Munich Cancer Registry

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

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

Cancer statistics: Baseline statistics

C45-C49: Mesoth. and soft tissue ca.

Year of diagnosis	1998-2013
Patients	4,048
Diseases	4,059
Creation date	05/19/2015
Export date	12/30/2014
Population	4.64 m

http://www.tumorregister-muenchen.de/en/facts/base/base_C4549E.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
C45.-	Mesothelioma
C46.-	Kaposi sarcoma
C47.-	Malignant neoplasm of peripheral nerves and autonomic nervous system
C48.-	Malignant neoplasm of retroperitoneum and peritoneum
C49.-	Malignant neoplasm of other connective and soft tissue

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	155	24	15.5	20.0	83.2	100.0	
1999	153	17	11.1	29.4	71.2	98.7	
2000	157	32	20.4	22.3	68.8	98.1	
2001	141	23	16.3	10.6	71.6	98.6	
2002	226	34	15.0	20.4	76.5	98.2	#
2003	248	31	12.5	22.2	75.0	97.2	
2004	258	30	11.6	20.2	67.4	98.1	
2005	269	16	5.9	21.9	69.5	95.2	
2006	241	19	7.9	26.1	66.8	96.3	
2007	333	16	4.8	24.3	62.2	87.4	# ##
2008	330	16	4.8	22.7	68.5	84.8	
2009	317	12	3.8	27.1	60.9	79.8	
2010	337	17	5.0	28.8	58.8	78.0	
2011	348	13	3.7	29.0	53.7	77.9	
2012	311	17	5.5	23.5	46.6	79.4	
2013	235	16	6.8	27.7	34.9	99.6	###
1998-2013	4059	333	8.2	24.1	63.2	89.7	

\# 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	155	87	68	56.1
1999	153	88	65	57.5
2000	157	90	67	57.3
2001	141	71	70	50.4
2002	226	130	96	57.5
2003	248	125	123	50.4
2004	258	166	92	64.3
2005	269	149	120	55.4
2006	241	142	99	58.9
2007	333	182	151	54.7
2008	330	186	144	56.4
2009	317	173	144	54.6
2010	337	179	158	53.1
2011	348	185	163	53.2
2012	311	175	136	56.3
2013	235	123	112	52.3
1998-2013	4059	2251	1808	55.5

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	68	7.9	5.8	5.5	3.4	7.2	4.3	8.6	5.1
1999	88	65	7.9	5.5	5.4	3.3	7.1	4.3	8.5	5.0
2000	90	67	7.9	5.6	5.5	3.5	7.2	4.2	8.5	5.0
2001	71	70	6.1	5.8	4.2	3.4	5.7	4.5	6.9	5.2
2002	130	96	7.0	4.9	4.9	2.9	6.2	3.8	7.4	4.4
2003	125	123	6.7	6.2	4.4	3.5	5.8	4.5	7.0	5.4
2004	166	92	8.8	4.7	5.7	3.0	7.4	3.6	8.7	4.1
2005	149	120	7.9	6.0	5.5	3.7	6.8	4.5	7.7	5.4
2006	142	99	7.4	4.9	4.5	3.1	6.1	3.8	7.6	4.4
2007	182	151	8.2	6.5	5.1	3.6	6.6	4.7	8.0	5.5
2008	186	144	8.4	6.2	5.0	3.3	6.7	4.4	7.9	5.2
2009	173	144	7.8	6.2	4.3	3.3	6.0	4.5	7.6	5.4
2010	179	158	7.9	6.8	4.9	3.5	6.4	4.7	7.6	5.7
2011	185	163	8.1	6.9	4.5	3.5	6.2	4.6	7.7	5.6
2012	175	136	7.7	5.8	4.2	3.2	5.8	4.0	7.2	4.7
2013	123	112	5.4	4.7	3.1	2.4	4.1	3.2	5.2	3.9
1998-2013	2251	1808	7.6	5.8	4.7	3.3	6.2	4.2	7.6	5.0

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	155	61.2	19.9	0.4	93.2	33.1	53.1	64.7	75.4	85.0
1999	153	61.7	16.3	3.5	97.4	39.8	52.9	64.2	73.0	78.9
2000	157	60.3	21.8	0.2	97.1	28.9	51.7	62.5	77.7	85.6
2001	141	61.6	16.3	11.8	95.4	40.7	51.1	62.5	73.1	82.0
2002	226	60.9	20.4	0.0	93.0	31.8	50.3	65.1	74.8	82.9
2003	248	63.0	19.3	2.6	92.5	32.4	55.8	66.7	77.0	83.4
2004	258	61.7	19.3	0.0	96.1	34.7	54.3	66.5	74.0	81.9
2005	269	60.5	20.5	0.2	92.0	31.7	51.4	65.4	74.1	82.3
2006	241	62.8	19.2	0.3	103	36.7	55.1	66.0	77.2	82.5
2007	333	63.6	18.5	0.1	96.4	39.2	58.0	67.8	75.5	81.1
2008	330	64.9	18.0	0.0	101	40.2	57.1	68.9	76.3	84.1
2009	317	66.1	16.5	0.2	97.3	42.7	59.0	68.7	77.6	83.5
2010	337	64.1	18.6	0.1	97.3	36.5	56.0	68.8	76.5	82.8
2011	348	66.2	17.3	0.0	96.8	41.9	58.4	70.3	77.9	83.9
2012	311	66.5	18.2	0.4	98.4	44.5	59.9	70.8	78.2	84.7
2013	235	66.3	17.8	0.0	96.7	42.9	58.3	70.6	77.3	85.5
1998-2013	4059	63.6	18.7	0.0	103	37.8	55.5	67.6	76.4	83.1

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	59.7	19.1	0.4	90.8	33.0	51.1	63.3	72.4	82.5
1999	88	61.4	16.7	3.5	97.4	39.4	54.5	63.4	72.1	78.4
2000	90	60.0	21.2	0.2	92.9	30.2	53.1	61.7	77.7	85.5
2001	71	62.1	16.9	11.8	95.4	43.0	51.5	63.7	73.7	81.4
2002	130	59.5	21.4	0.1	92.4	30.5	48.5	64.6	74.3	82.4
2003	125	61.3	19.4	7.6	90.3	31.0	55.4	66.2	74.8	82.7
2004	166	62.2	18.0	0.0	90.7	39.0	56.0	66.8	72.7	79.5
2005	149	58.9	20.2	0.2	90.9	34.9	50.5	64.0	71.7	80.8
2006	142	63.5	18.0	0.3	90.3	38.9	56.2	67.3	76.8	81.9
2007	182	63.0	19.1	0.1	96.4	37.3	57.8	68.2	74.6	79.5
2008	186	64.6	17.7	0.0	95.2	41.8	59.9	68.3	74.7	82.3
2009	173	66.8	17.7	0.2	97.3	41.4	61.6	69.6	79.2	83.8
2010	179	62.9	19.4	0.1	92.7	35.1	54.4	67.8	76.0	82.8
2011	185	65.5	17.4	0.0	95.3	38.6	58.3	70.5	76.5	83.4
2012	175	67.1	17.4	0.4	95.5	46.6	62.5	71.3	76.7	84.1
2013	123	65.7	18.0	0.0	92.4	39.3	60.8	69.5	77.2	82.6
1998-2013	2251	63.2	18.7	0.0	97.4	36.9	55.9	67.6	75.2	82.3

