Munich Cancer Registry

- Survival
- Selection Matrix
- Homepage
- *Deutsch*

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

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

Cancer statistics: Baseline statistics

C00-C14: HN cancer

Year of diagnosis	1998-2013
Patients	8,308
Diseases	8,582
Creation date	05/19/2015
Export date	12/30/2014
Population	4.64 m

http://www.tumorregister-muenchen.de/en/facts/base/base_C0014E.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.

Some remarks regarding this cancer type

As a general rule, these few results from the TRM form the basis of sophisticated analyses. For head and neck tumors this is not the case. Therefore the results for head and neck tumors should be interpreted with caution. In part this is due to problems of classification because of limited specific details of locality. Additionally, with advanced tumors in a close topographic location it is often not possible to determine the exact ICD localization of a tumor.

ICD-10 codes (ICD-10 2015) used for specifying cancer site

Code	Description
C00	Lip
C01	Base of tongue
C02	Other and unspecified parts of tongue
C03	Gum
C04	Floor of mouth
C05	Palate
C06	Other and unspecified parts of mouth
C07	Parotid gland
C08	Other and unspecified major salivary glands
C09	Tonsil
C10	Oropharynx
	Excl.: Topography code C10.1 Anterior surface of epiglottis
C11	Nasopharynx
C12	Piriform sinus
C13	Hypopharynx
C14	Other and ill-defined sites in the lip, oral cavity and pharynx

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	353	18	5.1	29.5	79.6	99.4	
1999	384	12	3.1	31.5	78.6	97.1	
2000	344	14	4.1	29.9	77.6	98.0	
2001	356	21	5.9	31.2	75.0	96.6	
2002	556	37	6.7	34.4	72.3	98.2	#
2003	567	24	4.2	34.7	73.0	98.8	
2004	542	24	4.4	31.2	70.5	98.0	
2005	569	26	4.6	32.7	64.7	96.5	
2006	549	10	1.8	29.3	64.1	96.2	
2007	659	39	5.9	29.9	61.9	89.2	# ##
2008	699	21	3.0	29.8	58.1	76.3	
2009	679	12	1.8	31.2	57.4	81.1	
2010	731	32	4.4	30.1	48.0	74.1	
2011	645	25	3.9	30.1	41.4	74.1	
2012	622	27	4.3	26.0	33.8	75.1	
2013	327	20	6.1	27.5	33.3	99.1	###
1998-2013	8582	362	4.2	30.6	60.3	88.6	

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	353	267	86	75.6
1999	384	278	106	72.4
2000	344	262	82	76.2
2001	356	264	92	74.2
2002	556	410	146	73.7
2003	567	418	149	73.7
2004	542	413	129	76.2
2005	569	421	148	74.0
2006	549	390	159	71.0
2007	659	486	173	73.7
2008	699	511	188	73.1
2009	679	491	188	72.3
2010	731	539	192	73.7
2011	645	459	186	71.2
2012	622	437	185	70.3
2013	327	230	97	70.3
1998-2013	8582	6276	2306	73.1

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 4.64 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	267	86	24.1	7.3	16.2	4.0	21.8	5.6	24.1	6.5
1999	278	106	24.8	8.9	16.2	5.1	22.4	6.9	24.9	7.9
2000	262	82	23.0	6.8	15.2	3.9	21.1	5.4	23.5	6.1
2001	264	92	22.8	7.6	15.0	4.3	20.6	5.9	22.9	6.6
2002	410	146	22.0	7.5	14.2	3.9	19.5	5.5	21.4	6.5
2003	418	149	22.3	7.6	14.6	4.2	20.1	5.8	21.8	6.7
2004	413	129	22.0	6.5	14.0	3.3	19.2	4.7	21.6	5.7
2005	421	148	22.2	7.4	14.1	4.2	19.1	5.8	21.3	6.5
2006	390	159	20.4	7.9	12.8	4.7	17.8	6.3	20.2	7.1
2007	486	173	21.9	7.5	13.5	4.1	18.6	5.6	21.0	6.4
2008	511	188	23.0	8.1	14.1	4.3	19.5	6.0	22.0	6.9
2009	491	188	22.0	8.1	13.1	4.4	18.2	6.0	20.6	7.0
2010	539	192	23.9	8.2	14.4	4.4	19.9	6.0	22.4	6.8
2011	459	186	20.1	7.9	11.6	4.3	16.2	5.9	18.6	6.7
2012	437	185	19.1	7.8	11.2	4.2	15.5	5.8	17.8	6.7
2013	230	97	10.1	4.1	6.1	2.1	8.4	2.9	9.4	3.3
1998-2013	6276	2306	21.1	7.4	13.1	4.0	18.1	5.6	20.2	6.4

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	353	59.2	12.6	0.9	97.4	46.4	51.8	58.1	65.9	76.0
1999	384	60.4	12.4	13.9	91.9	47.9	52.0	58.8	66.9	78.7
2000	344	60.0	11.7	31.0	91.9	46.0	51.7	58.6	67.5	77.0
2001	356	61.0	12.4	16.4	96.4	47.5	53.1	60.1	67.2	77.1
2002	556	61.4	11.9	26.4	99.0	47.0	53.6	60.9	68.2	78.6
2003	567	60.6	11.8	10.7	98.2	46.8	53.2	59.5	67.9	76.9
2004	542	61.6	12.4	24.7	97.9	45.8	53.6	61.3	69.3	78.2
2005	569	61.4	12.1	4.1	103	46.8	53.6	61.2	67.7	77.9
2006	549	61.4	12.5	17.6	101	46.7	53.2	60.1	69.2	78.0
2007	659	62.3	12.3	7.7	101	47.2	53.7	62.4	70.4	77.8
2008	699	63.3	11.6	19.8	100	49.5	55.4	62.7	69.6	79.3
2009	679	63.2	12.2	16.6	98.4	48.2	55.1	62.9	70.9	79.9
2010	731	62.5	12.8	18.2	95.3	47.0	53.7	62.6	70.7	78.7
2011	645	63.7	12.7	14.4	96.9	48.6	55.0	63.9	72.0	79.7
2012	622	63.6	11.8	21.5	100	49.1	55.3	63.8	72.0	78.4
2013	327	63.9	12.2	19.0	93.6	49.7	55.3	64.2	71.7	78.5
1998-2013	8582	62.0	12.3	0.9	103	47.6	53.8	61.5	69.8	78.4

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	267	57.6	11.2	0.9	87.6	46.1	51.4	57.3	63.8	71.0
1999	278	59.1	11.3	32.0	90.8	47.9	51.3	57.6	64.3	75.2
2000	262	59.5	10.6	35.6	89.7	47.5	51.7	58.5	66.6	73.6
2001	264	59.5	11.1	28.7	94.9	46.5	52.0	59.0	65.3	74.5
2002	410	59.8	10.4	26.4	96.8	46.6	53.0	60.0	65.3	73.3
2003	418	59.5	10.0	28.1	94.5	47.3	53.1	58.9	65.6	72.6
2004	413	60.2	11.4	26.7	92.4	45.5	53.0	60.1	66.3	75.3
2005	421	60.5	11.4	4.1	99.0	46.6	53.4	61.0	67.0	74.7
2006	390	61.0	11.3	17.6	92.0	47.2	53.4	59.6	67.7	77.0
2007	486	61.5	11.3	15.7	101	47.2	53.2	61.4	69.5	75.6
2008	511	62.4	10.7	19.8	100	49.4	54.8	62.1	68.9	76.8
2009	491	62.7	11.0	16.6	90.7	48.9	55.1	62.8	70.2	76.5
2010	539	61.8	12.4	18.2	95.3	46.9	53.5	61.4	70.0	76.9
2011	459	63.4	12.2	14.4	95.5	48.4	54.2	63.3	71.3	78.9
2012	437	63.1	11.0	21.6	94.3	49.2	54.9	62.9	70.8	77.4
2013	230	62.7	10.9	19.0	88.0	50.3	55.5	63.4	69.9	75.7
1998-2013	6276	61.1	11.3	0.9	101	47.6	53.4	60.8	68.4	76.0

