Munich Cancer Registry

- Survival
- Selection Matrix
- Homepage

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

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

Cancer statistics: Baseline statistics

C33, C34: Lung cancer

Year of diagnosis	1998-2012
Patients	26,286
Diseases	26,511
Creation date	03/20/2014
Export date	02/12/2014
Population	4.5 m

http://www.tumorregister-muenchen.de/en/facts/base/base_C3334E.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 4.5 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, March 2014

[#] 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 2013 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.

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	1028	157	15.3	14.2	93.5	99.1	
1999	1081	165	15.3	16.7	92.9	99.0	
2000	1097	220	20.1	17.9	91.9	99.1	
2001	1115	185	16.6	18.9	92.9	98.8	
2002	1799	371	20.6	20.7	92.0	98.8	#
2003	1842	322	17.5	21.7	91.9	99.3	#
2004	1824	314	17.2	21.5	91.6	99.1	#
2005	1813	270	14.9	22.6	91.2	98.4	#
2006	1855	280	15.1	23.0	88.0	98.2	#
2007	2214	304	13.7	21.2	86.5	95.5	# ##
2008	2218	246	11.1	24.1	84.6	91.2	
2009	2269	268	11.8	24.1	82.3	91.3	
2010	2251	256	11.4	25.0	79.9	90.6	
2011	2273	247	10.9	24.8	75.3	90.9	
2012	1832	240	13.1	26.3	59.4	97.9	###
1998-2012	26511	3845	14.5	22.2	85.1	95.8	

\# 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	1028	679	349	66.1
1999	1081	748	333	69.2
2000	1097	746	351	68.0
2001	1115	773	342	69.3
2002	1799	1216	583	67.6
2003	1842	1212	630	65.8
2004	1824	1187	637	65.1
2005	1813	1197	616	66.0
2006	1855	1220	635	65.8
2007	2214	1436	778	64.9
2008	2218	1433	785	64.6
2009	2269	1439	830	63.4
2010	2251	1410	841	62.6
2011	2273	1400	873	61.6
2012	1832	1114	718	60.8
1998-2012	26511	17210	9301	64.9

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 4.52 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	679	349	61.3	29.7	37.0	14.8	55.0	21.3	70.0	26.2
1999	748	333	66.8	28.1	40.7	14.1	59.6	20.3	74.5	25.0
2000	746	351	65.5	29.2	39.0	15.0	57.8	21.3	73.3	25.9
2001	773	342	66.7	28.1	40.2	14.2	58.6	20.4	73.0	25.0
2002	1216	583	65.3	29.8	37.0	14.5	55.2	21.1	71.3	25.8
2003	1212	630	64.7	32.0	36.2	15.9	53.8	22.8	68.4	27.5
2004	1187	637	63.1	32.2	34.3	15.5	51.3	22.4	65.9	27.5
2005	1197	616	63.2	31.0	34.1	14.9	50.3	21.6	64.3	26.3
2006	1220	635	63.7	31.6	33.9	15.0	50.1	21.8	63.7	26.5
2007	1436	778	64.8	33.7	33.8	16.8	50.4	24.0	65.5	28.9
2008	1433	785	64.4	33.8	33.4	16.6	49.5	23.7	63.2	28.6
2009	1439	830	64.5	35.7	33.4	16.8	49.2	24.1	62.2	29.5
2010	1410	841	62.6	35.9	31.9	17.1	46.8	24.5	59.1	29.6
2011	1400	873	61.3	37.0	30.8	17.1	45.3	24.7	57.4	30.1
2012	1114	718	48.8	30.4	24.1	14.0	35.7	20.2	46.1	24.6
1998-2012	17210	9301	62.7	32.4	33.6	15.6	49.7	22.4	63.2	27.3

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

Table 3

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	1028	66.8	11.2	28.1	93.1	52.5	58.3	67.3	75.3	81.2
1999	1081	66.8	11.3	24.9	96.3	52.6	58.8	67.2	74.7	81.6
2000	1097	66.9	11.7	15.8	96.0	51.9	58.9	67.1	75.5	81.5
2001	1115	66.8	11.3	17.0	96.4	52.2	59.5	66.7	74.7	80.9
2002	1799	68.0	11.6	14.1	99.5	52.8	60.3	68.5	76.5	82.0
2003	1842	68.0	11.1	17.5	97.6	53.5	60.6	68.3	75.8	82.2
2004	1824	68.2	11.2	24.4	98.0	53.8	61.1	68.1	76.6	82.2
2005	1813	68.1	11.2	18.1	98.5	54.2	61.0	68.3	76.6	82.5
2006	1855	68.4	10.9	27.5	102	54.8	61.4	68.1	76.6	82.3
2007	2214	68.3	11.3	7.5	99.1	53.9	61.3	68.6	76.6	81.9
2008	2218	68.4	10.9	22.3	99.4	54.5	61.4	68.7	76.4	81.9
2009	2269	68.8	11.2	20.3	102	54.2	61.5	69.2	76.6	83.1
2010	2251	68.7	11.0	0.5	97.8	54.5	61.8	69.2	76.3	82.3
2011	2273	68.9	11.0	22.2	97.6	54.1	61.9	69.7	76.6	82.9
2012	1832	69.5	11.1	18.5	96.8	54.4	62.8	70.2	77.4	83.3
1998-2012	26511	68.2	11.2	0.5	102	53.7	60.9	68.6	76.3	82.3

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	679	66.4	10.5	28.1	91.7	53.6	58.8	66.8	74.0	79.3
1999	748	66.3	10.7	24.9	96.3	53.0	58.8	66.7	73.3	80.3
2000	746	66.7	10.9	28.1	94.2	53.0	59.0	66.3	74.1	80.8
2001	773	66.4	10.8	17.0	96.4	52.7	59.8	66.1	73.5	80.0
2002	1216	67.9	11.0	14.1	94.9	53.6	61.0	67.9	75.8	81.7
2003	1212	67.9	10.3	36.8	95.4	54.5	61.3	68.2	75.2	81.2
2004	1187	68.2	10.6	35.7	94.3	54.4	61.4	68.5	76.2	81.5
2005	1197	68.1	10.6	18.1	98.5	55.3	61.7	68.3	75.8	81.5
2006	1220	68.1	10.0	28.7	102	55.1	61.8	68.0	75.7	80.7
2007	1436	68.8	10.6	7.5	97.3	55.2	62.4	69.1	76.7	81.7
2008	1433	68.7	10.4	22.3	99.4	55.6	61.9	69.2	76.4	81.3
2009	1439	68.8	10.7	25.6	100	55.3	61.7	69.0	76.4	82.4
2010	1410	68.7	10.8	0.5	97.5	54.7	62.1	69.5	75.8	81.8
2011	1400	68.8	10.7	28.1	94.3	54.3	62.2	69.9	76.1	82.3
2012	1114	69.7	10.7	27.0	96.6	55.7	63.4	70.4	77.4	83.0
1998-2012	17210	68.2	10.7	0.5	102	54.5	61.3	68.6	75.8	81.5

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	349	67.7	12.5	35.8	93.1	50.8	57.8	68.7	76.5	84.4
1999	333	67.9	12.3	32.9	94.8	51.6	58.5	68.8	77.6	83.7
2000	351	67.5	13.3	15.8	96.0	50.0	58.8	69.2	78.0	84.0
2001	342	67.6	12.4	24.4	93.9	50.0	58.8	68.6	76.3	82.9
2002	583	68.1	12.8	27.5	99.5	51.5	59.0	69.5	78.2	83.3
2003	630	68.0	12.6	17.5	97.6	52.0	59.3	68.6	77.5	83.3
2004	637	68.2	12.2	24.4	98.0	52.6	60.2	67.5	78.2	83.5
2005	616	68.1	12.4	21.6	96.1	52.6	59.0	68.4	78.0	83.9
2006	635	68.8	12.3	27.5	100	53.4	60.1	68.1	78.6	84.7
2007	778	67.5	12.4	22.0	99.1	51.0	59.3	67.8	76.5	82.7
2008	785	67.9	11.8	29.4	97.3	53.2	60.5	67.9	76.5	82.9
2009	830	68.8	11.9	20.3	102	53.2	60.9	69.5	77.3	83.8
2010	841	68.7	11.3	33.2	97.8	54.1	61.6	68.3	76.9	83.5
2011	873	69.1	11.4	22.2	97.6	53.4	61.5	69.3	77.6	84.5
2012	718	69.2	11.7	18.5	96.8	53.2	61.8	69.7	77.5	84.7
1998-2012	9301	68.3	12.1	15.8	102	52.4	60.1	68.7	77.5	83.7