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	68	63.0	20.9	3.4	93.2	33.1	54.6	67.2	77.6	85.2
1999	65	62.2	15.8	17.4	88.4	40.1	50.8	64.6	74.1	81.3
2000	67	60.6	22.7	0.4	97.1	28.1	46.9	64.9	78.0	87.6
2001	70	61.1	15.7	21.1	85.9	40.2	50.1	61.5	73.0	82.5
2002	96	62.7	18.7	0.0	93.0	39.0	53.4	65.8	75.8	83.4
2003	123	64.7	19.1	2.6	92.5	38.2	56.2	67.6	78.7	83.6
2004	92	61.0	21.5	0.2	96.1	30.8	49.8	65.9	76.6	83.7
2005	120	62.4	20.7	1.1	92.0	28.8	52.8	68.0	77.8	82.5
2006	99	61.8	21.0	1.6	103	33.8	53.7	64.8	78.2	83.9
2007	151	64.3	17.7	0.3	89.4	42.4	58.0	67.5	76.8	82.1
2008	144	65.3	18.4	4.4	101	39.5	55.0	69.5	79.5	86.2
2009	144	65.3	15.0	2.2	94.3	45.8	58.1	66.8	76.4	81.9
2010	158	65.4	17.7	0.9	97.3	40.1	56.4	70.0	77.3	83.0
2011	163	67.0	17.2	0.0	96.8	42.6	59.0	70.3	79.4	85.2
2012	136	65.6	19.2	0.4	98.4	42.6	58.6	69.7	79.5	84.9
2013	112	66.9	17.5	15.1	96.7	45.6	56.2	70.9	77.5	87.4
1998-2013	1808	64.2	18.6	0.0	103	39.4	55.0	67.6	77.4	84.0

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	77	1.9	1.9	52	2.3	2.3	25	1.4	1.4
5-9	21	0.5	2.4	13	0.6	2.9	8	0.4	1.8
10-14	24	0.6	3.0	12	0.5	3.4	12	0.7	2.5
15-19	31	0.8	3.8	15	0.7	4.1	16	0.9	3.4
20-24	39	1.0	4.7	22	1.0	5.1	17	0.9	4.3
25-29	58	1.4	6.2	28	1.2	6.3	30	1.7	6.0
30-34	94	2.3	8.5	54	2.4	8.7	40	2.2	8.2
35-39	119	2.9	11.4	75	3.3	12.0	44	2.4	10.6
40-44	147	3.6	15.0	72	3.2	15.2	75	4.1	14.8
45-49	152	3.7	18.8	72	3.2	18.4	80	4.4	19.2
50-54	220	5.4	24.2	120	5.3	23.8	100	5.5	24.7
55-59	318	7.8	32.0	168	7.5	31.2	150	8.3	33.0
60-64	430	10.6	42.6	249	11.1	42.3	181	10.0	43.0
65-69	585	14.4	57.0	360	16.0	58.3	225	12.4	55.5
70-74	609	15.0	72.0	368	16.3	74.6	241	13.3	68.8
75-79	481	11.9	83.9	256	11.4	86.0	225	12.4	81.3
80-84	369	9.1	93.0	179	8.0	94.0	190	10.5	91.8
85+	285	7.0	100.0	136	6.0	100.0	149	8.2	100.0
All ages	4059	100.0		2251	100.0		1808	100.0	

Included in the statistics are 29.2% multiple primaries in males and 31.2% 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=195 %	Females DCO rate n=138 %	Males Prop.all cancers n=158258 %	Females Prop.all cancers n=153136 %
0- 4	52	25	3.5	1.8	3.8		16.0	10.2
5- 9	13	8	0.9	0.6			7.4	6.4
10-14	12	12	0.8	0.8			7.2	7.1
15-19	15	16	1.0	1.1	6.7	6.3	4.2	5.5
20-24	22	17	1.2	1.0	4.5		3.6	3.2
25-29	28	30	1.4	1.5			2.9	2.7
30-34	54	40	2.4	1.8	1.9	2.5	3.6	1.9
35-39	75	44	3.0	1.9	6.7	2.3	3.3	1.2
40-44	72	75	2.7	3.0	1.4	2.7	2.2	1.2
45-49	72	80	3.0	3.5	9.7	2.5	1.3	0.9
50-54	120	100	5.9	4.9	8.3	3.0	1.4	0.9
55-59	168	150	9.2	7.8	7.7	5.3	1.2	1.1
60-64	248	181	14.0	9.6	6.9	2.2	1.1	1.0
65-69	360	225	22.8	13.0	6.4	2.2	1.3	1.2
70-74	368	241	28.7	15.9	7.9	5.8	1.4	1.3
75-79	256	224	31.0	18.9	11.7	8.9	1.2	1.3
80-84	179	190	35.8	20.4	17.9	17.9	1.3	1.2
85+	135	149	39.6	16.7	17.0	28.9	1.4	0.9
All ages	2249	1807			8.7	7.6	1.4	1.2
Incidence								
Raw			7.6	5.8				
WS			4.7	3.3				
ES			6.2	4.2				
BRD-S			7.5	5.0				

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 %
C03-C06 Oral cavity	3	0.5	6.1	1.3	17.9	#	5.9	
C09-C10 Oropharynx	2	0.6	3.4	0.4	12.1		3.3	
C15 Oesophagus	3	1.0	3.0	0.6	8.7		4.7	33.3
C16 Stomach	7	2.4	2.9	1.2	5.9	#	10.8	
C17 Small intestine	2	0.3	7.2	0.9	26.1		4.1	
C18 Colon	9	5.7	1.6	0.7	3.0		7.7	
C19-C20 Rectum	4	3.2	1.3	0.3	3.2		1.9	
C22 Liver	3	1.6	1.9	0.4	5.6		3.4	33.3
C23-C24 Bile	2	0.6	3.6	0.4	12.9		3.4	
C25 Pancreas	2	2.0	1.0	0.1	3.5		-0.1	50.0
C30-C31 Sinuses	2	0.1	20.8	2.5	75.1	#	4.5	
C33-C34 Lung	19	6.7	2.8	1.7	4.4	#	29.0	52.6
C43 Malign. melanoma	8	2.3	3.5	1.5	6.8	#	13.4	12.5
C46,C49 Soft tissue	3	0.3	9.3	1.9	27.1	#	6.3	
C61 Prostate	25	17.2	1.4	0.9	2.1		18.3	4.0
C64 Kidney	9	2.0	4.5	2.0	8.5	#	16.5	
C67 Bladder	5	2.6	1.9	0.6	4.5		5.7	20.0
C70-C72 CNS cancer	2	0.8	2.6	0.3	9.3		2.9	50.0
C82-C85 NHL	8	2.3	3.5	1.5	6.9	#	13.5	
C91-C96 Leukaemia	4	1.0	4.2	1.1	10.6	#	7.2	
Other primaries	11	3.9	2.8	1.4	5.0	#	16.7	
Not observed	0	1.5	0.0	0.0	2.5		-3.4	
All mult. primaries	133	58.5	2.3	1.9	2.7	#	175.7	12.8

