

Munich Cancer Registry



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ICD-10 C34: Lung cancer

Incidence and Mortality

Year of diagnosis	1998-2019
Patients	40,076
Diseases	40,505
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/bC34__E-ICD-10-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 2016) used for specifying cancer site

Code	Description
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	1018	191	18.8	11.6	4.8	95.5	99.2
1999	1072	190	17.7	12.6	4.8	94.8	99.0
2000	1098	254	23.1	13.1	4.7	94.4	99.1
2001	1105	234	21.2	13.7	4.7	94.8	98.9
2002	1736	387	22.3	14.4	4.6	95.0	98.8 #
2003	1778	341	19.2	14.9	4.5	94.5	99.2
2004	1755	327	18.6	15.3	4.5	94.4	99.0
2005	1755	295	16.8	15.9	4.4	94.1	98.6
2006	1796	295	16.4	16.3	4.4	92.2	98.3
2007	2161	313	14.5	16.5	4.4	91.2	98.0 #
2008	2190	261	11.9	16.9	4.3	90.0	99.3
2009	2224	283	12.7	17.3	4.2	90.2	98.7
2010	2250	268	11.9	17.6	4.0	90.4	99.0
2011	2293	260	11.3	18.0	3.8	89.1	99.3
2012	2280	251	11.0	18.4	3.6	87.1	99.3
2013	2288	259	11.3	18.7	3.4	86.2	99.0
2014	2298	261	11.4	19.0	3.2	82.4	98.3
2015	2356	309	13.1	19.3	2.8	80.7	98.2
2016	2225	297	13.3	19.5	2.6	76.6	99.9
2017	2038	292	14.3	19.8	2.3	69.7	99.8
2018	1557	48	3.1	20.1	2.0	49.6	99.8
2019	1232	22	1.8	20.3	2.1	36.1	83.0 ##
1998-2019	40505	5638	13.9	20.3	4.8	85.1	98.5

40,505 cases diagnosed 1998-2019 are related to a total of 40,076 patients. Currently, in 9,767 (24.4 %) of these 40,076 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 7,666 / 1,631 / 470 (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 2,038 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	680	66.8	125	18.4	11.5	5.0	96.0	99.4
1999	744	69.4	136	18.3	12.1	5.0	94.9	98.9
2000	746	67.9	158	21.2	12.8	5.0	94.9	99.1
2001	766	69.3	156	20.4	13.7	4.9	94.8	98.6
2002	1176	67.7	252	21.4	14.5	4.9	96.1	99.1 #
2003	1168	65.7	229	19.6	15.0	4.7	95.0	99.4
2004	1142	65.1	192	16.8	15.3	4.7	95.2	99.2
2005	1155	65.8	172	14.9	15.9	4.7	94.6	98.6
2006	1189	66.2	178	15.0	16.3	4.6	92.3	98.1
2007	1405	65.0	198	14.1	16.7	4.6	92.0	97.8 #
2008	1415	64.6	160	11.3	17.1	4.6	91.4	99.3
2009	1406	63.2	168	11.9	17.5	4.4	91.2	98.8
2010	1409	62.6	148	10.5	17.7	4.3	91.6	98.9
2011	1416	61.8	145	10.2	18.3	4.1	90.7	99.4
2012	1388	60.9	148	10.7	18.7	4.0	88.8	99.4
2013	1411	61.7	154	10.9	19.1	3.7	87.6	99.2
2014	1357	59.1	147	10.8	19.5	3.4	84.1	98.6
2015	1440	61.1	197	13.7	19.7	3.0	82.3	98.5
2016	1308	58.8	184	14.1	20.0	2.7	79.7	99.9
2017	1185	58.1	168	14.2	20.2	2.2	73.0	99.7
2018	896	57.5	29	3.2	20.6	1.9	52.0	99.8
2019	671	54.5	9	1.3	20.8	1.7	38.5	83.6 ##
1998–2019	25473	62.9	3453	13.6	20.8	5.0	87.1	98.6

25,473 cases diagnosed 1998-2019 are related to a total of 25,186 patients. Currently, in 6,317 (25.1 %) of these 25,186 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 4,957 / 1,051 / 309 (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 1,185 cases has been diagnosed, of which 20.2 % 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	328	30.6	54	16.5	13.8	4.4	94.5	99.1
2000	352	32.1	96	27.3	13.8	4.3	93.2	99.1
2001	339	30.7	78	23.0	13.7	4.3	94.7	99.7
2002	560	32.3	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	613	34.9	135	22.0	15.4	4.1	92.8	98.5
2005	600	34.2	123	20.5	15.7	4.1	93.0	98.5
2006	607	33.8	117	19.3	16.1	4.1	92.1	98.5
2007	756	35.0	115	15.2	16.0	4.0	89.7	98.3 #
2008	775	35.4	101	13.0	16.4	3.9	87.2	99.2
2009	818	36.8	115	14.1	16.9	3.8	88.5	98.7
2010	841	37.4	120	14.3	17.4	3.6	88.5	99.2
2011	877	38.2	115	13.1	17.6	3.3	86.4	99.1
2012	892	39.1	103	11.5	17.9	3.1	84.5	99.0
2013	877	38.3	105	12.0	17.9	3.0	84.0	98.5
2014	941	40.9	114	12.1	18.1	2.9	79.9	98.0
2015	916	38.9	112	12.2	18.5	2.6	78.2	97.7
2016	917	41.2	113	12.3	18.8	2.4	72.2	99.9
2017	853	41.9	124	14.5	19.1	2.4	65.1	99.8
2018	661	42.5	19	2.9	19.4	2.2	46.3	99.8
2019	561	45.5	13	2.3	19.5	2.6	33.3	82.2 ##
1998–2019	15032	37.1	2185	14.5	19.5	4.4	81.8	98.2

15,032 cases diagnosed 1998-2019 are related to a total of 14,890 patients. Currently, in 3,450 (23.2 %) of these 14,890 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 2,709 / 580 / 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 19.1 % 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	680	338	61.4	28.7	37.0	14.3	55.2	20.6	70.9	25.3
1999	744	328	66.5	27.6	40.4	13.7	59.4	19.9	74.4	24.6
2000	746	352	65.5	29.3	38.9	14.9	57.8	21.3	73.7	26.0
2001	766	339	66.1	27.9	39.8	13.9	58.1	20.1	72.6	24.8
2002	1176	560	63.1	28.6	35.6	13.9	53.3	20.3	69.1	24.8
2003	1168	610	62.3	31.0	34.9	15.4	51.9	22.1	65.9	26.6
2004	1142	613	60.7	31.0	33.0	14.8	49.3	21.4	63.4	26.5
2005	1155	600	61.0	30.2	32.8	14.6	48.5	21.2	62.1	25.7
2006	1189	607	62.1	30.2	33.0	14.4	48.8	20.8	62.2	25.3
2007	1405	756	63.4	32.7	33.1	16.2	49.3	23.2	64.1	28.1
2008	1415	775	63.6	33.4	33.0	16.4	49.0	23.5	62.4	28.2
2009	1406	818	63.0	35.2	32.4	16.5	48.0	23.7	60.8	29.0
2010	1409	841	62.5	35.9	31.8	17.1	46.7	24.5	59.0	29.7
2011	1416	877	63.3	37.5	31.5	17.3	46.4	24.9	58.9	30.5
2012	1388	892	61.1	37.8	30.1	17.4	44.4	25.2	56.8	30.5
2013	1411	877	61.3	36.8	29.9	17.2	44.1	24.6	56.0	29.5
2014	1357	941	58.2	39.1	27.4	18.2	40.8	25.9	52.6	31.4
2015	1440	916	60.5	37.6	28.9	16.9	43.0	24.5	54.8	29.9
2016	1308	917	54.4	37.3	26.1	16.9	38.7	24.4	49.1	29.7
2017	1185	853	49.1	34.6	23.1	15.3	34.2	22.2	43.8	27.3
2018	896	661	36.8	26.6	17.9	12.8	26.2	18.0	32.9	21.8
2019	671	561	27.6	22.6	12.8	10.4	19.1	14.9	24.5	18.1
1998-2019	25473	15032	57.8	32.8	29.6	15.4	43.7	22.2	55.4	27.0