Table 4

Age distribution by 5-year age group and gender for period 1998-2012 (incl. DCO)

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	2	0.0	0.0	2	0.0	0.0			0.0
5-9	1	0.0	0.0	1	0.0	0.0			0.0
10-14	1	0.0	0.0	1	0.0	0.0			0.0
15-19	8	0.0	0.0	5	0.0	0.1	3	0.0	0.0
20-24	11	0.0	0.1	4	0.0	0.1	7	0.1	0.1
25-29	25	0.1	0.2	14	0.1	0.2	11	0.1	0.2
30-34	48	0.2	0.4	22	0.1	0.3	26	0.3	0.5
35-39	146	0.6	0.9	80	0.5	0.7	66	0.7	1.2
40-44	380	1.4	2.3	216	1.3	2.0	164	1.8	3.0
45-49	885	3.3	5.7	510	3.0	5.0	375	4.0	7.0
50-54	1654	6.2	11.9	998	5.8	10.8	656	7.1	14.1
55-59	2859	10.8	22.7	1855	10.8	21.5	1004	10.8	24.9
60-64	3947	14.9	37.6	2641	15.3	36.9	1306	14.0	38.9
65-69	4593	17.3	54.9	3155	18.3	55.2	1438	15.5	54.4
70-74	4286	16.2	71.1	2986	17.4	72.6	1300	14.0	68.3
75-79	3648	13.8	84.8	2401	14.0	86.5	1247	13.4	81.7
80-84	2506	9.5	94.3	1535	8.9	95.4	971	10.4	92.2
85+	1511	5.7	100.0	784	4.6	100.0	727	7.8	100.0
All ages	26511	100.0		17210	100.0		9301	100.0	

Included in the statistics are 27.1% multiple primaries in males and 25.4% in females.

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 1998-2012

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males DCO rate n=2367 %	Females DCO rate n=1472 %	Males Prop.all cancers n=146755 %	Females Prop.all cancers n=142297 %
0- 4	2		0.1	0.0	50.0		0.7	
5- 9	1		0.1	0.0			0.6	
10-14	1		0.1	0.0			0.7	
15-19	5	3	0.4	0.2			1.6	1.1
20-24	4	7	0.2	0.4	25.0		0.7	1.4
25-29	14	11	0.8	0.6		9.1	1.6	1.1
30-34	22	26	1.0	1.3		3.8	1.6	1.4
35-39	80	66	3.4	3.0	2.5	6.1	3.8	1.9
40-44	216	163	8.9	7.1	3.2	2.5	7.2	2.8
45-49	506	374	23.5	17.7	5.5	6.4	10.3	4.7
50-54	994	654	53.8	34.6	6.0	5.7	12.4	6.4
55-59	1849	998	108.8	56.0	7.6	6.0	13.7	7.8
60-64	2626	1296	159.4	74.5	9.3	7.5	12.8	8.0
65-69	3138	1436	213.9	89.5	9.2	7.6	12.2	8.1
70-74	2967	1292	256.1	93.7	12.8	11.7	12.1	7.6
75-79	2389	1243	317.1	113.6	17.5	18.6	12.6	7.6
80-84	1530	969	336.9	112.2	26.3	32.9	12.2	6.5
85+	784	727	252.8	88.8	50.1	59.7	8.5	4.5
All ages	17128	9265			13.8	15.9	11.7	6.5
Incidence								
Raw			62.4	32.3				
WS			33.4	15.5				
ES			49.4	22.3				
BRD-S			62.9	27.2				

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

Table 6a

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of second primaries for period 1998-2012
MALES

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C00	Lip	2	0.3	6.5	0.8	23.5		1.0	50.0
C03-C06	Oral cavity	14	2.4	5.7	3.1	9.6	#	7.0	21.4
C09-C10	Oropharynx	27	3.1	8.8	5.8	12.8	#	14.5	11.1
C12-C13	Hypopharynx	12	1.8	6.8	3.5	12.0	#	6.2	8.3
C15	Oesophagus	27	5.0	5.4	3.5	7.8	#	13.4	11.1
C16	Stomach	36	11.6	3.1	2.2	4.3	#	14.9	13.9
C17	Small intestine	5	1.3	3.8	1.2	8.9	#	2.2	
C18	Colon	48	27.7	1.7	1.3	2.3	#	12.3	18.8
C19-C20	Rectum	29	16.0	1.8	1.2	2.6	#	7.9	10.3
C22	Liver	29	7.7	3.8	2.5	5.4	#	12.9	24.1
C23-C24	Bile	3	2.6	1.1	0.2	3.3		0.2	33.3
C25	Pancreas	33	9.5	3.5	2.4	4.9	#	14.3	39.4
C26	GI cancer	2	0.3	6.7	0.8	24.2		1.0	
C32	Larynx	31	3.1	10.1	6.9	14.3	#	17.0	22.6
C33-C34	Lung	125	33.9	3.7	3.1	4.4	#	55.4	4.8
C38,C45	Mesothelioma	2	1.8	1.1	0.1	4.0		0.1	
C40-C41	Bone	2	0.2	9.5	1.2	34.5	#	1.1	100.0
C43	Malign. melanoma	13	10.6	1.2	0.7	2.1		1.5	7.7
C46,C49	Soft tissue	5	1.4	3.5	1.1	8.2	#	2.2	
C61	Prostate	105	85.7	1.2	1.0	1.5	#	11.7	18.1
C64	Kidney	33	10.0	3.3	2.3	4.6	#	14.0	21.2
C65	Renal pelvis	8	1.1	7.3	3.1	14.4	#	4.2	
C67	Bladder	33	11.8	2.8	1.9	3.9	#	12.9	15.2
C70-C72	CNS cancer	6	3.7	1.6	0.6	3.5		1.4	50.0
C73	Thyroid	5	1.8	2.8	0.9	6.4		1.9	
C76-C79	CUP	7	4.6	1.5	0.6	3.1		1.5	14.3
C82-C85	NHL	27	10.8	2.5	1.6	3.6	#	9.8	14.8
C90	Mult. myeloma	4	3.5	1.2	0.3	3.0		0.3	50.0
C91-C96	Leukaemia	17	4.2	4.0	2.3	6.4	#	7.8	41.2
Other primaries		9	3.8	2.4	1.1	4.5	#	3.2	44.4
Not observed		0	3.2	0.0	0.0	1.2		-1.9	
All mult. primaries		699	284.5	2.5	2.3	2.6	#	252.0	16.7

Patients	11442
Mean age at second malignancy (years)	70.6
Person-years	16444
Mean observation time (years)	1.4
Median observation time (years)	0.7

