Munich Cancer Registry

- Survival
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- *Deutsch*

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

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

Cancer statistics: Baseline statistics

C77-C79: Unknown primary

Year of diagnosis	1998-2013
Patients	2,545
Diseases	2,547
Creation date	05/19/2015
Export date	12/30/2014
Population	4.64 m

http://www.tumorregister-muenchen.de/en/facts/base/base_C7779E.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.

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

Code	Description
C77.-	Secondary and unspecified malignant neoplasm of lymph nodes
C77.0	Lymph nodes of head, face and neck
C77.1	Intrathoracic lymph nodes
C77.2	Intra-abdominal lymph nodes
C77.3	Axillary and upper limb lymph nodes
C77.4	Inguinal and lower limb lymph nodes
C77.5	Intrapelvic lymph nodes
C77.8	Lymph nodes of multiple regions
C77.9	Lymph node, unspecified
C78.-	Secondary malignant neoplasm of respiratory and digestive organs
C78.0	Secondary malignant neoplasm of lung
C78.1	Secondary malignant neoplasm of mediastinum
C78.2	Secondary malignant neoplasm of pleura
C78.3	Secondary malignant neoplasm of other and unspecified respiratory organs
C78.4	Secondary malignant neoplasm of small intestine
C78.5	Secondary malignant neoplasm of large intestine and rectum
C78.6	Secondary malignant neoplasm of retroperitoneum and peritoneum
C78.7	Secondary malignant neoplasm of liver and intrahepatic bile duct
C78.8	Secondary malignant neoplasm of other and unspecified digestive organs
C79.-	Secondary malignant neoplasm of other and unspecified sites
C79.0	Secondary malignant neoplasm of kidney and renal pelvis
C79.1	Secondary malignant neoplasm of bladder and other and unspecified urinary organs
C79.2	Secondary malignant neoplasm of skin
C79.3	Secondary malignant neoplasm of brain and cerebral meninges
C79.4	Secondary malignant neoplasm of other and unspecified parts of nervous system
C79.5	Secondary malignant neoplasm of bone and bone marrow
C79.6	Secondary malignant neoplasm of ovary
C79.7	Secondary malignant neoplasm of adrenal gland
C79.8	Secondary malignant neoplasm of other specified sites
C79.9	Secondary malignant neoplasm, unspecified site

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	218	35	16.1	14.2	95.9	99.1	
1999	187	46	24.6	16.0	97.3	99.5	
2000	171	54	31.6	12.3	95.3	99.4	
2001	163	58	35.6	12.3	95.7	99.4	
2002	285	107	37.5	14.0	97.9	99.6	#
2003	287	116	40.4	11.5	97.6	100.0	
2004	240	79	32.9	12.5	96.3	99.6	
2005	173	80	46.2	22.5	98.8	99.4	
2006	144	80	55.6	16.7	93.1	98.6	
2007	152	90	59.2	11.8	93.4	98.0	# ##
2008	122	90	73.8	10.7	96.7	98.4	
2009	94	76	80.9	11.7	96.8	97.9	
2010	103	89	86.4	4.9	96.1	99.0	
2011	83	69	83.1	8.4	97.6	97.6	
2012	99	67	67.7	9.1	91.9	99.0	
2013	26	20	76.9	11.5	92.3	100.0	###
1998-2013	2547	1156	45.4	13.1	96.2	99.2	

\# 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	218	107	111	49.1
1999	187	91	96	48.7
2000	171	76	95	44.4
2001	163	80	83	49.1
2002	285	137	148	48.1
2003	287	144	143	50.2
2004	240	127	113	52.9
2005	173	85	88	49.1
2006	144	76	68	52.8
2007	152	79	73	52.0
2008	122	63	59	51.6
2009	94	52	42	55.3
2010	103	42	61	40.8
2011	83	31	52	37.3
2012	99	37	62	37.4
2013	26	10	16	38.5
1998-2013	2547	1237	1310	48.6

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	107	111	9.7	9.4	6.1	3.5	9.0	5.5	11.4	7.7
1999	91	96	8.1	8.1	4.9	3.5	7.3	5.2	9.2	6.7
2000	76	95	6.7	7.9	4.1	3.4	6.2	5.0	7.9	6.4
2001	80	83	6.9	6.8	3.9	2.8	6.1	4.2	8.4	5.4
2002	137	148	7.4	7.6	4.1	2.5	6.3	4.1	8.4	5.6
2003	144	143	7.7	7.3	4.2	2.6	6.5	4.1	8.7	5.6
2004	127	113	6.8	5.7	3.5	1.9	5.5	3.1	7.5	4.2
2005	85	88	4.5	4.4	2.2	1.6	3.5	2.5	4.9	3.3
2006	76	68	4.0	3.4	2.0	0.9	3.2	1.5	4.4	2.3
2007	79	73	3.6	3.2	1.7	0.9	2.8	1.5	3.7	2.2
2008	63	59	2.8	2.5	1.3	0.8	2.1	1.3	2.9	1.8
2009	52	42	2.3	1.8	1.0	0.5	1.8	0.8	2.5	1.1
2010	42	61	1.9	2.6	0.7	0.6	1.3	1.0	1.9	1.6
2011	31	52	1.4	2.2	0.6	0.5	0.9	0.9	1.2	1.3
2012	37	62	1.6	2.6	0.7	0.6	1.1	1.1	1.6	1.6
2013	10	16	0.4	0.7	0.2	0.2	0.3	0.3	0.4	0.4
1998-2013	1237	1310	4.2	4.2	2.1	1.4	3.3	2.2	4.4	3.0

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	218	71.3	13.5	30.2	99.6	53.4	61.2	71.7	82.4	87.8
1999	187	70.7	12.3	23.4	94.9	54.4	62.4	69.7	78.5	87.3
2000	171	69.7	15.7	28.6	99.2	47.7	57.4	71.4	82.1	88.3
2001	163	71.4	13.7	36.8	97.6	53.5	60.9	74.0	81.8	88.5
2002	285	73.6	13.3	30.7	97.2	54.1	65.1	76.0	82.8	89.2
2003	287	73.0	13.4	27.7	101	55.3	63.8	74.9	82.7	89.8
2004	240	73.3	13.1	34.1	97.4	56.5	64.7	76.0	82.6	89.1
2005	173	73.8	12.1	36.9	101	57.0	65.7	74.4	82.3	89.2
2006	144	76.7	14.4	0.2	97.1	58.0	70.3	80.5	86.0	91.6
2007	152	76.5	13.2	22.0	99.2	57.3	68.6	79.2	85.8	90.6
2008	122	76.3	11.6	46.1	97.3	60.3	68.9	78.7	85.8	88.5
2009	94	79.6	10.5	55.0	95.6	64.3	73.0	81.7	87.5	90.4
2010	103	80.4	10.4	35.5	99.2	65.9	76.5	82.1	87.0	90.5
2011	83	80.5	10.0	44.3	99.8	67.3	72.8	81.8	88.1	92.4
2012	99	79.7	11.2	45.5	98.1	63.0	73.9	81.7	88.3	91.9
2013	26	81.1	11.2	39.2	92.9	70.3	77.1	84.2	86.8	91.2
1998-2013	2547	74.2	13.3	0.2	101	55.6	65.6	76.4	84.4	89.9