Patients	1473
Median age at second malignancy (years)	72.3
Person-years	4238
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 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 %
C16	Stomach	2	1.3	1.6	0.2	5.7		1.9	
C18	Colon	4	3.5	1.1	0.3	2.9		1.4	
C19-C20	Rectum	6	1.5	3.9	1.4	8.5	#	11.7	
C25	Pancreas	2	1.5	1.3	0.2	4.8		1.3	50.0
C33-C34	Lung	6	2.5	2.4	0.9	5.2		9.1	33.3
C43	Malign. melanoma	3	1.3	2.3	0.5	6.6		4.4	
C46,C49	Soft tissue	4	0.2	19.2	5.2	49.3	#	9.9	25.0
C50	Breast	19	11.1	1.7	1.0	2.7	#	20.8	5.3
C53	Cervix uteri	3	0.5	5.5	1.1	16.2	#	6.4	
C54	Corpus uteri	6	2.0	3.0	1.1	6.6	#	10.5	
C56	Ovary	21	1.5	14.1	8.7	21.6	#	51.1	76.2
C64	Kidney	5	0.9	5.7	1.8	13.2	#	10.8	
C70-C72	CNS cancer	2	0.5	3.9	0.5	14.2		3.9	
C73	Thyroid	2	0.7	2.8	0.3	10.0		3.4	
C82-C85	NHL	4	1.3	3.0	0.8	7.6		6.9	
C91-C96	Leukaemia	3	0.6	5.3	1.1	15.6	#	6.4	
Other primaries		6	1.2	5.2	1.9	11.3	#	12.7	16.7
Not observed		0	3.9	0.0	0.0	1.0	#	-10.1	
All mult. primaries		98	35.9	2.7	2.2	3.3	#	162.4	22.4

Patients	1134
Median age at second malignancy (years)	72.0
Person-years	3820
Mean observation time (years)	3.4
Median observation time (years)	2.0

The occurrence of second malignancy is statistically significant.

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

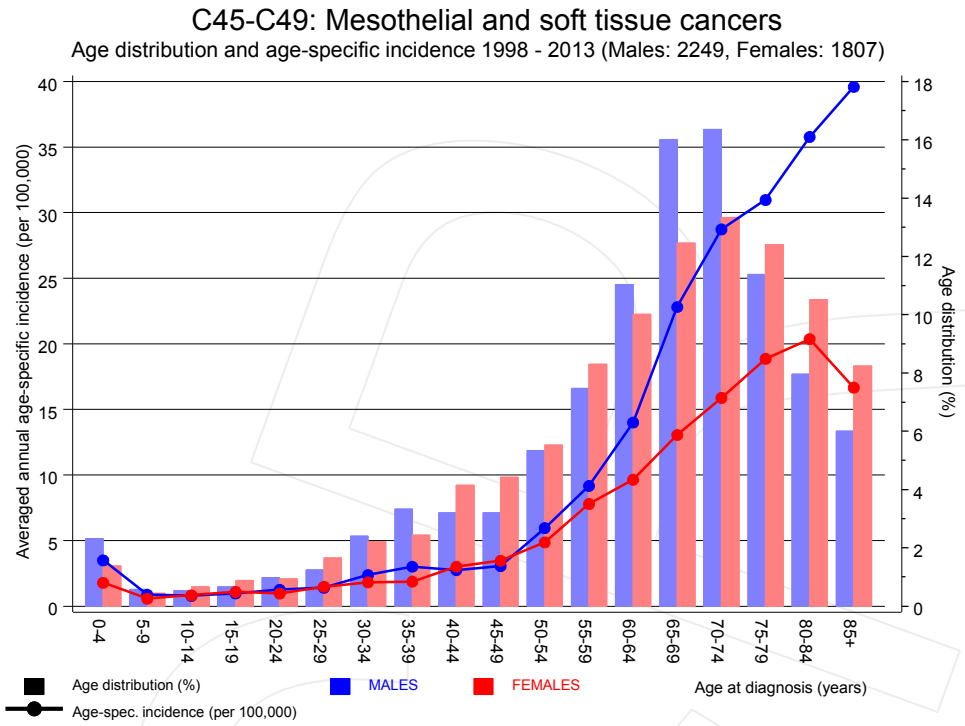


Figure 7. Age distribution and age-specific incidence

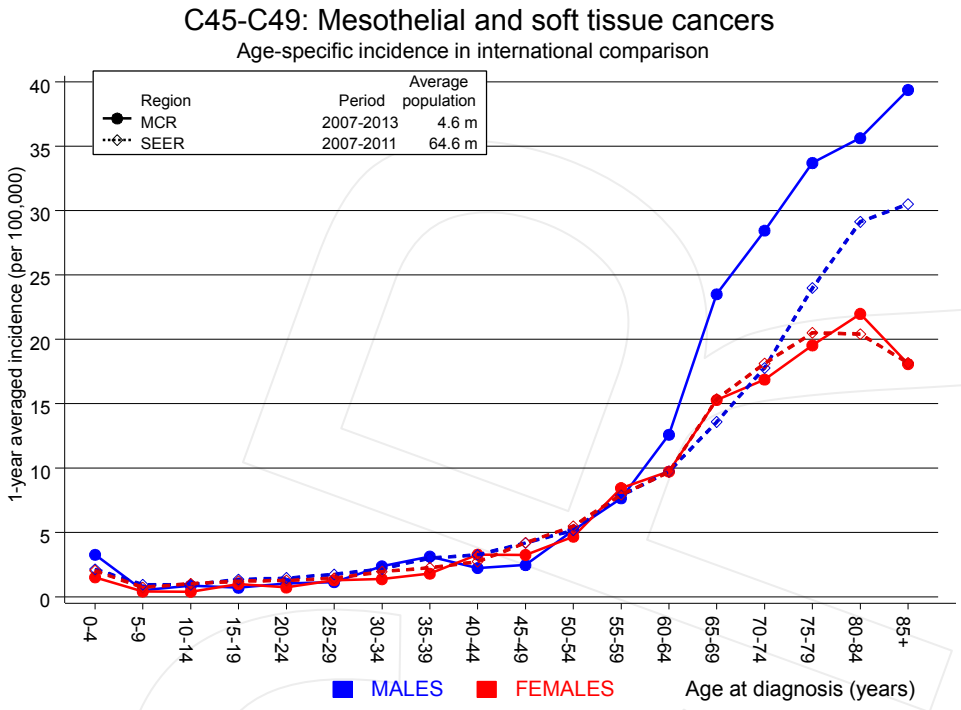


Figure 7a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

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.

