Munich Cancer Registry

- Survival
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- *Deutsch*

ICD-10 C00-C14: HN cancer

Incidence and Mortality

Year of diagnosis	1998-2014
Patients	8,725
Diseases	9,019
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/bC0014E-ICD-10-C00-C14-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
	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

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	353	18	5.1	30.0	79.6	99.4	
1999	384	12	3.1	32.0	79.2	97.1	
2000	344	14	4.1	30.5	78.5	98.0	
2001	356	21	5.9	32.3	76.7	96.1	
2002	556	37	6.7	35.6	74.1	97.8	#
2003	566	24	4.2	35.0	73.7	97.5	
2004	543	24	4.4	31.5	72.0	97.6	
2005	571	26	4.6	34.0	66.2	96.7	
2006	551	10	1.8	30.1	66.4	94.7	
2007	663	39	5.9	31.2	63.8	83.3	#
2008	702	21	3.0	30.8	60.4	78.9	
2009	681	12	1.8	32.0	59.0	82.5	
2010	733	32	4.4	31.2	51.7	76.0	
2011	649	24	3.7	30.8	44.2	77.0	
2012	645	28	4.3	27.3	41.4	79.8	
2013	573	19	3.3	26.5	38.2	99.3	
2014	149	25	16.8	34.9	39.6	98.0	##
1998–2014	9019	386	4.3	31.3	61.6	89.3	

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	353	267	86	75.6
1999	384	278	106	72.4
2000	344	263	81	76.5
2001	356	264	92	74.2
2002	556	410	146	73.7
2003	566	417	149	73.7
2004	543	413	130	76.1
2005	571	423	148	74.1
2006	551	392	159	71.1
2007	663	489	174	73.8
2008	702	512	190	72.9
2009	681	492	189	72.2
2010	733	541	192	73.8
2011	649	462	187	71.2
2012	645	455	190	70.5
2013	573	401	172	70.0
2014	149	105	44	70.5
1998-2014	9019	6584	2435	73.0

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	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	263	81	23.1	6.7	15.3	3.9	21.1	5.4	23.6	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	417	149	22.2	7.6	14.6	4.2	20.1	5.8	21.8	6.7
2004	413	130	22.0	6.6	14.0	3.3	19.2	4.7	21.6	5.7
2005	423	148	22.3	7.4	14.2	4.2	19.2	5.8	21.4	6.5
2006	392	159	20.5	7.9	12.9	4.7	17.9	6.3	20.3	7.1
2007	489	174	22.1	7.5	13.5	4.1	18.7	5.7	21.1	6.5
2008	512	190	23.0	8.2	14.2	4.4	19.5	6.0	22.0	6.9
2009	492	189	22.0	8.1	13.2	4.4	18.3	6.1	20.7	7.0
2010	541	192	24.0	8.2	14.4	4.4	19.9	6.0	22.5	6.8
2011	462	187	20.2	7.9	11.7	4.3	16.3	5.9	18.7	6.8
2012	455	190	19.9	8.1	11.7	4.3	16.3	5.9	18.6	6.9
2013	401	172	17.6	7.3	10.4	3.7	14.5	5.1	16.4	5.9
2014	105	44	4.6	1.9	2.7	0.9	3.8	1.3	4.2	1.5
1998–2014	6584	2435	20.6	7.3	12.7	3.9	17.5	5.4	19.7	6.3

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

Table 3

Age distribution parameters by year of diagnosis (All patients)
(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	59.9	11.7	31.0	91.9	46.0	51.6	58.6	67.5	76.4
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	566	60.6	11.8	10.7	98.2	46.8	53.2	59.5	67.8	76.9
2004	543	61.6	12.4	24.7	97.9	45.8	53.6	61.3	69.4	78.4
2005	571	61.4	12.1	4.1	103	46.8	53.5	61.2	67.7	77.8
2006	551	61.4	12.5	17.6	101	46.8	53.2	60.1	69.2	77.8
2007	663	62.3	12.3	7.7	101	47.2	53.7	62.4	70.4	77.6
2008	702	63.3	11.6	19.8	100	49.5	55.4	62.7	69.6	79.3
2009	681	63.2	12.2	16.6	98.4	48.2	55.1	62.8	70.8	79.9
2010	733	62.5	12.8	18.2	95.3	47.0	53.7	62.7	70.7	78.7
2011	649	63.7	12.7	14.4	96.9	48.6	55.0	63.9	72.0	79.7
2012	645	63.6	11.8	21.5	100	49.0	55.3	63.7	72.0	78.4
2013	573	64.2	12.6	12.1	95.5	49.6	55.7	64.1	72.1	79.9
2014	149	64.7	12.6	27.5	93.5	48.7	56.3	64.2	72.4	83.0
1998-2014	9019	62.2	12.3	0.9	103	47.6	53.8	61.6	70.0	78.6

Table 3a

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	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	263	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	417	59.4	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	423	60.4	11.4	4.1	99.0	46.6	53.4	61.0	67.0	74.7
2006	392	61.1	11.3	17.6	92.0	47.2	53.6	59.7	67.6	76.9
2007	489	61.5	11.2	15.7	101	47.2	53.2	61.4	69.5	75.6
2008	512	62.4	10.7	19.8	100	49.3	54.8	62.1	68.9	76.8
2009	492	62.7	11.0	16.6	90.7	48.5	55.1	62.8	70.2	76.5
2010	541	61.8	12.4	18.2	95.3	46.9	53.5	61.4	70.0	76.8
2011	462	63.3	12.1	14.4	95.5	48.9	54.2	63.2	71.3	78.4
2012	455	62.9	10.9	21.6	94.3	49.2	54.8	62.4	70.6	77.2
2013	401	63.2	11.2	19.0	93.9	50.1	55.8	63.0	70.3	77.1
2014	105	63.8	11.5	41.3	93.5	49.5	56.0	63.1	70.9	79.8
1998-2014	6584	61.2	11.3	0.9	101	47.6	53.5	60.9	68.5	76.1

