Munich Cancer Registry

- Survival
- Selection Matrix
- Homepage
- *Deutsch*

ICD-10 C33, C34: Lung cancer

Incidence and Mortality

Year of diagnosis	1998-2020
Patients	41,907
Diseases	42,387
Creation date	12/21/2021
Database export	12/20/2021
Population	4.95 m

Munich Cancer Registry
Cancer Registry Bavaria - Upper Bavaria Regional Center
at Klinikum Grosshadern/IBE
Marchioninistr. 15
Munich, 81377
Germany

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

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

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 2015) used for specifying cancer site

Code	Description
C33	Malignant neoplasm of trachea
C34.-	Malignant neoplasm of bronchus and lung
C34.0	Main bronchus
C34.1	Upper lobe, bronchus or lung
C34.2	Middle lobe, bronchus or lung
C34.3	Lower lobe, bronchus or lung
C34.8	Overlapping lesion of bronchus and lung
C34.9	Bronchus or lung, unspecified

INCIDENCE

Table 1

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

Year of diagnosis	All cases n	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	1019	191	18.7	11.6	5.0	95.8	99.2
1999	1077	190	17.6	12.6	4.9	95.1	99.0
2000	1100	254	23.1	13.1	4.9	94.6	99.1
2001	1106	233	21.1	13.7	4.9	94.9	98.9
2002	1738	387	22.3	14.4	4.8	95.1	98.8 #
2003	1779	341	19.2	14.9	4.7	94.9	99.3
2004	1758	327	18.6	15.3	4.7	94.9	99.0
2005	1761	295	16.8	15.9	4.6	94.4	98.7
2006	1802	295	16.4	16.3	4.6	92.9	98.3
2007	2163	312	14.4	16.5	4.6	92.1	98.1 #
2008	2198	261	11.9	16.9	4.5	90.5	99.3
2009	2230	283	12.7	17.3	4.4	90.8	98.7
2010	2253	268	11.9	17.7	4.2	90.9	99.2
2011	2296	260	11.3	18.1	4.0	90.6	99.3
2012	2289	252	11.0	18.4	3.8	88.5	99.3
2013	2293	258	11.3	18.7	3.6	87.4	99.0
2014	2308	261	11.3	19.0	3.5	84.1	98.4
2015	2367	308	13.0	19.4	3.1	82.8	98.3
2016	2267	296	13.1	19.6	2.8	79.8	99.8
2017	2169	291	13.4	19.9	2.6	76.0	99.8
2018	1763	141	8.0	20.3	2.3	63.1	99.8
2019	1393	20	1.4	20.5	2.0	52.8	100.0
2020	1258	2	0.2	20.7	1.4	44.6	99.6 ##
1998-2020	42387	5726	13.5	20.7	5.0	85.8	99.1

42,387 cases diagnosed 1998-2020 are related to a total of 41,907 patients. Currently, in 10,393 (24.8 %) of these 41,907 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 8,125 / 1,750 / 518 (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 1,763 cases has been diagnosed, of which 20.3 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 2.3 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1a

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

Year of diagnosis	Males n	Males %	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	681	66.8	125	18.4	11.5	5.2	96.3	99.4
1999	746	69.3	136	18.2	12.1	5.2	95.2	98.9
2000	748	68.0	158	21.1	12.8	5.1	95.2	99.1
2001	765	69.2	155	20.3	13.7	5.1	94.9	98.6
2002	1177	67.7	252	21.4	14.5	5.0	96.1	99.1 #
2003	1169	65.7	229	19.6	15.0	4.9	95.6	99.5
2004	1143	65.0	192	16.8	15.3	4.9	95.7	99.3
2005	1159	65.8	172	14.8	15.9	4.9	94.8	98.8
2006	1193	66.2	178	14.9	16.3	4.8	92.9	98.2
2007	1407	65.0	198	14.1	16.7	4.9	92.7	97.9 #
2008	1421	64.6	160	11.3	17.1	4.8	92.0	99.2
2009	1411	63.3	168	11.9	17.5	4.7	91.7	98.7
2010	1412	62.7	148	10.5	17.7	4.5	92.1	99.0
2011	1416	61.7	145	10.2	18.3	4.4	92.2	99.4
2012	1394	60.9	149	10.7	18.7	4.2	90.2	99.5
2013	1412	61.6	154	10.9	19.1	4.0	88.8	99.3
2014	1362	59.0	147	10.8	19.5	3.7	85.3	98.8
2015	1443	61.0	196	13.6	19.8	3.3	84.1	98.6
2016	1331	58.7	183	13.7	20.0	3.1	82.6	99.8
2017	1256	57.9	168	13.4	20.3	2.7	79.8	99.8
2018	1023	58.0	81	7.9	20.7	2.5	66.1	99.6
2019	760	54.6	7	0.9	20.9	2.0	58.3	100.0
2020	693	55.1	1	0.1	21.1	1.9	48.2	99.9 ##
1998-2020	26522	62.6	3502	13.2	21.1	5.2	87.9	99.1

26,522 cases diagnosed 1998-2020 are related to a total of 26,205 patients. Currently, in 6,663 (25.4 %) of these 26,205 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 5,205 / 1,121 / 337 (19.9 % / 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 1,023 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	331	30.7	54	16.3	13.8	4.6	94.9	99.1	
2000	352	32.0	96	27.3	13.7	4.5	93.5	99.1	
2001	341	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	615	35.0	135	22.0	15.4	4.3	93.3	98.5	
2005	602	34.2	123	20.4	15.8	4.3	93.5	98.5	
2006	609	33.8	117	19.2	16.2	4.2	92.9	98.5	
2007	756	35.0	114	15.1	16.1	4.1	91.0	98.5	#
2008	777	35.4	101	13.0	16.5	4.1	87.8	99.4	
2009	819	36.7	115	14.0	17.0	3.9	89.1	98.7	
2010	841	37.3	120	14.3	17.5	3.7	88.8	99.4	
2011	880	38.3	115	13.1	17.7	3.5	88.2	99.1	
2012	895	39.1	103	11.5	17.9	3.3	85.8	98.9	
2013	881	38.4	104	11.8	17.9	3.2	85.2	98.4	
2014	946	41.0	114	12.1	18.1	3.1	82.3	97.9	
2015	924	39.0	112	12.1	18.6	2.7	80.8	97.8	
2016	936	41.3	113	12.1	18.9	2.5	75.7	99.9	
2017	913	42.1	123	13.5	19.2	2.3	70.9	99.9	
2018	740	42.0	60	8.1	19.5	1.9	59.1	100.0	
2019	633	45.4	13	2.1	19.7	2.0	46.1	100.0	
2020	565	44.9	1	0.2	20.0	0.7	40.2	99.3	##
1998-2020	15865	37.4	2224	14.0	20.0	4.6	82.3	99.0	

