

Munich Cancer Registry



- ▶ Survival
- ▶ Selection Matrix
- ▶ Homepage
- ▶ *Deutsch*

ICD-10 C33, C34: Lung cancer

Incidence and Mortality

Year of diagnosis	1998-2016
Patients	35,059
Diseases	35,397
Creation date	08/21/2018
Export date	08/09/2018
Population	4.81 m




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<https://www.tumorregister-muenchen.de/en>

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

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**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 4.69 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, August 2018

[#] 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 2.65 million to 4.10 in 2002, and to 4.69 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

Cases with invasive cancer by year of diagnosis, proportions of DCO, further malignancies, deaths, and active follow-up (ALL PATIENTS) (incl. DCO)

Year of diagnosis	All cases n	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	1054	175	16.6	11.4	4.5	94.7	99.2
1999	1097	177	16.1	12.5	4.5	94.3	99.0
2000	1120	238	21.3	13.0	4.5	93.6	99.1
2001	1138	209	18.4	13.6	4.4	94.0	98.9
2002	1776	371	20.9	14.2	4.4	93.8	98.7 #
2003	1828	321	17.6	14.8	4.3	93.3	99.0
2004	1815	314	17.3	15.1	4.2	92.8	98.8
2005	1800	270	15.0	15.7	4.2	93.0	98.4
2006	1838	279	15.2	16.1	4.1	91.0	97.8
2007	2201	299	13.6	16.3	4.1	89.4	94.8 #
2008	2212	243	11.0	16.8	4.0	88.0	92.4
2009	2255	266	11.8	17.2	3.9	88.0	93.0
2010	2264	254	11.2	17.5	3.6	87.5	93.3
2011	2303	245	10.6	17.9	3.4	86.3	92.7
2012	2295	239	10.4	18.3	3.1	82.5	91.2
2013	2287	249	10.9	18.6	2.9	80.3	90.1
2014	2287	252	11.0	18.8	2.7	73.6	91.4
2015	2040	287	14.1	19.2	2.2	67.2	98.3
2016	1787	244	13.7	19.4	1.6	41.3	74.5 ##
1998-2016	35397	4932	13.9	19.4	4.5	84.6	94.2

35,397 cases diagnosed 1998-2016 are related to a total of 35,059 patients. Currently, in 8,175 (23.3 %) of these 35,059 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 6,511 / 1,301 / 363 (18.6 % / 3.7 % / 1.0 %) patients exist having 2 / 3 / 4+ malignancies.

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 retrieved from the respective headings.

How to interpret:

In 2014, a subgroup of 2,287 cases has been diagnosed, of which 18.8 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 2.7 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1a

Cases with invasive cancer by year of diagnosis, proportions of DCO, further malignancies, deaths, and active follow-up (MALES) (incl. DCO)

Year of diagnosis	Males n	Males %	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	703	66.7	116	16.5	11.2	4.8	95.6	99.4
1999	760	69.3	130	17.1	11.8	4.7	94.3	98.9
2000	761	67.9	145	19.1	12.7	4.7	93.8	99.1
2001	788	69.2	136	17.3	13.6	4.6	94.3	98.6
2002	1205	67.8	243	20.2	14.4	4.6	95.0	99.0 #
2003	1202	65.8	217	18.1	14.9	4.4	94.0	99.3
2004	1180	65.0	185	15.7	15.1	4.4	93.8	99.0
2005	1188	66.0	156	13.1	15.7	4.3	93.2	98.3
2006	1213	66.0	166	13.7	16.1	4.3	91.1	97.8
2007	1427	64.8	188	13.2	16.5	4.3	90.5	95.4 #
2008	1431	64.7	146	10.2	17.0	4.2	89.0	92.8
2009	1427	63.3	158	11.1	17.3	4.1	89.3	93.9
2010	1420	62.7	138	9.7	17.6	3.9	88.9	93.6
2011	1420	61.7	140	9.9	18.1	3.7	87.7	93.6
2012	1398	60.9	140	10.0	18.5	3.4	83.5	91.8
2013	1403	61.3	147	10.5	18.9	3.1	81.9	91.1
2014	1349	59.0	142	10.5	19.3	2.9	75.4	92.2
2015	1235	60.5	182	14.7	19.6	2.3	69.1	98.4
2016	1055	59.0	145	13.7	19.8	1.7	42.4	73.8 ##
1998-2016	22565	63.7	3020	13.4	19.8	4.8	86.1	94.7

22,565 cases diagnosed 1998-2016 are related to a total of 22,337 patients. Currently, in 5,344 (23.9 %) of these 22,337 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 4,248 / 854 / 242 (19.0 % / 3.8 % / 1.1 %) patients exist having 2 / 3 / 4+ malignancies.

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 retrieved from the respective headings.

How to interpret:

In 2014, a subgroup of 1,349 cases has been diagnosed, of which 19.3 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 2.9 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1b

Cases with invasive cancer by year of diagnosis, proportions of DCO, further malignancies, deaths, and active follow-up (FEMALES) (incl. DCO)

Year of diagnosis	Females n	Females %	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	351	33.3	59	16.8	11.7	4.2	92.9	98.9
1999	337	30.7	47	13.9	13.8	4.2	94.4	99.1
2000	359	32.1	93	25.9	13.7	4.1	93.0	99.2
2001	350	30.8	73	20.9	13.5	4.1	93.4	99.7
2002	571	32.2	128	22.4	13.9	4.0	91.2	98.1 #
2003	626	34.2	104	16.6	14.5	4.0	91.9	98.4
2004	635	35.0	129	20.3	15.2	3.9	90.9	98.4
2005	612	34.0	114	18.6	15.6	3.9	92.6	98.5
2006	625	34.0	113	18.1	16.0	3.9	90.7	97.8
2007	774	35.2	111	14.3	16.0	3.7	87.2	93.7 #
2008	781	35.3	97	12.4	16.4	3.7	86.2	91.7
2009	828	36.7	108	13.0	16.9	3.5	85.9	91.5
2010	844	37.3	116	13.7	17.4	3.3	85.3	92.8
2011	883	38.3	105	11.9	17.6	2.9	83.9	91.2
2012	897	39.1	99	11.0	17.9	2.7	80.8	90.2
2013	884	38.7	102	11.5	17.8	2.5	77.7	88.5
2014	938	41.0	110	11.7	18.0	2.3	71.1	90.2
2015	805	39.5	105	13.0	18.4	2.0	64.1	98.3
2016	732	41.0	99	13.5	18.7	1.5	39.8	75.4 ##
1998-2016	12832	36.3	1912	14.9	18.7	4.2	82.0	93.3

12,832 cases diagnosed 1998-2016 are related to a total of 12,722 patients. Currently, in 2,831 (22.3 %) of these 12,722 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 2,263 / 447 / 121 (17.8 % / 3.5 % / 1.0 %) patients exist having 2 / 3 / 4+ malignancies.

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 retrieved from the respective headings.

How to interpret:

In 2014, a subgroup of 938 cases has been diagnosed, of which 18.0 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 2.3 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 2

Incidence measures by year of diagnosis including DCO cases
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.81 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	703	351	63.4	29.8	38.2	14.9	57.1	21.4	73.3	26.3
1999	760	337	67.9	28.4	41.4	14.1	60.7	20.4	76.0	25.3
2000	761	359	66.8	29.9	39.7	15.3	59.0	21.8	74.9	26.5
2001	788	350	68.0	28.8	40.9	14.3	59.8	20.7	74.6	25.5
2002	1205	571	64.7	29.2	36.5	14.2	54.6	20.7	70.7	25.3
2003	1202	626	64.1	31.8	35.9	15.8	53.4	22.7	67.8	27.3
2004	1180	635	62.7	32.1	34.1	15.5	51.0	22.3	65.5	27.5
2005	1188	612	62.7	30.8	33.8	14.8	49.9	21.5	63.8	26.1
2006	1213	625	63.3	31.1	33.7	14.8	49.8	21.5	63.4	26.1
2007	1427	774	64.4	33.5	33.6	16.7	50.0	23.8	65.1	28.8
2008	1431	781	64.3	33.7	33.4	16.5	49.5	23.7	63.1	28.5
2009	1427	828	63.9	35.6	33.0	16.7	48.7	24.0	61.7	29.4
2010	1420	844	63.0	36.1	32.1	17.2	47.1	24.6	59.5	29.8
2011	1420	883	63.5	37.8	31.6	17.4	46.5	25.1	59.1	30.7
2012	1398	897	61.6	38.0	30.3	17.5	44.7	25.3	57.2	30.7
2013	1403	884	61.0	37.1	29.7	17.4	43.8	24.9	55.7	29.8
2014	1349	938	57.9	39.0	27.3	18.1	40.6	25.8	52.3	31.3
2015	1235	805	51.9	33.1	24.8	14.8	36.9	21.4	47.0	26.2
2016	1055	732	43.9	29.8	21.1	13.8	31.3	19.7	39.6	23.8
1998-2016	22565	12832	61.3	33.5	31.9	15.8	47.1	22.8	59.9	27.7

