Munich Cancer Registry

- Survival
- Selection Matrix
- Homepage
- *Deutsch*

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

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

Cancer statistics: Baseline statistics

C02-C06: Oral cavity cancer

Year of diagnosis	1998-2013
Patients	2,890
Diseases	2,911
Creation date	05/19/2015
Export date	12/30/2014
Population	4.64 m

http://www.tumorregister-muenchen.de/en/facts/base/base_C0206E.pdf

Global Statements about the statistics on the Internet −
Baseline Statistics (grey button), **Survival** (red button)

In these analyses, the clinics and physicians of Upper Bavaria and the city and county of Landshut[#], with a total of 4.64 million inhabitants, account for the frequency of cancer diseases[##] and the achieved long term results. Additionally, the long term survival evaluated by the Munich Cancer Registry (MCR) is compared with the results of the population-based registry in the USA (SEER), which is useful for checking the consistency of the data on an international level.

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

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

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

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

Munich Cancer Registry, May 2015

[#] Base data has been collected since 1998. An increase in new diseases is apparent, which is an effect of two extensions in the MCR catchment area (from a base population of 2.51 million to 3.96 in 2002, and to 4.52 million in 2007). Death certificates from 2014 are incorporated into these analyses.

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

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

Some remarks regarding this cancer type

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

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

Code	Description
C02	Other and unspecified parts of tongue Excl.: Topography code C02.4 Lingual tonsil
C03	Gum
C04	Floor of mouth
C05	Palate Excl.: Topography code C05.1 Soft palate, NOS C05.2 Uvula
C06	Other and unspecified parts of mouth

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	123	5	4.1	32.5	79.7	99.2	
1999	129	2	1.6	41.1	79.8	96.1	
2000	131	4	3.1	31.3	73.3	99.2	
2001	137	6	4.4	32.1	75.2	99.3	
2002	191	12	6.3	35.6	70.2	98.4	#
2003	191	9	4.7	35.6	67.5	99.0	
2004	192	6	3.1	34.9	68.2	97.9	
2005	161	6	3.7	28.0	67.1	96.3	
2006	196	3	1.5	31.6	61.7	95.4	
2007	224	9	4.0	29.5	61.2	87.5	# ##
2008	219	3	1.4	30.6	50.2	70.3	
2009	231	4	1.7	28.1	52.4	77.9	
2010	250	12	4.8	26.8	46.0	72.4	
2011	184	5	2.7	27.7	39.1	75.0	
2012	221	7	3.2	26.2	31.2	71.0	
2013	131	5	3.8	26.0	29.8	98.5	###
1998-2013	2911	98	3.4	30.8	57.9	87.7	

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	123	87	36	70.7
1999	129	80	49	62.0
2000	131	104	27	79.4
2001	137	94	43	68.6
2002	191	127	64	66.5
2003	191	135	56	70.7
2004	192	138	54	71.9
2005	161	104	57	64.6
2006	196	129	67	65.8
2007	224	151	73	67.4
2008	219	144	75	65.8
2009	231	153	78	66.2
2010	250	171	79	68.4
2011	184	112	72	60.9
2012	221	139	82	62.9
2013	131	88	43	67.2
1998-2013	2911	1956	955	67.2

Table 2

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

Year of diagnosis	Males n	Females n	Males Inc. raw	Fem. Inc. raw	Males Inc. WS	Fem. Inc. WS	Males Inc. ES	Fem. Inc. ES	Males Inc. BRD-S	Fem. Inc. BRD-S
1998	87	36	7.9	3.1	5.3	1.6	7.2	2.3	8.0	2.8
1999	80	49	7.1	4.1	4.7	2.4	6.5	3.3	7.1	3.7
2000	104	27	9.1	2.2	6.2	1.3	8.3	1.8	9.1	2.0
2001	94	43	8.1	3.5	5.2	1.9	7.2	2.7	8.1	3.0
2002	127	64	6.8	3.3	4.4	1.7	6.0	2.5	6.5	2.8
2003	135	56	7.2	2.8	4.8	1.6	6.5	2.2	7.1	2.5
2004	138	54	7.3	2.7	4.7	1.3	6.5	1.9	7.2	2.3
2005	104	57	5.5	2.9	3.4	1.6	4.6	2.2	5.2	2.5
2006	129	67	6.7	3.3	4.2	1.8	5.9	2.5	6.8	3.0
2007	151	73	6.8	3.2	4.3	1.7	5.9	2.3	6.5	2.8
2008	144	75	6.5	3.2	4.0	1.8	5.5	2.5	6.2	2.9
2009	153	78	6.9	3.4	4.1	1.8	5.7	2.4	6.4	2.9
2010	171	79	7.6	3.4	4.7	1.7	6.4	2.3	7.0	2.7
2011	112	72	4.9	3.1	3.0	1.5	4.1	2.2	4.5	2.5
2012	139	82	6.1	3.5	3.7	1.9	5.0	2.6	5.7	3.0
2013	88	43	3.9	1.8	2.3	0.9	3.2	1.2	3.6	1.4
1998-2013	1956	955	6.6	3.1	4.1	1.6	5.7	2.3	6.3	2.6

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)
(incl. DCO)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	123	59.1	12.2	0.9	91.4	46.4	51.8	57.6	66.3	76.3
1999	129	60.8	12.7	25.6	91.9	47.1	52.8	59.1	66.9	77.7
2000	131	58.7	11.4	33.5	85.8	45.0	50.1	58.1	66.6	73.1
2001	137	61.9	12.1	33.7	96.4	45.7	53.8	60.7	69.3	78.0
2002	191	61.2	12.4	26.4	99.0	45.5	53.0	60.9	68.3	78.6
2003	191	60.1	12.8	10.7	98.2	45.8	52.2	59.3	66.7	78.7
2004	192	61.8	12.8	29.5	97.9	45.5	53.4	61.6	70.4	79.7
2005	161	61.0	12.9	22.8	98.7	45.5	52.3	60.8	67.7	80.8
2006	196	62.7	13.0	22.6	96.2	47.5	54.9	61.4	71.6	81.2
2007	224	61.9	12.8	26.0	101	46.0	53.7	61.5	70.2	78.1
2008	219	62.4	11.7	21.8	100	48.5	53.8	62.4	69.5	77.6
2009	231	62.9	12.4	29.6	98.4	47.9	54.2	62.8	71.3	80.2
2010	250	62.3	13.3	21.9	92.8	46.7	52.1	61.9	70.7	81.8
2011	184	62.4	13.7	27.0	96.9	43.5	53.1	63.0	72.1	78.8
2012	221	62.5	12.5	21.5	100	48.2	54.9	64.0	70.9	77.2
2013	131	64.6	11.3	30.9	92.3	50.7	55.9	65.5	72.1	78.6
1998-2013	2911	61.8	12.6	0.9	101	46.5	53.3	61.1	69.7	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	87	57.0	11.5	0.9	81.3	45.5	51.1	56.2	62.3	72.0
1999	80	59.2	12.1	33.3	90.8	46.8	51.2	57.4	64.2	80.2
2000	104	58.0	10.1	35.8	85.5	45.1	50.0	58.1	65.3	72.0
2001	94	59.9	12.0	33.7	94.3	44.5	51.2	59.8	64.3	77.4
2002	127	59.1	10.7	26.4	92.2	45.2	52.3	60.2	64.7	72.1
2003	135	58.7	10.4	28.1	86.1	46.0	52.9	57.8	64.4	71.9
2004	138	59.4	11.6	29.7	88.7	44.9	51.9	59.7	65.4	75.0
2005	104	59.1	11.5	36.8	85.0	43.3	49.7	58.3	66.7	77.2
2006	129	61.5	12.2	23.9	92.0	46.9	53.8	59.6	69.4	78.2
2007	151	60.4	11.6	26.0	101	46.0	52.5	59.8	67.7	74.8
2008	144	61.4	11.2	21.8	100	48.3	53.5	61.8	68.6	75.1
2009	153	62.1	10.6	30.2	88.1	48.2	54.6	62.3	69.7	74.7
2010	171	60.2	12.3	24.5	92.8	45.4	51.8	59.7	69.0	75.3
2011	112	60.3	13.0	27.0	93.0	43.5	52.7	58.7	69.4	78.0
2012	139	61.6	11.3	21.6	85.9	48.2	53.1	63.0	69.8	75.3
2013	88	62.7	9.8	30.9	81.8	50.3	55.7	63.9	69.7	75.8
1998-2013	1956	60.1	11.5	0.9	101	46.2	52.5	59.6	67.6	75.1