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	1018	67.1	11.3	28.1	93.1	52.5	58.7	67.5	75.6	81.6
1999	1072	67.1	11.3	24.9	96.3	52.7	59.0	67.3	75.0	82.3
2000	1098	67.3	11.7	15.8	96.0	52.0	59.2	67.5	75.8	81.8
2001	1105	67.0	11.2	17.0	96.4	52.3	59.7	67.1	74.9	81.0
2002	1736	68.1	11.5	27.5	99.5	53.0	60.5	68.5	76.6	82.0
2003	1778	67.9	11.2	17.5	97.6	53.4	60.5	68.3	75.8	82.3
2004	1755	68.4	11.1	24.4	98.0	54.2	61.2	68.3	76.6	82.2
2005	1755	68.2	11.3	18.1	98.5	54.2	61.0	68.4	76.6	82.5
2006	1796	68.4	10.9	27.5	102	54.8	61.4	68.1	76.7	82.4
2007	2161	68.4	11.2	7.5	99.1	53.9	61.3	68.7	76.6	81.9
2008	2190	68.4	10.9	22.3	99.4	54.5	61.3	68.7	76.4	81.9
2009	2224	69.0	11.1	20.3	102	54.3	61.5	69.3	76.9	83.1
2010	2250	68.8	10.8	0.5	97.8	54.6	61.9	69.3	76.3	82.4
2011	2293	69.0	10.9	28.9	97.6	54.3	62.0	69.7	76.6	83.0
2012	2280	69.3	11.0	22.9	96.8	54.6	62.2	69.9	77.0	83.2
2013	2288	69.3	10.8	27.9	100	54.2	62.1	70.1	76.6	82.6
2014	2298	69.6	11.1	15.9	100	54.2	62.5	70.9	77.1	83.3
2015	2356	70.1	10.8	23.7	100	55.1	63.1	71.0	77.5	83.6
2016	2225	69.9	10.8	20.9	102	55.6	62.5	70.6	77.2	83.1
2017	2038	70.0	10.7	24.2	98.4	55.6	62.3	70.8	77.8	82.5
2018	1557	68.9	10.6	18.5	96.4	55.3	62.0	69.9	76.6	81.1
2019	1232	69.5	10.5	19.7	98.8	56.0	62.4	70.3	77.4	81.4
1998-2019	40505	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	680	66.7	10.7	28.1	91.7	53.7	58.9	67.0	74.9	80.3
1999	744	66.6	10.8	24.9	96.3	53.0	59.0	66.9	73.6	80.4
2000	746	67.0	10.8	28.1	94.2	53.3	59.3	66.8	74.7	80.8
2001	766	66.6	10.8	17.0	96.4	52.7	60.2	66.3	73.6	80.2
2002	1176	68.1	10.8	32.2	94.9	53.9	61.1	68.0	76.0	81.6
2003	1168	67.9	10.3	36.8	95.4	54.4	61.1	68.2	75.0	81.3
2004	1142	68.3	10.5	36.9	94.3	54.5	61.5	68.5	76.1	81.5
2005	1155	68.3	10.6	18.1	98.5	55.5	61.9	68.4	75.8	81.6
2006	1189	68.2	10.0	28.7	102	55.2	61.9	68.1	75.8	80.9
2007	1405	68.8	10.5	7.5	97.3	55.2	62.4	69.2	76.6	81.7
2008	1415	68.7	10.3	22.3	99.4	55.6	61.9	69.2	76.3	81.3
2009	1406	69.0	10.6	30.8	100	55.6	61.8	69.2	76.5	82.5
2010	1409	68.8	10.5	0.5	97.5	55.0	62.4	69.5	75.8	81.9
2011	1416	68.9	10.6	28.9	94.3	54.4	62.4	69.9	76.1	82.3
2012	1388	69.5	10.7	22.9	96.6	55.5	63.2	70.3	77.0	82.7
2013	1411	69.6	10.3	27.9	99.7	55.4	62.5	70.6	76.7	82.3
2014	1357	70.4	10.4	30.3	96.0	55.8	63.4	71.6	77.6	83.2
2015	1440	70.3	10.7	29.2	93.8	55.6	63.4	71.3	77.6	83.6
2016	1308	70.2	10.4	25.5	96.7	56.1	62.9	71.4	77.2	83.2
2017	1185	70.2	10.4	28.7	98.4	55.9	62.9	71.3	77.7	82.4
2018	896	69.8	10.1	24.7	96.4	56.5	63.1	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	25473	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	Mean	Std. dev.	Min. Max.		Median				
				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	328	68.2	12.2	32.9	94.8	51.8	59.1	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	339	68.0	12.1	31.5	93.9	50.2	59.2	69.1	77.1	83.6
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	613	68.5	12.1	24.4	98.0	53.1	60.5	68.1	78.3	83.6
2005	600	67.9	12.4	21.6	96.1	52.3	58.8	68.3	77.8	83.8
2006	607	68.7	12.4	27.5	100	53.4	60.1	68.1	78.6	84.7
2007	756	67.7	12.2	22.3	99.1	51.3	59.4	67.9	76.6	82.8
2008	775	67.9	11.9	29.4	97.3	52.4	60.5	67.9	76.5	82.9
2009	818	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	877	69.2	11.4	33.0	97.6	53.5	61.4	69.3	77.6	84.5
2012	892	69.0	11.4	33.3	96.8	53.8	60.8	69.4	76.9	84.0
2013	877	68.7	11.6	30.6	100	53.5	61.3	69.3	76.4	84.2
2014	941	68.4	12.0	15.9	100	51.7	60.9	69.7	76.5	83.3
2015	916	69.7	11.0	23.7	100	54.7	62.8	70.4	77.3	83.6
2016	917	69.4	11.3	20.9	102	54.7	62.3	69.7	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	561	68.5	10.9	19.7	98.8	55.0	61.3	69.2	76.4	81.0
1998-2019	15032	68.6	11.8	15.8	102	53.0	60.6	69.2	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	21	0.1	0.1	10	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	794	2.9	4.6	434	2.6	4.0	360	3.4	5.6
50-54	1593	5.8	10.4	874	5.2	9.2	719	6.7	12.3
55-59	2567	9.4	19.8	1521	9.1	18.3	1046	9.8	22.1
60-64	3634	13.3	33.0	2189	13.1	31.4	1445	13.5	35.6
65-69	4746	17.3	50.4	2928	17.5	48.9	1818	17.0	52.6
70-74	4902	17.9	68.3	3165	18.9	67.9	1737	16.3	68.9
75-79	4242	15.5	83.7	2731	16.3	84.2	1511	14.1	83.0
80-84	2725	9.9	93.7	1697	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	27392	100.0		16707	100.0		10685	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=1852 %	Females DCO rate n=1269 %	Males Prop.all cancers n=143063 %	Females Prop.all cancers n=144724 %
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	10	11	0.5	0.5			1.1	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	431	359	17.2	14.8	1.6	4.2	9.0	4.1
50-54	872	718	37.2	31.1	3.4	2.8	11.1	6.2
55-59	1513	1039	77.8	52.0	4.5	3.7	12.8	8.4
60-64	2172	1434	133.2	81.7	6.2	4.5	13.3	9.9
65-69	2904	1807	191.0	107.3	7.2	5.9	12.8	10.2
70-74	3144	1728	224.4	107.6	8.8	9.5	12.2	9.3
75-79	2712	1504	245.0	109.2	12.2	12.1	12.3	8.3
80-84	1692	1028	257.7	105.6	21.5	26.2	12.0	7.2
85+	941	785	220.7	81.3	45.4	51.6	9.6	5.1
All ages	16606	10638			11.2	11.9	11.6	7.4
Incidence								
Raw			55.1	34.2				
WS			27.0	15.9				
ES			39.9	22.7				
BRD-S			50.7	27.6				