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 1998-2012
FEMALES

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C09-C10	Oropharynx	3	0.5	6.1	1.3	17.9	#	2.6	
C15	Oesophagus	3	0.6	4.9	1.0	14.2	#	2.4	
C16	Stomach	15	3.7	4.0	2.2	6.6	#	11.5	26.7
C17	Small intestine	3	0.5	5.9	1.2	17.2	#	2.5	33.3
C18	Colon	27	10.4	2.6	1.7	3.8	#	16.9	18.5
C19-C20	Rectum	6	4.7	1.3	0.5	2.8		1.3	16.7
C22	Liver	3	1.2	2.6	0.5	7.5		1.9	33.3
C23-C24	Bile	2	1.5	1.3	0.2	4.9		0.5	100.0
C25	Pancreas	14	4.4	3.2	1.7	5.3	#	9.8	35.7
C32	Larynx	3	0.2	14.1	2.9	41.3	#	2.8	
C33-C34	Lung	48	7.9	6.1	4.5	8.1	#	40.9	6.3
C43	Malign. melanoma	6	3.8	1.6	0.6	3.5		2.3	16.7
C50	Breast	59	33.8	1.7	1.3	2.3	#	25.7	20.3
C51	Vulva	6	1.0	6.3	2.3	13.7	#	5.1	16.7
C53	Cervix uteri	7	1.5	4.8	1.9	9.8	#	5.6	28.6
C54	Corpus uteri	9	6.3	1.4	0.7	2.7		2.8	33.3
C55,C57	Fem. genitals un	2	0.2	9.4	1.1	34.0	#	1.8	100.0
C56	Ovary	8	4.6	1.7	0.7	3.4		3.4	25.0
C57.9	Fem. urogen.	2	0.0	166.1	20.1	600.0	#	2.0	
C64	Kidney	10	2.7	3.7	1.8	6.8	#	7.4	30.0
C65	Renal pelvis	3	0.3	9.5	2.0	27.8	#	2.7	
C67	Bladder	7	1.8	3.8	1.5	7.8	#	5.3	14.3
C70-C72	CNS cancer	5	1.6	3.2	1.0	7.5	#	3.5	40.0
C73	Thyroid	8	2.1	3.8	1.7	7.6	#	6.0	12.5
C76-C79	CUP	4	1.8	2.3	0.6	5.8		2.3	
C82-C85	NHL	7	4.1	1.7	0.7	3.5		3.0	28.6
C90	Mult. myeloma	2	1.3	1.5	0.2	5.5		0.7	50.0
C91-C96	Leukaemia	5	1.6	3.1	1.0	7.2	#	3.4	40.0
Other primaries		11	3.0	3.7	1.9	6.6	#	8.2	9.1
Not observed		0	1.5	0.0	0.0	2.4		-1.6	
All mult. primaries		288	108.6	2.7	2.4	3.0	#	182.9	20.1

Patients	6018
Mean age at second malignancy (years)	69.0
Person-years	9808
Mean observation time (years)	1.6
Median observation time (years)	0.8

The occurrence of second malignancy is statistically significant.

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

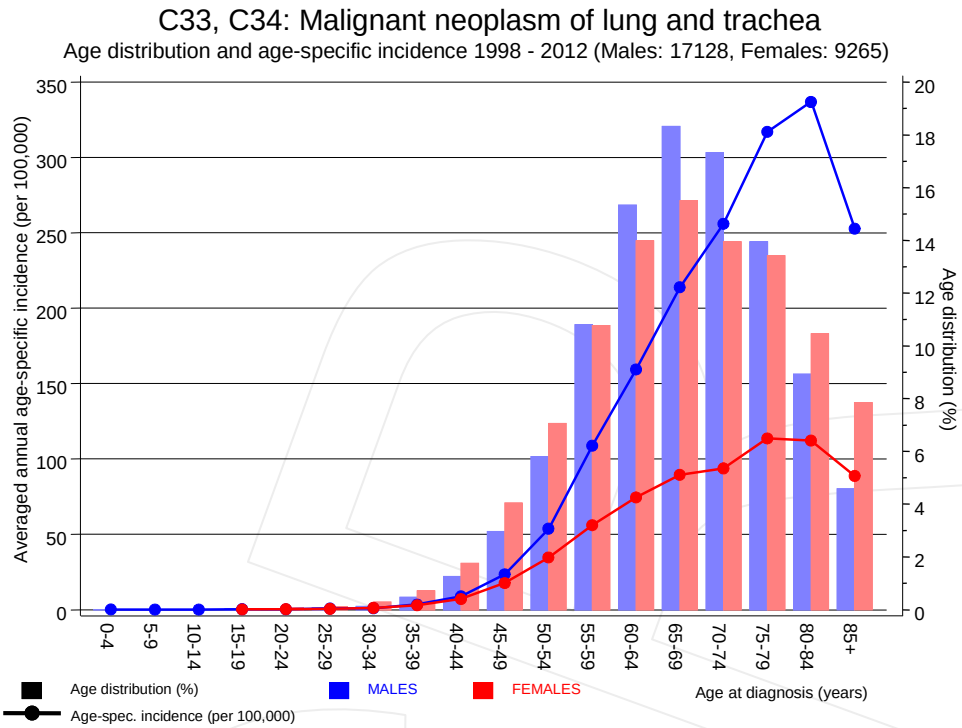


Figure 7. Age distribution and age-specific incidence

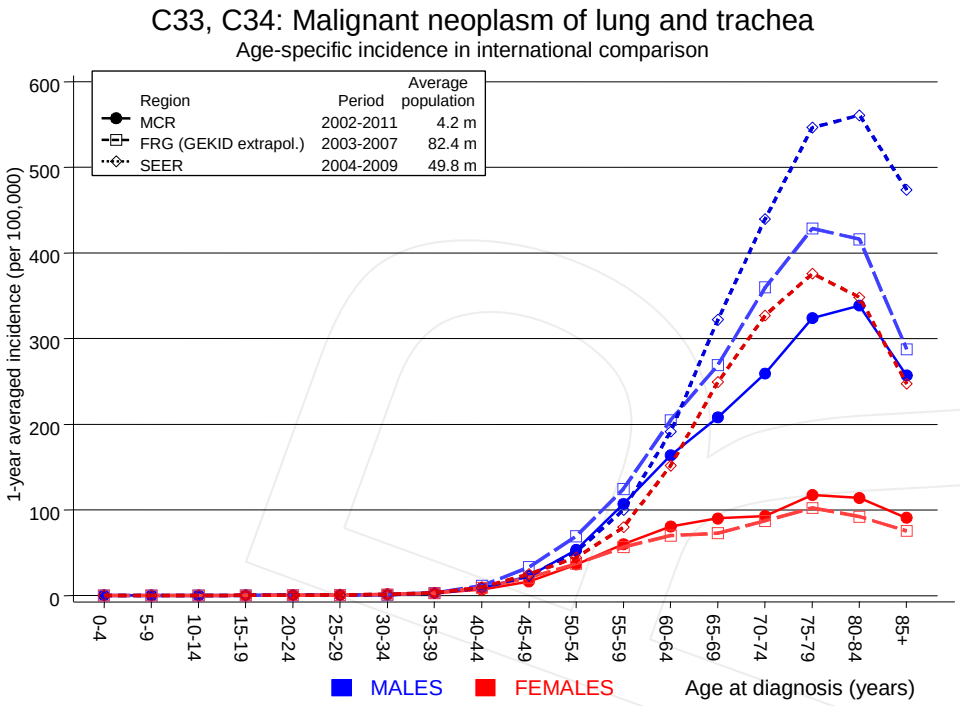


Figure 7a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

Extrapolated age-specific patient population of Germany, data status middle of 2010. Association of Population-based Cancer Registries in Germany (GEKID e.V.). Berlin, 2011. http://www.gekid.de. Last access: 05/12/2011

Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 18 Regs Research Data, released April 2012, based on the November 2011 submission. http://www.seer.cancer.gov.

