Munich Cancer Registry

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	1998-2013
Patients	28,088
Diseases	28,332
Creation date	05/19/2015
Export date	12/30/2014
Population	4.64 m

BERLIN

GERMANY

BAVARIA

MUNICH

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
C33	Malignant neoplasm of trachea
C34.-	Malignant neoplasm of bronchus and lung
C34.0	Main bronchus
C34.1	Upper lobe, bronchus or lung
C34.2	Middle lobe, bronchus or lung
C34.3	Lower lobe, bronchus or lung
C34.8	Overlapping lesion of bronchus and lung
C34.9	Bronchus or lung, unspecified

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	1021	153	15.0	14.5	93.8	99.2
1999	1071	161	15.0	16.7	93.3	99.1
2000	1091	220	20.2	17.9	92.4	99.1
2001	1107	185	16.7	19.1	93.2	98.6
2002	1776	371	20.9	21.0	92.6	98.9 #
2003	1827	322	17.6	21.9	92.3	99.3
2004	1809	314	17.4	21.8	92.0	99.2
2005	1797	270	15.0	22.9	91.8	98.5
2006	1838	280	15.2	22.9	88.8	98.2
2007	2200	304	13.8	21.3	87.4	95.5 # ##
2008	2203	244	11.1	24.2	85.6	91.4
2009	2254	268	11.9	24.3	84.8	91.8
2010	2247	252	11.2	25.5	83.1	91.1
2011	2284	246	10.8	25.5	80.3	91.5
2012	2224	237	10.7	25.3	70.5	88.2
2013	1583	253	16.0	25.4	55.8	98.5 ###
1998–2013	28332	4080	14.4	22.6	85.2	95.4

\#   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	1021	676	345	66.2
1999	1071	742	329	69.3
2000	1091	743	348	68.1
2001	1107	766	341	69.2
2002	1776	1204	572	67.8
2003	1827	1202	625	65.8
2004	1809	1176	633	65.0
2005	1797	1187	610	66.1
2006	1838	1211	627	65.9
2007	2200	1428	772	64.9
2008	2203	1425	778	64.7
2009	2254	1427	827	63.3
2010	2247	1410	837	62.8
2011	2284	1410	874	61.7
2012	2224	1349	875	60.7
2013	1583	961	622	60.7
1998-2013	28332	18317	10015	64.7

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	676	345	61.0	29.3	36.9	14.7	54.8	21.1	69.7	25.9
1999	742	329	66.3	27.7	40.4	13.8	59.1	20.0	73.8	24.7
2000	743	348	65.2	29.0	38.9	14.9	57.6	21.2	72.9	25.7
2001	766	341	66.1	28.0	39.8	14.1	58.1	20.3	72.3	24.9
2002	1204	572	64.6	29.2	36.5	14.3	54.6	20.8	70.7	25.4
2003	1202	625	64.1	31.7	35.9	15.8	53.4	22.7	67.8	27.3
2004	1176	633	62.5	32.0	34.0	15.5	50.8	22.2	65.3	27.4
2005	1187	610	62.7	30.7	33.7	14.8	49.8	21.4	63.7	26.0
2006	1211	627	63.2	31.2	33.6	14.9	49.7	21.5	63.3	26.1
2007	1428	772	64.5	33.4	33.6	16.6	50.1	23.8	65.1	28.7
2008	1425	778	64.0	33.5	33.2	16.4	49.2	23.5	62.9	28.4
2009	1427	827	63.9	35.6	33.0	16.7	48.7	24.0	61.7	29.3
2010	1410	837	62.6	35.8	31.9	17.0	46.8	24.4	59.1	29.5
2011	1410	874	61.7	37.0	31.0	17.1	45.6	24.7	57.8	30.1
2012	1349	875	59.0	37.1	29.3	17.3	43.4	25.0	55.8	30.3
2013	961	622	42.1	26.4	20.5	12.5	30.6	17.9	39.4	21.5
1998-2013	18317	10015	61.6	32.2	32.8	15.5	48.5	22.3	61.7	27.1

The computation of the incidence measures includes all primaries, irrespective of first or subsequent malignancy.
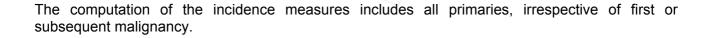
Table 3