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

Table 3

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

Year of diagnosis	Cases n	Std.		Median						
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	1054	67.1	11.3	28.1	93.1	52.6	58.7	67.5	75.5	81.6
1999	1097	67.0	11.3	24.9	96.3	52.7	59.0	67.3	74.9	82.1
2000	1120	67.1	11.7	15.8	96.0	52.0	59.0	67.1	75.7	81.5
2001	1138	67.0	11.4	17.0	96.4	52.3	59.7	67.0	74.9	81.2
2002	1776	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	1815	68.3	11.1	24.4	98.0	54.0	61.1	68.1	76.6	82.2
2005	1800	68.2	11.2	18.1	98.5	54.3	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	2201	68.4	11.2	7.5	99.1	53.8	61.3	68.7	76.6	81.9
2008	2212	68.4	10.9	22.3	99.4	54.5	61.4	68.7	76.4	81.9
2009	2255	68.9	11.1	20.3	102	54.3	61.5	69.3	76.8	83.1
2010	2264	68.7	10.9	0.5	97.8	54.6	61.9	69.2	76.2	82.3
2011	2303	69.0	11.0	22.2	97.6	54.2	61.9	69.7	76.6	83.0
2012	2295	69.3	11.0	22.9	96.8	54.5	62.2	69.9	77.0	83.3
2013	2287	69.2	10.8	27.9	100	54.2	62.1	70.0	76.6	82.7
2014	2287	69.6	11.1	15.9	100	54.2	62.6	70.9	77.1	83.3
2015	2040	70.2	10.9	29.2	100	55.1	63.0	71.1	77.5	83.7
2016	1787	69.7	10.8	20.9	98.3	55.3	62.3	70.2	77.2	83.0
1998-2016	35397	68.6	11.1	0.5	102	54.0	61.3	69.1	76.5	82.6

Table 3a

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

Year of diagnosis	Cases n	Std.		Median						
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	703	66.8	10.6	28.1	91.7	53.9	59.0	67.0	74.9	80.3
1999	760	66.5	10.8	24.9	96.3	53.0	58.8	66.8	73.5	80.5
2000	761	66.8	10.9	28.1	94.2	53.2	59.2	66.5	74.3	80.8
2001	788	66.5	10.8	17.0	96.4	52.7	59.9	66.3	73.6	80.2
2002	1205	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	1180	68.3	10.5	36.9	94.3	54.5	61.5	68.5	76.2	81.5
2005	1188	68.2	10.6	18.1	98.5	55.5	61.9	68.3	75.8	81.5
2006	1213	68.1	10.0	28.7	102	55.2	61.8	68.0	75.7	80.7
2007	1427	68.8	10.6	7.5	97.3	55.2	62.4	69.1	76.7	81.7
2008	1431	68.7	10.4	22.3	99.4	55.6	61.9	69.2	76.3	81.3
2009	1427	69.0	10.6	30.8	100	55.5	61.8	69.1	76.5	82.4
2010	1420	68.8	10.6	0.5	97.5	54.8	62.4	69.5	75.8	81.8
2011	1420	68.9	10.6	28.9	94.3	54.5	62.4	70.0	76.1	82.3
2012	1398	69.5	10.7	22.9	96.6	55.5	63.2	70.3	77.0	82.7
2013	1403	69.6	10.4	27.9	99.7	55.4	62.5	70.6	76.7	82.4
2014	1349	70.3	10.4	30.3	96.0	55.8	63.4	71.6	77.5	83.3
2015	1235	70.4	10.8	29.2	93.8	55.7	63.4	71.5	77.7	83.7
2016	1055	70.0	10.5	25.5	96.7	55.8	62.5	71.1	77.1	83.3
1998-2016	22565	68.7	10.6	0.5	102	54.8	61.7	69.2	76.2	82.0

Table 3b

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

Year of diagnosis	Cases n	Std.		Median						
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	351	67.7	12.5	35.8	93.1	50.8	57.6	68.6	76.5	84.4
1999	337	68.2	12.2	32.9	94.8	51.8	59.1	69.3	77.7	83.8
2000	359	67.6	13.3	15.8	96.0	49.6	58.8	69.3	78.0	84.0
2001	350	68.0	12.5	24.4	93.9	50.1	59.1	69.0	77.3	83.9
2002	571	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	635	68.2	12.2	24.4	98.0	52.6	60.1	67.5	78.2	83.5
2005	612	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	774	67.5	12.3	22.3	99.1	51.0	59.3	67.9	76.5	82.7
2008	781	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	844	68.6	11.3	33.2	97.8	54.0	61.5	68.3	77.0	83.6
2011	883	69.1	11.5	22.2	97.6	53.4	61.3	69.3	77.6	84.5
2012	897	69.0	11.4	33.3	96.8	53.6	60.7	69.4	76.9	84.1
2013	884	68.7	11.5	30.6	100	53.6	61.2	69.2	76.3	84.1
2014	938	68.5	12.0	15.9	100	51.7	60.9	69.7	76.5	83.9
2015	805	69.8	11.1	32.0	100	54.7	62.5	70.6	77.4	83.8
2016	732	69.1	11.2	20.9	98.3	54.7	62.1	69.3	77.2	82.6
1998–2016	12832	68.5	11.9	15.8	102	52.7	60.4	69.0	77.2	83.7

Table 4

Age distribution by 5-year age group and sex for period 2007–2016
(incl. DCO)

Age at diagnosis Years	Cases n	Males			Females				
		%	Cum.%	n	%	Cum.%	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	0	0.0	0.0			0.0			0.0
15–19	3	0.0	0.0	2	0.0	0.0	1	0.0	0.0
20–24	6	0.0	0.1	2	0.0	0.1	4	0.0	0.1
25–29	14	0.1	0.1	8	0.1	0.1	6	0.1	0.1
30–34	39	0.2	0.3	18	0.1	0.2	21	0.3	0.4
35–39	90	0.4	0.7	49	0.4	0.6	41	0.5	0.9
40–44	233	1.1	1.8	115	0.8	1.5	118	1.4	2.3
45–49	666	3.0	4.8	376	2.8	4.2	290	3.5	5.7
50–54	1313	6.0	10.8	719	5.3	9.5	594	7.1	12.8
55–59	2045	9.3	20.1	1230	9.1	18.6	815	9.7	22.6
60–64	2958	13.5	33.6	1809	13.3	31.9	1149	13.7	36.3
65–69	3811	17.4	51.0	2398	17.7	49.6	1413	16.9	53.2
70–74	3961	18.1	69.0	2610	19.2	68.8	1351	16.1	69.4
75–79	3170	14.5	83.5	2080	15.3	84.2	1090	13.0	82.4
80–84	2198	10.0	93.5	1378	10.2	94.3	820	9.8	92.2
85+	1421	6.5	100.0	768	5.7	100.0	653	7.8	100.0
All ages	21931	100.0		13565	100.0		8366	100.0	

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 2007–2016

Age at diagnosis Years	Males n	Females n	Males Age- spec. incid.	Females Age- spec. incid.	Males DCO rate n=1523 %	Females DCO rate n=1052 %	Males	Females
							Prop.all cancers %	Prop.all cancers %
0– 4	2		0.2		50.0		1.0	
5– 9	1		0.1				1.0	
10–14								
15–19	2	1	0.2	0.1			0.8	0.5
20–24	2	4	0.1	0.3			0.4	1.1
25–29	8	6	0.5	0.4			1.2	0.7
30–34	18	21	1.1	1.3	5.6		1.9	1.4
35–39	49	41	3.0	2.6		2.4	3.5	1.6
40–44	115	118	6.2	6.6	2.6	2.5	5.3	2.6
45–49	374	289	18.9	15.1	1.9	4.2	9.5	4.2
50–54	717	592	41.5	34.6	3.1	3.2	11.7	6.8
55–59	1223	808	86.4	55.0	4.7	4.1	13.3	8.7
60–64	1795	1138	146.5	85.6	6.4	5.2	13.6	10.1
65–69	2378	1407	200.7	108.3	7.5	5.5	12.7	10.0
70–74	2591	1346	234.2	106.3	8.9	9.9	12.3	9.1
75–79	2067	1087	259.4	108.5	12.4	13.1	12.5	8.1
80–84	1373	820	298.5	115.9	21.4	27.8	12.5	7.5
85+	767	653	250.5	89.0	46.8	52.7	9.7	5.1
All ages	13482	8331			11.3	12.6	11.8	7.4
Incidence								
Raw			59.0	35.2				
WS			29.3	16.4				
ES			43.3	23.6				
BRD-S			55.1	28.6				

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).