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).

ICD-10 C34: Malignant neoplasm of bronchus and lung
 Age distribution and age-specific incidence 2007 - 2019 (Males: 16606, Females: 10638)

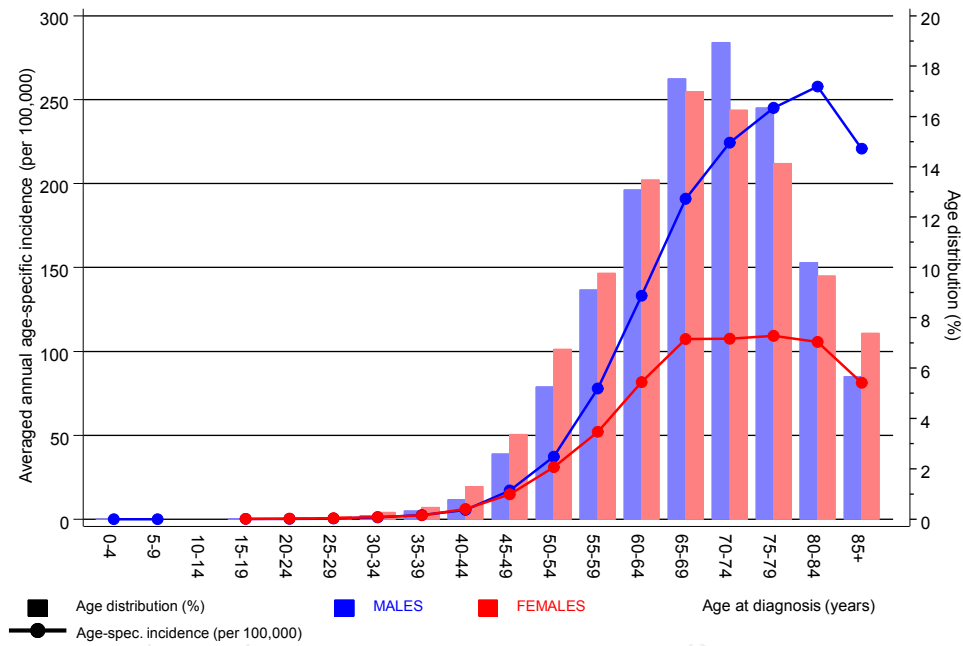


Figure 6. Age distribution (males: mean=69.5 yrs, median=70.3 yrs; females: mean=68.8 yrs, median=69.3 yrs) and age-specific incidence.

