Munich Cancer Registry

- Survival
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- *Deutsch*

ICD-10 C33, C34: Lung cancer

Incidence and Mortality

Year of diagnosis	1998-2014
Patients	30,185
Diseases	30,462
Creation date	04/13/2016
Export date	12/23/2015
Population	4.64 m

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

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

http://www.tumorregister-muenchen.de/en/facts/base/bC3334E-ICD-10-C33-C34-Lung-cancer-incidence-and-mortality.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.

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, April 2016

[#] 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).

[##] 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.

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

All patients with invasive cancer by year of diagnosis, proportions of DCO, multiple primaries, deaths, and active follow-up (incl. DCO)

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	94.1	99.2	
1999	1071	161	15.0	16.8	93.5	99.1	
2000	1092	221	20.2	17.9	92.5	99.1	
2001	1107	185	16.7	19.2	93.4	98.9	
2002	1777	371	20.9	21.2	92.9	98.9	#
2003	1828	322	17.6	22.0	92.6	99.2	
2004	1811	314	17.3	22.0	92.4	99.2	
2005	1799	270	15.0	23.0	92.3	98.4	
2006	1837	280	15.2	23.0	89.4	98.0	
2007	2202	303	13.8	21.4	88.1	94.6	#
2008	2208	244	11.1	24.5	86.5	92.2	
2009	2253	266	11.8	24.7	85.5	92.8	
2010	2255	253	11.2	25.6	84.7	92.3	
2011	2298	246	10.7	25.8	82.9	93.2	
2012	2274	239	10.5	25.8	76.4	91.2	
2013	2208	251	11.4	24.2	67.8	99.2	
2014	1421	240	16.9	27.5	44.4	96.1	##
1998–2014	30462	4319	14.2	23.0	84.6	96.0	

The increases of incident cases in 2002 and 2007 reflect the expansion to additional registry areas.

Please be aware that data of recent annual patient cohorts may not yet be fully processed. The years under evaluation can be found in the respective headings.

Table 1a

All patients with invasive cancer
by year of diagnosis and gender
(incl. DCO)

Year of diagnosis	All n	Males n	Females n	Prop. males %
1998	1021	676	345	66.2
1999	1071	742	329	69.3
2000	1092	744	348	68.1
2001	1107	766	341	69.2
2002	1777	1204	573	67.8
2003	1828	1202	626	65.8
2004	1811	1177	634	65.0
2005	1799	1188	611	66.0
2006	1837	1212	625	66.0
2007	2202	1430	772	64.9
2008	2208	1428	780	64.7
2009	2253	1425	828	63.2
2010	2255	1414	841	62.7
2011	2298	1417	881	61.7
2012	2274	1381	893	60.7
2013	2208	1349	859	61.1
2014	1421	808	613	56.9
1998-2014	30462	19563	10899	64.2

Table 2

Incidence measures by year of diagnosis 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	744	348	65.3	29.0	38.9	14.9	57.7	21.2	73.1	25.7
2001	766	341	66.1	28.0	39.8	14.1	58.1	20.3	72.3	24.9
2002	1204	573	64.6	29.3	36.5	14.3	54.6	20.8	70.7	25.4
2003	1202	626	64.1	31.8	35.9	15.8	53.4	22.7	67.8	27.3
2004	1177	634	62.6	32.1	34.0	15.5	50.8	22.3	65.4	27.4
2005	1188	611	62.7	30.7	33.8	14.8	49.9	21.5	63.8	26.1
2006	1212	625	63.3	31.1	33.6	14.8	49.8	21.5	63.3	26.1
2007	1430	772	64.6	33.4	33.6	16.6	50.1	23.8	65.2	28.7
2008	1428	780	64.2	33.6	33.3	16.5	49.4	23.6	63.0	28.4
2009	1425	828	63.8	35.6	32.9	16.7	48.7	24.0	61.6	29.4
2010	1414	841	62.7	35.9	32.0	17.1	46.9	24.5	59.2	29.7
2011	1417	881	62.0	37.3	31.1	17.3	45.8	24.9	58.1	30.4
2012	1381	893	60.4	37.8	30.1	17.6	44.4	25.4	57.1	30.8
2013	1349	859	59.0	36.4	29.0	17.3	43.2	24.7	55.5	29.7
2014	808	613	35.4	26.0	16.7	12.0	25.4	17.2	33.3	21.1
1998–2014	19563	10899	61.1	32.6	32.3	15.6	47.9	22.5	61.0	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 patients)
(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	1092	66.9	11.7	15.8	96.0	51.9	58.9	67.1	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	1777	68.1	11.5	27.5	99.5	53.0	60.4	68.5	76.5	82.0
2003	1828	67.9	11.1	17.5	97.6	53.4	60.6	68.3	75.8	82.2
2004	1811	68.3	11.1	24.4	98.0	54.0	61.1	68.2	76.6	82.2
2005	1799	68.2	11.2	18.1	98.5	54.2	61.0	68.4	76.6	82.5
2006	1837	68.4	10.9	27.5	102	54.8	61.4	68.1	76.6	82.4
2007	2202	68.4	11.2	7.5	99.1	53.9	61.3	68.7	76.6	81.9
2008	2208	68.4	10.9	22.3	99.4	54.5	61.4	68.7	76.4	82.0
2009	2253	68.9	11.1	20.3	102	54.3	61.5	69.3	76.7	83.1
2010	2255	68.7	10.9	0.5	97.8	54.5	61.9	69.2	76.3	82.3
2011	2298	69.0	11.0	22.2	97.6	54.2	62.0	69.7	76.6	83.1
2012	2274	69.3	11.0	22.9	96.8	54.6	62.2	69.9	77.0	83.3
2013	2208	69.3	10.9	0.3	99.7	54.2	62.1	70.2	76.6	82.8
2014	1421	70.0	11.0	30.5	100	55.1	63.1	71.2	77.4	83.7
1998-2014	30462	68.4	11.1	0.3	102	53.9	61.1	68.9	76.4	82.4

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	744	66.7	10.9	28.1	94.2	53.0	59.0	66.3	74.1	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	1177	68.3	10.5	36.9	94.3	54.5	61.5	68.5	76.2	81.6
2005	1188	68.2	10.6	18.1	98.5	55.5	61.9	68.3	75.8	81.5
2006	1212	68.1	10.0	28.7	102	55.2	61.8	68.0	75.7	80.7
2007	1430	68.8	10.5	7.5	97.3	55.2	62.4	69.2	76.7	81.6
2008	1428	68.7	10.4	22.3	99.4	55.6	61.9	69.2	76.4	81.3
2009	1425	69.0	10.6	30.8	100	55.5	61.8	69.1	76.5	82.4
2010	1414	68.8	10.6	0.5	97.5	54.8	62.3	69.5	75.8	81.8
2011	1417	68.9	10.6	28.9	94.3	54.5	62.4	70.0	76.1	82.3
2012	1381	69.5	10.7	22.9	96.6	55.5	63.2	70.3	77.1	82.7
2013	1349	69.7	10.3	27.9	99.7	55.6	62.5	70.8	76.9	82.5
2014	808	70.9	10.4	33.7	96.0	56.7	64.1	72.1	77.8	83.7
1998-2014	19563	68.5	10.6	0.5	102	54.7	61.6	68.9	76.0	81.8

