Munich Cancer Registry

- Survival
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- *Deutsch*

ICD-10 C00-C14,C30-C32: HN cancer

Incidence and Mortality

Year of diagnosis	1998-2014
Patients	11,407
Diseases	11,875
Creation date	04/13/2016
Export date	12/23/2015
Population	4.64 m

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

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

http://www.tumorregister-muenchen.de/en/facts/base/bC0032E-ICD-10-C00-C14-C30-C32-HN-cancer-incidence-and-mortality.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.

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

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

Munich Cancer Registry, April 2016

[#] 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).

[##] 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.

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
C11	Nasopharynx
C12	Piriform sinus
C13	Hypopharynx
C14	Other and ill-defined sites in the lip, oral cavity and pharynx
C30	Nasal cavity and middle ear
C31	Accessory sinuses
C32	Larynx

INCIDENCE

Table 1

All patients with invasive cancer by year of diagnosis, proportions of DCO, multiple primaries, deaths, and active follow-up (incl. DCO)

Year of diagnosis	Cases n	DCO cases n	Prop. DCO %	Prop. mult. primaries %	Prop. deaths %	Prop. actively followed %
1998	479	23	4.8	30.9	77.7	97.9
1999	502	19	3.8	33.1	76.9	97.0
2000	458	20	4.4	31.9	76.4	97.6
2001	456	24	5.3	33.1	75.4	96.7
2002	759	53	7.0	36.2	73.0	97.9 #
2003	755	37	4.9	35.1	72.8	97.5
2004	710	38	5.4	32.5	70.3	97.5
2005	752	31	4.1	34.8	65.4	96.3
2006	725	20	2.8	31.4	64.7	95.0
2007	864	51	5.9	32.3	61.3	81.9 #
2008	921	35	3.8	31.8	58.3	79.3
2009	902	23	2.5	31.7	56.2	81.4
2010	938	39	4.2	31.7	49.9	76.5
2011	860	36	4.2	29.9	45.8	76.5
2012	861	39	4.5	27.8	38.2	78.9
2013	746	31	4.2	26.9	36.7	99.1
2014	187	32	17.1	39.0	39.0	97.9 ##
1998-2014	11875	551	4.6	32.0	60.0	89.1

The increases of incident cases in 2002 and 2007 reflect the expansion to additional registry areas.

Please be aware that data of recent annual patient cohorts may not yet be fully processed. The years under evaluation can be found in the respective headings.

Table 1a

All patients with invasive cancer
by year of diagnosis and gender
(incl. DCO)

Year of diagnosis	All n	Males n	Females n	Prop. males %
1998	479	375	104	78.3
1999	502	374	128	74.5
2000	458	355	103	77.5
2001	456	349	107	76.5
2002	759	577	182	76.0
2003	755	570	185	75.5
2004	710	556	154	78.3
2005	752	579	173	77.0
2006	725	526	199	72.6
2007	864	654	210	75.7
2008	921	696	225	75.6
2009	902	674	228	74.7
2010	938	711	227	75.8
2011	860	623	237	72.4
2012	861	626	235	72.7
2013	746	538	208	72.1
2014	187	133	54	71.1
1998-2014	11875	8916	2959	75.1

Table 2

Incidence measures by year of diagnosis 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	375	104	33.8	8.8	22.4	4.8	30.6	6.7	34.5	7.9
1999	374	128	33.4	10.8	21.5	5.9	30.0	8.2	33.5	9.6
2000	355	103	31.2	8.6	20.5	5.1	28.4	6.9	32.2	7.8
2001	349	107	30.1	8.8	19.6	4.9	27.0	6.7	30.5	7.6
2002	577	182	31.0	9.3	19.8	4.8	27.3	6.8	30.3	8.1
2003	570	185	30.4	9.4	19.6	5.1	27.1	7.1	29.9	8.4
2004	556	154	29.6	7.8	18.5	4.0	25.6	5.6	29.1	6.8
2005	579	173	30.6	8.7	19.0	4.8	26.0	6.6	29.3	7.6
2006	526	199	27.5	9.9	17.2	5.8	23.9	7.8	27.1	8.9
2007	654	210	29.5	9.1	17.9	5.0	24.9	6.9	28.3	7.9
2008	696	225	31.3	9.7	18.8	5.2	26.2	7.2	30.0	8.2
2009	674	228	30.2	9.8	17.7	5.2	24.7	7.2	28.5	8.4
2010	711	227	31.5	9.7	18.7	5.1	25.9	7.0	29.5	8.0
2011	623	237	27.3	10.0	15.4	5.4	21.7	7.5	25.2	8.6
2012	626	235	27.4	10.0	16.0	5.3	22.1	7.3	25.5	8.4
2013	538	208	23.5	8.8	13.5	4.5	18.9	6.3	22.0	7.2
2014	133	54	5.8	2.3	3.3	1.1	4.7	1.6	5.4	1.9
1998–2014	8916	2959	27.8	8.9	16.9	4.8	23.5	6.6	26.7	7.6

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 patients)
(incl. DCO)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	Median 10%	25%	50%	75%	90%
1998	479	60.1	12.3	0.9	97.4	47.2	52.6	58.8	67.5	76.3
1999	502	61.2	12.4	13.9	91.9	48.1	52.5	59.8	69.5	78.2
2000	458	60.5	12.3	19.7	91.9	46.0	51.8	59.1	68.4	78.6
2001	456	61.7	12.3	16.4	96.4	48.0	53.8	60.4	68.8	78.5
2002	759	62.0	11.6	26.4	99.0	47.9	54.7	61.2	68.5	78.5
2003	755	61.5	11.9	10.7	98.2	47.5	53.6	60.4	69.2	77.9
2004	710	62.2	12.2	24.7	97.9	46.4	54.5	62.1	70.2	78.9
2005	752	62.1	12.0	4.1	103	47.5	54.4	62.0	68.8	78.1
2006	725	62.0	12.1	17.6	101	47.5	54.0	61.8	69.6	77.8
2007	864	62.7	12.2	7.7	101	47.7	54.5	63.1	70.7	78.1
2008	921	63.8	11.9	14.1	100	49.4	55.8	63.8	70.3	79.5
2009	902	63.9	12.4	2.4	98.4	48.5	55.6	63.6	72.1	80.1
2010	938	63.2	12.8	16.6	103	47.7	54.3	64.0	71.4	78.7
2011	860	64.2	12.5	14.4	96.9	49.1	55.5	64.6	72.7	79.8
2012	861	64.0	11.8	18.6	100	49.3	55.9	63.9	72.3	78.5
2013	746	64.9	12.2	12.1	95.5	50.1	56.6	65.5	73.2	79.9
2014	187	65.4	12.8	27.5	96.6	49.5	56.9	65.2	73.6	83.0
1998-2014	11875	62.8	12.3	0.9	103	48.0	54.5	62.3	70.7	78.9

Table 3a

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	Median 10%	25%	50%	75%	90%
1998	375	59.0	11.4	0.9	87.6	46.5	52.1	58.1	65.9	74.0
1999	374	60.1	11.3	32.0	90.8	48.1	52.3	58.8	66.6	75.2
2000	355	60.2	11.2	20.4	89.7	47.6	52.2	59.0	67.3	75.2
2001	349	60.5	11.1	28.7	94.9	47.8	53.3	59.9	66.2	75.4
2002	577	60.7	10.5	26.4	96.8	47.5	53.9	60.8	66.4	74.5
2003	570	60.4	10.3	28.1	94.5	47.7	53.5	60.0	67.3	74.1
2004	556	61.1	11.5	25.9	92.4	46.1	53.7	61.2	68.1	76.2
2005	579	61.4	11.3	4.1	99.0	47.1	54.0	61.8	68.2	76.5
2006	526	61.6	11.1	17.6	92.0	47.6	54.2	61.3	68.2	76.9
2007	654	62.2	11.3	15.7	101	48.0	54.4	62.7	70.0	76.7
2008	696	63.3	11.1	19.8	100	49.3	55.6	63.1	69.6	78.3
2009	674	63.4	11.4	2.4	90.7	49.1	55.7	63.4	70.8	78.4
2010	711	62.5	12.3	16.6	95.3	47.6	54.1	63.2	70.6	77.2
2011	623	64.0	11.9	14.4	95.5	49.2	55.3	64.2	72.5	79.2
2012	626	63.4	11.2	18.6	94.9	49.3	55.3	63.0	71.3	77.8
2013	538	64.4	11.1	19.0	93.9	50.6	57.0	64.6	72.2	78.5
2014	133	65.1	11.9	32.7	96.6	50.1	56.7	64.9	72.4	82.2
1998-2014	8916	62.1	11.4	0.9	101	48.1	54.3	61.8	69.6	76.9