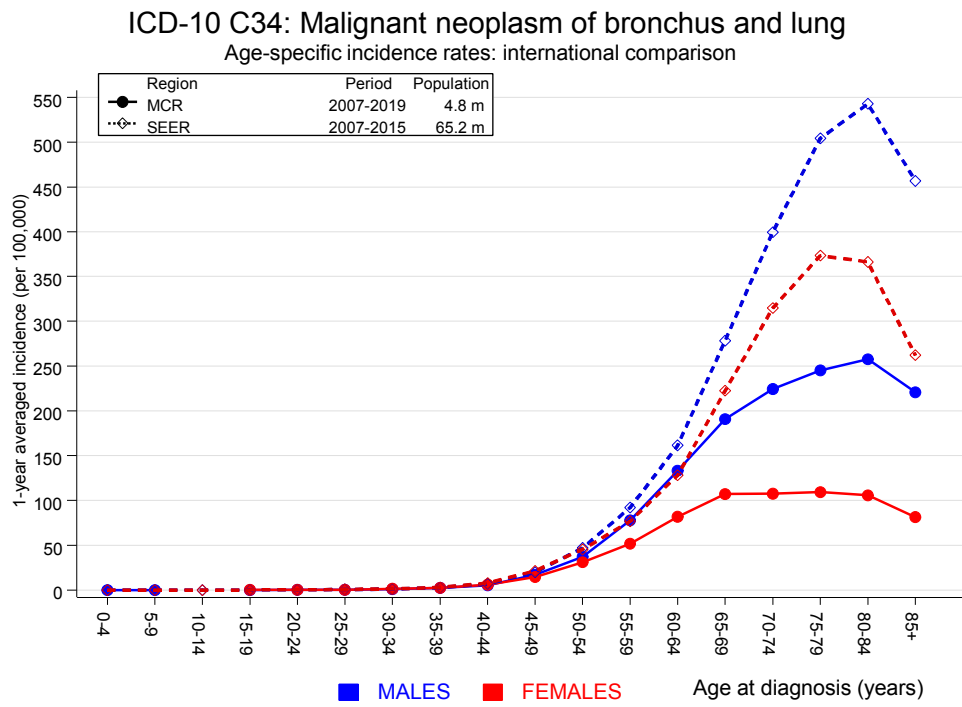


Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

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	57	5.9	9.7	7.4	12.6 #	15.2	5.3
C12–C13 Hypopharynx	18	3.2	5.6	3.3	8.9 #	4.4	5.6
C15 Oesophagus	56	11.0	5.1	3.8	6.6 #	13.4	10.7
C16 Stomach	79	21.3	3.7	2.9	4.6 #	17.1	12.7
C17 Small intestine	14	3.2	4.3	2.4	7.3 #	3.2	7.1
C18 Colon	115	52.3	2.2	1.8	2.6 #	18.6	17.4
C19–C20 Rectum	58	29.6	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 #	14.0	39.7
C26 GI cancer	4	0.5	7.4	2.0	18.9 #	1.0	25.0
C32 Larynx	64	5.7	11.3	8.7	14.4 #	17.3	12.5
C33–C34 Lung	292	66.4	4.4	3.9	4.9 #	67.0	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	24.6 #	1.1	50.0
C43 Malign. melanoma	39	24.0	1.6	1.2	2.2 #	4.5	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	20.2 #	0.8	
C50 Breast	5	1.5	3.4	1.1	7.8 #	1.0	60.0
C60 Penis	2	1.4	1.5	0.2	5.3	0.2	
C61 Prostate	208	159.3	1.3	1.1	1.5 #	14.5	18.8
C62 Testis	2	1.2	1.6	0.2	5.9	0.2	50.0
C64 Kidney	71	19.3	3.7	2.9	4.6 #	15.4	16.9
C65 Renal pelvis	11	2.4	4.6	2.3	8.2 #	2.6	
C67 Bladder	77	24.5	3.1	2.5	3.9 #	15.6	16.9
C68 Urinary org.	5	0.3	15.6	5.1	36.4 #	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	3.2 #	2.7	5.6
C82–C85 NHL	60	22.7	2.6	2.0	3.4 #	11.1	10.0
C90 Mult. myeloma	12	7.1	1.7	0.9	2.9	1.5	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	0.6	25.0
Not observed	0	1.4	0.0	0.0	2.6	-0.4	
All further malignancies	1524	556.2	2.7	2.6	2.9 #	287.5	14.1

Patients	22554
Median age at next malignancy (years)	71.5
Person-years	33661
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

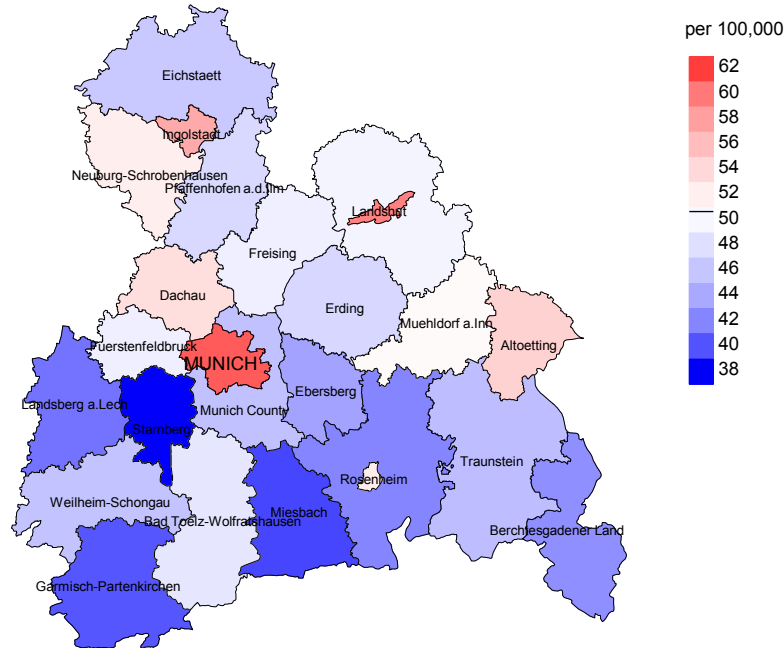
FEMALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C03–C06 Oral cavity	6	1.4	4.4	1.6	9.5 #	2.1	
C09–C10 Oropharynx	9	1.1	8.3	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	6.1	2.6	11.9 #	3.1	12.5
C18 Colon	48	20.6	2.3	1.7	3.1 #	12.6	16.7
C19–C20 Rectum	16	8.8	1.8	1.0	3.0 #	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	10.1	4.2	3.1	5.7 #	15.1	39.5
C32 Larynx	4	0.5	8.8	2.4	22.6 #	1.6	
C33–C34 Lung	142	18.9	7.5	6.3	8.9 #	56.5	1.4
C43 Malign. melanoma	17	8.8	1.9	1.1	3.1 #	3.8	11.8
C46,C49 Soft tissue	4	1.3	3.2	0.9	8.1	1.3	25.0
C50 Breast	166	74.4	2.2	1.9	2.6 #	42.0	17.5
C51 Vulva	13	2.3	5.7	3.0	9.7 #	4.9	7.7
C53 Cervix uteri	15	3.1	4.9	2.8	8.1 #	5.5	13.3
C54 Corpus uteri	20	13.6	1.5	0.9	2.3	2.9	20.0
C56 Ovary	16	9.4	1.7	1.0	2.8	3.0	18.8
C57.9 Fem. urogen.	2	0.0	136.4	16.5	492.7 #	0.9	
C64 Kidney	18	5.3	3.4	2.0	5.3 #	5.8	27.8
C65 Renal pelvis	8	0.7	11.5	5.0	22.7 #	3.4	
C66 Ureter	3	0.4	8.1	1.7	23.7 #	1.2	
C67 Bladder	21	4.1	5.1	3.2	7.9 #	7.8	14.3
C68 Urinary org.	2	0.1	30.4	3.7	109.8 #	0.9	100.0
C70–C72 CNS cancer	6	3.0	2.0	0.7	4.4	1.4	33.3
C73 Thyroid	17	4.0	4.2	2.5	6.8 #	6.0	11.8
C76–C79 CUP	16	3.8	4.2	2.4	6.9 #	5.6	
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	723	233.0	3.1	2.9	3.3 #	225.0	15.4
Patients		13114					
Median age at next malignancy (years)		70.3					
Person-years		21781					
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

