140	81.8	76.5	88.0	76.4
2007	166	77.9	71.3	86.9	71.5
2008	194	82.6	74.0	86.8	77.9
2009	175	82.2	75.8	87.7	77.4
2010	175	81.1	74.7	86.3	74.9
2011	199	82.1	73.4	86.8	75.8
2012	191	83.4	73.4	88.4	74.2
2013	231	83.7	77.7	87.8	78.3
1998-2013	2254	81.6	74.4	87.0	75.8

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	0.18	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	0.23	3.3	0.21	5.0	0.24	6.4	0.26
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	0.25
2004	109	5.8	0.25	3.1	0.21	4.7	0.24	6.2	0.27
2005	123	6.5	0.27	3.4	0.23	5.1	0.25	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	0.22	4.6	0.25	6.1	0.27
2008	133	6.0	0.22	2.8	0.17	4.4	0.20	6.3	0.24
2009	163	7.3	0.27	3.8	0.25	5.5	0.26	7.1	0.28
2010	137	6.1	0.19	2.9	0.16	4.4	0.18	5.9	0.20
2011	148	6.5	0.20	2.9	0.16	4.5	0.18	6.2	0.21
2012	174	7.6	0.26	3.5	0.21	5.3	0.24	7.1	0.26
2013	176	7.7	0.35	3.4	0.27	5.3	0.31	7.3	0.35
1998-2013	1792	6.0	0.24	3.1	0.20	4.7	0.23	6.3	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	32	2.7	0.13	1.1	0.08	1.7	0.10	2.3	0.12
2000	59	4.9	0.25	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	68	3.5	0.17	1.6	0.12	2.3	0.14	2.8	0.15
2004	78	3.9	0.18	1.7	0.12	2.5	0.14	3.1	0.15
2005	76	3.8	0.18	1.4	0.11	2.2	0.13	3.0	0.16
2006	78	3.9	0.18	1.5	0.11	2.3	0.13	3.1	0.16
2007	106	4.6	0.21	2.0	0.15	2.9	0.17	3.8	0.19
2008	99	4.3	0.18	1.7	0.13	2.6	0.14	3.3	0.16
2009	106	4.6	0.20	1.8	0.14	2.6	0.15	3.5	0.18
2010	108	4.6	0.17	1.7	0.11	2.6	0.13	3.3	0.14
2011	104	4.4	0.15	1.8	0.10	2.7	0.12	3.3	0.13
2012	108	4.6	0.18	1.9	0.12	2.7	0.14	3.3	0.15
2013	120	5.1	0.32	1.9	0.20	2.8	0.23	3.7	0.27
1998-2013	1269	4.1	0.18	1.7	0.12	2.5	0.14	3.2	0.16

Table 13

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

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
15-19	2	0.1	0.1	2	0.1	0.1			0.0
20-24	4	0.1	0.2	3	0.2	0.3	1	0.1	0.1
25-29	12	0.4	0.6	8	0.4	0.7	4	0.3	0.4
30-34	30	0.9	1.5	18	0.9	1.6	12	0.9	1.3
35-39	52	1.6	3.1	33	1.7	3.4	19	1.4	2.7
40-44	78	2.4	5.5	47	2.5	5.8	31	2.3	5.0
45-49	119	3.7	9.2	66	3.5	9.3	53	4.0	9.0
50-54	145	4.5	13.7	72	3.8	13.1	73	5.5	14.5
55-59	211	6.5	20.2	129	6.8	19.9	82	6.2	20.6
60-64	288	8.9	29.1	179	9.4	29.3	109	8.2	28.8
65-69	397	12.3	41.3	250	13.1	42.4	147	11.0	39.8
70-74	489	15.1	56.5	334	17.6	60.0	155	11.6	51.5
75-79	469	14.5	71.0	297	15.6	75.6	172	12.9	64.4
80-84	460	14.2	85.2	260	13.7	89.2	200	15.0	79.4
85+	480	14.8	100.0	205	10.8	100.0	275	20.6	100.0
All ages	3236	100.0		1903	100.0		1333	100.0	

