

Munich Cancer Registry



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

ICD-10 C33, C34: Lung cancer

Incidence and Mortality

Year of diagnosis	1998-2019
Patients	40,151
Diseases	40,586
Creation date	01/25/2021
Database export	01/07/2021
Population	4.92 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, January 2021

[#] 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	1019	191	18.7	11.6	4.8	95.5	99.2
1999	1077	190	17.6	12.6	4.8	94.8	99.0
2000	1100	254	23.1	13.1	4.7	94.4	99.1
2001	1106	234	21.2	13.7	4.7	94.8	98.9
2002	1737	387	22.3	14.4	4.7	95.0	98.8 #
2003	1779	341	19.2	14.9	4.6	94.4	99.2
2004	1758	327	18.6	15.3	4.5	94.4	99.0
2005	1760	295	16.8	15.9	4.5	94.0	98.6
2006	1802	295	16.4	16.3	4.4	92.2	98.3
2007	2164	313	14.5	16.5	4.4	91.2	98.0 #
2008	2197	261	11.9	16.9	4.3	89.9	99.3
2009	2229	283	12.7	17.3	4.2	90.2	98.7
2010	2253	268	11.9	17.7	4.0	90.5	99.0
2011	2297	260	11.3	18.1	3.8	89.0	99.3
2012	2288	252	11.0	18.4	3.6	87.2	99.3
2013	2294	259	11.3	18.7	3.4	86.2	99.0
2014	2302	261	11.3	19.0	3.2	82.3	98.3
2015	2360	309	13.1	19.3	2.8	80.7	98.2
2016	2231	297	13.3	19.6	2.6	76.5	99.9
2017	2039	292	14.3	19.8	2.3	69.7	99.8
2018	1561	49	3.1	20.2	2.0	49.7	99.8
2019	1233	22	1.8	20.3	2.1	36.2	83.0 ##
1998-2019	40586	5640	13.9	20.3	4.8	85.1	98.5

40,586 cases diagnosed 1998-2019 are related to a total of 40,151 patients. Currently, in 9,798 (24.4 %) of these 40,151 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 7,688 / 1,639 / 471 (19.1 % / 4.1 % / 1.2 %) 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 2017, a subgroup of 2,039 cases has been diagnosed, of which 19.8 % 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 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	681	66.8	125	18.4	11.5	5.0	96.0	99.4
1999	746	69.3	136	18.2	12.1	5.0	94.9	98.9
2000	748	68.0	158	21.1	12.8	5.0	94.9	99.1
2001	766	69.3	156	20.4	13.7	4.9	94.8	98.6
2002	1177	67.8	252	21.4	14.5	4.9	96.1	99.1 #
2003	1169	65.7	229	19.6	15.0	4.8	95.0	99.4
2004	1143	65.0	192	16.8	15.3	4.7	95.2	99.2
2005	1158	65.8	172	14.9	15.9	4.7	94.6	98.6
2006	1194	66.3	178	14.9	16.3	4.6	92.2	98.2
2007	1407	65.0	198	14.1	16.7	4.6	92.0	97.8 #
2008	1420	64.6	160	11.3	17.1	4.6	91.4	99.3
2009	1410	63.3	168	11.9	17.5	4.4	91.2	98.8
2010	1412	62.7	148	10.5	17.8	4.2	91.6	98.9
2011	1417	61.7	145	10.2	18.3	4.1	90.8	99.4
2012	1393	60.9	149	10.7	18.7	4.0	88.8	99.4
2013	1412	61.6	154	10.9	19.1	3.7	87.6	99.2
2014	1358	59.0	147	10.8	19.5	3.4	84.0	98.6
2015	1442	61.1	197	13.7	19.8	3.0	82.3	98.5
2016	1310	58.7	184	14.0	20.0	2.7	79.5	99.9
2017	1186	58.2	168	14.2	20.3	2.2	73.0	99.7
2018	900	57.7	30	3.3	20.6	1.9	52.2	99.8
2019	671	54.4	9	1.3	20.8	1.7	38.5	83.6 ##
1998–2019	25520	62.9	3455	13.5	20.8	5.0	87.1	98.6

25,520 cases diagnosed 1998-2019 are related to a total of 25,229 patients. Currently, in 6,337 (25.1 %) of these 25,229 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 4,972 / 1,055 / 310 (19.7 % / 4.2 % / 1.2 %) 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 2017, a subgroup of 1,186 cases has been diagnosed, of which 20.3 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 2.2 % 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	338	33.2	66	19.5	11.8	4.4	94.4	98.8
1999	331	30.7	54	16.3	13.8	4.4	94.6	99.1
2000	352	32.0	96	27.3	13.7	4.3	93.2	99.1
2001	340	30.7	78	22.9	13.7	4.3	94.7	99.7
2002	560	32.2	135	24.1	14.1	4.3	92.7	98.2 #
2003	610	34.3	112	18.4	14.7	4.2	93.4	98.9
2004	615	35.0	135	22.0	15.4	4.1	92.8	98.5
2005	602	34.2	123	20.4	15.8	4.1	92.9	98.5
2006	608	33.7	117	19.2	16.2	4.1	92.1	98.5
2007	757	35.0	115	15.2	16.1	4.0	89.7	98.3 #
2008	777	35.4	101	13.0	16.5	3.9	87.3	99.2
2009	819	36.7	115	14.0	17.0	3.8	88.4	98.7
2010	841	37.3	120	14.3	17.5	3.6	88.5	99.2
2011	880	38.3	115	13.1	17.7	3.3	86.3	99.1
2012	895	39.1	103	11.5	17.9	3.1	84.6	99.0
2013	882	38.4	105	11.9	17.9	3.0	84.0	98.5
2014	944	41.0	114	12.1	18.1	2.9	79.9	98.0
2015	918	38.9	112	12.2	18.6	2.6	78.2	97.7
2016	921	41.3	113	12.3	18.9	2.4	72.1	99.9
2017	853	41.8	124	14.5	19.2	2.4	65.1	99.8
2018	661	42.3	19	2.9	19.4	2.2	46.3	99.8
2019	562	45.6	13	2.3	19.5	2.6	33.5	82.2 ##
1998–2019	15066	37.1	2185	14.5	19.5	4.4	81.8	98.2

15,066 cases diagnosed 1998-2019 are related to a total of 14,922 patients. Currently, in 3,461 (23.2 %) of these 14,922 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 2,716 / 584 / 161 (18.2 % / 3.9 % / 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 2017, a subgroup of 853 cases has been diagnosed, of which 19.2 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 2.4 % 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 4.92 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	681	338	61.5	28.7	37.0	14.3	55.3	20.6	71.0	25.3
1999	746	331	66.7	27.9	40.5	13.9	59.5	20.0	74.6	24.9
2000	748	352	65.7	29.3	39.0	14.9	58.0	21.3	73.9	26.0
2001	766	340	66.1	27.9	39.8	13.9	58.1	20.1	72.6	24.9
2002	1177	560	63.2	28.6	35.6	13.9	53.4	20.3	69.2	24.8
2003	1169	610	62.4	31.0	35.0	15.4	52.0	22.1	65.9	26.6
2004	1143	615	60.8	31.1	33.0	14.9	49.3	21.5	63.4	26.6
2005	1158	602	61.1	30.3	32.9	14.6	48.6	21.2	62.2	25.8
2006	1194	608	62.3	30.3	33.1	14.4	49.0	20.9	62.5	25.4
2007	1407	757	63.5	32.8	33.1	16.2	49.3	23.2	64.2	28.1
2008	1420	777	63.8	33.5	33.1	16.4	49.1	23.5	62.6	28.3
2009	1410	819	63.2	35.2	32.5	16.5	48.1	23.7	61.0	29.1
2010	1412	841	62.6	35.9	31.8	17.1	46.8	24.5	59.1	29.7
2011	1417	880	63.3	37.6	31.5	17.3	46.4	25.0	58.9	30.6
2012	1393	895	61.4	37.9	30.2	17.5	44.5	25.3	57.0	30.7
2013	1412	882	61.3	37.0	29.9	17.3	44.1	24.8	56.0	29.7
2014	1358	944	58.2	39.2	27.5	18.2	40.9	26.0	52.6	31.5
2015	1442	918	60.6	37.7	29.0	17.0	43.1	24.5	54.9	30.0
2016	1310	921	54.5	37.5	26.2	17.0	38.7	24.5	49.2	29.8
2017	1186	853	49.1	34.6	23.1	15.3	34.3	22.2	43.8	27.3
2018	900	661	37.0	26.6	17.9	12.8	26.3	18.0	33.1	21.8
2019	671	562	27.6	22.6	12.8	10.5	19.1	15.0	24.5	18.1
1998-2019	25520	15066	57.9	32.9	29.6	15.5	43.7	22.2	55.5	27.1