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	1021	66.8	11.2	28.1	93.1	52.5	58.4	67.3	75.3	81.1
1999	1071	66.8	11.2	24.9	96.3	52.7	58.8	67.2	74.7	81.6
2000	1091	66.9	11.7	15.8	96.0	51.9	58.9	67.0	75.5	81.5
2001	1107	66.8	11.3	17.0	96.4	52.2	59.5	66.8	74.7	81.0
2002	1776	68.1	11.5	27.5	99.5	53.0	60.4	68.5	76.5	82.0
2003	1827	67.9	11.1	17.5	97.6	53.4	60.5	68.3	75.8	82.2
2004	1809	68.3	11.1	24.4	98.0	54.0	61.1	68.2	76.6	82.2
2005	1797	68.2	11.2	18.1	98.5	54.2	61.0	68.4	76.6	82.5
2006	1838	68.4	10.9	27.5	102	54.8	61.4	68.1	76.6	82.4
2007	2200	68.4	11.2	7.5	99.1	53.9	61.3	68.6	76.6	81.9
2008	2203	68.4	10.9	22.3	99.4	54.5	61.4	68.8	76.4	82.0
2009	2254	68.9	11.1	20.3	102	54.3	61.5	69.2	76.7	83.1
2010	2247	68.7	10.9	0.5	97.8	54.5	61.9	69.3	76.3	82.3
2011	2284	69.0	11.0	22.2	97.6	54.2	61.9	69.7	76.6	83.1
2012	2224	69.3	11.0	22.9	96.8	54.6	62.2	69.9	77.0	83.3
2013	1583	69.5	10.8	0.3	99.7	54.9	62.6	70.3	76.8	82.7
1998-2013	28332	68.3	11.1	0.3	102	53.9	61.0	68.7	76.4	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	676	66.4	10.5	28.1	91.7	53.7	58.8	66.8	74.0	79.3
1999	742	66.3	10.7	24.9	96.3	53.0	58.8	66.7	73.2	79.9
2000	743	66.6	10.9	28.1	94.2	53.0	58.9	66.2	74.0	80.8
2001	766	66.4	10.8	17.0	96.4	52.7	59.7	66.2	73.5	80.1
2002	1204	68.0	10.8	32.2	94.9	53.7	61.1	68.0	75.8	81.6
2003	1202	67.9	10.3	36.8	95.4	54.5	61.3	68.2	75.1	81.1
2004	1176	68.3	10.5	36.9	94.3	54.5	61.5	68.5	76.2	81.6
2005	1187	68.2	10.6	18.1	98.5	55.5	61.9	68.4	75.8	81.5
2006	1211	68.1	10.0	28.7	102	55.2	61.8	68.0	75.7	80.7
2007	1428	68.8	10.5	7.5	97.3	55.2	62.4	69.2	76.7	81.7
2008	1425	68.7	10.4	22.3	99.4	55.6	61.9	69.2	76.4	81.3
2009	1427	68.9	10.6	30.8	100	55.5	61.8	69.1	76.4	82.4
2010	1410	68.8	10.6	0.5	97.5	54.8	62.3	69.5	75.8	81.8
2011	1410	68.9	10.6	28.9	94.3	54.5	62.3	69.9	76.1	82.3
2012	1349	69.6	10.7	22.9	96.6	55.6	63.3	70.4	77.2	82.9
2013	961	70.0	10.2	27.9	99.7	56.0	63.6	71.0	77.0	82.3
1998-2013	18317	68.3	10.6	0.5	102	54.6	61.5	68.8	75.9	81.6

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	345	67.7	12.5	35.8	93.1	50.8	57.8	68.7	76.4	84.4
1999	329	68.1	12.2	32.9	94.8	51.8	59.0	69.1	77.7	83.8
2000	348	67.4	13.3	15.8	96.0	49.8	58.6	69.0	77.8	84.0
2001	341	67.7	12.4	24.4	93.9	50.2	59.1	68.6	76.5	82.9
2002	572	68.2	12.7	27.5	99.5	52.0	59.1	69.5	78.2	83.3
2003	625	68.0	12.6	17.5	97.6	51.9	59.1	68.6	77.3	83.3
2004	633	68.2	12.2	24.4	98.0	52.6	60.1	67.5	78.2	83.5
2005	610	68.1	12.4	21.6	96.1	52.6	58.9	68.4	78.1	83.9
2006	627	68.8	12.3	27.5	100	53.4	60.2	68.1	78.6	84.7
2007	772	67.5	12.3	22.3	99.1	51.0	59.3	67.8	76.5	82.7
2008	778	67.9	11.9	29.4	97.3	53.1	60.5	67.9	76.5	82.9
2009	827	68.8	11.9	20.3	102	53.1	60.9	69.6	77.3	83.9
2010	837	68.7	11.3	33.2	97.8	54.0	61.5	68.3	77.0	83.6
2011	874	69.1	11.5	22.2	97.6	53.4	61.4	69.3	77.8	84.5
2012	875	68.8	11.3	33.3	96.8	53.8	60.7	69.2	76.9	84.0
2013	622	68.8	11.6	0.3	99.2	53.9	62.0	69.3	76.3	84.0
1998-2013	10015	68.3	12.0	0.3	102	52.6	60.1	68.7	77.3	83.7

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	3	0.0	0.0	2	0.0	0.0	1	0.0	0.0
5-9	1	0.0	0.0	1	0.0	0.0			0.0
10-14	0	0.0	0.0			0.0			0.0
15-19	6	0.0	0.0	4	0.0	0.0	2	0.0	0.0
20-24	10	0.0	0.1	4	0.0	0.1	6	0.1	0.1
25-29	21	0.1	0.1	10	0.1	0.1	11	0.1	0.2
30-34	50	0.2	0.3	22	0.1	0.2	28	0.3	0.5
35-39	148	0.5	0.8	81	0.4	0.7	67	0.7	1.1
40-44	386	1.4	2.2	220	1.2	1.9	166	1.7	2.8
45-49	932	3.3	5.5	537	2.9	4.8	395	3.9	6.7
50-54	1763	6.2	11.7	1049	5.7	10.5	714	7.1	13.9
55-59	3039	10.7	22.4	1947	10.6	21.2	1092	10.9	24.8
60-64	4176	14.7	37.2	2771	15.1	36.3	1405	14.0	38.8
65-69	4914	17.3	54.5	3355	18.3	54.6	1559	15.6	54.4
70-74	4659	16.4	71.0	3238	17.7	72.3	1421	14.2	68.6
75-79	3922	13.8	84.8	2585	14.1	86.4	1337	13.3	81.9
80-84	2665	9.4	94.2	1638	8.9	95.3	1027	10.3	92.2
85+	1637	5.8	100.0	853	4.7	100.0	784	7.8	100.0
All ages	28332	100.0		18317	100.0		10015	100.0	

Included in the statistics are 27.9% multiple primaries in males and 25.6% 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=2504 %	Females DCO rate n=1571 %	Males Prop.all cancers n=158258 %	Females Prop.all cancers n=153136 %
0- 4	2	1	0.1	0.1	50.0	100.0	0.6	0.4
5- 9	1		0.1	0.0			0.6	
10-14			0.0	0.0				
15-19	4	2	0.3	0.1			1.1	0.7
20-24	4	6	0.2	0.3	25.0		0.7	1.1
25-29	10	11	0.5	0.5		9.1	1.0	1.0
30-34	22	28	1.0	1.3		3.6	1.5	1.4
35-39	81	67	3.3	2.8	2.5	4.5	3.6	1.8
40-44	220	166	8.4	6.7	3.6	3.0	6.9	2.7
45-49	533	394	22.6	17.0	5.4	6.3	10.0	4.5
50-54	1045	712	51.8	34.6	5.9	5.9	12.1	6.4
55-59	1940	1085	105.8	56.4	7.4	5.9	13.4	7.9
60-64	2755	1394	155.4	74.3	9.0	7.3	12.7	8.1
65-69	3334	1557	211.2	90.2	9.2	7.5	12.1	8.2
70-74	3219	1414	251.3	93.1	12.5	11.6	12.0	7.7
75-79	2573	1333	311.3	112.2	17.3	18.4	12.5	7.6
80-84	1633	1025	326.4	109.9	26.1	32.5	12.0	6.5
85+	852	784	249.8	87.7	50.1	59.8	8.6	4.6
All ages	18228	9979			13.7	15.7	11.5	6.5
Incidence								
Raw			61.3	32.1				
WS			32.6	15.4				
ES			48.3	22.2				
BRD-S			61.5	27.0				