Table 3b

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	Median 10%	25%	50%	75%	90%
1998	104	64.2	14.5	9.5	97.4	49.9	55.1	63.4	75.8	82.2
1999	128	64.5	14.6	13.9	91.9	48.3	55.4	65.8	75.6	81.6
2000	103	61.6	15.6	19.7	91.9	42.8	51.1	59.7	73.5	82.1
2001	107	65.6	15.0	16.4	96.4	49.3	56.2	63.5	74.6	88.1
2002	182	66.3	13.7	31.4	99.0	48.7	55.9	64.8	77.7	82.9
2003	185	64.6	15.4	10.7	98.2	46.2	53.9	63.8	77.4	83.7
2004	154	66.0	14.0	24.7	97.9	48.9	57.0	66.7	76.2	83.1
2005	173	64.5	13.9	22.8	103	49.6	55.8	63.3	73.9	83.4
2006	199	63.0	14.6	19.0	101	46.0	53.8	62.6	71.7	83.2
2007	210	64.1	14.4	7.7	98.2	46.9	54.6	63.6	74.1	83.7
2008	225	65.3	14.1	14.1	98.4	49.7	55.9	65.3	73.4	84.3
2009	228	65.2	15.0	16.8	98.4	47.6	55.1	64.4	76.2	85.3
2010	227	65.4	14.0	21.9	103	48.1	55.3	66.4	74.4	85.2
2011	237	64.5	13.9	17.2	96.9	47.7	56.5	64.9	73.2	82.9
2012	235	65.5	13.1	21.5	100	48.5	58.1	65.0	73.4	82.3
2013	208	66.1	14.7	12.1	95.5	47.2	55.4	67.3	76.0	86.5
2014	54	66.2	15.1	27.5	92.4	44.2	57.5	66.4	78.1	86.9
1998-2014	2959	64.9	14.4	7.7	103	47.6	55.4	64.8	75.2	83.8

Table 4

Age distribution by 5-year age group and gender for period 2007-2014
(incl. DCO)

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	1	0.0	0.0	1	0.0	0.0			0.0
5-9	1	0.0	0.0			0.0	1	0.1	0.1
10-14	3	0.0	0.1	1	0.0	0.0	2	0.1	0.2
15-19	11	0.2	0.3	8	0.2	0.2	3	0.2	0.4
20-24	9	0.1	0.4	6	0.1	0.3	3	0.2	0.6
25-29	26	0.4	0.8	13	0.3	0.6	13	0.8	1.4
30-34	42	0.7	1.5	20	0.4	1.1	22	1.4	2.7
35-39	64	1.0	2.5	42	0.9	2.0	22	1.4	4.1
40-44	170	2.7	5.2	120	2.6	4.5	50	3.1	7.1
45-49	435	6.9	12.1	336	7.2	11.8	99	6.1	13.2
50-54	721	11.5	23.6	569	12.2	24.0	152	9.4	22.6
55-59	864	13.8	37.4	665	14.3	38.3	199	12.3	34.9
60-64	992	15.8	53.2	763	16.4	54.7	229	14.1	49.0
65-69	1017	16.2	69.4	780	16.8	71.4	237	14.6	63.5
70-74	817	13.0	82.4	623	13.4	84.8	194	11.9	75.5
75-79	525	8.4	90.7	382	8.2	93.0	143	8.8	84.3
80-84	302	4.8	95.6	197	4.2	97.2	105	6.5	90.8
85+	279	4.4	100.0	129	2.8	100.0	150	9.2	100.0
All ages	6279	100.0		4655	100.0		1624	100.0	

Included in the statistics are 39.5% multiple primaries in males and 32.3% in females.

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 2007-2014

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males DCO rate n=195 %	Females DCO rate n=86 %	Males Prop.all cancers n=91183 %	Females Prop.all cancers n=89596 %
0- 4	1		0.1	0.0			0.6	
5- 9		1	0.0	0.1				1.3
10-14	1	2	0.1	0.2			1.0	2.2
15-19	8	3	0.8	0.3			3.7	1.8
20-24	6	3	0.5	0.3			1.6	1.0
25-29	13	13	1.1	1.1			2.3	2.0
30-34	20	22	1.6	1.8			2.6	1.9
35-39	41	22	3.1	1.7		4.5	3.6	1.1
40-44	117	50	7.2	3.3	0.9	2.0	6.4	1.3
45-49	326	96	20.6	6.3	0.9		10.1	1.8
50-54	557	148	43.0	11.6	1.8	2.7	11.4	2.2
55-59	651	194	61.3	17.3	2.0	3.6	8.9	2.6
60-64	746	223	75.9	21.0	2.9	2.2	6.9	2.4
65-69	766	233	79.6	22.3	4.2	2.1	4.9	2.0
70-74	617	192	67.8	18.4	6.6	3.6	3.6	1.6
75-79	381	141	69.2	19.8	5.5	2.8	3.1	1.4
80-84	195	102	55.8	18.2	9.2	9.8	2.3	1.2
85+	128	148	55.3	25.6	26.6	28.4	2.1	1.4
All ages	4574	1593			4.3	5.4	5.0	1.8
Incidence								
Raw			25.3	8.5				
WS			14.8	4.5				
ES			20.7	6.2				
BRD-S			23.8	7.2				

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).