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	1019	67.1	11.3	28.1	93.1	52.5	58.7	67.5	75.6	81.6
1999	1077	67.1	11.3	24.9	96.3	52.7	59.0	67.3	75.0	82.3
2000	1100	67.3	11.7	15.8	96.0	52.0	59.2	67.5	75.8	81.7
2001	1106	67.0	11.2	17.0	96.4	52.3	59.7	67.1	74.9	81.0
2002	1737	68.1	11.5	27.5	99.5	53.0	60.5	68.5	76.5	82.0
2003	1779	67.9	11.2	17.5	97.6	53.4	60.5	68.3	75.8	82.3
2004	1758	68.4	11.1	24.4	98.0	54.2	61.2	68.3	76.6	82.2
2005	1760	68.2	11.3	18.1	98.5	54.2	61.0	68.4	76.6	82.5
2006	1802	68.4	10.9	27.5	102	54.8	61.5	68.1	76.7	82.4
2007	2164	68.4	11.2	7.5	99.1	53.9	61.3	68.7	76.6	81.9
2008	2197	68.4	10.9	22.3	99.4	54.5	61.3	68.7	76.4	82.0
2009	2229	69.0	11.1	20.3	102	54.3	61.5	69.3	76.8	83.1
2010	2253	68.8	10.8	0.5	97.8	54.6	61.9	69.3	76.3	82.3
2011	2297	69.0	10.9	28.9	97.6	54.2	62.0	69.7	76.6	83.0
2012	2288	69.3	11.0	22.9	96.8	54.5	62.2	69.9	77.0	83.2
2013	2294	69.2	10.8	27.9	100	54.2	62.1	70.0	76.6	82.6
2014	2302	69.6	11.1	15.9	100	54.2	62.5	70.9	77.1	83.3
2015	2360	70.1	10.8	23.7	100	55.1	63.1	71.0	77.5	83.6
2016	2231	69.8	10.8	20.9	102	55.6	62.5	70.5	77.2	83.1
2017	2039	70.0	10.7	24.2	98.4	55.6	62.3	70.8	77.8	82.5
2018	1561	68.9	10.6	18.5	96.4	55.3	62.0	69.9	76.6	81.1
2019	1233	69.5	10.5	19.7	98.8	56.0	62.4	70.3	77.4	81.4
1998-2019	40586	68.8	11.0	0.5	102	54.3	61.5	69.3	76.7	82.5

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	681	66.7	10.7	28.1	91.7	53.8	58.9	67.0	74.9	80.3
1999	746	66.6	10.8	24.9	96.3	53.0	59.0	66.9	73.6	80.6
2000	748	67.0	10.8	28.1	94.2	53.3	59.3	66.8	74.6	80.8
2001	766	66.6	10.8	17.0	96.4	52.7	60.2	66.3	73.6	80.2
2002	1177	68.1	10.8	32.2	94.9	53.7	61.1	68.0	76.0	81.6
2003	1169	67.9	10.3	36.8	95.4	54.4	61.1	68.2	75.0	81.3
2004	1143	68.3	10.5	36.9	94.3	54.5	61.5	68.5	76.1	81.5
2005	1158	68.3	10.6	18.1	98.5	55.5	61.9	68.4	75.8	81.6
2006	1194	68.2	10.0	28.7	102	55.2	61.9	68.1	75.8	80.9
2007	1407	68.8	10.5	7.5	97.3	55.2	62.4	69.2	76.7	81.7
2008	1420	68.7	10.3	22.3	99.4	55.7	61.9	69.2	76.3	81.3
2009	1410	69.0	10.6	30.8	100	55.6	61.8	69.1	76.5	82.5
2010	1412	68.8	10.5	0.5	97.5	54.9	62.3	69.5	75.8	81.9
2011	1417	68.9	10.6	28.9	94.3	54.4	62.4	69.9	76.1	82.3
2012	1393	69.5	10.7	22.9	96.6	55.5	63.2	70.3	77.0	82.7
2013	1412	69.6	10.3	27.9	99.7	55.4	62.5	70.6	76.7	82.3
2014	1358	70.3	10.4	30.3	96.0	55.8	63.4	71.6	77.6	83.2
2015	1442	70.3	10.7	29.2	93.8	55.7	63.4	71.4	77.6	83.5
2016	1310	70.1	10.5	25.5	96.7	56.0	62.9	71.4	77.1	83.2
2017	1186	70.2	10.4	28.7	98.4	55.9	62.9	71.2	77.7	82.4
2018	900	69.8	10.1	24.7	96.4	56.6	63.0	70.4	77.0	81.5
2019	671	70.4	10.2	22.3	94.5	56.8	63.6	71.7	78.5	81.8
1998-2019	25520	68.9	10.6	0.5	102	55.1	61.9	69.5	76.4	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	338	67.9	12.5	35.8	93.1	50.8	58.0	68.8	76.7	84.4
1999	331	68.2	12.2	32.9	94.8	51.8	59.0	69.1	77.7	83.8
2000	352	67.8	13.2	15.8	96.0	50.0	58.9	69.4	78.0	84.0
2001	340	68.0	12.1	31.5	93.9	50.6	59.2	69.0	76.9	83.5
2002	560	68.2	12.8	27.5	99.5	51.7	59.1	69.5	78.2	83.6
2003	610	67.9	12.7	17.5	97.6	51.8	59.3	68.4	77.3	83.4
2004	615	68.5	12.1	24.4	98.0	52.9	60.3	68.1	78.3	83.6
2005	602	68.0	12.4	21.6	96.1	52.4	58.8	68.3	77.8	83.7
2006	608	68.7	12.4	27.5	100	53.4	60.1	68.1	78.6	84.7
2007	757	67.7	12.2	22.3	99.1	51.3	59.4	67.9	76.6	82.8
2008	777	67.9	11.9	29.4	97.3	52.4	60.5	67.9	76.5	82.9
2009	819	68.9	12.0	20.3	102	53.0	60.9	69.6	77.5	83.9
2010	841	68.7	11.3	33.2	97.8	54.0	61.6	68.3	77.0	83.6
2011	880	69.1	11.4	33.0	97.6	53.4	61.4	69.3	77.6	84.5
2012	895	69.0	11.4	33.3	96.8	53.6	60.7	69.5	77.0	84.0
2013	882	68.7	11.6	30.6	100	53.5	61.1	69.2	76.4	84.2
2014	944	68.4	11.9	15.9	100	51.7	60.9	69.7	76.5	83.3
2015	918	69.7	11.0	23.7	100	54.7	62.7	70.4	77.3	83.6
2016	921	69.4	11.3	20.9	102	54.7	62.2	69.6	77.4	82.9
2017	853	69.8	11.0	24.2	98.2	55.5	61.9	70.2	78.1	82.8
2018	661	67.6	11.2	18.5	90.9	52.8	60.7	69.0	75.7	80.2
2019	562	68.5	10.9	19.7	98.8	55.0	61.3	69.2	76.4	81.0
1998-2019	15066	68.6	11.8	15.8	102	53.0	60.6	69.1	77.2	83.5

Table 4

Age distribution by 5-year age group and sex for period 2007–2019
(incl. DCO)

Age at diagnosis 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	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	5	0.0	0.0	2	0.0	0.0	3	0.0	0.0
20–24	10	0.0	0.1	4	0.0	0.0	6	0.1	0.1
25–29	22	0.1	0.1	11	0.1	0.1	11	0.1	0.2
30–34	54	0.2	0.3	25	0.1	0.3	29	0.3	0.5
35–39	105	0.4	0.7	55	0.3	0.6	50	0.5	0.9
40–44	265	1.0	1.7	128	0.8	1.4	137	1.3	2.2
45–49	797	2.9	4.6	436	2.6	4.0	361	3.4	5.6
50–54	1601	5.8	10.4	876	5.2	9.2	725	6.8	12.3
55–59	2573	9.4	19.8	1524	9.1	18.3	1049	9.8	22.1
60–64	3645	13.3	33.1	2194	13.1	31.4	1451	13.5	35.7
65–69	4749	17.3	50.4	2930	17.5	48.9	1819	17.0	52.7
70–74	4915	17.9	68.3	3173	19.0	67.9	1742	16.3	68.9
75–79	4249	15.5	83.8	2735	16.3	84.2	1514	14.1	83.1
80–84	2729	9.9	93.7	1701	10.2	94.4	1028	9.6	92.7
85+	1727	6.3	100.0	942	5.6	100.0	785	7.3	100.0
All ages	27448	100.0		16738	100.0		10710	100.0	

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 2007–2019

Age at diagnosis Years	Males n	Females n	Males Age- spec. incid.	Females Age- spec. incid.	Males DCO rate n=1853 %	Females DCO rate n=1269 %	Males	Females
							Prop.all cancers %	Prop.all cancers %
0- 4	1		0.1		100.0		0.5	
5- 9	1		0.1				0.9	
10-14								
15-19	2	3	0.1	0.2			0.7	1.2
20-24	4	6	0.2	0.3			0.7	1.3
25-29	11	11	0.5	0.5			1.3	1.0
30-34	24	29	1.1	1.4	4.2		2.0	1.5
35-39	55	50	2.6	2.4		2.0	3.2	1.5
40-44	128	137	5.5	6.1	3.1	2.9	4.9	2.4
45-49	433	360	17.2	14.8	1.6	4.2	9.0	4.1
50-54	874	723	37.3	31.3	3.4	2.8	11.1	6.2
55-59	1516	1042	78.0	52.1	4.5	3.6	12.9	8.4
60-64	2177	1440	133.5	82.0	6.2	4.4	13.3	9.9
65-69	2906	1808	191.1	107.3	7.2	5.9	12.8	10.2
70-74	3151	1733	224.9	107.9	8.8	9.5	12.2	9.3
75-79	2715	1507	245.2	109.4	12.2	12.1	12.3	8.3
80-84	1696	1028	258.3	105.6	21.4	26.2	12.0	7.2
85+	941	785	220.7	81.3	45.4	51.6	9.6	5.1
All ages	16635	10662			11.1	11.9	11.6	7.4
Incidence								
Raw			55.2	34.3				
WS			27.1	15.9				
ES			40.0	22.8				
BRD-S			50.8	27.7				

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).