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 %
C00	Lip	2	0.4	5.7	0.7	20.4		0.9	50.0
C03-C06	Oral cavity	14	2.6	5.3	2.9	9.0	#	6.5	21.4
C09-C10	Oropharynx	28	3.3	8.6	5.7	12.4	#	14.1	10.7
C12-C13	Hypopharynx	12	1.8	6.5	3.4	11.4	#	5.8	8.3
C15	Oesophagus	29	5.4	5.4	3.6	7.7	#	13.5	10.3
C16	Stomach	37	12.2	3.0	2.1	4.2	#	14.2	13.5
C17	Small intestine	6	1.4	4.2	1.5	9.1	#	2.6	
C18	Colon	49	29.4	1.7	1.2	2.2	#	11.2	16.3
C19-C20	Rectum	29	16.9	1.7	1.1	2.5	#	6.9	10.3
C22	Liver	30	8.2	3.6	2.5	5.2	#	12.4	23.3
C23-C24	Bile	4	2.8	1.4	0.4	3.6		0.7	25.0
C25	Pancreas	35	10.3	3.4	2.4	4.7	#	14.1	40.0
C26	GI cancer	3	0.3	9.3	1.9	27.0	#	1.5	
C32	Larynx	36	3.3	11.1	7.8	15.3	#	18.7	19.4
C33-C34	Lung	137	36.0	3.8	3.2	4.5	#	57.7	4.4
C38,C45	Mesothelioma	2	1.9	1.0	0.1	3.7		0.0	
C40-C41	Bone	2	0.2	9.0	1.1	32.4	#	1.0	100.0
C43	Malign. melanoma	14	11.6	1.2	0.7	2.0		1.4	7.1
C46,C49	Soft tissue	5	1.5	3.3	1.1	7.7	#	2.0	
C60	Penis	2	0.7	3.1	0.4	11.1		0.8	
C61	Prostate	107	91.5	1.2	1.0	1.4		8.9	18.7
C64	Kidney	34	10.7	3.2	2.2	4.4	#	13.3	20.6
C65	Renal pelvis	8	1.2	6.7	2.9	13.1	#	3.9	
C67	Bladder	35	12.7	2.8	1.9	3.8	#	12.7	17.1
C70-C72	CNS cancer	6	3.9	1.5	0.6	3.3		1.2	50.0
C73	Thyroid	5	1.9	2.6	0.8	6.0		1.7	
C76-C79	CUP	9	4.9	1.8	0.8	3.5		2.3	11.1
C82-C85	NHL	32	11.7	2.7	1.9	3.9	#	11.6	12.5
C90	Mult. myeloma	4	3.7	1.1	0.3	2.7		0.2	50.0
C91-C96	Leukaemia	20	4.6	4.3	2.7	6.7	#	8.8	40.0
Other primaries		8	3.4	2.3	1.0	4.6	#	2.6	50.0
Not observed		0	3.4	0.0	0.0	1.1		-1.9	
All mult. primaries		744	304.0	2.4	2.3	2.6	#	251.6	16.1

Patients	11817
Median age at second malignancy (years)	71.2
Person-years	17492
Mean observation time (years)	1.5
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 1998-2013
FEMALES

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C09-C10	Oropharynx	3	0.5	5.8	1.2	17.0	#	2.3	
C15	Oesophagus	4	0.7	5.8	1.6	14.9	#	3.1	
C16	Stomach	16	4.0	4.0	2.3	6.5	#	11.3	25.0
C17	Small intestine	3	0.6	5.3	1.1	15.6	#	2.3	33.3
C18	Colon	27	11.1	2.4	1.6	3.5	#	15.0	18.5
C19-C20	Rectum	6	5.0	1.2	0.4	2.6		0.9	16.7
C22	Liver	3	1.3	2.3	0.5	6.8		1.6	33.3
C23-C24	Bile	2	1.6	1.2	0.2	4.5		0.4	100.0
C25	Pancreas	15	4.8	3.1	1.7	5.1	#	9.6	33.3
C32	Larynx	3	0.2	12.9	2.7	37.7	#	2.6	
C33-C34	Lung	49	8.6	5.7	4.2	7.6	#	38.2	4.1
C43	Malign. melanoma	7	4.1	1.7	0.7	3.5		2.7	14.3
C50	Breast	59	36.4	1.6	1.2	2.1	#	21.4	18.6
C51	Vulva	6	1.0	5.7	2.1	12.5	#	4.7	16.7
C53	Cervix uteri	7	1.6	4.5	1.8	9.2	#	5.1	28.6
C54	Corpus uteri	9	6.8	1.3	0.6	2.5		2.1	33.3
C55,C57	Fem. genitals un	2	0.2	8.8	1.1	31.7	#	1.7	100.0
C56	Ovary	8	4.9	1.6	0.7	3.2		2.9	25.0
C57.9	Fem. urogen.	2	0.0	167.2	20.2	603.9	#	1.9	
C64	Kidney	10	3.0	3.4	1.6	6.2	#	6.7	30.0
C65	Renal pelvis	3	0.3	8.7	1.8	25.5	#	2.5	
C67	Bladder	7	2.0	3.5	1.4	7.1	#	4.7	14.3
C70-C72	CNS cancer	5	1.6	3.0	1.0	7.1		3.2	40.0
C73	Thyroid	8	2.2	3.6	1.6	7.2	#	5.5	12.5
C76-C79	CUP	5	1.9	2.6	0.9	6.1		2.9	
C82-C85	NHL	8	4.4	1.8	0.8	3.6		3.4	25.0
C90	Mult. myeloma	3	1.4	2.1	0.4	6.2		1.5	66.7
C91-C96	Leukaemia	5	1.8	2.8	0.9	6.6		3.1	20.0
	Other primaries	11	3.2	3.4	1.7	6.2	#	7.4	9.1
	Not observed	0	1.7	0.0	0.0	2.2		-1.6	
	All mult. primaries	296	117.1	2.5	2.2	2.8	#	169.1	18.9

```
Patients                                    6251
Median age at second malignancy (years)     69.6
Person-years                               10580
Mean observation time (years)                1.7
Median observation time (years)              0.8
```