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	573	68.2	12.7	27.5	99.5	52.0	59.2	69.5	78.2	83.3
2003	626	68.0	12.6	17.5	97.6	51.9	59.1	68.5	77.3	83.3
2004	634	68.2	12.2	24.4	98.0	52.6	60.1	67.5	78.2	83.5
2005	611	68.1	12.4	21.6	96.1	52.6	58.9	68.4	78.1	83.9
2006	625	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	67.9	76.5	82.7
2008	780	67.9	11.8	29.4	97.3	53.2	60.5	67.9	76.4	82.9
2009	828	68.9	11.9	20.3	102	53.1	60.9	69.6	77.4	83.9
2010	841	68.6	11.3	33.2	97.8	54.0	61.5	68.3	77.0	83.6
2011	881	69.1	11.5	22.2	97.6	53.4	61.3	69.3	77.6	84.5
2012	893	68.9	11.4	33.3	96.8	53.8	60.7	69.4	76.9	84.1
2013	859	68.6	11.6	0.3	99.2	53.6	61.3	69.2	76.3	84.2
2014	613	68.9	11.7	30.5	100	52.6	61.9	70.1	76.7	83.9
1998-2014	10899	68.4	12.0	0.3	102	52.6	60.2	68.8	77.2	83.8

Table 4

Age distribution by 5-year age group and gender for period 2007-2014
(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	2	0.0	0.0	2	0.0	0.0			0.0
20-24	5	0.0	0.1	2	0.0	0.1	3	0.0	0.1
25-29	10	0.1	0.1	6	0.1	0.1	4	0.1	0.1
30-34	30	0.2	0.3	13	0.1	0.2	17	0.3	0.4
35-39	76	0.4	0.7	42	0.4	0.6	34	0.5	0.9
40-44	196	1.1	1.9	95	0.9	1.5	101	1.6	2.5
45-49	535	3.1	5.0	308	2.9	4.4	227	3.5	6.0
50-54	1009	5.9	10.9	547	5.1	9.6	462	7.1	13.1
55-59	1604	9.4	20.3	972	9.1	18.7	632	9.8	22.9
60-64	2367	13.8	34.1	1452	13.6	32.3	915	14.1	37.0
65-69	3042	17.8	51.9	1951	18.3	50.6	1091	16.9	53.9
70-74	3044	17.8	69.7	2030	19.1	69.7	1014	15.7	69.6
75-79	2397	14.0	83.7	1583	14.9	84.5	814	12.6	82.2
80-84	1717	10.0	93.7	1076	10.1	94.6	641	9.9	92.1
85+	1081	6.3	100.0	570	5.4	100.0	511	7.9	100.0
All ages	17119	100.0		10652	100.0		6467	100.0	

Included in the statistics are 32.6% multiple primaries in males and 28.2% in females.

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 2007-2014

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males DCO rate n=1198 %	Females DCO rate n=841 %	Males Prop.all cancers n=91183 %	Females Prop.all cancers n=89596 %
0- 4	2	1	0.2	0.1	50.0	100.0	1.1	0.7
5- 9	1		0.1	0.0			1.0	
10-14			0.0	0.0				
15-19	2		0.2	0.0			0.9	
20-24	2	3	0.2	0.3			0.5	1.0
25-29	6	4	0.5	0.3			1.1	0.6
30-34	13	17	1.0	1.4			1.7	1.5
35-39	42	34	3.2	2.7		5.9	3.6	1.7
40-44	95	101	5.8	6.6	3.2	3.0	5.2	2.7
45-49	306	226	19.4	14.9	2.3	4.9	9.5	4.1
50-54	545	460	42.1	35.9	3.5	3.0	11.2	6.8
55-59	966	626	91.0	55.7	5.3	4.5	13.2	8.4
60-64	1443	905	146.9	85.3	6.9	5.2	13.4	9.8
65-69	1936	1087	201.2	104.1	7.2	5.4	12.4	9.5
70-74	2013	1010	221.2	96.6	9.4	10.3	11.9	8.5
75-79	1573	811	285.6	113.7	12.6	13.9	12.6	8.1
80-84	1071	641	306.6	114.3	20.9	28.1	12.5	7.3
85+	569	511	245.8	88.4	46.6	54.6	9.3	5.0
All ages	10585	6437			11.3	13.1	11.6	7.2
Incidence								
Raw			58.6	34.4				
WS			29.6	16.2				
ES			43.8	23.3				
BRD-S			56.0	28.3				

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).