ICD-10 C33, C34: Malignant neoplasm of lung and trachea
 Age distribution and age-specific incidence 2007 - 2019 (Males: 16635, Females: 10662)

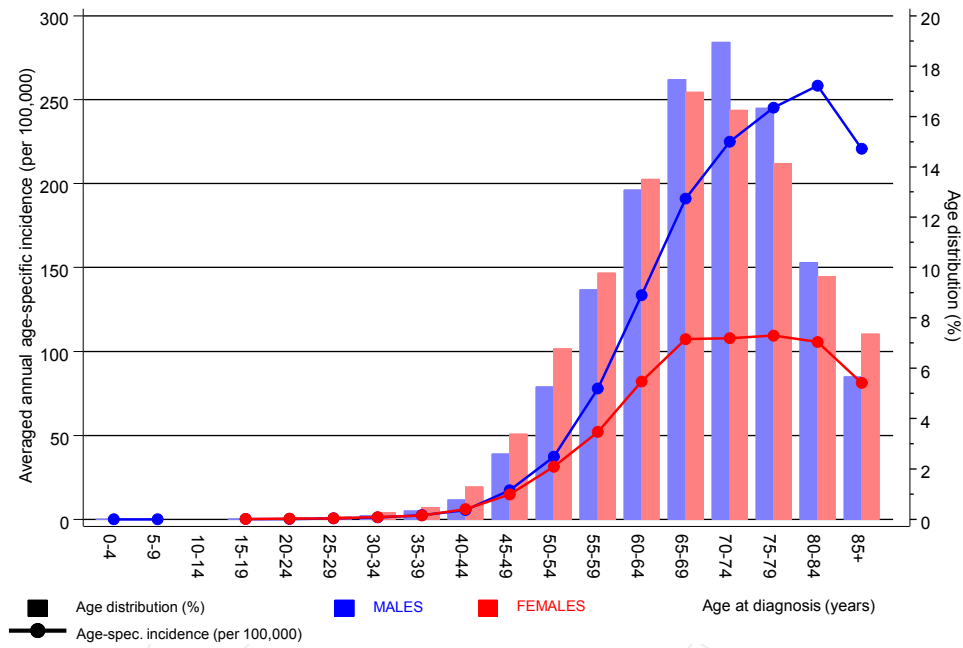


Figure 6. Age distribution (males: mean=69.5 yrs, median=70.3 yrs; females: mean=68.8 yrs, median=69.3 yrs) and age-specific incidence.

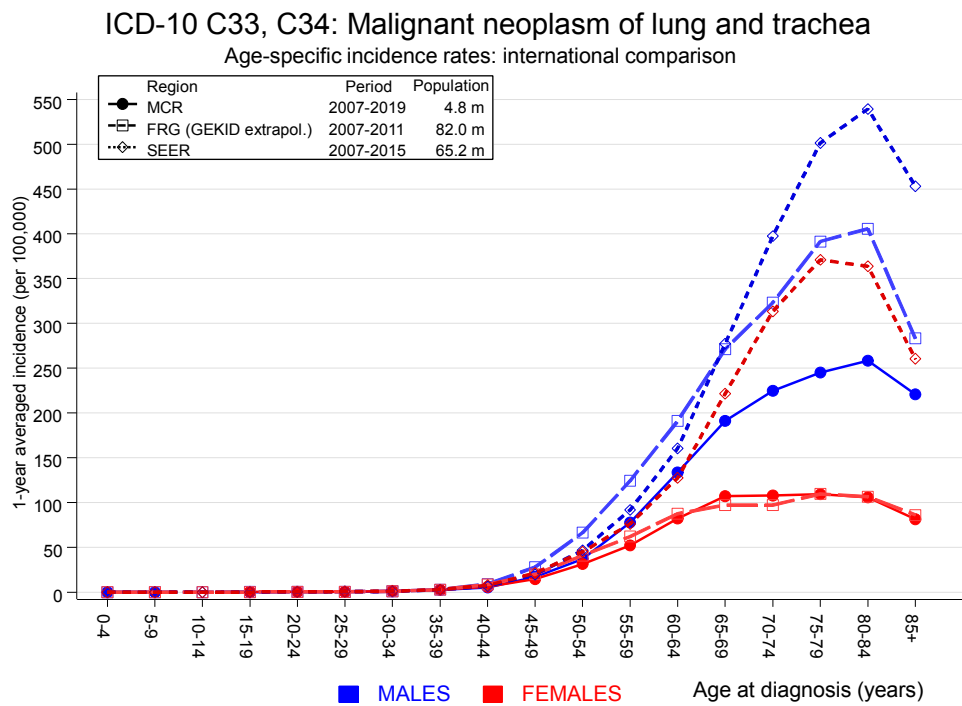


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).

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 2019, based on the November 2018 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 1998–2019

MALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C00 Lip	3	0.6	5.0	1.0	14.5 #	0.7	33.3
C03–C06 Oral cavity	39	4.7	8.3	5.9	11.4 #	10.2	17.9
C09–C10 Oropharynx	58	5.9	9.9	7.5	12.7 #	15.4	5.2
C12–C13 Hypopharynx	19	3.2	5.9	3.6	9.2 #	4.7	5.3
C15 Oesophagus	56	11.1	5.1	3.8	6.6 #	13.3	10.7
C16 Stomach	81	21.3	3.8	3.0	4.7 #	17.7	12.3
C17 Small intestine	14	3.2	4.3	2.4	7.3 #	3.2	7.1
C18 Colon	116	52.5	2.2	1.8	2.7 #	18.8	17.2
C19–C20 Rectum	58	29.7	2.0	1.5	2.5 #	8.4	6.9
C21 Anus/canal	2	1.3	1.6	0.2	5.6	0.2	
C22 Liver	55	16.2	3.4	2.6	4.4 #	11.5	18.2
C23–C24 Bile	13	5.7	2.3	1.2	3.9 #	2.2	15.4
C25 Pancreas	68	21.0	3.2	2.5	4.1 #	13.9	39.7
C26 GI cancer	4	0.5	7.4	2.0	18.9 #	1.0	25.0
C32 Larynx	66	5.7	11.6	9.0	14.7 #	17.9	15.2
C33–C34 Lung	293	66.6	4.4	3.9	4.9 #	67.1	2.7
C38,C45 Mesothelioma	4	3.8	1.1	0.3	2.7	0.1	
C40–C41 Bone	4	0.4	9.6	2.6	24.5 #	1.1	50.0
C43 Malign. melanoma	39	24.0	1.6	1.2	2.2 #	4.4	12.8
C46,C49 Soft tissue	8	3.0	2.7	1.2	5.3 #	1.5	
C48 Peritoneal	3	0.4	6.9	1.4	20.1 #	0.8	
C50 Breast	5	1.5	3.3	1.1	7.8 #	1.0	60.0
C60 Penis	2	1.4	1.5	0.2	5.3	0.2	
C61 Prostate	209	159.7	1.3	1.1	1.5 #	14.6	18.7
C62 Testis	2	1.2	1.6	0.2	5.8	0.2	50.0
C64 Kidney	71	19.4	3.7	2.9	4.6 #	15.3	16.9
C65 Renal pelvis	11	2.4	4.5	2.3	8.1 #	2.5	
C67 Bladder	78	24.5	3.2	2.5	4.0 #	15.8	16.7
C68 Urinary org.	5	0.3	15.5	5.0	36.3 #	1.4	60.0
C70–C72 CNS cancer	13	7.0	1.9	1.0	3.2	1.8	53.8
C73 Thyroid	10	3.6	2.8	1.3	5.1 #	1.9	
C74–C80 Cancer others	2	1.2	1.7	0.2	6.1	0.2	50.0
C76–C79 CUP	18	9.0	2.0	1.2	3.1 #	2.7	5.6
C82–C85 NHL	60	22.8	2.6	2.0	3.4 #	11.0	10.0
C90 Mult. myeloma	12	7.1	1.7	0.9	2.9	1.4	16.7
C91–C96 Leukaemia	25	8.0	3.1	2.0	4.6 #	5.0	36.0
Others, specified	8	6.1	1.3	0.6	2.6	0.5	25.0
Not observed	0	1.4	0.0	0.0	2.6	-0.4	
All further malignancies	1534	557.6	2.8	2.6	2.9 #	289.2	14.1

Patients	22596
Median age at next malignancy (years)	71.5
Person-years	33765
Mean observation time (years)	1.5
Median observation time (years)	0.7

The occurrence of further specified malignancy is statistically significant.