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	36	64.1	12.8	32.0	91.4	49.6	56.4	63.2	75.8	79.5
1999	49	63.3	13.4	25.6	91.9	47.1	56.1	65.4	72.2	77.7
2000	27	61.3	15.4	33.5	85.8	39.8	50.6	59.6	76.3	84.8
2001	43	66.4	11.3	44.0	96.4	53.2	59.8	63.7	71.3	84.0
2002	64	65.3	14.3	35.8	99.0	47.0	54.5	62.5	76.2	82.9
2003	56	63.4	16.8	10.7	98.2	44.8	51.1	62.3	78.2	83.7
2004	54	68.1	13.8	29.5	97.9	48.9	58.2	68.7	78.4	83.1
2005	57	64.5	14.4	22.8	98.7	50.2	54.9	62.3	76.0	83.7
2006	67	64.9	14.1	22.6	96.2	47.6	55.9	63.0	77.0	84.2
2007	73	65.1	14.6	31.0	98.2	46.1	55.3	65.0	75.2	83.6
2008	75	64.1	12.4	26.7	91.5	49.7	55.4	64.1	72.5	79.4
2009	78	64.4	15.3	29.6	98.4	43.1	53.7	65.4	75.4	83.5
2010	79	66.9	14.1	21.9	91.8	49.9	56.2	66.9	78.4	87.1
2011	72	65.8	14.2	31.2	96.9	47.7	57.7	67.3	75.1	84.1
2012	82	64.0	14.2	21.5	100	47.5	56.5	64.9	72.7	80.9
2013	43	68.5	13.2	41.3	92.3	51.3	58.7	67.7	76.3	86.7
1998-2013	955	65.1	14.1	10.7	100	47.6	55.6	64.9	75.2	83.6

Table 4

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

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	1	0.0	0.0	1	0.1	0.1			0.0
5-9	0	0.0	0.0			0.1			0.0
10-14	1	0.0	0.1			0.1	1	0.1	0.1
15-19	0	0.0	0.1			0.1			0.1
20-24	8	0.3	0.3	4	0.2	0.3	4	0.4	0.5
25-29	14	0.5	0.8	9	0.5	0.7	5	0.5	1.0
30-34	30	1.0	1.9	14	0.7	1.4	16	1.7	2.7
35-39	41	1.4	3.3	30	1.5	3.0	11	1.2	3.9
40-44	114	3.9	7.2	86	4.4	7.4	28	2.9	6.8
45-49	268	9.2	16.4	207	10.6	17.9	61	6.4	13.2
50-54	399	13.7	30.1	303	15.5	33.4	96	10.1	23.2
55-59	473	16.2	46.3	356	18.2	51.6	117	12.3	35.5
60-64	471	16.2	62.5	327	16.7	68.4	144	15.1	50.6
65-69	378	13.0	75.5	251	12.8	81.2	127	13.3	63.9
70-74	266	9.1	84.6	169	8.6	89.8	97	10.2	74.0
75-79	198	6.8	91.4	103	5.3	95.1	95	9.9	84.0
80-84	135	4.6	96.1	56	2.9	98.0	79	8.3	92.3
85+	114	3.9	100.0	40	2.0	100.0	74	7.7	100.0
All ages	2911	100.0		1956	100.0		955	100.0	

Included in the statistics are 41.6% multiple primaries in males and 33.3% in females.

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 1998-2013

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males DCO rate n=67 %	Females DCO rate n=31 %	Males Prop.all cancers n=158258 %	Females Prop.all cancers n=153136 %
0- 4	1		0.1	0.0	100.0		0.3	
5- 9			0.0	0.0				
10-14		1	0.0	0.1				0.6
15-19			0.0	0.0				
20-24	4	4	0.2	0.2			0.7	0.8
25-29	9	5	0.4	0.2			0.9	0.5
30-34	14	16	0.6	0.7			0.9	0.8
35-39	30	11	1.2	0.5			1.3	0.3
40-44	86	28	3.3	1.1	1.2		2.7	0.4
45-49	207	61	8.8	2.6	1.0		3.9	0.7
50-54	302	96	15.0	4.7	1.7	1.0	3.5	0.9
55-59	355	117	19.4	6.1	2.5	2.6	2.5	0.9
60-64	327	144	18.4	7.7	3.4	2.1	1.5	0.8
65-69	251	127	15.9	7.4	3.2	1.6	0.9	0.7
70-74	168	96	13.1	6.3	6.5		0.6	0.5
75-79	103	95	12.5	8.0	6.8	2.1	0.5	0.5
80-84	55	78	11.0	8.4	9.1	5.1	0.4	0.5
85+	39	74	11.4	8.3	17.9	21.6	0.4	0.4
All ages	1951	953			3.4	3.3	1.2	0.6
Incidence								
Raw			6.6	3.1				
WS			4.1	1.6				
ES			5.7	2.3				
BRD-S			6.3	2.6				

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

Table 6a

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

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C03-C06	Oral cavity	6	0.8	7.9	2.9	17.1	#	10.4	
C09-C10	Oropharynx	34	1.0	35.2	24.4	49.2	#	65.9	2.9
C12-C13	Hypopharynx	30	0.5	55.3	37.3	79.0	#	58.7	13.3
C15	Oesophagus	31	1.3	24.7	16.8	35.1	#	59.3	6.5
C16	Stomach	6	2.2	2.7	1.0	5.9		7.5	16.7
C17	Small intestine	2	0.3	6.4	0.8	23.2		3.4	50.0
C18	Colon	15	5.3	2.8	1.6	4.7	#	19.4	6.7
C19-C20	Rectum	11	3.5	3.1	1.6	5.6	#	14.9	
C21	Anus/canal	3	0.1	20.7	4.3	60.4	#	5.7	
C22	Liver	11	1.6	6.7	3.4	12.1	#	18.7	18.2
C25	Pancreas	4	2.0	2.0	0.5	5.1		4.0	
C30-C31	Sinuses	3	0.1	27.3	5.6	79.6	#	5.8	
C32	Larynx	17	0.8	21.8	12.7	34.9	#	32.3	11.8
C33-C34	Lung	70	7.2	9.7	7.6	12.3	#	125.2	14.3
C43	Malign. melanoma	7	2.6	2.6	1.1	5.5	#	8.7	
C46,C49	Soft tissue	2	0.3	6.1	0.7	22.0		3.3	
C61	Prostate	19	17.4	1.1	0.7	1.7		3.1	10.5
C64	Kidney	10	2.2	4.4	2.1	8.2	#	15.5	
C67	Bladder	6	2.2	2.7	1.0	5.8		7.5	16.7
C76-C79	CUP	5	1.0	5.1	1.7	11.9	#	8.0	
C82-C85	NHL	8	2.3	3.5	1.5	6.9	#	11.4	25.0
C91-C96	Leukaemia	4	0.8	4.8	1.3	12.2	#	6.3	
Other primaries		12	3.4	3.5	1.8	6.1	#	17.1	8.3
Not observed		0	1.4	0.0	0.0	2.6		-2.8	
All mult. primaries		316	60.6	5.2	4.7	5.8	#	509.1	9.5

Patients	1380
Median age at second malignancy (years)	63.5
Person-years	5016
Mean observation time (years)	3.6
Median observation time (years)	2.4

The occurrence of second malignancy is statistically significant.

