Munich Cancer Registry

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- *Deutsch*

ICD-10 C34: Lung cancer

Incidence and Mortality

Year of diagnosis	1998-2020
Patients	41,830
Diseases	42,304
Creation date	12/21/2021
Database export	12/20/2021
Population	4.95 m

Munich Cancer Registry
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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

Index of figures and tables

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, December 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	4.9	95.8	99.2
1999	1072	190	17.7	12.6	4.9	95.1	99.0
2000	1098	254	23.1	13.1	4.9	94.6	99.1
2001	1105	233	21.1	13.7	4.8	94.9	98.9
2002	1737	387	22.3	14.4	4.8	95.0	98.8 #
2003	1778	341	19.2	14.9	4.7	94.9	99.3
2004	1755	327	18.6	15.3	4.6	94.9	99.0
2005	1756	295	16.8	15.8	4.6	94.4	98.7
2006	1796	295	16.4	16.3	4.6	92.9	98.3
2007	2160	312	14.4	16.5	4.6	92.1	98.1 #
2008	2191	261	11.9	16.9	4.5	90.5	99.3
2009	2225	283	12.7	17.3	4.4	90.8	98.7
2010	2250	268	11.9	17.6	4.2	90.9	99.2
2011	2292	260	11.3	18.0	4.0	90.7	99.3
2012	2281	251	11.0	18.4	3.9	88.5	99.3
2013	2287	258	11.3	18.7	3.7	87.5	99.0
2014	2304	261	11.3	19.0	3.5	84.1	98.4
2015	2363	308	13.0	19.3	3.1	82.8	98.3
2016	2261	296	13.1	19.6	2.8	79.9	99.8
2017	2168	291	13.4	19.9	2.6	76.0	99.8
2018	1759	140	8.0	20.2	2.3	63.0	99.8
2019	1392	20	1.4	20.5	2.0	52.7	100.0
2020	1256	2	0.2	20.7	1.4	44.6	99.6 ##
1998-2020	42304	5724	13.5	20.7	4.9	85.8	99.0

42,304 cases diagnosed 1998-2020 are related to a total of 41,830 patients. Currently, in 10,362 (24.8 %) of these 41,830 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 8,103 / 1,742 / 517 (19.4 % / 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 retreived from the respective headings.

How to interpret:
In 2018, a subgroup of 1,759 cases has been diagnosed, of which 20.2 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 2.3 % 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	5.2	96.3	99.4
1999	744	69.4	136	18.3	12.1	5.1	95.2	98.9
2000	746	67.9	158	21.2	12.8	5.1	95.2	99.1
2001	765	69.2	155	20.3	13.7	5.1	94.9	98.6
2002	1176	67.7	252	21.4	14.5	5.0	96.1	99.1 #
2003	1168	65.7	229	19.6	15.0	4.9	95.6	99.5
2004	1142	65.1	192	16.8	15.3	4.9	95.7	99.3
2005	1156	65.8	172	14.9	15.9	4.9	94.8	98.8
2006	1188	66.1	178	15.0	16.3	4.8	92.9	98.1
2007	1405	65.0	198	14.1	16.7	4.8	92.7	97.9 #
2008	1416	64.6	160	11.3	17.1	4.8	92.0	99.2
2009	1407	63.2	168	11.9	17.5	4.7	91.7	98.7
2010	1409	62.6	148	10.5	17.7	4.5	92.1	99.0
2011	1415	61.7	145	10.2	18.2	4.4	92.2	99.4
2012	1389	60.9	148	10.7	18.7	4.3	90.3	99.5
2013	1411	61.7	154	10.9	19.1	4.0	88.8	99.3
2014	1361	59.1	147	10.8	19.5	3.7	85.3	98.8
2015	1441	61.0	196	13.6	19.7	3.3	84.1	98.6
2016	1329	58.8	183	13.8	20.0	3.1	82.7	99.8
2017	1255	57.9	168	13.4	20.2	2.7	79.8	99.8
2018	1019	57.9	80	7.9	20.7	2.5	65.9	99.6
2019	760	54.6	7	0.9	20.9	2.0	58.3	100.0
2020	691	55.0	1	0.1	21.1	1.9	48.2	99.9 ##
1998-2020	26473	62.6	3500	13.2	21.1	5.2	87.9	99.1

26,473 cases diagnosed 1998-2020 are related to a total of 26,160 patients. Currently, in 6,643 (25.4 %) of these 26,160 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 5,190 / 1,117 / 336 (19.8 % / 4.3 % / 1.3 %) 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 retreived from the respective headings.

How to interpret:
In 2018, a subgroup of 1,019 cases has been diagnosed, of which 20.7 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 2.5 % 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	4.6	94.7	98.8	
1999	328	30.6	54	16.5	13.8	4.5	94.8	99.1	
2000	352	32.1	96	27.3	13.8	4.5	93.5	99.1	
2001	340	30.8	78	22.9	13.7	4.5	95.0	99.7	
2002	561	32.3	135	24.1	14.1	4.5	92.9	98.2	#
2003	610	34.3	112	18.4	14.7	4.4	93.6	98.9	
2004	613	34.9	135	22.0	15.3	4.3	93.3	98.5	
2005	600	34.2	123	20.5	15.8	4.3	93.7	98.5	
2006	608	33.9	117	19.2	16.1	4.2	92.9	98.5	
2007	755	35.0	114	15.1	16.0	4.1	91.0	98.5	#
2008	775	35.4	101	13.0	16.4	4.1	87.7	99.4	
2009	818	36.8	115	14.1	16.9	3.9	89.2	98.7	
2010	841	37.4	120	14.3	17.4	3.7	88.8	99.4	
2011	877	38.3	115	13.1	17.6	3.5	88.4	99.1	
2012	892	39.1	103	11.5	17.9	3.3	85.8	98.9	
2013	876	38.3	104	11.9	17.9	3.2	85.3	98.4	
2014	943	40.9	114	12.1	18.1	3.1	82.4	97.9	
2015	922	39.0	112	12.1	18.6	2.7	80.8	97.8	
2016	932	41.2	113	12.1	18.9	2.5	75.9	99.9	
2017	913	42.1	123	13.5	19.2	2.3	70.9	99.9	
2018	740	42.1	60	8.1	19.5	1.9	59.1	100.0	
2019	632	45.4	13	2.1	19.7	2.0	46.0	100.0	
2020	565	45.0	1	0.2	20.0	0.7	40.2	99.3	##
1998-2020	15831	37.4	2224	14.0	20.0	4.6	82.3	99.0	

15,831 cases diagnosed 1998-2020 are related to a total of 15,670 patients. Currently, in 3,719 (23.7 %) of these 15,670 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 2,913 / 625 / 181 (18.6 % / 4.0 % / 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 retreived from the respective headings.

How to interpret:
In 2018, a subgroup of 740 cases has been diagnosed, of which 19.5 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 1.9 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 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 4.94 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	765	340	66.0	27.9	39.7	13.9	58.0	20.1	72.5	24.9
2002	1176	561	63.1	28.7	35.6	14.0	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	1156	600	61.0	30.2	32.8	14.6	48.5	21.2	62.1	25.7
2006	1188	608	62.0	30.3	33.0	14.4	48.8	20.9	62.2	25.4
2007	1405	755	63.4	32.7	33.1	16.2	49.3	23.2	64.1	28.0
2008	1416	775	63.6	33.4	33.0	16.4	49.0	23.5	62.5	28.2
2009	1407	818	63.0	35.2	32.4	16.5	48.0	23.7	60.9	29.0
2010	1409	841	62.5	35.9	31.8	17.1	46.7	24.5	59.0	29.7
2011	1415	877	63.2	37.5	31.5	17.3	46.4	24.9	58.8	30.5
2012	1389	892	61.2	37.8	30.1	17.4	44.4	25.2	56.8	30.5
2013	1411	876	61.3	36.7	29.9	17.2	44.1	24.6	56.0	29.5
2014	1361	943	58.4	39.2	27.5	18.2	41.0	26.0	52.8	31.5
2015	1441	922	60.6	37.9	29.0	17.1	43.1	24.6	54.9	30.1
2016	1329	932	55.3	38.0	26.6	17.2	39.4	24.7	49.9	30.2
2017	1255	913	52.0	37.0	24.4	16.4	36.2	23.7	46.4	29.2
2018	1019	740	41.9	29.8	20.1	13.9	29.6	19.7	37.4	24.0
2019	760	632	31.2	25.5	14.7	11.7	21.8	16.7	27.8	20.3
2020	691	565	28.4	22.8	13.8	10.4	20.2	14.9	25.3	18.3
1998–2020	26473	15831	56.9	32.8	29.0	15.4	42.8	22.1	54.3	26.9