The occurrence of second malignancy is statistically significant.

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

C33, C34: Malignant neoplasm of lung and trachea
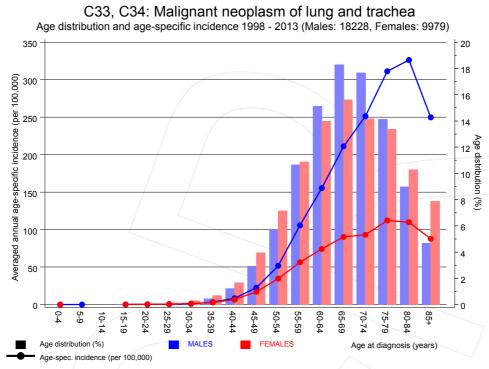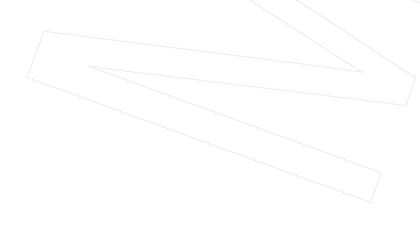Age distribution and age-specific incidence 1998 - 2013 (Males: 18228, Females: 9979)

Figure 7. Age distribution and age-specific incidence

C33, C34: Malignant neoplasm of lung and trachea
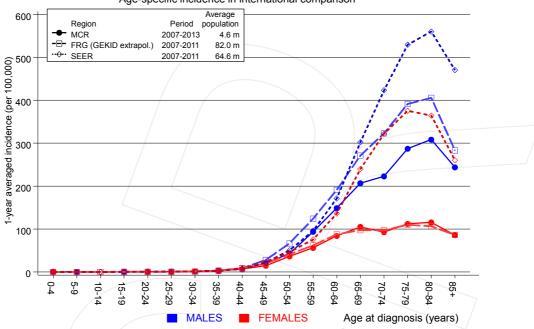### Age-specific incidence in international comparison

Region	Period	Average population
MCR	2007-2013	4.6 m
FRG (GEKID extrapol.)	2007-2011	82.0 m
SEER	2007-2011	64.6 m

MALES   FEMALES   Age at diagnosis (years)

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, 2014. http://www.gekid.de. Last access: 02/11/2015

Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 18 Regs Research Data, released April 2014, based on the November 2013 submission. http://www.seer.cancer.gov.

C33, C34: Malignant neoplasm of lung and trachea

Cumulative follow-up years since diagnosis for period 1998 - 2013 (excl. DCO)

Gender	n	Target Sum	Median	Actual Sum	Median
All patients					
Males	10721	19231	0.8	17436	0.7
Females	5570	11351	1.0	10539	0.9
Patients alive					
Males	2072	10233	3.8	8438	2.8
Females	1322	6345	3.7	5532	3.1
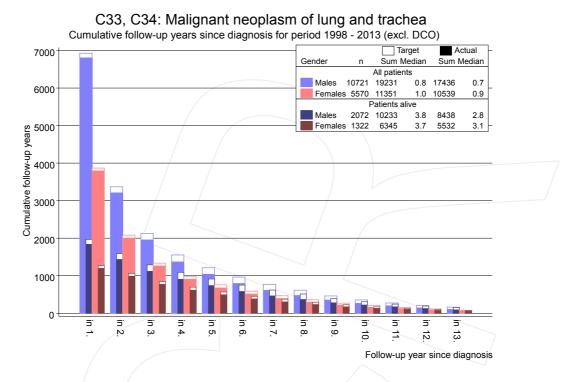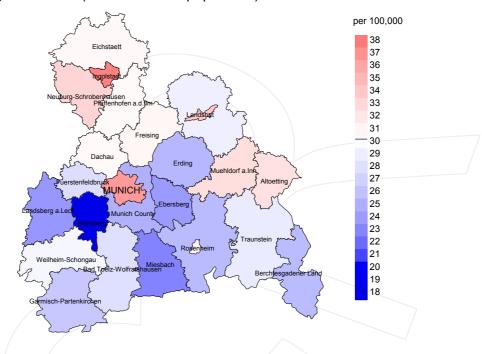
Figure 8. Cumulative follow-up years depending on time since diagnosis

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
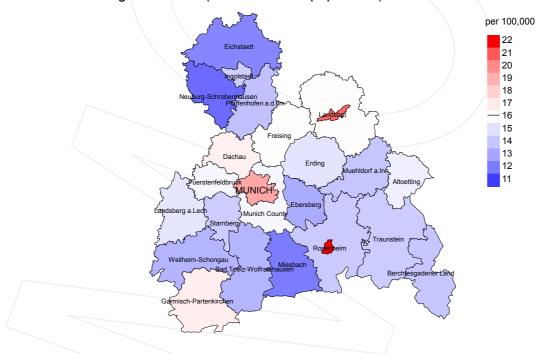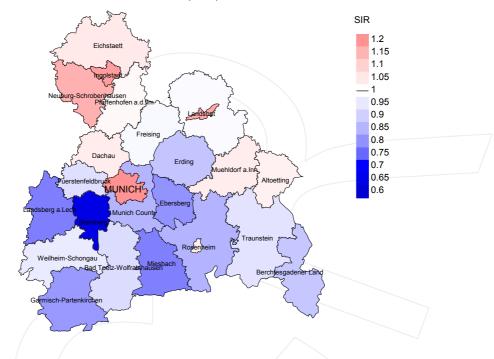
Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 30.3/100,000 WS N=9,351, females 16.2/100,000 WS N=5,559).