Included in the statistics are 48.0% multiple primaries in males and 31.8% 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			0.0		0.0			
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19	2		0.1	0.07	0.0		4.4	
20-24	3	1	0.2	0.04	0.1	0.01	3.3	2.0
25-29	8	4	0.4	0.07	0.2	0.02	7.4	3.5
30-34	18	12	0.8	0.08	0.5	0.04	9.7	5.3
35-39	33	19	1.3	0.09	0.8	0.04	8.3	3.7
40-44	47	31	1.8	0.11	1.2	0.05	5.5	2.7
45-49	66	53	2.8	0.12	2.3	0.09	3.7	2.6
50-54	72	73	3.6	0.13	3.6	0.12	2.2	2.4
55-59	129	82	7.0	0.17	4.3	0.14	2.2	1.7
60-64	179	109	10.1	0.19	5.8	0.17	2.0	1.7
65-69	250	147	15.8	0.21	8.5	0.20	2.1	1.8
70-74	334	155	26.1	0.31	10.2	0.23	2.5	1.6
75-79	297	172	35.9	0.41	14.5	0.33	2.3	1.6
80-84	260	200	52.0	0.55	21.4	0.46	2.4	1.8
85+	205	275	60.1	0.73	30.8	0.59	2.3	2.0
All ages	1903	1333					2.4	1.8
Mortality								
Raw			6.4	0.25	4.3	0.19		
WS			3.2	0.21	1.8	0.13		
ES			4.9	0.23	2.6	0.15		
BRD-S			6.7	0.26	3.3	0.17		
PYLL-70								
per 100,000			37.2		25.7			
ES			32.5		22.2			
AYLL-70			12.3		12.8			

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	11	0.9	4	36.4	1	9.1	6	54.5
C16 Stomach	34	2.7	9	26.5			25	73.5
C18 Colon	78	6.2	27	34.6	3	3.8	48	61.5
C19-C20 Rectum	59	4.7	20	33.9			39	66.1
C22 Liver	21	1.7	3	14.3			18	85.7
C25 Pancreas	42	3.3	2	4.8	2	4.8	38	90.5
C33-C34 Lung	111	8.8	8	7.2	8	7.2	95	85.6
C38,C45 Mesothelioma	11	0.9	2	18.2			9	81.8
C43 Malign. melanoma	170	13.5			51	30.0	119	70.0
C44 Skin others	170	13.5	33	19.4	51	30.0	86	50.6
C46,C49 Soft tissue	12	1.0	4	33.3	1	8.3	7	58.3
C61 Prostate	217	17.2	96	44.2	6	2.8	115	53.0
C64 Kidney	39	3.1	16	41.0	4	10.3	19	48.7
C67 Bladder	62	4.9	28	45.2	1	1.6	33	53.2
C70-C72 CNS cancer	31	2.5	6	19.4			25	80.6
C76-C79 CUP	16	1.3	1	6.3	1	6.3	14	87.5
C82-C85 NHL	53	4.2	22	41.5	3	5.7	28	52.8
C90 Mult. myeloma	18	1.4	4	22.2	1	5.6	13	72.2
C91-C96 Leukaemia	30	2.4	4	13.3	2	6.7	24	80.0
Other primaries	77	6.1	26	33.8	5	6.5	46	59.7
All mult. primaries	1262	100.0	315	25.0	140	11.1	807	63.9

Multiple primaries with number of cases 1 to 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 1998-2013
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C16	Stomach	22	2.7	4	18.2			18	81.8
C18	Colon	42	5.2	10	23.8	2	4.8	30	71.4
C19-C20	Rectum	19	2.3	8	42.1	1	5.3	10	52.6
C23-C24	Bile	12	1.5	1	8.3			11	91.7
C25	Pancreas	39	4.8	1	2.6	1	2.6	37	94.9
C33-C34	Lung	53	6.5	4	7.5			49	92.5
C43	Malign. melanoma	104	12.8			17	16.3	87	83.7
C44	Skin others	68	8.4	20	29.4	17	25.0	31	45.6
C46,C49	Soft tissue	11	1.4	3	27.3	2	18.2	6	54.5
C50	Breast	186	22.9	83	44.6	11	5.9	92	49.5
C53	Cervix uteri	21	2.6	10	47.6	2	9.5	9	42.9
C54	Corpus uteri	26	3.2	11	42.3			15	57.7
C56	Ovary	34	4.2	11	32.4	1	2.9	22	64.7
C64	Kidney	15	1.8	7	46.7	2	13.3	6	40.0
C67	Bladder	14	1.7	3	21.4			11	78.6
C70-C72	CNS cancer	21	2.6	2	9.5	1	4.8	18	85.7
C73	Thyroid	9	1.1	4	44.4			5	55.6
C76-C79	CUP	14	1.7	2	14.3	2	14.3	10	71.4
C82-C85	NHL	31	3.8	13	41.9	1	3.2	17	54.8
C90	Mult. myeloma	9	1.1	3	33.3			6	66.7
C91-C96	Leukaemia	14	1.7					14	100.0
Other primaries		50	6.1	22	44.0	2	4.0	26	52.0
All mult. primaries		814	100.0	222	27.3	62	7.6	530	65.1