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	Mean	Std. dev.	Min.	Max.	10%	25%	Median 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	1737	68.1	11.5	27.5	99.5	53.0	60.5	68.5	76.5	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	1756	68.2	11.2	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	2160	68.4	11.2	7.5	99.1	53.9	61.3	68.7	76.6	81.9
2008	2191	68.4	10.9	22.3	99.4	54.5	61.3	68.7	76.4	81.9
2009	2225	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	82.3
2011	2292	69.0	10.9	28.9	97.6	54.3	62.0	69.7	76.6	83.0
2012	2281	69.3	11.0	22.9	96.8	54.6	62.2	69.9	77.0	83.2
2013	2287	69.3	10.8	27.9	100	54.3	62.1	70.1	76.6	82.6
2014	2304	69.6	11.1	15.9	100	54.2	62.6	70.8	77.1	83.3
2015	2363	70.1	10.8	23.7	100	55.1	63.1	71.0	77.5	83.5
2016	2261	69.9	10.7	20.9	102	55.7	62.6	70.4	77.2	83.0
2017	2168	70.0	10.7	24.2	98.4	55.6	62.4	70.8	77.9	82.7
2018	1759	69.4	10.8	18.5	99.8	55.4	62.5	70.4	77.0	82.0
2019	1392	69.5	10.5	19.7	98.8	55.9	62.6	70.3	77.2	81.4
2020	1256	69.4	10.0	21.5	95.2	56.5	63.0	70.0	77.1	81.4
1998-2020	42304	68.8	11.0	0.5	102	54.4	61.6	69.4	76.7	82.5

Table 3a

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	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	765	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	1156	68.3	10.6	18.1	98.5	55.5	61.9	68.4	75.8	81.6
2006	1188	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	1416	68.7	10.3	22.3	99.4	55.6	61.9	69.2	76.3	81.3
2009	1407	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	1415	68.9	10.6	28.9	94.3	54.5	62.4	69.9	76.1	82.3
2012	1389	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	1361	70.3	10.4	30.3	96.0	55.8	63.4	71.6	77.5	83.2
2015	1441	70.3	10.7	29.2	93.8	55.7	63.4	71.3	77.5	83.5
2016	1329	70.1	10.4	25.5	96.7	56.2	63.0	71.2	77.1	83.1
2017	1255	70.2	10.4	28.7	98.4	55.9	62.8	71.3	77.8	82.5
2018	1019	70.1	10.1	24.7	96.4	56.6	63.3	70.9	77.2	82.0
2019	760	70.2	10.1	22.3	96.7	56.7	63.6	71.4	78.0	81.4
2020	691	69.7	9.6	30.6	94.4	57.5	62.9	70.1	77.2	81.5
1998-2020	26473	68.9	10.5	0.5	102	55.2	61.9	69.5	76.5	82.0

Table 3b

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	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	340	68.1	12.1	31.5	93.9	50.6	59.2	69.1	76.9	83.5
2002	561	68.2	12.8	27.5	99.5	51.8	59.2	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	52.5	58.8	68.3	77.8	83.8
2006	608	68.8	12.4	27.5	100	53.4	60.1	68.1	78.6	85.0
2007	755	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	68.6	11.4	33.2	97.8	53.9	61.5	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	876	68.7	11.5	30.6	100	53.6	61.3	69.2	76.4	84.2
2014	943	68.4	11.9	15.9	100	51.7	60.9	69.7	76.5	83.3
2015	922	69.7	11.0	23.7	100	54.7	62.8	70.4	77.3	83.5
2016	932	69.5	11.2	20.9	102	54.9	62.3	69.8	77.4	82.9
2017	913	69.8	11.1	24.2	98.2	55.2	61.9	70.3	78.1	82.9
2018	740	68.5	11.6	18.5	99.8	53.0	61.2	69.9	76.8	81.9
2019	632	68.7	11.0	19.7	98.8	55.1	61.6	69.7	76.4	81.4
2020	565	69.0	10.6	21.5	95.2	55.6	63.0	69.7	76.9	81.1
1998-2020	15831	68.7	11.8	15.8	102	53.1	60.7	69.2	77.2	83.4

Table 4

Age distribution by 5-year age group and sex for period 2007-2020 (incl. DCO)

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females 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	11	0.0	0.1	4	0.0	0.0	7	0.1	0.1
25-29	23	0.1	0.1	10	0.1	0.1	13	0.1	0.2
30-34	58	0.2	0.3	26	0.1	0.2	32	0.3	0.5
35-39	111	0.4	0.7	56	0.3	0.6	55	0.5	1.0
40-44	276	0.9	1.7	133	0.8	1.3	143	1.2	2.2
45-49	821	2.8	4.5	446	2.5	3.8	375	3.3	5.5
50-54	1681	5.8	10.2	919	5.2	9.0	762	6.6	12.1
55-59	2737	9.4	19.6	1627	9.2	18.2	1110	9.7	21.8
60-64	3888	13.3	32.9	2341	13.2	31.4	1547	13.5	35.2
65-69	5046	17.3	50.2	3093	17.5	48.9	1953	17.0	52.3
70-74	5225	17.9	68.1	3352	18.9	67.8	1873	16.3	68.6
75-79	4577	15.7	83.8	2908	16.4	84.3	1669	14.5	83.1
80-84	2908	10.0	93.8	1797	10.1	94.4	1111	9.7	92.8
85+	1820	6.2	100.0	992	5.6	100.0	828	7.2	100.0
All ages	29189	100.0		17708	100.0		11481	100.0	

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 2007–2020

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males DCO rate n=1900 %	Females DCO rate n=1308 %	Males Prop.all cancers n=153686 %	Females Prop.all cancers n=155051 %
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			0.6	1.1
20-24	4	7	0.2	0.4			0.6	1.4
25-29	10	13	0.4	0.6			1.0	1.1
30-34	25	32	1.1	1.4	4.0		1.9	1.5
35-39	56	55	2.4	2.4		3.6	3.1	1.6
40-44	133	143	5.3	5.9	3.0	2.1	4.8	2.3
45-49	442	374	16.5	14.4	1.6	4.0	8.8	4.0
50-54	916	760	35.9	30.3	3.5	2.8	10.8	6.1
55-59	1619	1103	76.3	50.6	4.3	3.5	12.7	8.3
60-64	2324	1535	131.4	80.8	6.1	4.2	13.2	9.8
65-69	3067	1941	187.9	107.0	6.8	5.7	12.6	10.2
70-74	3330	1864	222.1	108.4	8.6	9.0	12.1	9.4
75-79	2889	1661	238.8	110.6	11.7	11.4	12.0	8.5
80-84	1792	1109	247.5	104.2	20.5	25.1	11.7	7.2
85+	991	828	212.2	79.4	44.4	50.6	9.4	5.1
All ages	17602	11428			10.8	11.4	11.5	7.4
Incidence								
Raw			54.0	34.0				
WS			26.5	15.7				
ES			39.0	22.5				
BRD-S			49.6	27.4				

The age-specific incidence characterizes the disease risk in a particular age group. The age distribution depends on the patient population frequency in each age group and reflects the tangible clinical picture of everyday patients care (see following chart).