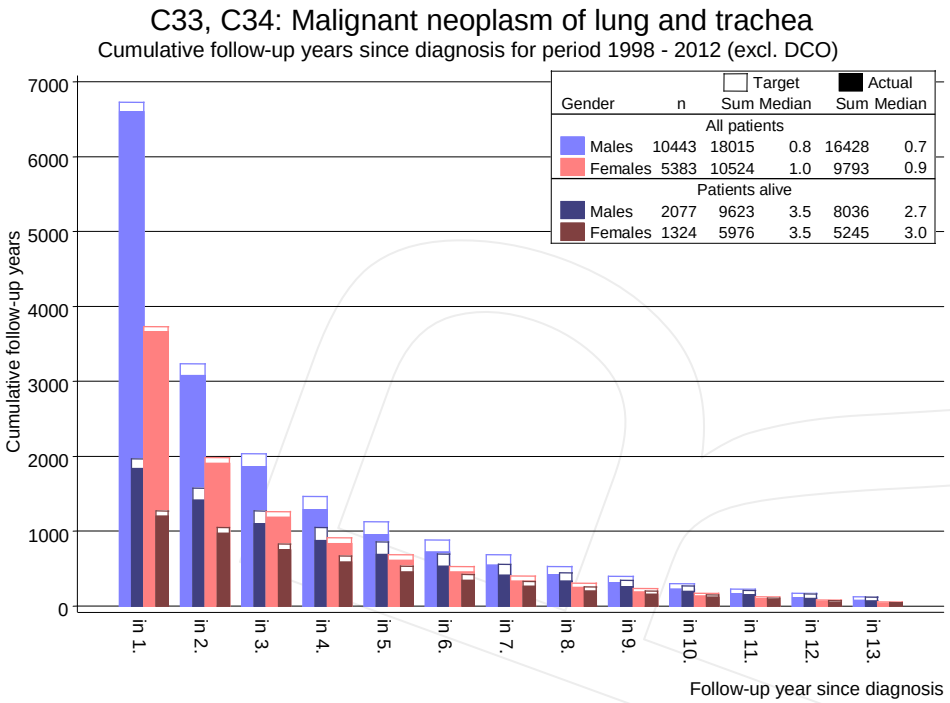
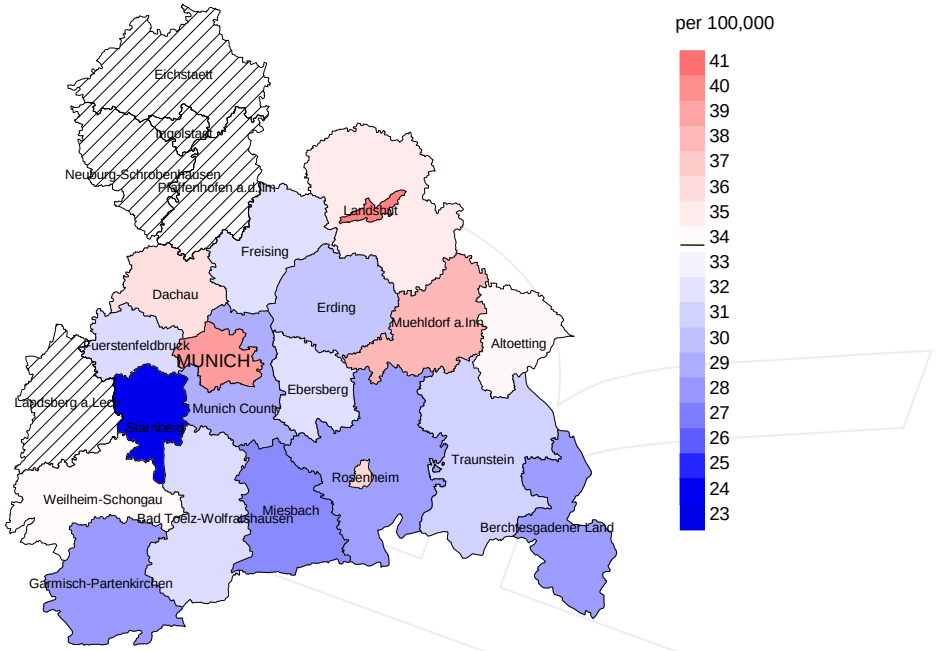


Figure 8. Cumulative follow-up years depending on time since diagnosis

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) 2003 - 2008: Males



Average incidence (world standard population) 2003 - 2008: Females

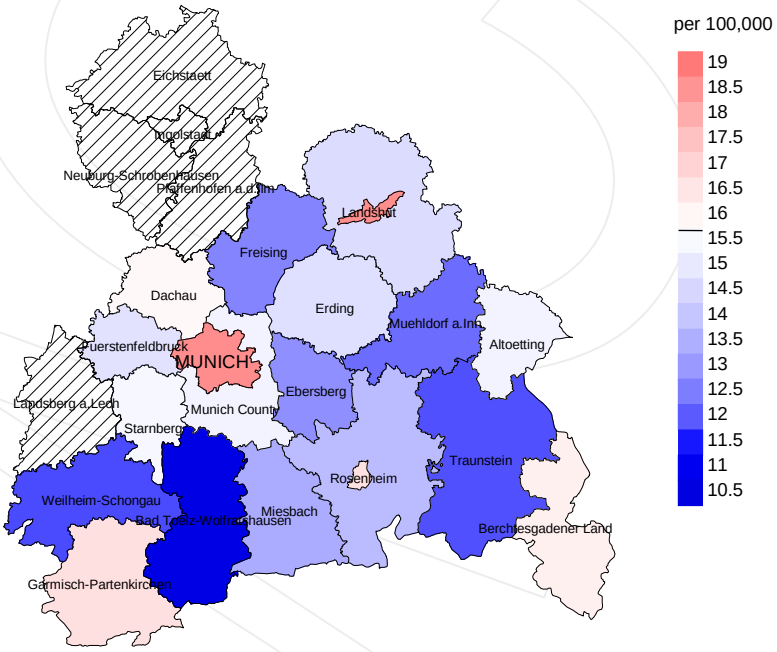
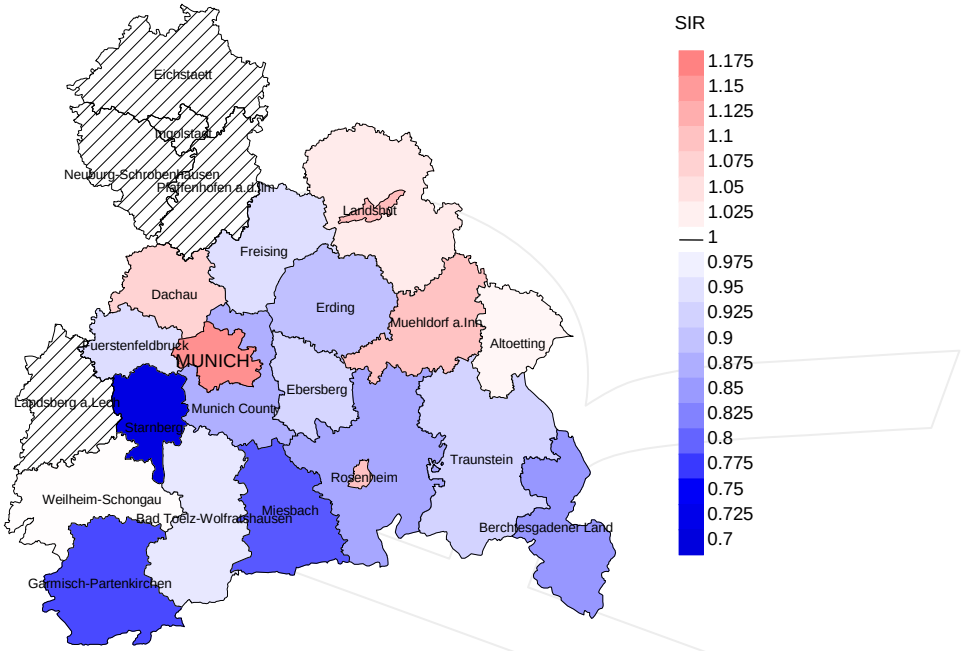


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 33.8/100,000 WS N=7,258, females 15.7/100,000 WS N=3,904). Since cancer data are not available in some counties until 2007, the local incidence rates were not calculated, and the map tiles show as shaded.

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 63,131 female residents (averaged) in the period from 2003 to 2008 a total of 95 women were identified with newly diagnosed lung cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 12.8/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 9.5 and 17.0/100,000.