15,865 cases diagnosed 1998-2020 are related to a total of 15,702 patients. Currently, in 3,730 (23.8 %) of these 15,702 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 2,920 / 629 / 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	681	338	61.5	28.7	37.0	14.3	55.3	20.6	71.0	25.3
1999	746	331	66.7	27.9	40.5	13.9	59.5	20.0	74.6	24.9
2000	748	352	65.7	29.3	39.0	14.9	58.0	21.3	73.9	26.0
2001	765	341	66.0	28.0	39.7	14.0	58.0	20.2	72.5	24.9
2002	1177	561	63.2	28.7	35.6	14.0	53.4	20.3	69.2	24.8
2003	1169	610	62.4	31.0	35.0	15.4	52.0	22.1	65.9	26.6
2004	1143	615	60.8	31.1	33.0	14.9	49.3	21.5	63.4	26.6
2005	1159	602	61.2	30.3	32.9	14.6	48.7	21.2	62.3	25.8
2006	1193	609	62.3	30.3	33.1	14.4	49.0	20.9	62.4	25.4
2007	1407	756	63.5	32.7	33.1	16.2	49.3	23.2	64.2	28.1
2008	1421	777	63.8	33.5	33.1	16.4	49.1	23.5	62.7	28.3
2009	1411	819	63.2	35.2	32.6	16.5	48.2	23.7	61.0	29.1
2010	1412	841	62.6	35.9	31.8	17.1	46.8	24.5	59.1	29.7
2011	1416	880	63.3	37.6	31.5	17.3	46.4	25.0	58.9	30.6
2012	1394	895	61.4	37.9	30.2	17.5	44.6	25.3	57.0	30.7
2013	1412	881	61.3	37.0	29.9	17.3	44.1	24.8	56.0	29.7
2014	1362	946	58.4	39.3	27.6	18.3	41.0	26.0	52.8	31.6
2015	1443	924	60.7	38.0	29.0	17.1	43.1	24.7	54.9	30.2
2016	1331	936	55.4	38.1	26.7	17.3	39.4	24.9	50.0	30.3
2017	1256	913	52.0	37.0	24.4	16.4	36.3	23.7	46.4	29.2
2018	1023	740	42.0	29.8	20.2	13.9	29.7	19.7	37.5	24.0
2019	760	633	31.2	25.5	14.7	11.7	21.8	16.8	27.8	20.4
2020	693	565	28.5	22.8	13.8	10.4	20.2	14.9	25.4	18.3
1998–2020	26522	15865	57.0	32.9	29.1	15.4	42.9	22.1	54.4	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	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	1019	67.1	11.3	28.1	93.1	52.5	58.7	67.5	75.6	81.6
1999	1077	67.1	11.3	24.9	96.3	52.7	59.0	67.3	75.0	82.3
2000	1100	67.3	11.7	15.8	96.0	52.0	59.2	67.5	75.8	81.7
2001	1106	67.0	11.2	17.0	96.4	52.3	59.7	67.1	74.9	81.0
2002	1738	68.1	11.5	27.5	99.5	53.0	60.5	68.5	76.5	82.0
2003	1779	67.9	11.2	17.5	97.6	53.4	60.5	68.3	75.8	82.3
2004	1758	68.4	11.1	24.4	98.0	54.2	61.2	68.3	76.6	82.2
2005	1761	68.2	11.2	18.1	98.5	54.2	61.0	68.4	76.6	82.5
2006	1802	68.4	10.9	27.5	102	54.8	61.5	68.1	76.7	82.4
2007	2163	68.4	11.2	7.5	99.1	53.9	61.4	68.7	76.6	81.9
2008	2198	68.4	10.9	22.3	99.4	54.5	61.3	68.7	76.4	82.0
2009	2230	69.0	11.1	20.3	102	54.3	61.5	69.3	76.8	83.1
2010	2253	68.7	10.8	0.5	97.8	54.5	61.9	69.3	76.3	82.3
2011	2296	69.0	10.9	28.9	97.6	54.2	62.0	69.7	76.6	83.0
2012	2289	69.3	11.0	22.9	96.8	54.5	62.2	69.9	77.0	83.2
2013	2293	69.2	10.8	27.9	100	54.2	62.1	70.0	76.6	82.6
2014	2308	69.6	11.1	15.9	100	54.2	62.6	70.8	77.1	83.3
2015	2367	70.1	10.8	23.7	100	55.1	63.1	71.0	77.5	83.5
2016	2267	69.8	10.8	20.9	102	55.6	62.5	70.4	77.2	83.0
2017	2169	70.0	10.7	24.2	98.4	55.6	62.4	70.8	77.9	82.7
2018	1763	69.4	10.8	18.5	99.8	55.4	62.5	70.4	77.0	81.9
2019	1393	69.5	10.5	19.7	98.8	55.9	62.6	70.3	77.2	81.4
2020	1258	69.4	10.0	21.5	95.2	56.5	63.0	70.0	77.1	81.4
1998–2020	42387	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	681	66.7	10.7	28.1	91.7	53.8	58.9	67.0	74.9	80.3
1999	746	66.6	10.8	24.9	96.3	53.0	59.0	66.9	73.6	80.6
2000	748	67.0	10.8	28.1	94.2	53.3	59.3	66.8	74.6	80.8
2001	765	66.6	10.8	17.0	96.4	52.7	60.2	66.3	73.6	80.2
2002	1177	68.1	10.8	32.2	94.9	53.7	61.1	68.0	76.0	81.6
2003	1169	67.9	10.3	36.8	95.4	54.4	61.1	68.2	75.0	81.3
2004	1143	68.3	10.5	36.9	94.3	54.5	61.5	68.5	76.1	81.5
2005	1159	68.3	10.6	18.1	98.5	55.5	61.9	68.4	75.8	81.6
2006	1193	68.2	10.0	28.7	102	55.2	61.9	68.1	75.7	80.7
2007	1407	68.8	10.5	7.5	97.3	55.2	62.4	69.2	76.7	81.7
2008	1421	68.7	10.3	22.3	99.4	55.7	61.9	69.2	76.3	81.3
2009	1411	69.0	10.6	30.8	100	55.6	61.8	69.1	76.5	82.5
2010	1412	68.8	10.5	0.5	97.5	54.9	62.3	69.5	75.8	81.9
2011	1416	68.9	10.6	28.9	94.3	54.5	62.4	69.9	76.1	82.3
2012	1394	69.5	10.7	22.9	96.6	55.5	63.1	70.3	77.0	82.7
2013	1412	69.6	10.3	27.9	99.7	55.4	62.5	70.6	76.7	82.3
2014	1362	70.3	10.4	30.3	96.0	55.8	63.4	71.6	77.5	83.2
2015	1443	70.3	10.7	29.2	93.8	55.7	63.4	71.4	77.5	83.5
2016	1331	70.1	10.4	25.5	96.7	56.2	62.9	71.2	77.1	83.1
2017	1256	70.2	10.4	28.7	98.4	55.9	62.8	71.3	77.8	82.5
2018	1023	70.0	10.1	24.7	96.4	56.7	63.3	70.9	77.2	81.9
2019	760	70.2	10.1	22.3	96.7	56.7	63.6	71.4	78.0	81.4
2020	693	69.7	9.6	30.6	94.4	57.5	63.0	70.1	77.2	81.5
1998–2020	26522	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	331	68.2	12.2	32.9	94.8	51.8	59.0	69.1	77.7	83.8
2000	352	67.8	13.2	15.8	96.0	50.0	58.9	69.4	78.0	84.0
2001	341	68.0	12.1	31.5	93.9	50.9	59.2	69.1	76.8	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	615	68.5	12.1	24.4	98.0	52.9	60.3	68.1	78.3	83.6
2005	602	68.0	12.4	21.6	96.1	52.5	58.8	68.3	77.8	83.7
2006	609	68.8	12.4	27.5	100	53.4	60.2	68.1	78.6	85.0
2007	756	67.7	12.2	22.3	99.1	51.3	59.4	68.0	76.6	82.8
2008	777	67.9	11.9	29.4	97.3	52.4	60.5	67.9	76.5	82.9
2009	819	68.9	12.0	20.3	102	53.0	60.9	69.6	77.5	83.9
2010	841	68.6	11.4	33.2	97.8	53.9	61.5	68.3	77.0	83.6
2011	880	69.1	11.4	33.0	97.6	53.4	61.4	69.3	77.6	84.5
2012	895	69.0	11.4	33.3	96.8	53.6	60.7	69.5	77.0	84.0
2013	881	68.7	11.5	30.6	100	53.6	61.1	69.2	76.3	84.1
2014	946	68.5	11.9	15.9	100	51.7	60.9	69.7	76.5	83.3
2015	924	69.7	11.0	23.7	100	54.7	62.8	70.4	77.3	83.5
2016	936	69.4	11.2	20.9	102	54.8	62.2	69.7	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	633	68.7	10.9	19.7	98.8	55.1	61.7	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	15865	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	24	0.1	0.1	11	0.1	0.1	13	0.1	0.2
30-34	58	0.2	0.3	26	0.1	0.3	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	0.7	1.3	143	1.2	2.2
45-49	824	2.8	4.5	448	2.5	3.8	376	3.3	5.5
50-54	1689	5.8	10.3	921	5.2	9.0	768	6.7	12.1
55-59	2743	9.4	19.6	1630	9.2	18.2	1113	9.7	21.8
60-64	3900	13.3	33.0	2347	13.2	31.5	1553	13.5	35.3
65-69	5049	17.3	50.2	3095	17.4	48.9	1954	17.0	52.3
70-74	5239	17.9	68.1	3361	18.9	67.8	1878	16.3	68.6
75-79	4584	15.7	83.8	2912	16.4	84.3	1672	14.5	83.1
80-84	2912	10.0	93.8	1801	10.2	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	29247	100.0		17741	100.0		11506	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=1901 %	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	11	13	0.5	0.6			1.2	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	444	375	16.5	14.4	1.6	4.0	8.8	4.0
50-54	918	765	36.0	30.5	3.5	2.7	10.9	6.1
55-59	1622	1106	76.4	50.8	4.3	3.5	12.8	8.3
60-64	2330	1541	131.8	81.2	6.1	4.2	13.2	9.9
65-69	3069	1942	188.0	107.1	6.8	5.7	12.6	10.2
70-74	3338	1869	222.6	108.7	8.7	9.0	12.2	9.4
75-79	2892	1664	239.0	110.8	11.7	11.4	12.0	8.5
80-84	1796	1109	248.0	104.2	20.4	25.1	11.7	7.2
85+	991	828	212.2	79.4	44.4	50.6	9.4	5.1
All ages	17633	11452			10.8	11.4	11.5	7.4
Incidence								
Raw			54.1	34.1				
WS			26.5	15.8				
ES			39.1	22.6				
BRD-S			49.7	27.5				