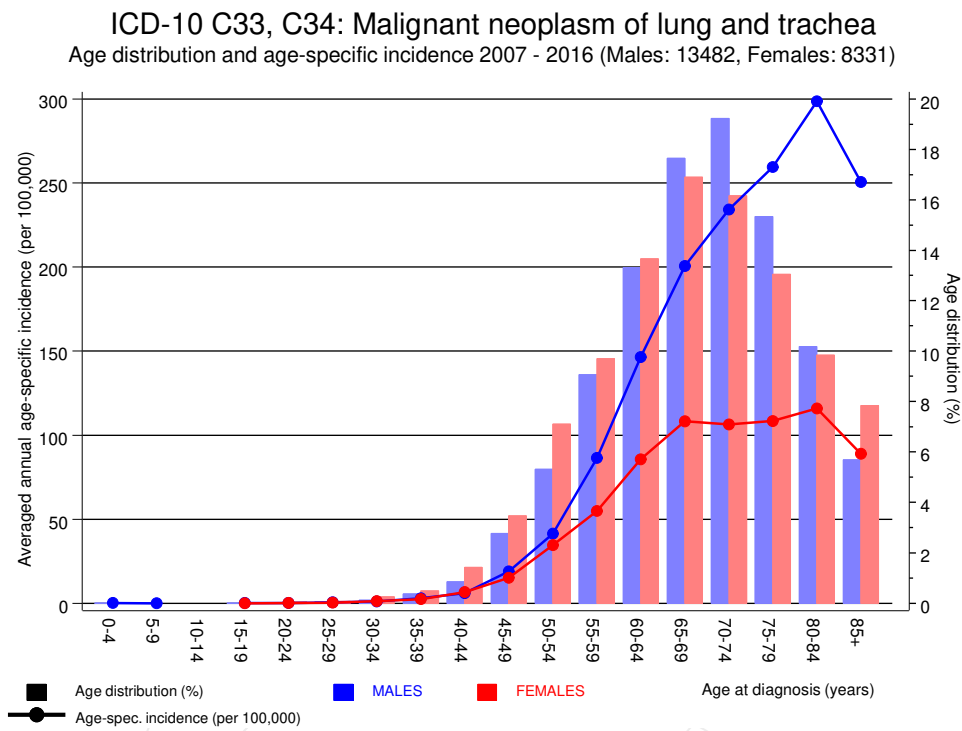


Figure 6. Age distribution (males: mean=69.4 yrs, median=70.1 yrs; females: mean=68.7 yrs, median=69.2 yrs) and age-specific incidence.

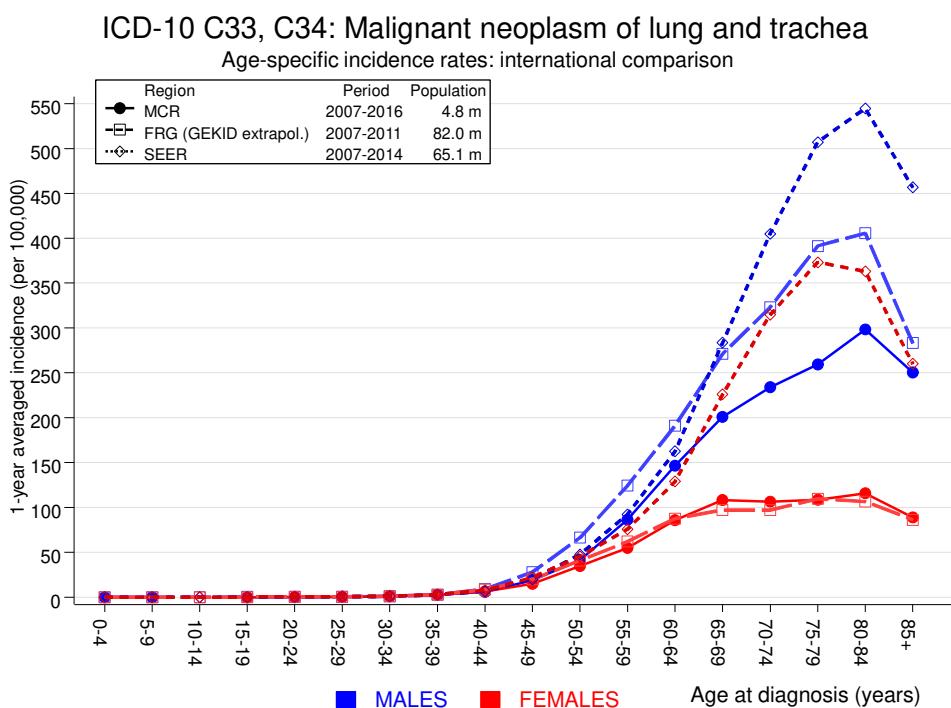


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).

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>.

Table 7a

Standardized incidence ratio (SIR, with 95% confidence limits),
excess absolute risk (EAR) and DCO rate of further malignancies
for period 1998–2016

MALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C00 Lip	3	0.5	5.7	1.2	16.7 #	0.9	33.3
C03-C06 Oral cavity	31	3.9	7.9	5.4	11.2 #	10.0	19.4
C09-C10 Oropharynx	45	4.9	9.1	6.6	12.2 #	14.8	6.7
C12-C13 Hypopharynx	17	2.7	6.3	3.7	10.0 #	5.3	5.9
C15 Oesophagus	47	8.7	5.4	3.9	7.1 #	14.2	12.8
C16 Stomach	70	17.9	3.9	3.0	4.9 #	19.3	12.9
C17 Small intestine	8	2.5	3.3	1.4	6.4 #	2.1	
C18 Colon	95	43.4	2.2	1.8	2.7 #	19.1	18.9
C19-C20 Rectum	49	24.8	2.0	1.5	2.6 #	8.9	8.2
C21 Anus/canal	2	1.0	2.0	0.2	7.2	0.4	
C22 Liver	48	13.2	3.6	2.7	4.8 #	12.9	16.7
C23-C24 Bile	10	4.4	2.3	1.1	4.1 #	2.1	20.0
C25 Pancreas	54	16.7	3.2	2.4	4.2 #	13.8	44.4
C26 GI cancer	3	0.5	6.4	1.3	18.6 #	0.9	
C32 Larynx	62	4.9	12.7	9.7	16.2 #	21.1	16.1
C33-C34 Lung	225	55.2	4.1	3.6	4.6 #	62.8	3.1
C38,C45 Mesothelioma	4	3.1	1.3	0.4	3.3	0.3	
C40-C41 Bone	2	0.4	5.5	0.7	19.9	0.6	100.0
C43 Malign. melanoma	31	19.5	1.6	1.1	2.3 #	4.3	12.9
C46,C49 Soft tissue	7	2.4	2.9	1.1	5.9 #	1.7	
C48 Peritoneal	2	0.4	5.6	0.7	20.3	0.6	
C50 Breast	5	1.2	4.3	1.4	10.0 #	1.4	60.0
C60 Penis	2	1.0	1.9	0.2	6.9	0.4	
C61 Prostate	159	134.1	1.2	1.0	1.4 #	9.2	18.9
C62 Testis	2	1.0	2.0	0.2	7.2	0.4	50.0
C64 Kidney	58	16.2	3.6	2.7	4.6 #	15.5	19.0
C65 Renal pelvis	10	1.9	5.2	2.5	9.5 #	3.0	
C67 Bladder	63	19.6	3.2	2.5	4.1 #	16.0	17.5
C68 Urinary org.	4	0.3	15.7	4.3	40.1 #	1.4	75.0
C70-C72 CNS cancer	11	5.9	1.9	0.9	3.3	1.9	63.6
C73 Thyroid	9	3.0	3.0	1.4	5.7 #	2.2	
C74-C80 Cancer others	2	1.0	2.0	0.2	7.1	0.4	50.0
C76-C79 CUP	12	7.5	1.6	0.8	2.8	1.7	8.3
C82-C85 NHL	52	18.2	2.9	2.1	3.8 #	12.5	11.5
C90 Mult. myeloma	9	5.8	1.5	0.7	2.9	1.2	33.3
C91-C96 Leukaemia	29	7.2	4.0	2.7	5.8 #	8.1	37.9
Others, specified	6	2.9	2.1	0.8	4.5	1.1	33.3
Not observed	0	3.0	0.0	0.0	1.2	-1.1	
All further malignancies	1248	461.0	2.7	2.6	2.9 #	291.2	15.6

Patients 19425
 Median age at next malignancy (years) 71.3
 Person-years 27029
 Mean observation time (years) 1.4
 Median observation time (years) 0.6

The occurrence of further malignancy listed is statistically significant.