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

Table 6b

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

Diagnosis	Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C03-C06 Oral cavity	6	0.2	32.8	12.0	71.3	#	21.3	
C07-C08 Salivary gland	2	0.0	44.7	5.4	161.4	#	7.1	
C09-C10 Oropharynx	12	0.1	92.5	47.8	161.6	#	43.4	
C12-C13 Hypopharynx	6	0.0	169.1	62.1	368.2	#	21.8	50.0
C15 Oesophagus	10	0.2	58.4	28.0	107.4	#	35.9	
C18 Colon	3	2.8	1.1	0.2	3.1		0.8	
C22 Liver	6	0.3	18.7	6.8	40.6	#	20.7	16.7
C23-C24 Bile	2	0.4	5.0	0.6	18.0		5.8	
C25 Pancreas	3	1.2	2.5	0.5	7.3		6.6	33.3
C30-C31 Sinuses	3	0.0	88.0	18.1	257.2	#	10.8	33.3
C32 Larynx	4	0.1	69.4	18.9	177.6	#	14.4	25.0
C33-C34 Lung	27	2.1	12.9	8.5	18.8	#	91.0	14.8
C43 Malign. melanoma	3	1.0	2.9	0.6	8.4		7.1	33.3
C50 Breast	12	9.1	1.3	0.7	2.3		10.6	
C56 Ovary	2	1.2	1.6	0.2	6.0		2.9	
C67 Bladder	3	0.5	5.8	1.2	17.0	#	9.1	66.7
C73 Thyroid	3	0.6	5.3	1.1	15.6	#	8.9	
C82-C85 NHL	3	1.1	2.8	0.6	8.1		7.0	
Other primaries	5	2.5	2.0	0.6	4.6		9.0	60.0
Not observed	0	5.6	0.0	0.0	0.7	#	-20.6	
All mult. primaries	115	29.2	3.9	3.3	4.7	#	313.6	14.8

Patients	650
Median age at second malignancy (years)	67.8
Person-years	2737
Mean observation time (years)	4.2
Median observation time (years)	3.0

The occurrence of second malignancy is statistically significant.

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

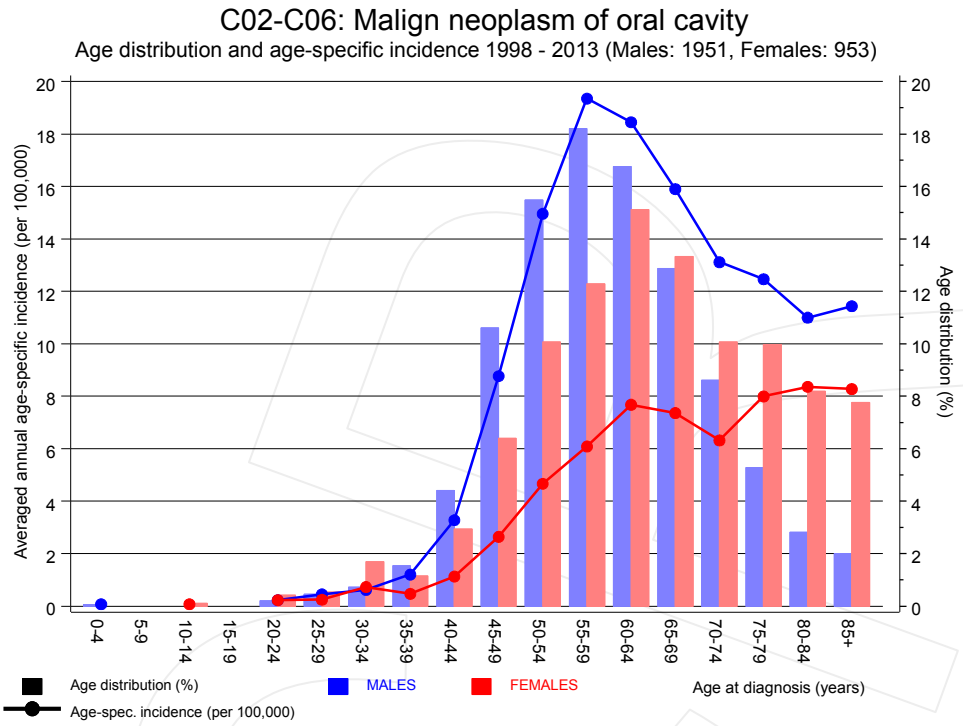


Figure 7. Age distribution and age-specific incidence

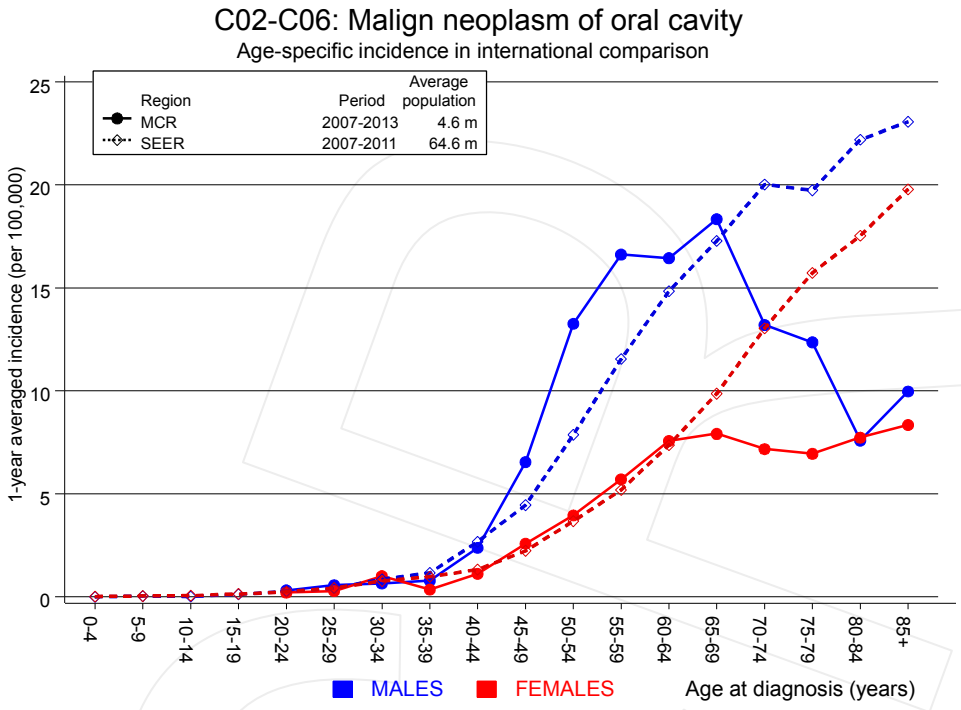


Figure 7a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

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.