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	107	66.9	13.1	30.2	93.3	49.3	57.9	68.5	75.3	85.3
1999	91	67.8	12.1	23.4	94.9	54.0	59.3	66.8	76.1	85.0
2000	76	67.2	14.3	39.6	96.8	48.4	55.3	67.8	78.0	86.7
2001	80	69.5	12.0	36.8	97.6	53.7	61.6	71.0	78.6	82.5
2002	137	69.8	13.3	30.7	93.6	51.8	61.3	70.1	79.8	88.1
2003	144	70.3	13.2	27.7	91.2	55.0	61.5	70.5	80.6	88.5
2004	127	70.3	12.2	36.9	94.0	55.8	62.2	72.1	79.8	84.5
2005	85	71.3	11.6	36.9	97.0	56.3	63.9	72.1	78.2	84.8
2006	76	73.5	15.8	0.2	97.1	53.8	68.5	76.3	84.2	89.6
2007	79	73.6	12.2	43.7	93.6	53.2	67.2	75.0	83.1	89.6
2008	63	74.2	11.3	49.1	95.7	57.9	68.1	75.4	82.2	87.5
2009	52	77.5	10.3	55.0	92.4	63.5	70.4	78.9	86.4	89.4
2010	42	76.1	12.0	35.5	93.2	62.7	70.9	79.6	84.3	86.3
2011	31	75.9	9.0	63.2	95.7	66.5	68.7	72.9	82.3	88.1
2012	37	75.3	11.5	45.5	92.2	61.8	67.2	76.9	84.3	90.7
2013	10	78.7	15.0	39.2	92.4	56.9	75.8	83.8	86.8	90.7
1998-2013	1237	71.1	12.9	0.2	97.6	53.7	62.8	72.1	80.6	87.1

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	111	75.5	12.6	43.7	99.6	57.2	65.8	77.9	84.2	90.8
1999	96	73.3	12.0	44.9	94.3	57.9	65.3	73.0	83.9	89.1
2000	95	71.6	16.5	28.6	99.2	47.1	59.8	75.5	85.4	88.9
2001	83	73.2	15.1	39.6	96.1	50.9	60.9	76.3	87.0	91.0
2002	148	77.2	12.4	38.9	97.2	57.4	70.5	80.7	86.5	90.3
2003	143	75.7	13.1	36.2	101	57.4	68.2	78.4	84.4	90.8
2004	113	76.6	13.3	34.1	97.4	59.3	68.6	79.9	84.6	91.3
2005	88	76.1	12.1	47.5	101	57.6	67.3	76.7	85.5	92.7
2006	68	80.2	11.9	37.0	93.4	66.5	76.5	82.3	88.3	92.2
2007	73	79.5	13.6	22.0	99.2	58.9	75.7	84.0	87.5	92.2
2008	59	78.6	11.5	46.1	97.3	61.9	72.5	80.8	87.2	90.3
2009	42	82.2	10.3	56.2	95.6	68.5	73.8	86.3	89.3	93.9
2010	61	83.5	7.9	57.2	99.2	75.1	79.7	84.6	88.2	90.7
2011	52	83.2	9.7	44.3	99.8	72.8	77.8	85.2	89.6	92.7
2012	62	82.4	10.2	46.6	98.1	71.6	78.6	84.2	88.7	92.3
2013	16	82.5	8.3	60.6	92.9	70.3	79.4	84.9	87.6	91.2
1998-2013	1310	77.2	13.0	22.0	101	58.4	69.9	80.2	86.7	91.3

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	0	0.0	0.0			0.1			0.0
15-19	0	0.0	0.0			0.1			0.0
20-24	2	0.1	0.1	1	0.1	0.2	1	0.1	0.1
25-29	3	0.1	0.2	2	0.2	0.3	1	0.1	0.2
30-34	7	0.3	0.5	5	0.4	0.7	2	0.2	0.3
35-39	22	0.9	1.4	11	0.9	1.6	11	0.8	1.1
40-44	24	0.9	2.3	13	1.1	2.7	11	0.8	2.0
45-49	74	2.9	5.2	44	3.6	6.2	30	2.3	4.3
50-54	100	3.9	9.1	66	5.3	11.6	34	2.6	6.9
55-59	165	6.5	15.6	104	8.4	20.0	61	4.7	11.5
60-64	217	8.5	24.1	128	10.3	30.3	89	6.8	18.3
65-69	266	10.4	34.6	178	14.4	44.7	88	6.7	25.0
70-74	289	11.3	45.9	156	12.6	57.3	133	10.2	35.2
75-79	375	14.7	60.7	190	15.4	72.7	185	14.1	49.3
80-84	411	16.1	76.8	161	13.0	85.7	250	19.1	68.4
85+	591	23.2	100.0	177	14.3	100.0	414	31.6	100.0
All ages	2547	100.0		1237	100.0		1310	100.0	

Included in the statistics are 18.3% multiple primaries in males and 12.3% 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=500 %	Females DCO rate n=655 %	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			0.0	0.0				
15-19			0.0	0.0				
20-24	1	1	0.1	0.1		100.0	0.2	0.2
25-29	2	1	0.1	0.0			0.2	0.1
30-34	5	2	0.2	0.1			0.3	0.1
35-39	11	11	0.4	0.5	18.2		0.5	0.3
40-44	13	11	0.5	0.4			0.4	0.2
45-49	44	30	1.9	1.3	13.6	10.0	0.8	0.3
50-54	66	34	3.3	1.7	15.2	14.7	0.8	0.3
55-59	104	61	5.7	3.2	18.3	9.8	0.7	0.4
60-64	127	89	7.2	4.7	25.2	25.8	0.6	0.5
65-69	178	88	11.3	5.1	28.1	25.0	0.6	0.5
70-74	156	133	12.2	8.8	40.4	33.8	0.6	0.7
75-79	189	185	22.9	15.6	47.6	44.3	0.9	1.1
80-84	161	250	32.2	26.8	60.9	58.8	1.2	1.6
85+	177	414	51.9	46.3	72.9	77.5	1.8	2.4
All ages	1235	1310			40.5	50.0	0.8	0.9
Incidence								
Raw			4.2	4.2				
WS			2.1	1.4				
ES			3.3	2.2				
BRD-S			4.4	3.0				

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 %
C09-C10 Oropharynx	5	0.2	33.0	10.7	77.1	#	56.3	
C12-C13 Hypopharynx	4	0.1	47.2	12.9	120.8	#	45.5	25.0
C15 Oesophagus	2	0.2	8.3	1.0	29.9	#	20.4	
C16 Stomach	4	0.6	6.2	1.7	16.0	#	39.0	50.0
C18 Colon	3	1.5	2.0	0.4	5.9		17.7	
C22 Liver	3	0.4	8.0	1.6	23.4	#	30.5	33.3
C23-C24 Bile	2	0.1	14.6	1.8	52.9	#	21.6	
C32 Larynx	3	0.2	19.2	4.0	56.1	#	33.0	
C33-C34 Lung	15	1.7	8.8	4.9	14.6	#	154.5	33.3
C38,C45 Mesothelioma	2	0.1	23.4	2.8	84.6	#	22.2	
C48 Peritoneal	2	0.0	198.4	24.0	716.8	#	23.1	100.0
C61 Prostate	11	4.5	2.4	1.2	4.4	#	75.5	9.1
C64 Kidney	3	0.5	6.0	1.2	17.5	#	29.0	
C76-C79 CUP	2	0.3	7.9	1.0	28.5		20.3	50.0
C82-C85 NHL	4	0.6	7.0	1.9	18.0	#	39.8	25.0
Other primaries	10	3.2	3.1	1.5	5.8	#	79.1	20.0
Not observed	0	0.7	0.0	0.0	5.3		-8.1	
All mult. primaries	75	14.8	5.1	4.0	6.4	#	699.5	21.3