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).

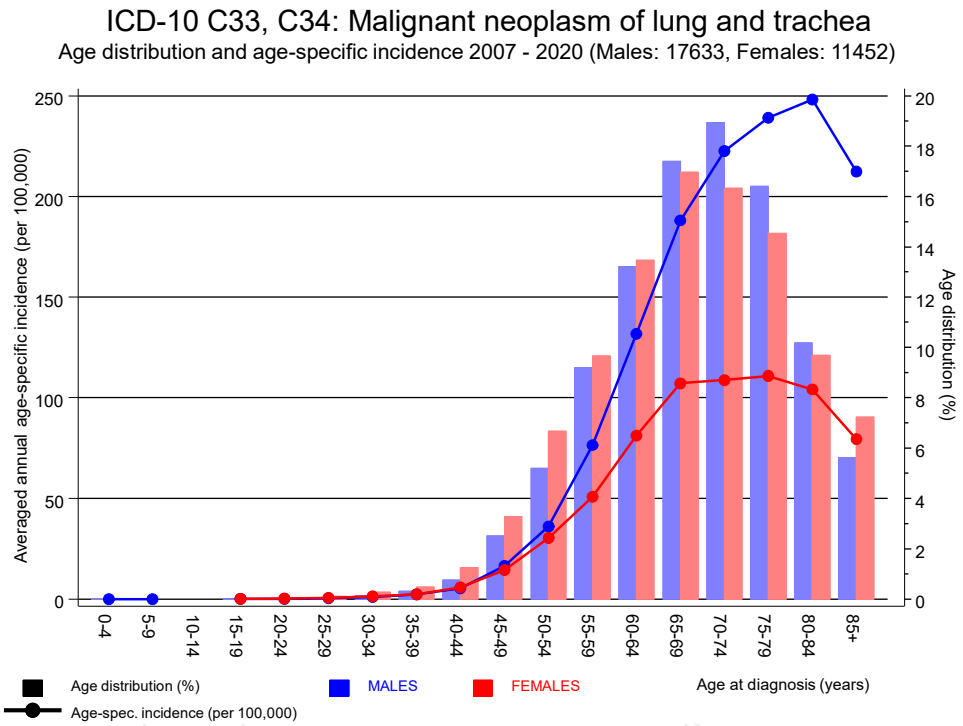


Figure 6. Age distribution (males: mean=69.6 yrs, median=70.3 yrs; females: mean=68.8 yrs, median=69.4 yrs) and age-specific incidence.

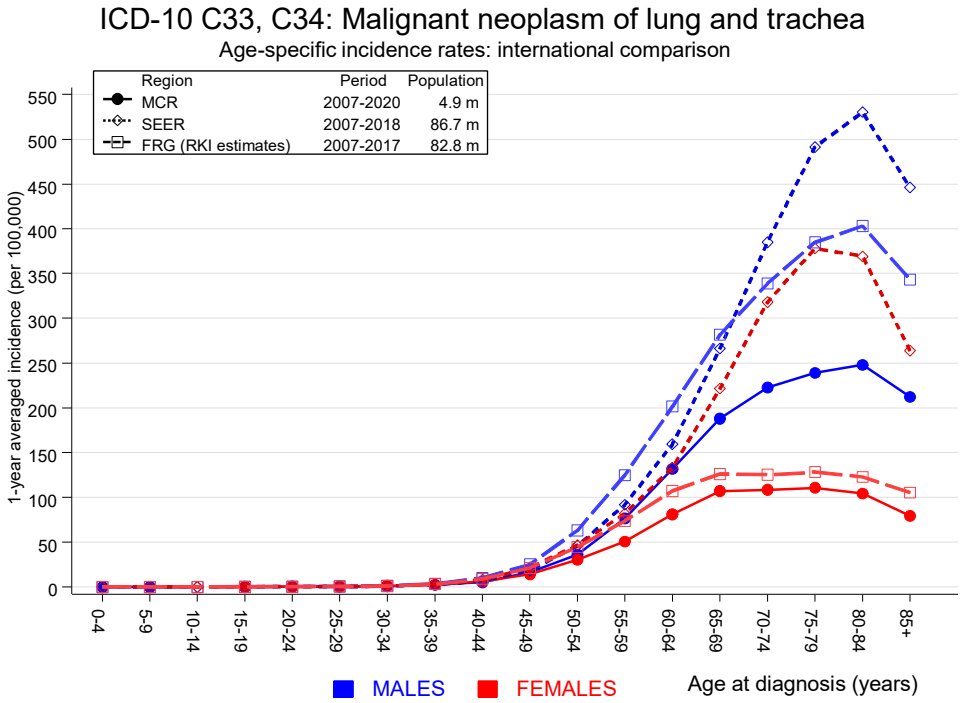


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, RKI estimates) and SEER (Surveillance, Epidemiology, and End Results, USA).

