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

C00-C14: HN cancer

Year of diagnosis	1998-2012
Patients	7,769
Diseases	8,012
Creation date	03/20/2014
Export date	02/12/2014
Population	4.5 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 4.5 million inhabitants, account for the frequency of cancer diseases[##] and the achieved long term results. Additionally, the long term survival evaluated by the Munich Cancer Registry (MCR) is compared with the results of the population-based registry in the USA (SEER), which is useful for checking the consistency of the data on an international level.

In comparing several tables, inconsistent figures may be detected. This is based on the fact that different patient cohorts are included in the base calculation, for example when proportions of multiple tumors or DCO-cases[###] are concerned. In other cases the individual tumor diagnosis is the basis for calculation, for example with incidence.

The foot notes describe the currentness of the data. The baseline statistics and survival data are updated annually. This yearly analysis comprises the Annual Report of the MCR. The time-delayed acquisition of data and the occasionally high DCO-rates indicate optimizing reserves, among others, because of current financial and legal conditions that hinder the analyses.

Clinics and physicians have access to essentially more detailed data, with which they can check, compare and in the best case optimize their own data and results.

We would be pleased to receive corrections, critique and useful suggestions. Just send an e-mail to tumor@ibe.med.uni-muenchen.de.

Munich Cancer Registry, March 2014

[#] Base data has been collected since 1998. An increase in new diseases is apparent, which is an effect of two extensions in the MCR catchment area (from a base population of 2.51 million to 3.96 in 2002, and to 4.52 million in 2007). Death certificates from 2013 are incorporated into these analyses.

[##] Due to the high frequency and good prognosis of non-malignant skin cancer (C44), no systematic ascertainment is performed for this diagnosis. C44 is not designated as a primary, but rather as a secondary tumor.

[###] DCO (death certificate only) identifies a cancer case that first becomes available to the MCR through the death certificate. A high proportion of DCO cases (≥5%) in particular cancer types indicate insufficient participation of specific cancer specializations.

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 used for specifying cancer site

ICD-10	Description
C00	Lip
C01	Base of tongue
C02	Tongue, other parts
C03	Gum
C04	Floor of mouth
C05	Palate
C06	Mouth, other parts
C07	Parotid gland
C08	Major salivary glands
C09	Tonsil
C10	Oropharynx excl. C10.1 Anterior surface of epiglottis
C11	Nasopharynx
C12	Piriform sinus
C13	Hypopharynx
C14	Lip, oral cavity and pharynx, other parts

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	78.2	99.4	
1999	383	12	3.1	31.1	77.5	97.4	
2000	343	14	4.1	30.0	77.3	98.0	
2001	355	21	5.9	30.7	73.5	96.9	
2002	557	37	6.6	33.0	70.6	98.4	#
2003	563	23	4.1	34.3	71.6	98.8	#
2004	538	24	4.5	30.7	69.9	98.0	#
2005	567	26	4.6	31.9	63.3	96.6	#
2006	546	10	1.8	28.9	62.3	96.3	#
2007	654	40	6.1	29.1	60.4	89.3	# ##
2008	688	21	3.1	27.9	54.9	78.1	
2009	667	12	1.8	29.7	55.0	81.9	
2010	698	35	5.0	29.2	47.0	79.4	
2011	614	27	4.4	27.9	35.7	79.2	
2012	486	30	6.2	25.9	26.3	96.7	###
1998-2012	8012	350	4.4	29.9	59.7	90.9	

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	383	277	106	72.3
2000	343	262	81	76.4
2001	355	263	92	74.1
2002	557	411	146	73.8
2003	563	415	148	73.7
2004	538	411	127	76.4
2005	567	419	148	73.9
2006	546	387	159	70.9
2007	654	483	171	73.9
2008	688	501	187	72.8
2009	667	481	186	72.1
2010	698	510	188	73.1
2011	614	437	177	71.2
2012	486	335	151	68.9
1998-2012	8012	5859	2153	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 4.52 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	267	86	24.1	7.3	16.2	4.0	21.8	5.6	24.1	6.5
1999	277	106	24.7	8.9	16.1	5.1	22.4	6.9	24.8	7.9
2000	262	81	23.0	6.7	15.2	3.9	21.1	5.4	23.5	6.1
2001	263	92	22.7	7.6	15.0	4.3	20.5	5.9	22.8	6.6
2002	411	146	22.1	7.5	14.3	3.9	19.5	5.5	21.4	6.5
2003	415	148	22.1	7.5	14.5	4.2	20.0	5.8	21.7	6.7
2004	411	127	21.8	6.4	14.0	3.3	19.1	4.6	21.5	5.6
2005	419	148	22.1	7.4	14.0	4.2	19.0	5.8	21.2	6.5
2006	387	159	20.2	7.9	12.7	4.7	17.7	6.3	20.1	7.1
2007	483	171	21.8	7.4	13.4	4.0	18.5	5.6	20.9	6.3
2008	501	187	22.5	8.1	13.8	4.3	19.1	5.9	21.6	6.8
2009	481	186	21.6	8.0	12.9	4.3	17.9	6.0	20.2	6.9
2010	510	188	22.6	8.0	13.5	4.3	18.7	5.9	21.2	6.7
2011	437	177	19.1	7.5	11.1	4.1	15.5	5.6	17.7	6.4
2012	335	151	14.7	6.4	8.6	3.4	11.9	4.7	13.6	5.5
1998-2012	5859	2153	21.3	7.5	13.3	4.1	18.3	5.6	20.5	6.5

The computation of the incidence measures includes all primaries, irrespective of first or subsequent malignancy.