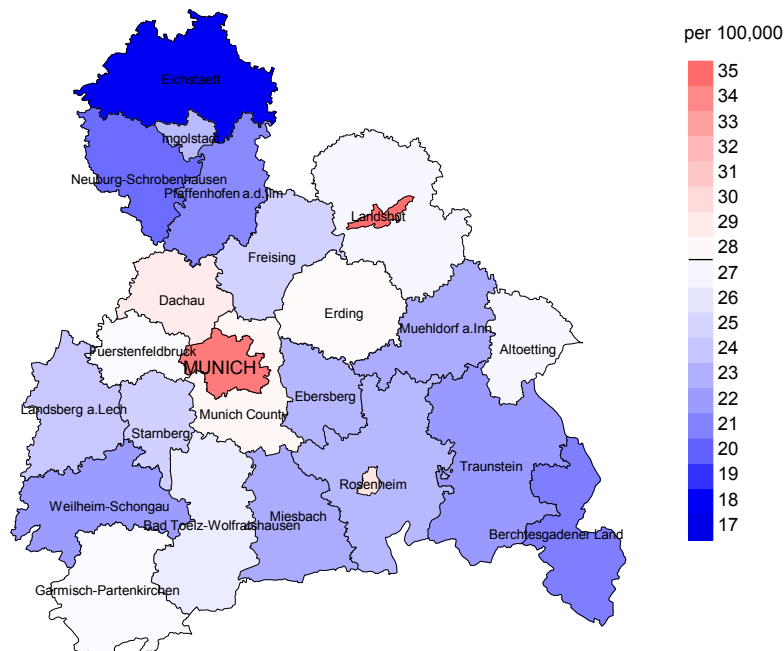
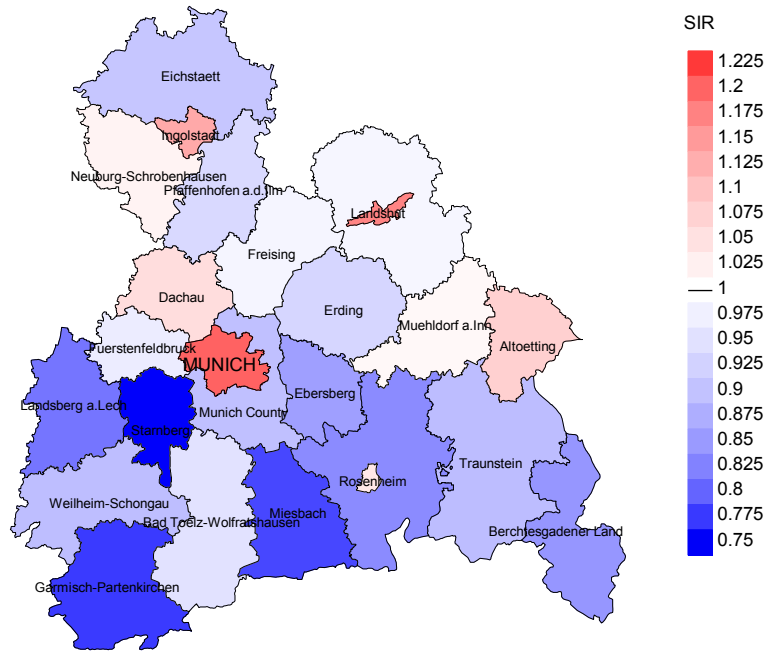


Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 50.7/100,000 WS N=16,606, females 27.6/100,000 WS N=10,638).

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

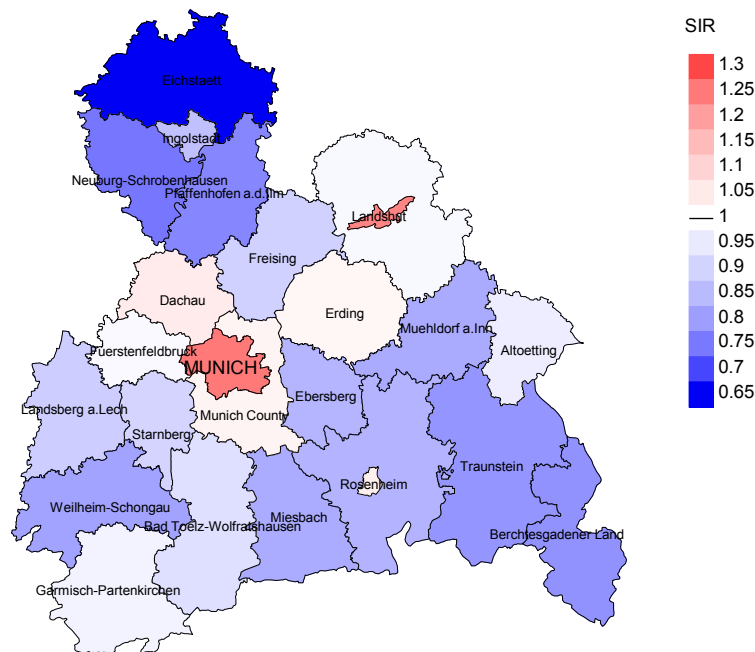


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=16,606, females N=10,638).