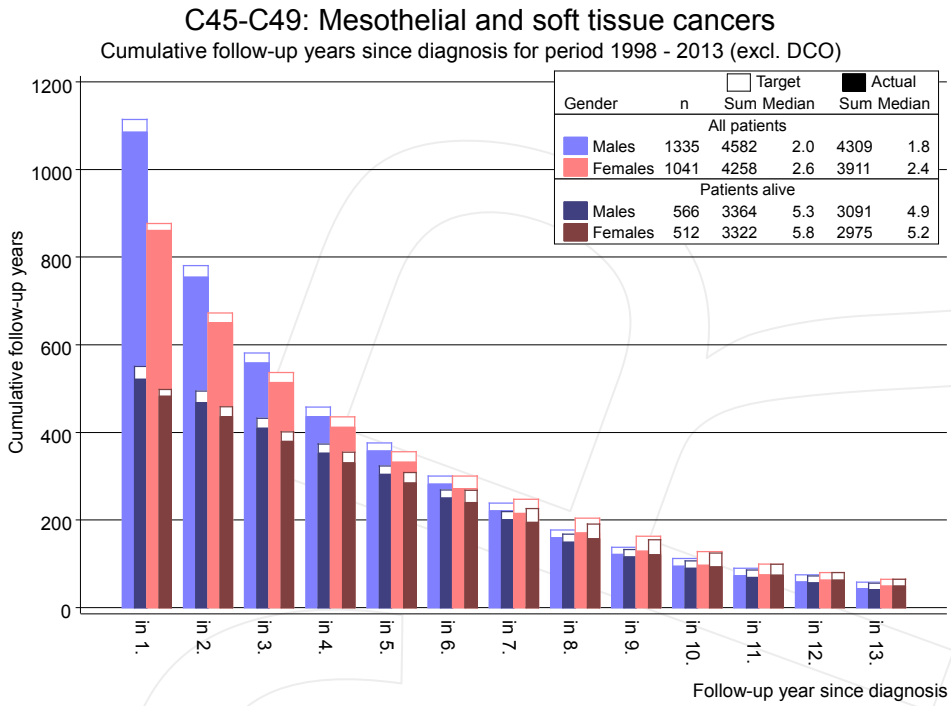
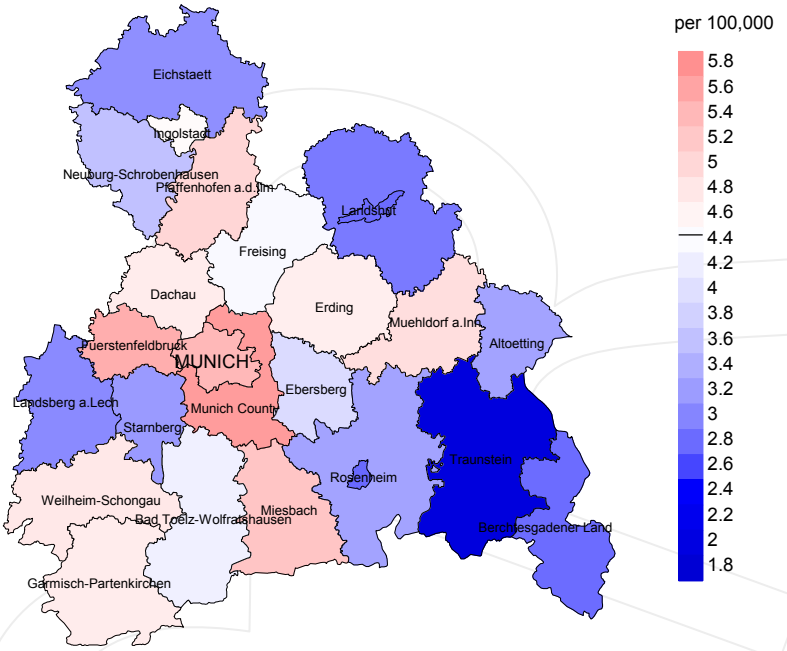


Figure 8. Cumulative follow-up years depending on time since diagnosis

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

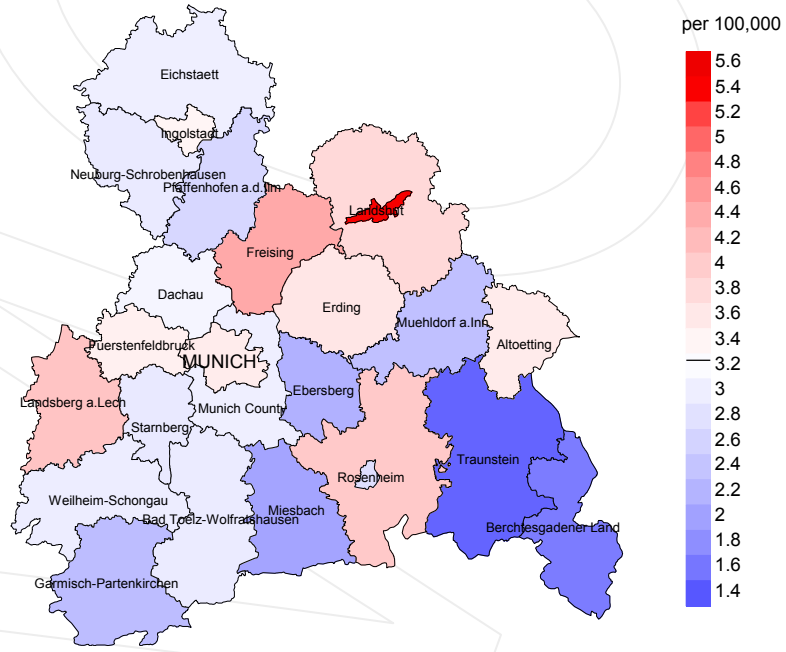
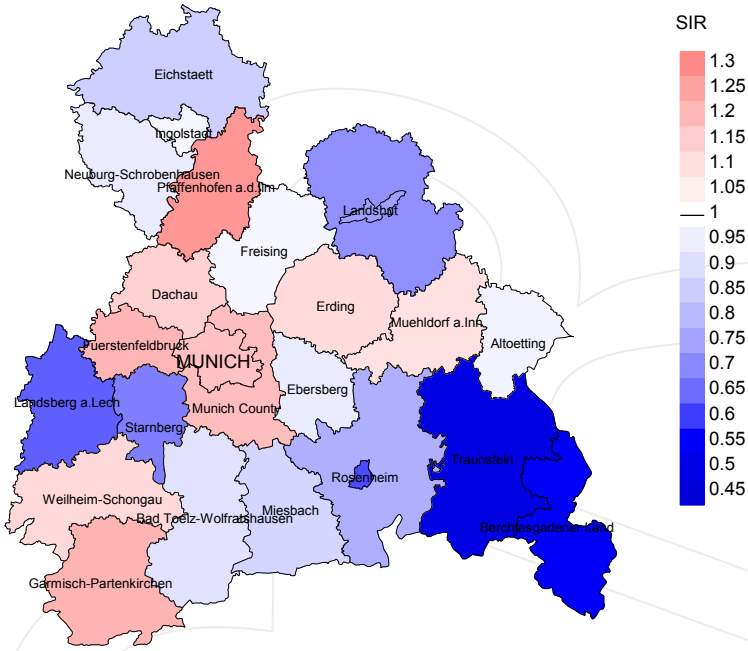


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 4.4/100,000 WS N=1,201, females 3.2/100,000 WS N=1,007).

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 19 women were identified with newly diagnosed mesoth. and soft tissue ca.. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 2.2/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.9 and 4.9/100,000.