Table 3

Age distribution parameters by year of diagnosis (All)
(incl. DCO)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	353	59.2	12.6	0.9	97.4	46.4	51.8	58.1	65.9	76.0
1999	383	60.4	12.4	13.9	91.9	47.9	52.0	58.8	66.9	78.7
2000	343	60.0	11.7	31.0	91.9	46.0	51.6	58.6	67.5	76.4
2001	355	61.0	12.4	16.4	96.4	47.5	53.0	60.0	67.1	77.1
2002	557	61.4	11.9	26.4	99.0	47.0	53.6	60.9	68.2	78.6
2003	563	60.6	11.8	10.7	98.2	47.0	53.2	59.5	67.9	76.8
2004	538	61.6	12.4	24.7	97.9	45.8	53.4	61.3	69.3	78.4
2005	567	61.4	12.1	4.1	103	47.0	53.6	61.2	67.7	77.9
2006	546	61.3	12.5	17.6	101	46.7	53.2	60.0	69.2	78.0
2007	654	62.3	12.3	7.7	101	47.3	53.7	62.5	70.5	77.8
2008	688	63.4	11.6	19.8	100	49.5	55.4	62.7	69.6	79.4
2009	667	63.2	12.2	16.6	98.4	48.2	55.0	62.8	70.8	79.9
2010	698	62.8	12.8	18.2	95.3	47.3	53.8	63.3	70.8	78.7
2011	614	63.7	12.7	14.4	96.9	48.6	55.0	63.7	71.9	79.7
2012	486	63.6	11.9	21.5	100	48.6	55.3	63.9	72.2	78.2
1998-2012	8012	62.0	12.3	0.9	103	47.5	53.7	61.4	69.7	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	277	59.2	11.2	32.0	90.8	47.9	51.4	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	263	59.5	11.2	28.7	94.9	46.5	51.9	58.9	65.2	74.5
2002	411	59.8	10.4	26.4	96.8	46.6	53.0	59.9	65.3	73.0
2003	415	59.5	10.0	28.1	94.5	47.5	53.2	59.1	65.6	72.6
2004	411	60.2	11.4	26.7	92.4	45.5	52.9	60.1	66.3	75.3
2005	419	60.5	11.3	4.1	99.0	46.6	53.4	61.0	67.0	74.8
2006	387	61.0	11.3	17.6	92.0	47.2	53.4	59.6	67.5	77.0
2007	483	61.5	11.3	15.7	101	47.3	53.2	61.4	69.6	75.6
2008	501	62.5	10.7	19.8	100	49.5	55.0	62.1	69.0	77.0
2009	481	62.6	11.0	16.6	90.7	48.9	55.0	62.6	70.0	76.5
2010	510	62.1	12.4	18.2	95.3	47.1	53.5	61.8	70.2	77.2
2011	437	63.3	12.2	14.4	95.5	48.4	54.1	63.1	71.3	78.9
2012	335	62.8	11.0	21.6	91.7	48.8	54.3	63.0	70.8	76.5
1998-2012	5859	61.0	11.3	0.9	101	47.5	53.3	60.6	68.3	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	81	61.6	14.7	31.0	91.9	43.3	51.4	59.6	74.0	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	148	63.6	15.3	10.7	98.2	44.8	53.4	62.9	75.9	83.8
2004	127	66.2	14.2	24.7	97.9	48.9	57.0	67.0	76.8	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	171	64.7	14.7	7.7	98.2	47.5	55.2	63.6	75.0	84.5
2008	187	65.8	13.4	25.6	98.4	49.7	57.2	66.0	74.1	83.5
2009	186	64.5	14.9	16.8	98.4	47.5	54.8	63.6	75.2	83.8
2010	188	64.7	13.6	21.9	91.8	47.8	54.9	65.9	72.3	85.0
2011	177	64.7	13.9	17.2	96.9	48.6	56.5	64.6	73.1	84.1
2012	151	65.3	13.5	21.5	100	48.5	57.4	65.0	73.3	80.9
1998-2012	2153	64.5	14.3	7.7	103	47.6	55.1	64.2	74.8	83.6

Table 4

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

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	3	0.0	0.0	3	0.1	0.1			0.0
5-9	2	0.0	0.1			0.1	2	0.1	0.1
10-14	4	0.0	0.1	2	0.0	0.1	2	0.1	0.2
15-19	10	0.1	0.2	5	0.1	0.2	5	0.2	0.4
20-24	14	0.2	0.4	6	0.1	0.3	8	0.4	0.8
25-29	32	0.4	0.8	19	0.3	0.6	13	0.6	1.4
30-34	57	0.7	1.5	28	0.5	1.1	29	1.3	2.7
35-39	102	1.3	2.8	68	1.2	2.2	34	1.6	4.3
40-44	276	3.4	6.2	212	3.6	5.9	64	3.0	7.3
45-49	693	8.6	14.9	554	9.5	15.3	139	6.5	13.7
50-54	1130	14.1	29.0	900	15.4	30.7	230	10.7	24.4
55-59	1297	16.2	45.2	1003	17.1	47.8	294	13.7	38.1
60-64	1347	16.8	62.0	1038	17.7	65.5	309	14.4	52.4
65-69	1094	13.7	75.6	806	13.8	79.3	288	13.4	65.8
70-74	764	9.5	85.2	558	9.5	88.8	206	9.6	75.4
75-79	534	6.7	91.8	336	5.7	94.5	198	9.2	84.6
80-84	355	4.4	96.3	191	3.3	97.8	164	7.6	92.2
85+	298	3.7	100.0	130	2.2	100.0	168	7.8	100.0
All ages	8012	100.0		5859	100.0		2153	100.0	

Included in the statistics are 36.7% multiple primaries in males and 32.6% in females.

Table 5

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

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males DCO rate n=229 %	Females DCO rate n=115 %	Males Prop.all cancers n=146755 %	Females Prop.all cancers n=142297 %
0- 4	2		0.1	0.0	50.0		0.7	
5- 9		2	0.0	0.2				1.8
10-14	2	2	0.1	0.1			1.4	1.2
15-19	5	5	0.4	0.4			1.6	1.9
20-24	6	8	0.4	0.5			1.1	1.6
25-29	18	13	1.0	0.7			2.0	1.3
30-34	28	29	1.3	1.4		3.4	2.0	1.5
35-39	67	34	2.9	1.5		2.9	3.2	1.0
40-44	208	64	8.6	2.8	1.0	1.6	6.9	1.1
45-49	545	137	25.3	6.5	2.0	2.2	11.1	1.7
50-54	888	221	48.0	11.7	2.4	1.8	11.1	2.2
55-59	988	290	58.1	16.3	2.3	2.8	7.3	2.3
60-64	1017	305	61.7	17.5	3.3	2.6	5.0	1.9
65-69	795	285	54.2	17.8	3.5	1.4	3.1	1.6
70-74	553	205	47.7	14.9	6.9	3.4	2.3	1.2
75-79	334	195	44.3	17.8	6.6	5.6	1.8	1.2
80-84	188	162	41.4	18.8	10.1	9.3	1.5	1.1
85+	129	167	41.6	20.4	23.3	31.1	1.4	1.0
All ages	5773	2124			4.0	5.4	3.9	1.5
Incidence								
Raw			21.0	7.4				
WS			13.1	4.0				
ES			18.1	5.6				
BRD-S			20.2	6.4				

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

Table 6a

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

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C00	Lip	2	0.2	12.0	1.5	43.4	#	1.4	
C03-C06	Oral cavity	40	2.0	19.9	14.2	27.1	#	28.5	7.5
C07-C08	Salivary gland	2	0.4	5.6	0.7	20.1		1.2	
C09-C10	Oropharynx	51	2.6	19.6	14.6	25.8	#	36.3	2.0
C11	Nasopharynx	3	0.2	19.2	4.0	56.0	#	2.1	
C12-C13	Hypopharynx	43	1.5	29.1	21.0	39.1	#	31.1	11.6
C15	Oesophagus	90	3.4	26.2	21.0	32.2	#	64.9	16.7
C16	Stomach	20	6.5	3.1	1.9	4.8	#	10.2	15.0
C17	Small intestine	3	0.9	3.5	0.7	10.3		1.6	66.7
C18	Colon	34	15.4	2.2	1.5	3.1	#	14.0	5.9
C19-C20	Rectum	22	10.0	2.2	1.4	3.3	#	9.0	
C21	Anus/canal	5	0.4	12.7	4.1	29.7	#	3.5	
C22	Liver	25	4.6	5.4	3.5	8.0	#	15.3	20.0
C25	Pancreas	15	5.7	2.6	1.5	4.4	#	7.0	26.7
C30-C31	Sinuses	4	0.3	13.6	3.7	34.7	#	2.8	
C32	Larynx	47	2.2	21.8	16.0	29.0	#	33.6	23.4
C33-C34	Lung	182	20.5	8.9	7.6	10.3	#	121.1	12.6
C38,C45	Mesothelioma	2	1.1	1.9	0.2	6.9		0.7	
C43	Malign. melanoma	12	7.1	1.7	0.9	2.9		3.6	
C46,C49	Soft tissue	3	0.9	3.3	0.7	9.5		1.6	
C61	Prostate	56	49.6	1.1	0.9	1.5		4.8	7.1
C62	Testis	2	0.7	2.8	0.3	10.0		1.0	
C64	Kidney	19	6.3	3.0	1.8	4.7	#	9.5	10.5
C65	Renal pelvis	3	0.6	5.0	1.0	14.7	#	1.8	
C67	Bladder	16	6.4	2.5	1.4	4.1	#	7.2	12.5
C70-C72	CNS cancer	2	2.5	0.8	0.1	2.9		-0.4	
C73	Thyroid	6	1.5	4.1	1.5	8.9	#	3.4	16.7
C76-C79	CUP	10	2.8	3.6	1.7	6.6	#	5.4	
C81	Hodgkin lymphoma	2	0.4	4.9	0.6	17.6		1.2	
C82-C85	NHL	18	6.5	2.8	1.7	4.4	#	8.7	16.7
C91-C96	Leukaemia	10	2.4	4.2	2.0	7.7	#	5.7	40.0
Other primaries		5	4.2	1.2	0.4	2.7		0.6	20.0
Not observed		0	1.8	0.0	0.0	2.0		-1.4	
All mult. primaries		754	171.2	4.4	4.1	4.7	#	437.0	12.1