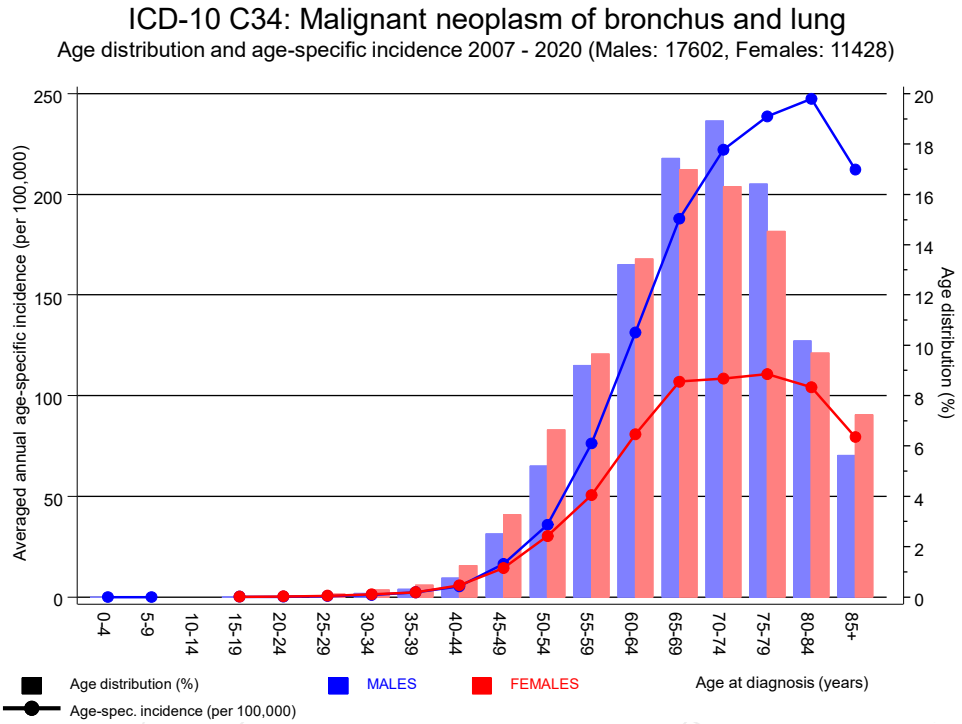


Figure 6. Age distribution (males: mean=69.6 yrs, median=70.3 yrs; females: mean=68.9 yrs, median=69.4 yrs) and age-specific incidence.

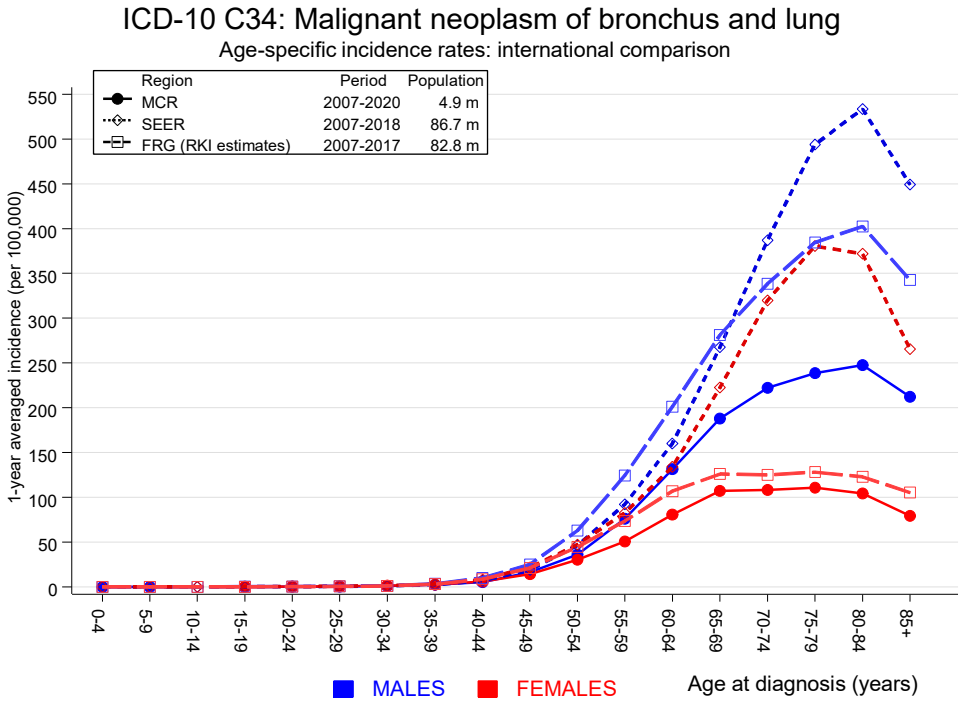


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, RKI estimates) and SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

Estimated age-specific patient population of Germany, latest update: 16 March 2021. German Centre for Cancer Registry Data, Robert Koch Institute (RKI), based on data of the population based cancer registries. http://www.krebsdaten.de. Last access: 08/17/2021
Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 21 Regs Research Data, released April 2021, based on the November 2020 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 1998–2020

MALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C00	Lip	3	0.6	4.7	1.0	13.8		0.7	33.3
C03–C06	Oral cavity	44	5.0	8.8	6.4	11.8	#	10.7	15.9
C09–C10	Oropharynx	63	6.2	10.1	7.8	12.9	#	15.6	4.8
C12–C13	Hypopharynx	20	3.4	5.9	3.6	9.1	#	4.6	5.0
C15	Oesophagus	60	12.1	5.0	3.8	6.4	#	13.2	10.0
C16	Stomach	80	22.6	3.5	2.8	4.4	#	15.8	12.5
C17	Small intestine	15	3.5	4.2	2.4	7.0	#	3.2	6.7
C18	Colon	120	56.2	2.1	1.8	2.6	#	17.5	16.7
C19–C20	Rectum	63	31.6	2.0	1.5	2.6	#	8.6	6.3
C22	Liver	59	17.4	3.4	2.6	4.4	#	11.4	16.9
C23–C24	Bile	13	6.2	2.1	1.1	3.6	#	1.9	15.4
C25	Pancreas	72	22.7	3.2	2.5	4.0	#	13.5	38.9
C26	GI cancer	5	0.6	9.0	2.9	20.9	#	1.2	20.0
C32	Larynx	66	6.0	11.0	8.5	14.0	#	16.5	12.1
C33–C34	Lung	318	70.6	4.5	4.0	5.0	#	68.0	2.5
C38,C45	Mesothelioma	5	4.0	1.2	0.4	2.9		0.3	
C40–C41	Bone	4	0.5	8.5	2.3	21.8	#	1.0	50.0
C43	Malign. melanoma	43	26.4	1.6	1.2	2.2	#	4.6	11.6
C46,C49	Soft tissue	8	3.3	2.5	1.1	4.8	#	1.3	
C48	Peritoneal	3	0.5	6.2	1.3	18.3	#	0.7	
C50	Breast	5	1.6	3.1	1.0	7.2	#	0.9	60.0
C61	Prostate	224	170.5	1.3	1.1	1.5	#	14.7	17.0
C62	Testis	4	1.3	3.0	0.8	7.7		0.7	25.0
C64	Kidney	75	20.6	3.6	2.9	4.6	#	15.0	17.3
C65	Renal pelvis	12	2.6	4.6	2.4	8.0	#	2.6	
C67	Bladder	84	26.6	3.2	2.5	3.9	#	15.8	13.1
C68	Urinary org.	5	0.3	14.8	4.8	34.5	#	1.3	60.0
C70–C72	CNS cancer	13	7.4	1.7	0.9	3.0		1.5	53.8
C73	Thyroid	10	3.8	2.6	1.3	4.9	#	1.7	
C76–C79	CUP	19	9.6	2.0	1.2	3.1	#	2.6	5.3
C82–C85	NHL	66	24.3	2.7	2.1	3.5	#	11.5	12.1
C90	Mult. myeloma	12	7.6	1.6	0.8	2.8		1.2	16.7
C91–C96	Leukaemia	28	8.6	3.3	2.2	4.7	#	5.3	35.7
Others, specified		15	10.8	1.4	0.8	2.3		1.1	20.0
Not observed		0	1.5	0.0	0.0	2.4		−0.4	
All further malignancies		1636	596.6	2.7	2.6	2.9	#	285.6	13.3

Patients	23750
Median age at next malignancy (years)	71.5
Person-years	36397
Mean observation time (years)	1.5
Median observation time (years)	0.6

The occurrence of further specified malignancy is statistically significant.