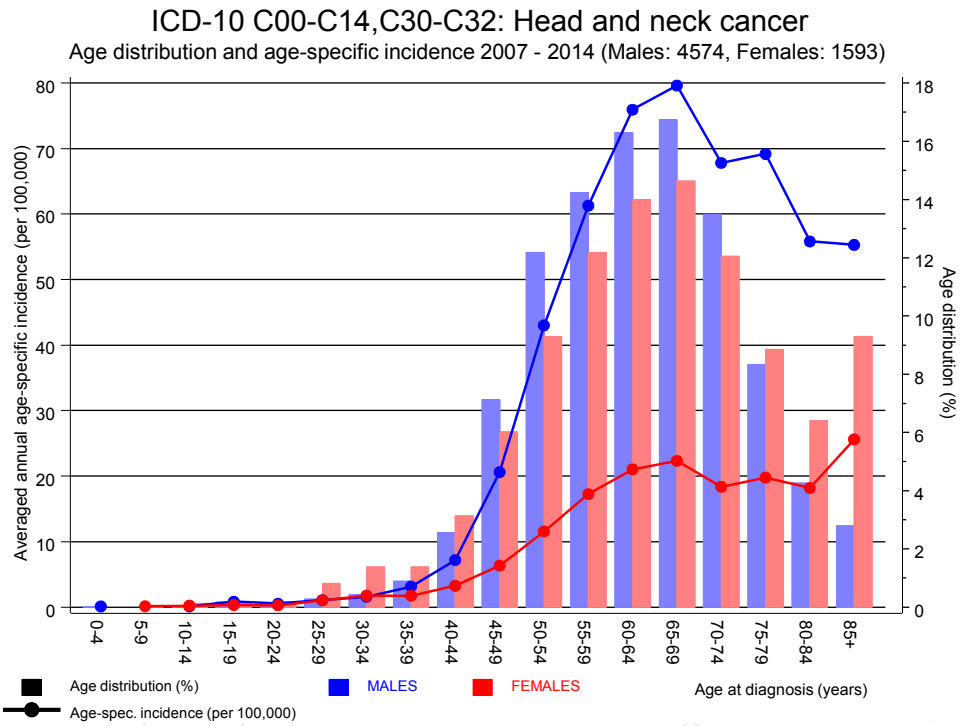


Figure 6. Age distribution and age-specific incidence

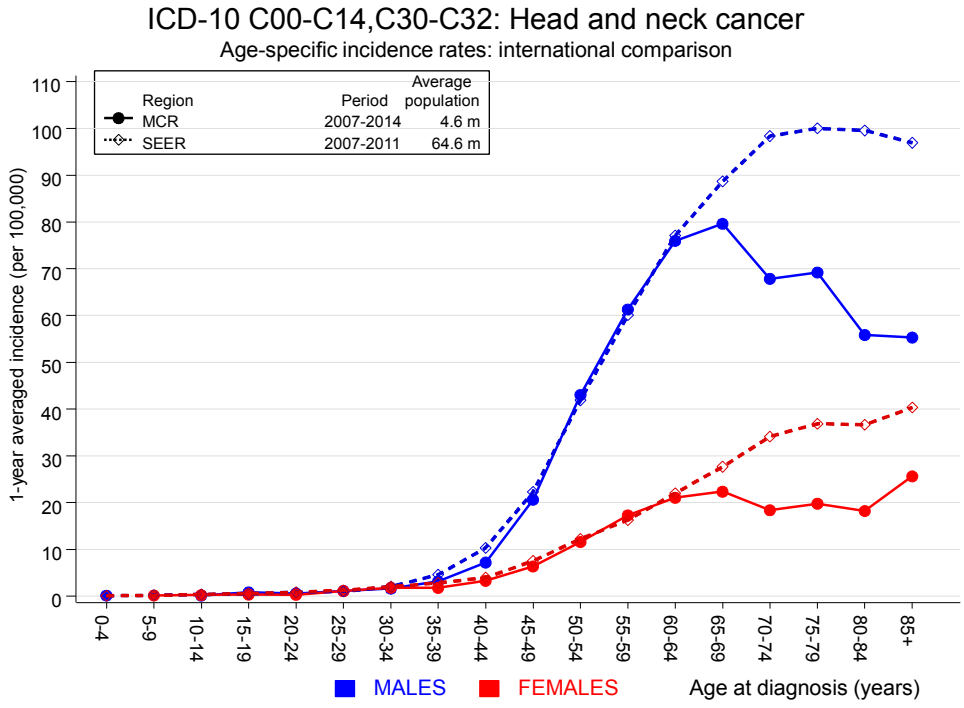


Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

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.

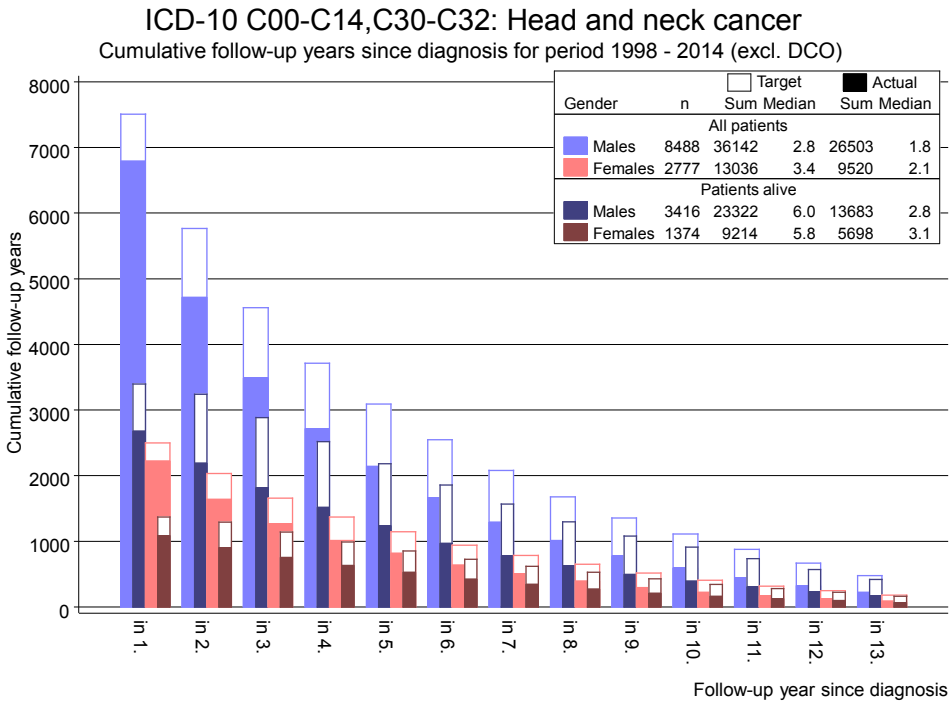


Figure 7. Cumulative follow-up years depending on time since diagnosis

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

Table 8a

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of second primaries for period 1998-2014
MALES

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C00	Lip	5	0.4	13.0	4.2	30.4	#	1.8	
C03-C06	Oral cavity	90	3.8	23.8	19.1	29.3	#	33.5	7.8
C07-C08	Salivary gland	5	0.7	6.9	2.2	16.0	#	1.7	
C09-C10	Oropharynx	105	4.9	21.6	17.7	26.2	#	38.9	3.8
C11	Nasopharynx	7	0.3	22.6	9.1	46.6	#	2.6	14.3
C12-C13	Hypopharynx	75	2.6	28.5	22.4	35.7	#	28.1	10.7
C15	Oesophagus	139	7.0	19.8	16.6	23.3	#	51.3	15.1
C16	Stomach	36	13.1	2.7	1.9	3.8	#	8.9	8.3
C17	Small intestine	9	1.8	4.9	2.2	9.2	#	2.8	22.2
C18	Colon	76	31.7	2.4	1.9	3.0	#	17.2	3.9
C19-C20	Rectum	46	19.8	2.3	1.7	3.1	#	10.2	6.5
C21	Anus/canal	6	0.8	7.4	2.7	16.1	#	2.0	
C22	Liver	56	9.6	5.8	4.4	7.6	#	18.0	10.7
C23-C24	Bile	6	3.2	1.9	0.7	4.1		1.1	33.3
C25	Pancreas	33	12.2	2.7	1.9	3.8	#	8.1	21.2
C26	GI cancer	2	0.3	5.8	0.7	21.0		0.6	
C30-C31	Sinuses	10	0.6	16.0	7.7	29.5	#	3.6	10.0
C32	Larynx	58	4.1	14.0	10.6	18.1	#	20.9	32.8
C33-C34	Lung	396	41.8	9.5	8.6	10.5	#	137.7	11.1
C38,C45	Mesothelioma	3	2.2	1.4	0.3	4.0		0.3	
C43	Malign. melanoma	30	15.6	1.9	1.3	2.8	#	5.6	16.7
C46,C49	Soft tissue	9	1.9	4.8	2.2	9.1	#	2.8	11.1
C61	Prostate	113	101.8	1.1	0.9	1.3		4.4	6.2
C64	Kidney	43	12.8	3.4	2.4	4.5	#	11.8	9.3
C65	Renal pelvis	5	1.3	3.8	1.2	8.8	#	1.4	
C67	Bladder	32	13.9	2.3	1.6	3.2	#	7.0	6.3
C70-C72	CNS cancer	3	4.9	0.6	0.1	1.8		-0.7	33.3
C73	Thyroid	15	2.8	5.3	3.0	8.7	#	4.7	6.7
C76-C79	CUP	27	5.7	4.7	3.1	6.9	#	8.3	
C81	Hodgkin lymphoma	5	0.8	5.9	1.9	13.8	#	1.6	20.0
C82-C85	NHL	34	13.4	2.5	1.8	3.5	#	8.0	8.8
C90	Mult. myeloma	6	4.2	1.4	0.5	3.1		0.7	
C91-C96	Leukaemia	15	5.2	2.9	1.6	4.8	#	3.8	33.3
Other primaries		9	3.7	2.4	1.1	4.6	#	2.1	11.1
Not observed		0	2.8	0.0	0.0	1.3		-1.1	
All mult. primaries		1509	352.1	4.3	4.1	4.5	#	449.9	10.7

Patients	8243
Median age at second malignancy (years)	65.9
Person-years	25714
Mean observation time (years)	3.1
Median observation time (years)	1.8

The occurrence of second malignancy is statistically significant.