Further observed 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 1998–2019

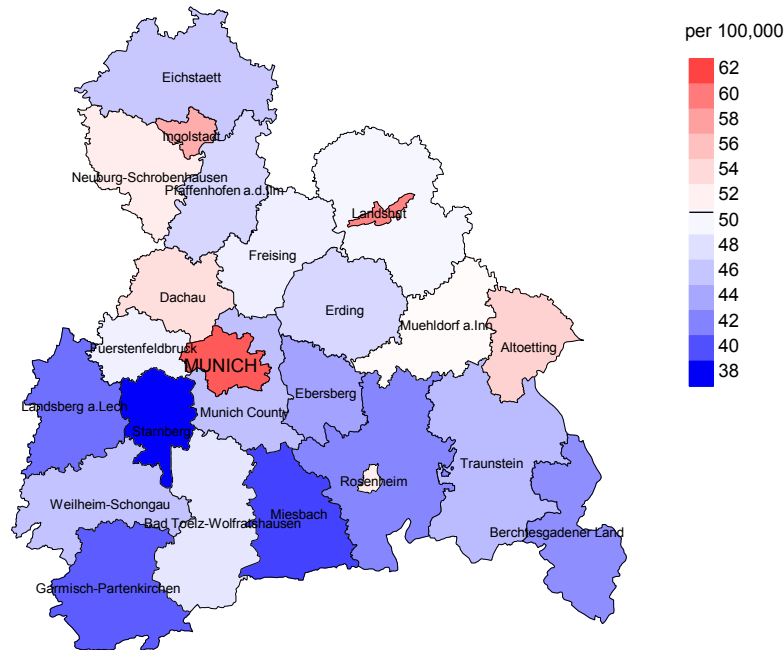
FEMALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C03–C06 Oral cavity	6	1.4	4.3	1.6	9.5 #	2.1	
C09–C10 Oropharynx	9	1.1	8.2	3.8	15.7 #	3.6	11.1
C15 Oesophagus	12	1.6	7.5	3.9	13.1 #	4.8	8.3
C16 Stomach	25	7.1	3.5	2.3	5.2 #	8.2	28.0
C17 Small intestine	8	1.3	6.0	2.6	11.9 #	3.1	12.5
C18 Colon	48	20.6	2.3	1.7	3.1 #	12.5	16.7
C19–C20 Rectum	16	8.8	1.8	1.0	2.9 #	3.3	12.5
C21 Anus/canal	4	1.3	3.1	0.8	7.9	1.2	
C22 Liver	12	2.8	4.3	2.2	7.5 #	4.2	33.3
C23–C24 Bile	5	3.0	1.7	0.5	3.9	0.9	40.0
C25 Pancreas	43	10.2	4.2	3.1	5.7 #	15.0	39.5
C32 Larynx	5	0.5	11.0	3.6	25.7 #	2.1	20.0
C33–C34 Lung	142	19.0	7.5	6.3	8.8 #	56.3	1.4
C43 Malign. melanoma	18	8.8	2.0	1.2	3.2 #	4.2	11.1
C46,C49 Soft tissue	4	1.3	3.2	0.9	8.1	1.3	25.0
C50 Breast	166	74.6	2.2	1.9	2.6 #	41.8	17.5
C51 Vulva	13	2.3	5.6	3.0	9.6 #	4.9	7.7
C53 Cervix uteri	15	3.1	4.9	2.7	8.1 #	5.5	13.3
C54 Corpus uteri	20	13.7	1.5	0.9	2.3	2.9	20.0
C56 Ovary	16	9.5	1.7	1.0	2.7	3.0	18.8
C57.9 Fem. urogen.	2	0.0	136.3	16.5	492.4 #	0.9	
C64 Kidney	18	5.4	3.4	2.0	5.3 #	5.8	27.8
C65 Renal pelvis	8	0.7	11.5	5.0	22.6 #	3.3	
C66 Ureter	3	0.4	8.1	1.7	23.7 #	1.2	
C67 Bladder	21	4.1	5.1	3.2	7.8 #	7.7	14.3
C68 Urinary org.	2	0.1	30.3	3.7	109.5 #	0.9	100.0
C70–C72 CNS cancer	6	3.0	2.0	0.7	4.4	1.4	33.3
C73 Thyroid	18	4.0	4.5	2.6	7.0 #	6.4	11.1
C76–C79 CUP	17	3.8	4.5	2.6	7.2 #	6.0	5.9
C82–C85 NHL	15	8.7	1.7	1.0	2.8	2.9	13.3
C90 Mult. myeloma	7	2.7	2.6	1.0	5.3 #	2.0	42.9
C91–C96 Leukaemia	10	3.2	3.2	1.5	5.8 #	3.1	10.0
Others, specified	13	4.1	3.1	1.7	5.4 #	4.1	30.8
Not observed	0	1.5	0.0	0.0	2.4	-0.7	
All further malignancies	727	233.6	3.1	2.9	3.3 #	225.9	15.5
Patients		13146					
Median age at next malignancy (years)		70.3					
Person-years		21841					
Mean observation time (years)		1.7					
Median observation time (years)		0.8					

The occurrence of further specified malignancy is statistically significant.

Further observed malignancies with count 1 are pooled in category "Others, specified".

Average incidence (Germany 1987 standard population) 2007 - 2019: Males



Average incidence (Germany 1987 standard population) 2007 - 2019: Females

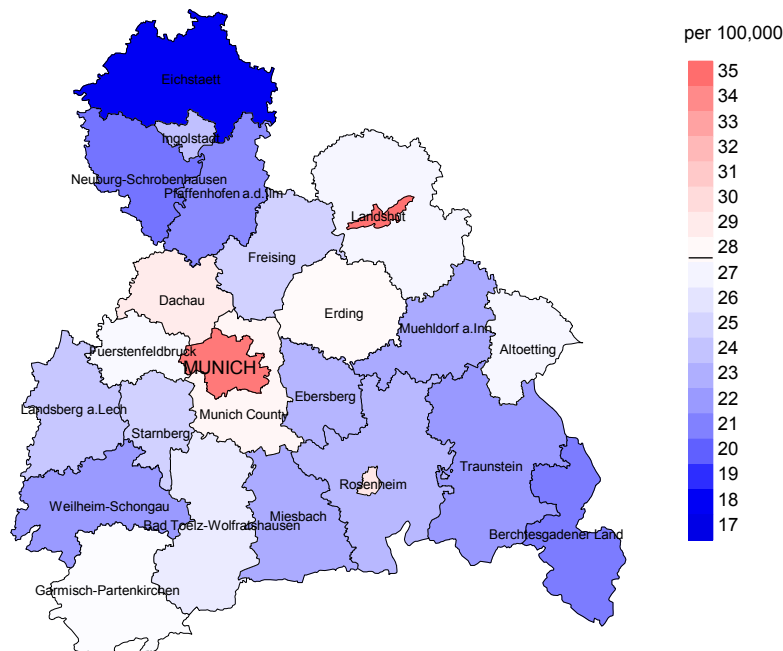
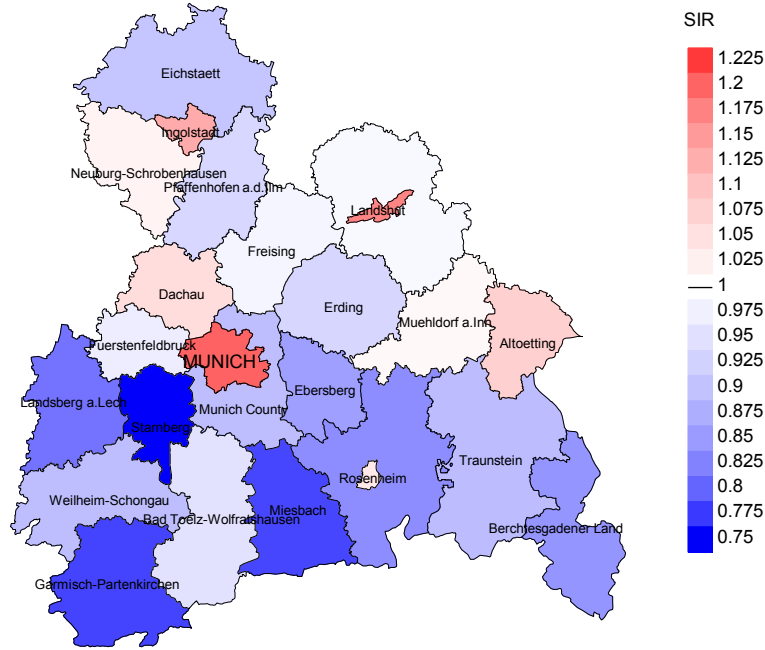


Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 50.8/100,000 WS N=16,635, females 27.7/100,000 WS N=10,662).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,462 female residents (averaged) in the period from 2007 to 2019 a total of 245 women were identified with newly diagnosed lung cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 23.3/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 19.6 and 27.4/100,000.