Further observed malignancies with count 1 to 2 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 1998–2020
FEMALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C03–C06	Oral cavity	8	1.5	5.3	2.3	10.4	#	2.7	
C09–C10	Oropharynx	13	1.2	10.7	5.7	18.4	#	4.9	7.7
C15	Oesophagus	15	1.8	8.2	4.6	13.6	#	5.4	6.7
C16	Stomach	26	7.8	3.4	2.2	4.9	#	7.5	30.8
C17	Small intestine	9	1.5	6.1	2.8	11.6	#	3.1	11.1
C18	Colon	55	22.6	2.4	1.8	3.2	#	13.4	16.4
C19–C20	Rectum	17	9.6	1.8	1.0	2.8	#	3.1	11.8
C21	Anus/canal	5	1.5	3.4	1.1	7.9	#	1.5	
C22	Liver	12	3.1	3.8	2.0	6.7	#	3.7	33.3
C23–C24	Bile	5	3.3	1.5	0.5	3.5		0.7	40.0
C25	Pancreas	50	11.2	4.4	3.3	5.9	#	16.0	36.0
C32	Larynx	5	0.5	10.0	3.2	23.3	#	1.9	
C33–C34	Lung	162	21.0	7.7	6.6	9.0	#	58.3	1.2
C43	Malign. melanoma	23	9.9	2.3	1.5	3.5	#	5.4	8.7
C46,C49	Soft tissue	5	1.4	3.5	1.1	8.2	#	1.5	20.0
C48	Peritoneal	3	1.2	2.6	0.5	7.5		0.8	33.3
C50	Breast	176	82.2	2.1	1.8	2.5	#	38.7	16.5
C51	Vulva	13	2.6	5.1	2.7	8.7	#	4.3	7.7
C53	Cervix uteri	16	3.3	4.8	2.7	7.8	#	5.2	18.8
C54	Corpus uteri	20	14.9	1.3	0.8	2.1		2.1	20.0
C56	Ovary	18	10.3	1.7	1.0	2.8	#	3.2	27.8
C64	Kidney	19	5.8	3.3	2.0	5.1	#	5.5	26.3
C65	Renal pelvis	9	0.8	11.7	5.4	22.2	#	3.4	
C66	Ureter	4	0.4	9.6	2.6	24.7	#	1.5	
C67	Bladder	26	4.5	5.7	3.7	8.4	#	8.9	11.5
C70–C72	CNS cancer	6	3.2	1.9	0.7	4.0		1.1	33.3
C73	Thyroid	18	4.3	4.2	2.5	6.6	#	5.7	11.1
C76–C79	CUP	17	4.1	4.1	2.4	6.6	#	5.3	
C82–C85	NHL	19	9.5	2.0	1.2	3.1	#	3.9	10.5
C90	Mult. myeloma	8	2.9	2.7	1.2	5.3	#	2.1	37.5
C91–C96	Leukaemia	13	3.5	3.7	2.0	6.4	#	3.9	7.7
Others, specified		21	4.2	5.0	3.1	7.6	#	6.9	23.8
Not observed		0	1.0	0.0	0.0	3.8		−0.4	
All further malignancies		816	256.8	3.2	3.0	3.4	#	231.1	14.3

Patients	14098
Median age at next malignancy (years)	70.7
Person-years	24200
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 to 2 are pooled in category “Others, specified”.

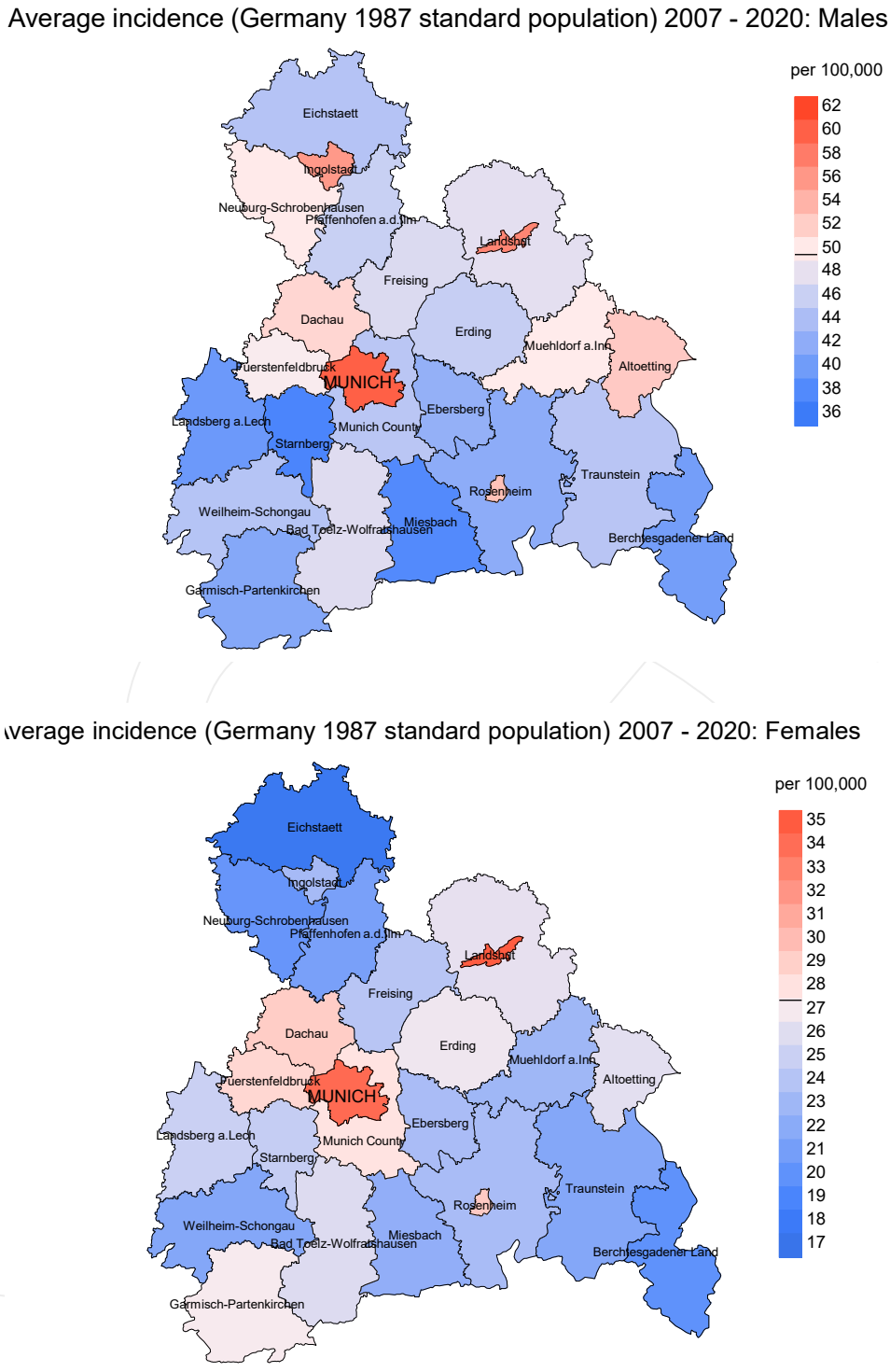


Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 49.6/100,000 WS N=17,602, females 27.4/100,000 WS N=11,428).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,727 female residents (averaged) in the period from 2007 to 2020 a total of 267 women were identified with newly diagnosed lung cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 23.5/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 19.9 and 27.5/100,000.