Observed second primaries with count 1 are pooled in category “Other primaries”

Table 8b

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of second primaries for period 1998–2014
FEMALES

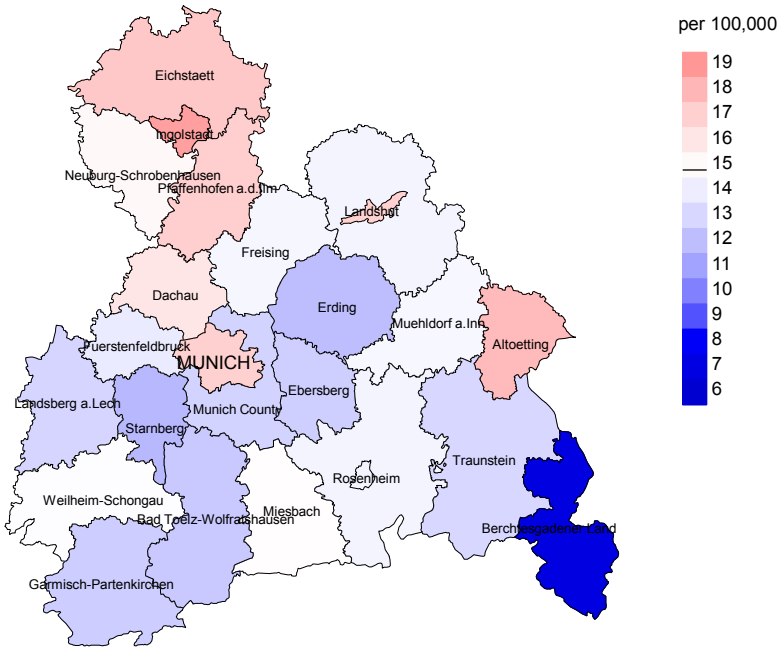
Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C03–C06	Oral cavity	22	0.6	36.4	22.8	55.2	#	23.1	
C07–C08	Salivary gland	4	0.2	26.1	7.1	66.9	#	4.2	
C09–C10	Oropharynx	38	0.4	88.2	62.4	121.1	#	40.6	
C11	Nasopharynx	4	0.0	108.4	29.5	277.5	#	4.3	25.0
C12–C13	Hypopharynx	17	0.1	147.5	85.9	236.2	#	18.2	23.5
C14	ENT cancer	2	0.0	115.4	14.0	416.8	#	2.1	100.0
C15	Oesophagus	28	0.6	47.7	31.7	68.9	#	29.6	7.1
C16	Stomach	9	3.3	2.7	1.2	5.2	#	6.2	11.1
C18	Colon	21	9.2	2.3	1.4	3.5	#	12.7	
C19–C20	Rectum	7	4.0	1.7	0.7	3.6		3.2	
C22	Liver	11	1.1	10.1	5.1	18.2	#	10.7	18.2
C23–C24	Bile	4	1.3	3.0	0.8	7.8		2.9	
C25	Pancreas	13	4.1	3.2	1.7	5.5	#	9.6	30.8
C30–C31	Sinuses	6	0.1	50.3	18.5	109.4	#	6.4	16.7
C32	Larynx	12	0.2	62.6	32.4	109.4	#	12.8	25.0
C33–C34	Lung	86	7.1	12.2	9.7	15.0	#	85.3	15.1
C43	Malign. melanoma	9	3.6	2.5	1.1	4.7	#	5.8	22.2
C50	Breast	46	30.3	1.5	1.1	2.0	#	16.9	6.5
C51	Vulva	3	0.9	3.2	0.7	9.4		2.2	
C53	Cervix uteri	8	1.4	5.8	2.5	11.5	#	7.2	12.5
C54	Corpus uteri	6	5.4	1.1	0.4	2.4		0.7	
C56	Ovary	6	4.0	1.5	0.6	3.3		2.2	16.7
C64	Kidney	3	2.3	1.3	0.3	3.8		0.7	
C67	Bladder	3	1.7	1.7	0.4	5.0		1.4	66.7
C70–C72	CNS cancer	4	1.3	3.0	0.8	7.7		2.9	50.0
C73	Thyroid	9	1.8	4.9	2.2	9.3	#	7.7	33.3
C76–C79	CUP	5	1.7	3.0	1.0	7.0		3.6	
C82–C85	NHL	10	3.6	2.8	1.3	5.1	#	6.9	
C91–C96	Leukaemia	4	1.5	2.7	0.7	6.8		2.7	25.0
Other primaries		7	2.9	2.4	1.0	5.0		4.5	
Not observed		0	2.3	0.0	0.0	1.6		−2.5	
All mult. primaries		407	97.2	4.2	3.8	4.6	#	334.7	11.8

Patients	2715
Median age at second malignancy (years)	67.8
Person-years	9256
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”

Average incidence (world standard population) 2007 - 2014: Males



Average incidence (world standard population) 2007 - 2014: Females

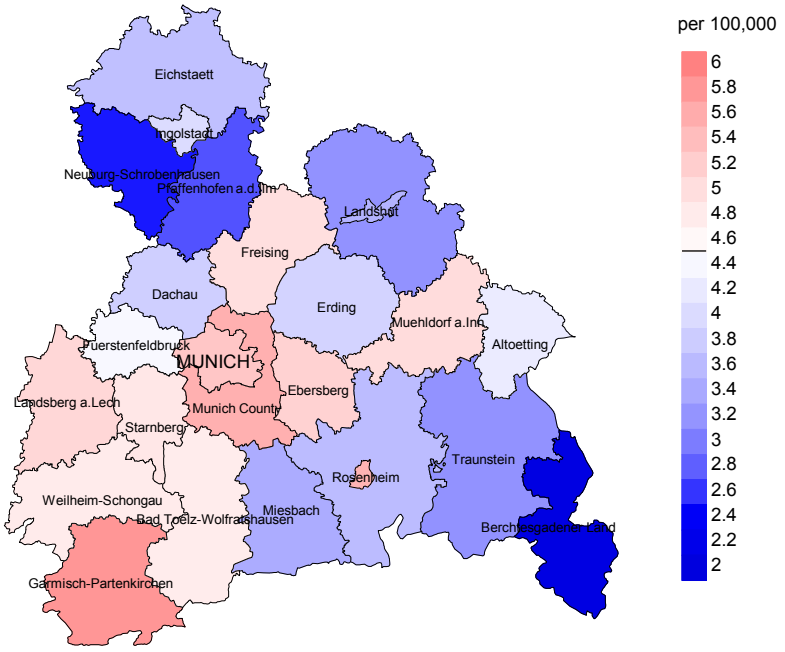


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2014. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 14.8/100,000 WS N=4,574, females 4.5/100,000 WS N=1,593).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 65,347 female residents (averaged) in the period from 2007 to 2014 a total of 49 women were identified with newly diagnosed HN cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 5.2/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 3.3 and 8.0/100,000.