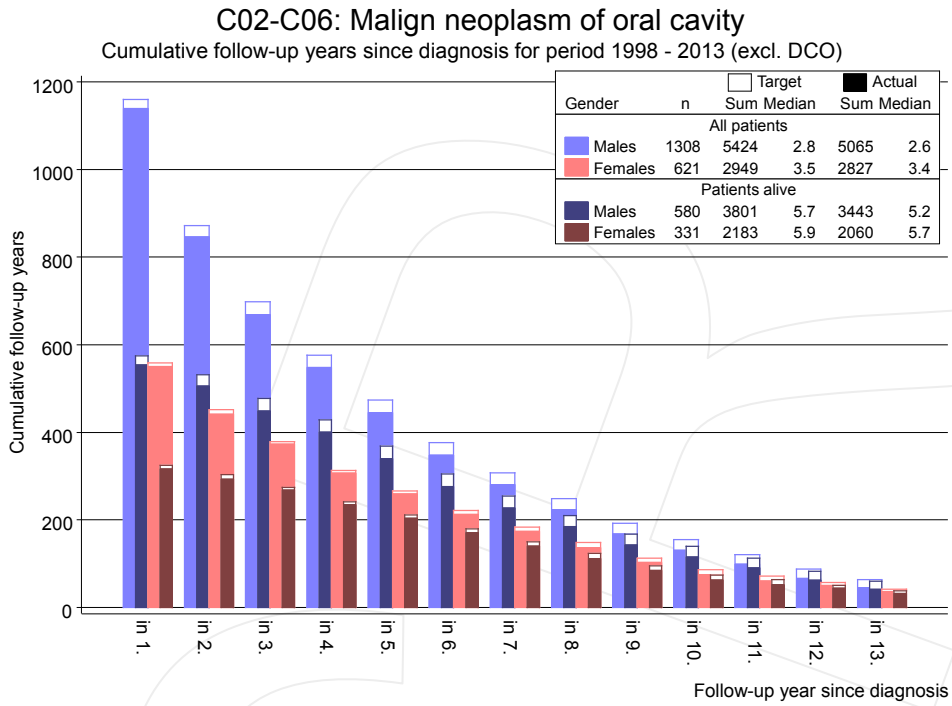
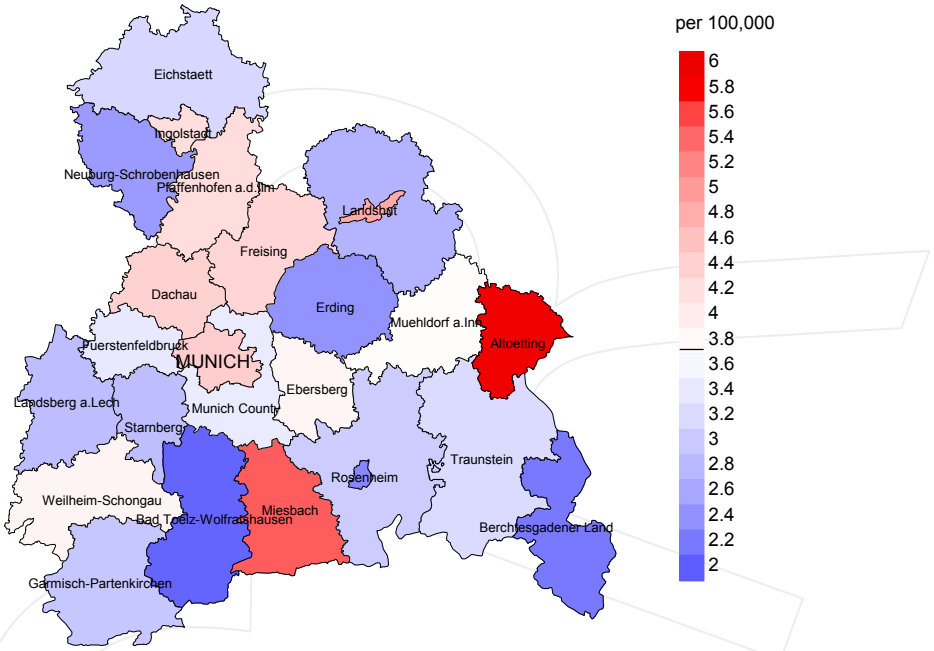


Figure 8. Cumulative follow-up years depending on time since diagnosis

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

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



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

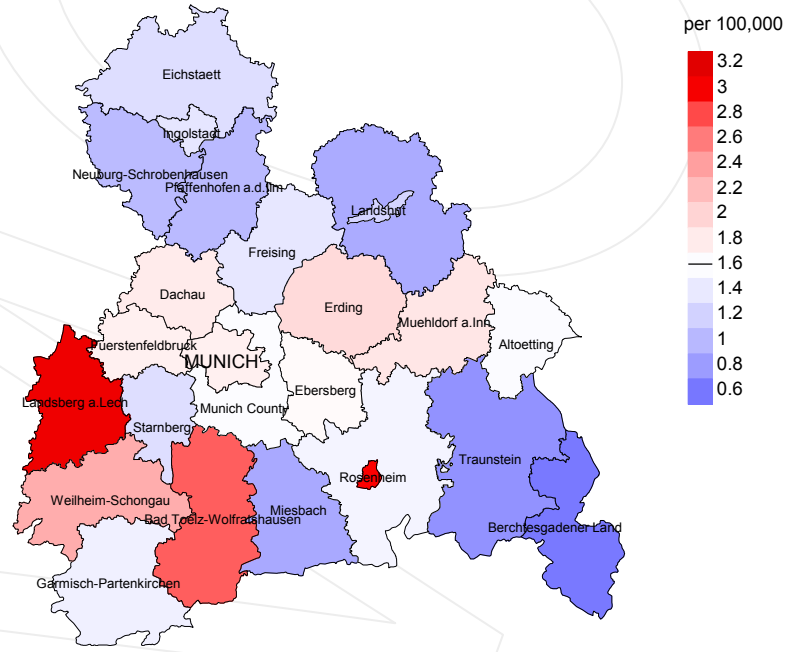
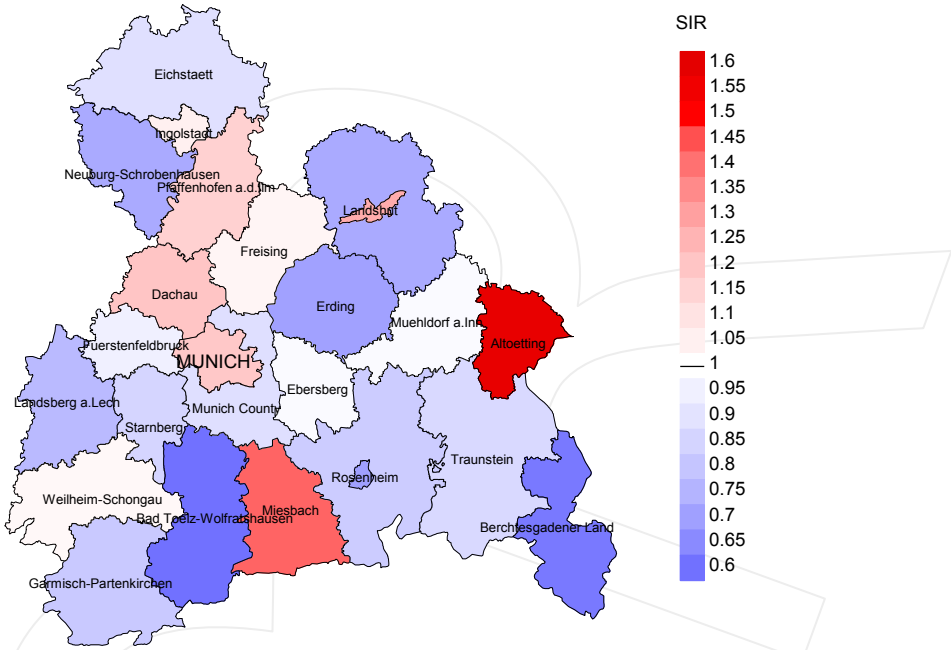


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 3.7/100,000 WS N=955, females 1.6/100,000 WS N=500).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,928 female residents (averaged) in the period from 2007 to 2013 a total of 16 women were identified with newly diagnosed oral cavity cancer. Therefore, the mean incidence 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 3.3/100,000.