Standardized incidence ratio (SIR) 2007 - 2013: Males



Standardized incidence ratio (SIR) 2007 - 2013: Females

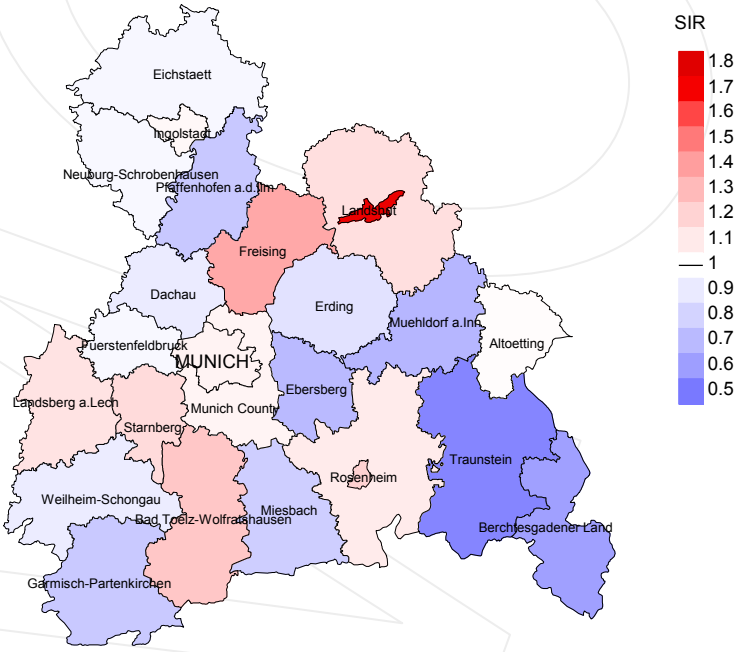


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=1,201, females N=1,007).

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 19 women were identified with newly diagnosed mesoth. and soft tissue ca.. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.70. Though, the value of this parameter may vary with an underlying probability of 99% between 0.36 and 1.23, 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	155	100.0	15.5	129	83.2	94.6
1999	153	98.7	11.1	109	71.2	93.6
2000	157	98.1	20.4	108	68.8	97.2
2001	141	98.6	16.3	101	71.6	95.0
2002	226	98.2	15.0	173	76.5	95.4
2003	248	97.2	12.5	186	75.0	95.2
2004	258	98.1	11.6	174	67.4	98.3
2005	269	95.2	5.9	187	69.5	97.3
2006	241	96.3	7.9	161	66.8	98.8
2007	333	87.4	4.8	207	62.2	98.6
2008	330	84.8	4.8	226	68.5	98.2
2009	317	79.8	3.8	193	60.9	95.9
2010	337	78.0	5.0	198	58.8	96.5
2011	348	77.9	3.7	187	53.7	96.8
2012	311	79.4	5.5	145	46.6	93.1
2013	235	99.6	6.8	82	34.9	95.1
1998-2013	4059	89.7	8.2	2566	63.2	96.5

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	155	116	94.8	45	29.0
1999	153	95	91.6	31	20.3
2000	157	110	94.5	37	23.6
2001	141	104	94.2	38	27.0
2002	226	147	96.6	63	27.9
2003	248	137	93.4	63	25.4
2004	258	173	96.5	60	23.3
2005	269	179	97.8	56	20.8
2006	241	178	96.6	50	20.7
2007	333	199	98.0	59	17.7
2008	330	198	98.5	67	20.3
2009	317	229	97.8	60	18.9
2010	337	241	98.3	64	19.0
2011	348	245	98.4	78	22.4
2012	311	248	99.2	66	21.2
2013	235	220	97.7	59	25.1
1998-2013	4059	2819	97.1	896	22.1

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	116	76.7	23.3	93.6
1999	95	83.2	16.8	95.4
2000	110	86.4	13.6	96.2
2001	104	90.4	9.6	98.0
2002	147	85.0	15.0	93.7
2003	137	88.3	11.7	91.4
2004	173	86.7	13.3	92.8
2005	179	89.9	10.1	92.6
2006	178	88.2	11.8	91.3
2007	199	87.9	12.1	94.9
2008	198	90.4	9.6	92.8
2009	229	87.3	12.7	90.6
2010	241	89.2	10.8	91.6
2011	245	86.9	13.1	91.7
2012	248	85.9	14.1	92.3
2013	220	89.5	10.5	94.0
1998-2013	2819	87.4	12.6	92.9

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	69	69.1	69.1	69.2	69.2
1999	62	68.2	65.6	75.9	67.7
2000	63	66.8	66.3	78.8	66.3
2001	56	65.1	64.6	77.7	65.6
2002	89	68.3	67.7	79.0	67.7
2003	75	69.5	66.7	88.3	66.5
2004	101	70.7	69.8	79.4	70.7
2005	108	69.1	69.1	69.6	69.1
2006	102	71.5	72.1	71.1	72.2
2007	131	69.7	69.5	73.7	69.5
2008	121	71.6	71.3	79.7	71.1
2009	133	72.1	71.1	83.1	71.4
2010	137	74.1	73.2	78.0	73.8
2011	140	75.0	74.3	80.7	74.4
2012	138	74.0	73.1	79.8	73.5
2013	122	74.2	73.6	85.0	74.0
1998-2013	1647	71.4	70.7	79.0	71.1

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	47	75.5	71.2	85.4	74.5
1999	33	67.7	67.6	70.2	70.6
2000	47	77.2	78.5	75.2	78.1
2001	48	69.9	70.1	60.9	70.5
2002	58	67.7	64.9	80.3	67.6
2003	62	74.0	69.9	82.6	72.2
2004	72	73.2	71.3	84.3	71.9
2005	71	75.0	73.3	77.5	73.5
2006	76	75.5	74.5	83.0	75.1
2007	68	73.9	73.1	79.0	73.1
2008	77	76.7	72.2	89.3	73.5
2009	96	74.0	72.9	86.2	73.7
2010	104	74.8	72.8	88.9	72.8
2011	105	77.0	75.8	84.8	76.0
2012	110	77.2	75.0	85.0	75.8
2013	98	74.7	73.1	93.6	73.3
1998-2013	1172	74.8	73.0	84.1	74.1

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	53	4.8	0.61	3.1	0.56	4.4	0.60	5.3	0.62
1999	53	4.7	0.60	3.2	0.60	4.3	0.61	5.2	0.62
2000	55	4.8	0.61	3.1	0.56	4.3	0.60	5.2	0.62
2001	49	4.2	0.69	2.8	0.66	3.7	0.64	4.4	0.64
2002	74	4.0	0.57	2.3	0.47	3.4	0.54	4.2	0.57
2003	66	3.5	0.53	2.2	0.49	3.0	0.51	3.8	0.54
2004	87	4.6	0.52	2.8	0.49	3.8	0.52	4.9	0.57
2005	97	5.1	0.65	3.0	0.54	4.1	0.60	5.2	0.67
2006	91	4.8	0.64	2.5	0.56	3.7	0.61	4.9	0.64
2007	117	5.3	0.64	2.9	0.56	4.1	0.62	5.3	0.66
2008	110	4.9	0.59	2.5	0.49	3.7	0.56	4.9	0.62
2009	113	5.1	0.65	2.4	0.57	3.6	0.61	4.8	0.63
2010	118	5.2	0.66	2.4	0.49	3.7	0.58	5.1	0.66
2011	122	5.3	0.66	2.5	0.56	3.8	0.62	5.2	0.68
2012	121	5.3	0.69	2.5	0.61	3.8	0.66	5.1	0.70
2013	107	4.7	0.88	2.3	0.74	3.3	0.80	4.4	0.86
1998-2013	1433	4.8	0.64	2.6	0.55	3.8	0.61	4.9	0.65