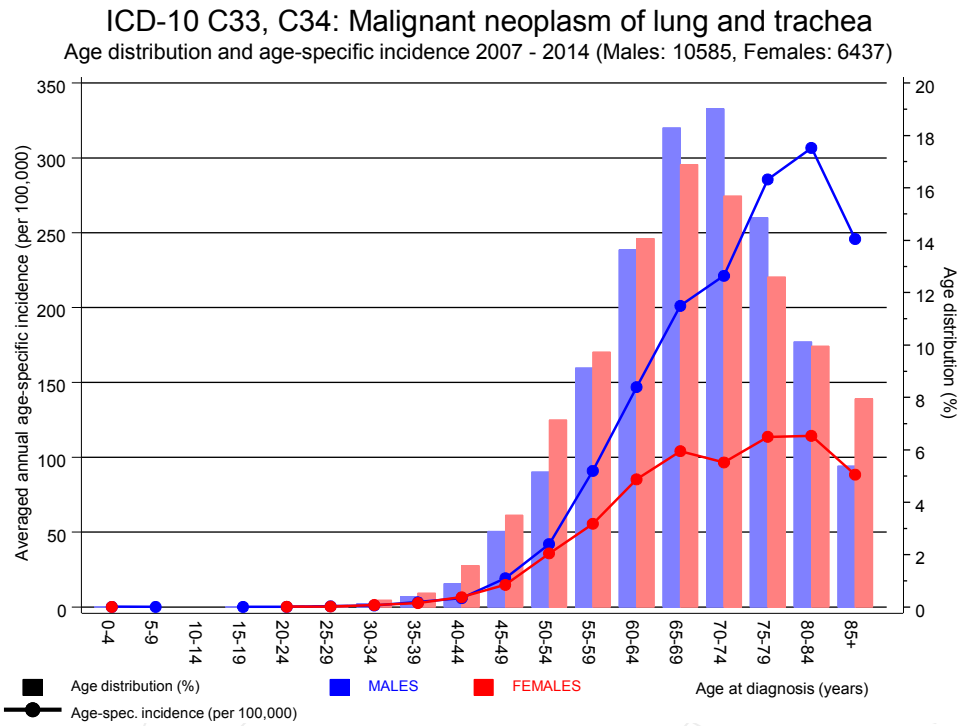


Figure 6. Age distribution and age-specific incidence

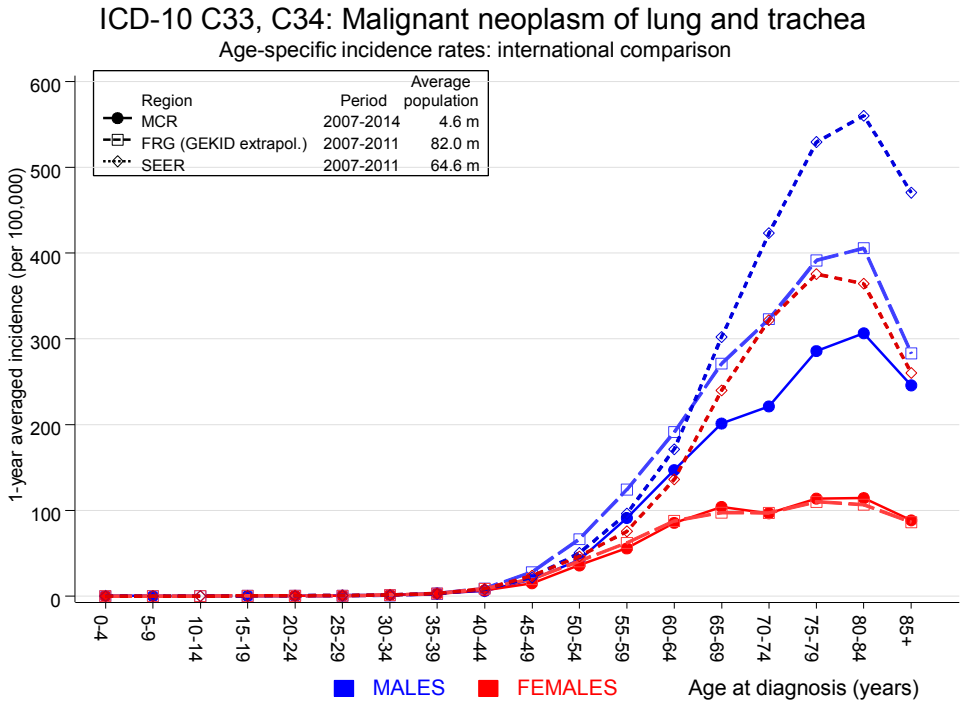


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).

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.

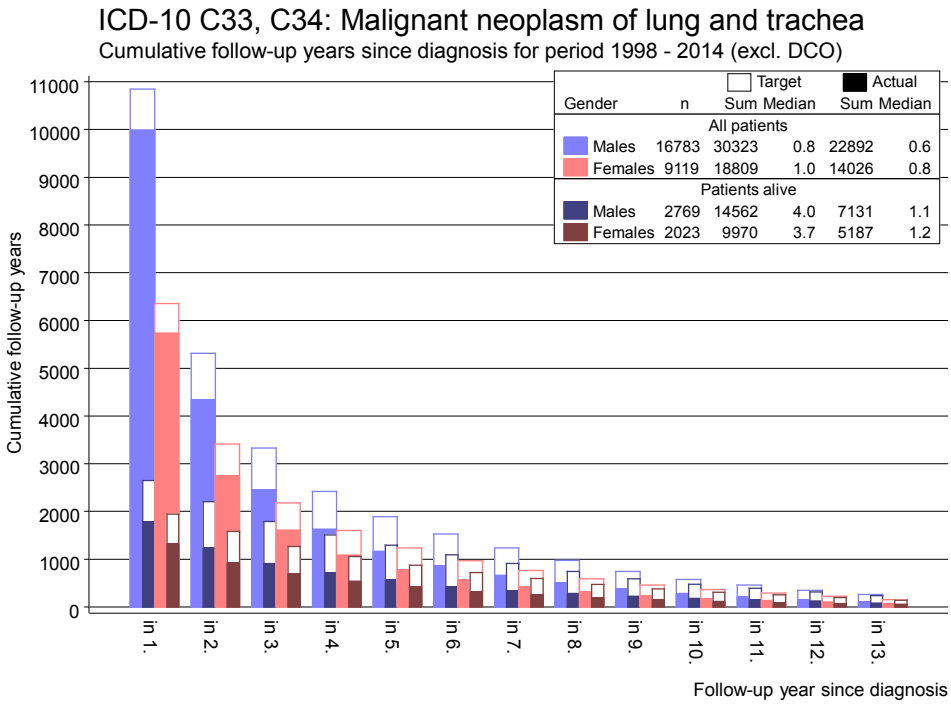


Figure 7. Cumulative follow-up years depending on time since diagnosis

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

Table 8a

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of second primaries for period 1998-2014
MALES

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C00	Lip	3	0.5	6.6	1.4	19.4	#	1.1	33.3
C03-C06	Oral cavity	23	3.3	6.9	4.4	10.4	#	8.6	21.7
C09-C10	Oropharynx	34	4.2	8.1	5.6	11.3	#	13.1	8.8
C12-C13	Hypopharynx	17	2.3	7.4	4.3	11.8	#	6.4	5.9
C15	Oesophagus	42	7.1	5.9	4.3	8.0	#	15.3	11.9
C16	Stomach	55	15.2	3.6	2.7	4.7	#	17.4	12.7
C17	Small intestine	6	1.9	3.1	1.1	6.8	#	1.8	
C18	Colon	77	37.1	2.1	1.6	2.6	#	17.5	19.5
C19-C20	Rectum	38	21.3	1.8	1.3	2.4	#	7.3	7.9
C21	Anus/canal	2	0.8	2.5	0.3	8.9		0.5	
C22	Liver	41	10.7	3.8	2.7	5.2	#	13.3	19.5
C23-C24	Bile	8	3.7	2.2	0.9	4.3		1.9	12.5
C25	Pancreas	45	13.6	3.3	2.4	4.4	#	13.8	40.0
C26	GI cancer	3	0.4	7.5	1.6	22.0	#	1.1	
C32	Larynx	52	4.1	12.6	9.4	16.5	#	21.0	17.3
C33-C34	Lung	192	46.3	4.1	3.6	4.8	#	63.9	3.6
C38,C45	Mesothelioma	3	2.5	1.2	0.2	3.5		0.2	
C40-C41	Bone	2	0.3	6.8	0.8	24.5		0.7	100.0
C43	Malign. melanoma	22	16.1	1.4	0.9	2.1		2.6	13.6
C46,C49	Soft tissue	6	2.0	3.0	1.1	6.6	#	1.8	
C48	Peritoneal	2	0.3	6.9	0.8	25.0		0.8	
C50	Breast	2	1.0	2.0	0.2	7.3		0.4	100.0
C60	Penis	2	0.9	2.3	0.3	8.4		0.5	
C61	Prostate	137	115.5	1.2	1.0	1.4		9.4	18.2
C62	Testis	2	0.9	2.3	0.3	8.4		0.5	50.0
C64	Kidney	50	13.7	3.6	2.7	4.8	#	15.9	16.0
C65	Renal pelvis	8	1.6	5.1	2.2	10.0	#	2.8	
C67	Bladder	50	16.4	3.0	2.3	4.0	#	14.7	16.0
C68	Urinary org.	2	0.2	11.6	1.4	41.9	#	0.8	100.0
C70-C72	CNS cancer	7	5.1	1.4	0.6	2.8		0.8	57.1
C73	Thyroid	9	2.5	3.6	1.6	6.8	#	2.8	
C74-C80	Cancer others	2	1.0	2.1	0.2	7.5		0.5	50.0
C76-C79	CUP	11	6.3	1.8	0.9	3.1		2.1	9.1
C82-C85	NHL	44	15.0	2.9	2.1	3.9	#	12.7	11.4
C90	Mult. myeloma	8	4.8	1.7	0.7	3.3		1.4	37.5
C91-C96	Leukaemia	25	6.0	4.2	2.7	6.1	#	8.3	44.0
Other primaries		6	2.4	2.5	0.9	5.5		1.6	33.3
Not observed		0	2.5	0.0	0.0	1.5		-1.1	
All mult. primaries		1038	389.3	2.7	2.5	2.8	#	284.5	15.5

Table 8a

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of second primaries for period 1998–2014
MALES

Diagnosis	Observed n	Expected n	SIR	LCL 95%	UCL 95%	EAR	DCO %
Patients		17322					
Median age at second malignancy (years)		71.1					
Person-years		22805					
Mean observation time (years)		1.3					
Median observation time (years)		0.6					

The occurrence of second malignancy is statistically significant.