Standardized incidence ratio (SIR) 2007 - 2019: Males



Standardized incidence ratio (SIR) 2007 - 2019: Females

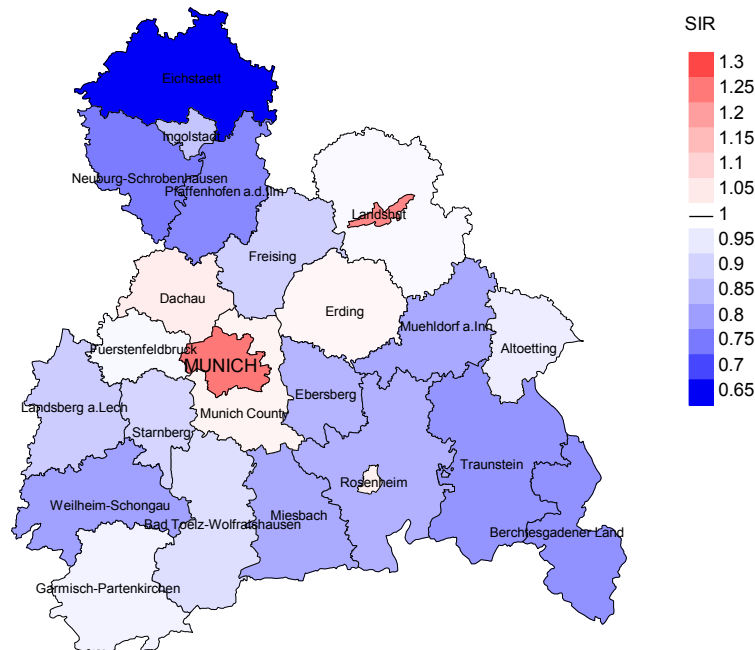


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=16,635, females N=10,662).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2019 a total of 245 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 0.84. Though, the value of this parameter may vary with an underlying probability of 99% between 0.71 and 0.99.

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 4.92 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	1019	99.2	18.7	973	95.5	93.4
1999	1077	99.0	17.6	1021	94.8	95.1
2000	1100	99.1	23.1	1038	94.4	95.5
2001	1106	98.9	21.2	1048	94.8	95.1
2002	1737	98.8	22.3	1650	95.0	97.3
2003	1779	99.2	19.2	1680	94.4	97.3
2004	1758	99.0	18.6	1659	94.4	97.5
2005	1760	98.6	16.8	1655	94.0	98.2
2006	1802	98.3	16.4	1661	92.2	98.2
2007	2164	98.0	14.5	1974	91.2	98.0
2008	2197	99.3	11.9	1976	89.9	98.2
2009	2229	98.7	12.7	2010	90.2	98.2
2010	2253	99.0	11.9	2038	90.5	98.0
2011	2297	99.3	11.3	2045	89.0	98.0
2012	2288	99.3	11.0	1994	87.2	96.7
2013	2294	99.0	11.3	1978	86.2	96.2
2014	2302	98.3	11.3	1895	82.3	95.8
2015	2360	98.2	13.1	1905	80.7	94.9
2016	2231	99.9	13.3	1706	76.5	89.6
2017	2039	99.8	14.3	1421	69.7	76.2
2018	1561	99.8	3.1	776	49.7	37.5
2019	1233	83.0	1.8	446	36.2	82.5
1998-2019	40586	98.5	13.9	34549	85.1	94.2

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 4.92 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	1019	853	92.0	444	43.6
1999	1077	896	94.2	451	41.9
2000	1100	979	95.1	495	45.0
2001	1106	968	94.3	478	43.2
2002	1737	1353	97.6	794	45.7
2003	1779	1456	97.8	804	45.2
2004	1758	1515	97.8	771	43.9
2005	1760	1495	97.9	787	44.7
2006	1802	1553	98.1	757	42.0
2007	2164	1731	98.5	890	41.1
2008	2197	1726	98.8	842	38.3
2009	2229	1831	99.1	863	38.7
2010	2253	1911	98.8	920	40.8
2011	2297	1944	99.0	953	41.5
2012	2288	1900	98.1	880	38.5
2013	2294	1943	98.1	918	40.0
2014	2302	1908	98.6	868	37.7
2015	2360	1989	98.7	912	38.6
2016	2231	1901	98.7	855	38.3
2017	2039	1801	97.5	800	39.2
2018	1561	1279	31.3	401	25.7
2019	1233	923	50.5	255	20.7
1998–2019	40586	33855	94.0	16138	39.8

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 4.92 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer- related %	Prop. non-cancer- related %	Prop. cancer recorded on death certificate %
1998	853	83.9	16.1	97.6
1999	896	88.6	11.4	97.4
2000	979	90.6	9.4	98.3
2001	968	88.1	11.9	96.7
2002	1353	92.2	7.8	97.2
2003	1456	93.4	6.6	97.6
2004	1515	94.9	5.1	98.0
2005	1495	93.2	6.8	96.9
2006	1553	92.9	7.1	97.2
2007	1731	93.8	6.2	97.2
2008	1726	94.6	5.4	97.4
2009	1831	93.7	6.3	97.4
2010	1911	93.7	6.3	97.1
2011	1944	94.3	5.7	96.8
2012	1900	93.4	6.6	96.7
2013	1943	93.9	6.1	96.7
2014	1908	93.3	6.7	96.2
2015	1989	92.9	7.1	95.6
2016	1901	91.8	8.2	95.4
2017	1801	89.7	10.3	95.0
2018	1279	74.0	26.0	91.8
2019	923	76.1	23.9	91.0
1998–2019	33855	91.5	8.5	96.7

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	584	69.1	68.4	71.4	69.8
1999	615	69.0	69.1	68.6	69.3
2000	664	68.3	68.0	72.3	68.4
2001	671	68.8	68.3	71.1	69.3
2002	945	69.0	68.5	74.4	68.8
2003	1020	68.8	68.5	72.1	68.9
2004	1010	69.6	69.5	73.0	69.7
2005	998	69.8	69.5	74.9	69.9
2006	1065	69.8	69.6	73.0	69.8
2007	1161	70.1	69.7	74.5	70.1
2008	1145	70.1	69.5	75.6	69.8
2009	1216	70.6	70.4	74.3	70.4
2010	1228	70.9	70.5	75.5	70.8
2011	1240	71.1	70.8	74.6	70.9
2012	1188	71.3	70.6	78.9	71.1
2013	1211	72.3	72.2	76.5	72.3
2014	1173	72.7	72.4	76.1	72.6
2015	1235	72.6	72.1	77.5	72.3
2016	1123	73.7	73.3	76.8	73.6
2017	1112	73.9	73.3	77.5	73.5
2018	795	72.9	71.1	76.0	73.0
2019	547	74.3	72.2	76.5	73.7
1998-2019	21946	71.1	70.6	75.2	70.9

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	269	69.1	68.7	75.0	70.3
1999	281	72.3	72.3	77.5	72.3
2000	315	70.3	69.7	78.1	70.4
2001	297	71.6	70.8	76.0	71.6
2002	408	70.8	70.1	76.7	70.8
2003	436	71.1	70.8	73.6	71.0
2004	505	71.9	70.9	80.3	71.5
2005	497	68.9	68.5	79.9	68.8
2006	488	70.6	69.9	78.5	70.0
2007	570	70.4	69.9	76.2	70.1
2008	581	70.1	69.6	79.8	69.9
2009	615	69.7	69.2	81.7	69.6
2010	683	70.2	70.0	78.3	70.2
2011	704	69.8	69.5	76.3	69.7
2012	712	71.2	70.9	79.6	71.1
2013	732	71.9	71.3	81.9	71.6
2014	735	71.9	71.3	82.5	71.5
2015	754	72.1	71.8	77.2	71.9
2016	778	72.0	71.5	76.3	71.5
2017	689	71.9	71.3	76.4	71.5
2018	484	72.3	70.7	76.6	73.2
2019	376	71.0	70.1	74.1	69.9
1998-2019	11909	71.0	70.5	77.5	70.8