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		0.6	33.3
C03–C06	Oral cavity	44	5.0	8.8	6.4	11.8	#	10.7	15.9
C09–C10	Oropharynx	64	6.3	10.2	7.9	13.0	#	15.8	4.7
C12–C13	Hypopharynx	21	3.4	6.2	3.8	9.4	#	4.8	4.8
C15	Oesophagus	60	12.1	5.0	3.8	6.4	#	13.1	10.0
C16	Stomach	82	22.7	3.6	2.9	4.5	#	16.3	12.2
C17	Small intestine	15	3.5	4.2	2.4	7.0	#	3.1	6.7
C18	Colon	121	56.3	2.1	1.8	2.6	#	17.7	16.5
C19–C20	Rectum	63	31.7	2.0	1.5	2.5	#	8.6	6.3
C22	Liver	59	17.5	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	22.8	3.2	2.5	4.0	#	13.5	38.9
C26	GI cancer	5	0.6	8.9	2.9	20.8	#	1.2	20.0
C32	Larynx	68	6.0	11.3	8.8	14.3	#	17.0	14.7
C33–C34	Lung	319	70.8	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	26.5	1.6	1.2	2.2	#	4.5	11.6
C46,C49	Soft tissue	8	3.3	2.4	1.1	4.8	#	1.3	
C48	Peritoneal	3	0.5	6.2	1.3	18.2	#	0.7	
C50	Breast	5	1.6	3.1	1.0	7.2	#	0.9	60.0
C61	Prostate	225	170.9	1.3	1.2	1.5	#	14.8	16.9
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	#	14.9	17.3
C65	Renal pelvis	12	2.6	4.6	2.4	8.0	#	2.6	
C67	Bladder	85	26.6	3.2	2.6	3.9	#	16.0	12.9
C68	Urinary org.	5	0.3	14.8	4.8	34.4	#	1.3	60.0
C70–C72	CNS cancer	13	7.5	1.7	0.9	3.0		1.5	53.8
C73	Thyroid	10	3.8	2.6	1.3	4.8	#	1.7	
C76–C79	CUP	19	9.6	2.0	1.2	3.1	#	2.6	5.3
C82–C85	NHL	66	24.4	2.7	2.1	3.4	#	11.4	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		1646	598.1	2.8	2.6	2.9	#	287.1	13.3

Patients	23794
Median age at next malignancy (years)	71.5
Person-years	36503
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	5.2	2.3	10.3	#	2.7	
C09–C10	Oropharynx	13	1.2	10.7	5.7	18.3	#	4.9	7.7
C15	Oesophagus	15	1.8	8.2	4.6	13.5	#	5.4	6.7
C16	Stomach	26	7.8	3.3	2.2	4.9	#	7.5	30.8
C17	Small intestine	9	1.5	6.1	2.8	11.5	#	3.1	11.1
C18	Colon	55	22.7	2.4	1.8	3.2	#	13.3	16.4
C19–C20	Rectum	17	9.6	1.8	1.0	2.8	#	3.0	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	11.3	4.4	3.3	5.8	#	16.0	36.0
C32	Larynx	6	0.5	11.9	4.4	26.0	#	2.3	16.7
C33–C34	Lung	162	21.1	7.7	6.5	9.0	#	58.1	1.2
C43	Malign. melanoma	24	10.0	2.4	1.5	3.6	#	5.8	8.3
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	82.4	2.1	1.8	2.5	#	38.6	16.5
C51	Vulva	13	2.6	5.0	2.7	8.6	#	4.3	7.7
C53	Cervix uteri	16	3.3	4.8	2.7	7.8	#	5.2	18.8
C54	Corpus uteri	20	15.0	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	#	5.4	26.3
C65	Renal pelvis	9	0.8	11.7	5.3	22.2	#	3.4	
C66	Ureter	4	0.4	9.6	2.6	24.6	#	1.5	
C67	Bladder	26	4.6	5.7	3.7	8.4	#	8.8	11.5
C70–C72	CNS cancer	6	3.2	1.9	0.7	4.0		1.1	33.3
C73	Thyroid	19	4.3	4.4	2.7	6.9	#	6.1	10.5
C76–C79	CUP	18	4.1	4.4	2.6	6.9	#	5.7	5.6
C82–C85	NHL	19	9.5	2.0	1.2	3.1	#	3.9	10.5
C90	Mult. myeloma	8	3.0	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	820	257.5	3.2	3.0	3.4	#	231.8	14.5

Patients	14130
Median age at next malignancy (years)	70.7
Person-years	24265
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”.

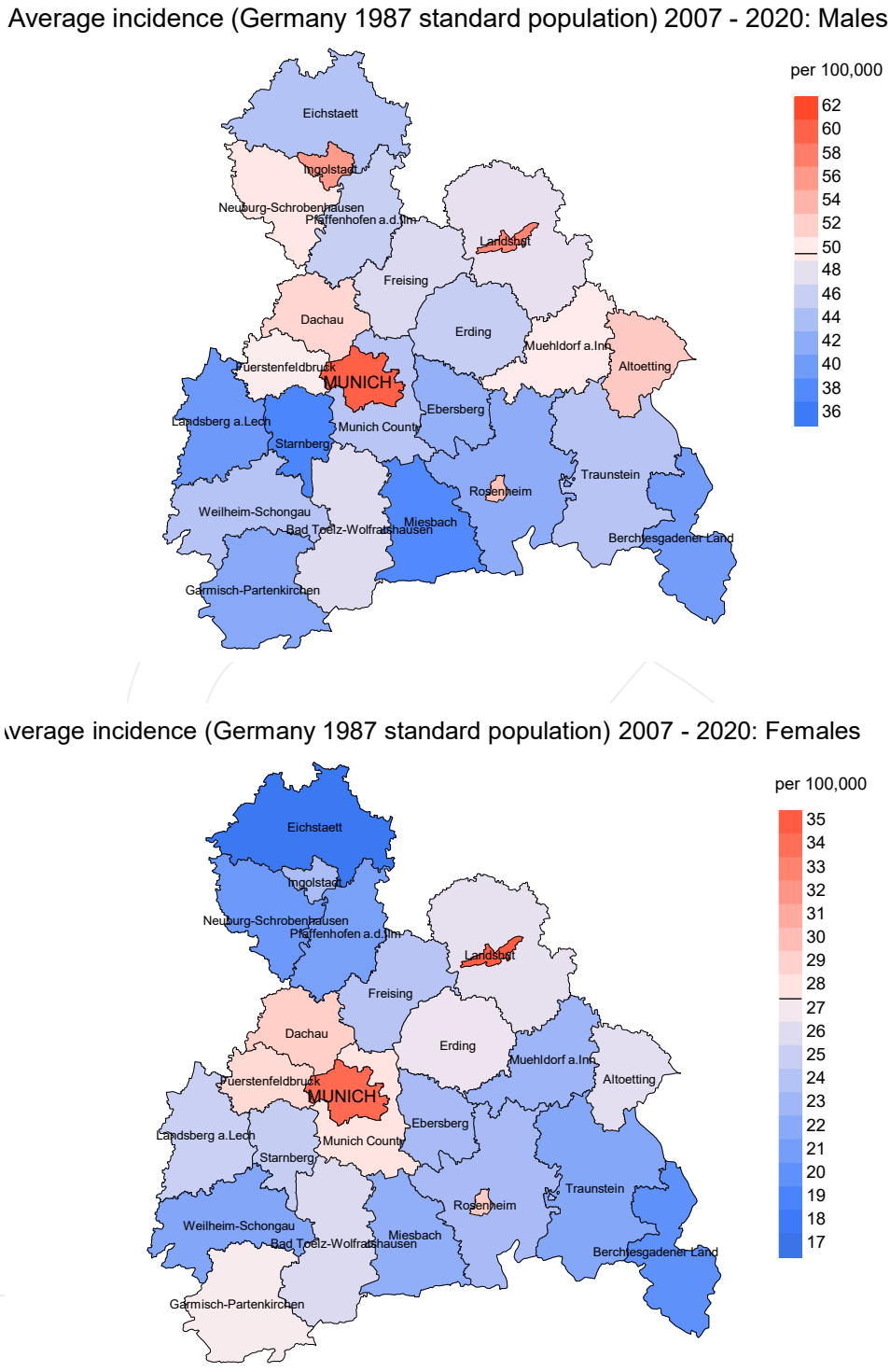


Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 49.7/100,000 WS N=17,633, females 27.5/100,000 WS N=11,452).