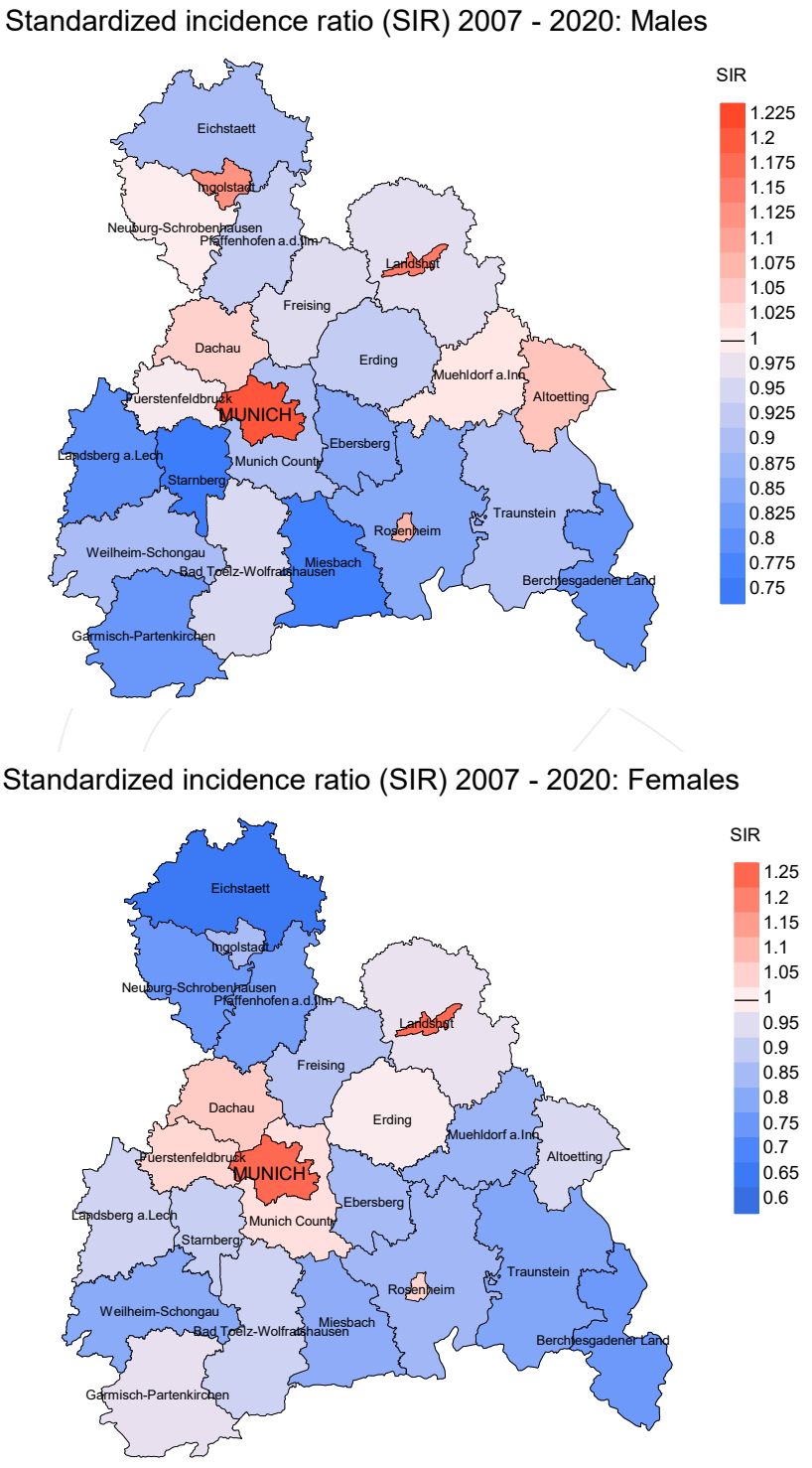


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=17,602, females N=11,428).

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 2020 a total of 267 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 0.85. Though, the value of this parameter may vary with an underlying probability of 99% between 0.72 and 1.00, and is therefore not statistically striking.

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 4.94 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	975	95.8	93.3
1999	1072	99.0	17.7	1019	95.1	95.1
2000	1098	99.1	23.1	1039	94.6	95.5
2001	1105	98.9	21.1	1049	94.9	95.1
2002	1737	98.8	22.3	1651	95.0	97.3
2003	1778	99.3	19.2	1688	94.9	97.2
2004	1755	99.0	18.6	1665	94.9	97.5
2005	1756	98.7	16.8	1658	94.4	98.3
2006	1796	98.3	16.4	1669	92.9	98.2
2007	2160	98.1	14.4	1989	92.1	98.0
2008	2191	99.3	11.9	1983	90.5	98.4
2009	2225	98.7	12.7	2020	90.8	98.3
2010	2250	99.2	11.9	2045	90.9	98.1
2011	2292	99.3	11.3	2079	90.7	97.8
2012	2281	99.3	11.0	2019	88.5	96.9
2013	2287	99.0	11.3	2000	87.5	96.7
2014	2304	98.4	11.3	1938	84.1	96.4
2015	2363	98.3	13.0	1957	82.8	96.1
2016	2261	99.8	13.1	1806	79.9	92.6
2017	2168	99.8	13.4	1648	76.0	85.4
2018	1759	99.8	8.0	1109	63.0	61.4
2019	1392	100.0	1.4	734	52.7	81.6
2020	1256	99.6	0.2	560	44.6	95.4
1998–2020	42304	99.0	13.5	36300	85.8	95.0

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 4.94 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	1737	1351	97.6	794	45.7
2003	1778	1454	97.8	804	45.2
2004	1755	1512	97.8	768	43.8
2005	1756	1491	97.9	784	44.6
2006	1796	1550	98.1	755	42.0
2007	2160	1729	98.5	890	41.2
2008	2191	1723	98.8	840	38.3
2009	2225	1827	99.1	862	38.7
2010	2250	1909	98.8	920	40.9
2011	2292	1943	99.0	952	41.5
2012	2281	1898	98.1	879	38.5
2013	2287	1936	98.2	914	40.0
2014	2304	1905	98.6	869	37.7
2015	2363	1987	98.7	911	38.6
2016	2261	1905	98.6	858	37.9
2017	2168	1872	97.9	858	39.6
2018	1759	1476	67.8	548	31.2
2019	1392	1129	44.3	313	22.5
2020	1256	1239	94.7	325	25.9
1998–2020	42304	35521	94.8	16707	39.5

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 4.94 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	93.3	6.7	96.8
2006	1550	92.9	7.1	97.2
2007	1729	93.8	6.2	97.2
2008	1723	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	1936	93.9	6.1	96.7
2014	1905	93.2	6.8	96.1
2015	1987	92.8	7.2	95.6
2016	1905	91.9	8.1	95.4
2017	1872	90.2	9.8	95.3
2018	1476	81.7	18.3	88.7
2019	1129	75.1	24.9	91.0
2020	1239	83.4	16.6	89.9
1998-2020	35521	91.3	8.7	96.2

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	669	68.7	68.2	71.1	69.2
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	75.2	69.9
2006	1061	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	1172	72.7	72.4	75.9	72.6
2015	1237	72.6	72.1	77.5	72.3
2016	1127	73.6	73.3	75.9	73.5
2017	1156	73.8	73.2	77.5	73.3
2018	905	73.1	72.2	76.0	73.1
2019	674	74.3	72.5	76.8	73.8
2020	730	74.1	72.9	79.7	73.1
1998–2020	22931	71.2	70.7	75.4	71.0

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	296	71.7	71.1	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	489	70.6	70.0	78.5	70.0
2007	570	70.4	69.9	76.2	70.1
2008	580	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	728	71.9	71.3	81.9	71.6
2014	733	71.9	71.3	82.5	71.5
2015	750	72.1	71.8	77.2	71.9
2016	778	72.1	71.5	76.7	71.5
2017	716	72.0	71.7	76.1	71.9
2018	571	73.2	72.3	76.7	72.9
2019	455	71.4	70.3	74.7	71.0
2020	509	73.6	72.8	78.1	73.1
1998–2020	12590	71.2	70.7	77.5	71.0