Patients	739
Median age at second malignancy (years)	64.5
Person-years	861
Mean observation time (years)	1.2
Median observation time (years)	0.4

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 %
C09-C10 Oropharynx	2	0.0	50.1	6.1	181.0	#	22.2	
C16 Stomach	2	0.5	4.2	0.5	15.0		17.2	
C18 Colon	3	1.2	2.4	0.5	7.0		19.9	66.7
C33-C34 Lung	5	0.7	7.4	2.4	17.2	#	49.0	40.0
C50 Breast	15	3.1	4.9	2.7	8.1	#	135.2	13.3
C53 Cervix uteri	2	0.2	13.3	1.6	48.0	#	21.0	
C56 Ovary	7	0.4	15.7	6.3	32.3	#	74.3	42.9
C64 Kidney	2	0.3	7.6	0.9	27.4		19.7	50.0
Other primaries	9	1.0	9.1	4.2	17.3	#	90.8	44.4
Not observed	0	3.5	0.0	0.0	1.1		-39.5	
All mult. primaries	47	10.8	4.3	3.2	5.8	#	409.8	29.8

Patients	684
Median age at second malignancy (years)	69.6
Person-years	882
Mean observation time (years)	1.3
Median observation time (years)	0.4

The occurrence of second malignancy is statistically significant.

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

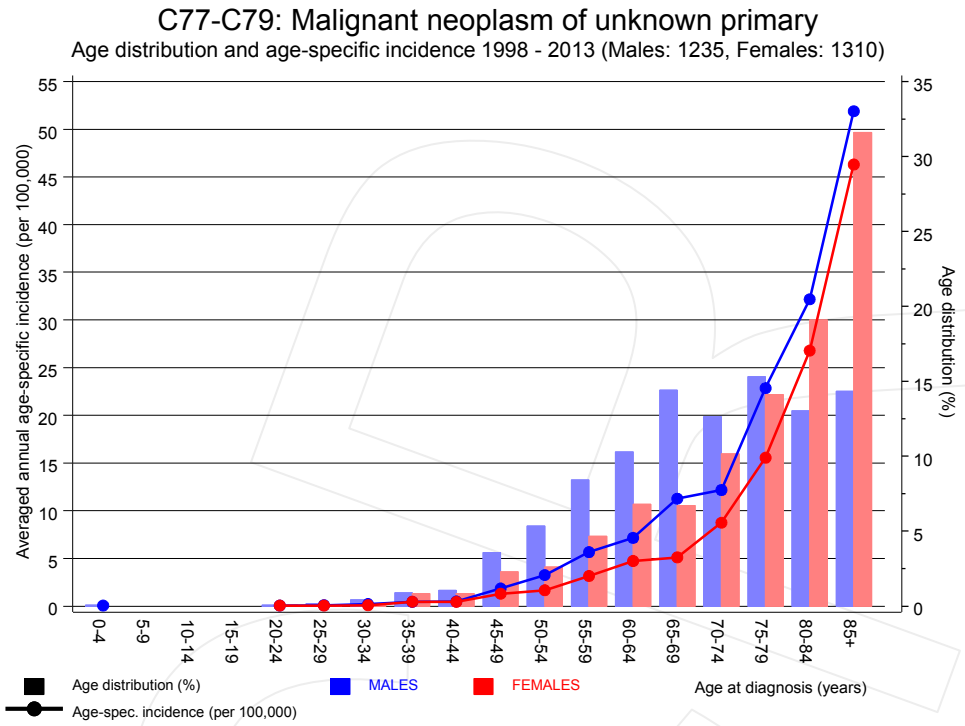


Figure 7. Age distribution and age-specific incidence

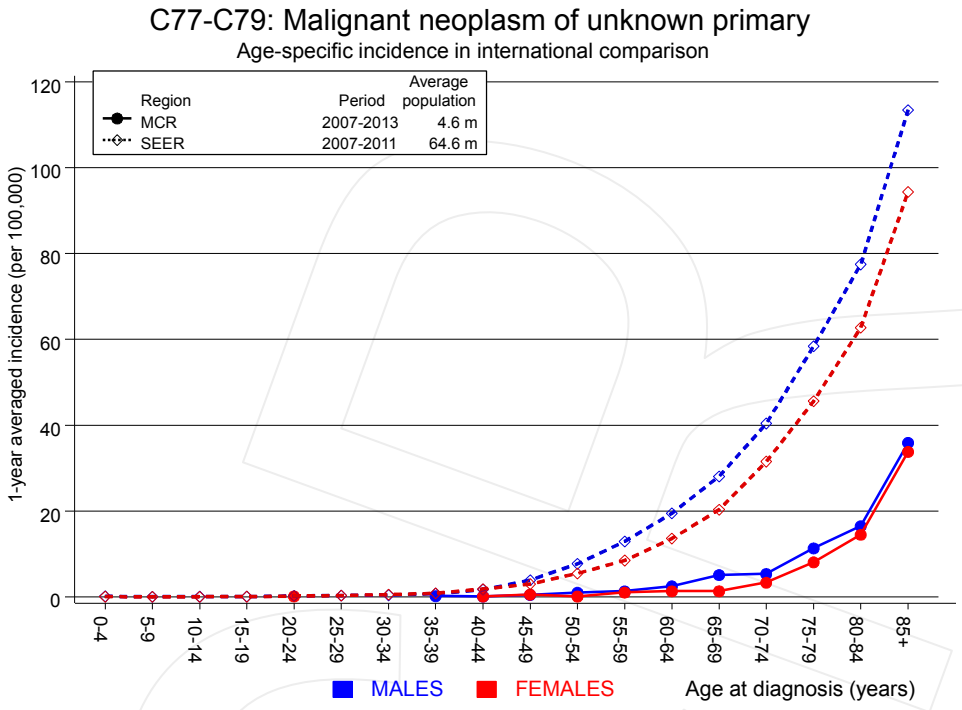


Figure 7a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

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.