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	86	64.0	15.3	9.5	97.4	49.6	54.5	62.2	75.9	83.1
1999	106	63.8	14.6	13.9	91.9	47.8	55.1	64.7	74.9	81.6
2000	82	61.8	14.8	31.0	91.9	43.3	51.4	59.7	74.5	81.3
2001	92	65.4	14.5	16.4	96.4	50.2	56.4	63.3	73.0	87.8
2002	146	65.9	14.3	31.4	99.0	48.1	55.5	63.9	77.7	84.2
2003	149	63.7	15.3	10.7	98.2	44.8	53.7	63.1	76.1	83.8
2004	129	66.2	14.1	24.7	97.9	48.9	57.0	67.0	76.2	83.1
2005	148	64.0	13.6	22.8	103	49.6	54.6	62.3	72.2	81.5
2006	159	62.2	15.0	19.0	101	45.4	51.8	61.7	71.5	84.0
2007	173	64.5	14.7	7.7	98.2	46.5	55.2	63.6	74.8	84.5
2008	188	65.7	13.4	25.6	98.4	49.7	57.1	65.8	74.1	83.5
2009	188	64.6	14.8	16.8	98.4	47.5	55.0	63.6	75.2	83.8
2010	192	64.5	13.8	21.9	91.8	47.8	54.1	65.9	72.3	83.9
2011	186	64.4	14.0	17.2	96.9	48.6	56.5	64.6	73.1	84.0
2012	185	65.0	13.4	21.5	100	48.4	57.2	64.9	73.3	81.6
2013	97	66.7	14.4	34.8	93.6	46.6	55.1	67.6	76.0	88.3
1998-2013	2306	64.6	14.3	7.7	103	47.5	55.1	64.3	74.8	83.6

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	3	0.0	0.0	3	0.0	0.0			0.0
5-9	2	0.0	0.1			0.0	2	0.1	0.1
10-14	4	0.0	0.1	2	0.0	0.1	2	0.1	0.2
15-19	11	0.1	0.2	6	0.1	0.2	5	0.2	0.4
20-24	14	0.2	0.4	6	0.1	0.3	8	0.3	0.7
25-29	37	0.4	0.8	23	0.4	0.6	14	0.6	1.3
30-34	63	0.7	1.6	32	0.5	1.1	31	1.3	2.7
35-39	109	1.3	2.8	73	1.2	2.3	36	1.6	4.2
40-44	289	3.4	6.2	217	3.5	5.8	72	3.1	7.4
45-49	729	8.5	14.7	581	9.3	15.0	148	6.4	13.8
50-54	1202	14.0	28.7	954	15.2	30.2	248	10.8	24.5
55-59	1383	16.1	44.8	1074	17.1	47.3	309	13.4	37.9
60-64	1437	16.7	61.6	1108	17.7	65.0	329	14.3	52.2
65-69	1185	13.8	75.4	872	13.9	78.9	313	13.6	65.8
70-74	836	9.7	85.1	617	9.8	88.7	219	9.5	75.3
75-79	579	6.7	91.9	365	5.8	94.5	214	9.3	84.6
80-84	378	4.4	96.3	206	3.3	97.8	172	7.5	92.0
85+	321	3.7	100.0	137	2.2	100.0	184	8.0	100.0
All ages	8582	100.0		6276	100.0		2306	100.0	

Included in the statistics are 37.9% multiple primaries in males and 33.8% 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=233 %	Females DCO rate n=123 %	Males Prop.all cancers n=158258 %	Females Prop.all cancers n=153136 %
0- 4	2		0.1	0.0	50.0		0.6	
5- 9		2	0.0	0.1				1.6
10-14	2	2	0.1	0.1			1.2	1.2
15-19	6	5	0.4	0.3			1.7	1.7
20-24	6	8	0.3	0.4			1.0	1.5
25-29	22	14	1.1	0.7			2.3	1.3
30-34	32	31	1.4	1.4		3.2	2.1	1.5
35-39	72	36	2.9	1.5		2.8	3.2	1.0
40-44	213	72	8.1	2.9	0.9	1.4	6.7	1.2
45-49	570	145	24.1	6.3	1.8	2.8	10.7	1.7
50-54	942	240	46.7	11.7	2.1	2.1	10.9	2.2
55-59	1056	305	57.6	15.9	2.1	2.3	7.3	2.2
60-64	1087	325	61.3	17.3	3.0	2.8	5.0	1.9
65-69	860	309	54.5	17.9	3.6	1.6	3.1	1.6
70-74	610	218	47.6	14.4	6.4	3.2	2.3	1.2
75-79	364	211	44.0	17.8	6.6	5.7	1.8	1.2
80-84	203	170	40.6	18.2	9.9	8.8	1.5	1.1
85+	136	183	39.9	20.5	22.8	30.6	1.4	1.1
All ages	6183	2276			3.8	5.4	3.9	1.5
Incidence								
Raw			20.8	7.3				
WS			12.9	4.0				
ES			17.8	5.5				
BRD-S			19.9	6.3				

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 %
C00	Lip	2	0.2	10.1	1.2	36.4	#	1.3	
C03-C06	Oral cavity	43	2.2	19.6	14.2	26.5	#	28.4	7.0
C07-C08	Salivary gland	3	0.4	7.8	1.6	22.7	#	1.8	
C09-C10	Oropharynx	56	2.8	20.1	15.1	26.0	#	37.0	1.8
C11	Nasopharynx	3	0.2	17.5	3.6	51.1	#	2.0	
C12-C13	Hypopharynx	45	1.6	28.8	21.0	38.6	#	30.2	11.1
C15	Oesophagus	94	3.8	25.0	20.2	30.6	#	62.7	16.0
C16	Stomach	20	6.9	2.9	1.8	4.5	#	9.1	15.0
C17	Small intestine	3	0.9	3.2	0.7	9.2		1.4	66.7
C18	Colon	37	16.6	2.2	1.6	3.1	#	14.2	5.4
C19-C20	Rectum	23	10.7	2.1	1.4	3.2	#	8.5	
C21	Anus/canal	5	0.4	11.6	3.8	27.1	#	3.2	
C22	Liver	26	5.1	5.1	3.4	7.5	#	14.6	19.2
C25	Pancreas	17	6.2	2.7	1.6	4.4	#	7.5	23.5
C30-C31	Sinuses	5	0.3	15.0	4.9	35.1	#	3.2	
C32	Larynx	50	2.3	21.6	16.0	28.4	#	33.1	26.0
C33-C34	Lung	198	22.2	8.9	7.7	10.3	#	122.2	12.1
C38,C45	Mesothelioma	2	1.2	1.7	0.2	6.3		0.6	
C43	Malign. melanoma	13	8.0	1.6	0.9	2.8		3.5	
C46,C49	Soft tissue	4	1.0	4.0	1.1	10.2	#	2.1	
C61	Prostate	60	54.0	1.1	0.8	1.4		4.2	8.3
C64	Kidney	20	6.8	2.9	1.8	4.5	#	9.1	10.0
C65	Renal pelvis	3	0.7	4.5	0.9	13.2		1.6	
C67	Bladder	18	7.1	2.5	1.5	4.0	#	7.6	11.1
C70-C72	CNS cancer	2	2.6	0.8	0.1	2.7		-0.4	
C73	Thyroid	6	1.6	3.7	1.4	8.2	#	3.1	16.7
C76-C79	CUP	12	3.0	4.0	2.1	7.0	#	6.2	
C81	Hodgkin lymphoma	2	0.5	4.4	0.5	16.0		1.1	
C82-C85	NHL	18	7.1	2.5	1.5	4.0	#	7.6	16.7
C91-C96	Leukaemia	10	2.6	3.8	1.8	7.0	#	5.1	40.0
Other primaries		6	5.4	1.1	0.4	2.4		0.4	16.7
Not observed		0	2.1	0.0	0.0	1.8		-1.4	
All mult. primaries		806	186.4	4.3	4.0	4.6	#	430.7	11.8