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	36	3.1	0.53	1.6	0.48	2.2	0.51	2.8	0.54
1999	26	2.2	0.40	1.4	0.41	1.7	0.39	2.0	0.40
2000	40	3.3	0.60	1.3	0.37	2.0	0.46	2.7	0.54
2001	45	3.7	0.64	2.0	0.58	2.6	0.58	3.2	0.62
2002	51	2.6	0.53	1.5	0.52	1.9	0.52	2.3	0.53
2003	55	2.8	0.45	1.5	0.42	1.9	0.41	2.3	0.42
2004	63	3.2	0.68	1.5	0.51	2.2	0.60	2.8	0.67
2005	64	3.2	0.53	1.4	0.38	2.0	0.44	2.6	0.49
2006	66	3.3	0.67	1.5	0.48	2.1	0.55	2.8	0.62
2007	58	2.5	0.38	1.0	0.28	1.5	0.32	2.1	0.37
2008	69	3.0	0.48	1.2	0.37	1.8	0.40	2.3	0.44
2009	87	3.7	0.60	1.6	0.48	2.3	0.50	3.0	0.55
2010	97	4.1	0.61	1.8	0.52	2.6	0.56	3.4	0.59
2011	91	3.9	0.56	1.4	0.41	2.1	0.46	2.9	0.53
2012	92	3.9	0.68	1.6	0.50	2.3	0.58	3.1	0.65
2013	90	3.8	0.80	1.6	0.67	2.3	0.72	2.9	0.75
1998-2013	1030	3.3	0.57	1.5	0.46	2.1	0.50	2.7	0.54

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	11	0.4	0.4	9	0.6	0.6	2	0.2	0.2
5-9	11	0.4	0.9	5	0.3	1.0	6	0.6	0.8
10-14	5	0.2	1.1	3	0.2	1.2	2	0.2	1.0
15-19	10	0.4	1.5	4	0.3	1.5	6	0.6	1.5
20-24	16	0.6	2.1	8	0.6	2.0	8	0.8	2.3
25-29	20	0.8	3.0	11	0.8	2.8	9	0.9	3.2
30-34	25	1.0	4.0	15	1.0	3.8	10	1.0	4.2
35-39	30	1.2	5.2	19	1.3	5.1	11	1.1	5.2
40-44	50	2.0	7.2	26	1.8	6.9	24	2.3	7.5
45-49	59	2.4	9.6	35	2.4	9.4	24	2.3	9.9
50-54	85	3.4	13.0	53	3.7	13.1	32	3.1	12.9
55-59	155	6.3	19.3	88	6.1	19.2	67	6.5	19.4
60-64	258	10.4	29.7	157	10.9	30.1	101	9.8	29.2
65-69	379	15.3	45.0	256	17.8	47.9	123	11.9	41.1
70-74	413	16.7	61.7	270	18.8	66.6	143	13.8	54.9
75-79	377	15.2	77.0	204	14.2	80.8	173	16.7	71.6
80-84	321	13.0	89.9	160	11.1	91.9	161	15.6	87.1
85+	249	10.1	100.0	116	8.1	100.0	133	12.9	100.0
All ages	2474	100.0		1439	100.0		1035	100.0	

Included in the statistics are 29.2% multiple primaries in males and 31.2% 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	9	2	0.6	0.17	0.1	0.08	27.3	7.7
5- 9	5	6	0.3	0.38	0.4	0.75	13.2	15.0
10-14	3	2	0.2	0.25	0.1	0.17	8.6	6.5
15-19	4	6	0.3	0.27	0.4	0.38	8.9	16.2
20-24	8	8	0.5	0.36	0.4	0.47	8.9	15.7
25-29	11	9	0.5	0.39	0.4	0.30	10.2	7.8
30-34	15	10	0.7	0.28	0.5	0.25	8.1	4.4
35-39	19	11	0.8	0.25	0.5	0.25	4.8	2.1
40-44	26	24	1.0	0.36	1.0	0.32	3.0	2.1
45-49	35	24	1.5	0.49	1.0	0.30	1.9	1.2
50-54	53	32	2.6	0.44	1.6	0.32	1.6	1.0
55-59	88	67	4.8	0.52	3.5	0.45	1.5	1.4
60-64	157	101	8.9	0.63	5.4	0.56	1.8	1.5
65-69	256	123	16.2	0.71	7.1	0.55	2.1	1.5
70-74	270	143	21.1	0.73	9.4	0.59	2.0	1.4
75-79	204	173	24.7	0.80	14.6	0.77	1.5	1.6
80-84	160	161	32.0	0.89	17.3	0.85	1.5	1.4
85+	116	133	34.0	0.85	14.9	0.89	1.3	1.0
All ages	1439	1035					1.8	1.4
Mortality								
Raw			4.8	0.64	3.3	0.57		
WS			2.6	0.56	1.5	0.46		
ES			3.8	0.61	2.1	0.50		
BRD-S			4.9	0.65	2.7	0.55		
PYLL-70								
per 100,000			32.4		23.0			
ES			31.3		22.0			
AYLL-70			12.6		14.3			

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 ←%
C09-C10 Oropharynx	8	1.8	4	50.0	1	12.5	3	37.5
C15 Oesophagus	6	1.4	1	16.7			5	83.3
C16 Stomach	14	3.2	9	64.3	1	7.1	4	28.6
C18 Colon	27	6.1	22	81.5	3	11.1	2	7.4
C19-C20 Rectum	23	5.2	17	73.9	1	4.3	5	21.7
C25 Pancreas	5	1.1	1	20.0	3	60.0	1	20.0
C33-C34 Lung	35	7.9	8	22.9	6	17.1	21	60.0
C43 Malign. melanoma	28	6.3	21	75.0	1	3.6	6	21.4
C44 Skin others	43	9.8	25	58.1			18	41.9
C46,C49 Soft tissue	6	1.4			1	16.7	5	83.3
C61 Prostate	82	18.6	61	74.4	4	4.9	17	20.7
C62 Testis	7	1.6	5	71.4			2	28.6
C64 Kidney	22	5.0	13	59.1	3	13.6	6	27.3
C67 Bladder	29	6.6	17	58.6	2	6.9	10	34.5
C70-C72 CNS cancer	9	2.0			2	22.2	7	77.8
C76-C79 CUP	6	1.4	4	66.7	1	16.7	1	16.7
C82-C85 NHL	30	6.8	16	53.3	4	13.3	10	33.3
C90 Mult. myeloma	8	1.8	4	50.0	2	25.0	2	25.0
C91-C96 Leukaemia	11	2.5	6	54.5	2	18.2	3	27.3
Other primaries	42	9.5	20	47.6	4	9.5	18	42.9
All mult. primaries	441	100.0	254	57.6	41	9.3	146	33.1

Multiple primaries with number of cases 1 to 4 are pooled in category "Other primaries".