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	1018	99.2	18.8	972	95.5	93.4
1999	1072	99.0	17.7	1016	94.8	95.1
2000	1098	99.1	23.1	1036	94.4	95.5
2001	1105	98.9	21.2	1047	94.8	95.1
2002	1736	98.8	22.3	1649	95.0	97.3
2003	1778	99.2	19.2	1680	94.5	97.3
2004	1755	99.0	18.6	1656	94.4	97.5
2005	1755	98.6	16.8	1651	94.1	98.2
2006	1796	98.3	16.4	1656	92.2	98.2
2007	2161	98.0	14.5	1971	91.2	98.0
2008	2190	99.3	11.9	1970	90.0	98.2
2009	2224	98.7	12.7	2006	90.2	98.3
2010	2250	99.0	11.9	2035	90.4	98.0
2011	2293	99.3	11.3	2043	89.1	98.0
2012	2280	99.3	11.0	1987	87.1	96.7
2013	2288	99.0	11.3	1973	86.2	96.2
2014	2298	98.3	11.4	1893	82.4	95.8
2015	2356	98.2	13.1	1901	80.7	94.9
2016	2225	99.9	13.3	1704	76.6	89.6
2017	2038	99.8	14.3	1420	69.7	76.2
2018	1557	99.8	3.1	772	49.6	37.6
2019	1232	83.0	1.8	445	36.1	82.7
1998-2019	40505	98.5	13.9	34483	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	1018	849	92.0	443	43.5
1999	1072	893	94.2	449	41.9
2000	1098	978	95.1	494	45.0
2001	1105	965	94.3	477	43.2
2002	1736	1351	97.6	794	45.7
2003	1778	1454	97.8	804	45.2
2004	1755	1512	97.8	768	43.8
2005	1755	1491	97.9	784	44.7
2006	1796	1550	98.1	755	42.0
2007	2161	1729	98.5	890	41.2
2008	2190	1722	98.8	840	38.4
2009	2224	1827	99.1	862	38.8
2010	2250	1909	98.8	920	40.9
2011	2293	1943	99.0	952	41.5
2012	2280	1898	98.1	879	38.6
2013	2288	1938	98.1	916	40.0
2014	2298	1903	98.6	868	37.8
2015	2356	1985	98.7	909	38.6
2016	2225	1898	98.7	854	38.4
2017	2038	1796	97.6	800	39.3
2018	1557	1277	31.2	399	25.6
2019	1232	918	50.7	254	20.6
1998–2019	40505	33786	94.0	16111	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	849	84.0	16.0	97.6
1999	893	88.6	11.4	97.4
2000	978	90.6	9.4	98.3
2001	965	88.1	11.9	96.7
2002	1351	92.2	7.8	97.2
2003	1454	93.5	6.5	97.6
2004	1512	94.9	5.1	98.0
2005	1491	93.2	6.8	96.8
2006	1550	92.9	7.1	97.2
2007	1729	93.8	6.2	97.2
2008	1722	94.6	5.4	97.4
2009	1827	93.7	6.3	97.4
2010	1909	93.7	6.3	97.1
2011	1943	94.3	5.7	96.8
2012	1898	93.4	6.6	96.7
2013	1938	93.9	6.1	96.7
2014	1903	93.3	6.7	96.2
2015	1985	92.8	7.2	95.6
2016	1898	91.8	8.2	95.4
2017	1796	89.8	10.2	95.0
2018	1277	73.9	26.1	91.7
2019	918	76.0	24.0	91.0
1998–2019	33786	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	581	69.1	68.4	71.4	69.9
1999	614	69.1	69.1	68.6	69.3
2000	663	68.3	68.0	72.3	68.5
2001	670	68.8	68.3	71.1	69.3
2002	943	69.0	68.5	74.4	68.9
2003	1019	68.8	68.5	72.2	68.9
2004	1009	69.6	69.5	73.0	69.7
2005	996	69.8	69.5	74.9	69.9
2006	1062	69.8	69.6	73.0	69.8
2007	1159	70.1	69.7	74.5	70.1
2008	1143	70.1	69.5	75.6	69.8
2009	1213	70.6	70.4	74.3	70.4
2010	1226	70.9	70.5	75.5	70.8
2011	1239	71.1	70.8	74.6	70.8
2012	1187	71.3	70.6	78.9	71.1
2013	1208	72.3	72.1	76.5	72.3
2014	1171	72.7	72.4	76.1	72.6
2015	1235	72.6	72.1	77.5	72.3
2016	1122	73.7	73.3	76.4	73.6
2017	1108	73.9	73.3	77.4	73.5
2018	793	72.9	71.1	76.0	73.0
2019	543	74.5	72.2	76.5	73.8
1998-2019	21904	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	268	69.1	68.7	75.1	70.4
1999	279	72.3	72.2	77.5	72.3
2000	315	70.3	69.7	78.1	70.4
2001	295	71.6	71.0	76.0	71.7
2002	408	70.8	70.1	76.7	70.8
2003	435	71.1	70.8	73.6	71.0
2004	503	71.9	70.9	80.3	71.5
2005	495	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	579	70.1	69.6	79.8	69.9
2009	614	69.7	69.2	81.7	69.7
2010	683	70.2	70.0	78.3	70.2
2011	704	69.8	69.5	76.3	69.7
2012	711	71.2	70.9	79.6	71.1
2013	730	72.0	71.3	81.9	71.6
2014	732	72.0	71.3	82.5	71.5
2015	750	72.1	71.8	77.2	71.9
2016	776	72.0	71.5	76.3	71.5
2017	688	71.9	71.4	76.4	71.6
2018	484	72.3	70.7	76.6	73.2
2019	375	71.0	70.1	74.1	69.9
1998-2019	11882	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	479	43.2	0.71	26.0	0.70	39.1	0.71	51.4	0.73
1999	543	48.5	0.73	28.6	0.71	43.5	0.73	57.5	0.77
2000	599	52.6	0.81	30.8	0.80	46.6	0.81	60.8	0.83
2001	586	50.6	0.77	29.5	0.75	44.3	0.77	57.7	0.80
2002	867	46.5	0.74	26.0	0.73	39.0	0.73	50.8	0.74
2003	950	50.7	0.82	28.1	0.81	41.8	0.81	54.0	0.82
2004	961	51.1	0.84	27.5	0.83	41.3	0.84	53.8	0.85
2005	916	48.4	0.80	25.2	0.77	37.9	0.78	49.8	0.80
2006	985	51.4	0.83	26.4	0.81	39.8	0.82	52.3	0.85
2007	1084	48.9	0.78	24.9	0.76	37.5	0.77	49.6	0.78
2008	1074	48.3	0.76	24.6	0.75	36.9	0.76	48.0	0.77
2009	1130	50.6	0.81	25.0	0.77	37.6	0.79	49.2	0.81
2010	1137	50.4	0.81	24.8	0.79	37.0	0.80	48.1	0.82
2011	1161	51.9	0.83	25.0	0.80	37.5	0.81	48.7	0.83
2012	1095	48.2	0.79	23.4	0.78	34.6	0.78	44.8	0.79
2013	1130	49.1	0.80	22.9	0.77	34.4	0.79	45.2	0.81
2014	1084	46.5	0.80	21.4	0.78	32.2	0.79	41.9	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	990	41.0	0.84	18.1	0.79	27.6	0.81	36.4	0.84
2018	567	23.3	0.64	10.7	0.60	16.1	0.62	20.6	0.63
2019	399	16.4	0.60	7.3	0.57	11.0	0.58	14.5	0.60
1998-2019	19881	45.1	0.78	22.4	0.76	33.5	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	248	20.9	0.76	9.7	0.71	14.4	0.73	18.4	0.75
2000	287	23.9	0.82	11.9	0.80	17.1	0.80	21.3	0.82
2001	265	21.8	0.78	10.3	0.74	15.1	0.75	19.0	0.77
2002	379	19.4	0.68	9.2	0.66	13.5	0.67	16.6	0.67
2003	409	20.8	0.67	9.7	0.63	14.4	0.65	17.7	0.67
2004	474	24.0	0.77	10.9	0.74	16.0	0.75	20.4	0.77
2005	474	23.8	0.79	11.1	0.77	16.3	0.77	20.1	0.78
2006	455	22.6	0.75	10.4	0.72	15.1	0.73	18.8	0.74
2007	538	23.3	0.72	10.9	0.68	15.9	0.69	19.6	0.70
2008	555	23.9	0.72	10.9	0.67	16.0	0.69	19.9	0.71
2009	581	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	0.76	18.8	0.76	23.3	0.77
2012	678	28.7	0.77	12.6	0.73	18.3	0.73	22.7	0.75
2013	690	28.9	0.79	12.4	0.72	18.1	0.73	22.4	0.76
2014	691	28.7	0.74	12.3	0.68	18.0	0.70	22.4	0.72
2015	713	29.3	0.78	12.3	0.73	18.1	0.75	22.9	0.77
2016	731	29.8	0.80	12.6	0.74	18.4	0.76	23.1	0.78
2017	624	25.3	0.73	10.8	0.70	15.7	0.71	19.7	0.72
2018	380	15.3	0.58	6.8	0.54	9.8	0.55	12.1	0.56
2019	302	12.2	0.54	5.4	0.52	7.8	0.52	9.7	0.54
1998-2019	11031	24.1	0.74	10.8	0.70	15.7	0.71	19.5	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	494	2.4	3.5	282	2.2	3.2	212	2.7	4.1
50-54	1032	5.0	8.5	596	4.6	7.8	436	5.6	9.7
55-59	1710	8.2	16.7	1037	8.0	15.8	673	8.6	18.3
60-64	2556	12.3	29.0	1573	12.1	27.9	983	12.6	30.9
65-69	3495	16.8	45.8	2179	16.8	44.6	1316	16.9	47.7
70-74	3833	18.4	64.2	2504	19.3	63.9	1329	17.0	64.8
75-79	3449	16.6	80.8	2265	17.4	81.3	1184	15.2	79.9
80-84	2455	11.8	92.6	1580	12.2	93.5	875	11.2	91.1
85+	1539	7.4	100.0	847	6.5	100.0	692	8.9	100.0
All ages	20801	100.0		12995	100.0		7806	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	0.30			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	282	212	11.2	0.65	8.7	0.59	21.0	13.4
50–54	596	436	25.4	0.68	18.9	0.61	23.7	17.8
55–59	1037	673	53.3	0.69	33.7	0.65	25.2	19.1
60–64	1573	983	96.5	0.72	56.0	0.69	26.4	21.3
65–69	2179	1316	143.3	0.75	78.1	0.73	25.4	20.3
70–74	2504	1329	178.7	0.80	82.7	0.77	22.6	16.3
75–79	2265	1184	204.6	0.84	86.0	0.79	19.8	13.2
80–84	1580	875	240.7	0.93	89.9	0.85	16.8	10.3
85+	847	692	198.6	0.90	71.7	0.88	10.3	6.3
All ages	12995	7806					20.3	13.7
Mortality								
Raw			43.1	0.78	25.1	0.73		
WS			20.4	0.76	11.0	0.69		
ES			30.6	0.77	16.0	0.70		
BRD-S			39.8	0.78	19.9	0.72		
PYLL-70								
per 100,000			192.0		132.1			
ES			163.4		108.4			
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	26	0.5	21	80.8	1	3.8	4	15.4
C03–C06 Oral cavity	203	3.7	159	78.3	24	11.8	20	9.9
C07–C08 Salivary gland	14	0.3	13	92.9	1	7.1		
C09–C10 Oropharynx	188	3.4	131	69.7	21	11.2	36	19.1
C12–C13 Hypopharynx	104	1.9	71	68.3	17	16.3	16	15.4
C15 Oesophagus	107	1.9	41	38.3	30	28.0	36	33.6
C16 Stomach	194	3.5	104	53.6	36	18.6	54	27.8
C17 Small intestine	24	0.4	9	37.5	6	25.0	9	37.5
C18 Colon	430	7.8	297	69.1	60	14.0	73	17.0
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	258	4.7	191	74.0	29	11.2	38	14.7
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	493	8.9	344	69.8	48	9.7	101	20.5
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	1177	21.3	963	81.8	80	6.8	134	11.4
C62 Testis	64	1.2	58	90.6	2	3.1	4	6.3
C64 Kidney	230	4.2	162	70.4	32	13.9	36	15.7
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	36	0.7	29	80.6	3	8.3	4	11.1
C76–C79 CUP	79	1.4	46	58.2	20	25.3	13	16.5
C81 Hodgkin lymphoma	60	1.1	58	96.7	2	3.3		
C82–C85 NHL	235	4.3	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	42	0.8	15	35.7	6	14.3	21	50.0
Others, specified	90	1.6	54	60.0	13	14.4	23	25.6
All further malignancies	5519	100.0	3702	67.1	690	12.5	1127	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	25	0.9	20	80.0	2	8.0	3	12.0
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	31.4	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	2.6	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	54	2.0	40	74.1	7	13.0	7	13.0
C76-C79 CUP	47	1.7	25	53.2	8	17.0	14	29.8
C81 Hodgkin lymphoma	22	0.8	22	100.0				
C82-C85 NHL	93	3.4	78	83.9	6	6.5	9	9.7
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	2703	100.0	1956	72.4	264	9.8	483	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	0.30			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	262	174	10.4	0.68	7.2	0.58	21.4	12.9
50-54	528	372	22.5	0.69	16.1	0.60	23.8	17.9
55-59	897	578	46.1	0.69	28.9	0.67	25.0	19.5
60-64	1307	820	80.1	0.72	46.7	0.70	26.2	21.7
65-69	1743	1032	114.6	0.78	61.3	0.75	25.3	20.1
70-74	1886	997	134.6	0.82	62.1	0.77	22.2	15.7
75-79	1615	900	145.9	0.86	65.4	0.80	19.3	13.0
80-84	1060	646	161.5	0.97	66.4	0.86	15.7	9.8
85+	546	533	128.0	0.88	55.2	0.89	9.2	6.1
All ages	9964	6144					20.1	13.6
Mortality								
Raw			33.1	0.79	19.8	0.74		
WS			16.2	0.76	8.8	0.70		
ES			23.9	0.77	12.8	0.71		
BRD-S			30.4	0.79	15.8	0.73		
PYLL-70								
per 100,000			166.2		111.1			
ES			141.5		91.3			
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		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	1.00			2.2	
20-24								
25-29	3		0.1	0.30			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	258	170	10.3	0.69	7.0	0.58	21.3	12.7
50-54	517	365	22.1	0.70	15.8	0.61	23.7	17.9
55-59	882	562	45.4	0.70	28.1	0.69	24.9	19.3
60-64	1258	803	77.1	0.73	45.7	0.71	25.6	21.7
65-69	1674	992	110.1	0.79	58.9	0.75	25.0	19.8
70-74	1801	960	128.5	0.82	59.8	0.77	22.0	15.6
75-79	1499	865	135.4	0.84	62.8	0.80	18.8	13.0
80-84	990	622	150.8	0.93	63.9	0.85	15.7	9.9
85+	507	509	118.9	0.83	52.7	0.85	9.3	6.1
All ages	9505	5939					20.0	13.6
Mortality								
Raw			31.5	0.79	19.1	0.74		
WS			15.5	0.77	8.6	0.70		
ES			22.9	0.77	12.4	0.71		
BRD-S			29.0	0.79	15.3	0.73		
PYLL-70								
per 100,000			162.3		108.6			
ES			138.1		89.3			
AYLL-70			9.1		9.5			