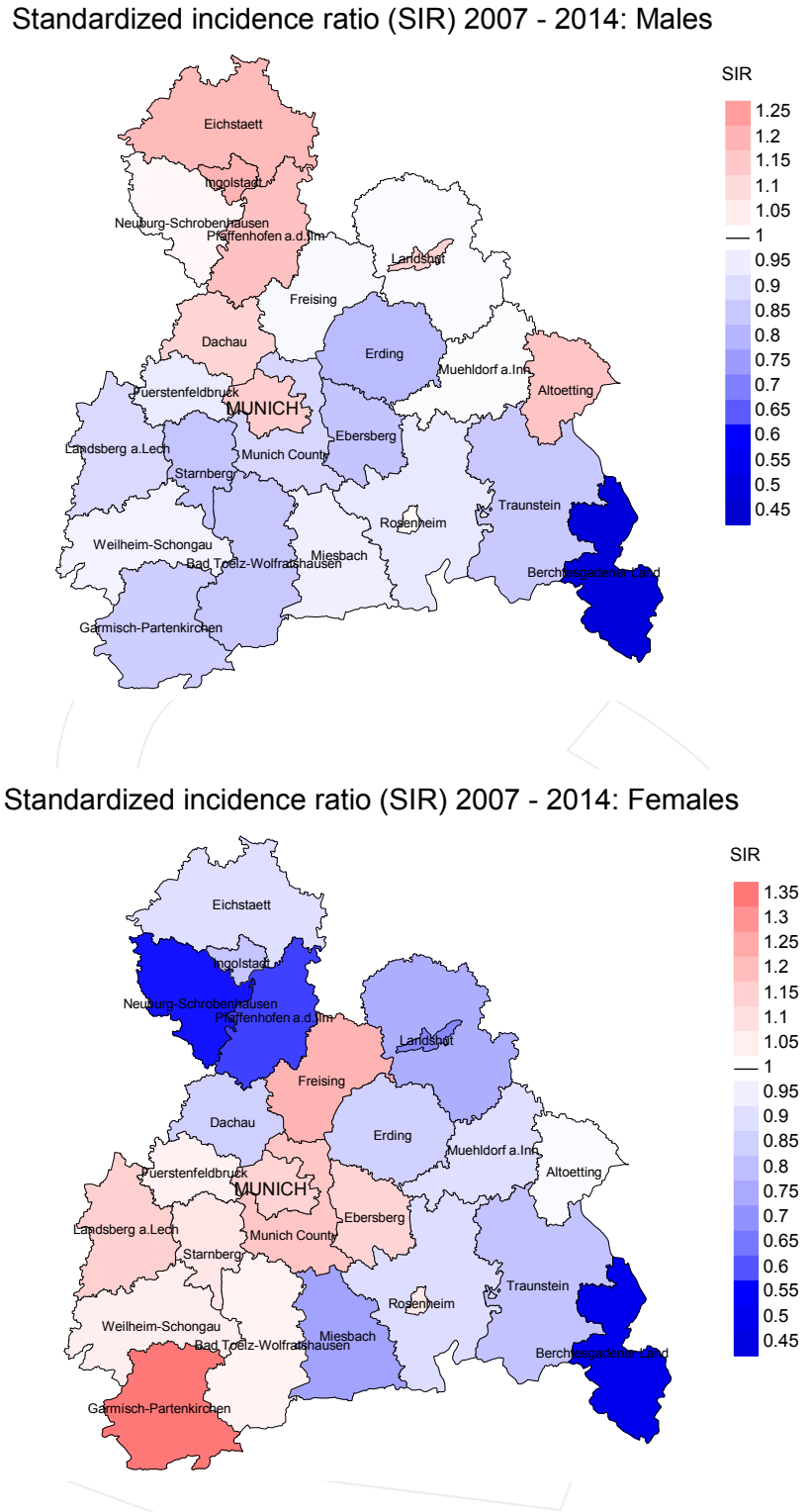


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2014. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=4,574, females N=1,593).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,924 female residents (averaged) in the period from 2007 to 2014 a total of 49 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 1.14. Though, the value of this parameter may vary with an underlying probability of 99% between 0.76 and 1.62, 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	479	97.9	4.8	372	77.7	95.4
1999	502	97.0	3.8	386	76.9	91.2
2000	458	97.6	4.4	350	76.4	94.9
2001	456	96.7	5.3	344	75.4	94.5
2002	759	97.9	7.0	554	73.0	96.9
2003	755	97.5	4.9	550	72.8	97.3
2004	710	97.5	5.4	499	70.3	96.0
2005	752	96.3	4.1	492	65.4	98.8
2006	725	95.0	2.8	469	64.7	97.9
2007	864	81.9	5.9	530	61.3	98.1
2008	921	79.3	3.8	537	58.3	98.0
2009	902	81.4	2.5	507	56.2	99.0
2010	938	76.5	4.2	468	49.9	98.9
2011	860	76.5	4.2	394	45.8	95.4
2012	861	78.9	4.5	329	38.2	96.0
2013	746	99.1	4.2	274	36.7	97.1
2014	187	97.9	17.1	73	39.0	93.2
1998-2014	11875	89.1	4.6	7128	60.0	96.8

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	479	311	91.6	64	13.4
1999	502	334	88.3	69	13.7
2000	458	327	94.8	56	12.2
2001	456	352	90.3	73	16.0
2002	759	504	97.0	119	15.7
2003	755	516	96.9	112	14.8
2004	710	527	96.6	116	16.3
2005	752	493	96.8	108	14.4
2006	725	563	96.8	106	14.6
2007	864	611	97.5	129	14.9
2008	921	603	98.3	127	13.8
2009	902	628	98.4	114	12.6
2010	938	627	98.7	128	13.6
2011	860	611	97.5	121	14.1
2012	861	671	97.3	121	14.1
2013	746	664	98.6	134	18.0
2014	187	537	97.8	65	34.8
1998-2014	11875	8879	96.7	1762	14.8

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	311	70.4	29.6	88.8
1999	334	67.1	32.9	85.1
2000	327	74.9	25.1	87.4
2001	352	73.3	26.7	88.7
2002	504	74.8	25.2	87.3
2003	516	73.6	26.4	86.0
2004	527	76.5	23.5	88.8
2005	493	79.7	20.3	90.8
2006	563	74.6	25.4	84.8
2007	611	76.8	23.2	88.6
2008	603	77.1	22.9	87.0
2009	628	76.4	23.6	87.7
2010	627	78.1	21.9	88.5
2011	611	72.8	27.2	85.2
2012	671	74.4	25.6	85.6
2013	664	73.6	26.4	85.8
2014	537	70.6	29.4	84.2
1998-2014	8879	74.7	25.3	87.0

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	231	62.2	60.2	66.2	62.2
1999	263	61.7	59.8	65.1	59.6
2000	255	63.8	62.2	66.9	64.0
2001	278	61.9	60.4	67.9	61.0
2002	399	63.6	62.5	70.2	62.6
2003	402	64.1	63.1	69.1	63.3
2004	413	63.6	62.4	70.8	63.0
2005	365	65.5	64.6	74.4	65.0
2006	437	65.4	64.6	71.8	64.8
2007	492	66.1	64.9	70.9	65.5
2008	474	67.5	66.6	71.7	67.2
2009	485	68.0	66.3	73.8	66.9
2010	492	67.6	66.5	72.2	66.5
2011	478	69.1	67.4	71.3	68.3
2012	516	70.7	69.6	74.2	69.8
2013	490	69.9	67.5	75.0	68.4
2014	409	70.7	68.8	75.4	69.7
1998-2014	6879	66.4	64.9	72.0	65.5

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	80	71.9	68.6	83.1	71.6
1999	71	73.4	67.4	78.0	70.3
2000	72	67.8	61.0	79.9	67.6
2001	74	72.2	69.7	75.2	71.9
2002	105	71.9	71.0	78.3	71.8
2003	114	71.0	65.0	78.3	70.7
2004	114	73.7	73.7	73.7	73.0
2005	128	68.4	65.9	82.3	66.7
2006	126	73.7	70.6	80.4	71.1
2007	119	70.9	68.4	81.5	69.2
2008	129	69.4	68.0	77.1	68.5
2009	143	70.3	68.5	81.7	69.6
2010	135	71.4	68.4	81.7	68.8
2011	133	72.7	70.5	82.4	71.1
2012	155	73.1	71.5	83.0	71.5
2013	174	74.2	72.2	83.9	72.8
2014	128	75.9	71.6	79.9	73.0
1998-2014	2000	72.3	69.4	80.4	70.3

By 2010, life expectancy at birth was 77.5 years for boys and 82.6 years for girls.