Patients	4114
Mean age at second malignancy (years)	64.4
Person-years	13336
Mean observation time (years)	3.2
Median observation time (years)	2.0

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 1998-2012
FEMALES

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C03-C06	Oral cavity	9	0.4	23.9	10.9	45.4	#	15.0	
C07-C08	Salivary gland	3	0.1	31.3	6.5	91.4	#	5.1	
C09-C10	Oropharynx	20	0.3	72.8	44.5	112.4	#	34.4	
C12-C13	Hypopharynx	10	0.1	135.0	64.8	248.3	#	17.3	20.0
C15	Oesophagus	20	0.3	58.8	35.9	90.8	#	34.3	
C16	Stomach	4	2.1	1.9	0.5	4.8		3.3	
C18	Colon	10	5.8	1.7	0.8	3.1		7.3	
C19-C20	Rectum	4	2.6	1.5	0.4	3.9		2.4	
C22	Liver	6	0.6	9.3	3.4	20.3	#	9.3	16.7
C23-C24	Bile	3	0.8	3.6	0.7	10.5		3.8	
C25	Pancreas	7	2.5	2.8	1.1	5.9	#	7.9	28.6
C30-C31	Sinuses	4	0.1	55.2	15.0	141.3	#	6.9	25.0
C32	Larynx	10	0.1	86.3	41.4	158.7	#	17.2	20.0
C33-C34	Lung	53	4.2	12.5	9.4	16.4	#	85.1	20.8
C43	Malign. melanoma	4	2.1	1.9	0.5	4.8		3.3	
C50	Breast	27	18.8	1.4	0.9	2.1		14.2	7.4
C51	Vulva	2	0.6	3.6	0.4	13.1		2.5	
C53	Cervix uteri	6	0.9	6.9	2.5	14.9	#	8.9	16.7
C54	Corpus uteri	2	3.3	0.6	0.1	2.2		-2.3	
C56	Ovary	5	2.5	2.0	0.6	4.6		4.3	20.0
C64	Kidney	3	1.4	2.1	0.4	6.0		2.7	
C67	Bladder	2	1.1	1.9	0.2	6.8		1.6	100.0
C70-C72	CNS cancer	3	0.8	3.5	0.7	10.3		3.8	66.7
C73	Thyroid	5	1.2	4.2	1.3	9.7	#	6.6	20.0
C82-C85	NHL	7	2.2	3.2	1.3	6.5	#	8.3	
C91-C96	Leukaemia	2	0.9	2.2	0.3	8.0		1.9	50.0
Other primaries		6	1.4	4.2	1.5	9.1	#	8.0	16.7
Not observed		0	2.8	0.0	0.0	1.3		-4.9	
All mult. primaries		237	60.3	3.9	3.4	4.5	#	308.3	12.7

Patients	1485
Mean age at second malignancy (years)	66.6
Person-years	5733
Mean observation time (years)	3.9
Median observation time (years)	2.7

The occurrence of second malignancy is statistically significant.

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

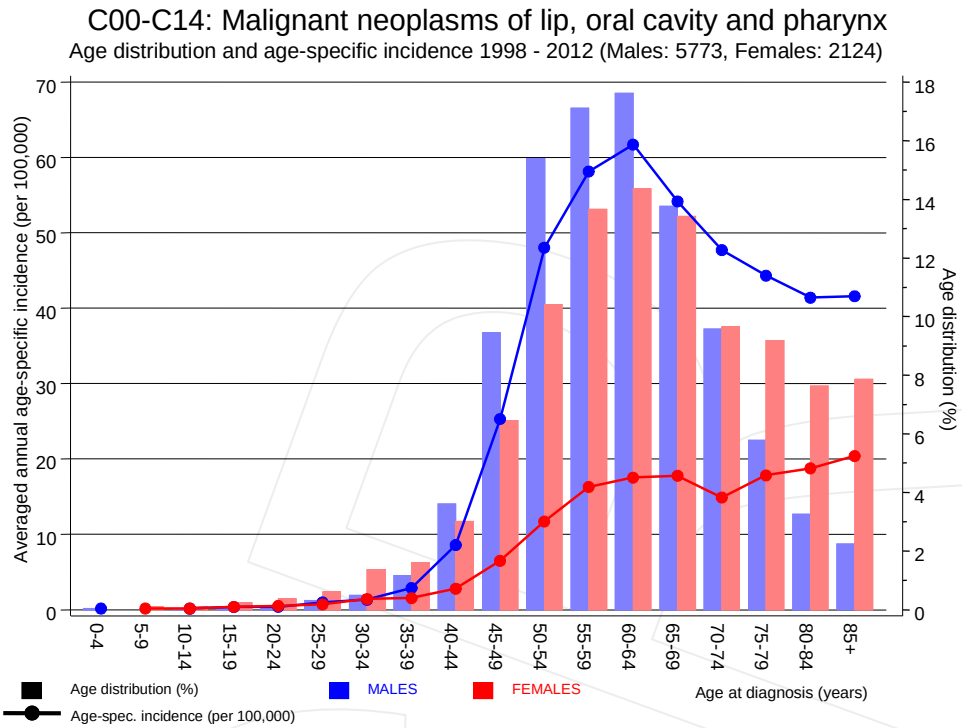


Figure 7. Age distribution and age-specific incidence

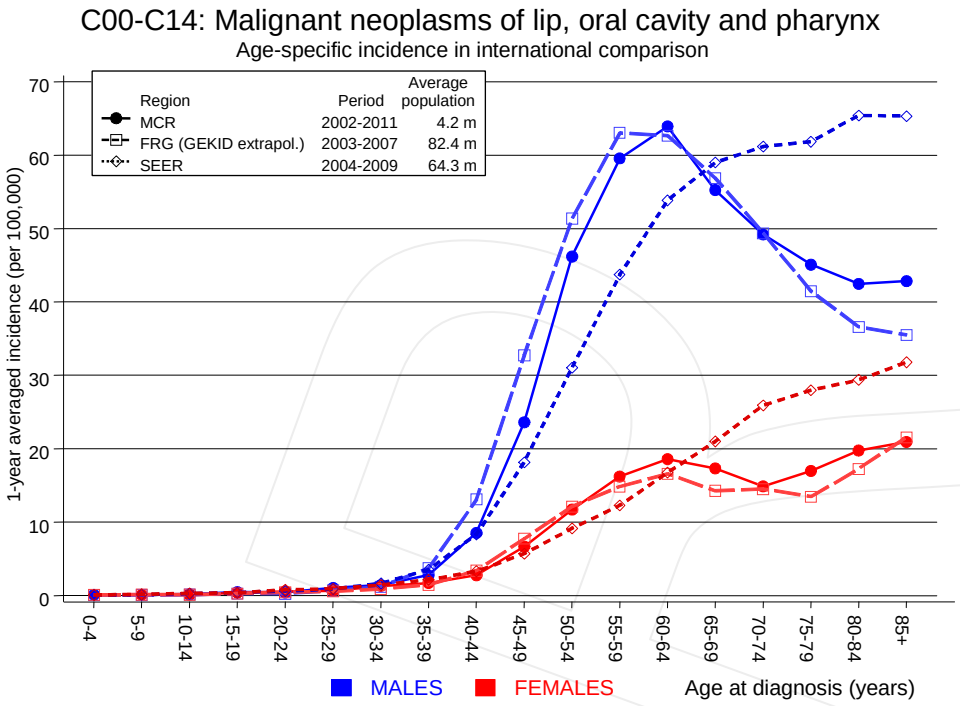


Figure 7a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).