Observed further malignancies with count 1 are pooled in category "Others, specified".

Table 7b

Standardized incidence ratio (SIR, with 95% confidence limits),
excess absolute risk (EAR) and DCO rate of further malignancies
for period 1998–2016

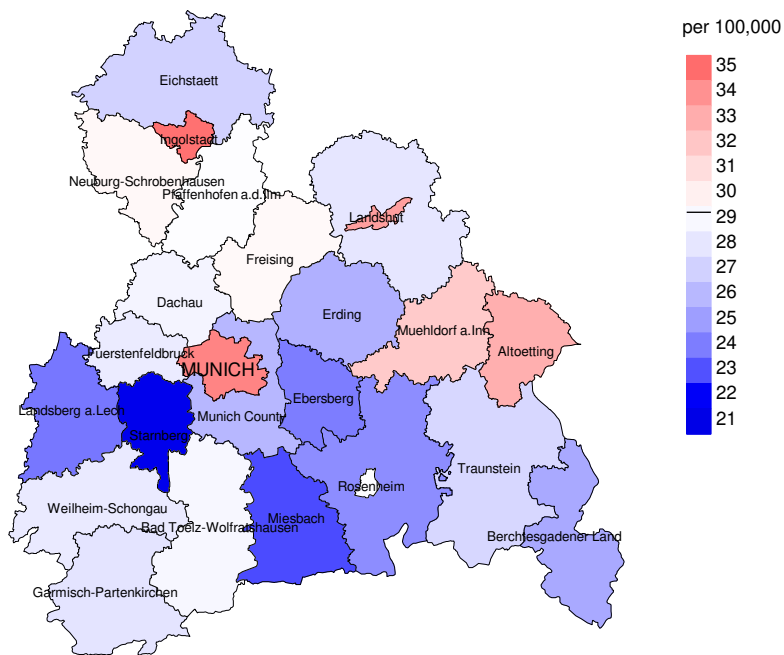
FEMALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C03–C06 Oral cavity	5	1.1	4.5	1.5	10.5 #	2.3	
C09–C10 Oropharynx	8	0.8	9.5	4.1	18.7 #	4.2	
C15 Oesophagus	9	1.2	7.4	3.4	14.0 #	4.6	11.1
C16 Stomach	22	5.9	3.7	2.3	5.7 #	9.5	31.8
C17 Small intestine	7	1.0	7.1	2.9	14.7 #	3.6	14.3
C18 Colon	43	16.6	2.6	1.9	3.5 #	15.6	16.3
C19–C20 Rectum	11	7.3	1.5	0.8	2.7	2.2	18.2
C21 Anus/canal	4	1.0	4.0	1.1	10.4 #	1.8	
C22 Liver	8	2.2	3.7	1.6	7.2 #	3.4	37.5
C23–C24 Bile	3	2.4	1.2	0.3	3.6	0.3	66.7
C25 Pancreas	34	7.9	4.3	3.0	6.0 #	15.4	44.1
C32 Larynx	6	0.4	16.3	6.0	35.5 #	3.3	16.7
C33–C34 Lung	106	14.6	7.3	6.0	8.8 #	54.0	1.9
C43 Malign. melanoma	11	7.0	1.6	0.8	2.8	2.4	18.2
C46,C49 Soft tissue	3	1.0	2.9	0.6	8.4	1.2	33.3
C50 Breast	128	57.7	2.2	1.9	2.6 #	41.6	21.9
C51 Vulva	10	1.7	5.7	2.8	10.5 #	4.9	10.0
C53 Cervix uteri	10	2.4	4.2	2.0	7.7 #	4.5	20.0
C54 Corpus uteri	13	10.6	1.2	0.7	2.1	1.4	23.1
C55,C57 Fem. genitals un	3	0.3	9.1	1.9	26.5 #	1.6	66.7
C56 Ovary	11	7.6	1.5	0.7	2.6	2.0	27.3
C57.9 Fem. urogen.	2	0.0	134.6	16.3	486.2 #	1.2	
C64 Kidney	15	4.5	3.4	1.9	5.5 #	6.2	33.3
C65 Renal pelvis	6	0.6	10.8	4.0	23.5 #	3.2	
C66 Ureter	2	0.3	7.0	0.8	25.2	1.0	
C67 Bladder	12	3.2	3.8	1.9	6.6 #	5.2	16.7
C70–C72 CNS cancer	6	2.5	2.4	0.9	5.2	2.1	33.3
C73 Thyroid	16	3.3	4.8	2.7	7.8 #	7.5	12.5
C76–C79 CUP	13	3.0	4.3	2.3	7.3 #	5.9	7.7
C82–C85 NHL	14	6.9	2.0	1.1	3.4 #	4.2	14.3
C90 Mult. myeloma	6	2.2	2.7	1.0	5.9 #	2.2	50.0
C91–C96 Leukaemia	10	2.8	3.6	1.7	6.6 #	4.3	10.0
Others, specified	11	2.2	5.0	2.5	9.0 #	5.2	27.3
Not observed	0	2.1	0.0	0.0	1.8	-1.2	
All further malignancies	568	184.3	3.1	2.8	3.3 #	226.8	18.3
Patients		10796					
Median age at next malignancy (years)		69.8					
Person-years		16922					
Mean observation time (years)		1.6					
Median observation time (years)		0.7					

The occurrence of further malignancy listed is statistically significant.

Observed further malignancies with count 1 are pooled in category "Others, specified".

Average incidence (world standard population) 2007 - 2016: Males



Average incidence (world standard population) 2007 - 2016: Females

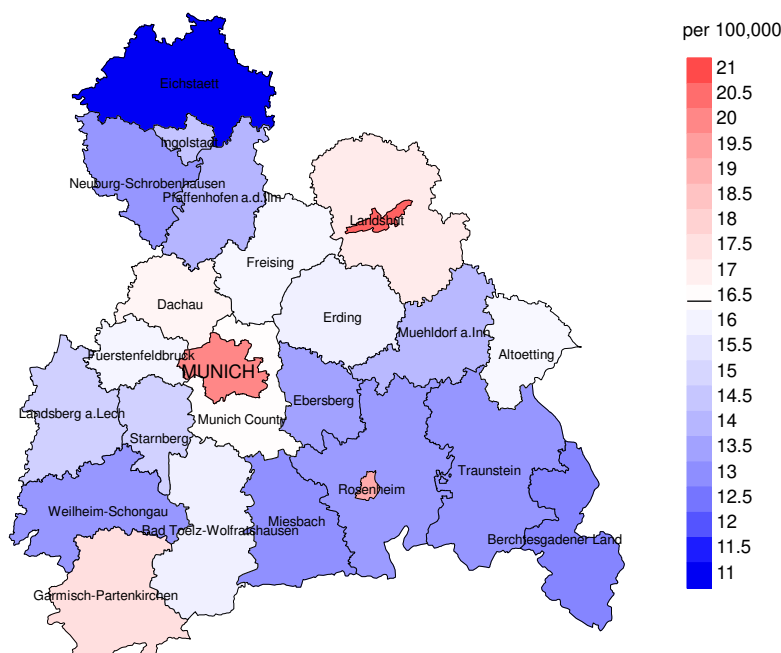
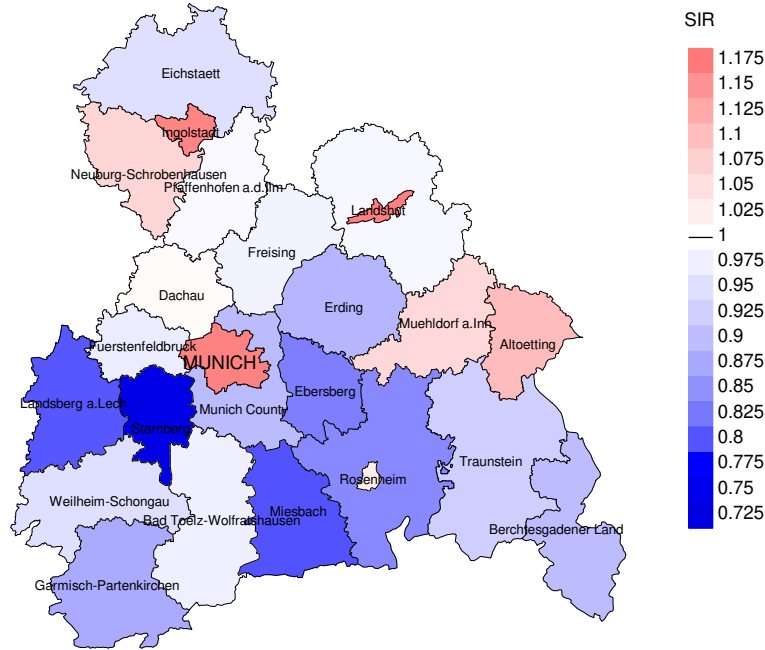