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	61.5	14.6	31.0	91.9	43.3	51.4	59.6	74.0	80.7
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	130	66.4	14.1	24.7	97.9	48.9	57.0	67.2	76.8	83.3
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	174	64.4	14.8	7.7	98.2	46.1	55.1	63.6	74.8	84.5
2008	190	65.8	13.5	25.6	98.4	50.0	57.2	65.8	74.1	83.6
2009	189	64.5	14.8	16.8	98.4	47.5	55.1	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	187	64.6	13.9	17.2	96.9	48.6	56.5	64.6	73.1	84.0
2012	190	65.1	13.5	21.5	100	48.0	57.2	65.0	73.3	82.2
2013	172	66.6	15.1	12.1	95.5	46.8	55.5	67.6	77.3	86.9
2014	44	66.9	14.9	27.5	92.4	48.3	57.7	69.3	78.1	86.9
1998-2014	2435	64.7	14.4	7.7	103	47.5	55.1	64.5	75.0	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.%
5-9	1	0.0	0.0			0.0	1	0.1	0.1
10-14	2	0.0	0.1	1	0.0	0.0	1	0.1	0.1
15-19	8	0.2	0.2	5	0.1	0.2	3	0.2	0.4
20-24	8	0.2	0.4	5	0.1	0.3	3	0.2	0.6
25-29	24	0.5	0.9	13	0.4	0.7	11	0.8	1.4
30-34	34	0.7	1.6	16	0.5	1.2	18	1.3	2.8
35-39	46	1.0	2.6	29	0.8	2.0	17	1.3	4.0
40-44	138	2.9	5.4	95	2.7	4.7	43	3.2	7.2
45-49	357	7.4	12.9	275	8.0	12.7	82	6.1	13.4
50-54	591	12.3	25.2	465	13.5	26.1	126	9.4	22.8
55-59	688	14.3	39.6	526	15.2	41.4	162	12.1	34.9
60-64	769	16.0	55.6	578	16.7	58.1	191	14.3	49.2
65-69	764	15.9	71.5	565	16.3	74.4	199	14.9	64.1
70-74	577	12.0	83.6	421	12.2	86.6	156	11.7	75.7
75-79	363	7.6	91.1	248	7.2	93.8	115	8.6	84.3
80-84	212	4.4	95.6	123	3.6	97.3	89	6.7	91.0
85+	213	4.4	100.0	92	2.7	100.0	121	9.0	100.0
All ages	4795	100.0		3457	100.0		1338	100.0	

Included in the statistics are 39.9% multiple primaries in males and 32.8% 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=130 %	Females DCO rate n=67 %	Males Prop.all cancers n=91183 %	Females Prop.all cancers n=89596 %
0- 4			0.0	0.0				
5- 9		1	0.0	0.1				1.3
10-14	1	1	0.1	0.1			1.0	1.1
15-19	5	3	0.5	0.3			2.3	1.8
20-24	5	3	0.4	0.3			1.3	1.0
25-29	13	11	1.1	0.9			2.3	1.7
30-34	16	18	1.3	1.4			2.1	1.6
35-39	28	17	2.1	1.3		5.9	2.4	0.9
40-44	92	43	5.7	2.8	1.1	2.3	5.0	1.1
45-49	267	80	16.9	5.3	0.7		8.3	1.5
50-54	458	122	35.4	9.5	1.5	2.5	9.4	1.8
55-59	516	158	48.6	14.1	1.9	3.8	7.0	2.1
60-64	566	187	57.6	17.6	3.0	2.7	5.3	2.0
65-69	556	195	57.8	18.7	4.0	1.5	3.6	1.7
70-74	415	155	45.6	14.8	6.5	2.6	2.4	1.3
75-79	247	114	44.9	16.0	5.7	2.6	2.0	1.1
80-84	121	87	34.6	15.5	6.6	9.2	1.4	1.0
85+	92	120	39.7	20.8	23.9	27.5	1.5	1.2
All ages	3398	1315			3.8	5.1	3.7	1.5
Incidence								
Raw			18.8	7.0				
WS			11.2	3.7				
ES			15.6	5.1				
BRD-S			17.6	5.9				

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).