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

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

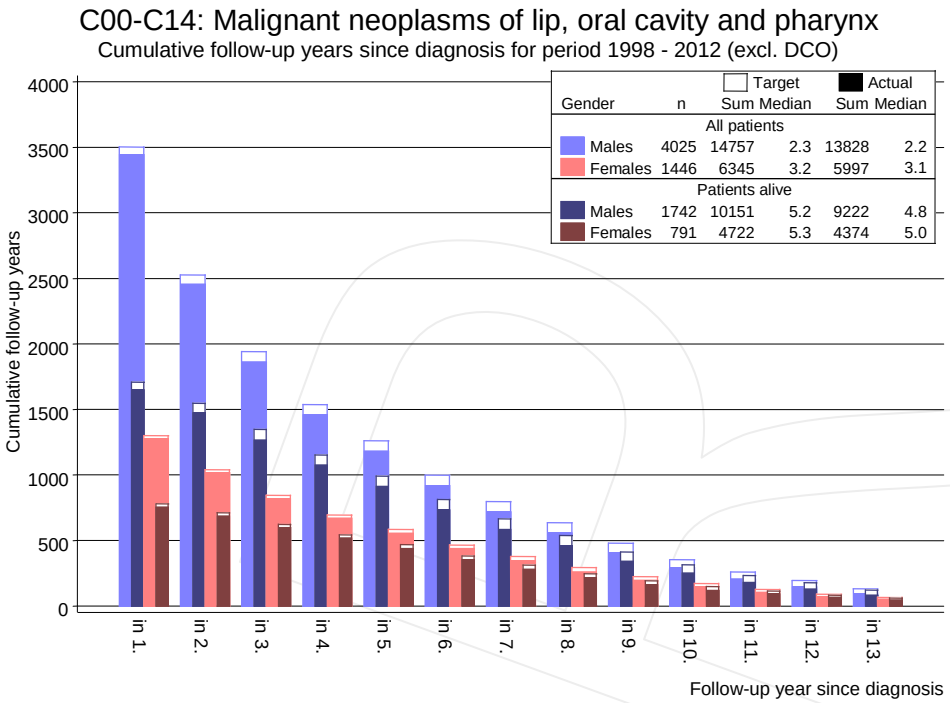
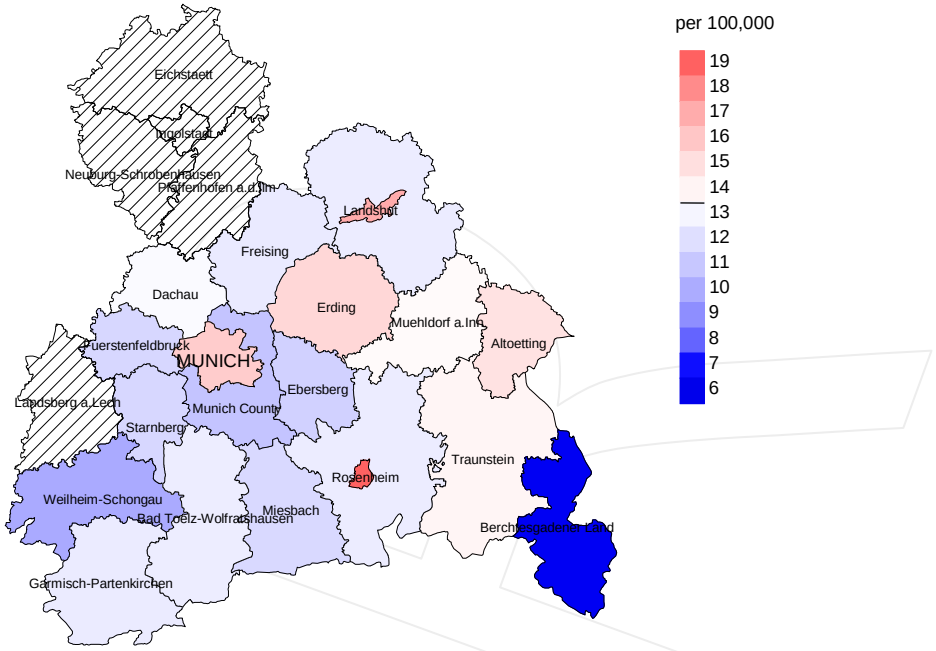


Figure 8. Cumulative follow-up years depending on time since diagnosis

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

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



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

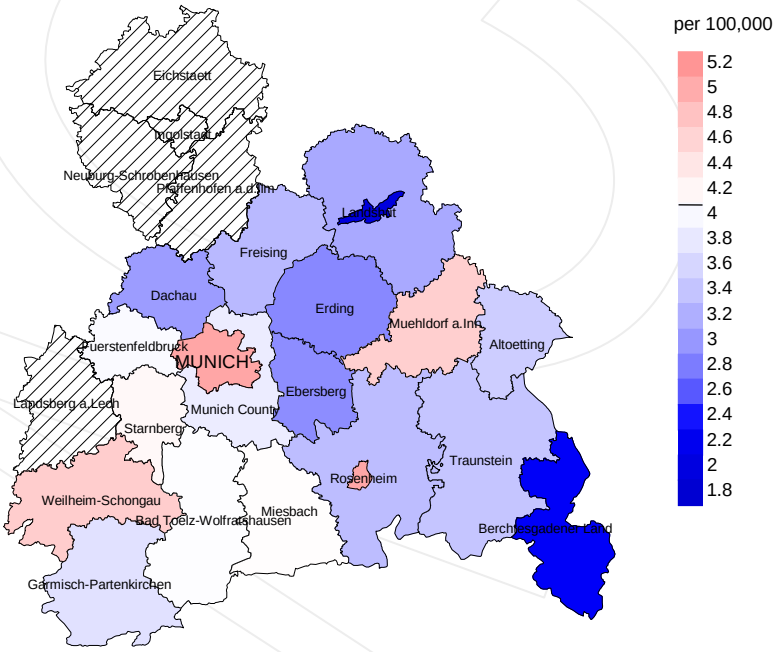
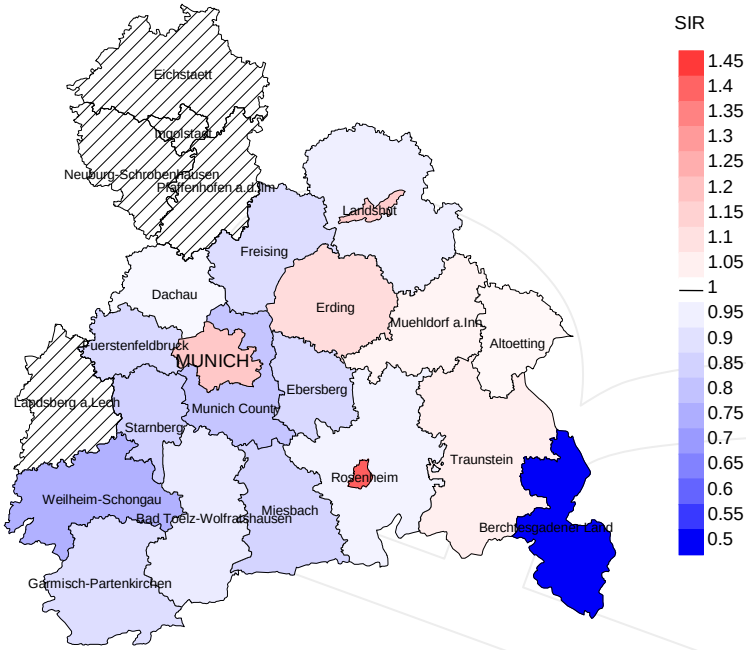