Observed second primaries with count 1 are pooled in category “Other primaries”

Table 8b

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of second primaries for period 1998-2014
FEMALES

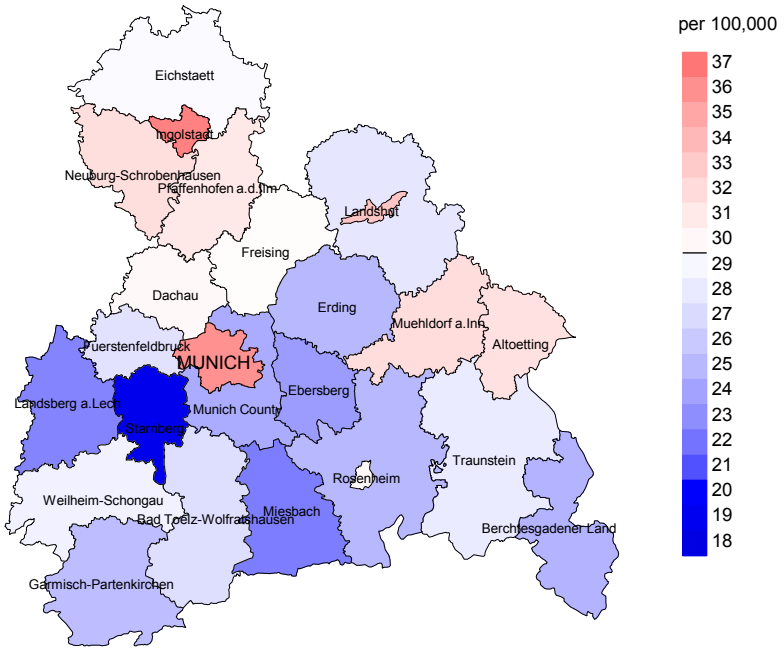
Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C03-C06	Oral cavity	3	0.9	3.2	0.7	9.3		1.5	
C09-C10	Oropharynx	6	0.7	8.8	3.2	19.2	#	3.8	
C15	Oesophagus	4	1.0	4.2	1.1	10.8	#	2.2	
C16	Stomach	19	5.0	3.8	2.3	6.0	#	10.0	26.3
C17	Small intestine	6	0.8	7.8	2.9	17.0	#	3.7	16.7
C18	Colon	36	14.1	2.6	1.8	3.5	#	15.6	19.4
C19-C20	Rectum	9	6.3	1.4	0.7	2.7		1.9	22.2
C21	Anus/canal	3	0.8	3.8	0.8	11.1		1.6	
C22	Liver	5	1.7	2.9	0.9	6.7		2.3	60.0
C23-C24	Bile	3	2.0	1.5	0.3	4.3		0.7	66.7
C25	Pancreas	25	6.4	3.9	2.5	5.8	#	13.3	32.0
C32	Larynx	5	0.3	16.3	5.3	38.0	#	3.3	20.0
C33-C34	Lung	83	11.6	7.1	5.7	8.8	#	50.9	2.4
C43	Malign. melanoma	10	5.7	1.7	0.8	3.2		3.1	10.0
C46,C49	Soft tissue	2	0.9	2.3	0.3	8.5		0.8	50.0
C50	Breast	101	48.1	2.1	1.7	2.6	#	37.7	17.8
C51	Vulva	8	1.4	5.6	2.4	11.1	#	4.7	12.5
C53	Cervix uteri	7	2.0	3.5	1.4	7.1	#	3.5	28.6
C54	Corpus uteri	11	8.9	1.2	0.6	2.2		1.5	27.3
C55,C57	Fem. genitals un	2	0.3	7.0	0.9	25.4		1.2	100.0
C56	Ovary	11	6.3	1.7	0.9	3.1		3.3	27.3
C57.9	Fem. urogen.	2	0.0	147.6	17.9	533.3	#	1.4	
C64	Kidney	15	3.8	3.9	2.2	6.5	#	8.0	33.3
C65	Renal pelvis	6	0.5	12.8	4.7	27.9	#	3.9	
C67	Bladder	11	2.6	4.2	2.1	7.5	#	6.0	9.1
C70-C72	CNS cancer	5	2.1	2.4	0.8	5.5		2.0	40.0
C73	Thyroid	14	2.8	5.0	2.7	8.4	#	8.0	7.1
C76-C79	CUP	10	2.5	4.0	1.9	7.4	#	5.4	10.0
C82-C85	NHL	11	5.7	1.9	1.0	3.4		3.7	18.2
C90	Mult. myeloma	6	1.8	3.3	1.2	7.2	#	3.0	50.0
C91-C96	Leukaemia	7	2.3	3.0	1.2	6.2	#	3.3	14.3
Other primaries		10	1.6	6.1	2.9	11.2	#	6.0	30.0
Not observed		0	2.2	0.0	0.0	1.7		-1.5	
All mult. primaries		456	153.2	3.0	2.7	3.3	#	215.8	17.8

Patients	9520
Median age at second malignancy (years)	69.7
Person-years	14029
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”

Average incidence (world standard population) 2007 - 2014: Males



Average incidence (world standard population) 2007 - 2014: Females

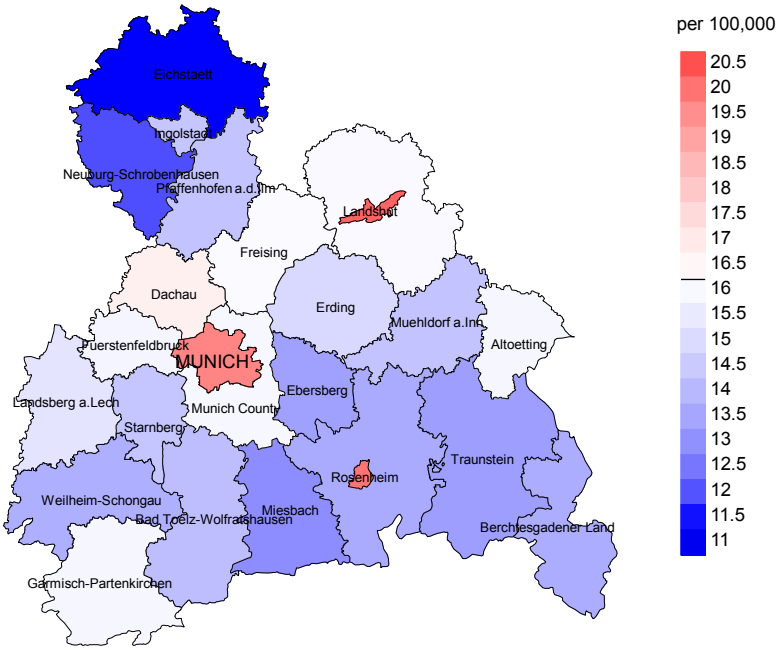
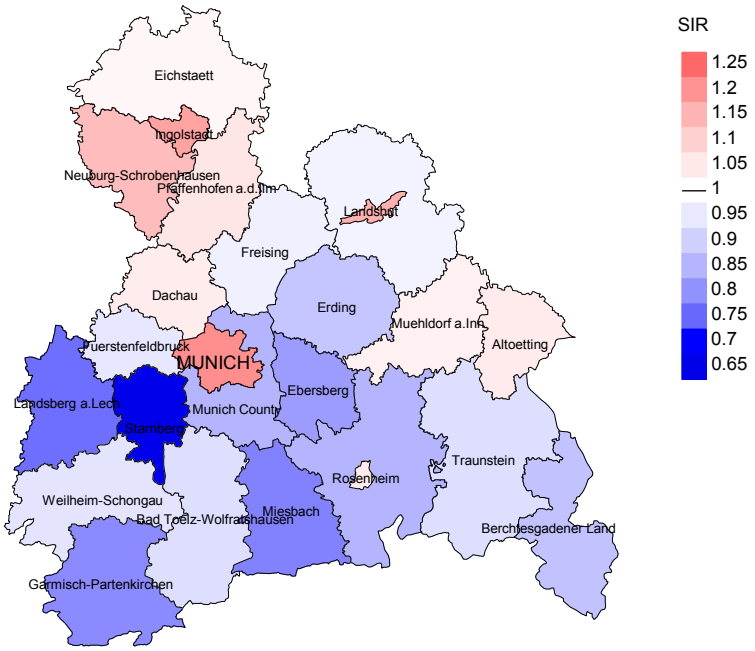