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.

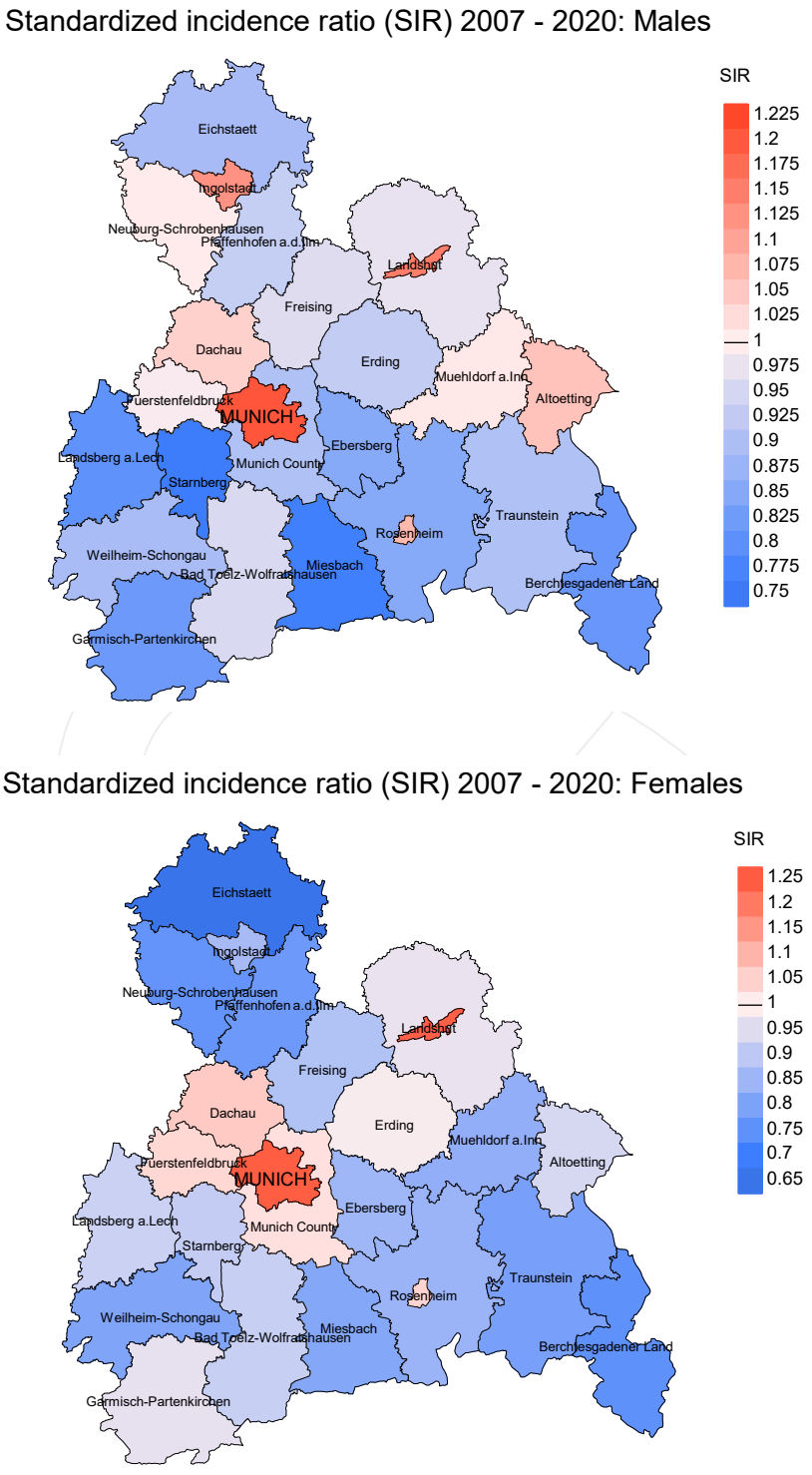


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=17,633, females N=11,452).

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 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 4.94 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	1019	99.2	18.7	976	95.8	93.3
1999	1077	99.0	17.6	1024	95.1	95.1
2000	1100	99.1	23.1	1041	94.6	95.5
2001	1106	98.9	21.1	1050	94.9	95.1
2002	1738	98.8	22.3	1652	95.1	97.3
2003	1779	99.3	19.2	1688	94.9	97.2
2004	1758	99.0	18.6	1668	94.9	97.5
2005	1761	98.7	16.8	1662	94.4	98.3
2006	1802	98.3	16.4	1674	92.9	98.2
2007	2163	98.1	14.4	1992	92.1	98.0
2008	2198	99.3	11.9	1989	90.5	98.3
2009	2230	98.7	12.7	2024	90.8	98.2
2010	2253	99.2	11.9	2048	90.9	98.1
2011	2296	99.3	11.3	2081	90.6	97.8
2012	2289	99.3	11.0	2026	88.5	96.9
2013	2293	99.0	11.3	2005	87.4	96.7
2014	2308	98.4	11.3	1941	84.1	96.4
2015	2367	98.3	13.0	1961	82.8	96.1
2016	2267	99.8	13.1	1808	79.8	92.6
2017	2169	99.8	13.4	1649	76.0	85.4
2018	1763	99.8	8.0	1113	63.1	61.4
2019	1393	100.0	1.4	735	52.8	81.5
2020	1258	99.6	0.2	561	44.6	95.4
1998–2020	42387	99.1	13.5	36368	85.8	94.9