Patients	4230
Median age at second malignancy (years)	64.2
Person-years	14386
Mean observation time (years)	3.4
Median observation time (years)	2.1

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 %
C03-C06	Oral cavity	9	0.4	21.7	9.9	41.3	#	13.7	
C07-C08	Salivary gland	3	0.1	29.0	6.0	84.8	#	4.6	
C09-C10	Oropharynx	21	0.3	70.8	43.8	108.3	#	33.0	
C11	Nasopharynx	2	0.0	81.1	9.8	292.9	#	3.1	
C12-C13	Hypopharynx	10	0.1	123.7	59.3	227.4	#	15.8	30.0
C14	ENT cancer	2	0.0	166.9	20.2	602.8	#	3.2	100.0
C15	Oesophagus	23	0.4	59.6	37.8	89.4	#	36.0	4.3
C16	Stomach	4	2.3	1.7	0.5	4.4		2.7	
C18	Colon	12	6.4	1.9	1.0	3.3		9.0	
C19-C20	Rectum	4	2.8	1.4	0.4	3.6		1.9	
C22	Liver	9	0.7	12.4	5.7	23.6	#	13.2	22.2
C23-C24	Bile	3	0.9	3.3	0.7	9.6		3.3	
C25	Pancreas	8	2.7	2.9	1.3	5.8	#	8.4	37.5
C30-C31	Sinuses	4	0.1	51.1	13.9	130.7	#	6.2	25.0
C32	Larynx	10	0.1	77.0	36.9	141.6	#	15.7	20.0
C33-C34	Lung	54	4.7	11.5	8.6	15.0	#	78.5	20.4
C43	Malign. melanoma	6	2.4	2.5	0.9	5.5		5.8	16.7
C50	Breast	29	20.6	1.4	0.9	2.0		13.3	6.9
C51	Vulva	2	0.6	3.3	0.4	11.8		2.2	
C53	Cervix uteri	6	0.9	6.4	2.3	13.8	#	8.1	16.7
C54	Corpus uteri	2	3.7	0.5	0.1	2.0		-2.7	
C56	Ovary	6	2.7	2.2	0.8	4.8		5.2	16.7
C64	Kidney	3	1.6	1.9	0.4	5.5		2.2	
C67	Bladder	3	1.2	2.5	0.5	7.4		2.9	66.7
C70-C72	CNS cancer	3	0.9	3.3	0.7	9.6		3.3	66.7
C73	Thyroid	5	1.3	3.9	1.3	9.0	#	5.9	20.0
C82-C85	NHL	7	2.5	2.9	1.1	5.9	#	7.2	
C91-C96	Leukaemia	2	1.0	2.0	0.2	7.2		1.6	50.0
Other primaries		4	1.5	2.6	0.7	6.6		3.9	
Not observed		0	3.1	0.0	0.0	1.2		-4.9	
All mult. primaries		256	66.1	3.9	3.4	4.4	#	302.4	14.1

Patients	1543
Median age at second malignancy (years)	66.8
Person-years	6280
Mean observation time (years)	4.1
Median observation time (years)	2.9

The occurrence of second malignancy is statistically significant.

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

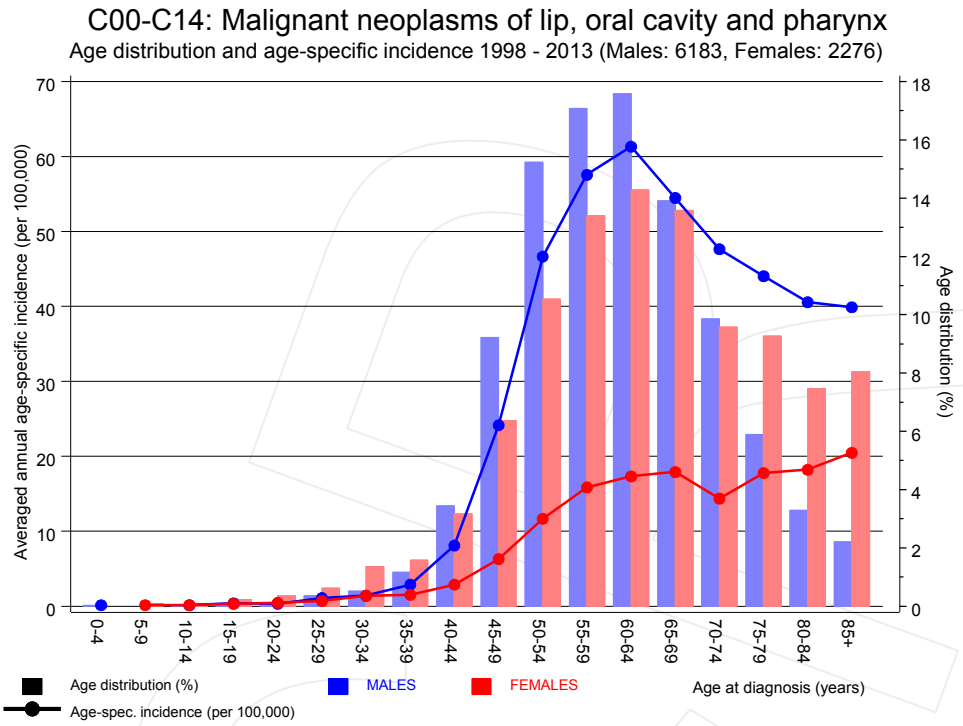


Figure 7. Age distribution and age-specific incidence

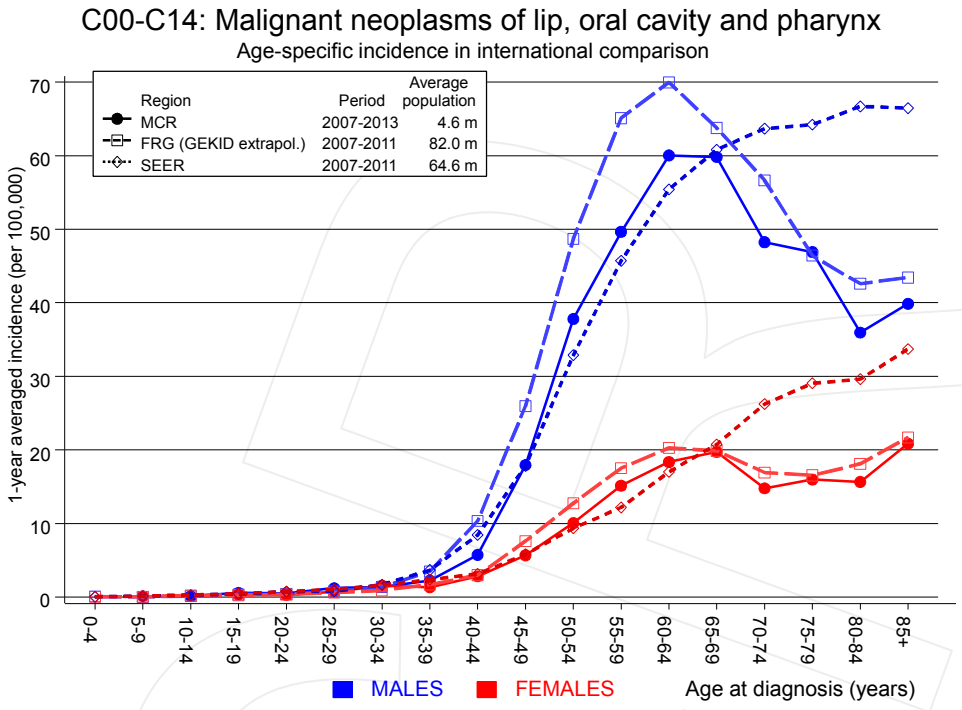


Figure 7a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).