Standardized incidence ratio (SIR) 2007 - 2013: Males



Standardized incidence ratio (SIR) 2007 - 2013: Females

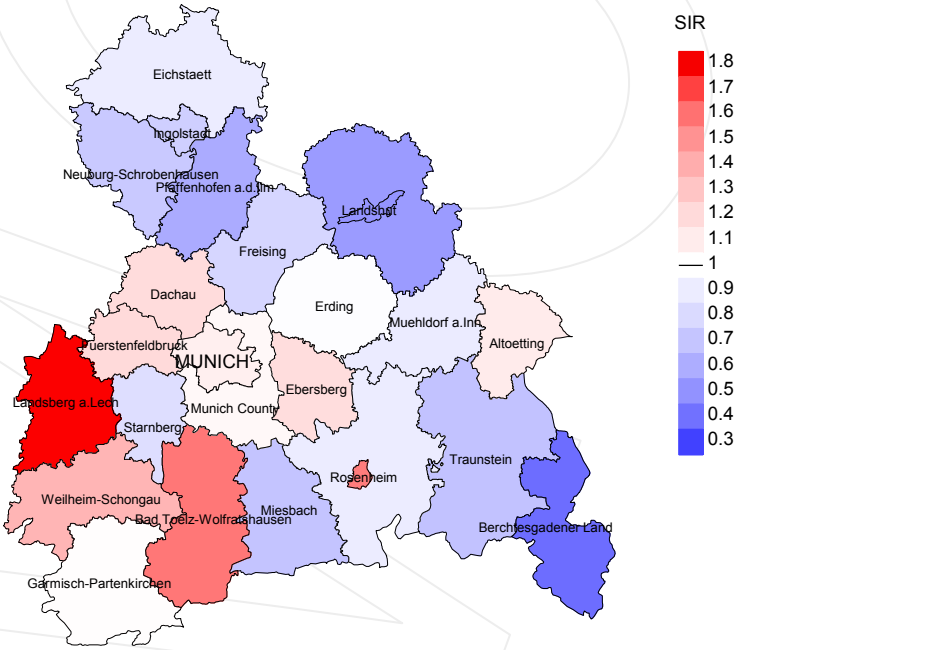


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=955, females N=500).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,642 female residents (averaged) in the period from 2007 to 2013 a total of 16 women were identified with newly diagnosed oral cavity cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.19. Though, the value of this parameter may vary with an underlying probability of 99% between 0.56 and 2.18, 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	123	99.2	4.1	98	79.7	94.9
1999	129	96.1	1.6	103	79.8	85.4
2000	131	99.2	3.1	96	73.3	95.8
2001	137	99.3	4.4	103	75.2	92.2
2002	191	98.4	6.3	134	70.2	97.0
2003	191	99.0	4.7	129	67.5	98.4
2004	192	97.9	3.1	131	68.2	96.2
2005	161	96.3	3.7	108	67.1	100.0
2006	196	95.4	1.5	121	61.7	97.5
2007	224	87.5	4.0	137	61.2	100.0
2008	219	70.3	1.4	110	50.2	95.5
2009	231	77.9	1.7	121	52.4	97.5
2010	250	72.4	4.8	115	46.0	98.3
2011	184	75.0	2.7	72	39.1	97.2
2012	221	71.0	3.2	69	31.2	91.3
2013	131	98.5	3.8	39	29.8	82.1
1998-2013	2911	87.7	3.4	1686	57.9	95.8

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	123	74	93.2	16	13.0
1999	129	70	87.1	12	9.3
2000	131	87	89.7	17	13.0
2001	137	117	88.9	23	16.8
2002	191	149	98.0	33	17.3
2003	191	151	98.0	28	14.7
2004	192	147	98.0	37	19.3
2005	161	134	98.5	18	11.2
2006	196	150	94.7	24	12.2
2007	224	157	98.1	33	14.7
2008	219	147	97.3	21	9.6
2009	231	187	97.3	28	12.1
2010	250	173	99.4	32	12.8
2011	184	170	97.6	23	12.5
2012	221	178	98.3	31	14.0
2013	131	155	98.7	24	18.3
1998-2013	2911	2246	96.6	400	13.7

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	74	71.6	28.4	88.4
1999	70	61.4	38.6	85.2
2000	87	64.4	35.6	88.5
2001	117	76.9	23.1	91.3
2002	149	75.2	24.8	89.7
2003	151	78.8	21.2	87.8
2004	147	76.2	23.8	88.9
2005	134	86.6	13.4	93.2
2006	150	71.3	28.7	85.2
2007	157	77.7	22.3	89.0
2008	147	77.6	22.4	90.2
2009	187	78.6	21.4	87.4
2010	173	79.2	20.8	92.4
2011	170	74.1	25.9	84.3
2012	178	78.1	21.9	89.7
2013	155	72.9	27.1	86.9
1998-2013	2246	76.0	24.0	88.7

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	56	60.5	60.5	60.6	61.0
1999	54	55.8	56.8	53.1	54.1
2000	69	62.4	61.8	63.9	65.4
2001	89	60.5	60.4	61.6	60.5
2002	107	62.1	62.0	63.6	61.7
2003	107	63.5	63.1	69.3	63.5
2004	104	63.2	61.1	65.8	62.1
2005	83	65.7	65.2	76.5	65.4
2006	109	62.9	62.6	63.9	62.6
2007	118	62.8	61.6	67.7	62.3
2008	104	64.9	64.4	70.0	64.2
2009	126	67.2	65.1	71.5	65.2
2010	125	66.0	64.5	68.7	65.4
2011	122	67.3	65.4	70.3	64.9
2012	130	65.4	65.3	66.5	65.3
2013	97	66.9	63.0	75.2	65.3
1998-2013	1600	64.0	63.0	67.7	63.5

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	18	62.0	65.0	55.7	62.0
1999	16	76.3	65.8	82.3	65.8
2000	18	68.8	67.6	85.4	68.8
2001	28	69.6	69.6	67.4	69.6
2002	42	71.9	69.1	82.9	71.8
2003	44	71.0	70.3	76.5	70.9
2004	43	72.3	73.7	69.1	71.7
2005	51	69.2	67.5	87.2	68.5
2006	41	78.3	77.4	80.4	76.9
2007	39	75.1	75.1	77.7	72.0
2008	43	71.4	69.6	72.5	69.4
2009	61	70.4	68.9	84.0	69.8
2010	48	73.0	69.4	86.4	70.0
2011	48	73.3	71.9	73.4	71.8
2012	48	72.1	69.5	85.7	70.5
2013	58	73.9	70.0	79.3	71.6
1998-2013	646	71.9	69.8	79.4	70.1

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	41	3.7	0.47	2.4	0.44	3.3	0.46	3.9	0.49
1999	35	3.1	0.44	2.0	0.43	2.8	0.44	3.1	0.44
2000	45	4.0	0.43	2.4	0.39	3.6	0.43	4.3	0.47
2001	68	5.9	0.73	3.8	0.73	5.3	0.75	6.1	0.77
2002	80	4.3	0.63	2.6	0.59	3.7	0.62	4.3	0.65
2003	87	4.6	0.64	2.8	0.59	4.0	0.61	4.6	0.65
2004	80	4.3	0.58	2.7	0.57	3.7	0.58	4.2	0.58
2005	71	3.7	0.68	2.1	0.62	3.1	0.67	3.8	0.72
2006	80	4.2	0.62	2.6	0.63	3.6	0.61	4.1	0.59
2007	93	4.2	0.62	2.6	0.60	3.6	0.60	4.0	0.61
2008	85	3.8	0.60	2.3	0.57	3.2	0.58	3.7	0.61
2009	102	4.6	0.67	2.6	0.64	3.7	0.65	4.3	0.67
2010	96	4.3	0.56	2.5	0.53	3.5	0.55	4.0	0.56
2011	89	3.9	0.79	2.2	0.73	3.1	0.76	3.7	0.81
2012	103	4.5	0.74	2.5	0.68	3.6	0.71	4.1	0.73
2013	71	3.1	0.81	1.8	0.78	2.5	0.79	2.9	0.81
1998-2013	1226	4.1	0.63	2.5	0.59	3.5	0.61	4.0	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	12	1.0	0.33	0.5	0.33	0.8	0.33	0.9	0.33
1999	8	0.7	0.16	0.3	0.14	0.5	0.15	0.6	0.16
2000	11	0.9	0.41	0.5	0.40	0.7	0.41	0.8	0.39
2001	22	1.8	0.51	0.9	0.45	1.2	0.46	1.6	0.52
2002	32	1.6	0.50	0.8	0.45	1.2	0.47	1.4	0.48
2003	33	1.7	0.59	0.8	0.53	1.2	0.56	1.5	0.59
2004	32	1.6	0.59	0.7	0.52	1.0	0.54	1.3	0.56
2005	45	2.3	0.79	1.1	0.68	1.6	0.72	1.9	0.75
2006	27	1.3	0.40	0.5	0.26	0.8	0.30	1.0	0.34
2007	29	1.3	0.40	0.5	0.30	0.8	0.33	1.0	0.36
2008	29	1.2	0.39	0.6	0.33	0.9	0.34	1.0	0.36
2009	45	1.9	0.58	0.9	0.52	1.3	0.54	1.5	0.54
2010	41	1.8	0.53	0.8	0.47	1.1	0.49	1.4	0.51
2011	37	1.6	0.51	0.7	0.43	1.0	0.44	1.1	0.45
2012	37	1.6	0.45	0.7	0.37	1.0	0.39	1.2	0.41
2013	42	1.8	0.98	0.8	0.91	1.1	0.90	1.3	0.93
1998-2013	482	1.6	0.51	0.7	0.43	1.0	0.45	1.2	0.47