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2014. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 29.5/100,000 WS N=10,585, females 16.2/100,000 WS N=6,437).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 65,347 female residents (averaged) in the period from 2007 to 2014 a total of 141 women were identified with newly diagnosed lung cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 13.4/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 10.5 and 17.0/100,000.

Standardized incidence ratio (SIR) 2007 - 2014: Males



Standardized incidence ratio (SIR) 2007 - 2014: Females

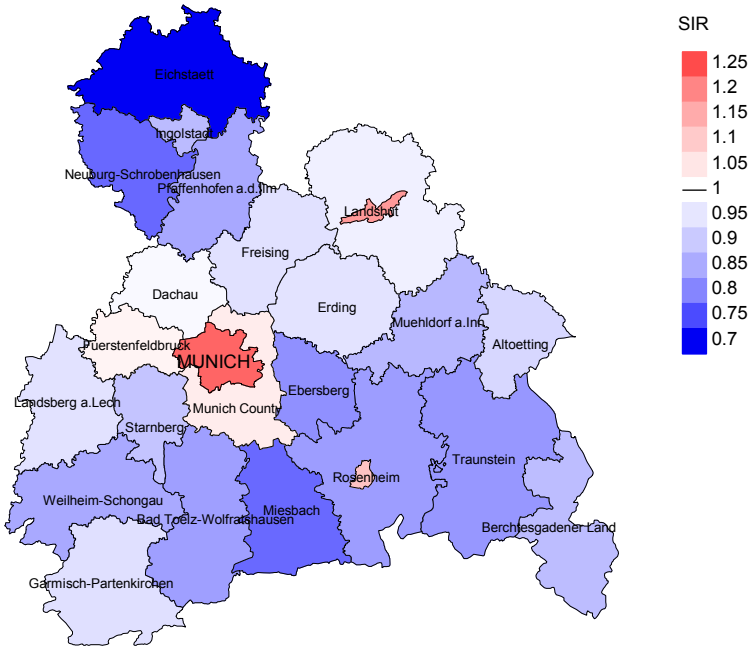


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2014. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=10,585, females N=6,437).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,924 female residents (averaged) in the period from 2007 to 2014 a total of 141 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 0.81. Though, the value of this parameter may vary with an underlying probability of 99% between 0.65 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	961	94.1	92.8
1999	1071	99.1	15.0	1001	93.5	94.8
2000	1092	99.1	20.2	1010	92.5	95.5
2001	1107	98.9	16.7	1034	93.4	95.2
2002	1777	98.9	20.9	1650	92.9	97.5
2003	1828	99.2	17.6	1692	92.6	97.6
2004	1811	99.2	17.3	1673	92.4	98.0
2005	1799	98.4	15.0	1660	92.3	98.7
2006	1837	98.0	15.2	1642	89.4	98.7
2007	2202	94.6	13.8	1941	88.1	98.9
2008	2208	92.2	11.1	1909	86.5	99.1
2009	2253	92.8	11.8	1927	85.5	99.2
2010	2255	92.3	11.2	1909	84.7	99.0
2011	2298	93.2	10.7	1904	82.9	99.1
2012	2274	91.2	10.5	1737	76.4	97.8
2013	2208	99.2	11.4	1498	67.8	96.9
2014	1421	96.1	16.9	631	44.4	95.1
1998-2014	30462	96.0	14.2	25779	84.6	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 4.64 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	1092	997	95.1	481	44.0
2001	1107	993	94.1	460	41.6
2002	1777	1391	97.5	812	45.7
2003	1828	1499	97.8	822	45.0
2004	1811	1568	97.8	795	43.9
2005	1799	1531	97.9	803	44.6
2006	1837	1599	98.1	780	42.5
2007	2202	1749	98.6	909	41.3
2008	2208	1762	99.0	850	38.5
2009	2253	1851	99.2	873	38.7
2010	2255	1927	98.9	924	41.0
2011	2298	1955	99.1	954	41.5
2012	2274	1907	98.2	886	39.0
2013	2208	1957	98.2	924	41.8
2014	1421	1528	99.2	542	38.1
1998–2014	30462	26011	97.8	12682	41.6

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	1599	93.1	6.9	97.3
2007	1749	93.9	6.1	97.2
2008	1762	94.7	5.3	97.4
2009	1851	93.8	6.2	97.4
2010	1927	93.8	6.2	97.2
2011	1955	94.3	5.7	96.9
2012	1907	93.2	6.8	96.7
2013	1957	93.9	6.1	96.7
2014	1528	92.3	7.7	95.9
1998-2014	26011	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	1171	70.1	69.7	74.7	70.1
2008	1169	69.9	69.5	74.9	69.7
2009	1225	70.6	70.4	74.6	70.4
2010	1242	70.9	70.5	75.5	70.8
2011	1249	71.1	70.8	74.4	70.8
2012	1193	71.3	70.6	78.4	71.1
2013	1216	72.3	72.2	76.7	72.3
2014	915	72.7	72.4	75.9	72.7
1998-2014	17157	70.3	70.0	74.2	70.3

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	506	70.6	70.0	77.5	70.0
2007	578	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	706	69.8	69.5	76.0	69.8
2012	714	71.2	70.9	79.3	71.1
2013	741	71.9	71.3	82.4	71.6
2014	613	71.8	71.0	82.7	71.4
1998-2014	8854	70.6	70.1	78.3	70.4

By 2010, life expectancy at birth was 77.5 years for boys and 82.6 years for girls.