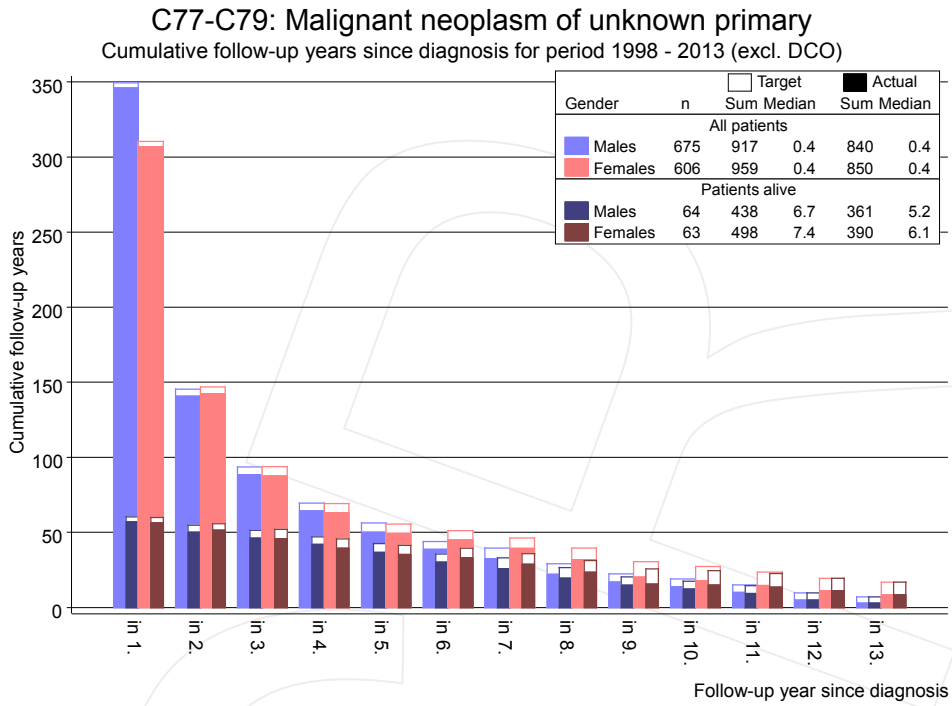
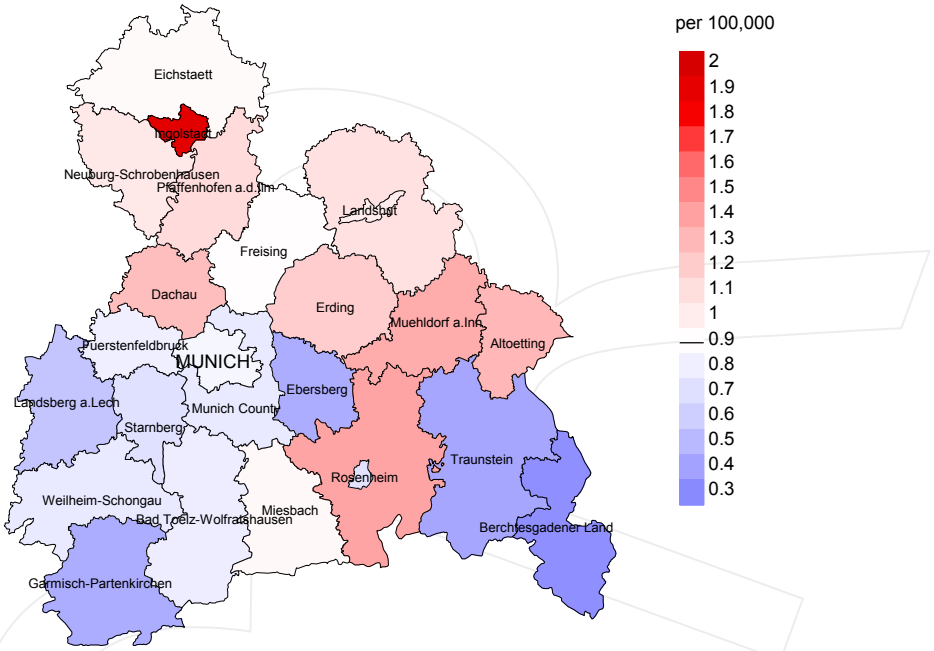


Figure 8. Cumulative follow-up years depending on time since diagnosis

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

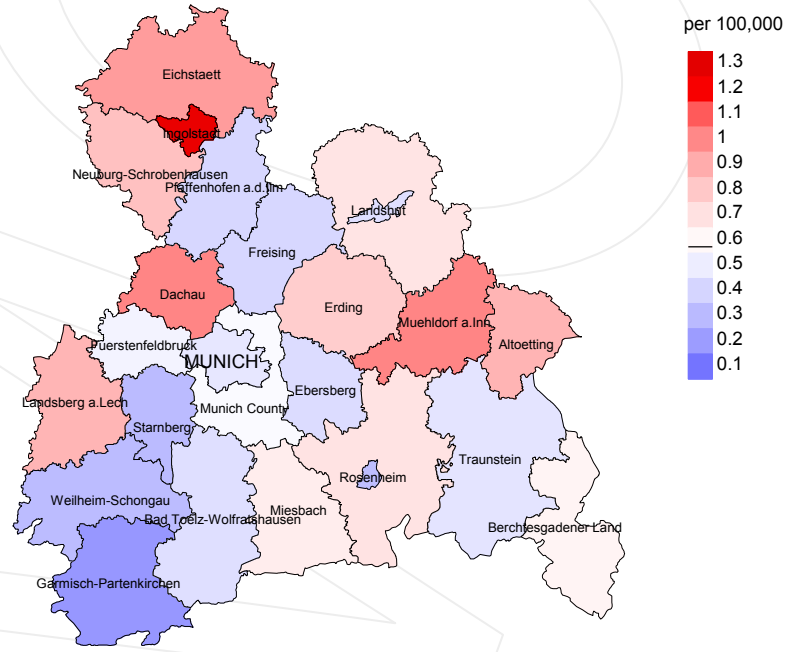
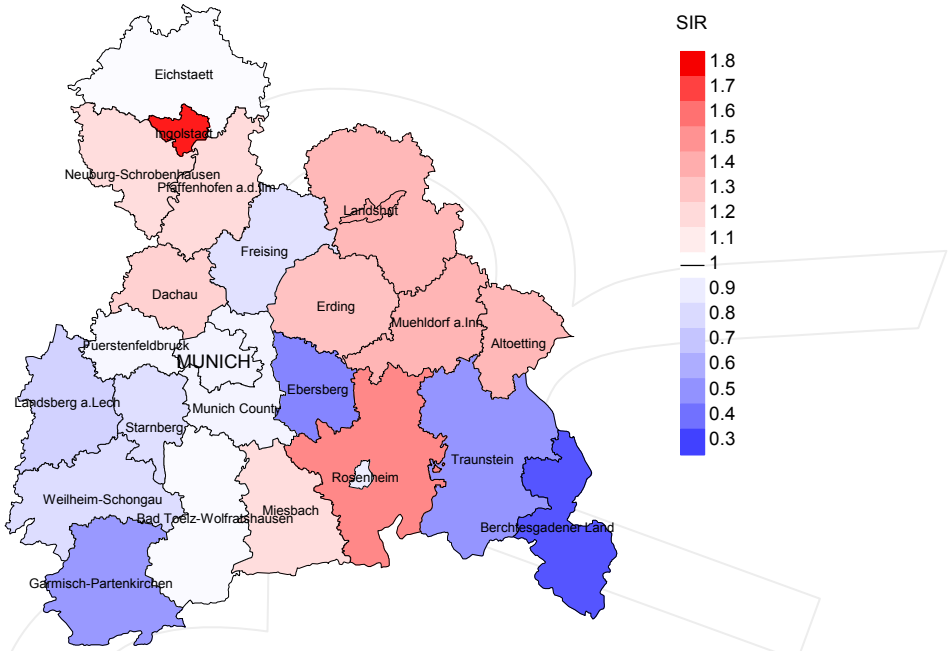


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 0.9/100,000 WS N=314, females 0.6/100,000 WS N=365).

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 8 women were identified with newly diagnosed unknown primary. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 0.4/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.1 and 1.1/100,000.