Standardized incidence ratio (SIR) 2003 - 2008: Males



Standardized incidence ratio (SIR) 2003 - 2008: Females

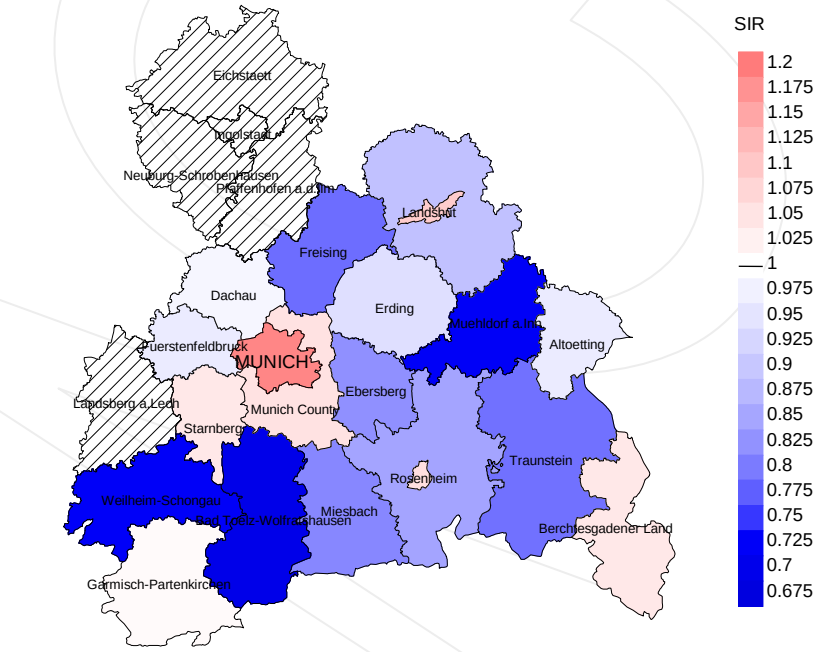


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=7,258, females N=3,904). Since cancer data are not available in some counties until 2007, the local SIR values were not calculated, and the map tiles show as shaded.

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 63,131 female residents (averaged) in the period from 2003 to 2008 a total of 95 women were identified with newly diagnosed lung cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.82. Though, the value of this parameter may vary with an underlying probability of 99% between 0.62 and 1.06, 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 4.52 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	1028	99.1	15.3	961	93.5	92.8
1999	1081	99.0	15.3	1004	92.9	94.8
2000	1097	99.1	20.1	1008	91.9	95.6
2001	1115	98.8	16.6	1036	92.9	95.1
2002	1799	98.8	20.6	1655	92.0	97.5
2003	1842	99.3	17.5	1693	91.9	97.6
2004	1824	99.1	17.2	1671	91.6	97.8
2005	1813	98.4	14.9	1653	91.2	98.7
2006	1855	98.2	15.1	1632	88.0	98.8
2007	2214	95.5	13.7	1915	86.5	98.9
2008	2218	91.2	11.1	1876	84.6	99.2
2009	2269	91.3	11.8	1868	82.3	99.1
2010	2251	90.6	11.4	1799	79.9	98.8
2011	2273	90.9	10.9	1712	75.3	98.3
2012	1832	97.9	13.1	1088	59.4	96.6
1998-2012	26511	95.8	14.5	22571	85.1	97.7

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 4.52 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	1028	888	91.9	437	42.5
1999	1081	920	94.2	438	40.5
2000	1097	1004	95.2	483	44.0
2001	1115	999	94.1	464	41.6
2002	1799	1407	97.5	820	45.6
2003	1842	1519	97.8	829	45.0
2004	1824	1579	97.8	799	43.8
2005	1813	1544	97.9	810	44.7
2006	1855	1615	98.0	790	42.6
2007	2214	1762	98.6	918	41.5
2008	2218	1773	99.1	855	38.5
2009	2269	1859	99.2	880	38.8
2010	2251	1934	99.0	928	41.2
2011	2273	1958	99.3	958	42.1
2012	1832	1804	99.0	795	43.4
1998-2012	26511	22565	97.8	11204	42.3

Table 10c

Annual cohorts of deaths, proportion of cancer-related and not 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 4.52 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. not cancer-related %	Prop. cancer recorded on death certificate %
1998	888	84.2	15.8	97.4
1999	920	89.0	11.0	97.3
2000	1004	91.1	8.9	98.3
2001	999	88.2	11.8	96.8
2002	1407	92.5	7.5	97.2
2003	1519	93.4	6.6	97.6
2004	1579	95.0	5.0	98.0
2005	1544	93.3	6.7	97.0
2006	1615	92.9	7.1	97.3
2007	1762	94.0	6.0	97.2
2008	1773	94.9	5.1	97.4
2009	1859	93.8	6.2	97.5
2010	1934	93.8	6.2	97.2
2011	1958	94.3	5.7	96.9
2012	1804	93.2	6.8	96.6
1998-2012	22565	92.8	7.2	97.3

Table 11a

Means 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 (not cancer-related) Years	Age at death (according to death certificate) Years
1998	610	68.4	67.7	71.8	68.7
1999	632	68.6	68.4	70.2	69.0
2000	681	68.4	68.2	70.1	68.5
2001	690	68.6	68.2	71.1	69.0
2002	981	68.9	68.6	72.8	68.8
2003	1061	68.7	68.4	72.3	68.7
2004	1051	69.0	68.9	71.4	69.1
2005	1029	69.7	69.4	73.1	69.7
2006	1104	69.7	69.5	72.3	69.7
2007	1178	69.7	69.4	74.1	69.7
2008	1178	69.5	69.2	75.1	69.3
2009	1230	70.4	70.1	74.7	70.2
2010	1243	70.4	70.0	75.6	70.2
2011	1249	70.4	70.1	74.8	70.1
2012	1131	70.6	70.0	77.6	70.3
1998-2012	15048	69.5	69.2	73.3	69.5

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

Means 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 (not cancer-related) Years	Age at death (according to death certificate) Years
1998	278	68.5	68.1	71.2	69.3
1999	288	69.9	69.8	71.3	70.0
2000	323	68.9	68.1	78.3	68.9
2001	309	70.5	69.7	77.4	70.2
2002	426	69.0	68.6	75.6	69.0
2003	458	69.9	69.6	73.9	69.7
2004	528	70.2	69.7	78.8	69.9
2005	515	69.2	68.8	78.0	69.2
2006	511	70.1	69.8	75.3	69.8
2007	584	69.8	69.5	75.5	69.5
2008	595	69.9	69.6	79.2	69.6
2009	629	69.4	68.8	80.9	69.2
2010	691	70.2	69.9	76.5	70.0
2011	709	70.2	69.9	76.7	70.2
2012	673	70.7	70.3	77.3	70.5
1998-2012	7517	69.8	69.4	76.3	69.7

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	505	45.6	0.74	27.4	0.74	41.1	0.75	53.6	0.77
1999	563	50.3	0.75	29.7	0.73	45.1	0.76	59.8	0.80
2000	618	54.3	0.83	31.8	0.82	48.1	0.83	62.5	0.86
2001	605	52.2	0.79	30.5	0.76	45.7	0.78	59.4	0.82
2002	904	48.5	0.75	27.2	0.74	40.7	0.74	52.9	0.74
2003	987	52.7	0.82	29.2	0.81	43.5	0.81	56.0	0.82
2004	1001	53.2	0.85	28.6	0.83	43.1	0.84	56.2	0.85
2005	947	50.0	0.79	26.0	0.77	39.1	0.78	51.4	0.80
2006	1023	53.4	0.84	27.5	0.82	41.4	0.83	54.2	0.86
2007	1105	49.9	0.78	25.4	0.75	38.3	0.77	50.6	0.78
2008	1111	49.9	0.78	25.5	0.77	38.2	0.78	49.6	0.79
2009	1147	51.4	0.80	25.5	0.77	38.2	0.78	49.9	0.81
2010	1152	51.1	0.82	25.2	0.80	37.6	0.81	48.8	0.83
2011	1169	51.2	0.84	24.9	0.81	37.2	0.83	48.3	0.85
2012	1042	45.6	0.94	22.3	0.93	33.1	0.93	43.0	0.94
1998-2012	13879	50.6	0.81	26.4	0.79	39.6	0.80	51.6	0.82