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	1019	853	92.0	444	43.6
1999	1077	896	94.2	451	41.9
2000	1100	979	95.1	495	45.0
2001	1106	968	94.3	478	43.2
2002	1738	1353	97.6	794	45.7
2003	1779	1456	97.8	804	45.2
2004	1758	1515	97.8	771	43.9
2005	1761	1495	97.9	787	44.7
2006	1802	1553	98.1	757	42.0
2007	2163	1731	98.5	890	41.1
2008	2198	1727	98.8	842	38.3
2009	2230	1831	99.1	863	38.7
2010	2253	1911	98.8	920	40.8
2011	2296	1944	99.0	953	41.5
2012	2289	1900	98.1	880	38.4
2013	2293	1941	98.2	916	39.9
2014	2308	1910	98.6	869	37.7
2015	2367	1991	98.7	914	38.6
2016	2267	1908	98.6	859	37.9
2017	2169	1877	97.8	858	39.6
2018	1763	1478	67.9	550	31.2
2019	1393	1134	44.2	314	22.5
2020	1258	1241	94.6	325	25.8
1998–2020	42387	35592	94.8	16734	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	853	83.9	16.1	97.6
1999	896	88.6	11.4	97.4
2000	979	90.6	9.4	98.3
2001	968	88.1	11.9	96.7
2002	1353	92.2	7.8	97.2
2003	1456	93.4	6.6	97.6
2004	1515	94.9	5.1	98.0
2005	1495	93.3	6.7	96.9
2006	1553	92.9	7.1	97.2
2007	1731	93.8	6.2	97.2
2008	1727	94.6	5.4	97.4
2009	1831	93.7	6.3	97.4
2010	1911	93.7	6.3	97.1
2011	1944	94.3	5.7	96.8
2012	1900	93.4	6.6	96.7
2013	1941	93.9	6.1	96.7
2014	1910	93.2	6.8	96.1
2015	1991	92.8	7.2	95.6
2016	1908	91.8	8.2	95.4
2017	1877	90.1	9.9	95.2
2018	1478	81.7	18.3	88.7
2019	1134	75.1	24.9	91.0
2020	1241	83.3	16.7	89.9
1998-2020	35592	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	584	69.1	68.4	71.4	69.8
1999	615	69.0	69.1	68.6	69.3
2000	664	68.3	68.0	72.3	68.4
2001	670	68.8	68.3	71.1	69.3
2002	945	69.0	68.5	74.4	68.8
2003	1020	68.8	68.5	72.1	68.9
2004	1010	69.6	69.5	73.0	69.7
2005	998	69.8	69.5	75.2	69.9
2006	1064	69.8	69.6	73.0	69.8
2007	1161	70.1	69.7	74.5	70.1
2008	1145	70.1	69.5	75.6	69.8
2009	1216	70.6	70.4	74.3	70.4
2010	1228	70.9	70.5	75.5	70.8
2011	1240	71.1	70.8	74.6	70.9
2012	1188	71.3	70.6	78.9	71.1
2013	1211	72.3	72.2	76.5	72.3
2014	1174	72.7	72.4	75.9	72.6
2015	1237	72.6	72.1	77.5	72.3
2016	1128	73.7	73.3	76.4	73.6
2017	1160	73.8	73.2	77.6	73.3
2018	907	73.1	72.2	76.0	73.1
2019	678	74.2	72.4	76.7	73.8
2020	731	74.1	72.9	79.6	73.1
1998–2020	22974	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	269	69.1	68.7	75.0	70.3
1999	281	72.3	72.3	77.5	72.3
2000	315	70.3	69.7	78.1	70.4
2001	298	71.6	70.9	76.0	71.7
2002	408	70.8	70.1	76.7	70.8
2003	436	71.1	70.8	73.6	71.0
2004	505	71.9	70.9	80.3	71.5
2005	497	68.9	68.5	79.9	68.8
2006	489	70.6	70.0	78.5	70.0
2007	570	70.4	69.9	76.2	70.1
2008	582	70.2	69.6	79.8	69.9
2009	615	69.7	69.2	81.7	69.6
2010	683	70.2	70.0	78.3	70.2
2011	704	69.8	69.5	76.3	69.7
2012	712	71.2	70.9	79.6	71.1
2013	730	71.8	71.3	81.9	71.6
2014	736	71.9	71.3	82.5	71.5
2015	754	72.1	71.8	77.2	71.9
2016	780	72.0	71.5	76.7	71.5
2017	717	72.0	71.6	76.1	71.9
2018	571	73.2	72.3	76.7	72.9
2019	456	71.4	70.2	74.7	71.0
2020	510	73.6	72.8	78.1	73.1
1998–2020	12618	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	482	43.5	0.71	26.1	0.71	39.4	0.71	51.6	0.73
1999	544	48.6	0.73	28.7	0.71	43.6	0.73	57.6	0.77
2000	600	52.7	0.81	30.9	0.80	46.6	0.81	60.8	0.83
2001	586	50.6	0.77	29.5	0.75	44.3	0.77	57.7	0.80
2002	869	46.6	0.74	26.1	0.73	39.0	0.73	50.9	0.74
2003	950	50.7	0.81	28.1	0.80	41.8	0.81	54.0	0.82
2004	962	51.1	0.84	27.5	0.83	41.4	0.84	53.9	0.85
2005	919	48.5	0.80	25.3	0.77	38.0	0.78	49.9	0.80
2006	987	51.5	0.83	26.4	0.80	39.9	0.82	52.4	0.84
2007	1086	49.0	0.78	24.9	0.76	37.6	0.77	49.7	0.78
2008	1076	48.3	0.76	24.6	0.75	36.9	0.76	48.1	0.77
2009	1133	50.8	0.81	25.1	0.77	37.7	0.79	49.3	0.81
2010	1139	50.5	0.81	24.9	0.79	37.1	0.80	48.2	0.82
2011	1162	51.9	0.83	25.0	0.80	37.5	0.82	48.8	0.83
2012	1096	48.3	0.79	23.4	0.78	34.6	0.78	44.8	0.79
2013	1133	49.2	0.81	23.0	0.77	34.5	0.79	45.3	0.81
2014	1086	46.6	0.80	21.5	0.78	32.3	0.79	42.0	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	1041	43.1	0.83	19.2	0.79	29.1	0.81	38.3	0.83
2018	723	29.7	0.71	13.4	0.67	20.2	0.69	26.2	0.70
2019	500	20.5	0.66	9.2	0.63	13.8	0.64	18.2	0.66
2020	589	24.2	0.85	10.7	0.78	16.3	0.81	21.4	0.84
1998-2020	20812	44.7	0.79	22.1	0.76	33.1	0.78	43.0	0.79

Table 11b

Mortality measures (cancer-related death) and mortality-incidence-index
by year of death
FEMALES

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	234	19.9	0.69	9.7	0.68	14.1	0.69	17.1	0.67
1999	250	21.1	0.76	9.8	0.71	14.4	0.73	18.5	0.75
2000	287	23.9	0.82	11.9	0.80	17.1	0.80	21.3	0.82
2001	268	22.0	0.79	10.4	0.75	15.3	0.76	19.2	0.77
2002	379	19.4	0.68	9.2	0.66	13.5	0.67	16.6	0.67
2003	410	20.8	0.67	9.8	0.63	14.4	0.65	17.8	0.67
2004	476	24.1	0.78	11.0	0.74	16.1	0.75	20.5	0.77
2005	476	23.9	0.79	11.2	0.77	16.4	0.77	20.2	0.79
2006	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	0.70
2008	558	24.0	0.72	11.0	0.67	16.1	0.69	20.0	0.71
2009	582	25.0	0.71	11.7	0.71	16.9	0.72	20.6	0.71
2010	652	27.9	0.78	12.6	0.74	18.1	0.75	22.5	0.76
2011	671	28.7	0.77	13.0	0.75	18.8	0.76	23.3	0.76
2012	679	28.8	0.76	12.6	0.72	18.3	0.73	22.8	0.75
2013	690	28.9	0.78	12.4	0.72	18.1	0.73	22.4	0.75
2014	695	28.9	0.74	12.4	0.68	18.1	0.70	22.6	0.72
2015	717	29.5	0.78	12.4	0.73	18.2	0.74	23.0	0.77
2016	736	30.0	0.79	12.6	0.73	18.6	0.75	23.3	0.77
2017	652	26.5	0.72	11.2	0.69	16.4	0.69	20.6	0.71
2018	487	19.6	0.66	8.2	0.60	12.0	0.62	15.1	0.63
2019	356	14.3	0.57	6.4	0.55	9.1	0.55	11.4	0.56
2020	445	17.9	0.79	7.2	0.70	10.7	0.72	13.7	0.75
1998-2020	11694	24.2	0.74	10.7	0.70	15.7	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	512	2.3	3.4	291	2.1	3.1	221	2.6	3.9
50-54	1089	4.9	8.3	621	4.5	7.5	468	5.5	9.4
55-59	1813	8.1	16.4	1107	8.0	15.5	706	8.3	17.8
60-64	2735	12.2	28.6	1680	12.1	27.6	1055	12.5	30.3
65-69	3728	16.7	45.2	2314	16.6	44.2	1414	16.7	47.0
70-74	4133	18.5	63.7	2683	19.3	63.5	1450	17.1	64.1
75-79	3763	16.8	80.5	2453	17.6	81.1	1310	15.5	79.6
80-84	2669	11.9	92.5	1700	12.2	93.3	969	11.5	91.1
85+	1684	7.5	100.0	928	6.7	100.0	756	8.9	100.0
All ages	22371	100.0		13913	100.0		8458	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	0.27			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	291	221	10.8	0.66	8.5	0.59	20.6	13.2
50-54	621	468	24.4	0.68	18.6	0.61	23.4	17.7
55-59	1107	706	52.1	0.68	32.4	0.64	25.0	18.5
60-64	1680	1055	95.0	0.72	55.6	0.68	26.2	21.1
65-69	2314	1414	141.8	0.75	78.0	0.73	25.2	20.3
70-74	2683	1450	179.0	0.80	84.3	0.78	22.6	16.6
75-79	2453	1310	202.7	0.85	87.2	0.79	19.6	13.3
80-84	1700	969	234.8	0.95	91.0	0.87	16.2	10.3
85+	928	756	198.7	0.94	72.5	0.91	10.2	6.3
All ages	13913	8458					20.1	13.7
Mortality								
Raw			42.7	0.79	25.2	0.74		
WS			20.1	0.76	11.0	0.70		
ES			30.2	0.77	16.0	0.71		
BRD-S			39.3	0.79	19.9	0.72		
PYLL-70								
per 100,000			187.5		129.7			
ES			159.0		106.1			
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	27	0.5	22	81.5	1	3.7	4	14.8
C03–C06	Oral cavity	215	3.7	168	78.1	25	11.6	22	10.2
C07–C08	Salivary gland	14	0.2	13	92.9	1	7.1		
C09–C10	Oropharynx	205	3.5	145	70.7	23	11.2	37	18.0
C12–C13	Hypopharynx	110	1.9	76	69.1	18	16.4	16	14.5
C15	Oesophagus	116	2.0	44	37.9	34	29.3	38	32.8
C16	Stomach	209	3.6	113	54.1	38	18.2	58	27.8
C17	Small intestine	25	0.4	10	40.0	6	24.0	9	36.0
C18	Colon	458	7.8	319	69.7	63	13.8	76	16.6
C19–C20	Rectum	249	4.2	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	1.6	19	19.6	20	20.6	58	59.8
C30–C31	Sinuses	22	0.4	20	90.9			2	9.1
C32	Larynx	278	4.7	208	74.8	30	10.8	40	14.4
C33–C34	Lung	326	5.5			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	523	8.9	363	69.4	48	9.2	112	21.4
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	1248	21.2	1022	81.9	85	6.8	141	11.3
C62	Testis	66	1.1	59	89.4	2	3.0	5	7.6
C64	Kidney	245	4.2	172	70.2	32	13.1	41	16.7
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	42	0.7	34	81.0	4	9.5	4	9.5
C76–C79	CUP	81	1.4	48	59.3	20	24.7	13	16.0
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	45	0.8	16	35.6	7	15.6	22	48.9
Others, specified		78	1.3	48	61.5	9	11.5	21	26.9
All further malignancies		5879	100.0	3954	67.3	729	12.4	1196	20.3