Figure 8a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 29.3/100,000 WS N=13,482, females 16.4/100,000 WS N=8,331).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 184 women were identified with newly diagnosed lung cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 13.5/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 10.9 and 16.6/100,000.

Standardized incidence ratio (SIR) 2007 - 2016: Males



Standardized incidence ratio (SIR) 2007 - 2016: Females

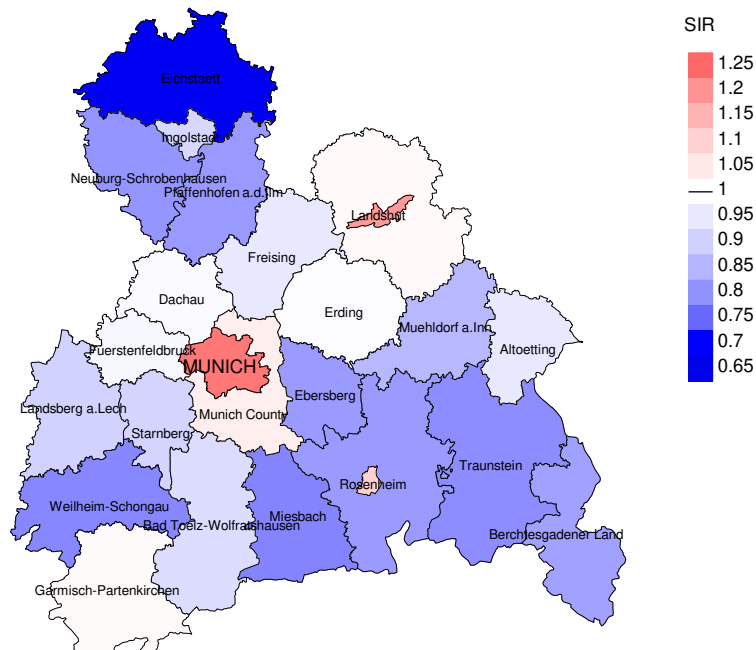


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=13,482, females N=8,331).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 184 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 0.66 and 0.98.

MORTALITY

Table 9a

Annual cohorts: Incident cancers, follow-up status, proportion of DCO, deaths among the annual cohorts and proportion of available death certificates (with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.81 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	1054	99.2	16.6	998	94.7	93.1
1999	1097	99.0	16.1	1035	94.3	95.1
2000	1120	99.1	21.3	1048	93.6	95.7
2001	1138	98.9	18.4	1070	94.0	95.3
2002	1776	98.7	20.9	1666	93.8	97.4
2003	1828	99.0	17.6	1705	93.3	97.5
2004	1815	98.8	17.3	1684	92.8	97.9
2005	1800	98.4	15.0	1674	93.0	98.6
2006	1838	97.8	15.2	1672	91.0	98.7
2007	2201	94.8	13.6	1967	89.4	98.8
2008	2212	92.4	11.0	1946	88.0	98.9
2009	2255	93.0	11.8	1985	88.0	99.0
2010	2264	93.3	11.2	1982	87.5	98.6
2011	2303	92.7	10.6	1987	86.3	98.8
2012	2295	91.2	10.4	1893	82.5	97.9
2013	2287	90.1	10.9	1836	80.3	98.0
2014	2287	91.4	11.0	1684	73.6	98.3
2015	2040	98.3	14.1	1370	67.2	96.4
2016	1787	74.5	13.7	738	41.3	87.1
1998-2016	35397	94.2	13.9	29940	84.6	97.5

Table 9b

Annual cohorts of incident cancers and deaths, proportion of death certificates and cases deceased within the same year of being diagnosed with cancer (incl. DCO)

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.81 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	1054	882	91.8	459	43.5
1999	1097	915	94.1	457	41.7
2000	1120	997	95.1	502	44.8
2001	1138	992	94.2	490	43.1
2002	1776	1391	97.5	812	45.7
2003	1828	1499	97.8	822	45.0
2004	1815	1568	97.8	795	43.8
2005	1800	1532	97.9	803	44.6
2006	1838	1600	98.1	779	42.4
2007	2201	1755	98.5	904	41.1
2008	2212	1764	98.9	848	38.3
2009	2255	1854	99.1	873	38.7
2010	2264	1928	98.9	924	40.8
2011	2303	1957	99.1	954	41.4
2012	2295	1910	98.1	886	38.6
2013	2287	1957	98.2	922	40.3
2014	2287	1908	98.7	868	38.0
2015	2040	1961	98.6	894	43.8
2016	1787	1490	98.3	655	36.7
1998-2016	35397	29860	97.8	14647	41.4

Table 9c

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 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.81 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	84.1	15.9	97.4
1999	915	88.6	11.4	97.3
2000	997	90.8	9.2	98.3
2001	992	88.0	12.0	96.8
2002	1391	92.5	7.5	97.2
2003	1499	93.4	6.6	97.6
2004	1568	95.0	5.0	98.0
2005	1532	93.4	6.6	97.0
2006	1600	93.1	6.9	97.3
2007	1755	93.9	6.1	97.2
2008	1764	94.7	5.3	97.4
2009	1854	93.7	6.3	97.4
2010	1928	93.7	6.3	97.2
2011	1957	94.3	5.7	96.9
2012	1910	93.5	6.5	96.7
2013	1957	93.9	6.1	96.7
2014	1908	93.1	6.9	96.2
2015	1961	92.4	7.6	95.6
2016	1490	91.3	8.7	95.0
1998-2016	29860	92.8	7.2	97.0

Table 10a

Medians of age at death according to the grouping in Table 9
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	685	68.4	68.1	71.1	69.1
2002	973	68.9	68.4	74.4	68.6
2003	1049	68.8	68.5	72.0	68.9
2004	1043	69.6	69.5	71.9	69.7
2005	1023	69.8	69.6	74.9	69.9
2006	1094	69.7	69.5	73.0	69.7
2007	1177	70.1	69.7	74.5	70.1
2008	1171	69.9	69.5	75.3	69.7
2009	1228	70.6	70.4	74.3	70.4
2010	1242	70.9	70.5	75.6	70.8
2011	1251	71.1	70.8	74.6	70.8
2012	1195	71.3	70.6	78.9	71.1
2013	1216	72.3	72.2	76.7	72.3
2014	1169	72.7	72.4	75.8	72.6
2015	1211	72.5	72.0	77.1	72.3
2016	878	74.3	73.9	77.5	74.1
1998–2016	19516	70.7	70.3	74.6	70.6

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 10b

Medians of age at death according to the grouping in Table 9
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	78.1	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	70.9	80.3	71.5
2005	509	68.6	68.1	79.9	68.6
2006	506	70.6	70.0	78.0	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	69.1	81.7	69.4
2010	686	70.2	70.0	78.3	70.1
2011	706	69.8	69.5	76.3	69.8
2012	715	71.2	70.9	79.6	71.1
2013	741	71.9	71.3	82.7	71.6
2014	739	71.9	71.3	81.7	71.4
2015	750	72.2	71.8	76.8	72.1
2016	612	71.5	71.1	76.7	71.2
1998-2016	10344	70.8	70.3	78.1	70.7