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	243	20.7	0.70	10.1	0.69	14.7	0.69	17.8	0.68
1999	256	21.6	0.78	10.0	0.72	14.8	0.74	19.0	0.76
2000	297	24.7	0.85	12.4	0.83	17.9	0.84	22.1	0.85
2001	277	22.8	0.81	10.8	0.76	15.8	0.77	19.8	0.79
2002	397	20.3	0.68	9.7	0.67	14.2	0.67	17.4	0.68
2003	432	21.9	0.69	10.2	0.65	15.1	0.67	18.7	0.68
2004	499	25.2	0.78	11.6	0.75	17.0	0.76	21.5	0.78
2005	493	24.8	0.80	11.7	0.79	17.0	0.79	20.9	0.80
2006	478	23.8	0.75	10.9	0.72	15.9	0.73	19.7	0.75
2007	552	23.9	0.72	11.2	0.67	16.3	0.69	20.1	0.70
2008	571	24.6	0.73	11.3	0.69	16.6	0.70	20.5	0.72
2009	596	25.6	0.72	12.0	0.72	17.3	0.72	21.1	0.72
2010	662	28.3	0.79	12.8	0.75	18.4	0.76	22.9	0.78
2011	677	28.7	0.78	13.0	0.76	18.8	0.77	23.3	0.78
2012	640	27.1	0.90	11.9	0.85	17.4	0.87	21.6	0.88
1998-2012	7070	24.6	0.76	11.3	0.73	16.5	0.74	20.5	0.75

Table 13

Age distribution of age at death (cancer-related) for period 1998-2012
(**incl. multiple primaries**)

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	1	0.0	0.0	1	0.0	0.0			0.0
5-9	0	0.0	0.0			0.0			0.0
10-14	0	0.0	0.0			0.0			0.0
15-19	1	0.0	0.0	1	0.0	0.0			0.0
20-24	4	0.0	0.0	4	0.0	0.0			0.0
25-29	7	0.0	0.1	4	0.0	0.1	3	0.0	0.0
30-34	7	0.0	0.1	4	0.0	0.1	3	0.0	0.1
35-39	82	0.4	0.5	45	0.3	0.4	37	0.5	0.6
40-44	233	1.1	1.6	125	0.9	1.3	108	1.5	2.1
45-49	607	2.9	4.4	362	2.6	3.9	245	3.4	5.5
50-54	1138	5.4	9.8	701	5.0	8.9	437	6.1	11.7
55-59	2083	9.8	19.6	1355	9.6	18.5	728	10.2	21.9
60-64	2990	14.1	33.8	2042	14.5	33.0	948	13.3	35.2
65-69	3665	17.3	51.0	2568	18.3	51.3	1097	15.4	50.5
70-74	3578	16.9	67.9	2509	17.8	69.2	1069	15.0	65.5
75-79	3172	15.0	82.9	2155	15.3	84.5	1017	14.3	79.8
80-84	2307	10.9	93.8	1476	10.5	95.0	831	11.6	91.4
85+	1318	6.2	100.0	705	5.0	100.0	613	8.6	100.0
All ages	21193	100.0		14057	100.0		7136	100.0	

Included in the statistics are 27.1% multiple primaries in males and 25.4% in females.

Table 14

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2012
(**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	0.50	0.0		3.2	
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19	1		0.1	0.20	0.0		2.4	
20-24	4		0.2	1.00	0.0		4.8	
25-29	4	3	0.2	0.29	0.2	0.27	4.2	2.8
30-34	4	3	0.2	0.18	0.1	0.12	2.3	1.4
35-39	45	37	1.9	0.56	1.7	0.56	11.7	7.4
40-44	125	108	5.2	0.58	4.7	0.66	15.4	10.1
45-49	362	245	16.8	0.71	11.6	0.65	21.4	13.0
50-54	701	437	37.9	0.70	23.1	0.67	22.8	15.2
55-59	1355	728	79.7	0.73	40.9	0.73	24.5	16.4
60-64	2042	948	123.9	0.77	54.5	0.73	24.5	15.7
65-69	2568	1097	175.0	0.81	68.4	0.76	22.8	14.3
70-74	2509	1069	216.5	0.84	77.5	0.82	20.3	11.9
75-79	2155	1017	286.0	0.90	93.0	0.82	17.8	10.3
80-84	1476	831	325.0	0.96	96.2	0.86	14.9	8.0
85+	705	613	227.3	0.90	74.8	0.84	8.8	4.9
All ages	14057	7136					19.0	10.7
Mortality								
Raw			51.2	0.82	24.9	0.77		
WS			26.7	0.80	11.5	0.74		
ES			40.1	0.81	16.7	0.75		
BRD-S			52.3	0.83	20.7	0.76		
PYLL-70								
per 100,000			260.8		148.8			
ES			229.7		127.1			
AYLL-70			9.0		10.1			

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

Table 15a

Multiple primaries in deaths in period 1998-2012
MALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03-C06 Oral cavity	144	3.8	120	83.3	10	6.9	14	9.7
C09-C10 Oropharynx	117	3.1	83	70.9	11	9.4	23	19.7
C12-C13 Hypopharynx	69	1.8	45	65.2	13	18.8	11	15.9
C15 Oesophagus	83	2.2	28	33.7	26	31.3	29	34.9
C16 Stomach	134	3.6	71	53.0	26	19.4	37	27.6
C18 Colon	294	7.8	195	66.3	45	15.3	54	18.4
C19-C20 Rectum	154	4.1	110	71.4	23	14.9	21	13.6
C22 Liver	51	1.4	16	31.4	15	29.4	20	39.2
C25 Pancreas	60	1.6	12	20.0	16	26.7	32	53.3
C32 Larynx	175	4.7	127	72.6	19	10.9	29	16.6
C33-C34 Lung	196	5.2			63	32.1	133	67.9
C43 Malign. melanoma	114	3.0	97	85.1	8	7.0	9	7.9
C44 Skin others	222	5.9	155	69.8	26	11.7	41	18.5
C61 Prostate	724	19.3	584	80.7	53	7.3	87	12.0
C62 Testis	35	0.9	32	91.4	1	2.9	2	5.7
C64 Kidney	138	3.7	88	63.8	25	18.1	25	18.1
C67 Bladder	452	12.1	372	82.3	25	5.5	55	12.2
C70-C72 CNS cancer	53	1.4	26	49.1	12	22.6	15	28.3
C76-C79 CUP	55	1.5	32	58.2	16	29.1	7	12.7
C81 Hodgkin lymphoma	33	0.9	32	97.0	1	3.0		
C82-C85 NHL	138	3.7	93	67.4	23	16.7	22	15.9
C90 Mult. myeloma	31	0.8	13	41.9	9	29.0	9	29.0
C91-C96 Leukaemia	53	1.4	26	49.1	12	22.6	15	28.3
Other primaries	224	6.0	152	67.9	26	11.6	46	20.5
All mult. primaries	3749	100.0	2509	66.9	504	13.4	736	19.6