Table 13

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

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	1	0.1	0.1	1	0.1	0.1			0.0
5-9	0	0.0	0.1			0.1			0.0
10-14	0	0.0	0.1			0.1			0.0
15-19	0	0.0	0.1			0.1			0.0
20-24	2	0.1	0.2	2	0.2	0.2			0.0
25-29	2	0.1	0.3	1	0.1	0.3	1	0.2	0.2
30-34	0	0.0	0.3			0.3			0.2
35-39	11	0.6	0.9	8	0.6	1.0	3	0.6	0.8
40-44	34	2.0	2.9	26	2.1	3.1	8	1.6	2.4
45-49	90	5.2	8.0	75	6.0	9.1	15	3.0	5.4
50-54	187	10.7	18.8	153	12.3	21.4	34	6.9	12.3
55-59	262	15.0	33.8	213	17.1	38.5	49	9.9	22.2
60-64	301	17.3	51.1	228	18.3	56.8	73	14.7	36.9
65-69	276	15.9	67.0	204	16.4	73.2	72	14.5	51.4
70-74	215	12.3	79.3	154	12.4	85.5	61	12.3	63.7
75-79	146	8.4	87.7	98	7.9	93.4	48	9.7	73.4
80-84	110	6.3	94.0	51	4.1	97.5	59	11.9	85.3
85+	104	6.0	100.0	31	2.5	100.0	73	14.7	100.0
All ages	1741	100.0		1245	100.0		496	100.0	

Included in the statistics are 41.6% multiple primaries in males and 33.3% in females.

Table 14

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2013
(**incl. multiple primaries**)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4	1		0.1	1.00	0.0		3.0	
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24	2		0.1	0.50	0.0		2.2	
25-29	1	1	0.0	0.11	0.0	0.20	0.9	0.9
30-34			0.0		0.0			
35-39	8	3	0.3	0.27	0.1	0.27	2.0	0.6
40-44	26	8	1.0	0.30	0.3	0.29	3.0	0.7
45-49	75	15	3.2	0.36	0.6	0.25	4.2	0.7
50-54	153	34	7.6	0.50	1.7	0.35	4.6	1.1
55-59	213	49	11.6	0.60	2.5	0.42	3.6	1.0
60-64	228	73	12.9	0.70	3.9	0.51	2.6	1.1
65-69	204	72	12.9	0.81	4.2	0.57	1.7	0.9
70-74	154	61	12.0	0.91	4.0	0.63	1.1	0.6
75-79	98	48	11.9	0.95	4.0	0.51	0.7	0.4
80-84	51	59	10.2	0.91	6.3	0.75	0.5	0.5
85+	31	73	9.1	0.78	8.2	0.99	0.3	0.5
All ages	1245	496					1.6	0.7
Mortality								
Raw			4.2	0.64	1.6	0.52		
WS			2.5	0.60	0.7	0.44		
ES			3.5	0.62	1.1	0.46		
BRD-S			4.0	0.64	1.3	0.49		
PYLL-70								
per 100,000			38.9		9.9			
ES			35.1		8.5			
AYLL-70			11.4		10.3			

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

Table 15a

Multiple primaries in deaths in period 1998-2013
MALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03-C06 Oral cavity	55	7.8			3	5.5	52	94.5
C09-C10 Oropharynx	49	6.9			12	24.5	37	75.5
C12-C13 Hypopharynx	53	7.5	18	34.0	5	9.4	30	56.6
C15 Oesophagus	59	8.3	7	11.9	9	15.3	43	72.9
C16 Stomach	13	1.8	2	15.4			11	84.6
C18 Colon	24	3.4	7	29.2	2	8.3	15	62.5
C19-C20 Rectum	29	4.1	5	17.2	1	3.4	23	79.3
C22 Liver	21	3.0	2	9.5	2	9.5	17	81.0
C25 Pancreas	8	1.1	1	12.5			7	87.5
C32 Larynx	45	6.4	24	53.3	8	17.8	13	28.9
C33-C34 Lung	159	22.5	16	10.1	13	8.2	130	81.8
C43 Malign. melanoma	14	2.0	7	50.0	1	7.1	6	42.9
C44 Skin others	32	4.5	13	40.6	3	9.4	16	50.0
C61 Prostate	34	4.8	18	52.9	1	2.9	15	44.1
C64 Kidney	11	1.6	2	18.2	1	9.1	8	72.7
C67 Bladder	25	3.5	15	60.0	1	4.0	9	36.0
C76-C79 CUP	12	1.7	5	41.7			7	58.3
C82-C85 NHL	14	2.0	7	50.0	2	14.3	5	35.7
Other primaries	50	7.1	24	48.0	4	8.0	22	44.0
All mult. primaries	707	100.0	173	24.5	68	9.6	466	65.9

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 15b

Multiple primaries in deaths in period 1998-2013
FEMALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03-C06 Oral cavity	21	8.3			1	4.8	20	95.2
C09-C10 Oropharynx	21	8.3			3	14.3	18	85.7
C12-C13 Hypopharynx	8	3.1					8	100.0
C14 ENT cancer	3	1.2			1	33.3	2	66.7
C15 Oesophagus	15	5.9					15	100.0
C16 Stomach	4	1.6	1	25.0	1	25.0	2	50.0
C18 Colon	13	5.1	7	53.8			6	46.2
C21 Anus/canal	3	1.2					3	100.0
C22 Liver	5	2.0			1	20.0	4	80.0
C23-C24 Bile	3	1.2					3	100.0
C25 Pancreas	4	1.6	1	25.0			3	75.0
C30-C31 Sinuses	5	2.0	1	20.0			4	80.0
C32 Larynx	7	2.8	3	42.9			4	57.1
C33-C34 Lung	43	16.9	2	4.7	1	2.3	40	93.0
C43 Malign. melanoma	4	1.6					4	100.0
C44 Skin others	10	3.9	3	30.0	2	20.0	5	50.0
C50 Breast	37	14.6	24	64.9			13	35.1
C53 Cervix uteri	10	3.9	8	80.0			2	20.0
C54 Corpus uteri	4	1.6	3	75.0			1	25.0
C56 Ovary	4	1.6	2	50.0			2	50.0
C67 Bladder	5	2.0	3	60.0			2	40.0
C70-C72 CNS cancer	6	2.4	1	16.7			5	83.3
C82-C85 NHL	4	1.6	1	25.0	1	25.0	2	50.0
Other primaries	15	5.9	9	60.0			6	40.0
All mult. primaries	254	100.0	69	27.2	11	4.3	174	68.5

Multiple primaries with number of cases 1 to 2 are pooled in category "Other primaries".

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

Table 16

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

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4			0.0		0.0			
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24	2		0.1	0.50	0.0		2.4	
25-29	1	1	0.0	0.11	0.0	0.20	1.0	0.9
30-34			0.0		0.0			
35-39	8	3	0.3	0.30	0.1	0.27	2.1	0.6
40-44	23	8	0.9	0.28	0.3	0.30	2.9	0.8
45-49	69	13	2.9	0.36	0.6	0.24	4.2	0.8
50-54	126	30	6.2	0.53	1.5	0.36	4.4	1.2
55-59	164	40	8.9	0.59	2.1	0.41	3.2	1.0
60-64	183	59	10.3	0.67	3.1	0.49	2.5	1.1
65-69	164	55	10.4	0.85	3.2	0.55	1.7	0.8
70-74	122	48	9.5	0.98	3.2	0.65	1.1	0.6
75-79	68	43	8.2	0.92	3.6	0.54	0.7	0.5
80-84	36	44	7.2	0.90	4.7	0.71	0.4	0.5
85+	26	62	7.6	0.93	6.9	1.02	0.4	0.6
All ages	992	406					1.6	0.7
Mortality								
Raw			3.3	0.63	1.3	0.51		
WS			2.0	0.59	0.6	0.43		
ES			2.8	0.61	0.9	0.45		
BRD-S			3.2	0.63	1.1	0.47		
PYLL-70								
per 100,000			32.2		8.5			
ES			28.8		7.3			
AYLL-70			11.6		10.8			

* See corresponding tables with multiple primaries.