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	0.85
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	1097	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	0.78
2009	1143	51.2	0.81	25.3	0.77	38.0	0.78	49.7	0.81
2010	1151	51.1	0.82	25.1	0.79	37.5	0.81	48.7	0.83
2011	1170	51.2	0.83	24.9	0.81	37.3	0.82	48.4	0.84
2012	1098	48.1	0.80	23.5	0.78	34.9	0.79	45.3	0.80
2013	1139	49.9	0.85	23.6	0.82	35.7	0.83	47.2	0.85
2014	835	36.5	1.04	17.1	1.03	26.1	1.03	34.4	1.04
1998-2014	15829	49.4	0.81	25.5	0.79	38.3	0.80	49.9	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	0.67	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	0.74	16.9	0.76	21.4	0.78
2005	488	24.5	0.80	11.6	0.78	16.9	0.79	20.7	0.80
2006	473	23.5	0.76	10.8	0.73	15.7	0.73	19.5	0.75
2007	546	23.6	0.71	11.1	0.67	16.2	0.69	19.9	0.70
2008	569	24.5	0.73	11.3	0.69	16.5	0.70	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	0.78	12.6	0.74	18.2	0.75	22.6	0.77
2011	674	28.6	0.77	13.0	0.75	18.8	0.76	23.2	0.77
2012	680	28.8	0.77	12.6	0.72	18.5	0.73	23.0	0.75
2013	699	29.6	0.81	12.9	0.75	18.8	0.76	23.2	0.78
2014	576	24.4	0.95	10.7	0.90	15.6	0.91	19.5	0.93
1998-2014	8329	24.9	0.77	11.4	0.73	16.6	0.74	20.6	0.76

Table 13

Age distribution of age at death (cancer-related) for period 2007-2014
(**incl. multiple primaries**)

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	2	0.0	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	3	0.0	0.0	2	0.0	0.0	1	0.0	0.0
25-29	3	0.0	0.1	3	0.0	0.1			0.0
30-34	9	0.1	0.1	3	0.0	0.1	6	0.1	0.2
35-39	44	0.3	0.4	22	0.2	0.4	22	0.4	0.6
40-44	129	0.9	1.4	71	0.8	1.2	58	1.1	1.7
45-49	350	2.5	3.9	212	2.4	3.6	138	2.7	4.5
50-54	704	5.1	8.9	408	4.6	8.2	296	5.9	10.3
55-59	1162	8.3	17.3	713	8.0	16.2	449	8.9	19.2
60-64	1809	13.0	30.3	1142	12.9	29.1	667	13.2	32.4
65-69	2422	17.4	47.7	1567	17.7	46.7	855	16.9	49.3
70-74	2589	18.6	66.3	1725	19.5	66.2	864	17.1	66.4
75-79	2100	15.1	81.3	1428	16.1	82.3	672	13.3	79.7
80-84	1612	11.6	92.9	1051	11.9	94.2	561	11.1	90.7
85+	986	7.1	100.0	518	5.8	100.0	468	9.3	100.0
All ages	13925	100.0		8867	100.0		5058	100.0	

Included in the statistics are 32.6% multiple primaries in males and 28.2% in females.

Table 14

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2014
(**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	8.3	6.7
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19	1		0.1	0.50	0.0		2.8	
20-24	2	1	0.2	1.00	0.1	0.33	4.2	3.6
25-29	3		0.2	0.50	0.0		4.8	
30-34	3	6	0.2	0.23	0.5	0.35	3.4	5.5
35-39	22	22	1.7	0.52	1.7	0.65	12.4	8.5
40-44	71	58	4.4	0.75	3.8	0.57	15.4	9.2
45-49	212	138	13.4	0.69	9.1	0.61	20.7	11.3
50-54	408	296	31.5	0.75	23.1	0.64	21.9	16.6
55-59	713	449	67.1	0.73	40.0	0.71	23.1	17.2
60-64	1142	667	116.3	0.79	62.9	0.73	23.9	18.7
65-69	1567	855	162.9	0.80	81.9	0.78	21.9	16.4
70-74	1725	864	189.6	0.85	82.6	0.85	18.9	13.1
75-79	1428	672	259.3	0.90	94.2	0.83	16.8	10.7
80-84	1051	561	300.9	0.98	100.0	0.88	14.2	8.5
85+	518	468	223.7	0.91	81.0	0.92	8.6	5.4
All ages	8867	5058					17.8	11.6
Mortality								
Raw			49.1	0.83	27.0	0.78		
WS			24.0	0.81	12.2	0.74		
ES			36.1	0.82	17.7	0.75		
BRD-S			47.3	0.84	21.9	0.77		
PYLL-70								
per 100,000			227.3		149.6			
ES			199.1		126.8			
AYLL-70			8.8		9.5			

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

Table 15a

Multiple primaries in deaths in period 1998–2014
MALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03–C06 Oral cavity	163	3.6	131	80.4	16	9.8	16	9.8
C09–C10 Oropharynx	138	3.1	98	71.0	16	11.6	24	17.4
C12–C13 Hypopharynx	80	1.8	53	66.3	14	17.5	13	16.3
C15 Oesophagus	91	2.0	33	36.3	26	28.6	32	35.2
C16 Stomach	159	3.5	85	53.5	31	19.5	43	27.0
C18 Colon	344	7.6	227	66.0	55	16.0	62	18.0
C19–C20 Rectum	182	4.0	132	72.5	24	13.2	26	14.3
C22 Liver	60	1.3	19	31.7	19	31.7	22	36.7
C25 Pancreas	65	1.4	13	20.0	17	26.2	35	53.8
C32 Larynx	206	4.6	147	71.4	27	13.1	32	15.5
C33–C34 Lung	235	5.2			72	30.6	163	69.4
C43 Malign. melanoma	144	3.2	122	84.7	10	6.9	12	8.3
C44 Skin others	320	7.1	225	70.3	31	9.7	64	20.0
C61 Prostate	872	19.3	713	81.8	60	6.9	99	11.4
C62 Testis	41	0.9	38	92.7	1	2.4	2	4.9
C64 Kidney	173	3.8	115	66.5	28	16.2	30	17.3
C67 Bladder	531	11.7	438	82.5	31	5.8	62	11.7
C70–C72 CNS cancer	64	1.4	31	48.4	15	23.4	18	28.1
C76–C79 CUP	63	1.4	35	55.6	19	30.2	9	14.3
C82–C85 NHL	162	3.6	109	67.3	26	16.0	27	16.7
C90 Mult. myeloma	45	1.0	18	40.0	13	28.9	14	31.1
C91–C96 Leukaemia	72	1.6	37	51.4	13	18.1	22	30.6
Other primaries	312	6.9	222	71.2	32	10.3	58	18.6
All mult. primaries	4522	100.0	3041	67.2	596	13.2	885	19.6