Multiple primaries with number of cases n<30 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 1998-2012
FEMALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03-C06 Oral cavity	41	2.3	37	90.2	3	7.3	1	2.4
C09-C10 Oropharynx	22	1.2	18	81.8	1	4.5	3	13.6
C12-C13 Hypopharynx	10	0.6	9	90.0	1	10.0		
C15 Oesophagus	12	0.7	6	50.0	2	16.7	4	33.3
C16 Stomach	40	2.2	19	47.5	7	17.5	14	35.0
C18 Colon	135	7.5	96	71.1	15	11.1	24	17.8
C19-C20 Rectum	43	2.4	35	81.4	3	7.0	5	11.6
C21 Anus/canal	17	0.9	13	76.5	2	11.8	2	11.8
C23-C24 Bile	10	0.6	5	50.0	1	10.0	4	40.0
C25 Pancreas	40	2.2	14	35.0	7	17.5	19	47.5
C32 Larynx	19	1.1	14	73.7	2	10.5	3	15.8
C33-C34 Lung	71	4.0			21	29.6	50	70.4
C43 Malign. melanoma	48	2.7	44	91.7	1	2.1	3	6.3
C44 Skin others	59	3.3	40	67.8	4	6.8	15	25.4
C50 Breast	506	28.3	421	83.2	40	7.9	45	8.9
C51 Vulva	24	1.3	17	70.8	4	16.7	3	12.5
C53 Cervix uteri	98	5.5	81	82.7	9	9.2	8	8.2
C54 Corpus uteri	99	5.5	87	87.9	3	3.0	9	9.1
C55,C57 Fem. genitals un	12	0.7	10	83.3	1	8.3	1	8.3
C56 Ovary	48	2.7	34	70.8	6	12.5	8	16.7
C64 Kidney	55	3.1	39	70.9	6	10.9	10	18.2
C67 Bladder	81	4.5	63	77.8	8	9.9	10	12.3
C70-C72 CNS cancer	52	2.9	23	44.2	10	19.2	19	36.5
C73 Thyroid	32	1.8	21	65.6	7	21.9	4	12.5
C76-C79 CUP	30	1.7	18	60.0	5	16.7	7	23.3
C81 Hodgkin lymphoma	13	0.7	12	92.3	1	7.7		
C82-C85 NHL	56	3.1	47	83.9	4	7.1	5	8.9
C90 Mult. myeloma	15	0.8	5	33.3	3	20.0	7	46.7
C91-C96 Leukaemia	29	1.6	8	27.6	9	31.0	12	41.4
Other primaries	73	4.1	44	60.3	10	13.7	19	26.0
All mult. primaries	1790	100.0	1280	71.5	196	10.9	314	17.5

Multiple primaries with number of cases n<10 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 1998-2012
(**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	0.50	0.0		3.8	
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19	1		0.1	0.25	0.0		2.6	
20-24	4		0.2	1.00	0.0		5.1	
25-29	3	3	0.2	0.23	0.2	0.27	3.3	2.9
30-34	4	2	0.2	0.18	0.1	0.09	2.3	1.1
35-39	43	32	1.8	0.57	1.4	0.52	12.0	7.1
40-44	118	99	4.9	0.59	4.3	0.67	15.8	10.6
45-49	336	212	15.6	0.72	10.0	0.65	21.9	13.0
50-54	620	386	33.5	0.69	20.4	0.68	23.1	16.0
55-59	1193	633	70.2	0.74	35.5	0.74	24.9	16.8
60-64	1738	782	105.5	0.78	44.9	0.74	24.7	15.8
65-69	2076	890	141.5	0.82	55.5	0.79	22.8	14.3
70-74	2007	841	173.2	0.87	61.0	0.82	20.5	11.7
75-79	1611	812	213.8	0.90	74.2	0.83	17.5	10.3
80-84	1076	647	236.9	0.98	74.9	0.85	14.5	7.8
85+	503	493	162.2	0.87	60.2	0.83	8.2	4.8
All ages	11334	5832					19.1	10.7
Mortality								
Raw			41.3	0.82	20.3	0.77		
WS			21.9	0.80	9.5	0.74		
ES			32.6	0.81	13.8	0.75		
BRD-S			41.8	0.83	17.0	0.76		
PYLL-70								
per 100,000			229.2		128.3			
ES			202.2		109.9			
AYLL-70			9.3		10.4			

* See corresponding tables with multiple primaries.

Table 17

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2012
(**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	0.50	0.0		4.0	
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19	1		0.1	0.25	0.0		2.6	
20-24	3		0.2	1.00	0.0		4.1	
25-29	3	3	0.2	0.23	0.2	0.27	3.6	3.1
30-34	4	2	0.2	0.18	0.1	0.09	2.4	1.2
35-39	42	32	1.8	0.57	1.4	0.54	12.2	7.8
40-44	118	98	4.9	0.60	4.3	0.68	16.6	11.4
45-49	332	206	15.4	0.73	9.7	0.65	23.1	14.1
50-54	607	380	32.8	0.69	20.1	0.69	24.9	17.5
55-59	1173	609	69.0	0.75	34.2	0.74	26.9	18.2
60-64	1672	760	101.5	0.79	43.7	0.74	26.9	17.6
65-69	1977	849	134.7	0.82	52.9	0.78	25.1	16.0
70-74	1909	799	164.7	0.86	57.9	0.81	23.2	13.2
75-79	1496	775	198.5	0.87	70.8	0.82	20.1	11.6
80-84	1009	614	222.2	0.94	71.1	0.83	17.1	8.8
85+	483	481	155.7	0.85	58.7	0.81	9.8	5.5
All ages	10830	5608					21.5	12.0
Mortality								
Raw			39.5	0.81	19.5	0.77		
WS			21.1	0.80	9.2	0.74		
ES			31.2	0.80	13.3	0.75		
BRD-S			39.8	0.82	16.3	0.76		
PYLL-70								
per 100,000			223.6		124.9			
ES			197.3		107.0			
AYLL-70			9.3		10.4			

* See corresponding tables with multiple primaries.

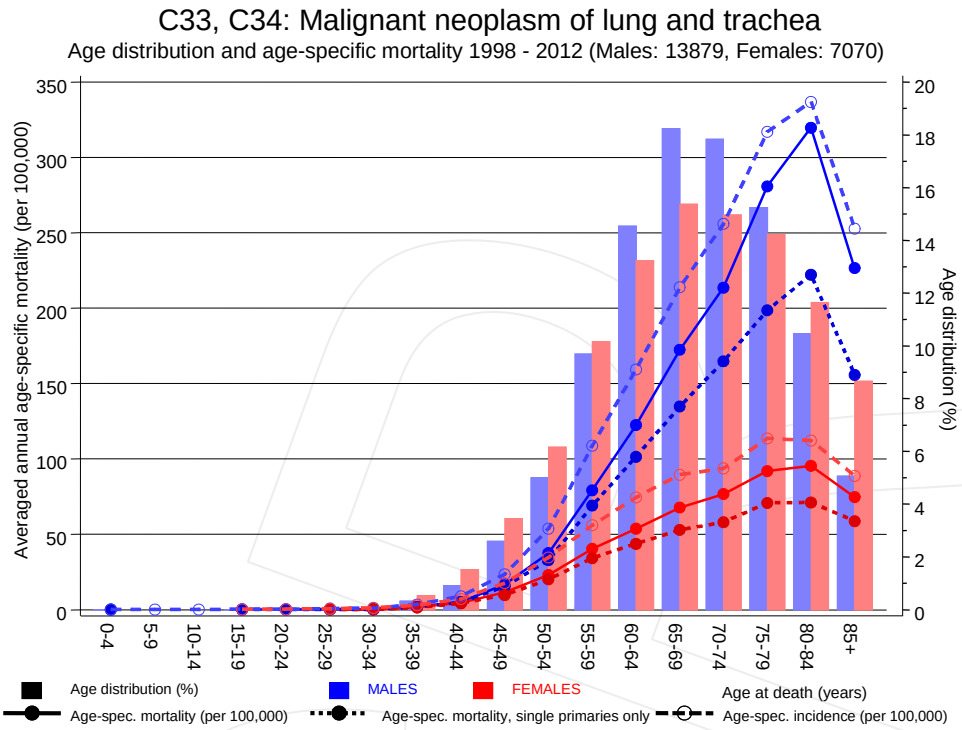
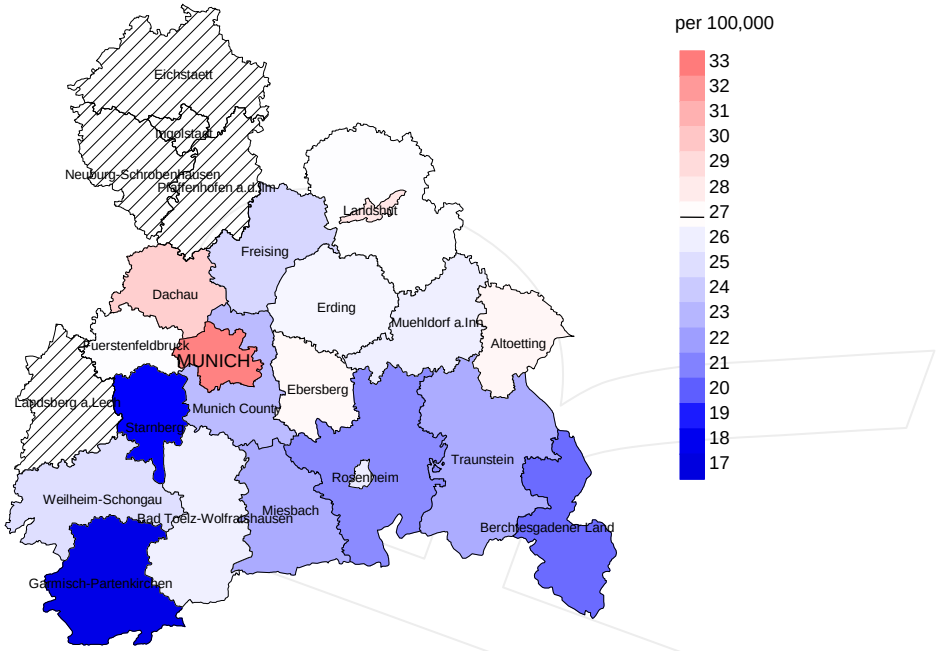