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 119 women were identified with newly diagnosed lung cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 13.2/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 10.1 and 17.1/100,000.

Standardized incidence ratio (SIR) 2007 - 2013: Males

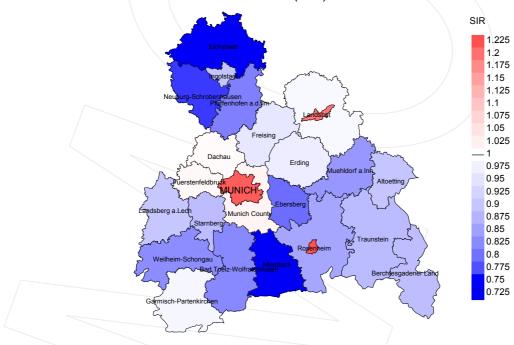Standardized incidence ratio (SIR) 2007 - 2013: Females

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=9,351, females N=5,559).

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 119 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 0.80. Though, the value of this parameter may vary with an underlying probability of 99% between 0.62 and 1.01, 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	1021	99.2	15.0	958	93.8	92.8
1999	1071	99.1	15.0	999	93.3	94.9
2000	1091	99.1	20.2	1008	92.4	95.5
2001	1107	98.6	16.7	1032	93.2	95.0
2002	1776	98.9	20.9	1645	92.6	97.3
2003	1827	99.3	17.6	1687	92.3	97.4
2004	1809	99.2	17.4	1665	92.0	97.8
2005	1797	98.5	15.0	1649	91.8	98.5
2006	1838	98.2	15.2	1633	88.8	98.7
2007	2200	95.5	13.8	1923	87.4	98.8
2008	2203	91.4	11.1	1885	85.6	99.0
2009	2254	91.8	11.9	1911	84.8	98.7
2010	2247	91.1	11.2	1867	83.1	98.5
2011	2284	91.5	10.8	1834	80.3	98.3
2012	2224	88.2	10.7	1569	70.5	95.5
2013	1583	98.5	16.0	884	55.8	91.0
1998-2013	28332	95.4	14.4	24149	85.2	97.2

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	1021	882	91.8	432	42.3
1999	1071	915	94.1	435	40.6
2000	1091	997	95.1	481	44.1
2001	1107	993	94.1	460	41.6
2002	1776	1391	97.5	812	45.7
2003	1827	1499	97.8	822	45.0
2004	1809	1568	97.8	795	43.9
2005	1797	1531	97.9	803	44.7
2006	1838	1598	98.1	781	42.5
2007	2200	1746	98.6	908	41.3
2008	2203	1760	99.1	850	38.6
2009	2254	1848	99.2	876	38.9
2010	2247	1927	98.9	924	41.1
2011	2284	1950	99.1	954	41.8
2012	2224	1902	98.4	884	39.7
2013	1583	1665	98.6	683	43.1
1998-2013	28332	24172	97.7	11900	42.0

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	882	84.2	15.8	97.4
1999	915	89.1	10.9	97.3
2000	997	90.9	9.1	98.3
2001	993	88.1	11.9	96.8
2002	1391	92.4	7.6	97.2
2003	1499	93.4	6.6	97.6
2004	1568	95.0	5.0	98.0
2005	1531	93.3	6.7	97.0
2006	1598	93.1	6.9	97.3
2007	1746	94.0	6.0	97.2
2008	1760	94.8	5.2	97.4
2009	1848	93.8	6.2	97.4
2010	1927	93.7	6.3	97.2
2011	1950	94.2	5.8	96.8
2012	1902	93.3	6.7	96.7
2013	1665	93.9	6.1	96.5
1998-2013	24172	92.9	7.1	97.2

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	606	68.8	68.3	71.5	69.3
1999	629	69.0	69.0	70.0	69.2
2000	676	68.2	68.0	72.3	68.3
2001	686	68.4	68.0	71.2	69.1
2002	973	68.9	68.4	74.3	68.6
2003	1049	68.8	68.5	72.0	68.9
2004	1043	69.6	69.5	71.9	69.7
2005	1022	69.8	69.6	74.7	69.9
2006	1093	69.7	69.5	72.9	69.7
2007	1169	70.1	69.7	74.8	70.1
2008	1167	69.9	69.5	74.9	69.7
2009	1222	70.6	70.4	74.6	70.4
2010	1242	70.9	70.5	75.5	70.8
2011	1245	71.1	70.8	74.4	70.8
2012	1188	71.3	70.6	78.7	71.1
2013	1025	72.3	72.2	77.1	72.3
1998-2013	16035	70.1	69.8	74.0	70.1

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	276	69.0	68.3	75.0	70.1
1999	286	72.3	72.2	77.5	72.3
2000	321	70.2	69.6	78.2	70.3
2001	307	71.7	71.0	76.0	71.7
2002	418	70.5	69.9	76.7	70.5
2003	450	71.3	70.9	73.6	71.1
2004	525	71.9	70.8	80.4	71.5
2005	509	68.6	68.1	79.9	68.6
2006	505	70.6	70.0	77.5	70.1
2007	577	70.3	69.9	76.2	70.0
2008	593	70.1	69.4	79.8	69.6
2009	626	69.7	69.0	81.7	69.4
2010	685	70.2	70.0	78.3	70.1
2011	705	69.8	69.5	76.0	69.8
2012	714	71.2	70.9	79.3	71.1
2013	640	71.5	70.7	83.6	70.9
1998-2013	8137	70.4	70.0	78.2	70.3