Multiple primaries with number of cases 1 to 40 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 1998–2014
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03–C06	Oral cavity	47	2.2	41	87.2	4	8.5	2	4.3
C09–C10	Oropharynx	28	1.3	22	78.6	2	7.1	4	14.3
C16	Stomach	47	2.2	22	46.8	11	23.4	14	29.8
C18	Colon	150	7.0	106	70.7	18	12.0	26	17.3
C19–C20	Rectum	57	2.7	44	77.2	4	7.0	9	15.8
C21	Anus/canal	25	1.2	19	76.0	3	12.0	3	12.0
C25	Pancreas	44	2.1	15	34.1	8	18.2	21	47.7
C32	Larynx	23	1.1	17	73.9	2	8.7	4	17.4
C33–C34	Lung	94	4.4			25	26.6	69	73.4
C43	Malign. melanoma	62	2.9	56	90.3	1	1.6	5	8.1
C44	Skin others	79	3.7	49	62.0	5	6.3	25	31.6
C50	Breast	611	28.5	507	83.0	50	8.2	54	8.8
C51	Vulva	29	1.4	22	75.9	4	13.8	3	10.3
C53	Cervix uteri	110	5.1	93	84.5	9	8.2	8	7.3
C54	Corpus uteri	116	5.4	104	89.7	3	2.6	9	7.8
C56	Ovary	54	2.5	39	72.2	6	11.1	9	16.7
C64	Kidney	62	2.9	42	67.7	10	16.1	10	16.1
C67	Bladder	96	4.5	73	76.0	11	11.5	12	12.5
C70–C72	CNS cancer	62	2.9	26	41.9	12	19.4	24	38.7
C73	Thyroid	41	1.9	28	68.3	8	19.5	5	12.2
C76–C79	CUP	33	1.5	19	57.6	6	18.2	8	24.2
C82–C85	NHL	69	3.2	57	82.6	4	5.8	8	11.6
C91–C96	Leukaemia	33	1.5	10	30.3	9	27.3	14	42.4
Other primaries		173	8.1	108	62.4	23	13.3	42	24.3
All mult. primaries		2145	100.0	1519	70.8	238	11.1	388	18.1

Multiple primaries with number of cases 1 to 20 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 2007-2014
(**First 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		10.0	
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19	1		0.1	1.00	0.0		3.0	
20-24	1	1	0.1	1.00	0.1	0.33	2.3	3.8
25-29	3		0.2	0.50	0.0		5.5	
30-34	3	6	0.2	0.23	0.5	0.38	3.5	6.3
35-39	20	17	1.5	0.51	1.3	0.57	12.1	7.5
40-44	66	51	4.1	0.74	3.3	0.56	15.6	9.2
45-49	198	113	12.5	0.71	7.5	0.59	21.5	11.0
50-54	363	257	28.0	0.75	20.1	0.64	22.7	17.3
55-59	604	386	56.9	0.74	34.4	0.73	23.1	18.0
60-64	945	545	96.2	0.79	51.4	0.74	24.1	19.2
65-69	1251	670	130.0	0.82	64.2	0.81	22.1	16.3
70-74	1313	658	144.3	0.88	62.9	0.84	18.8	13.0
75-79	1015	533	184.3	0.92	74.7	0.87	16.3	11.0
80-84	722	425	206.7	1.03	75.8	0.87	13.5	8.4
85+	343	361	148.1	0.87	62.5	0.90	7.8	5.3
All ages	6849	4023					17.8	11.7
Mortality								
Raw			37.9	0.84	21.5	0.79		
WS			19.1	0.81	9.8	0.75		
ES			28.3	0.82	14.3	0.76		
BRD-S			36.3	0.84	17.5	0.77		
PYLL-70								
per 100,000			196.2		125.4			
ES			171.8		106.3			
AYLL-70			9.1		9.7			

* See corresponding tables with multiple primaries.

Table 17

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2014
(**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		10.0	
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19	1		0.1	1.00	0.0		3.0	
20-24		1	0.0		0.1	0.33		4.2
25-29	3		0.2	0.50	0.0		5.9	
30-34	3	6	0.2	0.23	0.5	0.38	3.5	7.2
35-39	20	17	1.5	0.51	1.3	0.59	12.7	8.3
40-44	66	50	4.1	0.74	3.3	0.57	16.6	9.8
45-49	195	110	12.3	0.71	7.3	0.58	22.6	12.0
50-54	351	254	27.1	0.75	19.8	0.65	24.5	19.1
55-59	590	373	55.6	0.73	33.2	0.72	25.4	19.9
60-64	899	527	91.5	0.78	49.7	0.74	26.4	21.8
65-69	1193	634	124.0	0.82	60.7	0.79	25.1	18.7
70-74	1245	626	136.8	0.87	59.9	0.82	22.0	15.1
75-79	934	503	169.6	0.88	70.5	0.85	19.3	12.7
80-84	671	407	192.1	0.97	72.6	0.85	16.5	10.0
85+	327	343	141.2	0.84	59.4	0.86	9.6	6.1
All ages	6499	3851					20.6	13.4
Mortality								
Raw			36.0	0.82	20.6	0.77		
WS			18.2	0.80	9.4	0.74		
ES			26.9	0.81	13.7	0.75		
BRD-S			34.3	0.83	16.8	0.76		
PYLL-70								
per 100,000			190.1		122.0			
ES			166.3		103.5			
AYLL-70			9.2		9.8			

* See corresponding tables with multiple primaries.

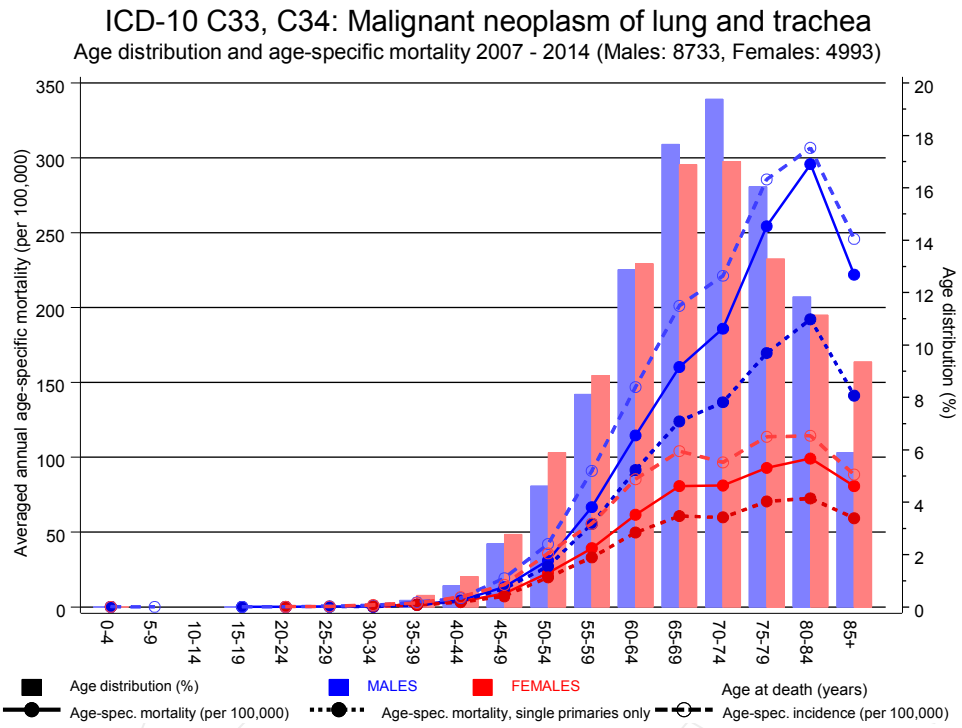
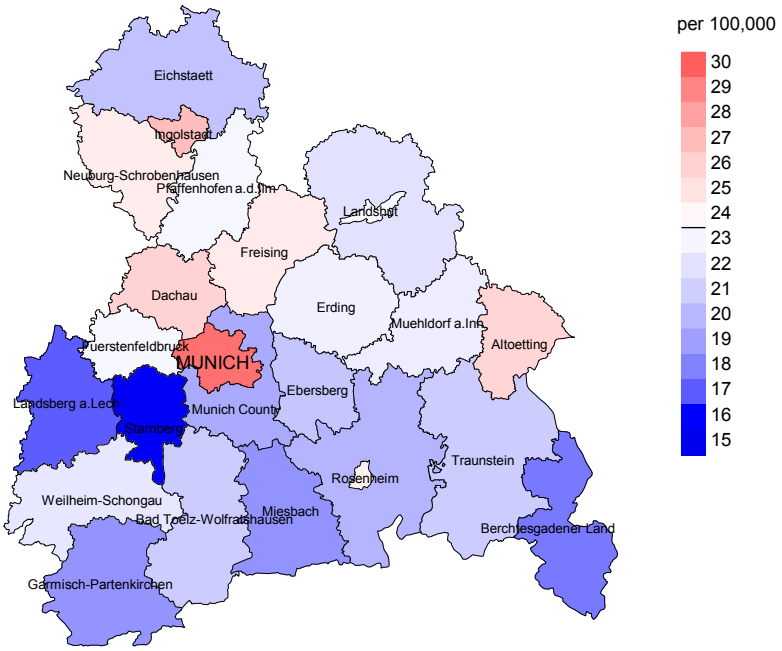