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	2.3	17	24.6	18	26.1	34	49.3
C32	Larynx	29	1.0	22	75.9	2	6.9	5	17.2
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	31.5	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	63	2.1	45	71.4	11	17.5	7	11.1
C76–C79	CUP	51	1.7	26	51.0	10	19.6	15	29.4
C81	Hodgkin lymphoma	23	0.8	23	100.0				
C82–C85	NHL	105	3.6	88	83.8	7	6.7	10	9.5
C90	Mult. myeloma	15	0.5	6	40.0	3	20.0	6	40.0
C91–C96	Leukaemia	22	0.7	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		2937	100.0	2125	72.4	291	9.9	521	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	0.27			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	270	182	10.1	0.68	7.0	0.58	20.9	12.7
50-54	550	398	21.6	0.68	15.8	0.62	23.5	17.7
55-59	956	604	45.0	0.69	27.7	0.66	24.8	18.9
60-64	1397	871	79.0	0.73	45.9	0.70	26.1	21.4
65-69	1834	1108	112.4	0.78	61.1	0.75	25.0	20.0
70-74	2015	1079	134.4	0.83	62.8	0.77	22.2	15.9
75-79	1729	993	142.9	0.87	66.1	0.81	19.0	13.2
80-84	1143	706	157.8	0.99	66.3	0.88	15.4	9.8
85+	597	571	127.8	0.91	54.8	0.91	9.2	6.1
All ages	10614	6607					19.8	13.5
Mortality								
Raw			32.6	0.80	19.7	0.74		
WS			15.9	0.77	8.8	0.70		
ES			23.5	0.78	12.7	0.71		
BRD-S			29.9	0.80	15.6	0.73		
PYLL-70								
per 100,000			161.9		108.7			
ES			137.4		89.1			
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	0.30			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	266	178	9.9	0.69	6.8	0.58	20.8	12.5
50-54	539	391	21.2	0.70	15.6	0.62	23.3	17.7
55-59	941	587	44.3	0.70	27.0	0.68	24.7	18.7
60-64	1345	853	76.1	0.74	44.9	0.72	25.5	21.4
65-69	1760	1066	107.8	0.79	58.8	0.75	24.6	19.7
70-74	1923	1038	128.3	0.83	60.4	0.78	22.0	15.8
75-79	1606	952	132.7	0.85	63.4	0.80	18.5	13.1
80-84	1062	682	146.7	0.95	64.1	0.87	15.2	9.8
85+	551	545	118.0	0.86	52.3	0.87	9.3	6.1
All ages	10115	6386					19.7	13.5
Mortality								
Raw			31.1	0.79	19.0	0.75		
WS			15.2	0.77	8.5	0.71		
ES			22.5	0.78	12.3	0.72		
BRD-S			28.5	0.80	15.1	0.73		
PYLL-70								
per 100,000			158.1		106.3			
ES			134.2		87.1			
AYLL-70			9.1		9.5			

* See corresponding tables with multiple malignancies.

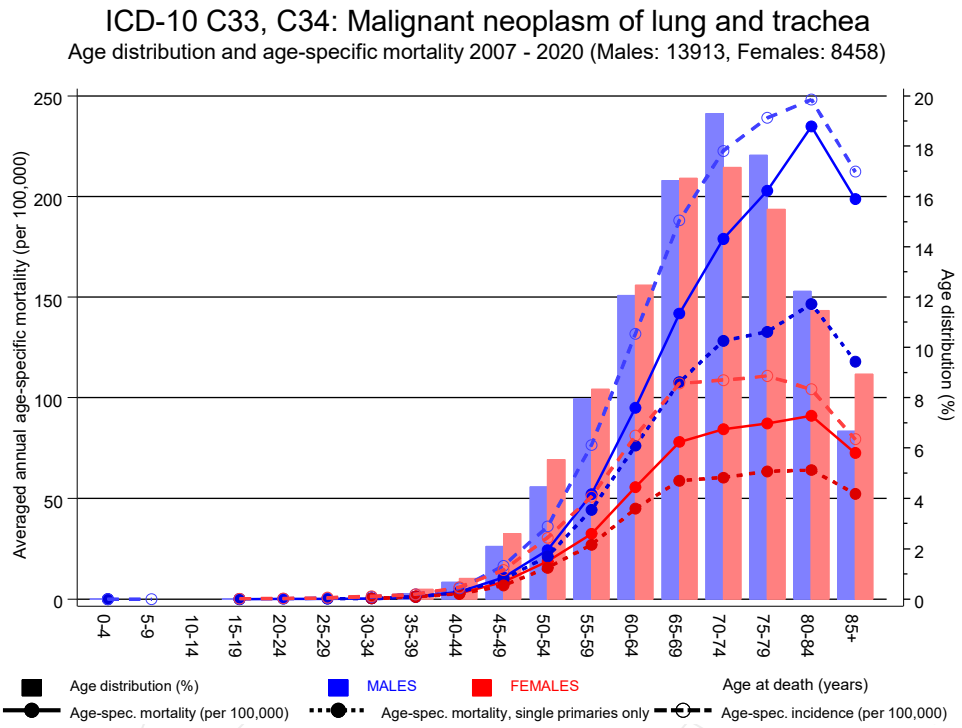


Figure 17. Distribution of age at death (bars; males: mean=69.3 yrs, median=70.0 yrs; females: mean=68.9 yrs, median=69.3 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed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