By 2018, Bavarians' life expectancy at birth is estimated at 79.3 years for boys and 83.8 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	482	43.5	0.71	26.1	0.71	39.4	0.71	51.6	0.73
1999	544	48.6	0.73	28.7	0.71	43.6	0.73	57.6	0.77
2000	600	52.7	0.81	30.9	0.80	46.6	0.81	60.8	0.83
2001	587	50.7	0.77	29.6	0.75	44.4	0.77	57.9	0.80
2002	869	46.6	0.74	26.1	0.73	39.0	0.73	50.9	0.74
2003	950	50.7	0.81	28.1	0.80	41.8	0.81	54.0	0.82
2004	962	51.1	0.84	27.5	0.83	41.4	0.84	53.9	0.85
2005	918	48.5	0.80	25.2	0.77	37.9	0.78	49.9	0.80
2006	988	51.6	0.83	26.5	0.80	40.0	0.82	52.4	0.84
2007	1086	49.0	0.78	24.9	0.76	37.6	0.77	49.7	0.78
2008	1076	48.3	0.76	24.6	0.75	36.9	0.76	48.1	0.77
2009	1133	50.8	0.81	25.1	0.77	37.7	0.79	49.3	0.81
2010	1139	50.5	0.81	24.9	0.79	37.1	0.80	48.2	0.82
2011	1162	51.9	0.83	25.0	0.80	37.5	0.81	48.8	0.83
2012	1096	48.3	0.79	23.4	0.78	34.6	0.78	44.8	0.79
2013	1133	49.2	0.81	23.0	0.77	34.5	0.79	45.3	0.81
2014	1086	46.6	0.80	21.5	0.79	32.3	0.79	42.0	0.80
2015	1130	47.5	0.79	22.0	0.77	33.1	0.78	43.1	0.79
2016	1014	42.2	0.78	19.0	0.73	28.9	0.75	37.9	0.78
2017	992	41.1	0.84	18.2	0.79	27.6	0.81	36.4	0.84
2018	569	23.4	0.64	10.8	0.60	16.2	0.62	20.6	0.63
2019	402	16.5	0.60	7.4	0.58	11.1	0.58	14.6	0.60
1998-2019	19918	45.2	0.78	22.4	0.76	33.6	0.77	43.6	0.79

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	234	19.9	0.69	9.7	0.68	14.1	0.69	17.1	0.67
1999	250	21.1	0.76	9.8	0.71	14.4	0.73	18.5	0.75
2000	287	23.9	0.82	11.9	0.80	17.1	0.80	21.3	0.82
2001	267	21.9	0.79	10.4	0.75	15.2	0.76	19.2	0.77
2002	379	19.4	0.68	9.2	0.66	13.5	0.67	16.6	0.67
2003	410	20.8	0.67	9.8	0.63	14.4	0.65	17.8	0.67
2004	476	24.1	0.78	11.0	0.74	16.1	0.75	20.5	0.77
2005	476	23.9	0.79	11.2	0.77	16.4	0.77	20.2	0.79
2006	455	22.6	0.75	10.4	0.72	15.1	0.72	18.8	0.74
2007	538	23.3	0.72	10.9	0.68	15.9	0.69	19.6	0.70
2008	557	24.0	0.72	11.0	0.67	16.1	0.69	19.9	0.71
2009	582	25.0	0.71	11.7	0.71	16.9	0.72	20.6	0.71
2010	652	27.9	0.78	12.6	0.74	18.1	0.75	22.5	0.76
2011	671	28.7	0.77	13.0	0.75	18.8	0.76	23.3	0.76
2012	679	28.8	0.76	12.6	0.72	18.3	0.73	22.8	0.75
2013	692	29.0	0.78	12.4	0.72	18.1	0.73	22.4	0.76
2014	694	28.8	0.74	12.4	0.68	18.1	0.70	22.5	0.72
2015	717	29.5	0.78	12.4	0.74	18.2	0.75	23.0	0.77
2016	733	29.9	0.80	12.6	0.74	18.5	0.76	23.2	0.78
2017	625	25.4	0.73	10.8	0.71	15.8	0.71	19.8	0.73
2018	380	15.3	0.58	6.8	0.54	9.8	0.55	12.1	0.56
2019	303	12.2	0.54	5.4	0.52	7.8	0.52	9.7	0.54
1998-2019	11057	24.1	0.74	10.8	0.70	15.7	0.71	19.6	0.73

Table 12

Age distribution of age at death (cancer-related) for period 2007-2019
(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	2	0.0	0.0	2	0.0	0.0			0.0
25-29	3	0.0	0.0	3	0.0	0.1			0.0
30-34	12	0.1	0.1	6	0.0	0.1	6	0.1	0.1
35-39	58	0.3	0.4	28	0.2	0.3	30	0.4	0.5
40-44	161	0.8	1.1	91	0.7	1.0	70	0.9	1.4
45-49	495	2.4	3.5	283	2.2	3.2	212	2.7	4.1
50-54	1035	5.0	8.5	596	4.6	7.8	439	5.6	9.7
55-59	1717	8.2	16.7	1042	8.0	15.8	675	8.6	18.3
60-64	2561	12.3	29.0	1576	12.1	27.9	985	12.6	30.9
65-69	3500	16.8	45.8	2181	16.8	44.6	1319	16.9	47.8
70-74	3843	18.4	64.2	2510	19.3	63.9	1333	17.0	64.8
75-79	3454	16.6	80.8	2268	17.4	81.3	1186	15.2	80.0
80-84	2458	11.8	92.6	1582	12.2	93.5	876	11.2	91.2
85+	1540	7.4	100.0	848	6.5	100.0	692	8.8	100.0
All ages	20841	100.0		13018	100.0		7823	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007–2019
(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	1.00			5.3	
5– 9								
10–14								
15–19	1		0.1	0.50			2.1	
20–24	2		0.1	0.50			3.0	
25–29	3		0.1	0.27			3.5	
30–34	6	6	0.3	0.25	0.3	0.21	4.7	3.8
35–39	28	30	1.3	0.51	1.4	0.60	11.5	8.2
40–44	91	70	3.9	0.71	3.1	0.51	15.9	8.7
45–49	283	212	11.3	0.65	8.7	0.59	21.1	13.4
50–54	596	439	25.4	0.68	19.0	0.61	23.7	17.9
55–59	1042	675	53.6	0.69	33.8	0.65	25.3	19.1
60–64	1576	985	96.6	0.72	56.1	0.68	26.4	21.4
65–69	2181	1319	143.4	0.75	78.3	0.73	25.4	20.3
70–74	2510	1333	179.1	0.80	83.0	0.77	22.6	16.3
75–79	2268	1186	204.9	0.84	86.1	0.79	19.8	13.2
80–84	1582	876	241.0	0.93	90.0	0.85	16.8	10.3
85+	848	692	198.9	0.90	71.7	0.88	10.3	6.3
All ages	13018	7823					20.4	13.8
Mortality								
Raw			43.2	0.78	25.2	0.73		
WS			20.5	0.76	11.0	0.69		
ES			30.6	0.77	16.1	0.70		
BRD-S			39.9	0.78	20.0	0.72		
PYLL-70								
per 100,000			192.4		132.5			
ES			163.7		108.7			
AYLL-70			8.8		9.3			

Table 14a

Further malignancies in deaths in period 1998–2019
MALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C00 Lip	27	0.5	22	81.5	1	3.7	4	14.8
C03–C06 Oral cavity	205	3.7	161	78.5	24	11.7	20	9.8
C07–C08 Salivary gland	14	0.3	13	92.9	1	7.1		
C09–C10 Oropharynx	190	3.4	132	69.5	21	11.1	37	19.5
C12–C13 Hypopharynx	105	1.9	71	67.6	18	17.1	16	15.2
C15 Oesophagus	108	1.9	42	38.9	30	27.8	36	33.3
C16 Stomach	195	3.5	104	53.3	36	18.5	55	28.2
C17 Small intestine	24	0.4	9	37.5	6	25.0	9	37.5
C18 Colon	432	7.8	298	69.0	61	14.1	73	16.9
C19–C20 Rectum	230	4.2	165	71.7	34	14.8	31	13.5
C21 Anus/canal	19	0.3	15	78.9	3	15.8	1	5.3
C22 Liver	87	1.6	28	32.2	24	27.6	35	40.2
C23–C24 Bile	20	0.4	8	40.0	4	20.0	8	40.0
C25 Pancreas	92	1.7	19	20.7	20	21.7	53	57.6
C30–C31 Sinuses	21	0.4	19	90.5			2	9.5
C32 Larynx	263	4.7	193	73.4	30	11.4	40	15.2
C33–C34 Lung	310	5.6			88	28.4	222	71.6
C43 Malign. melanoma	171	3.1	143	83.6	11	6.4	17	9.9
C44 Skin others	494	8.9	345	69.8	48	9.7	101	20.4
C46,C49 Soft tissue	25	0.5	17	68.0	3	12.0	5	20.0
C50 Breast	18	0.3	11	61.1	4	22.2	3	16.7
C61 Prostate	1180	21.3	966	81.9	80	6.8	134	11.4
C62 Testis	64	1.2	58	90.6	2	3.1	4	6.3
C64 Kidney	231	4.2	163	70.6	32	13.9	36	15.6
C65 Renal pelvis	27	0.5	16	59.3			11	40.7
C67 Bladder	375	6.8	287	76.5	26	6.9	62	16.5
C69 Eye melanoma	14	0.3	13	92.9			1	7.1
C70–C72 CNS cancer	27	0.5	12	44.4	4	14.8	11	40.7
C73 Thyroid	37	0.7	30	81.1	3	8.1	4	10.8
C76–C79 CUP	80	1.4	47	58.8	20	25.0	13	16.3
C81 Hodgkin lymphoma	60	1.1	58	96.7	2	3.3		
C82–C85 NHL	235	4.2	165	70.2	34	14.5	36	15.3
C90 Mult. myeloma	29	0.5	18	62.1	4	13.8	7	24.1
C91–C96 Leukaemia	43	0.8	16	37.2	6	14.0	21	48.8
Others, specified	90	1.6	54	60.0	13	14.4	23	25.6
All further malignancies	5542	100.0	3718	67.1	693	12.5	1131	20.4