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.

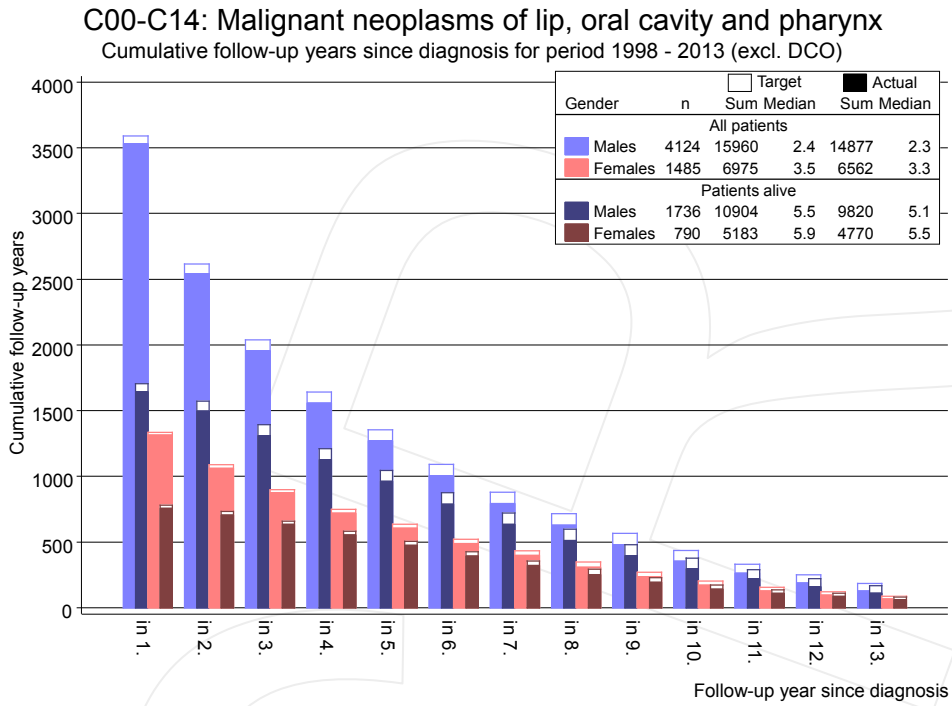
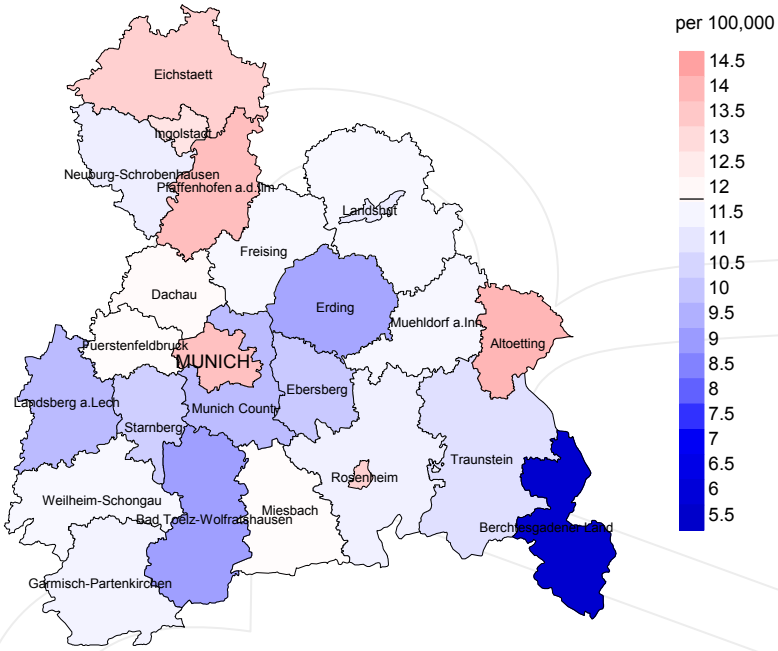


Figure 8. Cumulative follow-up years depending on time since diagnosis

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

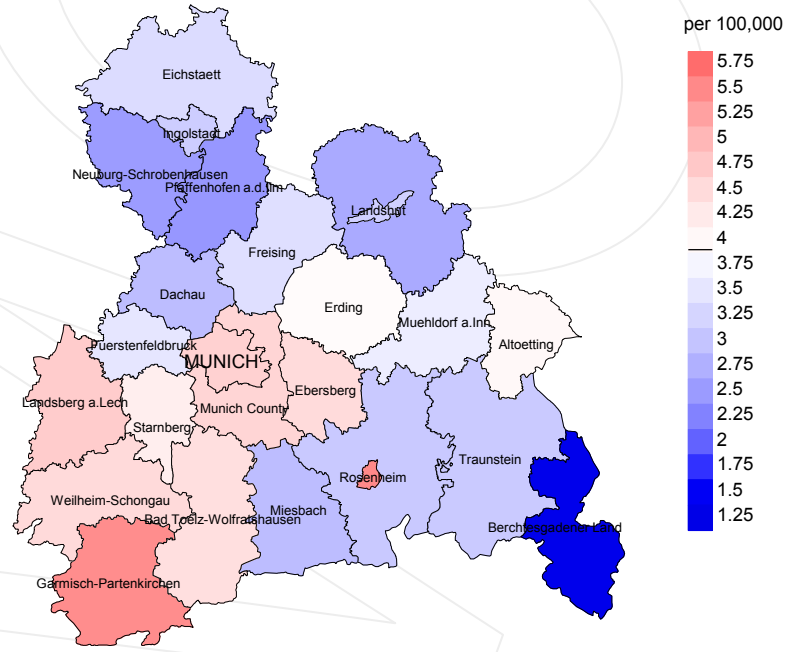
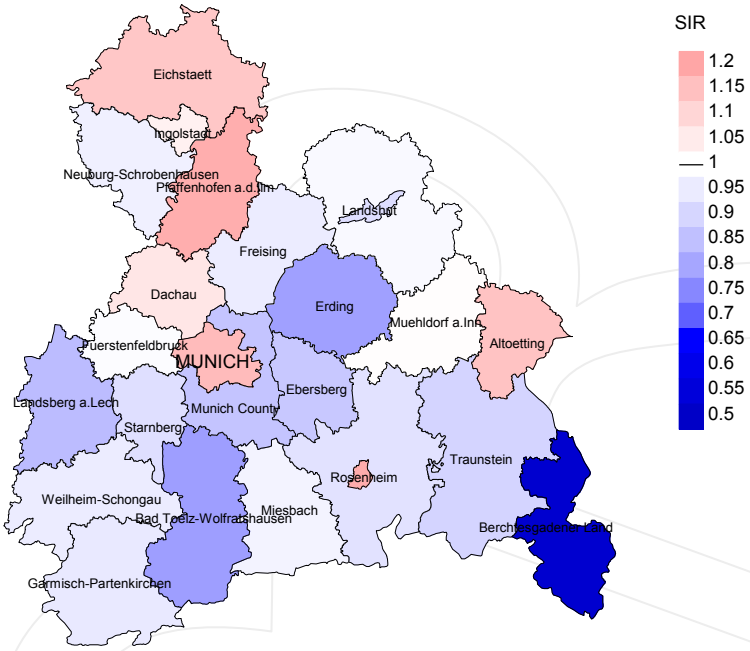


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 11.8/100,000 WS N=3,096, females 3.9/100,000 WS N=1,188).