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 13.5/100,000 WS N=2,455, females 4.1/100,000 WS N=898). 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 19 women were identified with newly diagnosed HN cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 2.9/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 1.4 and 5.4/100,000.

Standardized incidence ratio (SIR) 2003 - 2008: Males



Standardized incidence ratio (SIR) 2003 - 2008: Females

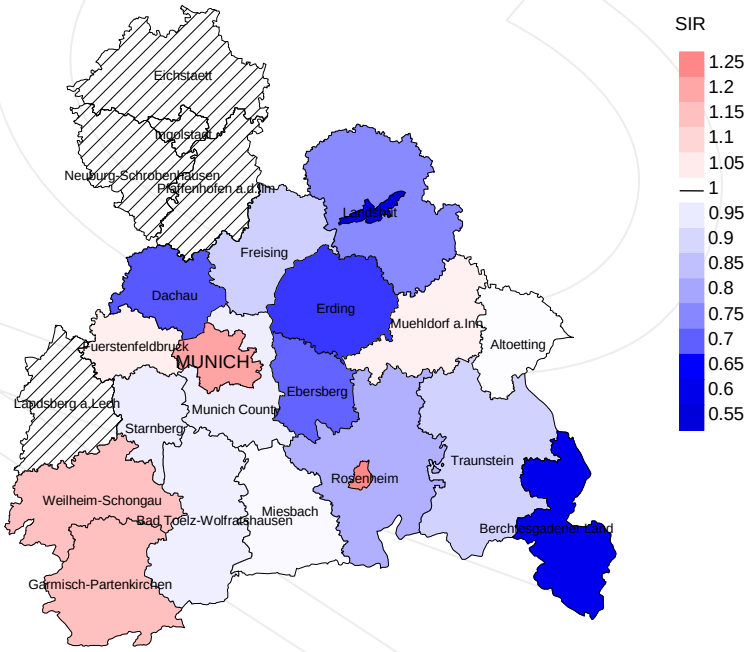


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=2,455, females N=898). 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 19 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 0.70. Though, the value of this parameter may vary with an underlying probability of 99% between 0.36 and 1.24, 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	353	99.4	5.1	276	78.2	96.4
1999	383	97.4	3.1	297	77.5	89.6
2000	343	98.0	4.1	265	77.3	95.1
2001	355	96.9	5.9	261	73.5	95.0
2002	557	98.4	6.6	393	70.6	95.9
2003	563	98.8	4.1	403	71.6	96.8
2004	538	98.0	4.5	376	69.9	96.3
2005	567	96.6	4.6	359	63.3	98.9
2006	546	96.3	1.8	340	62.3	98.5
2007	654	89.3	6.1	395	60.4	98.2
2008	688	78.1	3.1	378	54.9	97.6
2009	667	81.9	1.8	367	55.0	98.4
2010	698	79.4	5.0	328	47.0	98.5
2011	614	79.2	4.4	219	35.7	97.7
2012	486	96.7	6.2	128	26.3	95.3
1998-2012	8012	90.9	4.4	4785	59.7	96.7

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	353	236	91.5	53	15.0
1999	383	244	89.3	54	14.1
2000	343	251	93.6	48	14.0
2001	355	279	91.0	61	17.2
2002	557	378	97.6	87	15.6
2003	563	394	96.2	86	15.3
2004	538	409	96.6	93	17.3
2005	567	377	97.3	85	15.0
2006	546	428	97.0	85	15.6
2007	654	466	97.6	104	15.9
2008	688	440	98.2	97	14.1
2009	667	482	98.5	90	13.5
2010	698	483	99.0	101	14.5
2011	614	480	98.3	93	15.1
2012	486	483	99.2	83	17.1
1998-2012	8012	5830	96.7	1220	15.2

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	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	80.2	19.8	91.6
2005	377	82.2	17.8	91.0
2006	428	77.8	22.2	87.0
2007	466	79.2	20.8	89.0
2008	440	78.2	21.8	87.3
2009	482	79.0	21.0	89.7
2010	483	80.1	19.9	90.2
2011	480	73.3	26.7	85.0
2012	483	77.0	23.0	87.3
1998-2012	5830	77.5	22.5	88.7

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	171	61.8	59.8	67.4	61.7
1999	187	61.3	60.4	63.8	60.0
2000	193	63.8	63.1	66.0	63.8
2001	218	61.9	60.9	64.8	61.9
2002	294	63.4	62.4	67.4	62.5
2003	304	64.4	63.4	68.4	63.6
2004	315	63.6	62.3	68.9	62.8
2005	271	65.0	63.8	71.3	64.4
2006	326	64.8	63.5	69.8	64.0
2007	368	64.8	63.4	71.0	63.9
2008	330	65.6	64.6	69.7	64.9
2009	353	66.4	65.3	71.3	65.7
2010	372	66.2	65.1	71.3	65.5
2011	371	67.8	66.2	72.6	66.7
2012	354	68.1	67.2	71.4	67.3
1998-2012	4427	65.0	63.8	69.4	64.3

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	65	70.6	68.9	74.4	69.9
1999	57	71.2	66.7	76.1	67.7
2000	58	66.1	63.8	74.8	65.8
2001	61	70.9	69.2	75.4	69.5
2002	84	71.0	69.4	74.9	70.2
2003	90	69.1	66.7	74.6	68.2
2004	94	72.1	71.8	73.0	72.0
2005	106	70.4	67.5	81.0	68.5
2006	102	73.9	71.5	79.7	71.7
2007	98	72.9	70.6	79.3	71.5
2008	110	70.3	67.1	77.5	67.9
2009	129	71.8	69.2	78.8	70.3
2010	111	70.2	67.6	78.7	68.1
2011	109	73.4	70.9	78.5	71.5
2012	129	73.1	71.2	79.3	71.6
1998-2012	1403	71.4	69.1	77.4	69.8