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 11a

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	501	45.2	0.71	27.2	0.71	40.8	0.72	53.3	0.73
1999	556	49.7	0.73	29.3	0.71	44.5	0.73	58.8	0.77
2000	612	53.7	0.81	31.5	0.80	47.6	0.81	62.0	0.83
2001	599	51.7	0.76	30.2	0.74	45.3	0.76	58.9	0.79
2002	897	48.1	0.75	27.0	0.74	40.4	0.74	52.5	0.74
2003	976	52.1	0.81	28.8	0.80	43.0	0.81	55.4	0.82
2004	993	52.8	0.84	28.4	0.83	42.8	0.84	55.7	0.85
2005	943	49.8	0.80	25.9	0.77	39.0	0.79	51.3	0.81
2006	1017	53.1	0.84	27.3	0.82	41.1	0.83	53.9	0.85
2007	1102	49.7	0.78	25.3	0.76	38.2	0.77	50.4	0.78
2008	1101	49.5	0.77	25.2	0.76	37.8	0.77	49.2	0.78
2009	1145	51.3	0.81	25.4	0.77	38.1	0.79	49.8	0.81
2010	1152	51.1	0.82	25.1	0.79	37.5	0.80	48.8	0.83
2011	1173	52.4	0.83	25.3	0.81	37.8	0.82	49.2	0.84
2012	1103	48.6	0.79	23.5	0.78	34.8	0.78	45.1	0.79
2013	1137	49.4	0.81	23.1	0.78	34.6	0.79	45.5	0.82
2014	1080	46.3	0.80	21.4	0.79	32.2	0.79	41.8	0.80
2015	1102	46.3	0.90	21.6	0.88	32.4	0.88	42.0	0.90
2016	789	32.8	0.75	14.5	0.69	22.2	0.71	29.5	0.75
1998-2016	17978	48.8	0.80	24.7	0.78	37.0	0.79	48.2	0.81

Table 11b

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	0.69	10.1	0.68	14.6	0.68	17.7	0.67
1999	255	21.5	0.76	10.0	0.71	14.8	0.73	18.9	0.75
2000	293	24.4	0.82	12.2	0.80	17.6	0.81	21.8	0.82
2001	275	22.6	0.79	10.7	0.75	15.7	0.76	19.7	0.77
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	496	25.1	0.78	11.5	0.74	16.8	0.75	21.4	0.78
2005	488	24.5	0.80	11.6	0.78	16.9	0.79	20.7	0.79
2006	472	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	0.68	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	11.9	0.72	17.2	0.72	21.0	0.72
2010	655	28.0	0.78	12.6	0.74	18.2	0.75	22.6	0.76
2011	673	28.8	0.76	13.0	0.75	18.9	0.76	23.4	0.76
2012	682	28.9	0.76	12.6	0.73	18.4	0.73	22.9	0.75
2013	700	29.4	0.79	12.6	0.73	18.4	0.74	22.7	0.76
2014	697	28.9	0.75	12.4	0.69	18.2	0.71	22.7	0.73
2015	710	29.2	0.89	12.2	0.83	18.0	0.85	22.8	0.87
2016	574	23.4	0.79	10.0	0.73	14.7	0.74	18.2	0.76
1998-2016	9732	25.4	0.76	11.4	0.72	16.7	0.74	20.7	0.75

Table 12

Age distribution of age at death (cancer-related) for period 2007-2016
(incl. multiple malignancies)

Age at death Years	Cases			Males			Females		
	n	%	Cum.%	n	%	Cum.%	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	3	0.0	0.0	2	0.0	0.0	1	0.0	0.0
25-29	3	0.0	0.0	3	0.0	0.1			0.0
30-34	11	0.1	0.1	5	0.0	0.1	6	0.1	0.1
35-39	50	0.3	0.4	25	0.2	0.3	25	0.4	0.5
40-44	150	0.9	1.3	85	0.8	1.1	65	1.0	1.5
45-49	431	2.5	3.8	254	2.3	3.5	177	2.8	4.3
50-54	866	5.0	8.8	491	4.5	8.0	375	5.9	10.1
55-59	1433	8.3	17.1	868	8.0	15.9	565	8.8	19.0
60-64	2164	12.5	29.6	1358	12.5	28.4	806	12.6	31.6
65-69	2931	17.0	46.5	1864	17.1	45.5	1067	16.7	48.2
70-74	3191	18.5	65.0	2112	19.4	64.9	1079	16.9	65.1
75-79	2725	15.8	80.8	1806	16.6	81.5	919	14.4	79.5
80-84	2025	11.7	92.5	1310	12.0	93.6	715	11.2	90.6
85+	1298	7.5	100.0	699	6.4	100.0	599	9.4	100.0
All ages	17283	100.0		10884	100.0		6399	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007–2016
(incl. multiple malignancies)

Age at death Years	Males		Females		Males		Females	
	n	n	Age- spec. mortal.	MI-index	Age- spec. mortal.	MI-index	Prop.all cancers %	Prop.all cancers %
0- 4	1		0.1	0.50			6.7	
5- 9								
10-14								
15-19	1		0.1	0.50			2.3	
20-24	2	1	0.1	1.00	0.1	0.25	3.5	3.0
25-29	3		0.2	0.38			4.1	
30-34	5	6	0.3	0.28	0.4	0.29	4.8	5.0
35-39	25	25	1.5	0.51	1.6	0.61	12.4	8.8
40-44	85	65	4.6	0.74	3.6	0.55	17.2	9.7
45-49	254	177	12.9	0.68	9.3	0.61	22.1	13.5
50-54	491	375	28.4	0.68	21.9	0.63	23.9	19.0
55-59	868	565	61.3	0.71	38.4	0.70	25.7	19.8
60-64	1358	806	110.9	0.76	60.6	0.71	27.3	21.5
65-69	1864	1067	157.3	0.78	82.1	0.76	25.6	20.0
70-74	2112	1079	190.9	0.82	85.3	0.80	22.7	15.9
75-79	1806	919	226.7	0.87	91.8	0.85	20.1	13.1
80-84	1310	715	284.8	0.95	101.1	0.87	17.4	10.5
85+	699	599	228.3	0.91	81.6	0.92	10.7	6.5
All ages	10884	6399					20.8	13.8
Mortality								
Raw			47.6	0.81	27.0	0.77		
WS			22.9	0.78	12.0	0.73		
ES			34.3	0.79	17.4	0.74		
BRD-S			44.7	0.81	21.6	0.76		
PYLL-70								
per 100,000			216.5		146.2			
ES			186.3		121.5			
AYLL-70			8.8		9.5			

Table 14a

Further malignancies in deaths in period 1998–2016
MALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C03–C06 Oral cavity	181	3.8	143	79.0	20	11.0	18	9.9
C09–C10 Oropharynx	162	3.4	115	71.0	18	11.1	29	17.9
C12–C13 Hypopharynx	94	2.0	65	69.1	14	14.9	15	16.0
C15 Oesophagus	101	2.1	38	37.6	26	25.7	37	36.6
C16 Stomach	174	3.6	92	52.9	35	20.1	47	27.0
C18 Colon	380	7.9	254	66.8	57	15.0	69	18.2
C19–C20 Rectum	202	4.2	147	72.8	27	13.4	28	13.9
C22 Liver	78	1.6	24	30.8	24	30.8	30	38.5
C25 Pancreas	78	1.6	16	20.5	18	23.1	44	56.4
C32 Larynx	229	4.8	167	72.9	26	11.4	36	15.7
C33–C34 Lung	256	5.4			74	28.9	182	71.1
C43 Malign. melanoma	146	3.1	122	83.6	10	6.8	14	9.6
C44 Skin others	398	8.3	279	70.1	39	9.8	80	20.1
C61 Prostate	1012	21.2	828	81.8	69	6.8	115	11.4
C62 Testis	54	1.1	49	90.7	2	3.7	3	5.6
C64 Kidney	205	4.3	141	68.8	29	14.1	35	17.1
C67 Bladder	343	7.2	263	76.7	26	7.6	54	15.7
C76–C79 CUP	70	1.5	39	55.7	19	27.1	12	17.1
C81 Hodgkin lymphoma	46	1.0	45	97.8	1	2.2		
C82–C85 NHL	190	4.0	130	68.4	28	14.7	32	16.8
C91–C96 Leukaemia	47	1.0	17	36.2	8	17.0	22	46.8
Others, specified	336	7.0	214	63.7	43	12.8	79	23.5
All further malignancies	4782	100.0	3188	66.7	613	12.8	981	20.5

Further malignancies with number of cases 1 to 34 are pooled in category “Others, specified”.