Multiple primaries with number of cases 1 to 8 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			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		2.4	
20-24	2	1	0.1	0.03	0.1	0.01	2.4	2.1
25-29	7	4	0.3	0.06	0.2	0.02	7.1	3.7
30-34	17	12	0.7	0.08	0.5	0.04	9.4	6.0
35-39	31	18	1.2	0.10	0.8	0.04	8.3	3.9
40-44	45	28	1.7	0.11	1.1	0.05	5.7	2.8
45-49	61	42	2.6	0.13	1.8	0.08	3.7	2.4
50-54	64	55	3.2	0.13	2.7	0.11	2.2	2.1
55-59	113	74	6.2	0.18	3.8	0.15	2.2	1.8
60-64	147	89	8.3	0.20	4.7	0.17	2.0	1.7
65-69	193	105	12.2	0.23	6.1	0.19	2.0	1.6
70-74	240	120	18.7	0.36	7.9	0.25	2.2	1.5
75-79	193	120	23.4	0.47	10.1	0.31	1.9	1.4
80-84	178	146	35.6	0.66	15.7	0.46	2.2	1.6
85+	129	205	37.8	0.83	22.9	0.61	1.9	1.9
All ages	1421	1019					2.2	1.7
Mortality								
Raw			4.8	0.25	3.3	0.17		
WS			2.5	0.20	1.4	0.12		
ES			3.7	0.23	2.0	0.13		
BRD-S			4.9	0.26	2.6	0.15		
PYLL-70								
per 100,000			32.9		21.8			
ES			28.7		18.8			
AYLL-70			12.9		13.5			

* 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			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		2.4	
20-24	2	1	0.1	0.03	0.1	0.01	2.5	2.3
25-29	7	4	0.3	0.07	0.2	0.02	7.6	3.9
30-34	15	11	0.7	0.07	0.5	0.04	8.6	6.0
35-39	31	17	1.2	0.10	0.7	0.04	8.7	4.0
40-44	43	23	1.6	0.11	0.9	0.05	5.8	2.5
45-49	56	38	2.4	0.13	1.6	0.07	3.6	2.5
50-54	57	43	2.8	0.13	2.1	0.10	2.2	1.8
55-59	90	54	4.9	0.17	2.8	0.12	1.9	1.5
60-64	105	60	5.9	0.18	3.2	0.13	1.6	1.3
65-69	128	60	8.1	0.19	3.5	0.13	1.5	1.1
70-74	152	70	11.9	0.29	4.6	0.17	1.7	1.1
75-79	105	74	12.7	0.32	6.2	0.23	1.3	1.0
80-84	91	93	18.2	0.41	10.0	0.34	1.4	1.3
85+	62	129	18.2	0.49	14.4	0.43	1.2	1.4
All ages	945	677					1.7	1.3
Mortality								
Raw			3.2	0.19	2.2	0.13		
WS			1.8	0.17	1.0	0.09		
ES			2.5	0.18	1.4	0.10		
BRD-S			3.2	0.20	1.7	0.11		
PYLL-70								
per 100,000			28.7		17.7			
ES			25.0		15.4			
AYLL-70			14.4		15.1			

* See corresponding tables with multiple primaries.