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	585	50.5	0.77	29.5	0.74	44.3	0.77	57.6	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	917	48.4	0.80	25.2	0.77	37.9	0.78	49.8	0.81
2006	984	51.4	0.83	26.4	0.81	39.8	0.82	52.2	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	0.82	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	1131	47.5	0.79	22.1	0.77	33.1	0.78	43.1	0.79
2016	1018	42.4	0.77	19.1	0.72	29.0	0.74	38.1	0.77
2017	1039	43.1	0.83	19.1	0.79	29.0	0.81	38.2	0.83
2018	721	29.6	0.71	13.3	0.67	20.2	0.69	26.1	0.70
2019	497	20.4	0.66	9.1	0.62	13.7	0.63	18.1	0.65
2020	589	24.2	0.85	10.7	0.78	16.3	0.81	21.4	0.85
1998-2020	20775	44.7	0.79	22.1	0.76	33.0	0.78	42.9	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	266	21.9	0.78	10.3	0.74	15.1	0.75	19.1	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	456	22.7	0.75	10.4	0.72	15.2	0.73	18.8	0.74
2007	538	23.3	0.72	10.9	0.68	15.9	0.69	19.6	0.71
2008	556	24.0	0.72	10.9	0.67	16.1	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	688	28.9	0.79	12.3	0.72	18.0	0.73	22.3	0.76
2014	692	28.7	0.74	12.3	0.68	18.0	0.70	22.5	0.72
2015	713	29.3	0.78	12.3	0.73	18.1	0.74	22.9	0.76
2016	734	29.9	0.79	12.6	0.73	18.5	0.75	23.2	0.77
2017	651	26.4	0.71	11.2	0.68	16.3	0.69	20.5	0.70
2018	487	19.6	0.66	8.2	0.60	12.0	0.62	15.1	0.63
2019	355	14.3	0.56	6.3	0.55	9.1	0.55	11.4	0.56
2020	444	17.9	0.79	7.2	0.70	10.7	0.72	13.7	0.75
1998-2020	11667	24.2	0.74	10.7	0.70	15.6	0.71	19.5	0.73

Table 12

Age distribution of age at death (cancer-related) for period 2007-2020
(**incl. multiple malignancies**)

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females 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	63	0.3	0.4	30	0.2	0.3	33	0.4	0.5
40-44	163	0.7	1.1	93	0.7	1.0	70	0.8	1.3
45-49	511	2.3	3.4	290	2.1	3.1	221	2.6	3.9
50-54	1086	4.9	8.2	621	4.5	7.5	465	5.5	9.4
55-59	1806	8.1	16.3	1102	7.9	15.5	704	8.3	17.8
60-64	2730	12.2	28.6	1677	12.1	27.5	1053	12.5	30.2
65-69	3723	16.7	45.2	2312	16.6	44.2	1411	16.7	47.0
70-74	4123	18.5	63.7	2677	19.3	63.5	1446	17.1	64.1
75-79	3758	16.8	80.5	2450	17.6	81.1	1308	15.5	79.6
80-84	2666	11.9	92.5	1698	12.2	93.3	968	11.5	91.1
85+	1682	7.5	100.0	927	6.7	100.0	755	8.9	100.0
All ages	22330	100.0		13890	100.0		8440	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**incl. multiple malignancies**)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4	1		0.1	1.00			5.3	
5- 9								
10-14								
15-19	1		0.1	0.50			2.1	
20-24	2		0.1	0.50			2.7	
25-29	3		0.1	0.30			3.2	
30-34	6	6	0.3	0.24	0.3	0.19	4.2	3.3
35-39	30	33	1.3	0.54	1.5	0.60	11.2	8.1
40-44	93	70	3.7	0.70	2.9	0.49	15.3	8.2
45-49	290	221	10.8	0.66	8.5	0.59	20.5	13.2
50-54	621	465	24.4	0.68	18.5	0.61	23.4	17.6
55-59	1102	704	51.9	0.68	32.3	0.64	24.9	18.4
60-64	1677	1053	94.9	0.72	55.5	0.69	26.2	21.1
65-69	2312	1411	141.6	0.75	77.8	0.73	25.1	20.2
70-74	2677	1446	178.6	0.80	84.1	0.78	22.6	16.5
75-79	2450	1308	202.5	0.85	87.1	0.79	19.6	13.3
80-84	1698	968	234.5	0.95	90.9	0.87	16.2	10.3
85+	927	755	198.5	0.94	72.4	0.91	10.2	6.3
All ages	13890	8440					20.0	13.7
Mortality								
Raw			42.7	0.79	25.1	0.74		
WS			20.1	0.76	10.9	0.70		
ES			30.1	0.77	15.9	0.71		
BRD-S			39.2	0.79	19.9	0.72		
PYLL-70								
per 100,000			187.1		129.4			
ES			158.7		105.8			
AYLL-70			8.7		9.2			

Table 14a

Further malignancies in deaths in period 1998–2020
MALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C00	Lip	26	0.4	21	80.8	1	3.8	4	15.4
C03–C06	Oral cavity	213	3.6	166	77.9	25	11.7	22	10.3
C07–C08	Salivary gland	14	0.2	13	92.9	1	7.1		
C09–C10	Oropharynx	203	3.5	144	70.9	23	11.3	36	17.7
C12–C13	Hypopharynx	109	1.9	76	69.7	17	15.6	16	14.7
C15	Oesophagus	115	2.0	43	37.4	34	29.6	38	33.0
C16	Stomach	208	3.6	113	54.3	38	18.3	57	27.4
C17	Small intestine	25	0.4	10	40.0	6	24.0	9	36.0
C18	Colon	456	7.8	318	69.7	62	13.6	76	16.7
C19–C20	Rectum	249	4.3	178	71.5	38	15.3	33	13.3
C21	Anus/canal	20	0.3	16	80.0	3	15.0	1	5.0
C22	Liver	90	1.5	29	32.2	24	26.7	37	41.1
C23–C24	Bile	26	0.4	12	46.2	5	19.2	9	34.6
C25	Pancreas	97	1.7	19	19.6	20	20.6	58	59.8
C30–C31	Sinuses	22	0.4	20	90.9			2	9.1
C32	Larynx	273	4.7	206	75.5	29	10.6	38	13.9
C33–C34	Lung	326	5.6			92	28.2	234	71.8
C38,C45	Mesothelioma	14	0.2	7	50.0	5	35.7	2	14.3
C43	Malign. melanoma	181	3.1	149	82.3	12	6.6	20	11.0
C44	Skin others	522	8.9	362	69.3	48	9.2	112	21.5
C46,C49	Soft tissue	27	0.5	19	70.4	3	11.1	5	18.5
C50	Breast	19	0.3	12	63.2	4	21.1	3	15.8
C61	Prostate	1245	21.3	1019	81.8	85	6.8	141	11.3
C62	Testis	66	1.1	59	89.4	2	3.0	5	7.6
C64	Kidney	244	4.2	171	70.1	32	13.1	41	16.8
C65	Renal pelvis	33	0.6	21	63.6			12	36.4
C67	Bladder	395	6.7	305	77.2	28	7.1	62	15.7
C69	Eye melanoma	16	0.3	15	93.8			1	6.3
C70–C72	CNS cancer	29	0.5	14	48.3	4	13.8	11	37.9
C73	Thyroid	41	0.7	33	80.5	4	9.8	4	9.8
C76–C79	CUP	80	1.4	47	58.8	20	25.0	13	16.3
C81	Hodgkin lymphoma	63	1.1	61	96.8	2	3.2		
C82–C85	NHL	256	4.4	179	69.9	38	14.8	39	15.2
C90	Mult. myeloma	31	0.5	18	58.1	5	16.1	8	25.8
C91–C96	Leukaemia	44	0.8	15	34.1	7	15.9	22	50.0
Others, specified		78	1.3	48	61.5	9	11.5	21	26.9
All further malignancies		5856	100.0	3938	67.2	726	12.4	1192	20.4