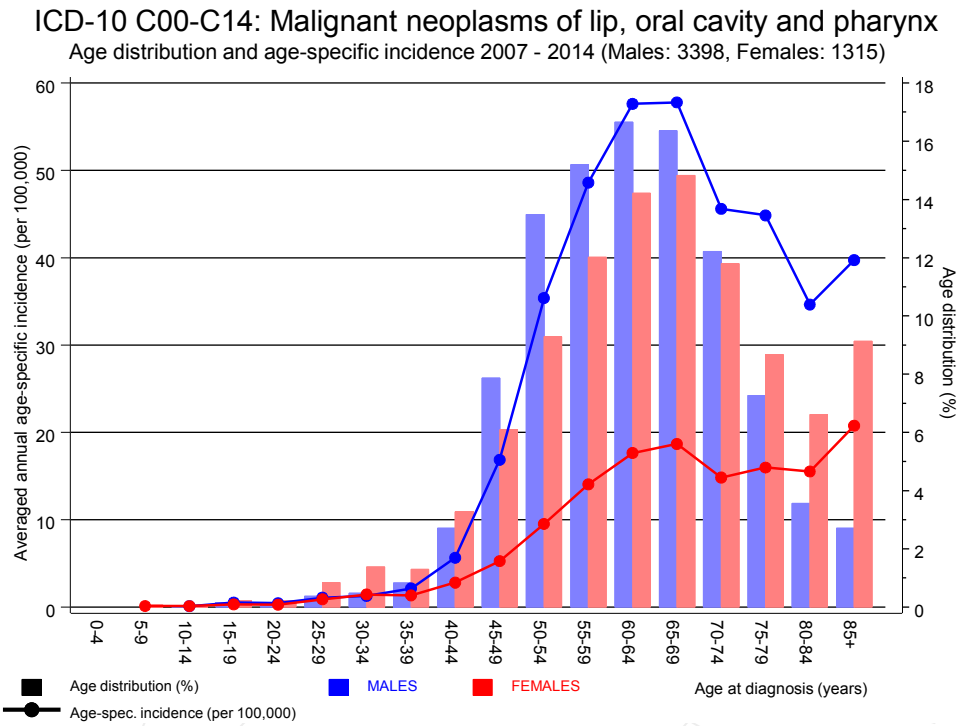


Figure 6. Age distribution and age-specific incidence

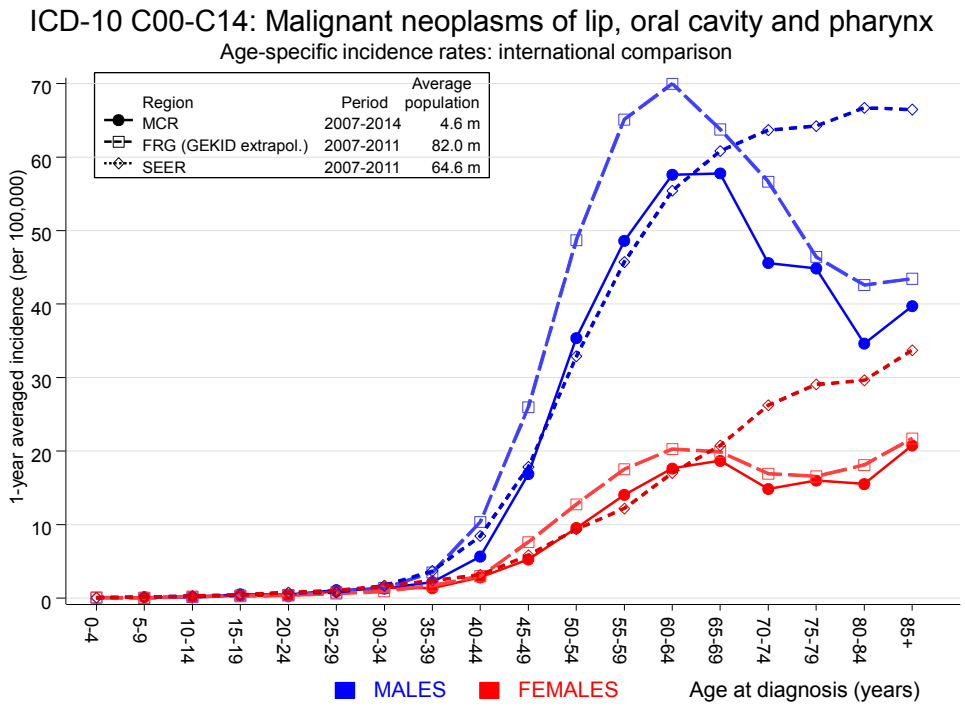


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).

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.

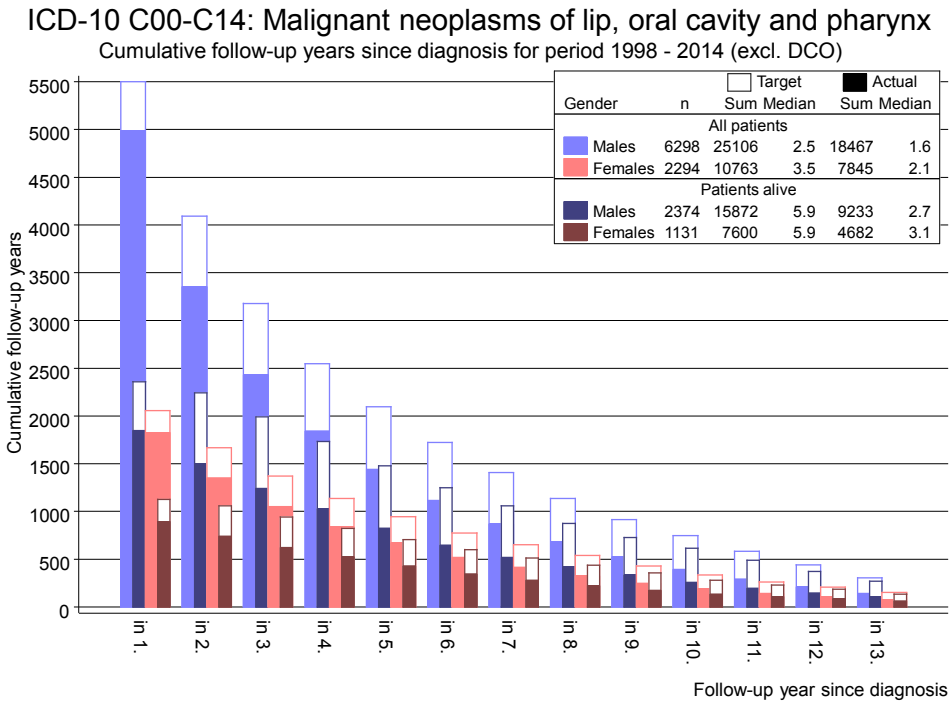


Figure 7. Cumulative follow-up years depending on time since diagnosis

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	4	0.2	16.2	4.4	41.6	#	2.1	
C03-C06	Oral cavity	67	2.6	25.3	19.6	32.1	#	35.9	7.5
C07-C08	Salivary gland	4	0.5	8.4	2.3	21.5	#	2.0	
C09-C10	Oropharynx	78	3.4	22.8	18.0	28.4	#	41.5	1.3
C11	Nasopharynx	6	0.2	27.8	10.2	60.5	#	3.2	16.7
C12-C13	Hypopharynx	62	1.9	33.4	25.6	42.8	#	33.5	12.9
C15	Oesophagus	114	4.7	24.0	19.8	28.9	#	60.9	15.8
C16	Stomach	23	8.4	2.7	1.7	4.1	#	8.1	13.0
C17	Small intestine	3	1.2	2.4	0.5	7.1		1.0	66.7
C18	Colon	49	20.4	2.4	1.8	3.2	#	16.0	6.1
C19-C20	Rectum	28	13.1	2.1	1.4	3.1	#	8.3	
C21	Anus/canal	5	0.5	9.1	3.0	21.3	#	2.5	
C22	Liver	37	6.3	5.9	4.1	8.1	#	17.1	13.5
C23-C24	Bile	2	2.1	1.0	0.1	3.5		-0.0	50.0
C25	Pancreas	24	7.9	3.0	1.9	4.5	#	9.0	20.8
C30-C31	Sinuses	5	0.4	12.0	3.9	27.9	#	2.6	
C32	Larynx	68	2.8	24.2	18.8	30.6	#	36.3	27.9
C33-C34	Lung	275	27.5	10.0	8.9	11.3	#	137.9	11.6
C38,C45	Mesothelioma	2	1.4	1.4	0.2	5.0		0.3	
C43	Malign. melanoma	23	10.4	2.2	1.4	3.3	#	7.0	8.7
C46,C49	Soft tissue	7	1.2	5.6	2.3	11.6	#	3.2	14.3
C61	Prostate	78	66.2	1.2	0.9	1.5		6.6	9.0
C64	Kidney	27	8.5	3.2	2.1	4.6	#	10.3	7.4
C65	Renal pelvis	3	0.8	3.5	0.7	10.4		1.2	
C67	Bladder	23	8.9	2.6	1.6	3.9	#	7.9	8.7
C70-C72	CNS cancer	2	3.3	0.6	0.1	2.2		-0.7	
C73	Thyroid	11	2.0	5.5	2.8	9.9	#	5.0	9.1
C76-C79	CUP	17	3.7	4.6	2.7	7.4	#	7.4	
C81	Hodgkin lymphoma	3	0.6	5.2	1.1	15.2	#	1.4	33.3
C82-C85	NHL	25	8.8	2.9	1.8	4.2	#	9.0	12.0
C90	Mult. myeloma	2	2.7	0.7	0.1	2.7		-0.4	
C91-C96	Leukaemia	10	3.3	3.0	1.4	5.5	#	3.7	40.0
Other primaries		8	2.5	3.1	1.4	6.2	#	3.0	
Not observed		0	2.0	0.0	0.0	1.8		-1.1	
All mult. primaries		1095	230.6	4.7	4.5	5.0	#	481.6	11.5

Patients	6144
Median age at second malignancy (years)	64.6
Person-years	17949
Mean observation time (years)	2.9
Median observation time (years)	1.6