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	164	14.8	0.44	9.6	0.44	13.3	0.44	15.5	0.45
1999	186	16.6	0.51	10.5	0.50	15.0	0.51	17.4	0.53
2000	191	16.8	0.54	10.4	0.51	15.0	0.53	18.1	0.56
2001	208	17.9	0.60	11.5	0.60	16.1	0.60	18.3	0.61
2002	304	16.3	0.54	9.9	0.51	14.3	0.53	16.9	0.57
2003	302	16.1	0.55	9.8	0.51	13.9	0.53	16.2	0.56
2004	318	16.9	0.58	10.2	0.56	14.5	0.58	17.0	0.59
2005	292	15.4	0.51	8.8	0.47	12.6	0.49	15.3	0.53
2006	333	17.4	0.64	10.2	0.60	14.4	0.61	17.1	0.64
2007	381	17.2	0.59	9.9	0.56	14.2	0.58	16.8	0.60
2008	377	16.9	0.55	9.5	0.51	13.6	0.53	16.3	0.55
2009	376	16.8	0.57	9.2	0.53	13.4	0.55	16.1	0.58
2010	390	17.3	0.56	9.5	0.52	13.8	0.55	16.4	0.57
2011	350	15.3	0.57	8.2	0.55	11.9	0.56	14.3	0.58
2012	382	16.7	0.62	8.6	0.55	12.6	0.58	15.7	0.62
2013	357	15.6	0.67	8.3	0.62	12.0	0.64	14.7	0.67
2014	303	13.3	2.30	6.8	2.07	10.0	2.16	12.4	2.33
1998-2014	5214	16.3	0.59	9.3	0.56	13.4	0.58	15.9	0.61

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	55	4.7	0.53	2.2	0.47	3.3	0.49	4.1	0.52
1999	38	3.2	0.31	1.6	0.28	2.3	0.29	2.9	0.31
2000	55	4.6	0.54	2.5	0.49	3.5	0.51	4.1	0.53
2001	50	4.1	0.48	1.9	0.39	2.7	0.41	3.4	0.46
2002	73	3.7	0.40	1.8	0.37	2.6	0.38	3.1	0.39
2003	79	4.0	0.43	2.1	0.40	3.0	0.42	3.5	0.43
2004	85	4.3	0.56	1.8	0.45	2.7	0.48	3.5	0.51
2005	101	5.1	0.59	2.5	0.54	3.7	0.56	4.3	0.58
2006	88	4.4	0.45	1.8	0.32	2.7	0.36	3.5	0.40
2007	88	3.8	0.43	1.8	0.36	2.6	0.38	3.1	0.41
2008	88	3.8	0.39	1.8	0.35	2.6	0.37	3.1	0.38
2009	105	4.5	0.48	2.1	0.42	3.1	0.43	3.6	0.44
2010	101	4.3	0.46	2.0	0.41	2.9	0.43	3.5	0.45
2011	96	4.1	0.41	1.8	0.35	2.6	0.36	3.1	0.37
2012	118	5.0	0.51	2.2	0.42	3.2	0.44	3.9	0.47
2013	132	5.6	0.64	2.4	0.52	3.5	0.56	4.3	0.61
2014	78	3.3	1.44	1.4	1.26	2.1	1.31	2.5	1.34
1998-2014	1430	4.3	0.49	2.0	0.42	2.9	0.44	3.5	0.46

Table 13

Age distribution of age at death (cancer-related) for period 2007-2014
(**incl. multiple primaries**)

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
15-19	1	0.0	0.0			0.0	1	0.1	0.1
20-24	4	0.1	0.1	3	0.1	0.1	1	0.1	0.2
25-29	4	0.1	0.2	1	0.0	0.1	3	0.3	0.6
30-34	3	0.1	0.3	1	0.0	0.2	2	0.2	0.8
35-39	15	0.4	0.7	8	0.3	0.4	7	0.8	1.6
40-44	49	1.2	1.9	41	1.3	1.7	8	0.9	2.5
45-49	153	3.8	5.7	126	4.0	5.7	27	3.1	5.7
50-54	360	8.9	14.6	305	9.7	15.4	55	6.4	12.0
55-59	508	12.6	27.3	430	13.6	29.0	78	9.0	21.1
60-64	584	14.5	41.8	469	14.8	43.8	115	13.3	34.4
65-69	703	17.5	59.3	555	17.6	61.4	148	17.1	51.5
70-74	614	15.3	74.5	501	15.9	77.2	113	13.1	64.6
75-79	443	11.0	85.5	352	11.1	88.4	91	10.5	75.1
80-84	291	7.2	92.8	219	6.9	95.3	72	8.3	83.4
85+	291	7.2	100.0	148	4.7	100.0	143	16.6	100.0
All ages	4023	100.0		3159	100.0		864	100.0	

Included in the statistics are 39.5% multiple primaries in males and 32.3% in females.

Table 14

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2014
(**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		1	0.0		0.1	0.33		4.5
20-24	3	1	0.3	0.50	0.1	0.33	6.3	3.6
25-29	1	3	0.1	0.08	0.2	0.23	1.6	4.7
30-34	1	2	0.1	0.05	0.2	0.09	1.1	1.8
35-39	8	7	0.6	0.19	0.6	0.32	4.5	2.7
40-44	41	8	2.5	0.34	0.5	0.16	8.9	1.3
45-49	126	27	8.0	0.38	1.8	0.27	12.3	2.2
50-54	305	55	23.6	0.54	4.3	0.36	16.3	3.1
55-59	430	78	40.5	0.65	6.9	0.39	13.9	3.0
60-64	469	115	47.7	0.61	10.8	0.50	9.8	3.2
65-69	555	148	57.7	0.71	14.2	0.62	7.8	2.8
70-74	501	113	55.1	0.80	10.8	0.58	5.5	1.7
75-79	352	91	63.9	0.92	12.8	0.64	4.1	1.4
80-84	219	72	62.7	1.11	12.8	0.69	3.0	1.1
85+	148	143	63.9	1.15	24.7	0.95	2.4	1.6
All ages	3159	864					6.3	2.0
Mortality								
Raw			17.5	0.68	4.6	0.53		
WS			9.5	0.63	2.1	0.46		
ES			13.8	0.65	3.0	0.48		
BRD-S			16.6	0.69	3.6	0.50		
PYLL-70								
per 100,000			125.2		28.6			
ES			110.8		24.6			
AYLL-70			10.3		10.2			

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

Table 15a

Multiple primaries in deaths in period 1998–2014
MALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03–C06	Oral cavity	118	4.3			7	5.9	111	94.1
C09–C10	Oropharynx	140	5.1			34	24.3	106	75.7
C12–C13	Hypopharynx	98	3.6			30	30.6	68	69.4
C15	Oesophagus	230	8.4	38	16.5	33	14.3	159	69.1
C16	Stomach	68	2.5	15	22.1	4	5.9	49	72.1
C18	Colon	124	4.5	43	34.7	5	4.0	76	61.3
C19–C20	Rectum	80	2.9	19	23.8	3	3.8	58	72.5
C22	Liver	71	2.6	3	4.2	10	14.1	58	81.7
C25	Pancreas	57	2.1	6	10.5	5	8.8	46	80.7
C32	Larynx	82	3.0			14	17.1	68	82.9
C33–C34	Lung	622	22.8	78	12.5	70	11.3	474	76.2
C43	Malign. melanoma	50	1.8	24	48.0	5	10.0	21	42.0
C44	Skin others	239	8.7	81	33.9	34	14.2	124	51.9
C61	Prostate	220	8.0	105	47.7	17	7.7	98	44.5
C64	Kidney	51	1.9	17	33.3	5	9.8	29	56.9
C67	Bladder	121	4.4	55	45.5	3	2.5	63	52.1
C76–C79	CUP	68	2.5	33	48.5	5	7.4	30	44.1
C82–C85	NHL	57	2.1	23	40.4	8	14.0	26	45.6
C91–C96	Leukaemia	34	1.2	8	23.5	2	5.9	24	70.6
Other primaries		204	7.5	73	35.8	13	6.4	118	57.8
All mult. primaries		2734	100.0	621	22.7	307	11.2	1806	66.1