Table 17

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

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4			0.0		0.0			
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24	2		0.1	0.50	0.0		2.5	
25-29	1	1	0.0	0.11	0.0	0.33	1.1	1.0
30-34			0.0		0.0			
35-39	8	1	0.3	0.33	0.0	0.11	2.2	0.2
40-44	22	7	0.8	0.30	0.3	0.28	2.9	0.8
45-49	61	11	2.6	0.38	0.5	0.23	4.0	0.7
50-54	97	27	4.8	0.48	1.3	0.35	3.7	1.2
55-59	111	31	6.1	0.50	1.6	0.37	2.4	0.9
60-64	109	36	6.1	0.49	1.9	0.36	1.7	0.8
65-69	101	30	6.4	0.62	1.7	0.41	1.2	0.5
70-74	78	30	6.1	0.74	2.0	0.45	0.9	0.5
75-79	47	30	5.7	0.66	2.5	0.44	0.6	0.4
80-84	25	29	5.0	0.68	3.1	0.53	0.4	0.4
85+	21	48	6.2	0.88	5.4	0.86	0.4	0.5
All ages	683	281					1.3	0.6
Mortality								
Raw			2.3	0.51	0.9	0.41		
WS			1.4	0.49	0.4	0.35		
ES			1.9	0.50	0.6	0.37		
BRD-S			2.2	0.52	0.7	0.38		
PYLL-70								
per 100,000			24.4		6.5			
ES			21.8		5.6			
AYLL-70			12.8		11.9			

* See corresponding tables with multiple primaries.

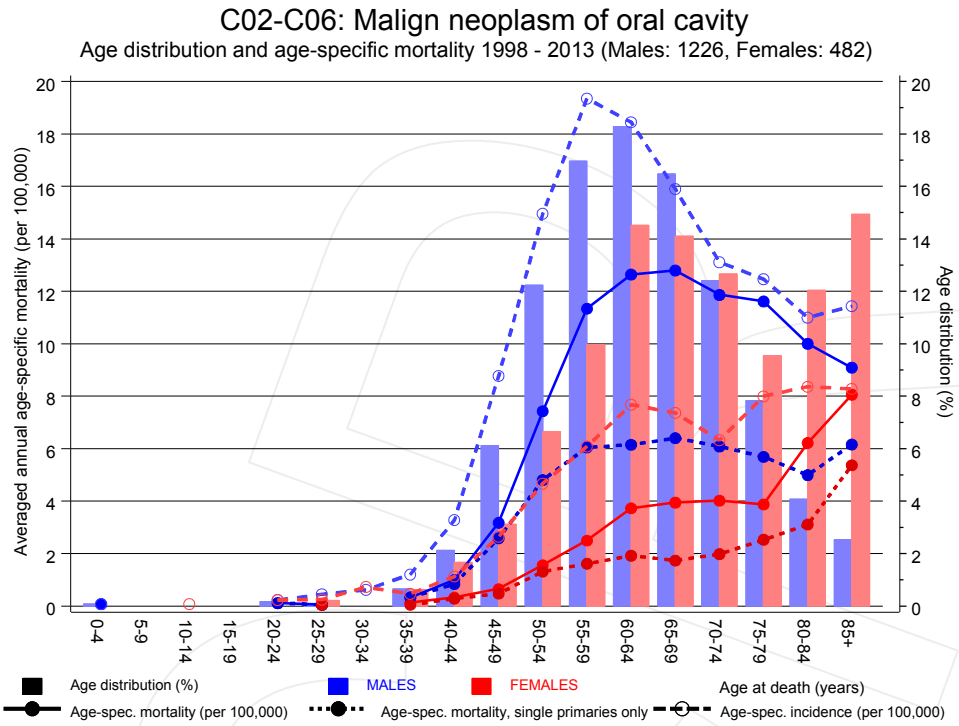
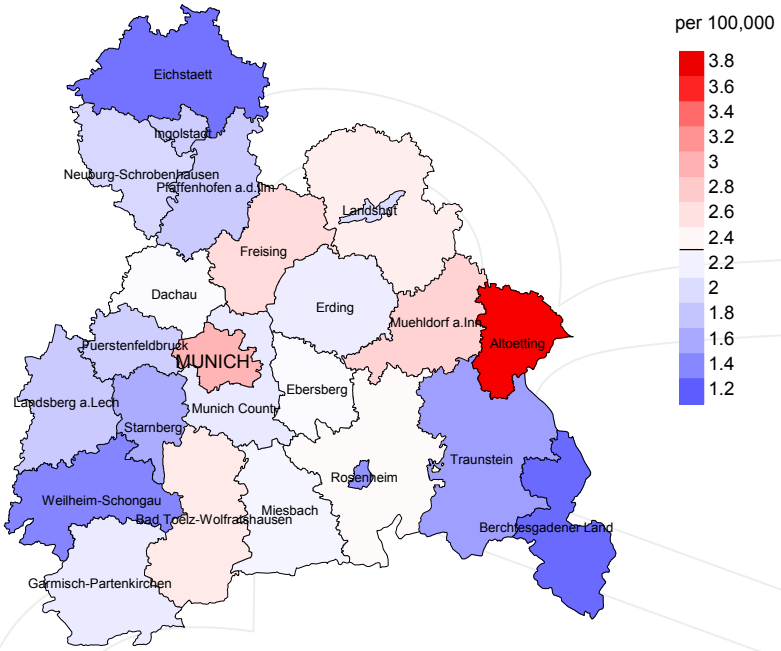