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

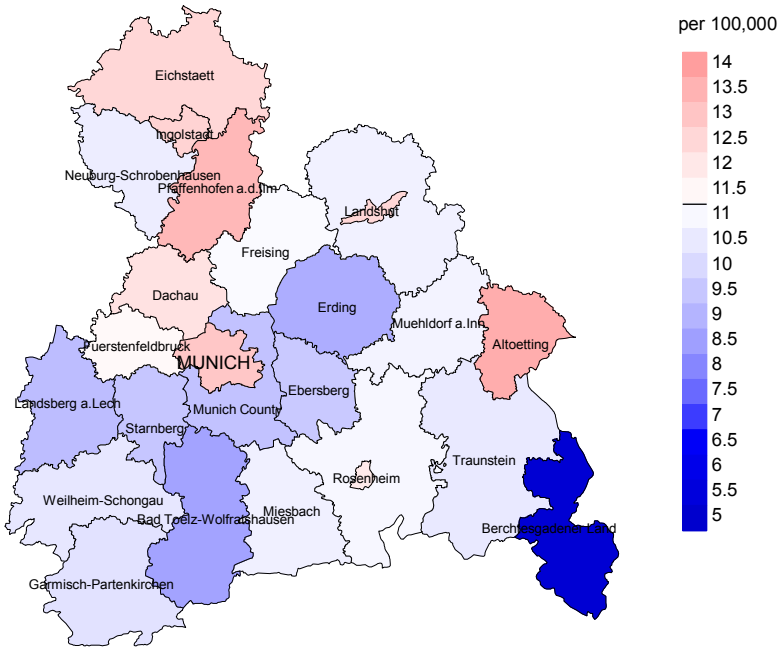
Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C03–C06	Oral cavity	17	0.5	33.9	19.8	54.3	#	21.5	
C07–C08	Salivary gland	3	0.1	23.8	4.9	69.5	#	3.7	
C09–C10	Oropharynx	28	0.4	77.9	51.8	112.6	#	36.0	
C11	Nasopharynx	3	0.0	97.9	20.2	286.1	#	3.9	
C12–C13	Hypopharynx	16	0.1	165.7	94.7	269.0	#	20.7	25.0
C14	ENT cancer	2	0.0	141.2	17.1	509.9	#	2.6	100.0
C15	Oesophagus	25	0.5	51.2	33.1	75.6	#	31.9	8.0
C16	Stomach	7	2.7	2.6	1.0	5.3	#	5.6	14.3
C18	Colon	15	7.6	2.0	1.1	3.3	#	9.7	
C19–C20	Rectum	6	3.3	1.8	0.7	3.9		3.5	
C22	Liver	10	0.9	11.2	5.4	20.6	#	11.9	20.0
C23–C24	Bile	4	1.1	3.7	1.0	9.5	#	3.8	
C25	Pancreas	9	3.4	2.7	1.2	5.1	#	7.4	33.3
C30–C31	Sinuses	5	0.1	51.0	16.6	119.0	#	6.4	20.0
C32	Larynx	14	0.2	88.2	48.2	147.9	#	18.0	21.4
C33–C34	Lung	72	5.9	12.3	9.6	15.5	#	86.2	18.1
C43	Malign. melanoma	7	3.0	2.3	0.9	4.8		5.2	14.3
C50	Breast	40	25.2	1.6	1.1	2.2	#	19.4	7.5
C51	Vulva	3	0.8	3.9	0.8	11.4		2.9	
C53	Cervix uteri	7	1.1	6.2	2.5	12.7	#	7.6	14.3
C54	Corpus uteri	3	4.5	0.7	0.1	2.0		−1.9	
C56	Ovary	6	3.3	1.8	0.7	4.0		3.6	16.7
C64	Kidney	3	1.9	1.6	0.3	4.6		1.4	
C67	Bladder	3	1.4	2.1	0.4	6.1		2.0	66.7
C70–C72	CNS cancer	4	1.1	3.6	1.0	9.3		3.8	50.0
C73	Thyroid	7	1.5	4.6	1.8	9.5	#	7.1	14.3
C76–C79	CUP	2	1.4	1.5	0.2	5.2		0.8	
C82–C85	NHL	9	3.0	3.0	1.4	5.7	#	7.8	
C91–C96	Leukaemia	2	1.2	1.6	0.2	5.9		1.0	50.0
Other primaries		7	2.4	3.0	1.2	6.1	#	6.0	
Not observed		0	1.9	0.0	0.0	1.9		−2.5	
All mult. primaries		339	80.3	4.2	3.8	4.7	#	337.1	12.7

Patients	2254
Median age at second malignancy (years)	67.5
Person-years	7673
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

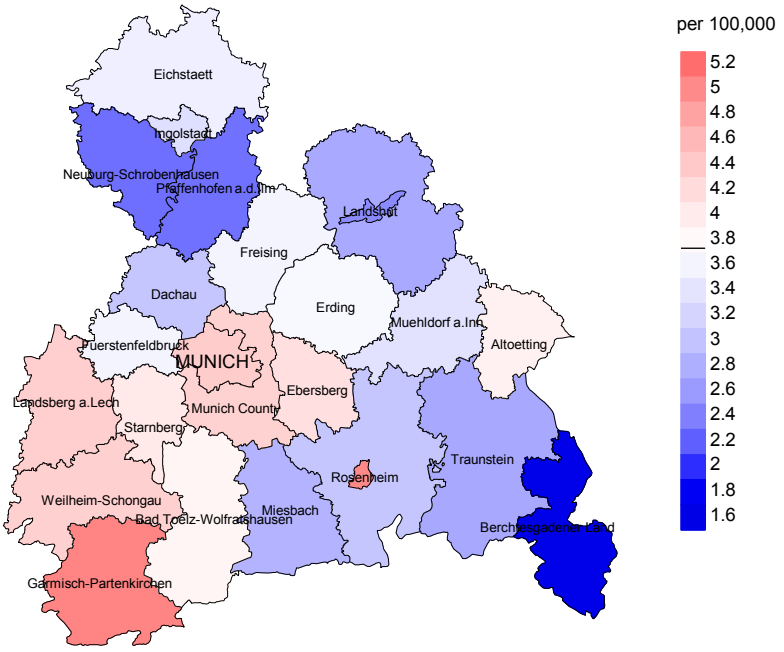
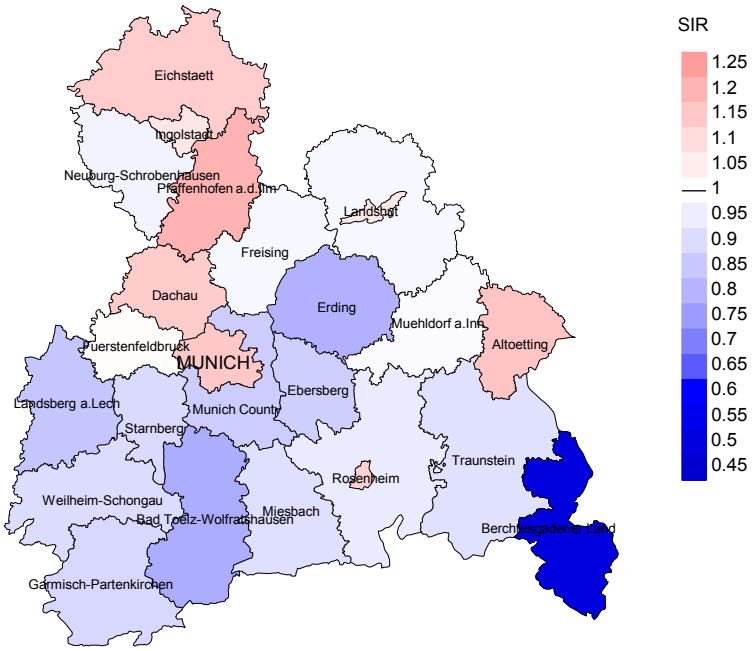