* See corresponding tables with multiple malignancies.

ICD-10 C34: Malignant neoplasm of bronchus and lung
 Age distribution and age-specific mortality 2007 - 2019 (Males: 12995, Females: 7806)

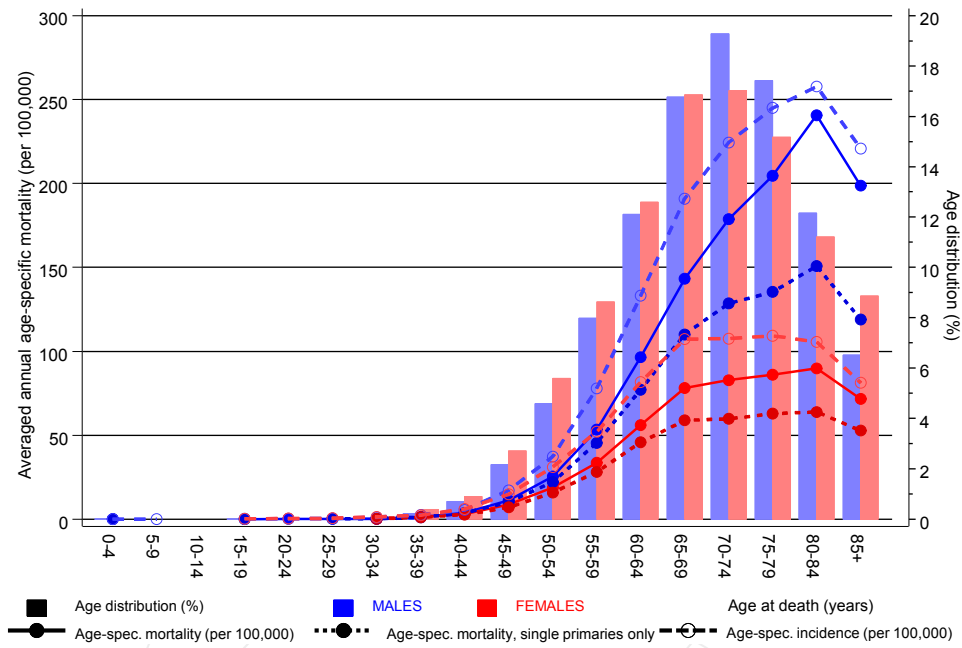
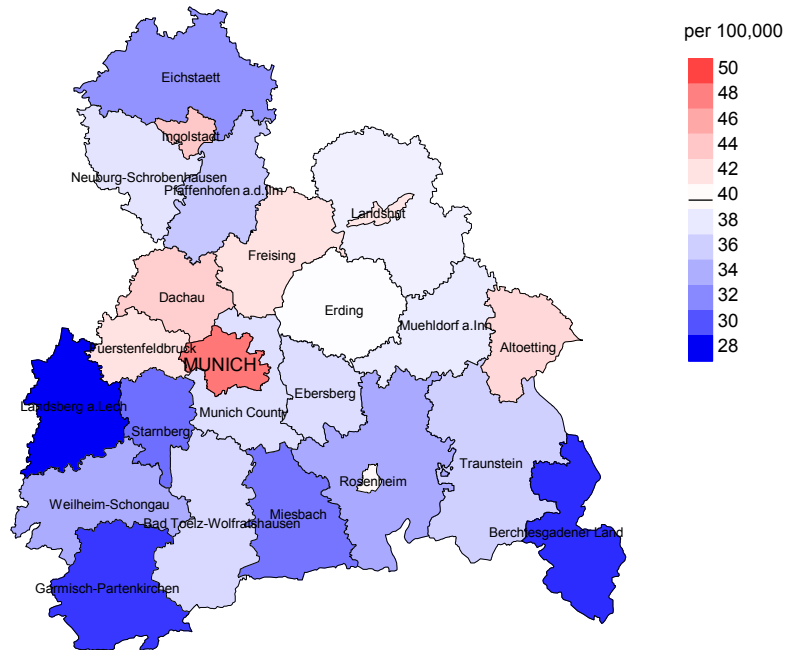