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

Table 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 ←%
C16	Stomach	5	1.3	4	80.0			1	20.0
C18	Colon	22	5.7	11	50.0	3	13.6	8	36.4
C19-C20	Rectum	6	1.6	3	50.0	1	16.7	2	33.3
C25	Pancreas	6	1.6			2	33.3	4	66.7
C33-C34	Lung	13	3.4	3	23.1	2	15.4	8	61.5
C43	Malign. melanoma	20	5.2	15	75.0	2	10.0	3	15.0
C44	Skin others	19	4.9	9	47.4	4	21.1	6	31.6
C46,C49	Soft tissue	6	1.6			1	16.7	5	83.3
C50	Breast	104	27.0	81	77.9	3	2.9	20	19.2
C51	Vulva	5	1.3	2	40.0	1	20.0	2	40.0
C53	Cervix uteri	10	2.6	10	100.0				
C54	Corpus uteri	24	6.2	13	54.2	6	25.0	5	20.8
C56	Ovary	59	15.3	15	25.4	11	18.6	33	55.9
C64	Kidney	9	2.3	3	33.3	2	22.2	4	44.4
C67	Bladder	7	1.8	5	71.4			2	28.6
C70-C72	CNS cancer	10	2.6			1	10.0	9	90.0
C73	Thyroid	6	1.6	6	100.0				
C82-C85	NHL	17	4.4	10	58.8	5	29.4	2	11.8
C90	Mult. myeloma	7	1.8	4	57.1	1	14.3	2	28.6
C91-C96	Leukaemia	8	2.1	2	25.0			6	75.0
Other primaries		22	5.7	9	40.9	5	22.7	8	36.4
All mult. primaries		385	100.0	205	53.2	50	13.0	130	33.8

Multiple primaries with number of cases 1 to 3 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	9	2	0.6	0.18	0.1	0.08	32.1	8.3
5- 9	5	6	0.3	0.38	0.4	0.75	13.9	16.2
10-14	3	1	0.2	0.27	0.1	0.09	8.6	3.4
15-19	4	5	0.3	0.27	0.3	0.33	9.5	15.2
20-24	7	7	0.4	0.33	0.4	0.44	8.3	14.9
25-29	11	9	0.5	0.41	0.4	0.30	11.1	8.3
30-34	13	9	0.6	0.25	0.4	0.24	7.2	4.5
35-39	18	8	0.7	0.25	0.3	0.22	4.8	1.7
40-44	24	21	0.9	0.36	0.8	0.32	3.0	2.1
45-49	32	22	1.4	0.48	1.0	0.32	2.0	1.3
50-54	43	29	2.1	0.42	1.4	0.34	1.5	1.1
55-59	78	54	4.3	0.52	2.8	0.44	1.5	1.3
60-64	132	83	7.4	0.63	4.4	0.56	1.8	1.6
65-69	213	95	13.5	0.73	5.5	0.54	2.2	1.4
70-74	213	110	16.6	0.75	7.2	0.59	2.0	1.4
75-79	155	129	18.8	0.85	10.9	0.81	1.6	1.5
80-84	123	122	24.6	0.90	13.1	0.82	1.5	1.4
85+	89	104	26.1	0.85	11.6	0.89	1.3	0.9
All ages	1172	816					1.8	1.4
Mortality								
Raw			3.9	0.63	2.6	0.56		
WS			2.2	0.54	1.2	0.44		
ES			3.1	0.60	1.7	0.48		
BRD-S			4.0	0.64	2.2	0.53		
PYLL-70								
per 100,000			29.1		19.8			
ES			28.4		19.1			
AYLL-70			13.2		15.0			

* 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	9	2	0.6	0.18	0.1	0.08	33.3	8.3
5- 9	5	6	0.3	0.38	0.4	0.75	14.3	16.7
10-14	3	1	0.2	0.27	0.1	0.09	8.6	3.7
15-19	4	5	0.3	0.27	0.3	0.33	9.5	17.9
20-24	7	6	0.4	0.33	0.3	0.40	8.9	13.6
25-29	11	9	0.5	0.42	0.4	0.30	12.0	8.7
30-34	13	9	0.6	0.27	0.4	0.25	7.4	4.9
35-39	16	8	0.6	0.24	0.3	0.23	4.5	1.9
40-44	22	20	0.8	0.37	0.8	0.32	2.9	2.2
45-49	30	22	1.3	0.48	1.0	0.32	2.0	1.4
50-54	40	27	2.0	0.42	1.3	0.34	1.5	1.2
55-59	72	51	3.9	0.50	2.7	0.46	1.6	1.4
60-64	130	76	7.3	0.68	4.1	0.55	2.0	1.6
65-69	200	81	12.7	0.74	4.7	0.51	2.4	1.4
70-74	191	92	14.9	0.75	6.1	0.54	2.1	1.4
75-79	141	114	17.1	0.84	9.6	0.79	1.8	1.6
80-84	107	109	21.4	0.84	11.7	0.80	1.7	1.5
85+	77	93	22.6	0.80	10.4	0.82	1.4	1.0
All ages	1078	731					2.0	1.5
Mortality								
Raw			3.6	0.62	2.4	0.54		
WS			2.0	0.54	1.1	0.43		
ES			2.9	0.59	1.5	0.47		
BRD-S			3.7	0.64	1.9	0.51		
PYLL-70								
per 100,000			27.9		18.9			
ES			27.3		18.3			
AYLL-70			13.3		15.5			

* See corresponding tables with multiple primaries.

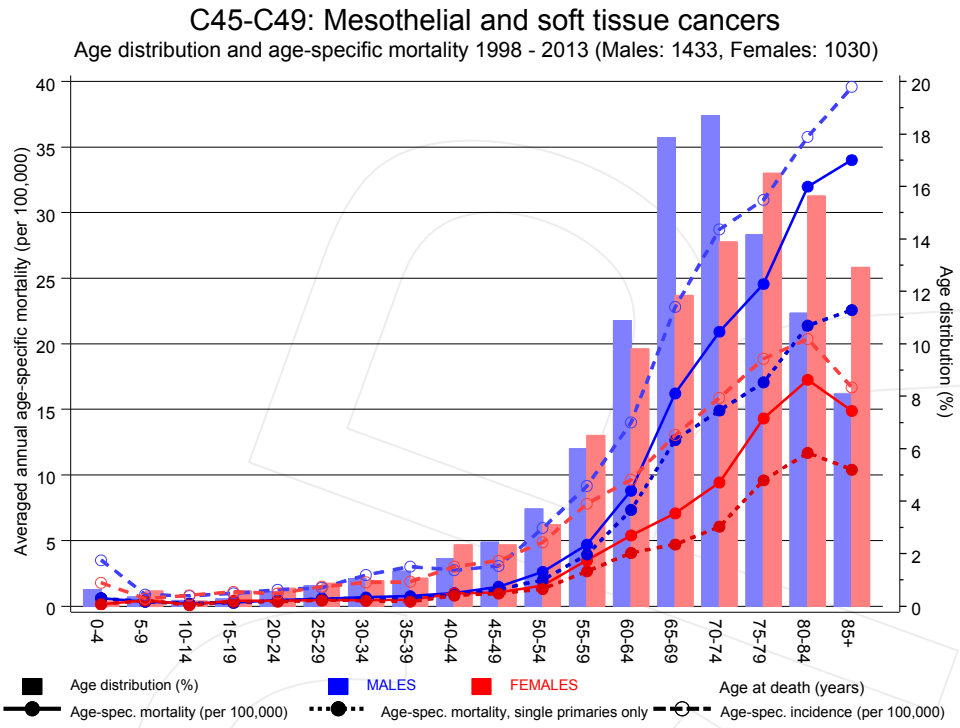
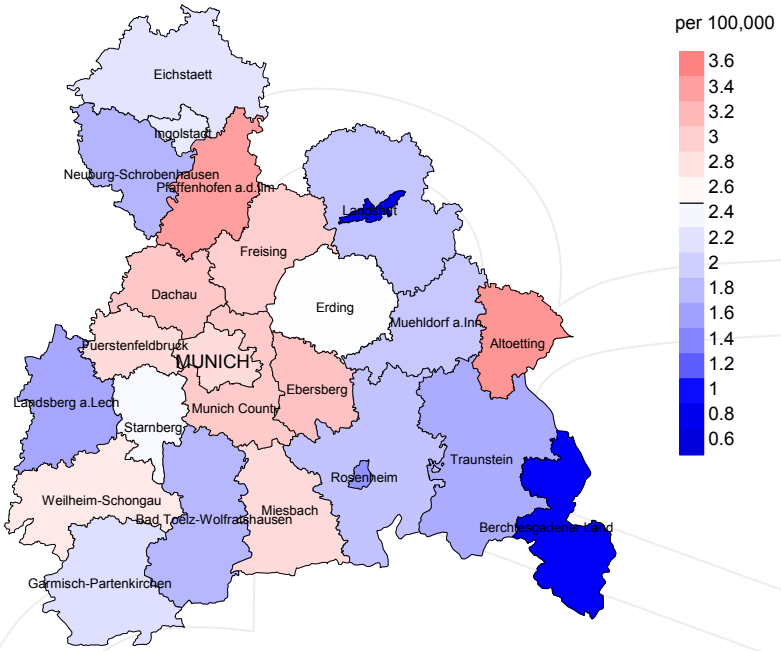