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	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	0.51
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	0.60
2003	241	12.9	0.59	7.9	0.55	11.2	0.57	12.8	0.60
2004	255	13.6	0.63	8.4	0.61	11.8	0.63	13.5	0.64
2005	227	12.0	0.54	7.0	0.51	10.0	0.53	11.6	0.55
2006	262	13.7	0.68	8.3	0.66	11.6	0.66	13.3	0.67
2007	297	13.4	0.62	7.9	0.60	11.3	0.62	13.0	0.63
2008	268	12.0	0.54	6.9	0.51	9.9	0.53	11.5	0.54
2009	288	12.9	0.61	7.3	0.58	10.4	0.59	12.2	0.61
2010	302	13.4	0.61	7.6	0.58	10.9	0.60	12.7	0.61
2011	279	12.2	0.65	6.8	0.62	9.7	0.64	11.4	0.66
2012	274	12.0	0.83	6.3	0.74	9.2	0.78	11.2	0.83
1998-2012	3507	12.8	0.61	7.6	0.58	10.7	0.59	12.5	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	0.57	2.1	0.54	2.9	0.55	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	0.42	2.8	0.43
2004	73	3.7	0.58	1.6	0.48	2.3	0.51	3.0	0.54
2005	83	4.2	0.57	2.1	0.52	3.1	0.54	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	0.36	2.1	0.38	2.5	0.40
2008	76	3.3	0.41	1.6	0.38	2.3	0.39	2.7	0.40
2009	94	4.0	0.52	1.9	0.45	2.8	0.47	3.2	0.48
2010	85	3.6	0.47	1.8	0.43	2.6	0.45	3.0	0.47
2011	74	3.1	0.42	1.4	0.35	2.0	0.36	2.3	0.37
2012	98	4.2	0.66	1.8	0.56	2.7	0.58	3.2	0.60
1998-2012	1015	3.5	0.48	1.7	0.42	2.4	0.44	2.9	0.45

Table 13

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

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	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	2	0.0	0.1	2	0.1	0.1			0.0
25-29	2	0.0	0.1	1	0.0	0.1	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	0.6	0.8	21	0.6	0.7	7	0.7	0.9
40-44	91	1.9	2.7	75	2.0	2.8	16	1.5	2.4
45-49	282	5.9	8.6	235	6.3	9.1	47	4.4	6.8
50-54	542	11.3	19.9	462	12.5	21.6	80	7.5	14.3
55-59	773	16.2	36.1	642	17.3	38.9	131	12.2	26.5
60-64	844	17.7	53.8	676	18.2	57.1	168	15.7	42.2
65-69	719	15.1	68.8	578	15.6	72.7	141	13.2	55.4
70-74	544	11.4	80.2	423	11.4	84.2	121	11.3	66.7
75-79	418	8.8	89.0	305	8.2	92.4	113	10.6	77.2
80-84	268	5.6	94.6	167	4.5	96.9	101	9.4	86.6
85+	258	5.4	100.0	115	3.1	100.0	143	13.4	100.0
All ages	4776	100.0		3705	100.0		1071	100.0	

Included in the statistics are 36.7% multiple primaries in males and 32.6% in females.

Table 14

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2012
(**incl. multiple primaries**)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4	2		0.1	0.67	0.0		6.5	
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24	2		0.1	0.33	0.0		2.4	
25-29	1	1	0.1	0.05	0.1	0.08	1.0	0.9
30-34	1	2	0.0	0.04	0.1	0.07	0.6	0.9
35-39	21	7	0.9	0.31	0.3	0.21	5.5	1.4
40-44	75	16	3.1	0.35	0.7	0.25	9.3	1.5
45-49	235	47	10.9	0.42	2.2	0.34	13.9	2.5
50-54	462	80	25.0	0.51	4.2	0.35	15.1	2.8
55-59	642	131	37.8	0.64	7.4	0.45	11.6	2.9
60-64	676	168	41.0	0.65	9.7	0.54	8.1	2.8
65-69	578	141	39.4	0.72	8.8	0.49	5.1	1.8
70-74	423	121	36.5	0.76	8.8	0.59	3.4	1.3
75-79	305	113	40.5	0.91	10.3	0.57	2.5	1.1
80-84	167	101	36.8	0.87	11.7	0.62	1.7	1.0
85+	115	143	37.1	0.88	17.5	0.85	1.4	1.1
All ages	3705	1071					5.0	1.6
Mortality								
Raw			13.5	0.63	3.7	0.50		
WS			8.0	0.60	1.8	0.44		
ES			11.4	0.62	2.6	0.46		
BRD-S			13.2	0.64	3.1	0.47		
PYLL-70								
per 100,000			125.0		26.5			
ES			112.8		22.8			
AYLL-70			11.5		10.9			

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

Table 15a

Multiple primaries in deaths in period 1998-2012
MALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03-C06 Oral cavity	97	5.7			5	5.2	92	94.8
C09-C10 Oropharynx	106	6.2			24	22.6	82	77.4
C12-C13 Hypopharynx	81	4.8			24	29.6	57	70.4
C15 Oesophagus	175	10.3	33	18.9	23	13.1	119	68.0
C16 Stomach	42	2.5	12	28.6	2	4.8	28	66.7
C18 Colon	65	3.8	26	40.0	4	6.2	35	53.8
C19-C20 Rectum	49	2.9	11	22.4	2	4.1	36	73.5
C22 Liver	43	2.5	2	4.7	7	16.3	34	79.1
C25 Pancreas	32	1.9	5	15.6	1	3.1	26	81.3
C30-C31 Sinuses	12	0.7	4	33.3	2	16.7	6	50.0
C32 Larynx	50	2.9			10	20.0	40	80.0
C33-C34 Lung	363	21.3	45	12.4	34	9.4	284	78.2
C43 Malign. melanoma	30	1.8	15	50.0	3	10.0	12	40.0
C44 Skin others	149	8.7	55	36.9	20	13.4	74	49.7
C61 Prostate	104	6.1	56	53.8	5	4.8	43	41.3
C62 Testis	10	0.6	8	80.0	1	10.0	1	10.0
C64 Kidney	30	1.8	11	36.7	4	13.3	15	50.0
C67 Bladder	65	3.8	35	53.8	2	3.1	28	43.1
C76-C79 CUP	48	2.8	26	54.2	4	8.3	18	37.5
C82-C85 NHL	35	2.1	16	45.7	6	17.1	13	37.1
C91-C96 Leukaemia	18	1.1	5	27.8	1	5.6	12	66.7
Other primaries	101	5.9	39	38.6	8	7.9	54	53.5
All mult. primaries	1705	100.0	404	23.7	192	11.3	1109	65.0

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

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03-C06 Oral cavity	20	4.0			1	5.0	19	95.0
C09-C10 Oropharynx	22	4.5			3	13.6	19	86.4
C12-C13 Hypopharynx	15	3.0			3	20.0	12	80.0
C14 ENT cancer	4	0.8			2	50.0	2	50.0
C15 Oesophagus	39	7.9	3	7.7	6	15.4	30	76.9
C16 Stomach	13	2.6	3	23.1	3	23.1	7	53.8
C18 Colon	22	4.5	11	50.0	1	4.5	10	45.5
C19-C20 Rectum	6	1.2	2	33.3			4	66.7
C21 Anus/canal	6	1.2	2	33.3			4	66.7
C22 Liver	6	1.2			1	16.7	5	83.3
C23-C24 Bile	4	0.8					4	100.0
C25 Pancreas	7	1.4	1	14.3	1	14.3	5	71.4
C30-C31 Sinuses	6	1.2	1	16.7			5	83.3
C32 Larynx	21	4.3	7	33.3	3	14.3	11	52.4
C33-C34 Lung	83	16.8	4	4.8	7	8.4	72	86.7
C43 Malign. melanoma	4	0.8					4	100.0
C44 Skin others	27	5.5	9	33.3	3	11.1	15	55.6
C50 Breast	82	16.6	53	64.6	5	6.1	24	29.3
C51 Vulva	4	0.8	1	25.0			3	75.0
C53 Cervix uteri	15	3.0	11	73.3			4	26.7
C54 Corpus uteri	9	1.8	6	66.7	1	11.1	2	22.2
C56 Ovary	10	2.0	4	40.0			6	60.0
C67 Bladder	9	1.8	6	66.7			3	33.3
C70-C72 CNS cancer	8	1.6	1	12.5	1	12.5	6	75.0
C73 Thyroid	6	1.2	4	66.7	1	16.7	1	16.7
C76-C79 CUP	12	2.4	8	66.7			4	33.3
C82-C85 NHL	13	2.6	5	38.5	1	7.7	7	53.8
C91-C96 Leukaemia	5	1.0	2	40.0			3	60.0
Other primaries	16	3.2	6	37.5	3	18.8	7	43.8
All mult. primaries	494	100.0	150	30.4	46	9.3	298	60.3

Multiple primaries with number of cases n<4 are pooled in category "Other primaries".