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2014. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 11.2/100,000 WS N=3,398, females 3.7/100,000 WS N=1,315).

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 39 women were identified with newly diagnosed HN cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 4.1/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 2.5 and 6.8/100,000.

Standardized incidence ratio (SIR) 2007 - 2014: Males



Standardized incidence ratio (SIR) 2007 - 2014: Females

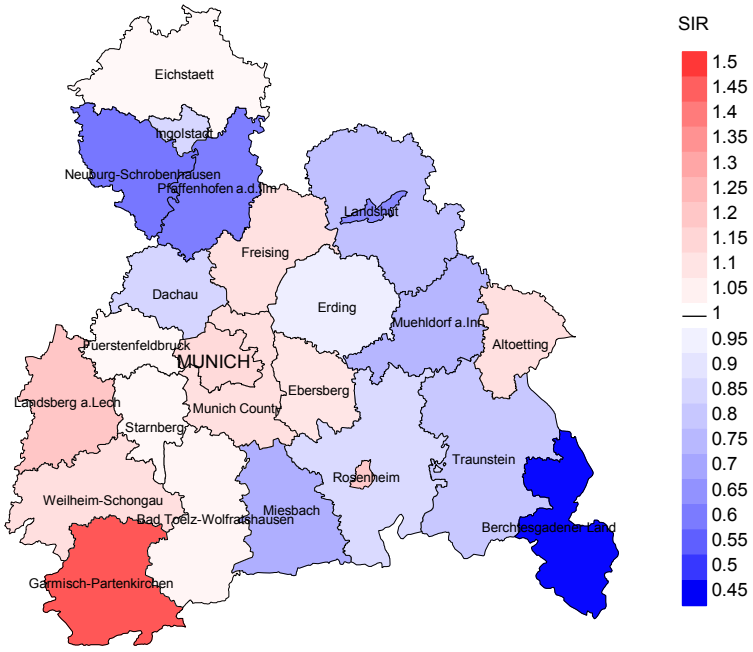


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2014. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=3,398, females N=1,315).

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 39 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 1.09. Though, the value of this parameter may vary with an underlying probability of 99% between 0.70 and 1.63, 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	96.4
1999	384	97.1	3.1	304	79.2	89.5
2000	344	98.0	4.1	270	78.5	95.6
2001	356	96.1	5.9	273	76.7	95.2
2002	556	97.8	6.7	412	74.1	96.1
2003	566	97.5	4.2	417	73.7	97.1
2004	543	97.6	4.4	391	72.0	95.7
2005	571	96.7	4.6	378	66.2	98.9
2006	551	94.7	1.8	366	66.4	97.8
2007	663	83.3	5.9	423	63.8	98.1
2008	702	78.9	3.0	424	60.4	98.3
2009	681	82.5	1.8	402	59.0	98.8
2010	733	76.0	4.4	379	51.7	98.9
2011	649	77.0	3.7	287	44.2	96.2
2012	645	79.8	4.3	267	41.4	96.3
2013	573	99.3	3.3	219	38.2	96.8
2014	149	98.0	16.8	59	39.6	93.2
1998-2014	9019	89.3	4.3	5552	61.6	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	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	566	396	96.2	86	15.2
2004	543	409	96.6	93	17.1
2005	571	378	97.4	85	14.9
2006	551	427	97.0	85	15.4
2007	663	468	97.4	103	15.5
2008	702	439	98.4	97	13.8
2009	681	483	98.6	90	13.2
2010	733	484	99.0	101	13.8
2011	649	483	97.7	94	14.5
2012	645	505	97.8	94	14.6
2013	573	499	98.6	108	18.8
2014	149	409	97.6	53	35.6
1998-2014	9019	6768	96.8	1392	15.4

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	396	77.0	23.0	87.1
2004	409	80.0	20.0	91.6
2005	378	82.3	17.7	91.0
2006	427	77.8	22.2	87.0
2007	468	78.8	21.2	89.0
2008	439	78.6	21.4	87.3
2009	483	79.1	20.9	89.7
2010	484	80.2	19.8	90.2
2011	483	73.9	26.1	85.0
2012	505	77.8	22.2	87.7
2013	499	76.8	23.2	87.8
2014	409	75.1	24.9	86.2
1998-2014	6768	77.4	22.6	88.5

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	306	63.1	62.5	67.8	62.6
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	63.3	69.6	63.8
2008	329	66.2	65.0	68.8	65.7
2009	354	66.4	65.2	70.8	65.4
2010	373	66.0	64.3	70.7	64.7
2011	374	68.4	66.1	72.1	66.7
2012	374	68.9	68.8	71.0	68.6
2013	353	67.8	66.0	71.7	66.6
2014	308	69.1	67.8	75.0	68.2
1998-2014	5116	64.7	63.6	69.4	64.1

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

Table 11b

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	101	72.8	68.5	81.7	68.9
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	69.8	82.4	70.2
2012	131	72.5	70.1	82.8	71.5
2013	146	74.0	71.1	83.4	71.8
2014	101	76.1	71.7	79.5	74.2
1998-2014	1652	71.8	68.9	80.4	69.7

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	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	0.55	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	243	13.0	0.60	7.9	0.56	11.3	0.57	12.9	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	0.65	11.6	0.65	13.3	0.66
2007	297	13.4	0.62	7.9	0.60	11.3	0.61	13.0	0.63
2008	269	12.1	0.53	7.0	0.50	9.9	0.52	11.6	0.53
2009	289	12.9	0.60	7.3	0.57	10.4	0.58	12.2	0.60
2010	303	13.4	0.57	7.6	0.54	11.0	0.56	12.7	0.58
2011	283	12.4	0.63	6.9	0.60	9.8	0.62	11.6	0.63
2012	292	12.8	0.65	6.7	0.58	9.8	0.61	11.9	0.65
2013	274	12.0	0.69	6.5	0.64	9.4	0.66	11.2	0.69
2014	246	10.8	2.37	5.7	2.16	8.3	2.24	10.0	2.40
1998-2014	4053	12.7	0.62	7.4	0.59	10.5	0.61	12.3	0.63