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 37 women were identified with newly diagnosed HN cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 4.5/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 2.6 and 7.5/100,000.

Standardized incidence ratio (SIR) 2007 - 2013: Males



Standardized incidence ratio (SIR) 2007 - 2013: Females

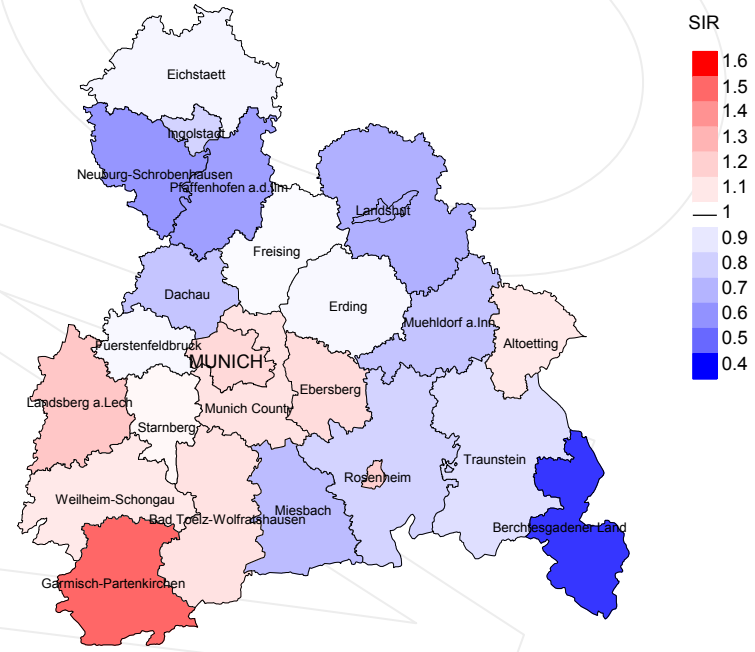


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=3,096, females N=1,188).

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 37 women were identified with newly diagnosed HN cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.15. Though, the value of this parameter may vary with an underlying probability of 99% between 0.72 and 1.73, 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	353	99.4	5.1	281	79.6	95.7
1999	384	97.1	3.1	302	78.6	89.7
2000	344	98.0	4.1	267	77.6	95.5
2001	356	96.6	5.9	267	75.0	94.4
2002	556	98.2	6.7	402	72.3	95.5
2003	567	98.8	4.2	414	73.0	96.6
2004	542	98.0	4.4	382	70.5	96.1
2005	569	96.5	4.6	368	64.7	98.6
2006	549	96.2	1.8	352	64.1	98.0
2007	659	89.2	5.9	408	61.9	98.0
2008	699	76.3	3.0	406	58.1	97.0
2009	679	81.1	1.8	390	57.4	97.7
2010	731	74.1	4.4	351	48.0	98.0
2011	645	74.1	3.9	267	41.4	95.9
2012	622	75.1	4.3	210	33.8	94.3
2013	327	99.1	6.1	109	33.3	87.2
1998-2013	8582	88.6	4.2	5176	60.3	96.1

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	353	236	91.5	53	15.0
1999	384	244	89.3	54	14.1
2000	344	251	93.6	48	14.0
2001	356	279	91.0	61	17.1
2002	556	378	97.6	87	15.6
2003	567	394	96.2	86	15.2
2004	542	409	96.6	93	17.2
2005	569	378	97.4	85	14.9
2006	549	428	97.0	85	15.5
2007	659	468	97.4	103	15.6
2008	699	440	98.2	97	13.9
2009	679	482	98.5	90	13.3
2010	731	484	99.0	101	13.8
2011	645	482	97.7	94	14.6
2012	622	506	97.8	94	15.1
2013	327	452	98.7	72	22.0
1998-2013	8582	6311	96.7	1303	15.2

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	236	72.9	27.1	90.3
1999	244	68.0	32.0	86.2
2000	251	77.3	22.7	89.8
2001	279	75.3	24.7	89.4
2002	378	78.3	21.7	90.5
2003	394	76.9	23.1	87.1
2004	409	80.0	20.0	91.6
2005	378	82.3	17.7	91.0
2006	428	77.8	22.2	87.0
2007	468	79.1	20.9	89.0
2008	440	78.2	21.8	87.3
2009	482	79.0	21.0	89.7
2010	484	80.2	19.8	90.2
2011	482	73.4	26.6	84.9
2012	506	77.3	22.7	87.7
2013	452	76.1	23.9	87.9
1998-2013	6311	77.4	22.6	88.6

Table 11a

Medians of age at death according to the grouping in Table 10
MALES

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	171	60.5	58.7	63.8	60.5
1999	187	58.9	58.1	62.6	58.0
2000	193	61.6	61.2	65.6	61.7
2001	218	60.5	60.2	64.5	60.5
2002	294	61.7	61.2	66.5	61.4
2003	304	63.2	62.6	67.8	62.9
2004	315	62.5	61.3	66.0	62.1
2005	271	64.3	63.8	73.1	64.1
2006	326	64.1	63.0	67.1	63.9
2007	370	64.5	63.2	69.9	63.8
2008	330	66.2	65.0	69.1	65.7
2009	353	66.4	65.2	70.8	65.4
2010	373	66.0	64.3	70.7	64.7
2011	373	68.4	66.1	71.9	66.7
2012	375	68.9	68.8	70.9	68.7
2013	319	68.3	66.1	72.3	66.8
1998-2013	4772	64.5	63.3	69.2	63.9

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	65	72.7	68.6	77.7	72.2
1999	57	72.7	63.9	79.2	64.9
2000	58	65.8	60.6	78.0	65.8
2001	61	70.4	68.0	72.5	68.0
2002	84	71.9	69.2	77.5	71.8
2003	90	69.7	64.7	77.2	66.2
2004	94	73.7	73.7	73.7	73.7
2005	107	68.5	64.6	84.9	66.0
2006	102	73.2	68.7	81.7	69.2
2007	98	72.8	69.3	83.4	69.4
2008	110	69.2	67.8	78.1	67.9
2009	129	70.4	68.6	81.7	69.8
2010	111	70.6	67.5	81.7	68.2
2011	109	72.3	70.0	82.3	70.2
2012	131	72.5	70.6	82.8	71.5
2013	133	73.8	70.5	81.1	71.3
1998-2013	1539	71.4	68.5	80.0	69.4

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

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

Table 12a

Mortality measures (cancer-related death) and mortality-incidence-index
by year of death
MALES