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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) 2007 - 2014: Males



Average mortality (world standard population) 2007 - 2014: Females

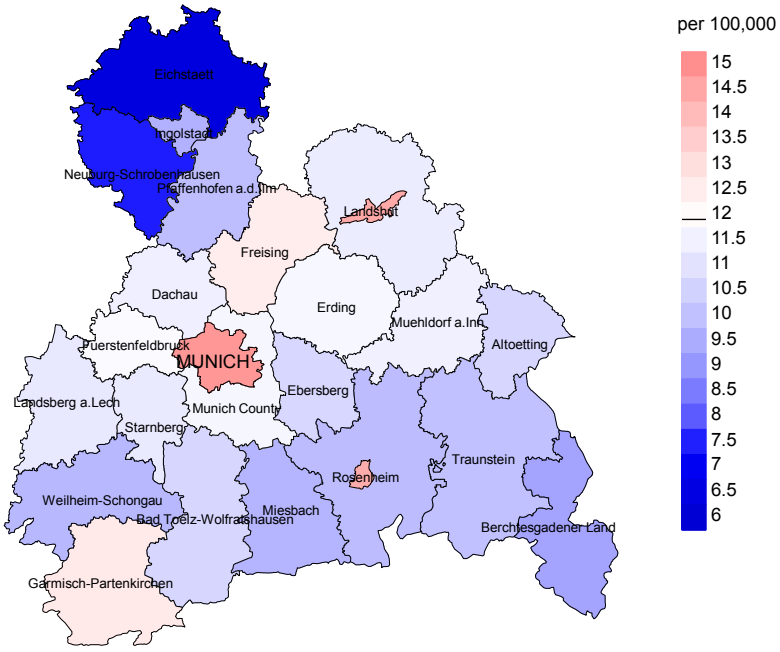
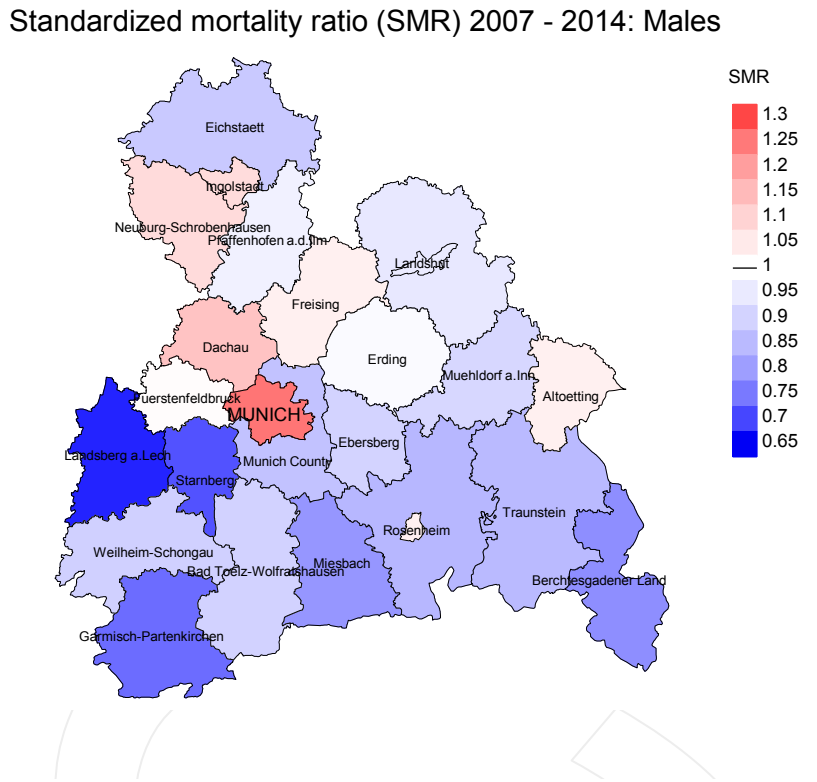


Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2014. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 23.5/100,000 WS N=8,696, females 11.9/100,000 WS N=4,968).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 65,347 female residents (averaged) in the period from 2007 to 2014 a total of 122 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 8.1 and 13.7/100,000.



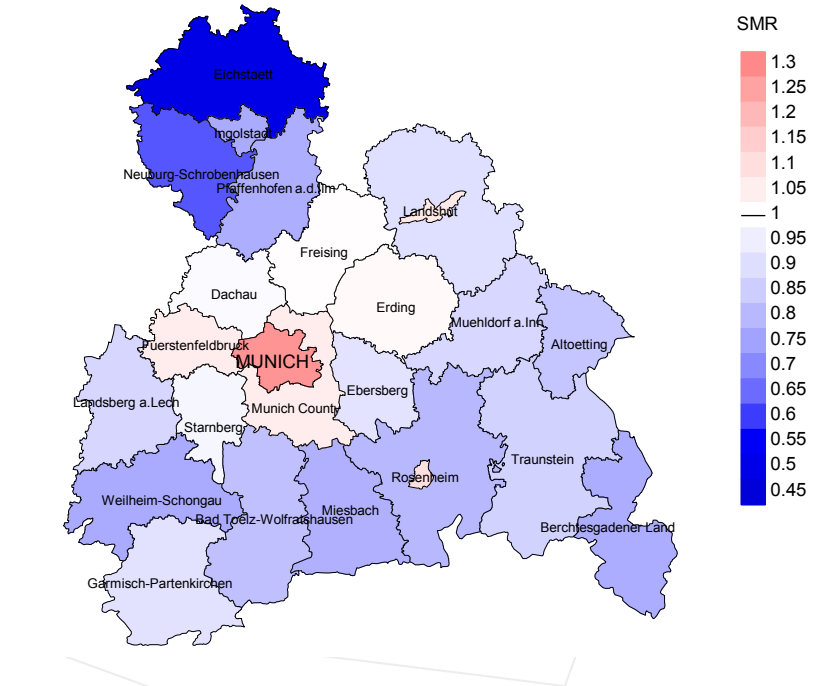


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2014. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=8,696, females N=4,968).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,924 female residents (averaged) in the period from 2007 to 2014 a total of 122 women died from lung cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.92. Though, the value of this parameter may vary with an underlying probability of 99% between 0.72 and 1.15, 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, where applicable. 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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