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	0.41	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	71	3.5	0.46	1.5	0.34	2.3	0.37	2.8	0.40
2007	72	3.1	0.42	1.4	0.35	2.1	0.37	2.5	0.40
2008	76	3.3	0.40	1.6	0.38	2.3	0.39	2.7	0.39
2009	94	4.0	0.51	1.9	0.44	2.8	0.46	3.2	0.47
2010	85	3.6	0.46	1.8	0.42	2.6	0.44	3.0	0.46
2011	75	3.2	0.41	1.4	0.33	2.0	0.35	2.4	0.36
2012	102	4.3	0.55	2.0	0.46	2.8	0.48	3.4	0.50
2013	109	4.6	0.64	2.0	0.54	2.9	0.57	3.6	0.61
2014	62	2.6	1.41	1.1	1.22	1.6	1.27	2.0	1.30
1998-2014	1191	3.6	0.50	1.7	0.43	2.4	0.45	2.9	0.47

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.%
20-24	3	0.1	0.1	2	0.1	0.1	1	0.1	0.1
25-29	3	0.1	0.2	1	0.0	0.1	2	0.3	0.4
30-34	2	0.1	0.3			0.1	2	0.3	0.7
35-39	12	0.4	0.6	6	0.2	0.4	6	0.8	1.5
40-44	45	1.4	2.1	38	1.6	2.0	7	1.0	2.5
45-49	139	4.5	6.5	113	4.7	6.6	26	3.7	6.2
50-54	304	9.7	16.3	259	10.8	17.4	45	6.3	12.5
55-59	436	14.0	30.3	370	15.4	32.8	66	9.3	21.8
60-64	483	15.5	45.8	380	15.8	48.6	103	14.5	36.2
65-69	536	17.2	62.9	414	17.2	65.8	122	17.1	53.4
70-74	456	14.6	77.6	363	15.1	80.8	93	13.1	66.4
75-79	305	9.8	87.3	237	9.8	90.7	68	9.6	76.0
80-84	189	6.1	93.4	133	5.5	96.2	56	7.9	83.8
85+	206	6.6	100.0	91	3.8	100.0	115	16.2	100.0
All ages	3119	100.0		2407	100.0		712	100.0	

Included in the statistics are 39.9% multiple primaries in males and 32.8% 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			0.0		0.0			
20-24	2	1	0.2	0.40	0.1	0.33	4.2	3.6
25-29	1	2	0.1	0.08	0.2	0.18	1.6	3.1
30-34		2	0.0		0.2	0.11		1.8
35-39	6	6	0.5	0.21	0.5	0.35	3.4	2.3
40-44	38	7	2.3	0.40	0.5	0.16	8.3	1.1
45-49	113	26	7.1	0.41	1.7	0.32	11.0	2.1
50-54	259	45	20.0	0.56	3.5	0.36	13.9	2.5
55-59	370	66	34.8	0.70	5.9	0.41	12.0	2.5
60-64	380	103	38.7	0.66	9.7	0.54	8.0	2.9
65-69	414	122	43.0	0.73	11.7	0.61	5.8	2.3
70-74	363	93	39.9	0.86	8.9	0.60	4.0	1.4
75-79	237	68	43.0	0.96	9.5	0.59	2.8	1.1
80-84	133	56	38.1	1.08	10.0	0.63	1.8	0.9
85+	91	115	39.3	0.99	19.9	0.95	1.5	1.3
All ages	2407	712					4.8	1.6
Mortality								
Raw			13.3	0.70	3.8	0.53		
WS			7.5	0.65	1.8	0.46		
ES			10.7	0.68	2.5	0.48		
BRD-S			12.6	0.70	3.0	0.50		
PYLL-70								
per 100,000			105.9		24.4			
ES			93.6		20.9			
AYLL-70			10.7		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	113	5.5			6	5.3	107	94.7
C09–C10 Oropharynx	136	6.6			34	25.0	102	75.0
C12–C13 Hypopharynx	96	4.7			30	31.3	66	68.8
C15 Oesophagus	198	9.6	36	18.2	28	14.1	134	67.7
C16 Stomach	44	2.1	12	27.3	2	4.5	30	68.2
C18 Colon	73	3.6	27	37.0	4	5.5	42	57.5
C19–C20 Rectum	57	2.8	15	26.3	2	3.5	40	70.2
C22 Liver	53	2.6	3	5.7	7	13.2	43	81.1
C25 Pancreas	40	1.9	5	12.5	2	5.0	33	82.5
C32 Larynx	63	3.1			13	20.6	50	79.4
C33–C34 Lung	421	20.5	54	12.8	45	10.7	322	76.5
C43 Malign. melanoma	34	1.7	17	50.0	4	11.8	13	38.2
C44 Skin others	202	9.8	71	35.1	28	13.9	103	51.0
C61 Prostate	138	6.7	71	51.4	10	7.2	57	41.3
C64 Kidney	35	1.7	13	37.1	4	11.4	18	51.4
C67 Bladder	82	4.0	44	53.7	2	2.4	36	43.9
C76–C79 CUP	51	2.5	28	54.9	4	7.8	19	37.3
C82–C85 NHL	41	2.0	19	46.3	6	14.6	16	39.0
C91–C96 Leukaemia	22	1.1	7	31.8	1	4.5	14	63.6
Other primaries	157	7.6	66	42.0	13	8.3	78	49.7
All mult. primaries	2056	100.0	488	23.7	245	11.9	1323	64.3