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	127	11.5	0.48	7.5	0.47	10.3	0.48	11.6	0.49
1999	136	12.2	0.50	7.7	0.49	10.9	0.50	12.3	0.50
2000	149	13.1	0.57	8.1	0.53	11.7	0.56	14.2	0.60
2001	166	14.3	0.64	9.3	0.63	13.0	0.64	14.6	0.65
2002	236	12.7	0.58	7.9	0.56	11.2	0.58	12.8	0.61
2003	241	12.9	0.59	7.9	0.55	11.2	0.57	12.8	0.60
2004	254	13.5	0.62	8.4	0.61	11.8	0.62	13.5	0.63
2005	227	12.0	0.54	7.0	0.50	10.0	0.52	11.6	0.55
2006	262	13.7	0.68	8.3	0.66	11.6	0.66	13.3	0.66
2007	298	13.5	0.62	8.0	0.60	11.3	0.62	13.1	0.63
2008	268	12.0	0.53	6.9	0.50	9.9	0.51	11.5	0.53
2009	288	12.9	0.60	7.3	0.57	10.4	0.58	12.2	0.60
2010	303	13.4	0.58	7.6	0.55	11.0	0.57	12.7	0.58
2011	281	12.3	0.63	6.8	0.60	9.8	0.62	11.5	0.64
2012	291	12.7	0.67	6.7	0.60	9.8	0.63	11.9	0.68
2013	246	10.8	1.08	5.9	0.98	8.5	1.03	10.0	1.08
1998-2013	3773	12.7	0.61	7.5	0.58	10.6	0.60	12.3	0.62

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	45	3.8	0.52	1.8	0.45	2.6	0.48	3.4	0.52
1999	30	2.5	0.29	1.3	0.26	1.9	0.27	2.2	0.28
2000	46	3.8	0.56	2.1	0.53	2.9	0.54	3.4	0.55
2001	44	3.6	0.48	1.7	0.41	2.5	0.42	3.0	0.46
2002	60	3.1	0.41	1.5	0.38	2.2	0.40	2.6	0.40
2003	63	3.2	0.43	1.7	0.40	2.4	0.41	2.8	0.42
2004	73	3.7	0.57	1.6	0.48	2.3	0.50	3.0	0.53
2005	84	4.2	0.58	2.1	0.52	3.1	0.55	3.6	0.56
2006	72	3.6	0.46	1.5	0.34	2.3	0.37	2.8	0.40
2007	72	3.1	0.43	1.4	0.35	2.1	0.37	2.5	0.40
2008	76	3.3	0.41	1.6	0.38	2.3	0.39	2.7	0.39
2009	94	4.0	0.51	1.9	0.45	2.8	0.47	3.2	0.48
2010	85	3.6	0.46	1.8	0.42	2.6	0.44	3.0	0.46
2011	74	3.1	0.40	1.4	0.33	2.0	0.34	2.3	0.35
2012	101	4.3	0.55	1.9	0.46	2.7	0.48	3.3	0.51
2013	98	4.2	1.02	1.8	0.88	2.6	0.90	3.2	0.98
1998-2013	1117	3.6	0.49	1.7	0.43	2.4	0.45	2.9	0.47

Table 13

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

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	2	0.0	0.0	2	0.1	0.1			0.0
5-9	0	0.0	0.0			0.1			0.0
10-14	0	0.0	0.0			0.1			0.0
15-19	0	0.0	0.0			0.1			0.0
20-24	3	0.1	0.1	3	0.1	0.1			0.0
25-29	2	0.0	0.1	1	0.0	0.2	1	0.1	0.1
30-34	3	0.1	0.2	1	0.0	0.2	2	0.2	0.3
35-39	28	0.5	0.7	21	0.5	0.7	7	0.6	0.8
40-44	96	1.9	2.6	80	2.0	2.7	16	1.4	2.2
45-49	292	5.6	8.2	243	6.1	8.8	49	4.1	6.4
50-54	565	10.9	19.2	485	12.2	20.9	80	6.8	13.1
55-59	829	16.0	35.2	688	17.2	38.2	141	11.9	25.1
60-64	915	17.7	52.9	726	18.2	56.4	189	16.0	41.1
65-69	779	15.1	67.9	613	15.4	71.7	166	14.1	55.1
70-74	615	11.9	79.8	479	12.0	83.7	136	11.5	66.6
75-79	457	8.8	88.7	333	8.3	92.1	124	10.5	77.1
80-84	297	5.7	94.4	186	4.7	96.7	111	9.4	86.5
85+	289	5.6	100.0	130	3.3	100.0	159	13.5	100.0
All ages	5172	100.0		3991	100.0		1181	100.0	

Included in the statistics are 37.9% multiple primaries in males and 33.8% 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	2		0.1	0.67	0.0		6.1	
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24	3		0.2	0.50	0.0		3.3	
25-29	1	1	0.0	0.04	0.0	0.07	0.9	0.9
30-34	1	2	0.0	0.03	0.1	0.06	0.5	0.9
35-39	21	7	0.8	0.29	0.3	0.19	5.3	1.4
40-44	80	16	3.1	0.37	0.6	0.22	9.3	1.4
45-49	243	49	10.3	0.42	2.1	0.33	13.4	2.4
50-54	485	80	24.0	0.51	3.9	0.32	14.7	2.6
55-59	688	141	37.5	0.64	7.3	0.46	11.6	3.0
60-64	726	189	41.0	0.66	10.1	0.57	8.2	2.9
65-69	613	166	38.8	0.70	9.6	0.53	5.1	2.0
70-74	479	136	37.4	0.78	9.0	0.62	3.5	1.4
75-79	333	124	40.3	0.91	10.4	0.58	2.5	1.2
80-84	186	111	37.2	0.90	11.9	0.65	1.7	1.0
85+	130	159	38.1	0.95	17.8	0.86	1.5	1.2
All ages	3991	1181					5.0	1.6
Mortality								
Raw			13.4	0.64	3.8	0.51		
WS			7.9	0.60	1.8	0.45		
ES			11.2	0.62	2.6	0.47		
BRD-S			13.0	0.64	3.1	0.49		
PYLL-70								
per 100,000			122.4		25.9			
ES			110.1		22.2			
AYLL-70			11.4		10.6			

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	104	5.5			5	4.8	99	95.2
C09-C10 Oropharynx	122	6.5			32	26.2	90	73.8
C12-C13 Hypopharynx	88	4.7			25	28.4	63	71.6
C15 Oesophagus	186	9.9	35	18.8	25	13.4	126	67.7
C16 Stomach	43	2.3	12	27.9	2	4.7	29	67.4
C18 Colon	72	3.8	27	37.5	4	5.6	41	56.9
C19-C20 Rectum	53	2.8	13	24.5	2	3.8	38	71.7
C22 Liver	46	2.5	2	4.3	7	15.2	37	80.4
C25 Pancreas	36	1.9	5	13.9	1	2.8	30	83.3
C30-C31 Sinuses	13	0.7	4	30.8	2	15.4	7	53.8
C32 Larynx	59	3.1			12	20.3	47	79.7
C33-C34 Lung	388	20.7	47	12.1	38	9.8	303	78.1
C43 Malign. melanoma	36	1.9	19	52.8	4	11.1	13	36.1
C44 Skin others	174	9.3	61	35.1	25	14.4	88	50.6
C61 Prostate	120	6.4	61	50.8	7	5.8	52	43.3
C64 Kidney	32	1.7	12	37.5	4	12.5	16	50.0
C67 Bladder	75	4.0	41	54.7	2	2.7	32	42.7
C76-C79 CUP	49	2.6	26	53.1	4	8.2	19	38.8
C82-C85 NHL	38	2.0	17	44.7	6	15.8	15	39.5
C91-C96 Leukaemia	19	1.0	5	26.3	1	5.3	13	68.4
Other primaries	123	6.6	52	42.3	9	7.3	62	50.4
All mult. primaries	1876	100.0	439	23.4	217	11.6	1220	65.0