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	502	45.3	0.74	27.2	0.74	40.9	0.75	53.3	0.77
1999	560	50.0	0.76	29.5	0.73	44.8	0.76	59.3	0.81
2000	612	53.7	0.83	31.5	0.81	47.6	0.83	62.0	0.85
2001	601	51.9	0.79	30.3	0.76	45.4	0.78	59.1	0.82
2002	896	48.1	0.75	27.0	0.74	40.4	0.74	52.4	0.74
2003	976	52.1	0.81	28.8	0.80	43.0	0.81	55.4	0.82
2004	993	52.8	0.85	28.4	0.84	42.8	0.84	55.7	0.86
2005	941	49.7	0.80	25.8	0.77	38.9	0.78	51.2	0.81
2006	1015	53.0	0.84	27.2	0.81	41.0	0.83	53.8	0.85
2007	1096	49.5	0.77	25.2	0.75	38.0	0.76	50.2	0.78
2008	1100	49.4	0.78	25.2	0.76	37.7	0.77	49.1	0.79
2009	1140	51.1	0.80	25.3	0.77	37.9	0.78	49.6	0.81
2010	1149	51.0	0.82	25.1	0.79	37.4	0.81	48.6	0.83
2011	1164	50.9	0.83	24.8	0.81	37.1	0.82	48.2	0.84
2012	1095	47.9	0.82	23.4	0.80	34.8	0.81	45.2	0.81
2013	959	42.0	1.00	19.8	0.97	30.0	0.98	39.6	1.01
1998-2013	14799	49.8	0.81	25.8	0.79	38.7	0.80	50.5	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	241	20.5	0.70	10.1	0.69	14.6	0.69	17.7	0.68
1999	255	21.5	0.78	10.0	0.73	14.8	0.75	18.9	0.77
2000	294	24.5	0.84	12.2	0.82	17.6	0.83	21.8	0.85
2001	275	22.6	0.81	10.7	0.76	15.7	0.77	19.7	0.79
2002	389	19.9	0.68	9.6	0.67	14.0	0.68	17.1	0.68
2003	424	21.5	0.68	10.1	0.64	14.9	0.66	18.4	0.67
2004	497	25.1	0.79	11.5	0.75	16.9	0.76	21.4	0.78
2005	488	24.5	0.80	11.6	0.79	16.9	0.79	20.7	0.80
2006	472	23.5	0.75	10.8	0.72	15.7	0.73	19.5	0.75
2007	545	23.6	0.71	11.1	0.67	16.1	0.69	19.9	0.70
2008	569	24.5	0.74	11.3	0.69	16.5	0.71	20.4	0.72
2009	593	25.5	0.72	12.0	0.72	17.3	0.72	21.0	0.72
2010	656	28.0	0.79	12.6	0.75	18.2	0.75	22.6	0.77
2011	673	28.5	0.77	12.9	0.76	18.7	0.76	23.1	0.77
2012	680	28.8	0.78	12.6	0.74	18.5	0.74	23.0	0.76
2013	605	25.6	0.97	11.3	0.90	16.3	0.91	20.1	0.93
1998-2013	7656	24.6	0.77	11.3	0.73	16.5	0.74	20.4	0.76

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	2	0.0		1	0.0	0.0	1	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	5	0.0	0.0	4	0.0	0.0	1	0.0	0.0
25-29	7	0.0	0.1	4	0.0	0.1	3	0.0	0.1
30-34	9	0.0	0.1	5	0.0	0.1	4	0.1	0.1
35-39	83	0.4	0.5	46	0.3	0.4	37	0.5	0.6
40-44	239	1.1	1.5	129	0.9	1.3	110	1.4	2.0
45-49	633	2.8	4.3	375	2.5	3.8	258	3.3	5.4
50-54	1218	5.4	9.7	744	5.0	8.7	474	6.1	11.5
55-59	2187	9.6	19.3	1412	9.4	18.1	775	10.0	21.5
60-64	3173	14.0	33.2	2153	14.4	32.5	1020	13.2	34.7
65-69	3906	17.2	50.4	2710	18.1	50.6	1196	15.5	50.2
70-74	3915	17.2	67.7	2726	18.2	68.7	1189	15.4	65.6
75-79	3412	15.0	82.7	2321	15.5	84.2	1091	14.1	79.7
80-84	2481	10.9	93.6	1595	10.6	94.9	886	11.5	91.1
85+	1458	6.4	100.0	772	5.1	100.0	686	8.9	100.0
All ages	22729	100.0		14998	100.0		7731	100.0	

Included in the statistics are 27.9% multiple primaries in males and 25.6% 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	1	0.1	0.50	0.1	1.00	3.0	3.8
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19	1		0.1	0.25	0.0		2.2	
20-24	4	1	0.2	1.00	0.1	0.17	4.4	2.0
25-29	4	3	0.2	0.40	0.1	0.27	3.7	2.6
30-34	5	4	0.2	0.23	0.2	0.14	2.7	1.8
35-39	46	37	1.8	0.57	1.6	0.55	11.5	7.2
40-44	129	110	4.9	0.59	4.4	0.66	15.1	9.7
45-49	375	258	15.9	0.70	11.2	0.65	20.8	12.8
50-54	744	474	36.8	0.71	23.1	0.66	22.6	15.3
55-59	1412	775	77.0	0.73	40.3	0.71	23.9	16.3
60-64	2153	1020	121.5	0.78	54.4	0.73	24.2	15.6
65-69	2710	1196	171.7	0.81	69.3	0.77	22.7	14.4
70-74	2726	1189	212.8	0.84	78.3	0.84	20.0	12.0
75-79	2321	1091	280.8	0.90	91.9	0.82	17.6	10.2
80-84	1595	886	318.8	0.97	95.0	0.86	14.7	7.9
85+	772	686	226.4	0.91	76.8	0.88	8.7	5.0
All ages	14998	7731					18.7	10.7
Mortality								
Raw			50.4	0.82	24.9	0.77		
WS			26.1	0.80	11.4	0.74		
ES			39.2	0.81	16.7	0.75		
BRD-S			51.2	0.83	20.6	0.76		
PYLL-70								
per 100,000			252.9		147.2			
ES			222.4		125.7			
AYLL-70			8.9		10.1			