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 further malignancy.

Table 14b

Further malignancies in deaths in period 1998–2016
FEMALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C03–C06 Oral cavity	52	2.3	46	88.5	4	7.7	2	3.8
C09–C10 Oropharynx	35	1.5	28	80.0	2	5.7	5	14.3
C15 Oesophagus	22	1.0	13	59.1	2	9.1	7	31.8
C16 Stomach	51	2.2	23	45.1	13	25.5	15	29.4
C18 Colon	164	7.1	115	70.1	18	11.0	31	18.9
C19–C20 Rectum	65	2.8	50	76.9	5	7.7	10	15.4
C21 Anus/canal	29	1.3	23	79.3	3	10.3	3	10.3
C25 Pancreas	61	2.6	16	26.2	15	24.6	30	49.2
C32 Larynx	27	1.2	19	70.4	2	7.4	6	22.2
C33–C34 Lung	112	4.8			25	22.3	87	77.7
C43 Malign. melanoma	62	2.7	58	93.5	1	1.6	3	4.8
C44 Skin others	101	4.4	68	67.3	5	5.0	28	27.7
C50 Breast	690	29.9	572	82.9	51	7.4	67	9.7
C51 Vulva	25	1.1	17	68.0	3	12.0	5	20.0
C53 Cervix uteri	126	5.5	110	87.3	8	6.3	8	6.3
C54 Corpus uteri	131	5.7	119	90.8	3	2.3	9	6.9
C56 Ovary	61	2.6	42	68.9	8	13.1	11	18.0
C64 Kidney	69	3.0	48	69.6	10	14.5	11	15.9
C67 Bladder	63	2.7	46	73.0	8	12.7	9	14.3
C73 Thyroid	48	2.1	34	70.8	8	16.7	6	12.5
C76–C79 CUP	42	1.8	23	54.8	7	16.7	12	28.6
C82–C85 NHL	81	3.5	67	82.7	6	7.4	8	9.9
C91–C96 Leukaemia	23	1.0	9	39.1	5	21.7	9	39.1
Others, specified	171	7.4	103	60.2	23	13.5	45	26.3
All further malignancies	2311	100.0	1649	71.4	235	10.2	427	18.5

Further malignancies with number of cases 1 to 19 are pooled in category “Others, specified”.

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 further malignancy.

Table 15

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2016
(First primaries only *)

Age at death Years	Males		Males		Females		Females	
	n	n	Age- spec. mortal.	MI-index	Age- spec. mortal.	MI-index	Prop.all cancers %	Prop.all cancers %
0- 4	1		0.1	0.50			7.1	
5- 9								
10-14								
15-19	1		0.1	1.00			2.4	
20-24	1	1	0.1	1.00	0.1	0.25	2.0	3.2
25-29	3		0.2	0.38			4.5	
30-34	5	6	0.3	0.29	0.4	0.30	4.9	5.7
35-39	22	20	1.4	0.49	1.3	0.54	11.6	7.8
40-44	79	58	4.2	0.74	3.2	0.55	17.3	9.7
45-49	237	148	12.0	0.70	7.8	0.61	22.6	13.1
50-54	435	318	25.2	0.69	18.6	0.63	24.1	19.0
55-59	748	489	52.8	0.71	33.3	0.72	25.4	20.5
60-64	1131	666	92.3	0.76	50.1	0.72	27.1	21.7
65-69	1501	840	126.7	0.81	64.7	0.78	25.7	19.8
70-74	1597	815	144.4	0.83	64.4	0.79	22.2	15.4
75-79	1299	710	163.0	0.89	70.9	0.88	19.6	13.1
80-84	907	542	197.2	1.00	76.6	0.88	16.5	10.2
85+	464	465	151.5	0.89	63.4	0.91	9.7	6.3
All ages	8431	5078					20.6	13.7
Mortality								
Raw			36.9	0.81	21.4	0.77		
WS			18.2	0.79	9.7	0.73		
ES			27.0	0.80	14.0	0.74		
BRD-S			34.5	0.82	17.2	0.76		
PYLL-70								
per 100,000			187.8		123.3			
ES			161.6		102.7			
AYLL-70			9.1		9.7			

* See corresponding tables with multiple malignancies.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2016
(**Single primaries only** *)

Age at death Years	Males		Males		Females		Females	
	n	n	Age- spec. mortal.	MI-index	Age- spec. mortal.	MI-index	Prop.all cancers %	Prop.all cancers %
0- 4	1		0.1	0.50			7.1	
5- 9								
10-14								
15-19	1		0.1	1.00			2.4	
20-24		1			0.1	0.25		3.2
25-29	3		0.2	0.38			4.5	
30-34	5	6	0.3	0.29	0.4	0.30	4.9	5.8
35-39	22	20	1.4	0.49	1.3	0.56	11.7	7.9
40-44	79	57	4.2	0.74	3.2	0.56	17.4	9.7
45-49	234	145	11.8	0.70	7.6	0.60	22.6	13.0
50-54	426	313	24.7	0.70	18.3	0.63	23.9	19.0
55-59	734	478	51.9	0.72	32.5	0.74	25.3	20.3
60-64	1086	652	88.7	0.76	49.0	0.74	26.4	21.7
65-69	1440	803	121.5	0.82	61.8	0.78	25.2	19.4
70-74	1529	785	138.2	0.83	62.0	0.79	22.0	15.2
75-79	1206	679	151.4	0.87	67.8	0.87	19.0	12.9
80-84	848	522	184.4	0.96	73.8	0.87	16.4	10.2
85+	436	443	142.4	0.85	60.4	0.88	9.9	6.3
All ages	8050	4904					20.5	13.6
Mortality								
Raw			35.2	0.81	20.7	0.77		
WS			17.5	0.79	9.4	0.73		
ES			25.8	0.79	13.6	0.75		
BRD-S			32.9	0.81	16.7	0.76		
PYLL-70								
per 100,000			183.2		120.7			
ES			157.6		100.6			
AYLL-70			9.2		9.7			

* See corresponding tables with multiple malignancies.

ICD-10 C33, C34: Malignant neoplasm of lung and trachea
 Age distribution and age-specific mortality 2007 - 2016 (Males: 10884, Females: 6399)

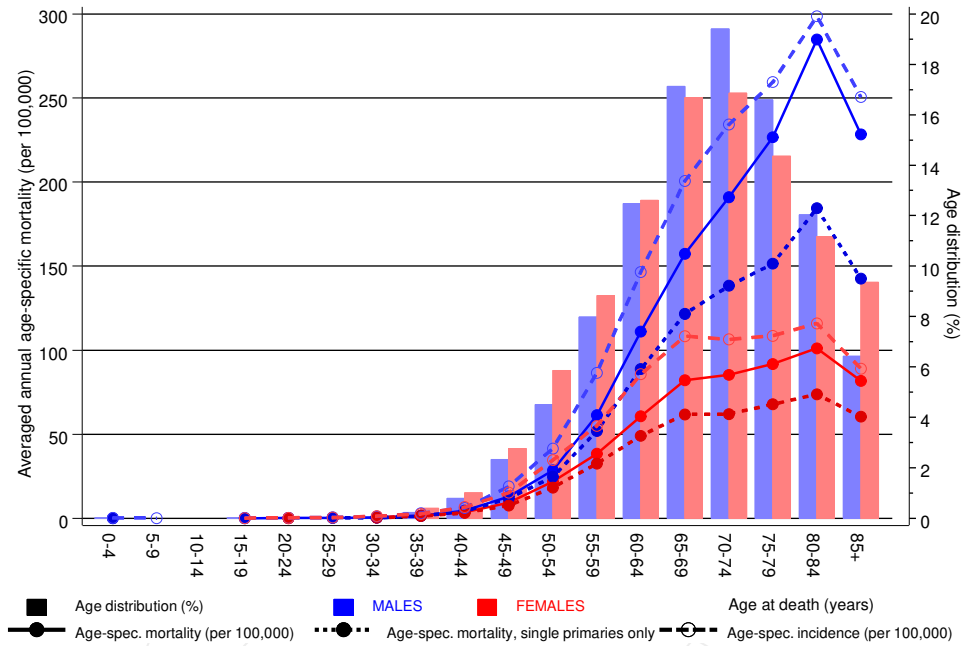
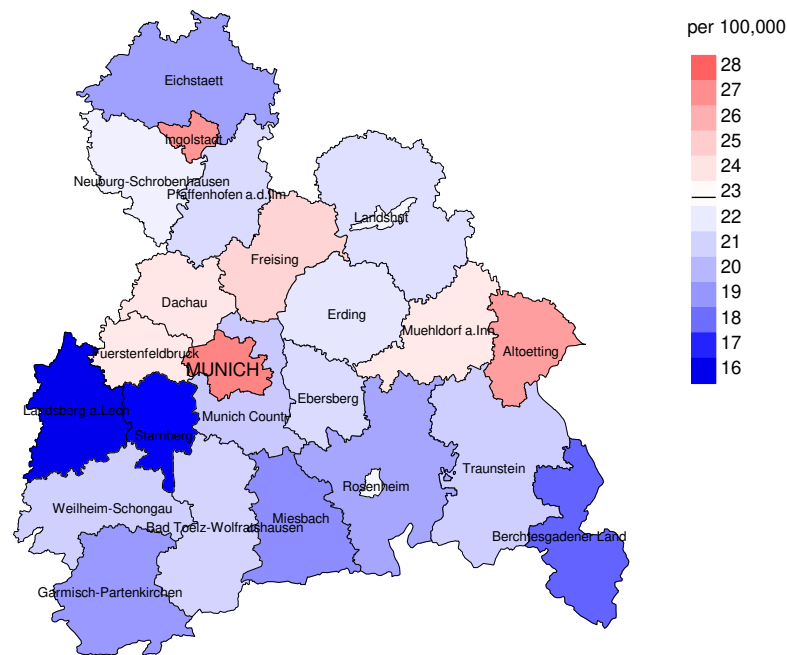