Figure 17. Distribution of age at death (bars; males: mean=69.2 yrs, median=69.9 yrs; females: mean=68.8 yrs, median=69.1 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed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

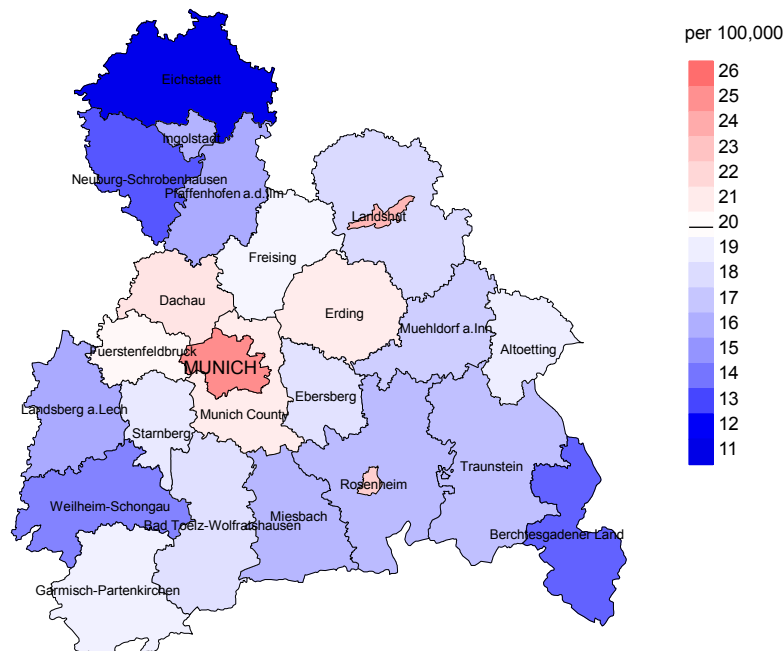
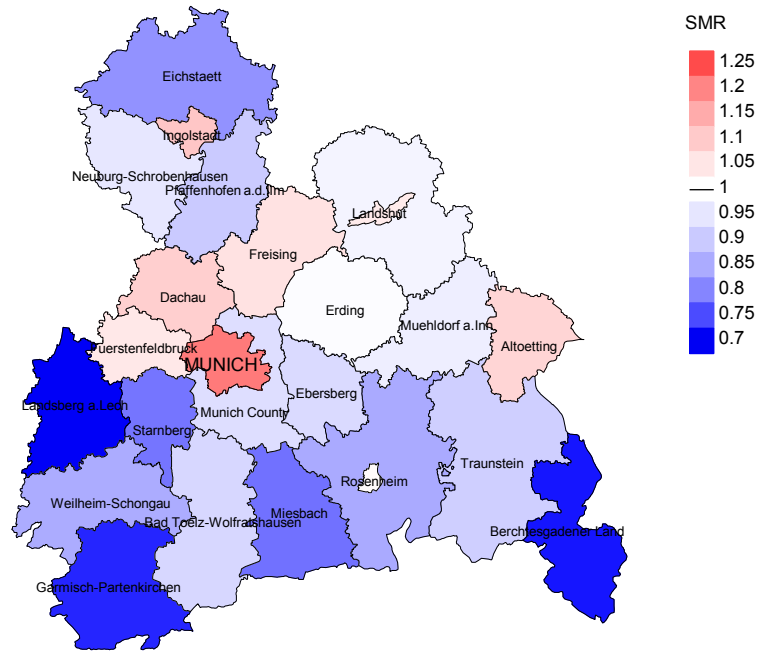


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2019. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 39.8/100,000 WS N=12,995, females 19.9/100,000 WS N=7,806).

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

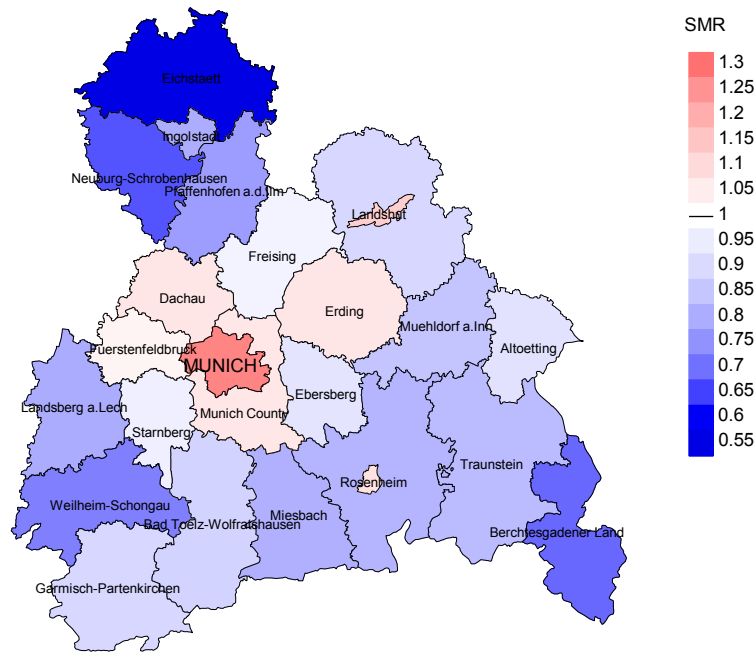


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=12,995, females N=7,806).

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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