Multiple primaries with number of cases 1 to 10 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 ←%
C03-C06 Oral cavity	22	4.0			1	4.5	21	95.5
C09-C10 Oropharynx	26	4.7			5	19.2	21	80.8
C12-C13 Hypopharynx	17	3.1			3	17.6	14	82.4
C15 Oesophagus	43	7.8	4	9.3	6	14.0	33	76.7
C16 Stomach	13	2.4	3	23.1	3	23.1	7	53.8
C18 Colon	25	4.5	12	48.0	1	4.0	12	48.0
C19-C20 Rectum	8	1.4	4	50.0			4	50.0
C21 Anus/canal	6	1.1	2	33.3			4	66.7
C22 Liver	7	1.3			1	14.3	6	85.7
C25 Pancreas	10	1.8	1	10.0	1	10.0	8	80.0
C30-C31 Sinuses	8	1.4	2	25.0			6	75.0
C32 Larynx	22	4.0	7	31.8	3	13.6	12	54.5
C33-C34 Lung	88	15.9	5	5.7	7	8.0	76	86.4
C43 Malign. melanoma	7	1.3					7	100.0
C44 Skin others	29	5.3	9	31.0	4	13.8	16	55.2
C50 Breast	92	16.7	60	65.2	5	5.4	27	29.3
C53 Cervix uteri	18	3.3	14	77.8			4	22.2
C54 Corpus uteri	11	2.0	8	72.7	1	9.1	2	18.2
C56 Ovary	11	2.0	5	45.5			6	54.5
C67 Bladder	9	1.6	6	66.7			3	33.3
C70-C72 CNS cancer	8	1.4	1	12.5	1	12.5	6	75.0
C73 Thyroid	7	1.3	5	71.4	1	14.3	1	14.3
C76-C79 CUP	15	2.7	10	66.7			5	33.3
C82-C85 NHL	14	2.5	6	42.9	1	7.1	7	50.0
Other primaries	36	6.5	9	25.0	6	16.7	21	58.3
All mult. primaries	552	100.0	173	31.3	50	9.1	329	59.6

Multiple primaries with number of cases 1 to 5 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			0.0		0.0			
20-24	3		0.2	0.50	0.0		3.6	
25-29	1	1	0.0	0.05	0.0	0.08	1.0	0.9
30-34	1	2	0.0	0.03	0.1	0.07	0.6	1.0
35-39	18	5	0.7	0.28	0.2	0.15	4.8	1.1
40-44	69	14	2.6	0.35	0.6	0.21	8.7	1.4
45-49	209	43	8.9	0.41	1.9	0.34	12.8	2.5
50-54	409	64	20.3	0.50	3.1	0.31	14.2	2.5
55-59	564	115	30.7	0.64	6.0	0.46	11.0	2.9
60-64	578	143	32.6	0.64	7.6	0.52	7.7	2.7
65-69	477	126	30.2	0.70	7.3	0.52	4.9	1.9
70-74	375	103	29.3	0.85	6.8	0.62	3.5	1.3
75-79	234	99	28.3	0.98	8.3	0.60	2.3	1.2
80-84	124	79	24.8	0.89	8.5	0.60	1.5	0.9
85+	89	126	26.1	1.05	14.1	0.86	1.3	1.1
All ages	3151	920					4.9	1.6
Mortality								
Raw			10.6	0.63	3.0	0.49		
WS			6.3	0.59	1.4	0.43		
ES			8.9	0.61	2.0	0.45		
BRD-S			10.2	0.64	2.4	0.47		
PYLL-70								
per 100,000			101.3		21.0			
ES			91.0		18.0			
AYLL-70			11.7		10.9			

* See corresponding tables with multiple primaries.

Table 17

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

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4			0.0		0.0			
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24	3		0.2	0.50	0.0		3.8	
25-29	1	1	0.0	0.05	0.0	0.09	1.1	1.0
30-34	1	1	0.0	0.04	0.0	0.04	0.6	0.5
35-39	18	3	0.7	0.31	0.1	0.10	5.0	0.7
40-44	64	13	2.4	0.37	0.5	0.22	8.6	1.4
45-49	182	29	7.7	0.41	1.3	0.26	11.9	1.9
50-54	327	58	16.2	0.46	2.8	0.32	12.5	2.5
55-59	433	91	23.6	0.59	4.7	0.44	9.4	2.6
60-64	425	100	24.0	0.55	5.3	0.42	6.5	2.2
65-69	337	88	21.3	0.59	5.1	0.43	4.0	1.5
70-74	247	72	19.3	0.67	4.7	0.48	2.8	1.1
75-79	152	67	18.4	0.71	5.6	0.48	1.9	0.9
80-84	81	55	16.2	0.64	5.9	0.47	1.3	0.7
85+	70	100	20.5	0.92	11.2	0.73	1.3	1.1
All ages	2341	678					4.3	1.4
Mortality								
Raw			7.9	0.54	2.2	0.42		
WS			4.8	0.52	1.1	0.36		
ES			6.7	0.53	1.5	0.38		
BRD-S			7.6	0.54	1.8	0.39		
PYLL-70								
per 100,000			81.5		16.2			
ES			73.1		14.0			
AYLL-70			12.2		11.2			

* See corresponding tables with multiple primaries.

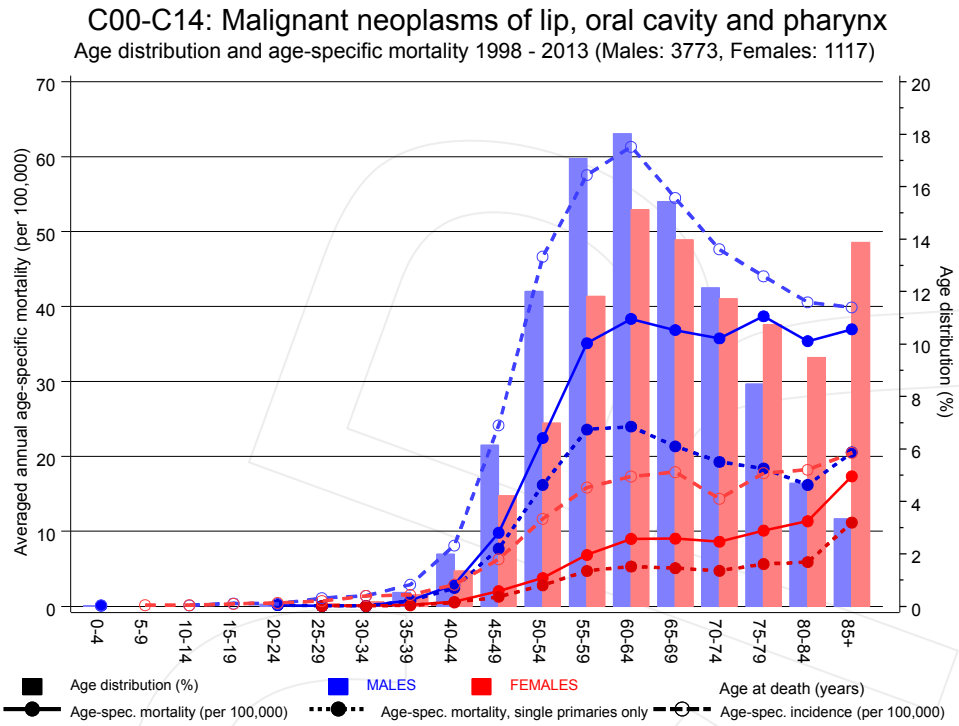
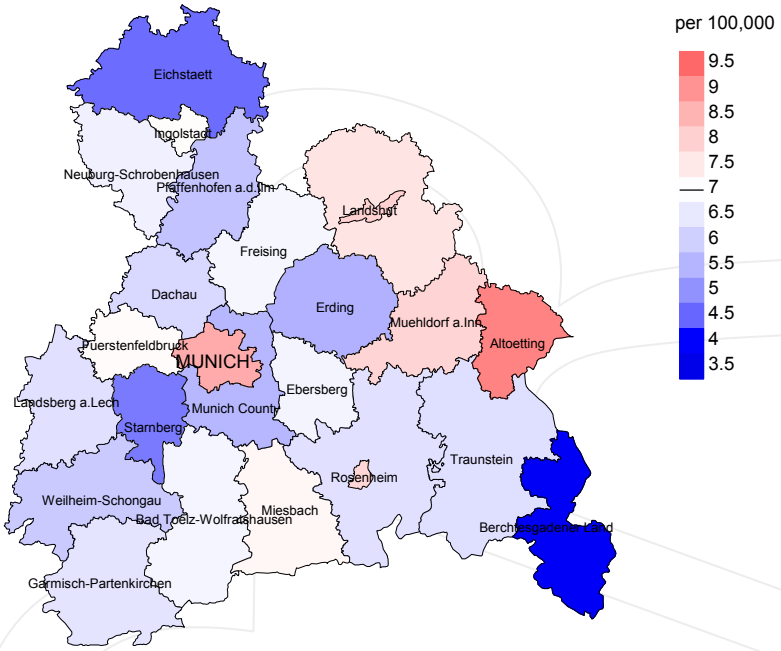