Figure 17. Distribution of age at death (bars; males: mean=69.1 yrs, median=69.7 yrs; females: mean=68.7 yrs, median=69.0 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed 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 - 2016: Males



Average mortality (world standard population) 2007 - 2016: Females

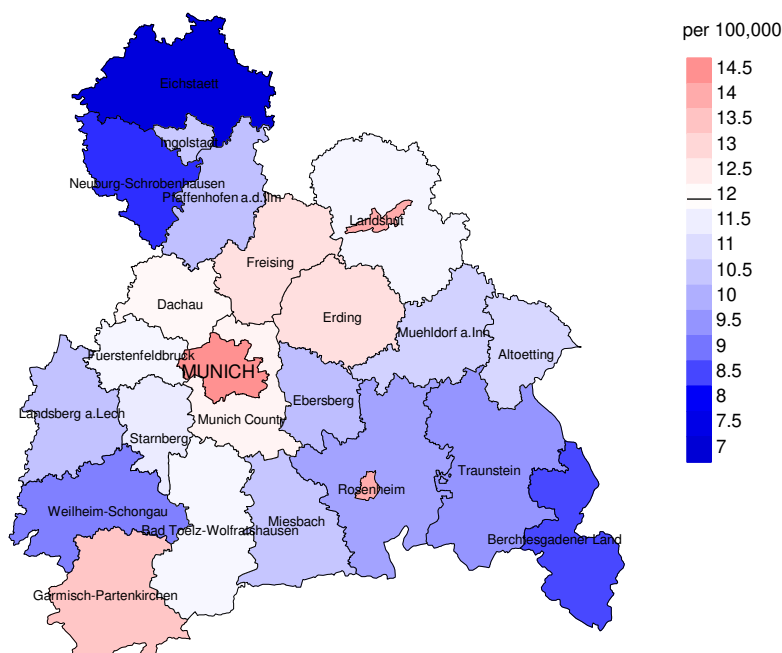
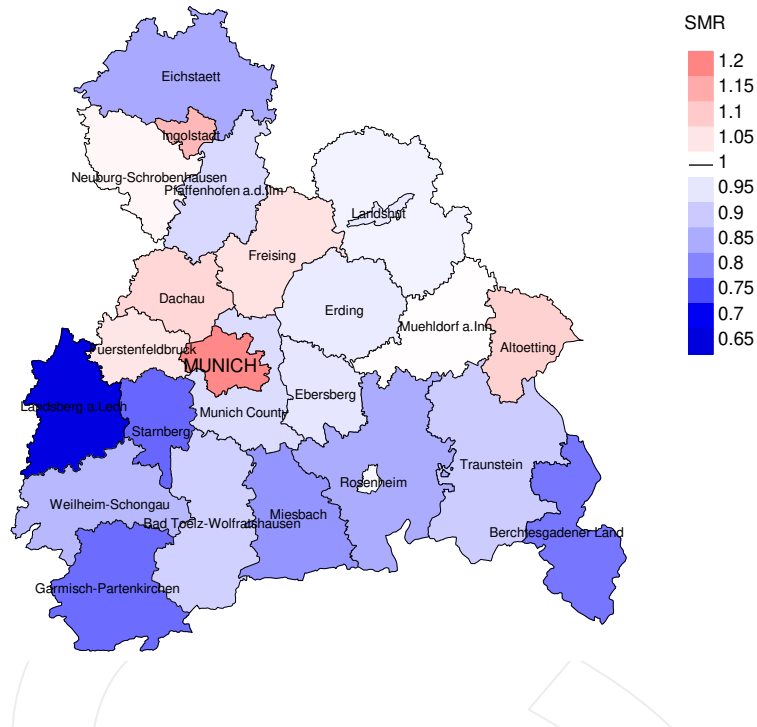


Figure 18a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2016. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 22.9/100,000 WS N=10,884, females 12.0/100,000 WS N=6,399).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 155 women died from lung cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 10.3/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 8.1 and 13.0/100,000.

Standardized mortality ratio (SMR) 2007 - 2016: Males



Standardized mortality ratio (SMR) 2007 - 2016: Females

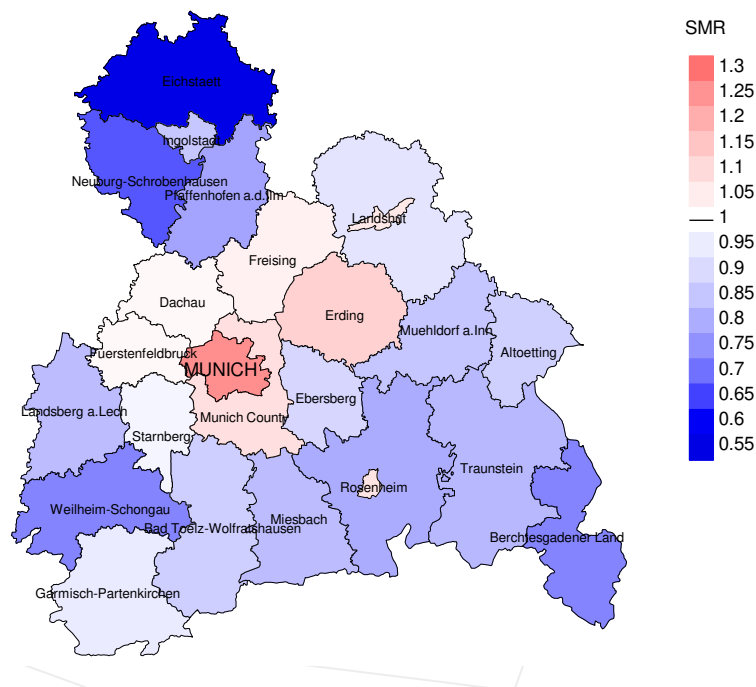


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=10,884, females N=6,399).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 155 women died from lung cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.89. Though, the value of this parameter may vary with an underlying probability of 99% between 0.72 and 1.09, 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

MCR	Munich Cancer Registry (Tumorregister München)
GEKID	Association of Population-based Cancer Registries in Germany (Gesellschaft der epidemiologischen Krebsregister in Deutschland e.V.)
SEER	Surveillance, Epidemiology, and End Results (USA)
DCO	Death certificate only
BRD-S	German standard population
ES	European standard population (old)
WS	World standard population
SIR	Standardized incidence ratio
CI	Confidence interval
EAR	Excess absolute risk = excess cancer cases (O - E) per 10,000 person-years
PYLL-70	Potential years of life lost prior to age 70 given a person dies before that age
AYLL-70	Average years of life lost prior to age 70 given a person dies before that age
SMR	Standardized mortality ratio
MI-index	Ratio between mortality and incidence
FRG	Federal Republic of Germany

Recommended Citation

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