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	152	3.7	125	82.2	13	8.6	14	9.2
C09-C10	Oropharynx	127	3.1	91	71.7	13	10.2	23	18.1
C12-C13	Hypopharynx	74	1.8	49	66.2	13	17.6	12	16.2
C15	Oesophagus	89	2.1	31	34.8	26	29.2	32	36.0
C16	Stomach	147	3.5	78	53.1	29	19.7	40	27.2
C18	Colon	316	7.6	209	66.1	49	15.5	58	18.4
C19-C20	Rectum	165	4.0	121	73.3	23	13.9	21	12.7
C22	Liver	54	1.3	17	31.5	17	31.5	20	37.0
C25	Pancreas	63	1.5	12	19.0	17	27.0	34	54.0
C32	Larynx	190	4.6	138	72.6	22	11.6	30	15.8
C33-C34	Lung	220	5.3			70	31.8	150	68.2
C43	Malign. melanoma	132	3.2	113	85.6	8	6.1	11	8.3
C44	Skin others	272	6.6	195	71.7	27	9.9	50	18.4
C61	Prostate	794	19.2	649	81.7	54	6.8	91	11.5
C64	Kidney	164	4.0	108	65.9	28	17.1	28	17.1
C67	Bladder	494	11.9	406	82.2	29	5.9	59	11.9
C70-C72	CNS cancer	59	1.4	27	45.8	14	23.7	18	30.5
C76-C79	CUP	59	1.4	35	59.3	16	27.1	8	13.6
C82-C85	NHL	147	3.5	98	66.7	24	16.3	25	17.0
C91-C96	Leukaemia	64	1.5	33	51.6	13	20.3	18	28.1
Other primaries		363	8.8	257	70.8	40	11.0	66	18.2
All mult. primaries		4145	100.0	2792	67.4	545	13.1	808	19.5

Multiple primaries with number of cases 1 to 39 are pooled in category "Other primaries".

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

Table 15b

Multiple primaries in deaths in period 1998-2013
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03-C06	Oral cavity	43	2.2	38	88.4	3	7.0	2	4.7
C09-C10	Oropharynx	23	1.2	19	82.6	1	4.3	3	13.0
C15	Oesophagus	13	0.7	7	53.8	2	15.4	4	30.8
C16	Stomach	43	2.2	20	46.5	9	20.9	14	32.6
C18	Colon	142	7.3	100	70.4	17	12.0	25	17.6
C19-C20	Rectum	49	2.5	39	79.6	4	8.2	6	12.2
C21	Anus/canal	20	1.0	15	75.0	3	15.0	2	10.0
C23-C24	Bile	12	0.6	6	50.0	2	16.7	4	33.3
C25	Pancreas	43	2.2	15	34.9	8	18.6	20	46.5
C32	Larynx	21	1.1	16	76.2	2	9.5	3	14.3
C33-C34	Lung	82	4.2			22	26.8	60	73.2
C43	Malign. melanoma	51	2.6	47	92.2	1	2.0	3	5.9
C44	Skin others	70	3.6	44	62.9	5	7.1	21	30.0
C50	Breast	549	28.3	456	83.1	46	8.4	47	8.6
C51	Vulva	26	1.3	19	73.1	4	15.4	3	11.5
C53	Cervix uteri	102	5.3	85	83.3	9	8.8	8	7.8
C54	Corpus uteri	104	5.4	92	88.5	3	2.9	9	8.7
C55,C57	Fem. genitals un	15	0.8	13	86.7	1	6.7	1	6.7
C56	Ovary	51	2.6	37	72.5	6	11.8	8	15.7
C64	Kidney	58	3.0	39	67.2	9	15.5	10	17.2
C67	Bladder	86	4.4	67	77.9	9	10.5	10	11.6
C70-C72	CNS cancer	55	2.8	22	40.0	11	20.0	22	40.0
C73	Thyroid	35	1.8	24	68.6	7	20.0	4	11.4
C76-C79	CUP	32	1.6	19	59.4	5	15.6	8	25.0
C81	Hodgkin lymphoma	13	0.7	13	100.0				
C82-C85	NHL	65	3.3	53	81.5	4	6.2	8	12.3
C90	Mult. myeloma	19	1.0	6	31.6	5	26.3	8	42.1
C91-C96	Leukaemia	32	1.6	10	31.3	9	28.1	13	40.6
Other primaries		88	4.5	52	59.1	13	14.8	23	26.1
All mult. primaries		1942	100.0	1373	70.7	220	11.3	349	18.0

Multiple primaries with number of cases 1 to 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 1998-2013
(**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	0.50	0.0		3.6	
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19	1		0.1	0.33	0.0		2.4	
20-24	3	1	0.2	1.00	0.1	0.17	3.6	2.1
25-29	3	3	0.1	0.33	0.1	0.27	3.0	2.8
30-34	5	3	0.2	0.23	0.1	0.12	2.8	1.5
35-39	44	32	1.8	0.58	1.4	0.52	11.8	6.9
40-44	123	100	4.7	0.60	4.0	0.67	15.6	10.1
45-49	346	221	14.7	0.71	9.6	0.64	21.1	12.8
50-54	661	419	32.7	0.70	20.4	0.68	23.0	16.1
55-59	1237	678	67.4	0.73	35.3	0.73	24.2	16.9
60-64	1822	841	102.8	0.78	44.8	0.74	24.4	15.8
65-69	2191	968	138.8	0.81	56.1	0.79	22.6	14.4
70-74	2161	934	168.7	0.87	61.5	0.83	20.2	11.9
75-79	1716	877	207.6	0.90	73.8	0.84	17.2	10.2
80-84	1147	689	229.2	0.99	73.9	0.86	14.2	7.8
85+	541	552	158.6	0.87	61.8	0.87	8.0	5.0
All ages	12002	6318					18.8	10.8
Mortality								
Raw			40.4	0.82	20.3	0.78		
WS			21.3	0.80	9.5	0.74		
ES			31.6	0.81	13.8	0.75		
BRD-S			40.6	0.83	16.9	0.77		
PYLL-70								
per 100,000			221.6		126.6			
ES			195.1		108.3			
AYLL-70			9.2		10.3			