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

Average mortality (world standard population) 2003 - 2008: Males



Average mortality (world standard population) 2003 - 2008: Females

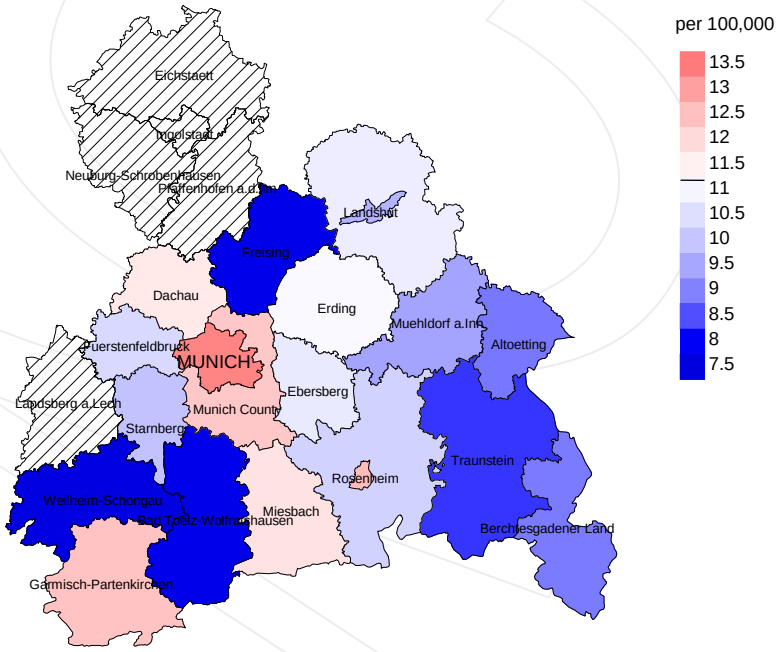
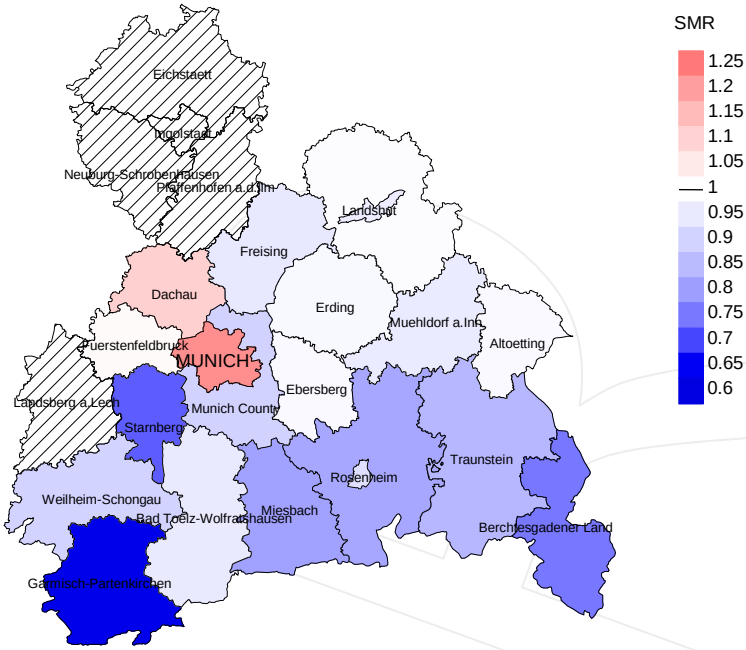


Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2003 to 2008. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 26.9/100,000 WS N=5,911, females 11.2/100,000 WS N=2,926). Since cancer data are not available in some counties until 2007, the local mortality rates were not calculated, and the map tiles show as shaded.

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 63,131 female residents (averaged) in the period from 2003 to 2008 a total of 82 women died from lung cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 10.7/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 7.7 and 14.6/100,000.

Standardized mortality ratio (SMR) 2003 - 2008: Males



Standardized mortality ratio (SMR) 2003 - 2008: Females

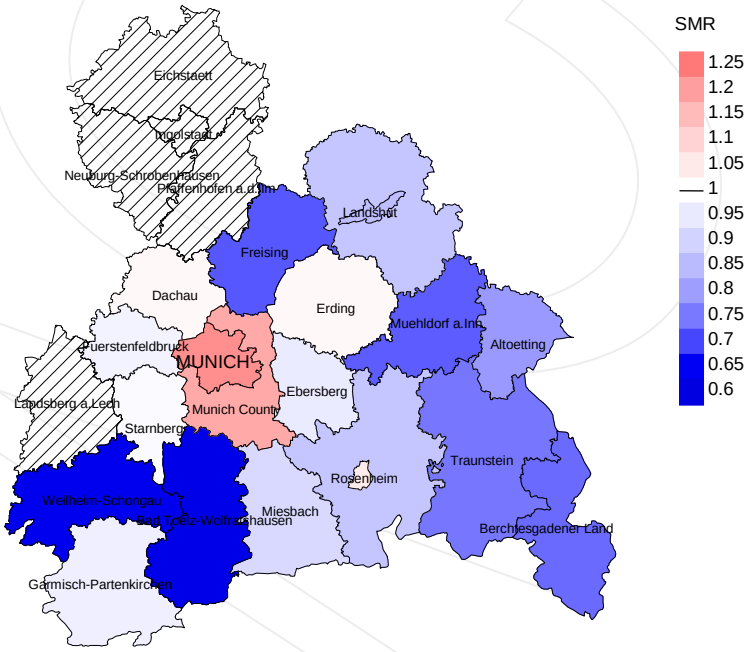


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=5,911, females N=2,926). Since cancer data are not available in some counties until 2007, the local SMR values were not calculated, and the map tiles show as shaded.

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 63,131 female residents (averaged) in the period from 2003 to 2008 a total of 82 women died from lung cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.95. Though, the value of this parameter may vary with an underlying probability of 99% between 0.70 and 1.26, 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 tumor-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

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)
FRG	Federal Republic of Germany
GEKID	Association of Population-based Cancer Registries in Germany (Gesellschaft der epidemiologischen Krebsregister in Deutschland e.V.)
LCL	Lower confidence limit
MI-index	Ratio between mortality and incidence
MCR	Munich Cancer Registry (Tumorregister München)
PYLL-70	Potential years of life lost prior to age 70 given a person dies before that age
SEER	Surveillance, Epidemiology, and End Results (USA)
SIR	Standardized incidence ratio
SMR	Standardized mortality ratio
UCL	Upper confidence limit
WS	World standard population

Recommended Citation

Munich Cancer Registry. Baseline statistics C33, C34: Lung cancer [Internet]. 2014 [updated 2014 Mar 20; cited 2014 May 1]. Available from: http://www.tumorregister-muenchen.de/en/facts/base/base_C3334E.pdf

Copyright

Disclaimer

Index of figures and tables