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

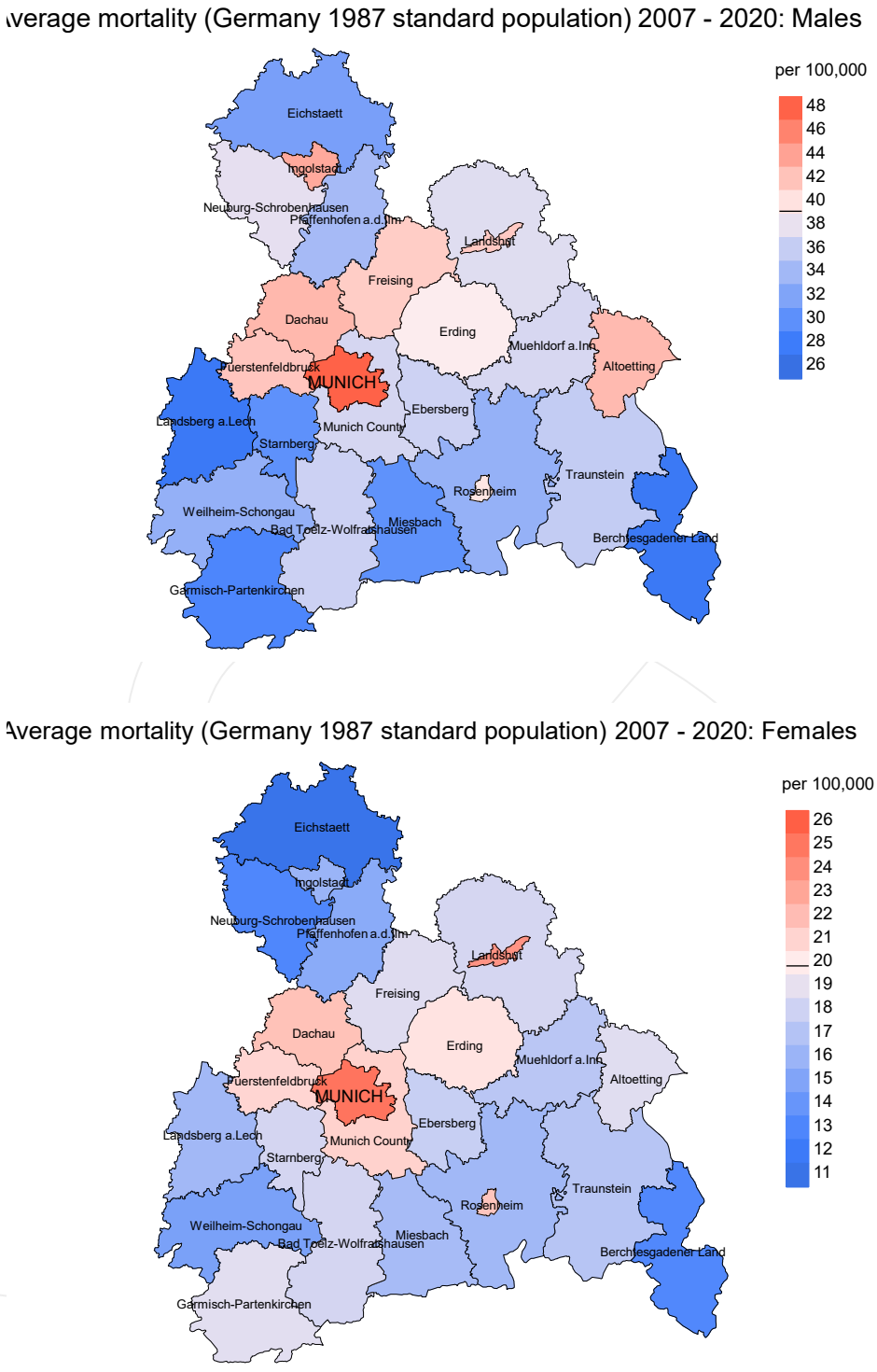
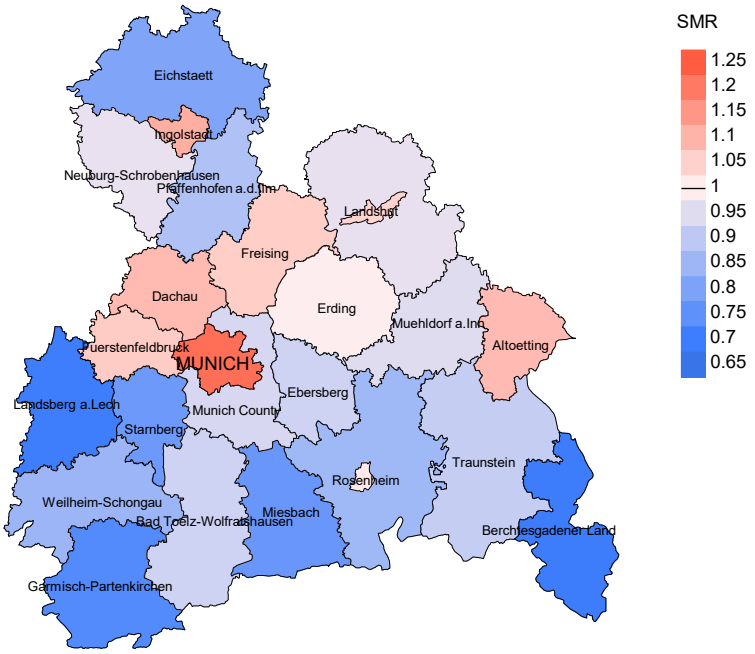


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2020. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 39.3/100,000 WS N=13,913, females 19.9/100,000 WS N=8,458).

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

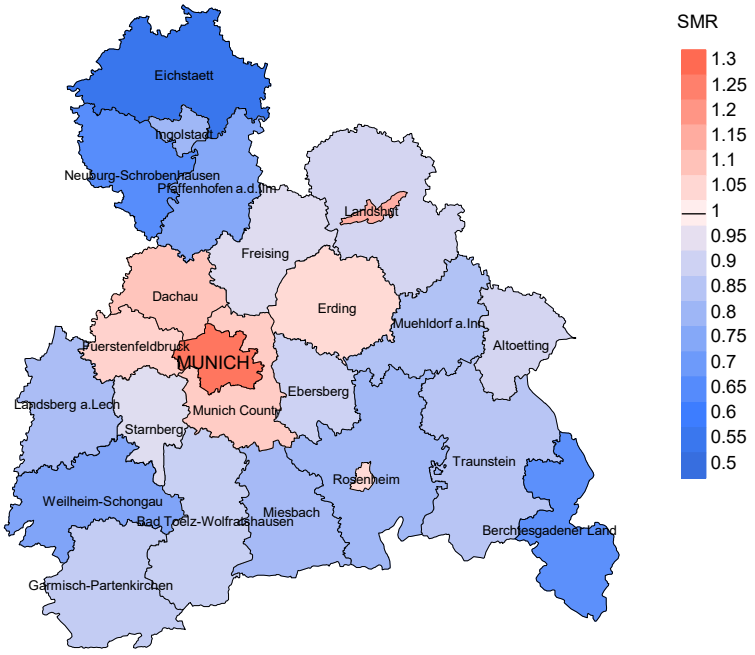


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=13,913, females N=8,458).

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 0.74 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

Recommended Citation

Munich Cancer Registry. ICD-10 C33, C34: Lung cancer - Incidence and Mortality [Internet]. 2021 [updated 2021 Dec 21; cited 2022 Feb 1]. Available from: https://www.tumorregister-muenchen.de/en/facts/base/bC3334E-ICD-10-C33-C34-Lung-cancer-incidence-and-mortality.pdf

Copyright

Disclaimer