Further malignancies with number of cases 1 to 12 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 1998–2020
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03–C06	Oral cavity	57	1.9	51	89.5	4	7.0	2	3.5
C07–C08	Salivary gland	12	0.4	9	75.0	2	16.7	1	8.3
C09–C10	Oropharynx	47	1.6	36	76.6	2	4.3	9	19.1
C12–C13	Hypopharynx	11	0.4	10	90.9	1	9.1		
C15	Oesophagus	28	1.0	15	53.6	2	7.1	11	39.3
C16	Stomach	55	1.9	25	45.5	14	25.5	16	29.1
C17	Small intestine	13	0.4	7	53.8	3	23.1	3	23.1
C18	Colon	209	7.1	151	72.2	20	9.6	38	18.2
C19–C20	Rectum	83	2.8	66	79.5	7	8.4	10	12.0
C21	Anus/canal	31	1.1	25	80.6	3	9.7	3	9.7
C22	Liver	19	0.6	8	42.1	2	10.5	9	47.4
C23–C24	Bile	16	0.5	9	56.3	2	12.5	5	31.3
C25	Pancreas	69	2.4	17	24.6	18	26.1	34	49.3
C32	Larynx	27	0.9	22	81.5	2	7.4	3	11.1
C33–C34	Lung	147	5.0			33	22.4	114	77.6
C43	Malign. melanoma	84	2.9	78	92.9	2	2.4	4	4.8
C44	Skin others	138	4.7	92	66.7	9	6.5	37	26.8
C46,C49	Soft tissue	10	0.3	6	60.0	2	20.0	2	20.0
C50	Breast	924	31.6	773	83.7	69	7.5	82	8.9
C51	Vulva	35	1.2	25	71.4	4	11.4	6	17.1
C53	Cervix uteri	147	5.0	127	86.4	9	6.1	11	7.5
C54	Corpus uteri	167	5.7	154	92.2	3	1.8	10	6.0
C55,C57	Fem. genitals un	17	0.6	16	94.1	1	5.9		
C56	Ovary	74	2.5	53	71.6	8	10.8	13	17.6
C64	Kidney	78	2.7	55	70.5	12	15.4	11	14.1
C65	Renal pelvis	15	0.5	8	53.3	1	6.7	6	40.0
C67	Bladder	76	2.6	56	73.7	9	11.8	11	14.5
C70–C72	CNS cancer	10	0.3	3	30.0			7	70.0
C73	Thyroid	58	2.0	43	74.1	8	13.8	7	12.1
C76–C79	CUP	50	1.7	26	52.0	9	18.0	15	30.0
C81	Hodgkin lymphoma	23	0.8	23	100.0				
C82–C85	NHL	104	3.6	87	83.7	7	6.7	10	9.6
C90	Mult. myeloma	15	0.5	6	40.0	3	20.0	6	40.0
C91–C96	Leukaemia	22	0.8	8	36.4	5	22.7	9	40.9
Others, specified		57	1.9	32	56.1	11	19.3	14	24.6
All further malignancies		2928	100.0	2122	72.5	287	9.8	519	17.7

Further malignancies with number of cases 1 to 9 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 2007-2020
(**First primaries only** *)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4	1		0.1	1.00			5.3	
5- 9								
10-14								
15-19	1		0.1	1.00			2.2	
20-24	1		0.0	0.33			1.5	
25-29	3		0.1	0.30			3.5	
30-34	6	6	0.3	0.27	0.3	0.19	4.3	3.8
35-39	26	27	1.1	0.50	1.2	0.55	10.4	7.3
40-44	85	62	3.4	0.70	2.6	0.49	15.2	8.2
45-49	269	182	10.0	0.68	7.0	0.58	20.8	12.7
50-54	550	396	21.6	0.68	15.8	0.61	23.5	17.6
55-59	952	603	44.8	0.69	27.7	0.66	24.7	18.9
60-64	1395	870	78.9	0.73	45.8	0.70	26.0	21.3
65-69	1834	1105	112.4	0.78	60.9	0.75	25.0	20.0
70-74	2013	1076	134.3	0.83	62.6	0.77	22.2	15.9
75-79	1728	992	142.8	0.87	66.1	0.81	19.0	13.2
80-84	1143	705	157.8	0.99	66.2	0.87	15.4	9.7
85+	597	570	127.8	0.91	54.7	0.91	9.2	6.1
All ages	10604	6594					19.8	13.5
Mortality								
Raw			32.6	0.80	19.6	0.74		
WS			15.9	0.77	8.7	0.70		
ES			23.4	0.78	12.7	0.71		
BRD-S			29.9	0.80	15.6	0.73		
PYLL-70								
per 100,000			161.6		108.5			
ES			137.2		88.9			
AYLL-70			9.0		9.4			

* See corresponding tables with multiple malignancies.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**Single primaries only** *)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4	1		0.1	1.00			5.3	
5- 9								
10-14								
15-19	1		0.1	1.00			2.2	
20-24								
25-29	3		0.1	0.33			3.5	
30-34	6	6	0.3	0.29	0.3	0.19	4.4	3.8
35-39	26	27	1.1	0.51	1.2	0.57	10.5	7.4
40-44	85	61	3.4	0.70	2.5	0.52	15.3	8.2
45-49	265	178	9.9	0.69	6.8	0.58	20.7	12.5
50-54	539	389	21.2	0.70	15.5	0.62	23.3	17.6
55-59	937	586	44.1	0.70	26.9	0.68	24.6	18.7
60-64	1344	851	76.0	0.74	44.8	0.72	25.5	21.3
65-69	1760	1064	107.8	0.79	58.7	0.75	24.6	19.7
70-74	1921	1035	128.1	0.83	60.2	0.78	22.0	15.8
75-79	1606	951	132.7	0.85	63.3	0.80	18.5	13.1
80-84	1062	681	146.7	0.95	64.0	0.87	15.2	9.8
85+	551	544	118.0	0.86	52.2	0.87	9.3	6.0
All ages	10107	6373					19.7	13.4
Mortality								
Raw			31.0	0.80	19.0	0.75		
WS			15.2	0.77	8.5	0.71		
ES			22.4	0.78	12.3	0.72		
BRD-S			28.5	0.80	15.1	0.73		
PYLL-70								
per 100,000			157.8		106.0			
ES			134.0		86.9			
AYLL-70			9.1		9.5			

* See corresponding tables with multiple malignancies.

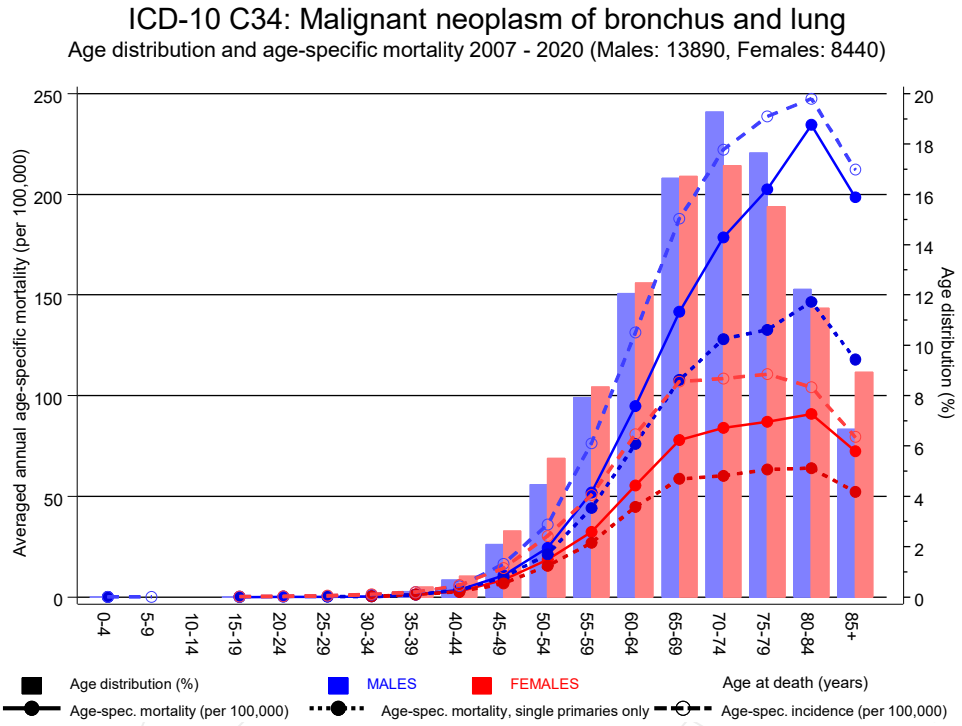
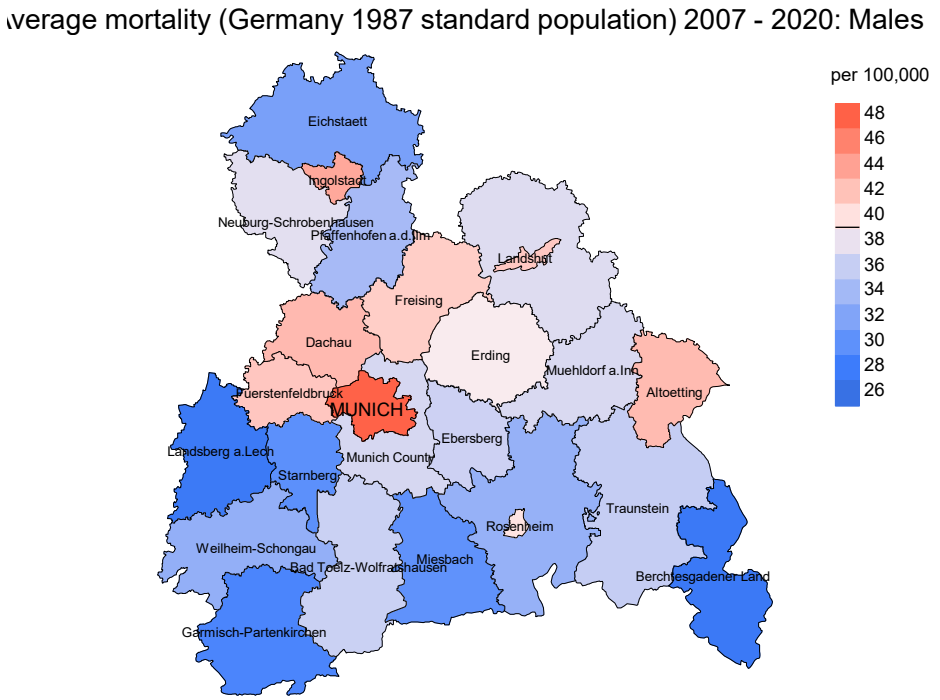