Further malignancies with number of cases 1 to 13 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 1998-2019
FEMALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C03-C06 Oral cavity	54	2.0	48	88.9	4	7.4	2	3.7
C07-C08 Salivary gland	10	0.4	9	90.0	1	10.0		
C09-C10 Oropharynx	46	1.7	37	80.4	2	4.3	7	15.2
C12-C13 Hypopharynx	11	0.4	10	90.9	1	9.1		
C15 Oesophagus	25	0.9	15	60.0	2	8.0	8	32.0
C16 Stomach	52	1.9	24	46.2	13	25.0	15	28.8
C17 Small intestine	12	0.4	6	50.0	3	25.0	3	25.0
C18 Colon	195	7.2	140	71.8	19	9.7	36	18.5
C19-C20 Rectum	75	2.8	59	78.7	6	8.0	10	13.3
C21 Anus/canal	30	1.1	24	80.0	3	10.0	3	10.0
C22 Liver	18	0.7	7	38.9	2	11.1	9	50.0
C23-C24 Bile	15	0.6	9	60.0	2	13.3	4	26.7
C25 Pancreas	64	2.4	15	23.4	18	28.1	31	48.4
C32 Larynx	27	1.0	20	74.1	2	7.4	5	18.5
C33-C34 Lung	133	4.9			29	21.8	104	78.2
C43 Malign. melanoma	77	2.8	71	92.2	2	2.6	4	5.2
C44 Skin others	128	4.7	84	65.6	8	6.3	36	28.1
C46,C49 Soft tissue	9	0.3	5	55.6	2	22.2	2	22.2
C50 Breast	848	31.3	709	83.6	60	7.1	79	9.3
C51 Vulva	29	1.1	21	72.4	3	10.3	5	17.2
C53 Cervix uteri	136	5.0	118	86.8	9	6.6	9	6.6
C54 Corpus uteri	151	5.6	138	91.4	3	2.0	10	6.6
C55,C57 Fem. genitals un	16	0.6	15	93.8	1	6.3		
C56 Ovary	69	2.5	49	71.0	7	10.1	13	18.8
C64 Kidney	76	2.8	53	69.7	12	15.8	11	14.5
C65 Renal pelvis	15	0.6	8	53.3	1	6.7	6	40.0
C67 Bladder	71	2.6	52	73.2	9	12.7	10	14.1
C69 Eye melanoma	9	0.3	6	66.7	1	11.1	2	22.2
C70-C72 CNS cancer	10	0.4	3	30.0			7	70.0
C73 Thyroid	59	2.2	42	71.2	10	16.9	7	11.9
C76-C79 CUP	48	1.8	25	52.1	9	18.8	14	29.2
C81 Hodgkin lymphoma	22	0.8	22	100.0				
C82-C85 NHL	94	3.5	79	84.0	6	6.4	9	9.6
C90 Mult. myeloma	14	0.5	6	42.9	3	21.4	5	35.7
C91-C96 Leukaemia	19	0.7	7	36.8	5	26.3	7	36.8
Others, specified	45	1.7	23	51.1	10	22.2	12	26.7
All further malignancies	2712	100.0	1959	72.2	268	9.9	485	17.9

Further malignancies with number of cases 1 to 7 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 2007-2019
(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	1.00			5.3	
5- 9								
10-14								
15-19	1		0.1	1.00			2.2	
20-24	1		0.1	0.33			1.7	
25-29	3		0.1	0.27			3.9	
30-34	6	6	0.3	0.29	0.3	0.21	4.8	4.3
35-39	25	24	1.2	0.49	1.1	0.53	11.0	7.3
40-44	83	62	3.5	0.70	2.7	0.51	15.7	8.8
45-49	263	174	10.5	0.68	7.2	0.58	21.5	12.9
50-54	528	374	22.5	0.69	16.2	0.61	23.8	18.0
55-59	901	579	46.3	0.70	29.0	0.67	25.1	19.5
60-64	1309	821	80.3	0.73	46.8	0.70	26.2	21.7
65-69	1743	1035	114.6	0.78	61.4	0.75	25.3	20.1
70-74	1888	1000	134.7	0.82	62.3	0.77	22.2	15.8
75-79	1616	901	146.0	0.86	65.4	0.80	19.3	13.0
80-84	1060	647	161.5	0.97	66.5	0.86	15.7	9.8
85+	546	533	128.0	0.88	55.2	0.89	9.2	6.1
All ages	9974	6156					20.1	13.6
Mortality								
Raw			33.1	0.79	19.8	0.74		
WS			16.2	0.76	8.9	0.70		
ES			23.9	0.77	12.9	0.71		
BRD-S			30.5	0.79	15.8	0.73		
PYLL-70								
per 100,000			166.6		111.3			
ES			141.8		91.5			
AYLL-70			9.1		9.5			

* See corresponding tables with multiple malignancies.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2019
(**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	1.00			5.3	
5- 9								
10-14								
15-19	1		0.1	1.00			2.2	
20-24								
25-29	3		0.1	0.27			3.9	
30-34	6	6	0.3	0.29	0.3	0.21	4.9	4.4
35-39	25	24	1.2	0.50	1.1	0.55	11.1	7.4
40-44	83	61	3.5	0.71	2.7	0.53	15.8	8.8
45-49	259	170	10.3	0.69	7.0	0.58	21.4	12.7
50-54	517	367	22.1	0.70	15.9	0.61	23.7	18.0
55-59	886	563	45.6	0.71	28.2	0.68	25.0	19.3
60-64	1259	805	77.2	0.73	45.9	0.71	25.7	21.8
65-69	1674	994	110.1	0.79	59.0	0.75	25.0	19.8
70-74	1803	963	128.7	0.82	60.0	0.77	22.0	15.7
75-79	1499	866	135.4	0.83	62.9	0.80	18.8	13.0
80-84	990	623	150.8	0.93	64.0	0.85	15.7	9.9
85+	507	509	118.9	0.83	52.7	0.85	9.3	6.1
All ages	9513	5951					20.0	13.6
Mortality								
Raw			31.6	0.79	19.1	0.74		
WS			15.5	0.77	8.6	0.70		
ES			22.9	0.77	12.5	0.71		
BRD-S			29.0	0.79	15.3	0.73		
PYLL-70								
per 100,000			162.6		108.8			
ES			138.3		89.5			
AYLL-70			9.2		9.5			

* See corresponding tables with multiple malignancies.