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

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



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

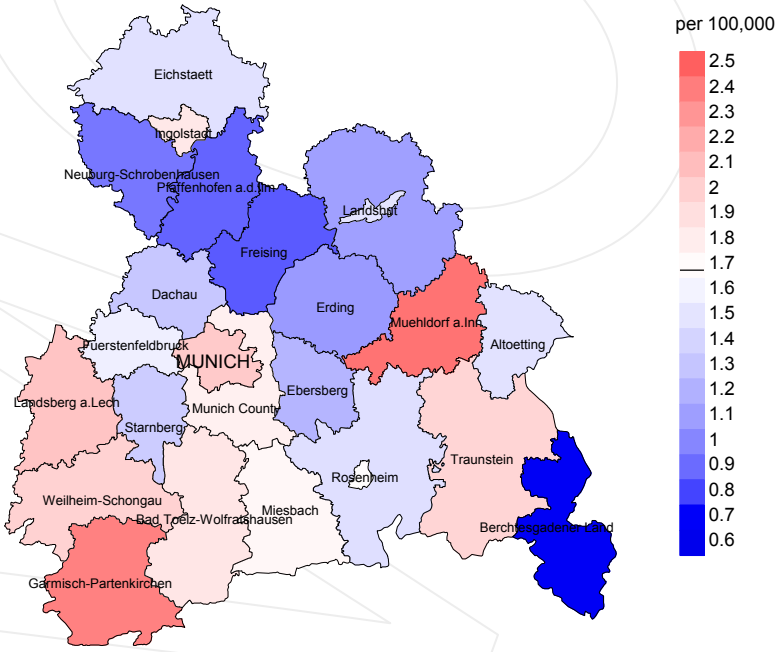


Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2013. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 7.0/100,000 WS N=1,959, females 1.7/100,000 WS N=596).

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 14 women died from HN cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 1.2/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.5 and 2.6/100,000.

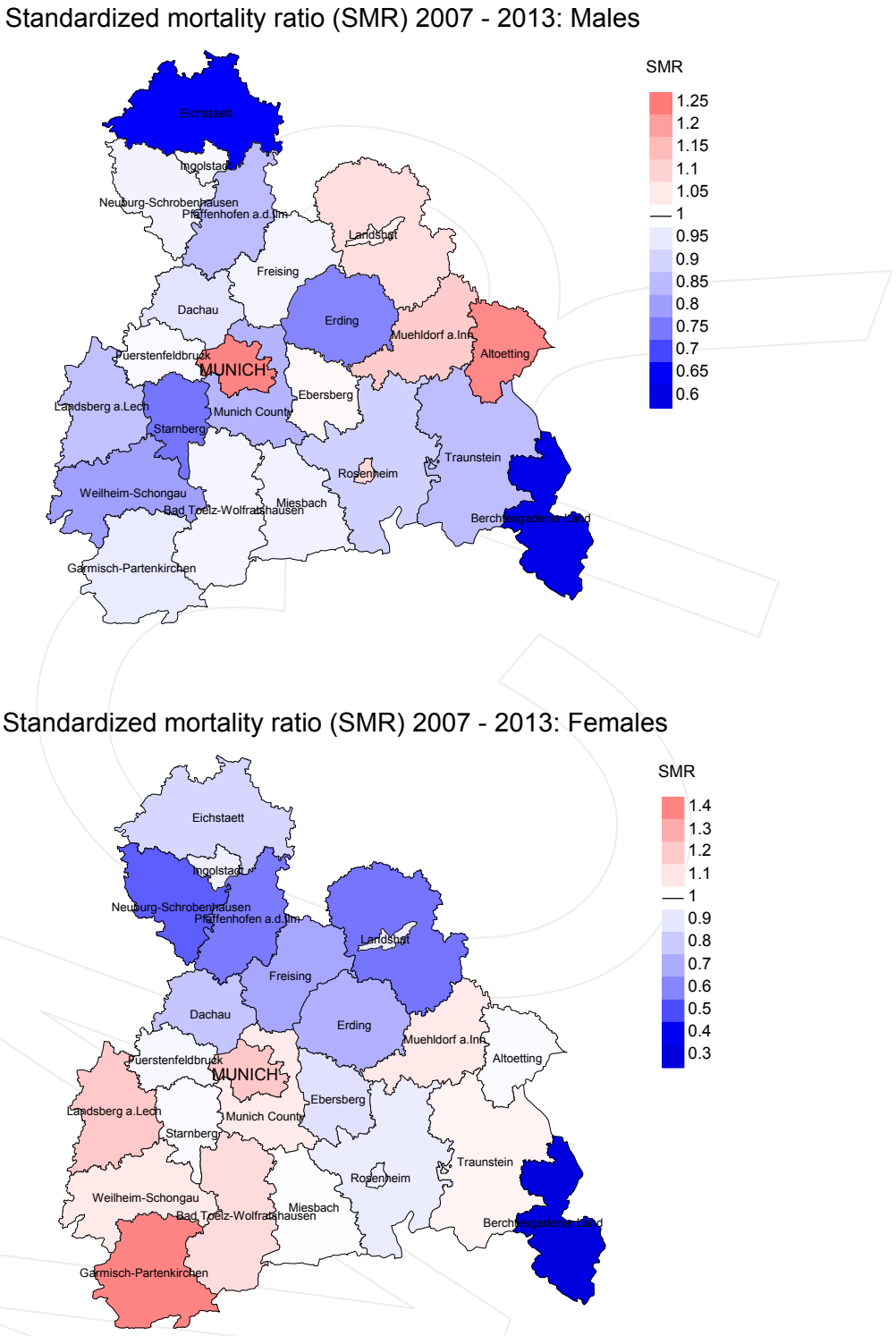


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=1,959, females N=596).

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 14 women died from HN cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.88. Though, the value of this parameter may vary with an underlying probability of 99% between 0.39 and 1.69, 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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