Standardized incidence ratio (SIR) 2007 - 2013: Males



Standardized incidence ratio (SIR) 2007 - 2013: Females

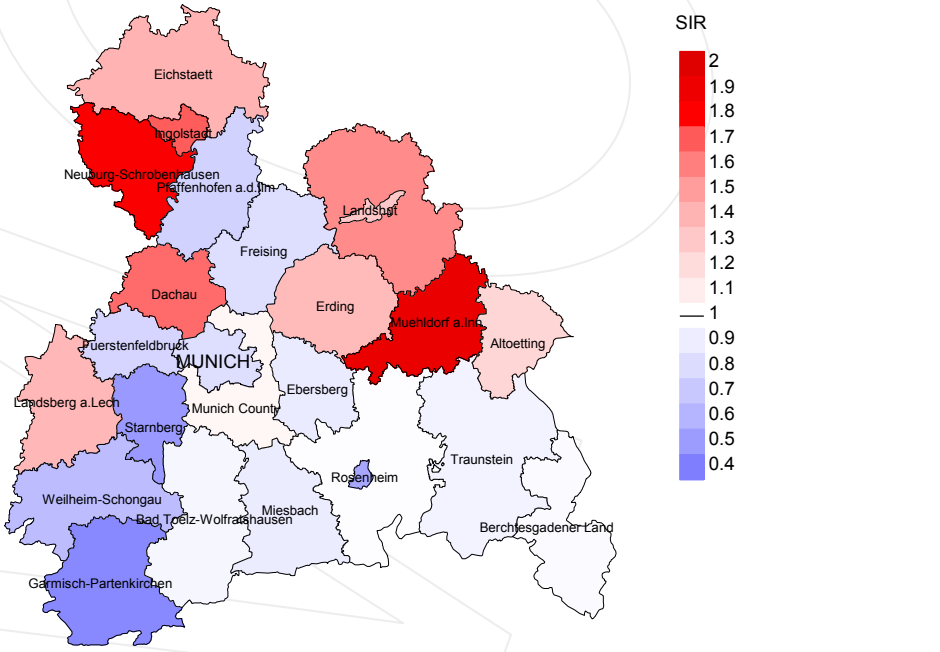


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=314, females N=365).

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 8 women were identified with newly diagnosed unknown primary. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.89. Though, the value of this parameter may vary with an underlying probability of 99% between 0.29 and 2.07, 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	218	99.1	16.1	209	95.9	94.3
1999	187	99.5	24.6	182	97.3	93.4
2000	171	99.4	31.6	163	95.3	96.9
2001	163	99.4	35.6	156	95.7	98.7
2002	285	99.6	37.5	279	97.9	98.2
2003	287	100.0	40.4	280	97.6	98.9
2004	240	99.6	32.9	231	96.3	100.0
2005	173	99.4	46.2	171	98.8	98.8
2006	144	98.6	55.6	134	93.1	99.3
2007	152	98.0	59.2	142	93.4	100.0
2008	122	98.4	73.8	118	96.7	100.0
2009	94	97.9	80.9	91	96.8	100.0
2010	103	99.0	86.4	99	96.1	100.0
2011	83	97.6	83.1	81	97.6	100.0
2012	99	99.0	67.7	91	91.9	100.0
2013	26	100.0	76.9	24	92.3	100.0
1998-2013	2547	99.2	45.4	2451	96.2	98.3

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	218	189	94.2	132	60.6
1999	187	184	94.6	116	62.0
2000	171	181	96.7	115	67.3
2001	163	154	96.8	107	65.6
2002	285	201	98.0	178	62.5
2003	287	231	98.3	193	67.2
2004	240	224	98.7	152	63.3
2005	173	162	98.8	118	68.2
2006	144	143	97.9	110	76.4
2007	152	107	99.1	106	69.7
2008	122	107	100.0	102	83.6
2009	94	77	100.0	81	86.2
2010	103	74	100.0	88	85.4
2011	83	65	100.0	74	89.2
2012	99	69	100.0	84	84.8
2013	26	27	100.0	24	92.3
1998-2013	2547	2195	97.8	1780	69.9

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	189	94.2	5.8	96.6
1999	184	98.9	1.1	97.7
2000	181	100.0		96.0
2001	154	98.7	1.3	95.3
2002	201	99.0	1.0	96.4
2003	231	100.0		96.0
2004	224	98.2	1.8	95.9
2005	162	99.4	0.6	97.5
2006	143	98.6	1.4	95.0
2007	107	99.1	0.9	95.3
2008	107	97.2	2.8	93.5
2009	77	97.4	2.6	97.4
2010	74	97.3	2.7	90.5
2011	65	96.9	3.1	87.7
2012	69	97.1	2.9	89.9
2013	27	96.3	3.7	88.9
1998-2013	2195	98.3	1.7	95.4

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	97	68.6	68.6	59.7	68.6
1999	90	69.3	69.2	95.0	68.3
2000	88	68.6	68.6		68.2
2001	69	71.3	71.3		72.0
2002	102	70.7	70.8	67.1	70.8
2003	117	70.9	70.9		70.5
2004	120	71.5	71.3	89.3	70.7
2005	87	69.9	69.8	91.8	69.8
2006	65	71.6	71.7	54.7	71.6
2007	58	75.1	75.0	85.6	75.7
2008	58	73.4	73.4	76.3	73.7
2009	46	79.4	79.9	73.0	79.4
2010	31	73.6	72.8	94.0	71.7
2011	27	77.7	77.7		77.7
2012	29	79.4	79.4		80.2
2013	12	73.9	73.9		74.7
1998-2013	1096	71.7	71.7	73.8	71.5

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	92	78.7	77.9	84.8	78.2
1999	94	75.6	75.5	81.6	75.7
2000	93	76.5	76.5		76.3
2001	85	78.0	78.6	66.3	79.0
2002	99	80.9	80.8	87.3	80.9
2003	114	76.8	76.8		78.4
2004	104	79.8	79.7	81.8	80.0
2005	75	78.7	78.7		78.9
2006	78	80.9	80.8	84.8	80.9
2007	49	84.2	84.2		84.2
2008	49	77.7	77.5	97.8	77.5
2009	31	80.6	81.2	73.0	80.6
2010	43	83.8	83.8	70.9	83.8
2011	38	85.2	85.2	85.6	86.0
2012	40	84.0	82.8	90.2	82.5
2013	15	85.1	84.2	85.1	85.1
1998-2013	1099	79.7	79.5	84.6	79.7

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	92	8.3	0.86	5.0	0.82	7.5	0.84	9.8	0.86
1999	89	8.0	0.98	4.9	1.00	7.4	1.01	9.5	1.02
2000	88	7.7	1.16	4.6	1.11	6.9	1.13	9.1	1.15
2001	69	6.0	0.86	3.4	0.88	5.4	0.88	7.3	0.88
2002	101	5.4	0.74	3.0	0.74	4.6	0.74	6.3	0.75
2003	117	6.2	0.81	3.3	0.80	5.2	0.80	7.0	0.81
2004	119	6.3	0.94	3.4	0.95	5.2	0.95	6.9	0.93
2005	86	4.5	1.02	2.5	1.11	3.7	1.05	4.8	0.99
2006	64	3.3	0.84	1.8	0.88	2.6	0.82	3.5	0.80
2007	57	2.6	0.72	1.2	0.71	2.0	0.71	2.7	0.72
2008	56	2.5	0.89	1.2	0.88	1.9	0.88	2.6	0.88
2009	45	2.0	0.87	0.9	0.87	1.5	0.86	2.1	0.86
2010	30	1.3	0.71	0.6	0.79	0.9	0.75	1.3	0.68
2011	27	1.2	0.87	0.4	0.77	0.7	0.81	1.1	0.91
2012	29	1.3	0.78	0.5	0.72	0.8	0.75	1.2	0.78
2013	12	0.5	1.20	0.2	1.46	0.4	1.31	0.5	1.16
1998-2013	1081	3.6	0.88	1.9	0.88	2.9	0.87	3.8	0.87