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

The difference between age at diagnosis (Table 3) and age at mesoth. and soft tissue ca.-related death (see Table 10) should be considered.

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



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

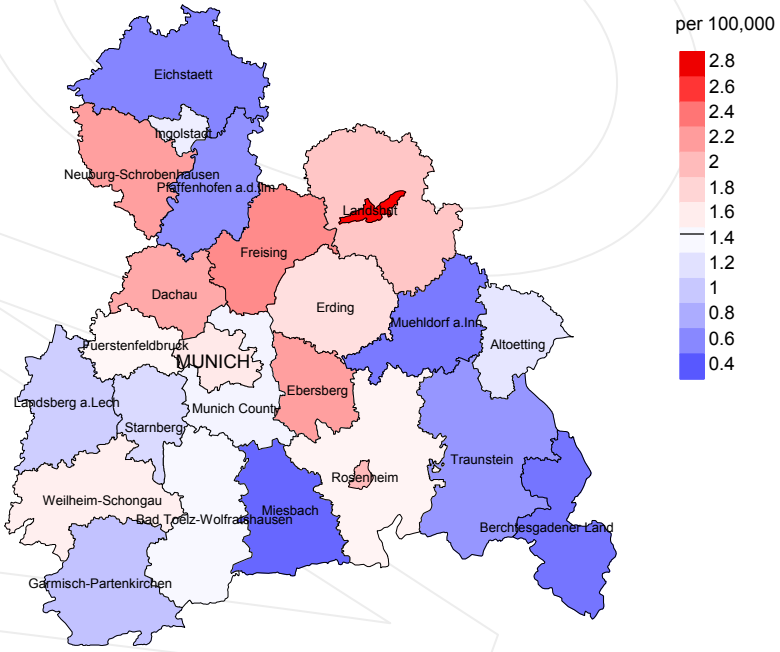
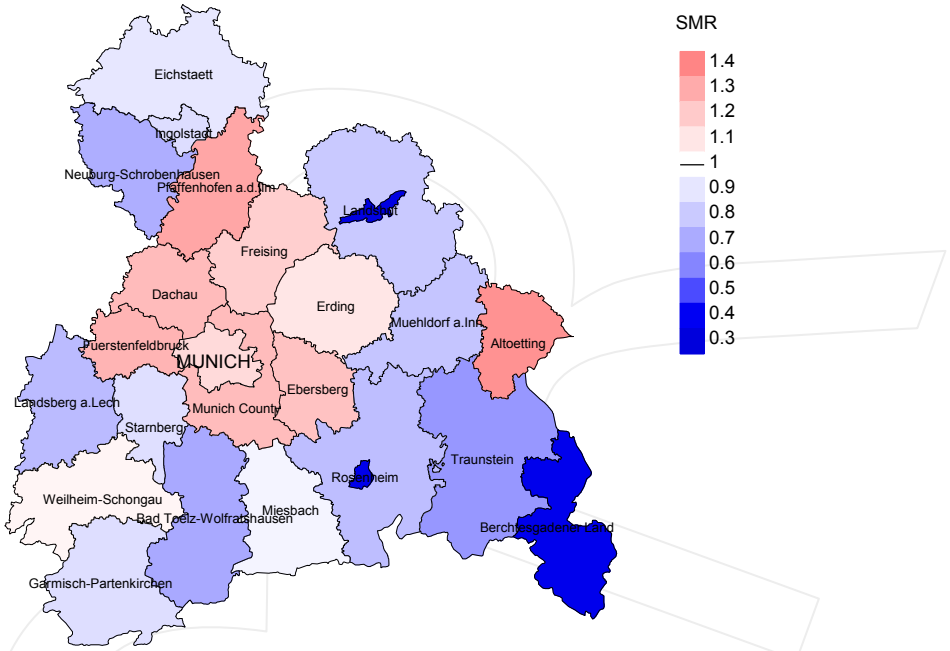


Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2013. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 2.5/100,000 WS N=803, females 1.5/100,000 WS N=580).

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 19 women died from mesoth. and soft tissue ca.. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 2.2/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.8 and 5.0/100,000.

Standardized mortality ratio (SMR) 2007 - 2013: Males



Standardized mortality ratio (SMR) 2007 - 2013: Females

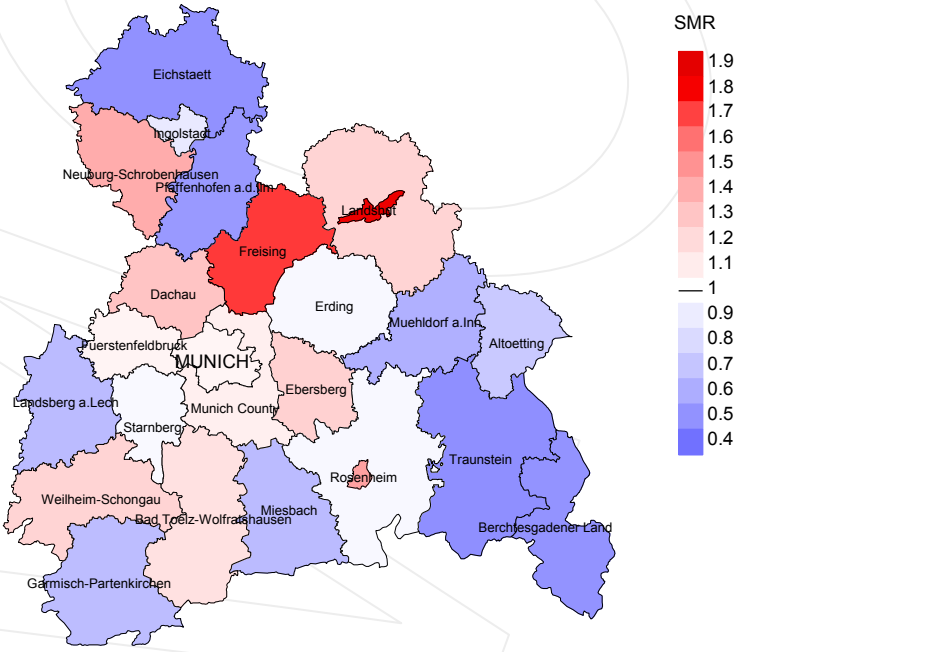


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=803, females N=580).

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 19 women died from mesoth. and soft tissue ca.. 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 0.63 and 2.19, 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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