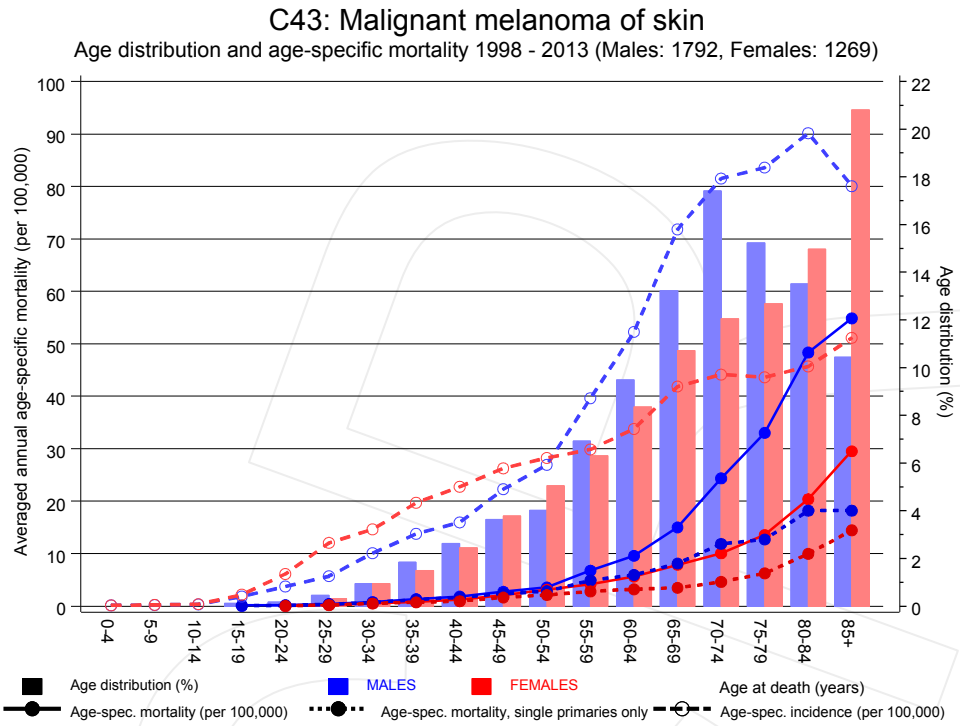
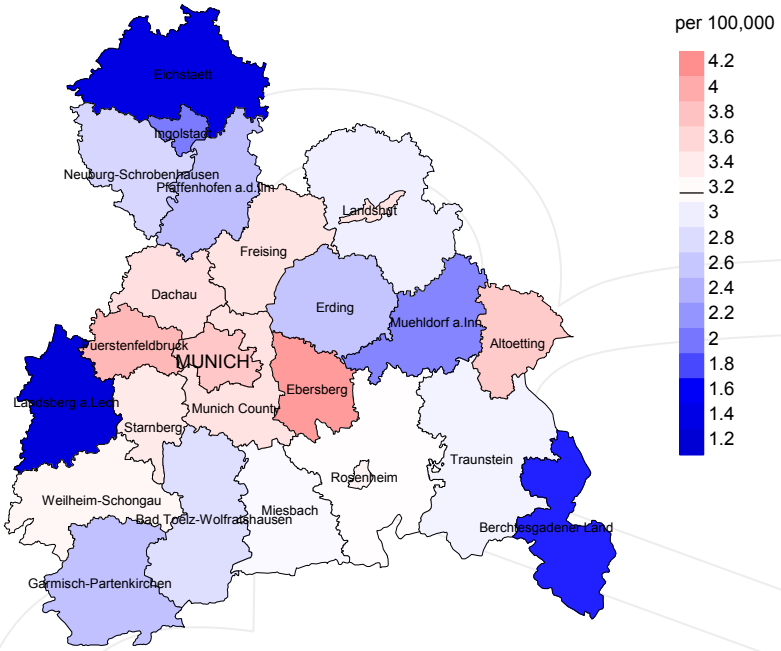


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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) 2007 - 2013: Males