Figure 17. Distribution of age at death (bars; males: mean=69.3 yrs, median=70.0 yrs; females: mean=68.9 yrs, median=69.3 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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



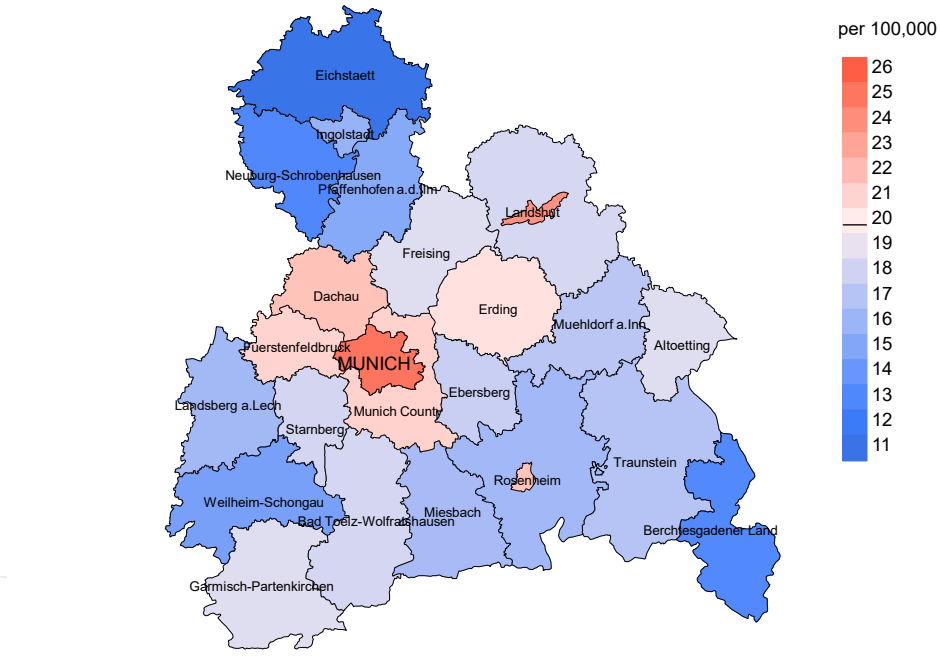
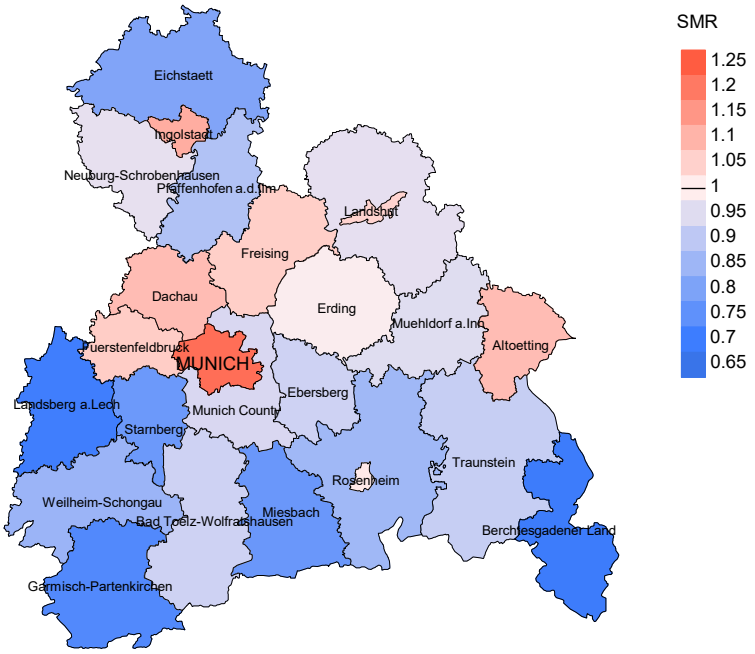


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2020. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 39.2/100,000 WS N=13,890, females 19.9/100,000 WS N=8,440).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,727 female residents (averaged) in the period from 2007 to 2020 a total of 207 women died from lung cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 17.8/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 14.7 and 21.3/100,000.

Standardized mortality ratio (SMR) 2007 - 2020: Males



Standardized mortality ratio (SMR) 2007 - 2020: Females

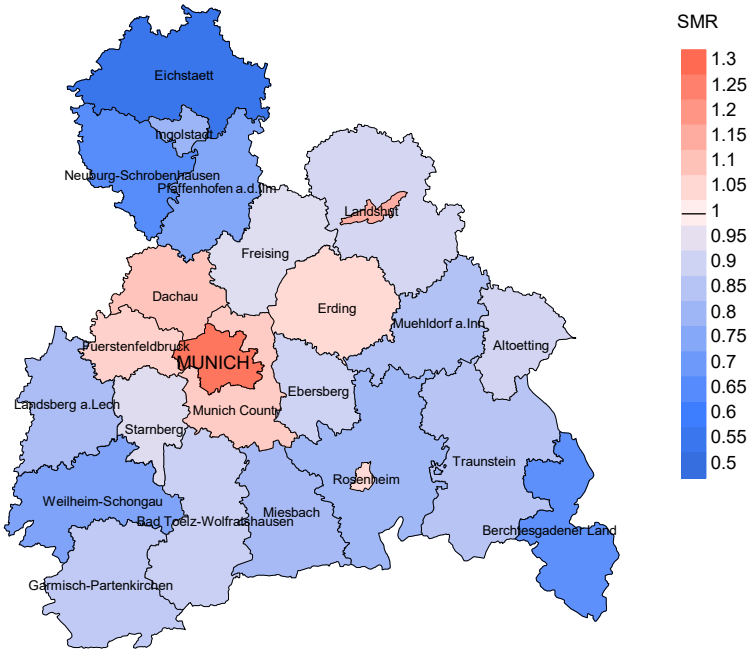


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=13,890, females N=8,440).

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 2020 a total of 207 women died from lung cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.90. Though, the value of this parameter may vary with an underlying probability of 99% between 0.75 and 1.07, 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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