Multiple primaries with number of cases 1 to 15 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	25	4.2			1	4.0	24	96.0
C09–C10	Oropharynx	27	4.6			5	18.5	22	81.5
C12–C13	Hypopharynx	17	2.9			3	17.6	14	82.4
C15	Oesophagus	45	7.6	5	11.1	6	13.3	34	75.6
C16	Stomach	15	2.5	3	20.0	3	20.0	9	60.0
C18	Colon	26	4.4	12	46.2	2	7.7	12	46.2
C19–C20	Rectum	9	1.5	4	44.4			5	55.6
C21	Anus/canal	6	1.0	2	33.3			4	66.7
C22	Liver	8	1.4	1	12.5	1	12.5	6	75.0
C25	Pancreas	12	2.0	1	8.3	1	8.3	10	83.3
C30–C31	Sinuses	9	1.5	3	33.3			6	66.7
C32	Larynx	21	3.6	7	33.3	3	14.3	11	52.4
C33–C34	Lung	96	16.2	6	6.3	9	9.4	81	84.4
C43	Malign. melanoma	8	1.4	1	12.5			7	87.5
C44	Skin others	35	5.9	12	34.3	4	11.4	19	54.3
C50	Breast	96	16.2	60	62.5	5	5.2	31	32.3
C53	Cervix uteri	20	3.4	15	75.0			5	25.0
C54	Corpus uteri	12	2.0	9	75.0	1	8.3	2	16.7
C56	Ovary	12	2.0	6	50.0			6	50.0
C67	Bladder	9	1.5	6	66.7			3	33.3
C70–C72	CNS cancer	9	1.5	2	22.2	1	11.1	6	66.7
C73	Thyroid	9	1.5	6	66.7	1	11.1	2	22.2
C76–C79	CUP	15	2.5	10	66.7			5	33.3
C82–C85	NHL	14	2.4	6	42.9	1	7.1	7	50.0
Other primaries		36	6.1	9	25.0	6	16.7	21	58.3
All mult. primaries		591	100.0	186	31.5	53	9.0	352	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 2007-2014
(**First primaries only** *)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	Males MI-index	Females Age-spec. mortal.	Females 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	1	0.2	0.40	0.1	0.33	4.7	3.8
25-29	1	2	0.1	0.08	0.2	0.20	1.8	3.4
30-34		2	0.0		0.2	0.13		2.1
35-39	3	4	0.2	0.13	0.3	0.29	1.8	1.8
40-44	33	7	2.0	0.39	0.5	0.17	7.8	1.3
45-49	91	23	5.8	0.39	1.5	0.32	9.9	2.2
50-54	210	36	16.2	0.54	2.8	0.36	13.1	2.4
55-59	298	53	28.1	0.71	4.7	0.42	11.4	2.5
60-64	296	76	30.1	0.65	7.2	0.50	7.5	2.7
65-69	313	93	32.5	0.75	8.9	0.65	5.5	2.3
70-74	276	70	30.3	0.94	6.7	0.58	4.0	1.4
75-79	166	50	30.1	1.02	7.0	0.60	2.7	1.0
80-84	87	42	24.9	1.16	7.5	0.62	1.6	0.8
85+	64	85	27.6	1.14	14.7	0.89	1.5	1.3
All ages	1840	544					4.8	1.6
Mortality								
Raw			10.2	0.69	2.9	0.52		
WS			5.8	0.64	1.4	0.45		
ES			8.2	0.67	1.9	0.47		
BRD-S			9.6	0.70	2.3	0.49		
PYLL-70								
per 100,000			84.8		19.8			
ES			75.1		16.9			
AYLL-70			10.9		10.6			

* 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			0.0		0.0			
20-24	2	1	0.2	0.40	0.1	0.33	5.1	4.2
25-29	1	2	0.1	0.08	0.2	0.22	2.0	3.6
30-34		1	0.0		0.1	0.07		1.2
35-39	3	2	0.2	0.14	0.2	0.14	1.9	1.0
40-44	28	7	1.7	0.39	0.5	0.18	7.1	1.4
45-49	79	19	5.0	0.35	1.3	0.29	9.2	2.1
50-54	166	32	12.8	0.46	2.5	0.34	11.6	2.4
55-59	223	43	21.0	0.60	3.8	0.39	9.6	2.3
60-64	209	48	21.3	0.50	4.5	0.35	6.1	2.0
65-69	214	66	22.2	0.58	6.3	0.52	4.5	1.9
70-74	183	44	20.1	0.73	4.2	0.41	3.2	1.1
75-79	107	36	19.4	0.73	5.0	0.50	2.2	0.9
80-84	56	26	16.0	0.82	4.6	0.42	1.4	0.6
85+	47	68	20.3	0.92	11.8	0.75	1.4	1.2
All ages	1318	395					4.2	1.4
Mortality								
Raw			7.3	0.55	2.1	0.41		
WS			4.2	0.52	1.0	0.36		
ES			6.0	0.54	1.4	0.38		
BRD-S			6.9	0.55	1.7	0.39		
PYLL-70								
per 100,000			66.0		15.6			
ES			58.3		13.4			
AYLL-70			11.4		11.2			

* See corresponding tables with multiple primaries.

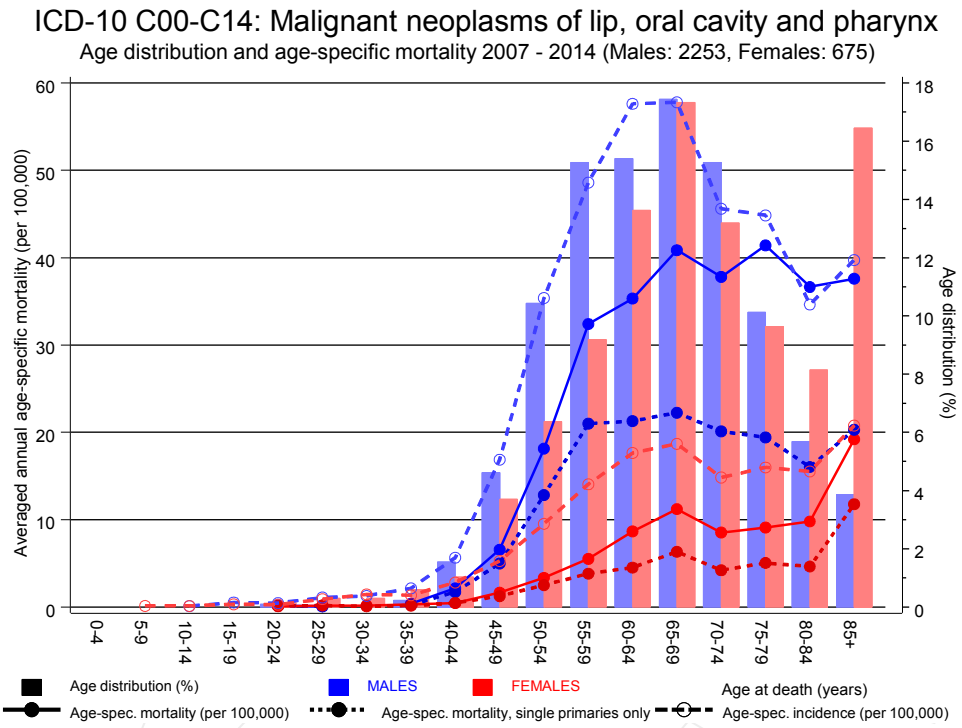
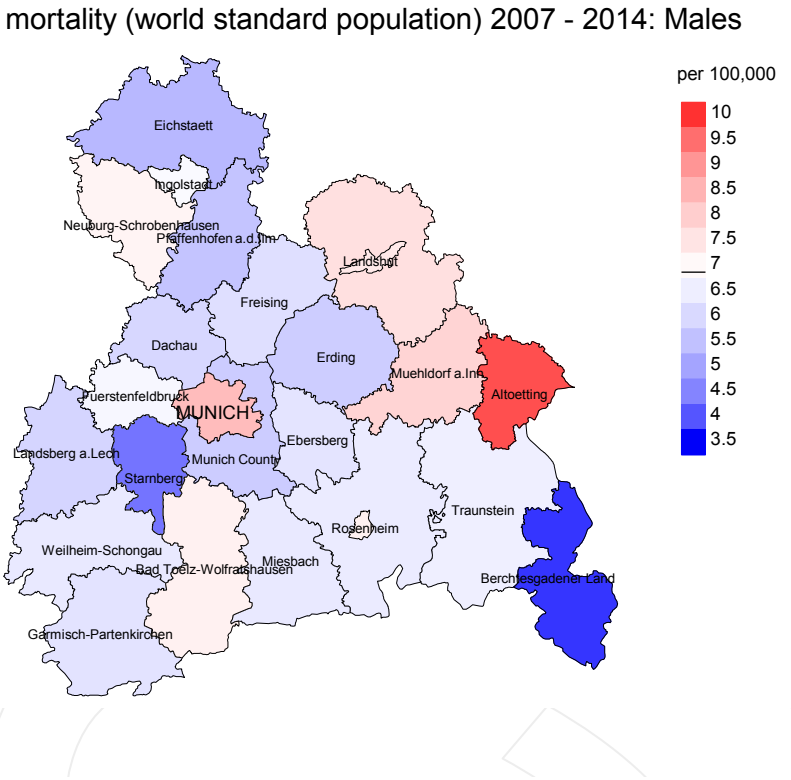