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	86	7.3	0.77	2.8	0.79	4.3	0.77	5.8	0.75
1999	93	7.8	0.97	3.1	0.90	4.8	0.92	6.3	0.95
2000	93	7.7	0.98	3.1	0.92	4.7	0.94	6.2	0.97
2001	83	6.8	1.00	2.5	0.89	3.9	0.94	5.3	0.98
2002	98	5.0	0.66	1.7	0.68	2.8	0.68	3.7	0.66
2003	114	5.8	0.80	2.2	0.83	3.4	0.82	4.6	0.81
2004	101	5.1	0.89	1.7	0.90	2.8	0.89	3.8	0.89
2005	75	3.8	0.85	1.3	0.82	2.1	0.83	2.7	0.83
2006	77	3.8	1.13	1.3	1.41	2.0	1.32	2.7	1.20
2007	49	2.1	0.67	0.7	0.73	1.1	0.72	1.5	0.66
2008	48	2.1	0.81	0.7	0.96	1.1	0.90	1.5	0.84
2009	30	1.3	0.71	0.4	0.88	0.6	0.82	0.9	0.82
2010	42	1.8	0.69	0.4	0.80	0.8	0.75	1.2	0.71
2011	36	1.5	0.69	0.3	0.68	0.6	0.69	0.9	0.69
2012	38	1.6	0.61	0.4	0.68	0.7	0.65	1.0	0.62
2013	14	0.6	0.88	0.1	0.93	0.3	0.94	0.4	0.90
1998-2013	1077	3.5	0.82	1.2	0.85	1.9	0.84	2.5	0.83

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	0.0	0.0	1	0.1	0.1			0.0
5-9	0	0.0	0.0			0.1			0.0
10-14	0	0.0	0.0			0.1			0.0
15-19	0	0.0	0.0			0.1			0.0
20-24	1	0.0	0.1	1	0.1	0.2			0.0
25-29	2	0.1	0.2	1	0.1	0.3	1	0.1	0.1
30-34	8	0.4	0.6	6	0.6	0.8	2	0.2	0.3
35-39	16	0.7	1.3	8	0.7	1.6	8	0.7	1.0
40-44	21	1.0	2.3	11	1.0	2.6	10	0.9	1.9
45-49	56	2.6	4.9	35	3.2	5.8	21	1.9	3.9
50-54	86	4.0	8.8	54	5.0	10.8	32	3.0	6.9
55-59	154	7.1	16.0	101	9.3	20.1	53	4.9	11.8
60-64	195	9.0	25.0	112	10.3	30.5	83	7.7	19.5
65-69	246	11.4	36.4	160	14.8	45.2	86	8.0	27.5
70-74	273	12.6	49.0	157	14.5	59.7	116	10.8	38.2
75-79	310	14.3	63.4	160	14.8	74.5	150	13.9	52.1
80-84	321	14.9	78.2	140	12.9	87.4	181	16.8	68.9
85+	471	21.8	100.0	136	12.6	100.0	335	31.1	100.0
All ages	2161	100.0		1083	100.0		1078	100.0	

Included in the statistics are 18.3% multiple primaries in males and 12.3% 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	1		0.1	1.00	0.0		1.1	
25-29	1	1	0.0	0.50	0.0	1.00	0.9	0.9
30-34	6	2	0.3	1.20	0.1	1.00	3.2	0.9
35-39	8	8	0.3	0.73	0.3	0.73	2.0	1.5
40-44	11	10	0.4	0.85	0.4	0.91	1.3	0.9
45-49	35	21	1.5	0.80	0.9	0.70	1.9	1.0
50-54	54	32	2.7	0.82	1.6	0.94	1.6	1.0
55-59	101	53	5.5	0.97	2.8	0.87	1.7	1.1
60-64	112	83	6.3	0.88	4.4	0.93	1.3	1.3
65-69	160	86	10.1	0.90	5.0	0.98	1.3	1.0
70-74	157	116	12.3	1.01	7.6	0.87	1.2	1.2
75-79	160	150	19.4	0.84	12.6	0.81	1.2	1.4
80-84	140	181	28.0	0.87	19.4	0.72	1.3	1.6
85+	136	335	39.9	0.77	37.5	0.81	1.5	2.5
All ages	1083	1078					1.4	1.5
Mortality								
Raw			3.6	0.88	3.5	0.82		
WS			1.9	0.88	1.2	0.85		
ES			2.9	0.87	1.9	0.84		
BRD-S			3.8	0.87	2.5	0.83		
PYLL-70								
per 100,000			19.3		12.0			
ES			17.3		10.2			
AYLL-70			10.6		10.8			

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	5	2.2	2	40.0			3	60.0
C09-C10 Oropharynx	16	7.0	2	12.5	3	18.8	11	68.8
C12-C13 Hypopharynx	7	3.1	1	14.3			6	85.7
C15 Oesophagus	5	2.2	1	20.0	2	40.0	2	40.0
C16 Stomach	7	3.1	1	14.3	1	14.3	5	71.4
C18 Colon	14	6.1	6	42.9	6	42.9	2	14.3
C19-C20 Rectum	6	2.6	4	66.7	1	16.7	1	16.7
C22 Liver	4	1.8					4	100.0
C32 Larynx	9	3.9	7	77.8			2	22.2
C33-C34 Lung	19	8.3			7	36.8	12	63.2
C43 Malign. melanoma	8	3.5	6	75.0	1	12.5	1	12.5
C44 Skin others	13	5.7	5	38.5	2	15.4	6	46.2
C61 Prostate	49	21.5	36	73.5	3	6.1	10	20.4
C64 Kidney	5	2.2			1	20.0	4	80.0
C67 Bladder	15	6.6	13	86.7	1	6.7	1	6.7
C70-C72 CNS cancer	5	2.2	3	60.0			2	40.0
C73 Thyroid	3	1.3	2	66.7			1	33.3
C82-C85 NHL	12	5.3	8	66.7	2	16.7	2	16.7
C90 Mult. myeloma	3	1.3	2	66.7	1	33.3		
C91-C96 Leukaemia	7	3.1	2	28.6	5	71.4		
Other primaries	16	7.0	3	18.8	3	18.8	10	62.5
All mult. primaries	228	100.0	104	45.6	39	17.1	85	37.3