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

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



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

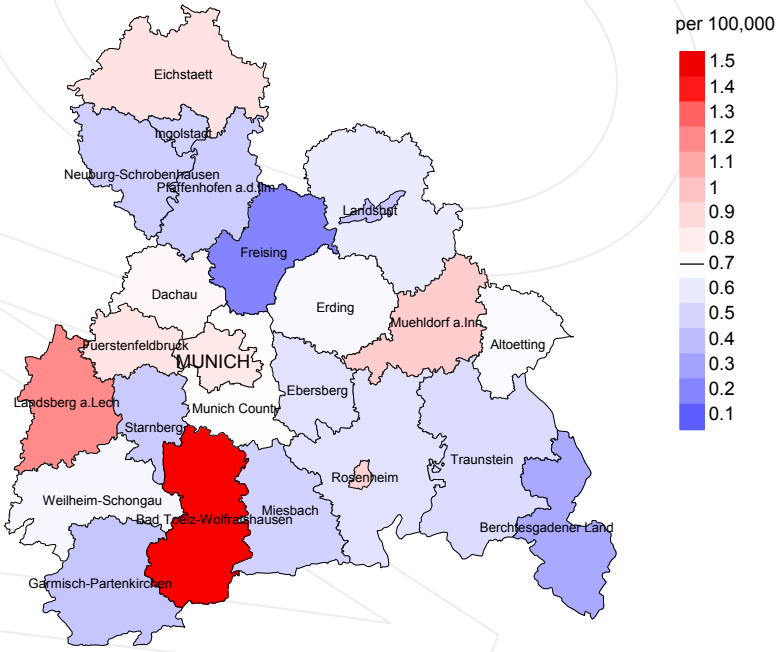
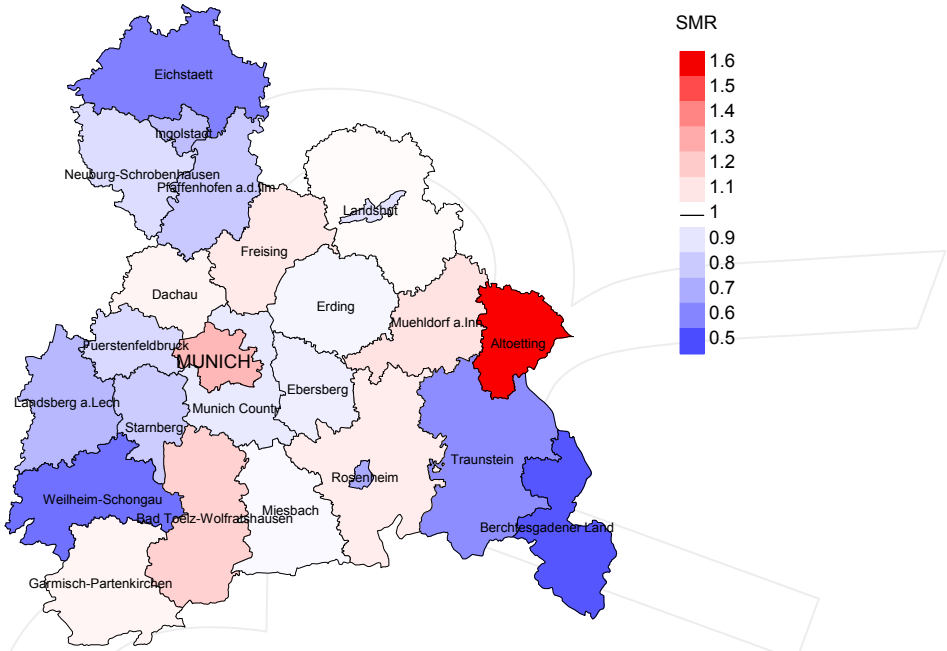


Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2013. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 2.3/100,000 WS N=634, females 0.7/100,000 WS N=259).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,928 female residents (averaged) in the period from 2007 to 2013 a total of 6 women died from oral cavity cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.6/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.1 and 1.7/100,000.

Standardized mortality ratio (SMR) 2007 - 2013: Males



Standardized mortality ratio (SMR) 2007 - 2013: Females

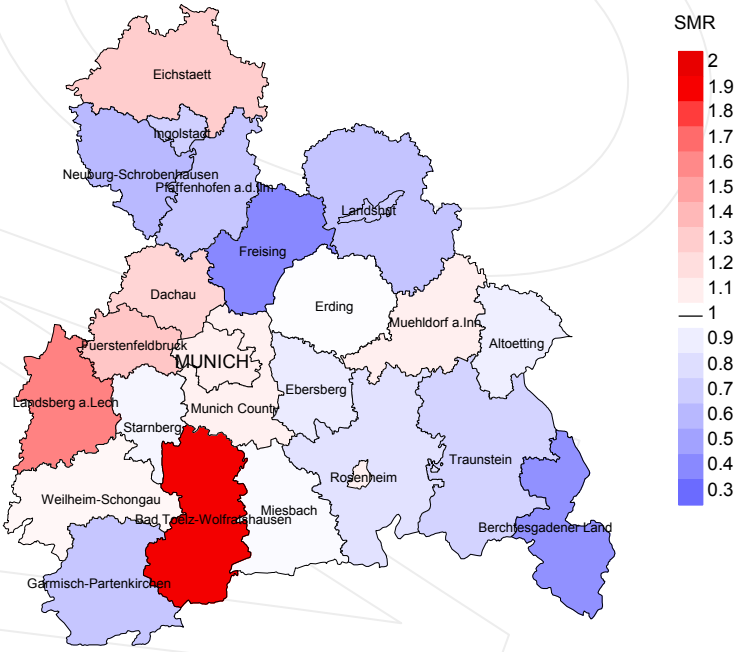


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=634, females N=259).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,642 female residents (averaged) in the period from 2007 to 2013 a total of 6 women died from oral cavity cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.88. Though, the value of this parameter may vary with an underlying probability of 99% between 0.22 and 2.29, and is therefore not statistically striking.

Statistical Notes

In all tables and figures the respective reference values should be carefully considered. The incidence rates include diagnoses (with multiple primary), and death certificate only (DCO) cases. For mortality statistics patients, diagnoses and progressive course of disease are presented. In the calculations, all courses of disease are considered whereby progressions occurred and/or death certificate identified progressive cancers were ascertained. Additionally there are three groups of disease course to consider:

1. **All multiple primaries included**

   The mortality statistic describes the tumor-specific death, independent of any malignancy. The patient perspective, induced secondary malignancies, and the problem of multiple malignancies from the same primary tumor all have reasons for their inclusion.

2. **First singular primary** (no information about other prior or synchronous malignancy)

   The mortality statistic describes the cancer-related death for patients who have no therapeutic restrictions due to a previous or synchronous cancer. These statistics are comparable to studies that have exclusion criteria based on a second malignancy.

3. **Single primary** (no information about other prior, syn- or metachronous malignancy)

   The mortality statistic describes the tumor-specific death that occurs without any impact through secondary primaries, earlier, synchronous, later or induced. Precisely the difference between disease group 1 and 2 highlight the magnitude of the problem of secondary malignancies.

For this reason differences appear concerning official mono-causal mortality statistics. To judge the maximum deviation, 2 further tables are presented. In the first table the distribution of secondary malignancies before, at or after the described cancer are shown, that could be an alternative cause of death. In the second table, the age-specific mortality rates for all courses of disease, without designation of secondary malignancies are shown.

A previously minimally acknowledged statistic is the **age at death**, which allows for a good assessment of the quality of classification of the apparent tumor-specific death. For assumed tumor-independent deaths, the age of death should be estimated from the age of diagnosis and the normal life expectancy, whereas tumor-dependent deaths can be estimated from the age of diagnosis plus the average tumor-specific life expectancy. The comparison of different tumors demonstrates this association, if the causes of cancer and the competing cause of death are independent of each other (e.g. breast and colon versus head/neck and lung).

The index from mortality and incidence (Mortality-Incidence ratio, **MI-index**) is a statistic that allows for the evaluation of the quality of data. For diseases with poor prognoses, comparable values are obtained from all age groups, because to a large extent, the numerator and denominator contain the same cases. For tumors with a good prognosis, increasing and decreasing incidence and age-specific differences in prognosis can more strongly alter the MI- index. Additionally, attention should be paid to the confidence intervals where fewer cases are reported.

The complexity of problems identified here emphasizes the importance of relative survival data for the appropriate analysis of long term results.

As a measurement of the burden of disease, the number of potential life years loss due to premature deaths in a cohort can be calculated (**PYLL**, potential years of life lost, standardized per 100,000 persons or per European standard) as well as the average loss of life years per individual (**AYLL**, average years of life lost). Depending upon the analytic aim (health economy, prevention, health care research) different methods exist for the generation of these measurements. In the results presented here, the age for a premature death is considered to be before 70 years, according to the guidelines of the OECD and the WHO (as seen in the abbreviation PYLL-70 or AYLL-70).

Shortcuts

FRG	Federal Republic of Germany
GEKID	Association of Population-based Cancer Registries in Germany (Gesellschaft der epidemiologischen Krebsregister in Deutschland e.V.)
MCR	Munich Cancer Registry (Tumorregister München)
SEER	Surveillance, Epidemiology, and End Results (USA)
AYLL-70	Average years of life lost prior to age 70 given a person dies before that age
BRD-S	German standard population
DCO	Death certificate only
EAR	Excess absolute risk = excess cancer cases (O - E) per 10,000 person-years
ES	European standard population (old)
LCL	Lower confidence limit
MI-index	Ratio between mortality and incidence
PYLL-70	Potential years of life lost prior to age 70 given a person dies before that age
SIR	Standardized incidence ratio
SMR	Standardized mortality ratio
UCL	Upper confidence limit
WS	World standard population

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Index of figures and tables