ICD-10 C33, C34: Malignant neoplasm of lung and trachea
 Age distribution and age-specific mortality 2007 - 2019 (Males: 13018, Females: 7823)

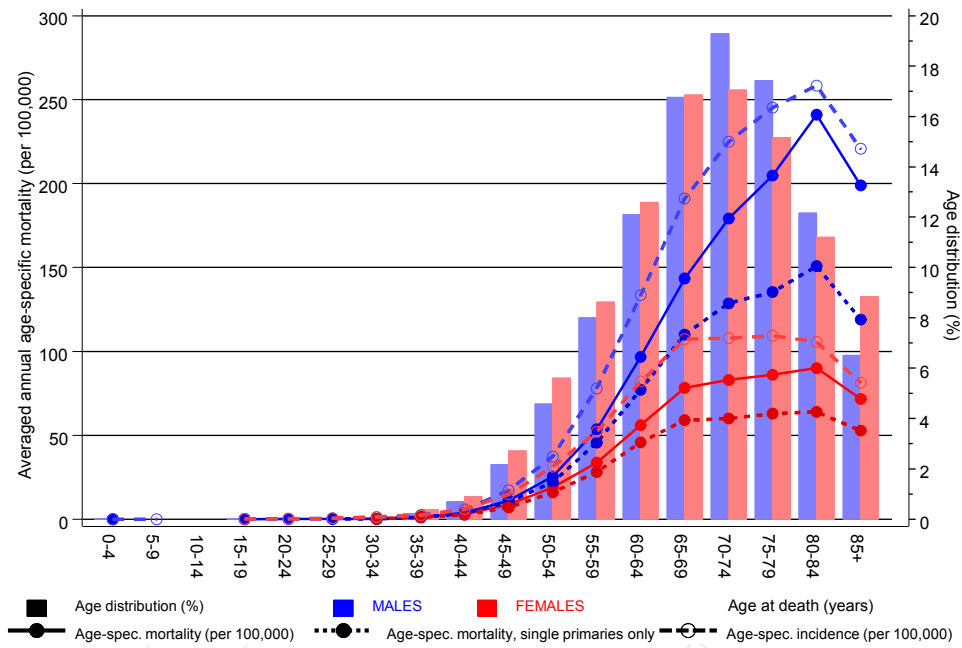
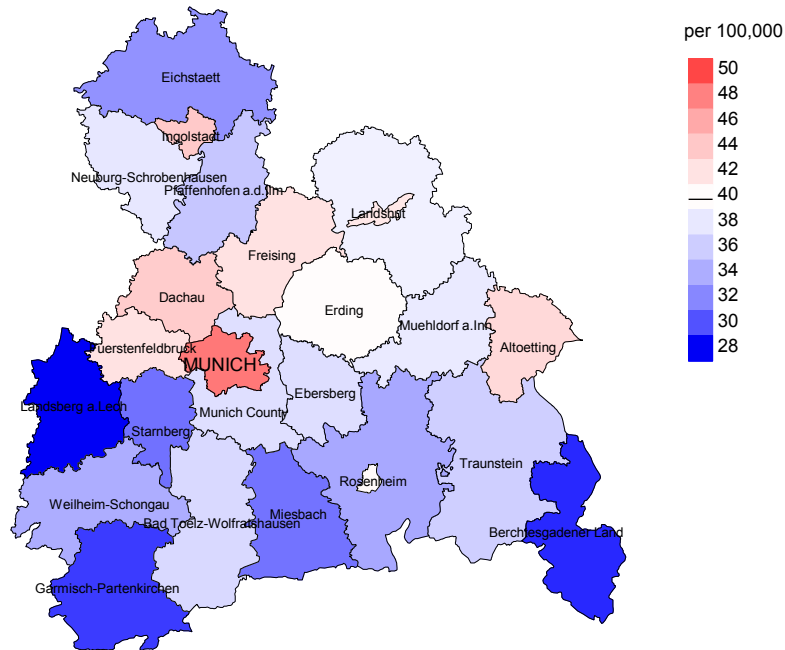


Figure 17. Distribution of age at death (bars; males: mean=69.2 yrs, median=69.9 yrs; females: mean=68.8 yrs, median=69.1 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

Average mortality (Germany 1987 standard population) 2007 - 2019: Males



Average mortality (Germany 1987 standard population) 2007 - 2019: Females

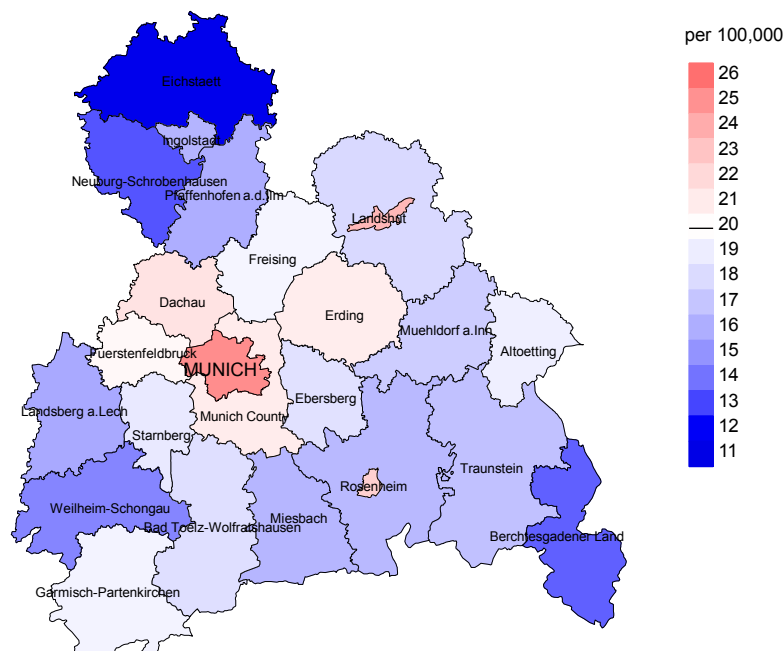
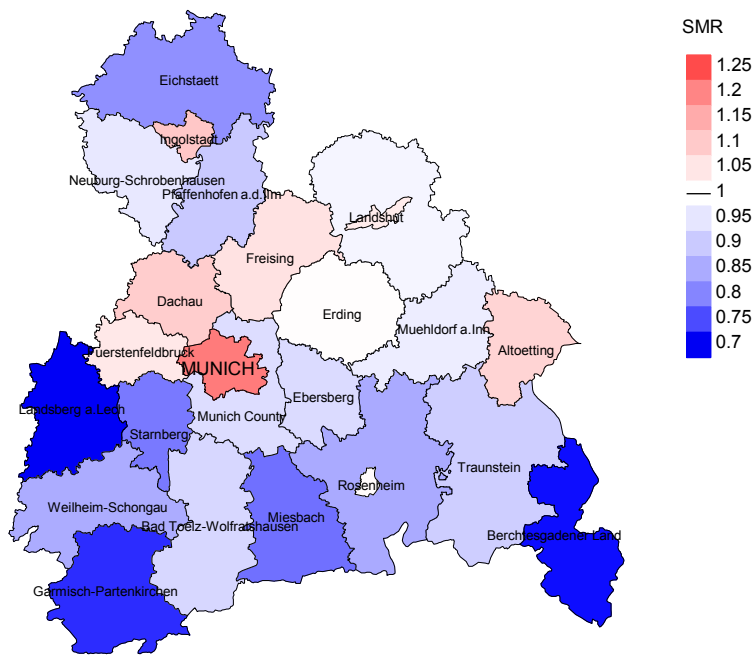


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2019. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 39.9/100,000 WS N=13,018, females 20.0/100,000 WS N=7,823).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,462 female residents (averaged) in the period from 2007 to 2019 a total of 198 women died from lung cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 18.4/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 15.2 and 22.1/100,000.

Standardized mortality ratio (SMR) 2007 - 2019: Males



Standardized mortality ratio (SMR) 2007 - 2019: Females

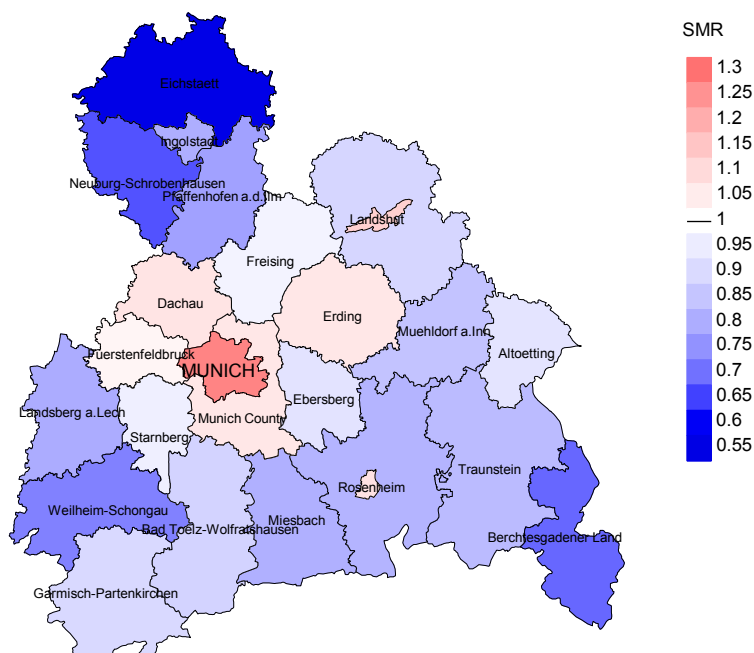


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=13,018, females N=7,823).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2019 a total of 198 women died from lung cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.93. Though, the value of this parameter may vary with an underlying probability of 99% between 0.77 and 1.11, 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 ratio of mortality and incidence (mortality-to-incidence ratio, **MIR, MI-Index**) is a statistical index 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 MIR. 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 (FRG) 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 of mortality to incidence, MIR
FRG	Federal Republic of Germany

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