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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



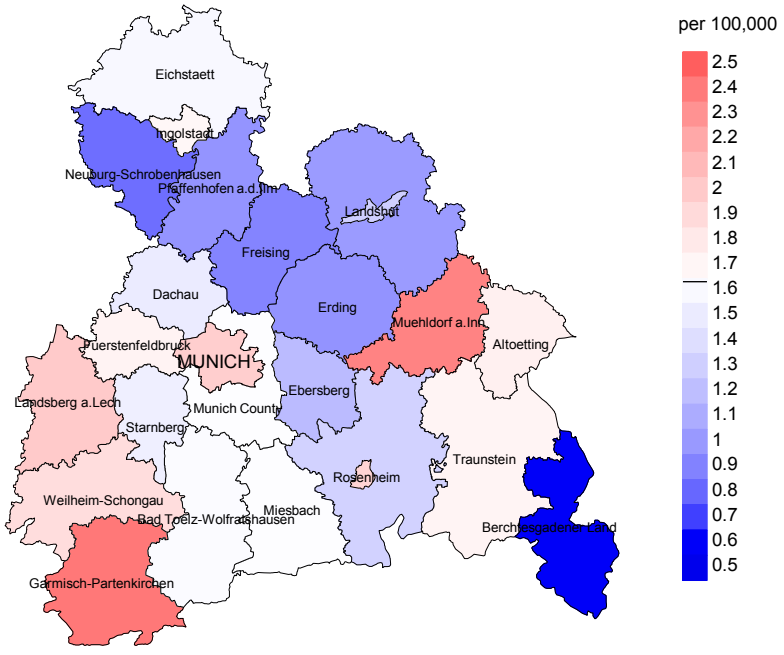
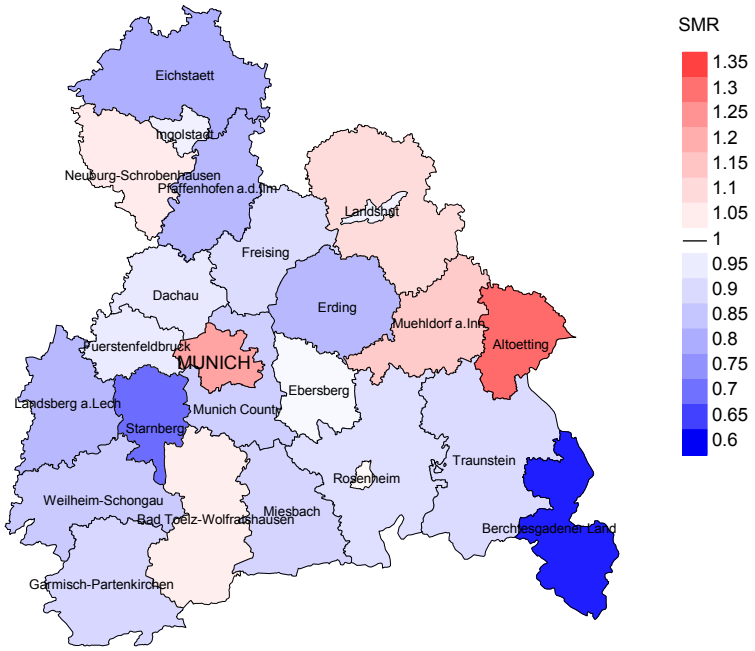


Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2014. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 6.9/100,000 WS N=2,235, females 1.6/100,000 WS N=670).

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 16 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 2.4/100,000.

Standardized mortality ratio (SMR) 2007 - 2014: Males



Standardized mortality ratio (SMR) 2007 - 2014: Females

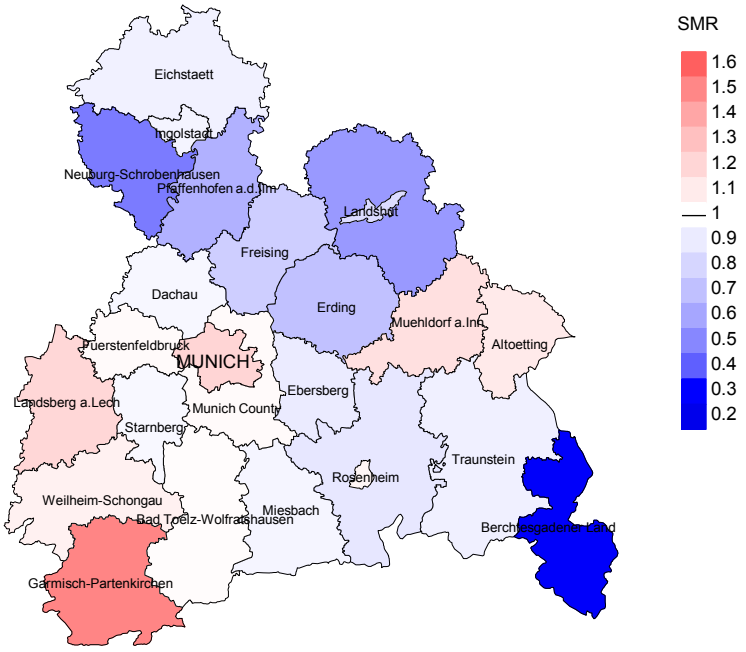


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2014. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=2,235, females N=670).

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 16 women died from HN cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.90. Though, the value of this parameter may vary with an underlying probability of 99% between 0.42 and 1.65, 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

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