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 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 ←%
C09-C10 Oropharynx	6	3.4					6	100.0
C15 Oesophagus	3	1.7	1	33.3	1	33.3	1	33.3
C16 Stomach	3	1.7	1	33.3	1	33.3	1	33.3
C17 Small intestine	3	1.7	1	33.3	1	33.3	1	33.3
C18 Colon	11	6.2	4	36.4	2	18.2	5	45.5
C19-C20 Rectum	2	1.1	1	50.0	1	50.0		
C22 Liver	4	2.2	1	25.0	3	75.0		
C23-C24 Bile	2	1.1	1	50.0			1	50.0
C25 Pancreas	3	1.7	2	66.7			1	33.3
C33-C34 Lung	14	7.9	5	35.7	3	21.4	6	42.9
C43 Malign. melanoma	5	2.8	2	40.0	2	40.0	1	20.0
C44 Skin others	4	2.2	4	100.0				
C50 Breast	44	24.7	22	50.0	3	6.8	19	43.2
C53 Cervix uteri	7	3.9	4	57.1	1	14.3	2	28.6
C54 Corpus uteri	15	8.4	15	100.0				
C55,C57 Fem. genitals un	6	3.4	4	66.7	2	33.3		
C56 Ovary	13	7.3	4	30.8	2	15.4	7	53.8
C64 Kidney	5	2.8	3	60.0	1	20.0	1	20.0
C66 Ureter	2	1.1	2	100.0				
C67 Bladder	5	2.8	5	100.0				
C70-C72 CNS cancer	2	1.1	1	50.0	1	50.0		
C74-C80 Cancer others	2	1.1	1	50.0	1	50.0		
C76-C79 CUP	2	1.1			2	100.0		
C82-C85 NHL	6	3.4	4	66.7			2	33.3
Other primaries	9	5.1	6	66.7	1	11.1	2	22.2
All mult. primaries	178	100.0	94	52.8	28	15.7	56	31.5

Multiple primaries with number of cases 1 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	1		0.1	1.00	0.0		3.6	
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24	1		0.1	1.00	0.0		1.2	
25-29	1	1	0.0	0.50	0.0	1.00	1.0	0.9
30-34	6	2	0.3	1.20	0.1	1.00	3.3	1.0
35-39	8	8	0.3	0.73	0.3	0.73	2.1	1.7
40-44	11	9	0.4	0.85	0.4	1.00	1.4	0.9
45-49	34	16	1.4	0.79	0.7	0.59	2.1	0.9
50-54	50	30	2.5	0.82	1.5	0.94	1.7	1.2
55-59	89	49	4.9	0.97	2.5	0.89	1.7	1.2
60-64	100	73	5.6	0.89	3.9	0.95	1.3	1.4
65-69	139	71	8.8	0.89	4.1	0.91	1.4	1.1
70-74	139	98	10.9	1.01	6.5	0.84	1.3	1.3
75-79	139	138	16.8	0.85	11.6	0.83	1.4	1.6
80-84	113	161	22.6	0.84	17.3	0.70	1.4	1.8
85+	121	312	35.5	0.73	34.9	0.79	1.8	2.8
All ages	952	968					1.5	1.7
Mortality								
Raw			3.2	0.87	3.1	0.81		
WS			1.6	0.87	1.1	0.83		
ES			2.5	0.86	1.7	0.83		
BRD-S			3.3	0.86	2.3	0.81		
PYLL-70								
per 100,000			17.9		10.7			
ES			16.0		9.1			
AYLL-70			10.9		11.0			

* 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	1		0.1	1.00	0.0		3.7	
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24	1		0.1	1.00	0.0		1.3	
25-29	1	1	0.0	0.50	0.0	1.00	1.1	1.0
30-34	6	2	0.3	1.20	0.1	1.00	3.4	1.1
35-39	8	8	0.3	0.80	0.3	0.73	2.2	1.9
40-44	10	8	0.4	0.83	0.3	0.89	1.3	0.9
45-49	32	14	1.4	0.84	0.6	0.61	2.1	0.9
50-54	42	28	2.1	0.84	1.4	0.93	1.6	1.2
55-59	78	44	4.3	0.94	2.3	0.94	1.7	1.2
60-64	88	63	5.0	0.84	3.4	0.86	1.3	1.4
65-69	133	67	8.4	0.89	3.9	0.91	1.6	1.2
70-74	131	92	10.2	0.98	6.1	0.81	1.5	1.4
75-79	128	135	15.5	0.80	11.4	0.83	1.6	1.9
80-84	105	155	21.0	0.78	16.6	0.68	1.6	2.1
85+	118	307	34.6	0.73	34.3	0.78	2.2	3.2
All ages	882	924					1.6	1.8
Mortality								
Raw			3.0	0.84	3.0	0.79		
WS			1.5	0.85	1.0	0.82		
ES			2.3	0.84	1.6	0.81		
BRD-S			3.1	0.83	2.1	0.80		
PYLL-70								
per 100,000			16.2		9.8			
ES			14.4		8.3			
AYLL-70			10.9		11.0			

* See corresponding tables with multiple primaries.

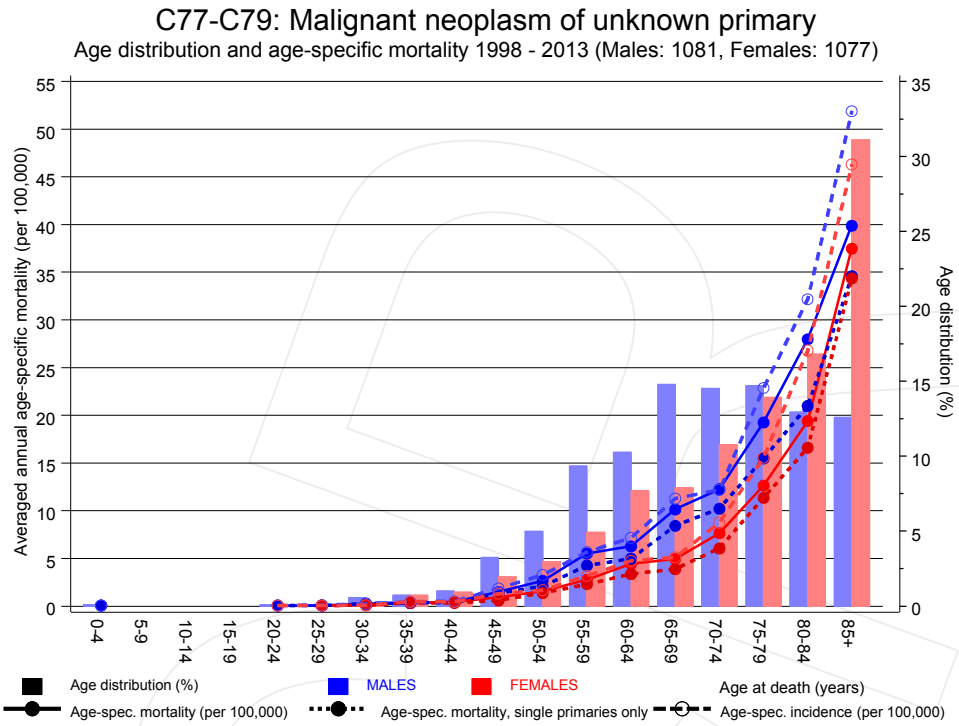
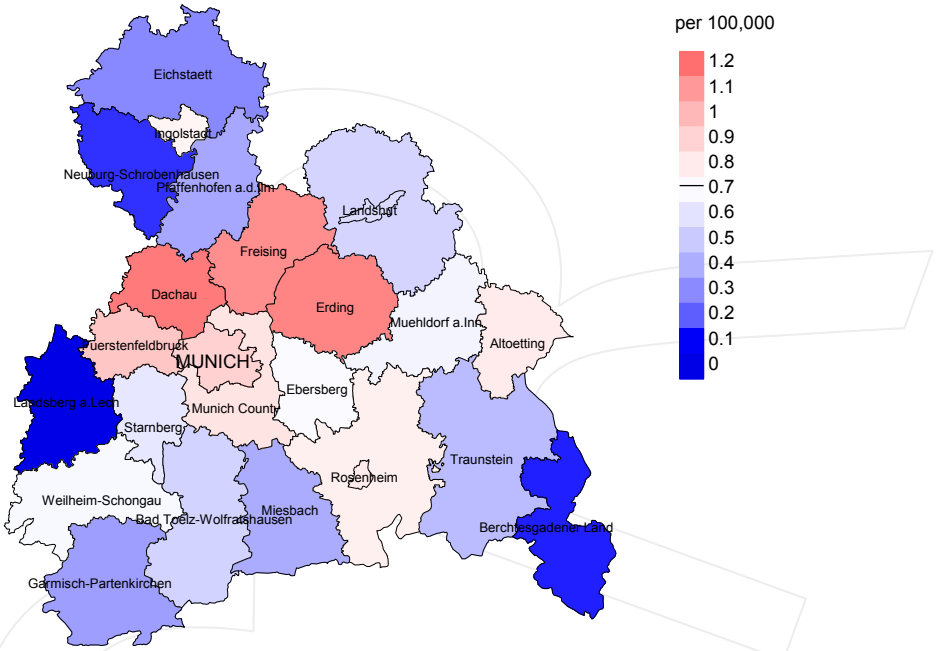