ICD-10 C44 (Other malignant neoplasms of skin) is not systematically recorded by MCR and therefore not considered for evaluation as a particular primary but at least as a multiple malignancy.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2012
(**Singular primaries only** *)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4			0.0		0.0			
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24	2		0.1	0.33	0.0		2.6	
25-29	1	1	0.1	0.06	0.1	0.08	1.1	1.0
30-34	1	2	0.0	0.04	0.1	0.07	0.6	1.1
35-39	18	5	0.8	0.30	0.2	0.16	5.0	1.1
40-44	67	14	2.8	0.35	0.6	0.23	8.9	1.5
45-49	203	41	9.4	0.41	1.9	0.33	13.2	2.5
50-54	390	64	21.1	0.51	3.4	0.34	14.5	2.6
55-59	529	109	31.1	0.64	6.1	0.45	11.0	2.9
60-64	537	128	32.6	0.64	7.4	0.49	7.6	2.6
65-69	447	109	30.5	0.71	6.8	0.48	4.9	1.7
70-74	330	93	28.5	0.82	6.7	0.59	3.4	1.3
75-79	221	93	29.3	1.00	8.5	0.61	2.4	1.2
80-84	111	71	24.4	0.87	8.2	0.56	1.5	0.9
85+	79	112	25.5	0.98	13.7	0.84	1.3	1.1
All ages	2936	842					4.9	1.5
Mortality								
Raw			10.7	0.62	2.9	0.48		
WS			6.4	0.59	1.4	0.42		
ES			9.1	0.61	2.0	0.44		
BRD-S			10.4	0.63	2.4	0.46		
PYLL-70								
per 100,000			104.0		21.6			
ES			93.6		18.6			
AYLL-70			11.7		11.2			

* See corresponding tables with multiple primaries.

Table 17

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2012
(**Single primaries only** *)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4			0.0		0.0			
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24	2		0.1	0.33	0.0		2.7	
25-29	1	1	0.1	0.06	0.1	0.09	1.2	1.0
30-34	1	1	0.0	0.04	0.0	0.04	0.6	0.6
35-39	18	3	0.8	0.32	0.1	0.10	5.2	0.7
40-44	63	13	2.6	0.37	0.6	0.25	8.9	1.5
45-49	177	27	8.2	0.41	1.3	0.25	12.3	1.9
50-54	315	58	17.0	0.47	3.1	0.34	12.9	2.7
55-59	406	85	23.9	0.58	4.8	0.42	9.3	2.5
60-64	393	90	23.8	0.54	5.2	0.40	6.3	2.1
65-69	319	76	21.7	0.60	4.7	0.40	4.1	1.4
70-74	218	64	18.8	0.64	4.6	0.45	2.7	1.1
75-79	144	62	19.1	0.71	5.7	0.48	1.9	0.9
80-84	73	51	16.1	0.62	5.9	0.46	1.2	0.7
85+	62	89	20.0	0.85	10.9	0.72	1.3	1.0
All ages	2192	620					4.4	1.3
Mortality								
Raw			8.0	0.54	2.2	0.40		
WS			4.9	0.52	1.1	0.35		
ES			6.8	0.53	1.5	0.37		
BRD-S			7.7	0.54	1.8	0.38		
PYLL-70								
per 100,000			84.0		16.6			
ES			75.6		14.5			
AYLL-70			12.3		11.5			

* See corresponding tables with multiple primaries.

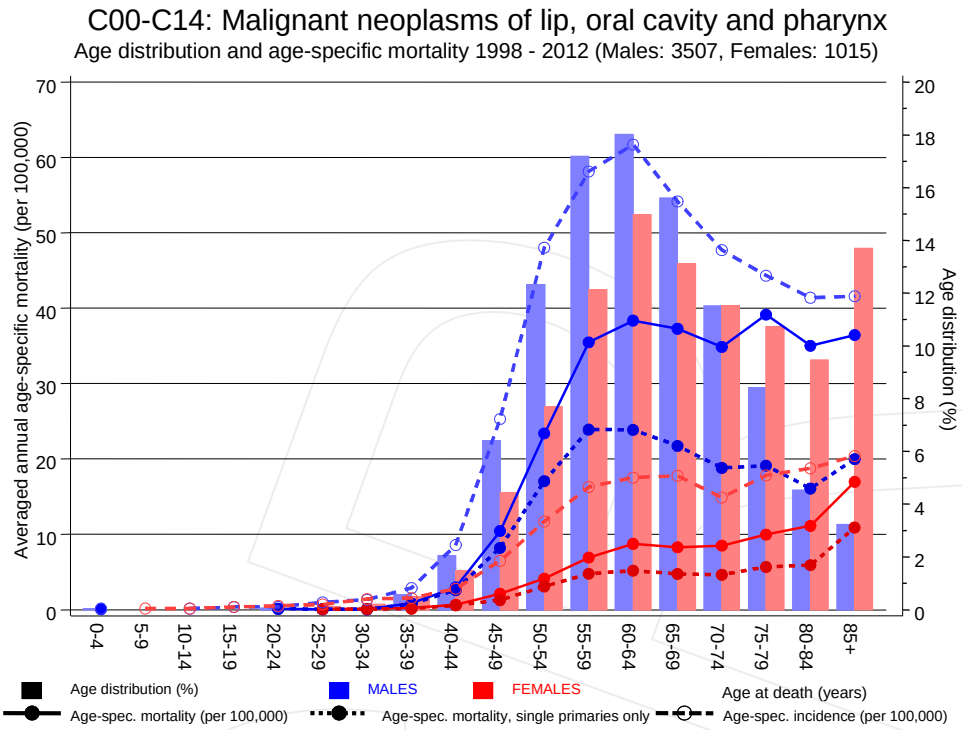
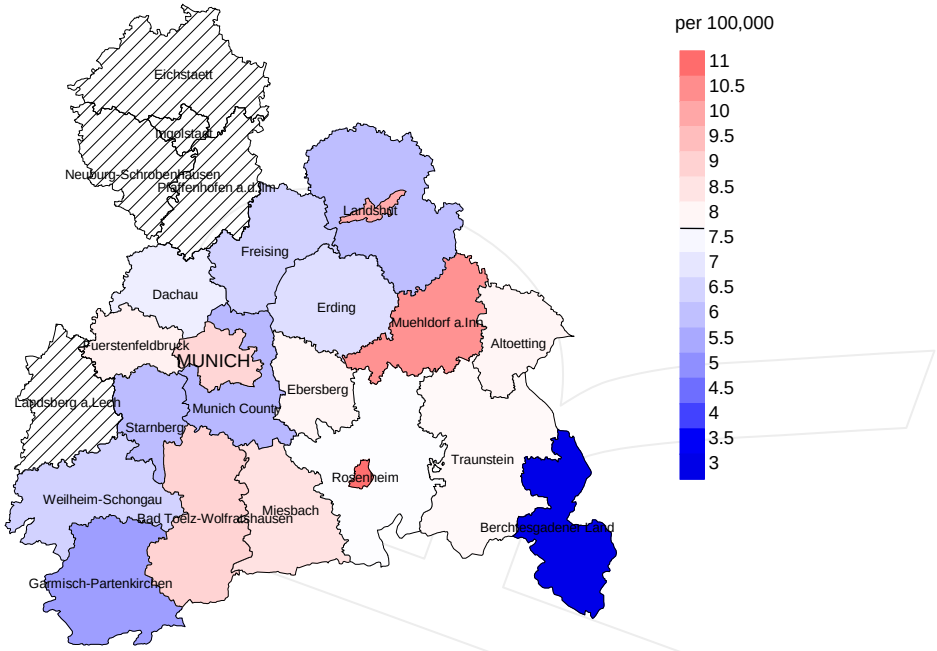