Multiple primaries with number of cases 1 to 19 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 1998–2014
FEMALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03–C06 Oral cavity	29	4.0			1	3.4	28	96.6
C09–C10 Oropharynx	33	4.6			7	21.2	26	78.8
C12–C13 Hypopharynx	19	2.6			3	15.8	16	84.2
C15 Oesophagus	48	6.7	6	12.5	6	12.5	36	75.0
C16 Stomach	18	2.5	4	22.2	3	16.7	11	61.1
C18 Colon	37	5.1	16	43.2	4	10.8	17	45.9
C19–C20 Rectum	11	1.5	4	36.4			7	63.6
C22 Liver	10	1.4	1	10.0	2	20.0	7	70.0
C25 Pancreas	15	2.1	1	6.7	1	6.7	13	86.7
C32 Larynx	13	1.8			1	7.7	12	92.3
C33–C34 Lung	119	16.5	10	8.4	11	9.2	98	82.4
C43 Malign. melanoma	14	1.9	3	21.4	1	7.1	10	71.4
C44 Skin others	42	5.8	12	28.6	6	14.3	24	57.1
C50 Breast	123	17.1	76	61.8	6	4.9	41	33.3
C53 Cervix uteri	23	3.2	17	73.9			6	26.1
C54 Corpus uteri	17	2.4	11	64.7	1	5.9	5	29.4
C56 Ovary	14	1.9	6	42.9			8	57.1
C67 Bladder	12	1.7	7	58.3			5	41.7
C70–C72 CNS cancer	17	2.4	5	29.4	2	11.8	10	58.8
C73 Thyroid	10	1.4	7	70.0	1	10.0	2	20.0
C76–C79 CUP	17	2.4	10	58.8			7	41.2
C82–C85 NHL	18	2.5	8	44.4	1	5.6	9	50.0
C91–C96 Leukaemia	10	1.4	3	30.0			7	70.0
Other primaries	51	7.1	11	21.6	6	11.8	34	66.7
All mult. primaries	720	100.0	218	30.3	63	8.8	439	61.0

Multiple primaries with number of cases 1 to 7 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 2007-2014
(**First 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	0.0		0.1	0.33		5.0
20-24	3	1	0.3	0.50	0.1	0.33	7.0	3.8
25-29	1	3	0.1	0.08	0.2	0.27	1.8	5.1
30-34	1	2	0.1	0.06	0.2	0.10	1.2	2.1
35-39	5	5	0.4	0.14	0.4	0.28	3.0	2.2
40-44	36	8	2.2	0.33	0.5	0.17	8.5	1.4
45-49	100	24	6.3	0.35	1.6	0.28	10.9	2.3
50-54	248	45	19.2	0.52	3.5	0.36	15.5	3.0
55-59	350	63	33.0	0.66	5.6	0.41	13.4	2.9
60-64	367	82	37.4	0.61	7.7	0.46	9.4	2.9
65-69	426	110	44.3	0.73	10.5	0.64	7.5	2.7
70-74	377	80	41.4	0.87	7.7	0.53	5.4	1.6
75-79	249	69	45.2	0.97	9.7	0.67	4.0	1.4
80-84	153	52	43.8	1.22	9.3	0.66	2.9	1.0
85+	109	108	47.1	1.42	18.7	0.92	2.5	1.6
All ages	2425	653					6.3	1.9
Mortality								
Raw			13.4	0.68	3.5	0.51		
WS			7.4	0.62	1.6	0.44		
ES			10.7	0.65	2.3	0.46		
BRD-S			12.7	0.69	2.8	0.48		
PYLL-70								
per 100,000			100.8		23.3			
ES			89.3		20.1			
AYLL-70			10.5		10.7			

* See corresponding tables with multiple primaries.

Table 17

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2014
(**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	0.0		0.1	0.33		5.6
20-24	3	1	0.3	0.50	0.1	0.33	7.7	4.2
25-29	1	3	0.1	0.08	0.2	0.30	2.0	5.4
30-34	1	1	0.1	0.06	0.1	0.06	1.2	1.2
35-39	5	2	0.4	0.15	0.2	0.12	3.2	1.0
40-44	31	7	1.9	0.33	0.5	0.16	7.8	1.4
45-49	84	20	5.3	0.31	1.3	0.25	9.8	2.2
50-54	198	40	15.3	0.45	3.1	0.35	13.8	3.0
55-59	257	51	24.2	0.54	4.5	0.38	11.0	2.7
60-64	258	53	26.3	0.47	5.0	0.32	7.6	2.2
65-69	276	77	28.7	0.54	7.4	0.50	5.8	2.3
70-74	233	50	25.6	0.64	4.8	0.37	4.1	1.2
75-79	148	49	26.9	0.65	6.9	0.54	3.1	1.2
80-84	92	32	26.3	0.83	5.7	0.45	2.3	0.8
85+	70	81	30.2	1.00	14.0	0.74	2.0	1.4
All ages	1657	468					5.3	1.6
Mortality								
Raw			9.2	0.52	2.5	0.41		
WS			5.2	0.49	1.2	0.35		
ES			7.4	0.50	1.7	0.37		
BRD-S			8.7	0.52	2.0	0.38		
PYLL-70								
per 100,000			77.6		18.3			
ES			68.7		15.9			
AYLL-70			11.2		11.3			

* See corresponding tables with multiple primaries.

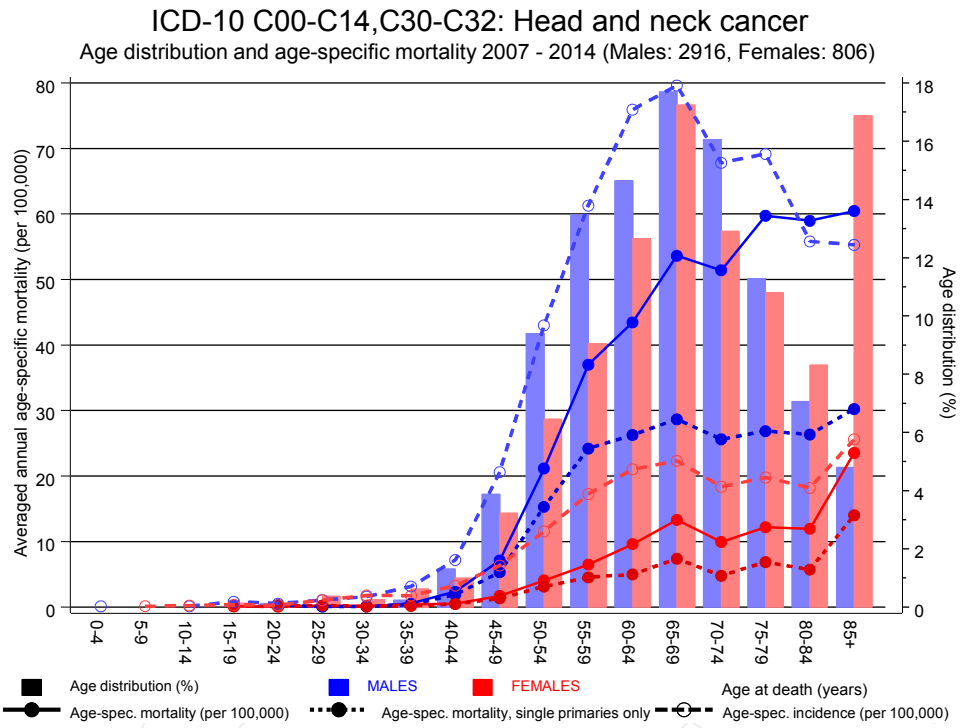
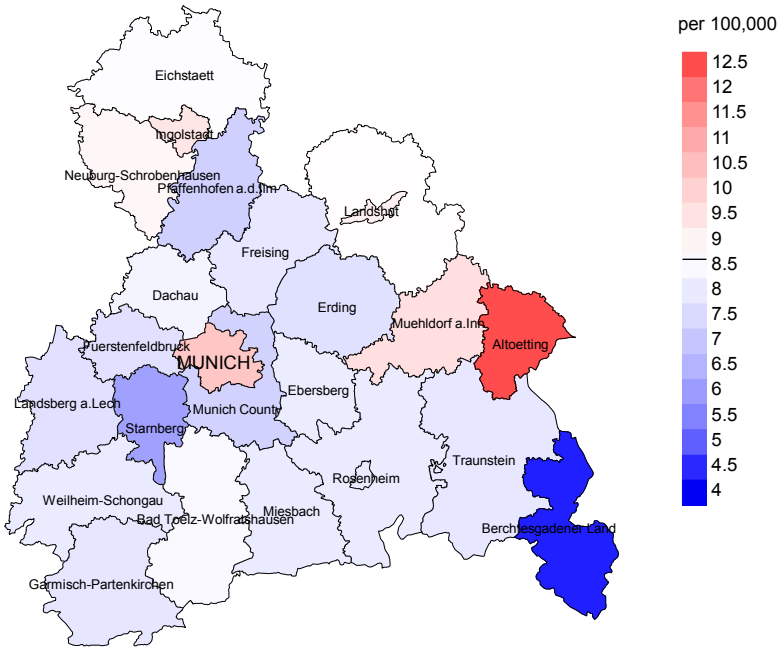