* 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	0.50	0.0		3.7	
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19	1		0.1	0.33	0.0		2.4	
20-24	2	1	0.1	1.00	0.1	0.17	2.5	2.3
25-29	3	3	0.1	0.33	0.1	0.27	3.3	2.9
30-34	5	3	0.2	0.23	0.1	0.13	2.9	1.6
35-39	43	32	1.7	0.57	1.4	0.53	12.0	7.5
40-44	123	99	4.7	0.61	4.0	0.68	16.5	10.8
45-49	341	215	14.4	0.71	9.3	0.65	22.2	13.9
50-54	646	412	32.0	0.71	20.0	0.69	24.8	17.6
55-59	1213	655	66.1	0.74	34.1	0.72	26.2	18.4
60-64	1750	817	98.7	0.79	43.6	0.75	26.6	17.6
65-69	2088	921	132.3	0.82	53.4	0.78	25.0	16.2
70-74	2051	886	160.1	0.86	58.4	0.82	23.0	13.5
75-79	1589	838	192.3	0.87	70.6	0.82	19.8	11.6
80-84	1075	654	214.9	0.95	70.1	0.84	16.8	8.8
85+	520	534	152.5	0.85	59.7	0.84	9.6	5.6
All ages	11451	6070					21.2	12.1
Mortality								
Raw			38.5	0.81	19.5	0.77		
WS			20.4	0.80	9.1	0.74		
ES			30.3	0.81	13.3	0.75		
BRD-S			38.6	0.82	16.3	0.76		
PYLL-70								
per 100,000			215.8		123.3			
ES			190.0		105.5			
AYLL-70			9.3		10.4			

* See corresponding tables with multiple primaries.

C33, C34: Malignant neoplasm of lung and trachea
Age distribution and age-specific mortality 1998 - 2013 (Males: 14799, Females: 7656)
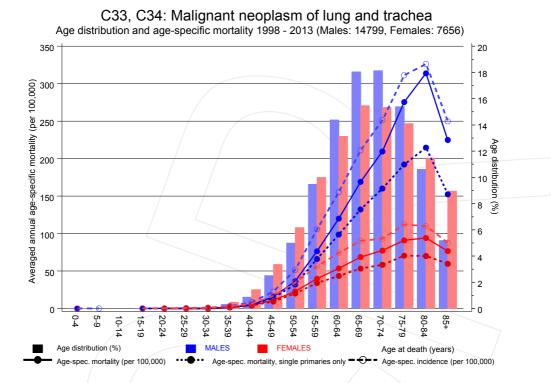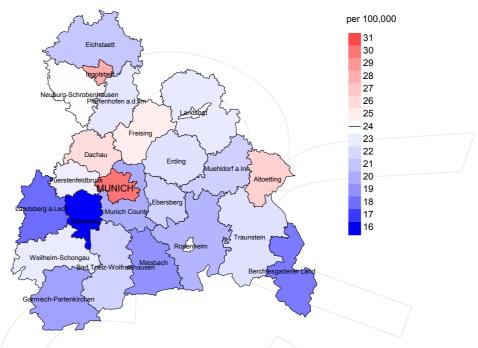
Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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) 2007 - 2013: Males

Average mortality (world standard population) 2007 - 2013: Females
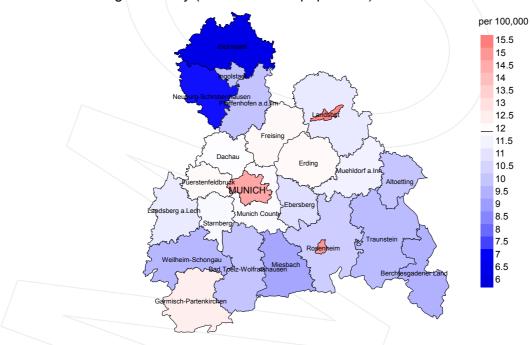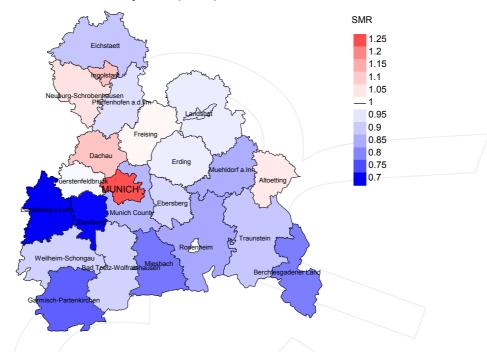
Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2013. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 24.1/100,000 WS N=7,674, females 11.9/100,000 WS N=4,299).

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 104 women died from lung cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 10.9/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 8.1 and 14.2/100,000.

Standardized mortality ratio (SMR) 2007 - 2013: Males

Standardized mortality ratio (SMR) 2007 - 2013: Females
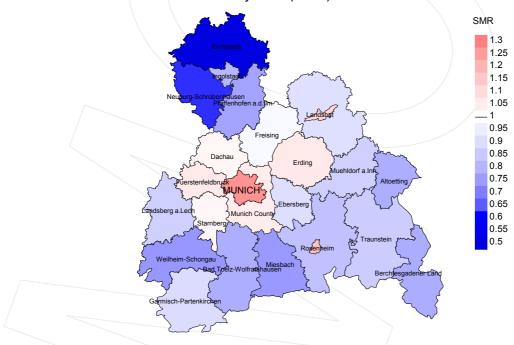
Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=7,674, females N=4,299).

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 104 women died from lung cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.91. Though, the value of this parameter may vary with an underlying probability of 99% between 0.69 and 1.16, 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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