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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) 2003 - 2008: Males



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

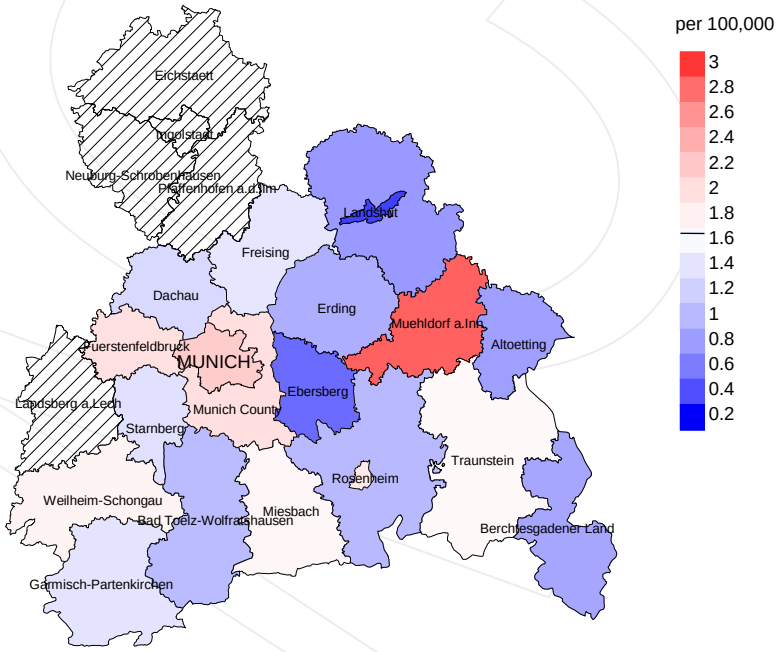
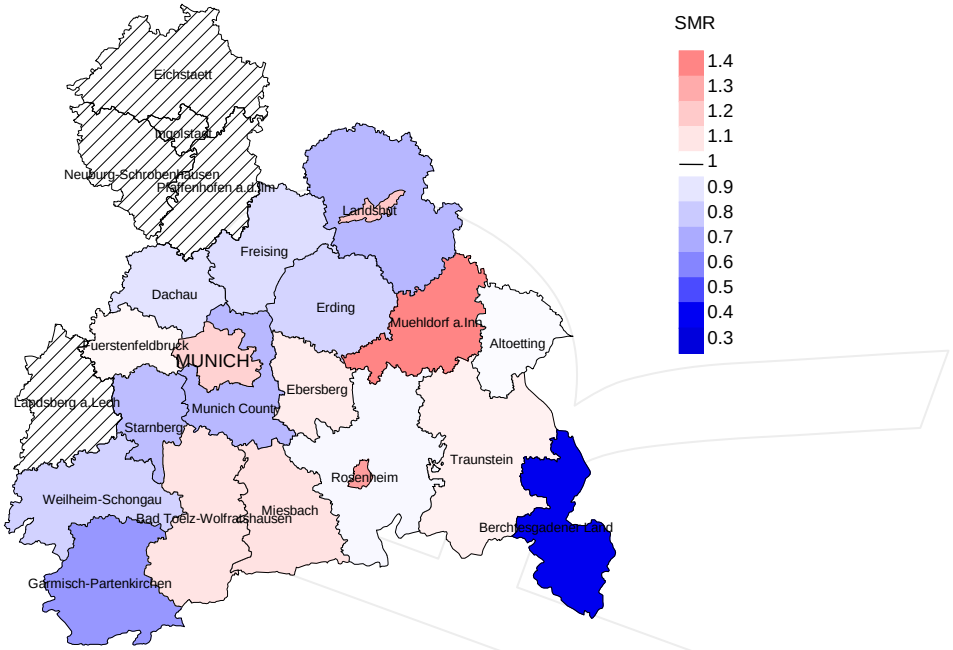


Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2003 to 2008. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 7.7/100,000 WS N=1,481, females 1.7/100,000 WS N=426). 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 4 women died from HN cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.5/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.1 and 1.8/100,000.

Standardized mortality ratio (SMR) 2003 - 2008: Males



Standardized mortality ratio (SMR) 2003 - 2008: Females

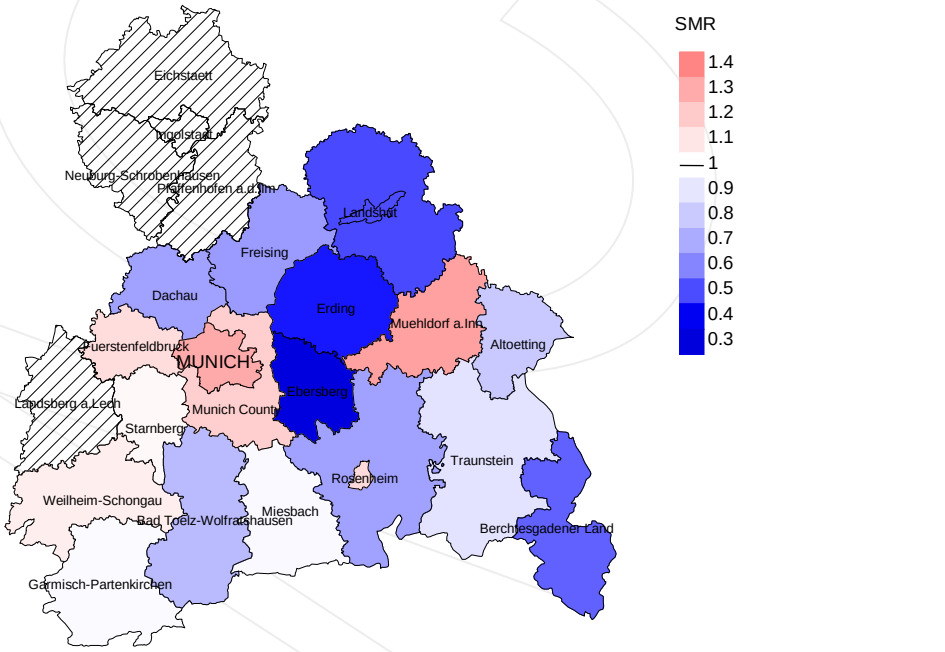


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=1,481, females N=426). 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 4 women died from HN cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.32. Though, the value of this parameter may vary with an underlying probability of 99% between 0.05 and 1.01, 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

Recommended Citation

Munich Cancer Registry. Baseline statistics C00-C14: HN cancer [Internet]. 2014 [updated 2014 Mar 20; cited 2014 May 1]. Available from: http://www.tumorregister-muenchen.de/en/facts/base/base_C0014E.pdf

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