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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 - 2014: Males



Average mortality (world standard population) 2007 - 2014: Females

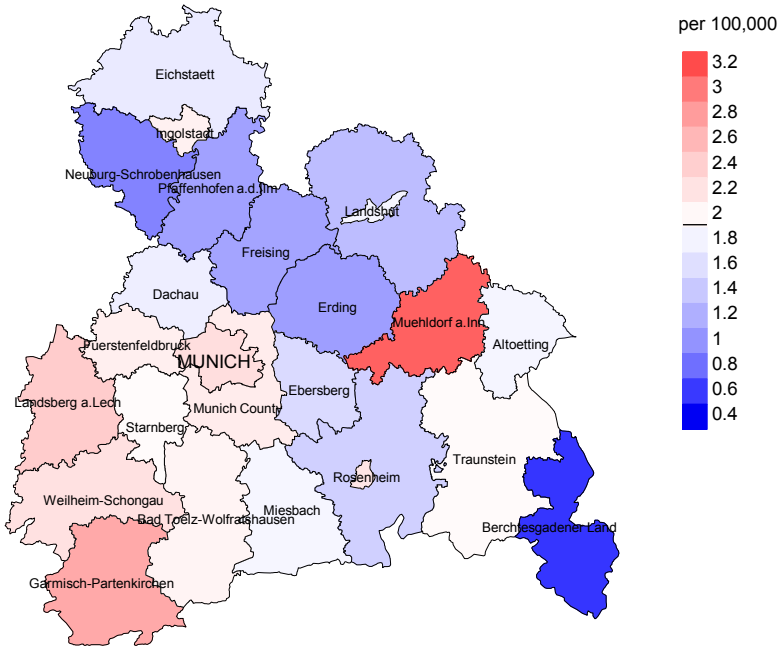
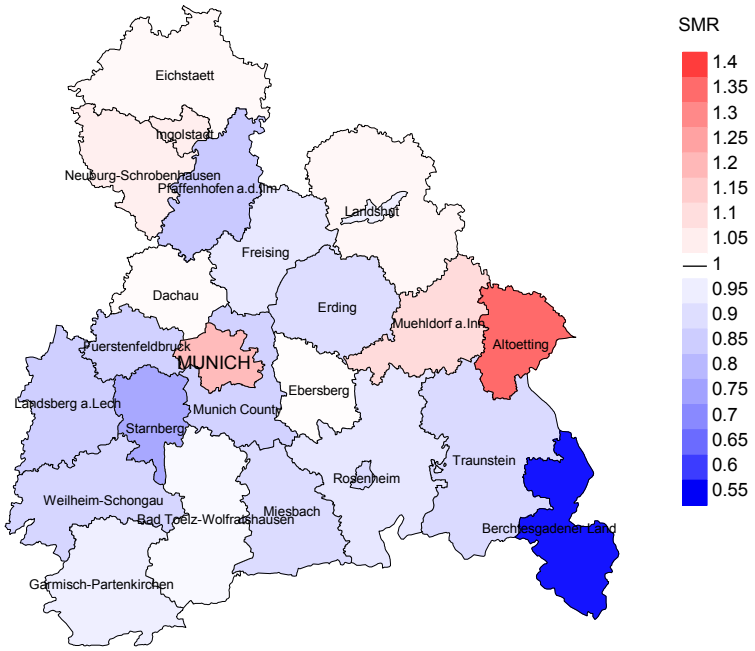


Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2014. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 8.6/100,000 WS N=2,890, females 1.9/100,000 WS N=798).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 65,347 female residents (averaged) in the period from 2007 to 2014 a total of 21 women died from HN cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 1.6/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.7 and 2.9/100,000.

Standardized mortality ratio (SMR) 2007 - 2014: Males



Standardized mortality ratio (SMR) 2007 - 2014: Females

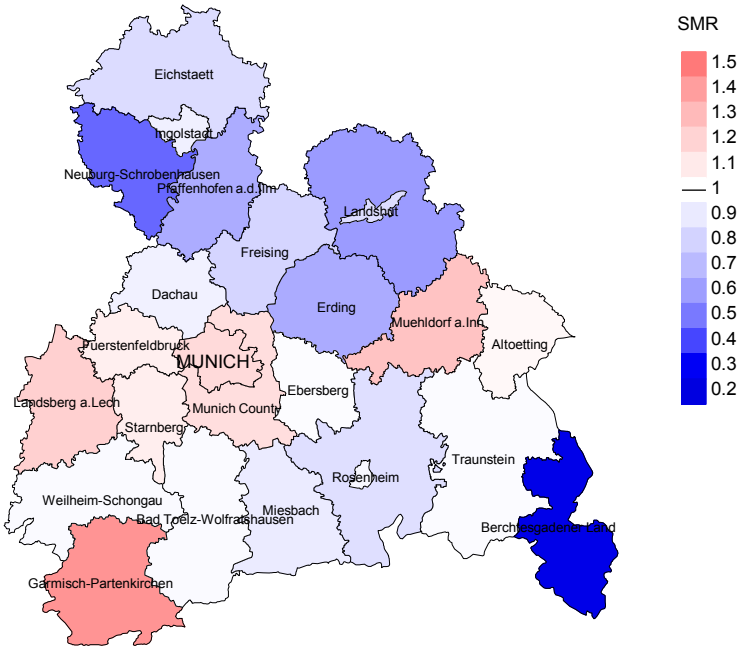


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2014. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=2,890, females N=798).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,924 female residents (averaged) in the period from 2007 to 2014 a total of 21 women died from HN cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.99. Though, the value of this parameter may vary with an underlying probability of 99% between 0.52 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, where applicable. 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

Recommended Citation

Munich Cancer Registry. ICD-10 C00-C14,C30-C32: HN cancer - Incidence and Mortality [Internet]. 2016 [updated 2016 Apr 13; cited 2016 Jun 1]. Available from: http://www.tumorregister-muenchen.de/en/facts/base/bC0032E-ICD-10-C00-C14-C30-C32-HN-cancer-incidence-and-mortality.pdf

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