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

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



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

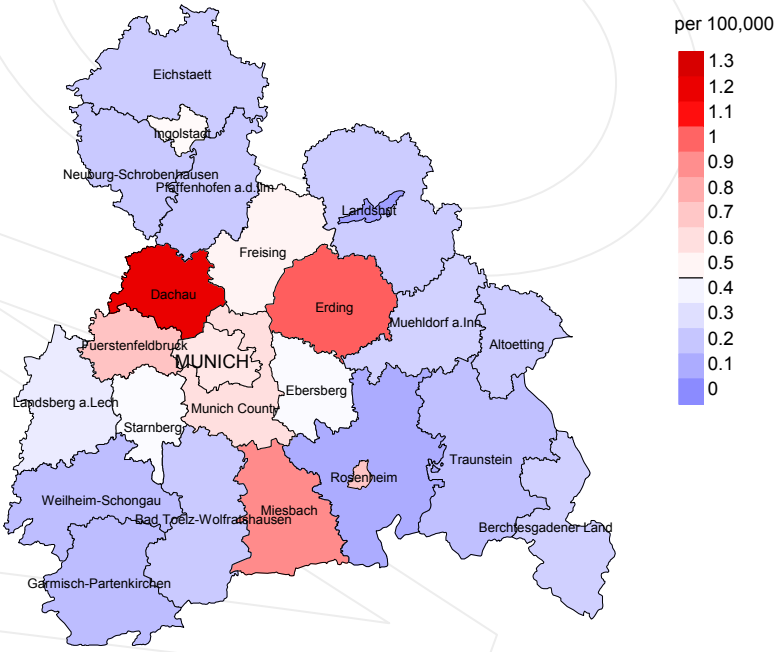
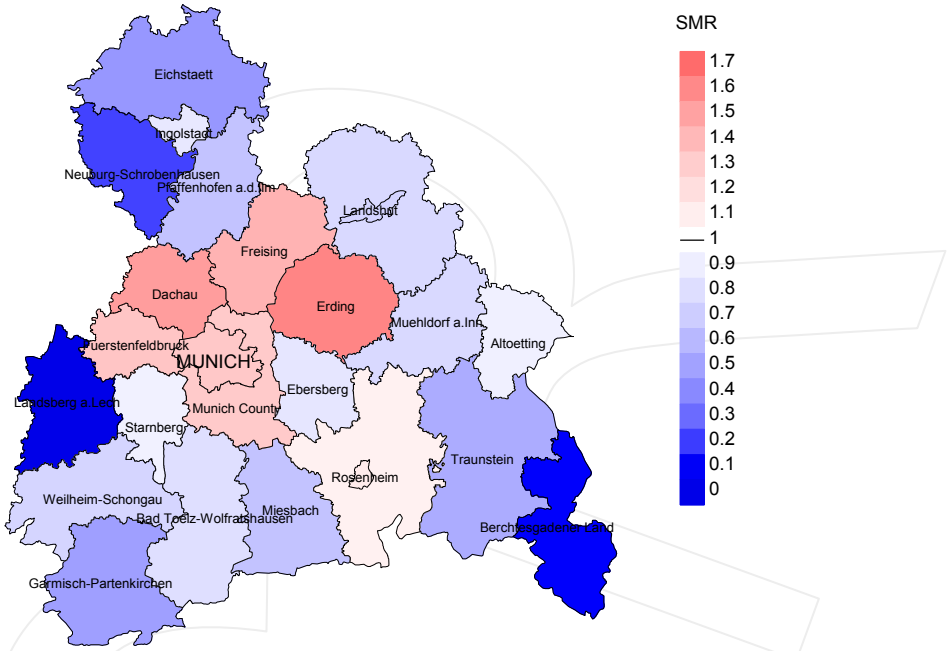


Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2013. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 0.7/100,000 WS N=255, females 0.5/100,000 WS N=256).

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 8 women died from unknown primary. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.4/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.1 and 1.2/100,000.

Standardized mortality ratio (SMR) 2007 - 2013: Males



Standardized mortality ratio (SMR) 2007 - 2013: Females

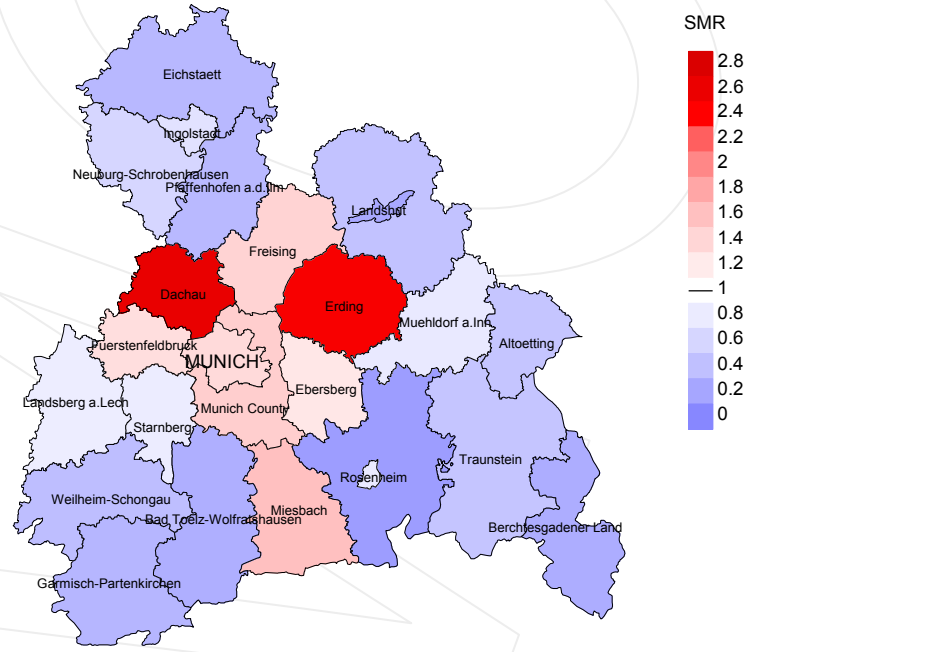


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=255, females N=256).

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 8 women died from unknown primary. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.25. Though, the value of this parameter may vary with an underlying probability of 99% between 0.40 and 2.90, 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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