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

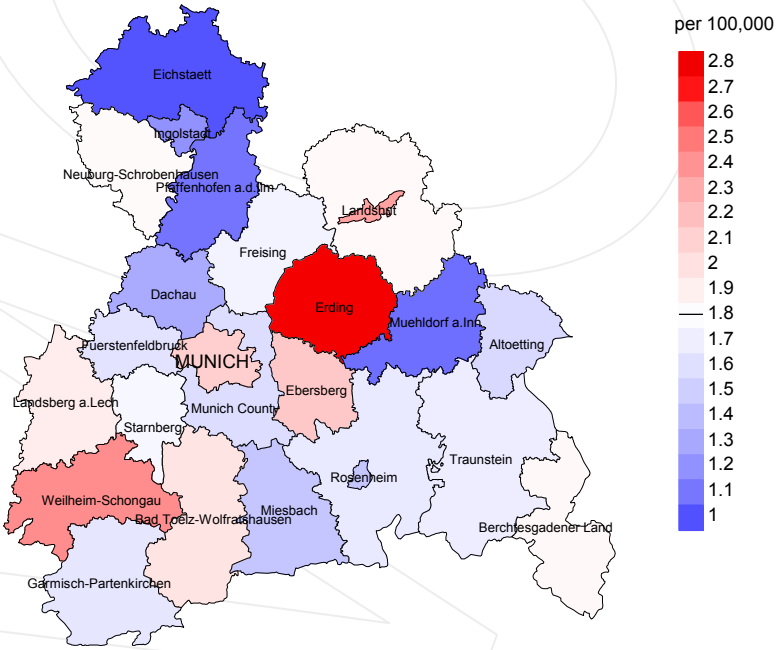
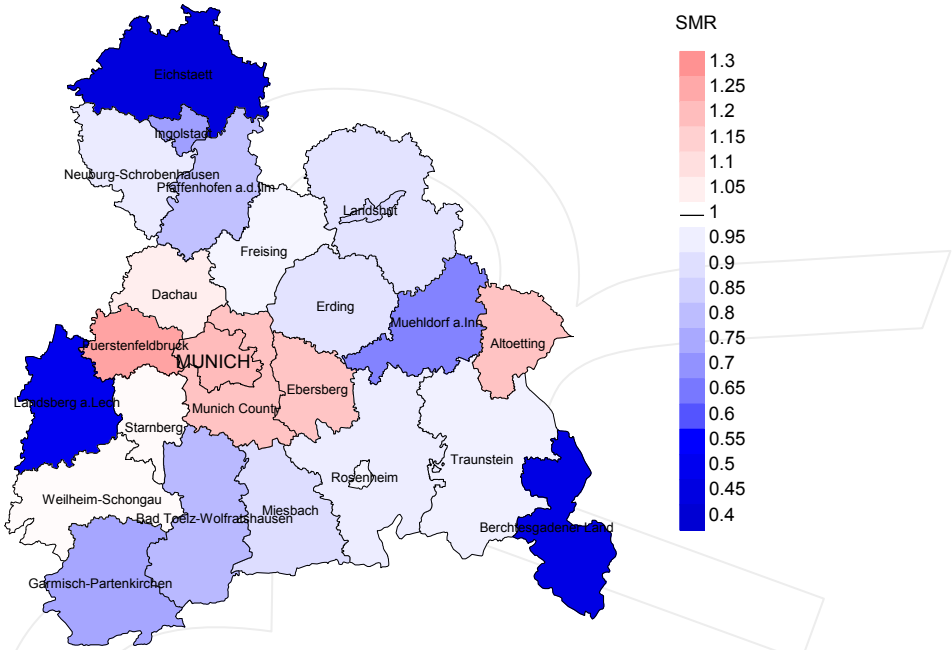


Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2013. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 3.2/100,000 WS N=1,053, females 1.8/100,000 WS N=744).

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 23 women died from malignant melanoma. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 2.1/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 1.1 and 3.9/100,000.

Standardized mortality ratio (SMR) 2007 - 2013: Males



Standardized mortality ratio (SMR) 2007 - 2013: Females

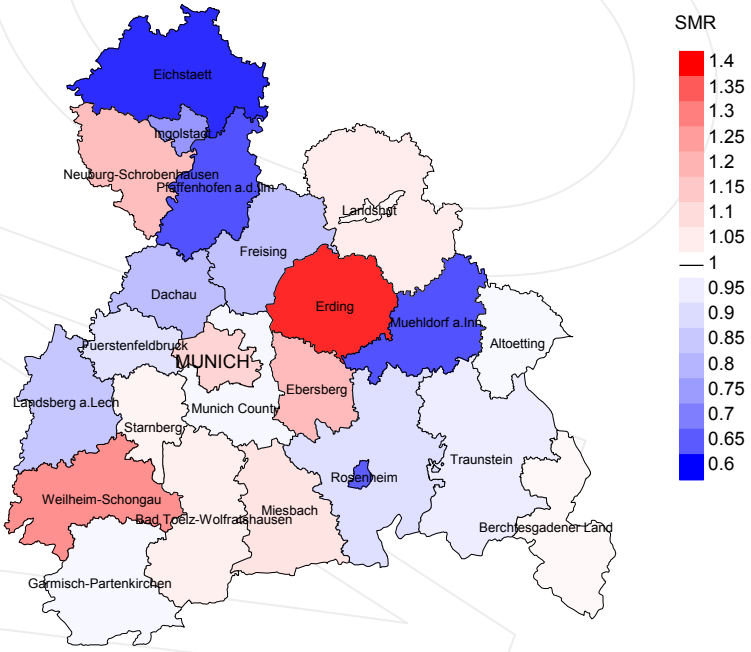


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=1,053, females N=744).

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 23 women died from malignant melanoma. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.18. Though, the value of this parameter may vary with an underlying probability of 99% between 0.64 and 1.98, 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

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