

Munich Cancer Registry



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- ▶ Selection Matrix
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- ▶ *Deutsch*

ICD-10 C00-C96.9: All cancers (excl. C44)

Incidence and Mortality

Year of diagnosis	1998-2019
Patients	409,162
Diseases	455,600
Creation date	01/25/2021
Database export	01/07/2021
Population	4.92 m



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

<https://www.tumorregister-muenchen.de/en/facts/base/bC0096E-ICD-10-C00-C96.9-All-cancers-excl.-C44-incidence-and-mortality.pdf>

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**Global Statements about the statistics on the Internet –
Baseline Statistics** (grey button ) , **Survival** (red button )

In these analyses, the clinics and physicians of Upper Bavaria and the city and county of Landshut[#], with a total of 4.69 million inhabitants, account for the frequency of cancer diseases^{##} and the achieved long term results. Additionally, the long term survival evaluated by the Munich Cancer Registry (MCR) is compared with the results of the population-based registry in the USA (SEER), which is useful for checking the consistency of the data on an international level.

In comparing several tables, inconsistent figures may be detected. This is based on the fact that different patient cohorts are included in the base calculation, for example when proportions of multiple tumors or DCO-cases^{###} are concerned. In other cases the individual tumor diagnosis is the basis for calculation, for example with incidence.

The foot notes describe the currentness of the data. The baseline statistics and survival data are updated annually. This yearly analysis comprises the Annual Report of the MCR.

Clinics and physicians have access to essentially more detailed data, with which they can check, compare and in the best case optimize their own data and results.

We would be pleased to receive corrections, critique and useful suggestions. Just send an e-mail to tumor@ibe.med.uni-muenchen.de.

Munich Cancer Registry, January 2021

[#] Base data has been collected since 1998. An increase in new diseases is apparent, which is an effect of two extensions in the MCR catchment area (from a base population of 2.65 million to 4.10 in 2002, and to 4.69 million in 2007).

^{##} Due to the high frequency and good prognosis of non-malignant skin cancer (C44), no systematic ascertainment is performed for this diagnosis. C44 is not designated as a primary, but rather as a secondary tumor.

^{###} DCO (death certificate only) identifies a cancer case that first becomes available to the MCR through the death certificate.

ICD-10 codes (ICD-10 2015) used for specifying cancer site

Code	Description
C00-C96.9	Malignant neoplasms
	Excl.: C44.- Other malignant neoplasms of skin

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	12400	1515	12.2	11.2	10.4	75.8	97.0
1999	12335	1438	11.7	11.5	10.2	73.6	96.7
2000	12364	1604	13.0	11.9	10.1	72.2	97.1
2001	12783	1600	12.5	12.1	9.9	70.5	96.4
2002	21830	3263	14.9	12.4	9.8	72.4	97.2 #
2003	21366	2718	12.7	12.6	9.5	70.0	96.8
2004	21586	2513	11.6	12.7	9.3	67.6	96.6
2005	21599	2237	10.4	13.1	9.0	66.1	96.0
2006	21673	1946	9.0	13.4	8.7	63.8	94.3
2007	25095	2353	9.4	13.6	8.3	62.5	92.9 #
2008	25494	2203	8.6	13.9	7.9	60.3	97.9
2009	25229	2052	8.1	14.3	7.5	58.9	97.9
2010	25059	2104	8.4	14.6	7.0	57.3	97.8
2011	25205	1992	7.9	15.0	6.6	55.3	97.8
2012	25341	1936	7.6	15.3	6.1	52.8	97.6
2013	24998	1926	7.7	15.6	5.6	51.1	97.5
2014	24273	1967	8.1	15.9	5.1	49.3	96.6
2015	23413	2015	8.6	16.1	4.6	47.9	95.3
2016	21867	2049	9.4	16.4	4.1	44.8	99.3
2017	20737	1888	9.1	16.7	3.5	37.5	99.4
2018	16843	397	2.4	16.8	2.9	24.5	99.4
2019	14110	137	1.0	17.0	2.1	17.2	75.0 ##
1998-2019	455600	41853	9.2	17.0	10.4	56.5	96.3

455,600 cases diagnosed 1998-2019 are related to a total of 409,162 patients. Currently, in 79,135 (19.3 %) of these 409,162 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 64,563 / 11,262 / 3,310 (15.8 % / 2.8 % / 0.8 %) patients exist having 2 / 3 / 4+ malignancies.

The increases of incident cases in 2002 and 2007 reflect the expansion to additional registry areas.

Please be aware that data of recent annual patient cohorts may not yet be fully processed. The years under evaluation can be retrieved from the respective headings.

How to interpret:

In 2017, a subgroup of 20,737 cases has been diagnosed, of which 16.7 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 3.5 % 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 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	6140	49.5	766	12.5	10.7	11.8	79.5	97.6
1999	6123	49.6	727	11.9	10.9	11.7	78.3	97.6
2000	6280	50.8	820	13.1	11.3	11.5	76.2	97.4
2001	6465	50.6	765	11.8	11.6	11.4	74.4	96.9
2002	11328	51.9	1578	13.9	12.1	11.2	75.3	97.6 #
2003	11166	52.3	1313	11.8	12.4	11.0	72.7	97.4
2004	11218	52.0	1161	10.3	12.6	10.7	70.6	97.2
2005	11134	51.5	1048	9.4	13.1	10.4	69.0	96.4
2006	11257	51.9	953	8.5	13.4	10.0	67.4	94.4
2007	13209	52.6	1169	8.9	13.7	9.6	65.4	92.6 #
2008	13039	51.1	1069	8.2	14.2	9.2	64.2	98.3
2009	12829	50.9	990	7.7	14.6	8.7	62.8	98.2
2010	12635	50.4	974	7.7	15.0	8.2	61.2	98.0
2011	12856	51.0	945	7.4	15.4	7.7	59.1	98.2
2012	12946	51.1	924	7.1	15.8	7.2	55.9	97.9
2013	12864	51.5	937	7.3	16.1	6.6	54.4	97.6
2014	12347	50.9	955	7.7	16.4	6.1	52.7	96.6
2015	11657	49.8	1015	8.7	16.7	5.5	52.6	95.4
2016	10714	49.0	1037	9.7	17.0	5.0	49.8	99.3
2017	9874	47.6	918	9.3	17.3	4.3	42.2	99.6
2018	7576	45.0	195	2.6	17.5	3.5	29.0	99.6
2019	5848	41.4	68	1.2	17.6	2.6	22.1	75.7 ##
1998-2019	229505	50.4	20327	8.9	17.6	11.8	60.7	96.7

229,505 cases diagnosed 1998-2019 are related to a total of 203,712 patients. Currently, in 41,266 (20.3 %) of these 203,712 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 32,947 / 6,190 / 2,129 (16.2 % / 3.0 % / 1.0 %) patients exist having 2 / 3 / 4+ malignancies.

The increases of incident cases in 2002 and 2007 reflect the expansion to additional registry areas.

Please be aware that data of recent annual patient cohorts may not yet be fully processed. The years under evaluation can be retrieved from the respective headings.

How to interpret:

In 2017, a subgroup of 9,874 cases has been diagnosed, of which 17.3 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 4.3 % 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 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	6260	50.5	749	12.0	11.7	8.9	72.1	96.5
1999	6212	50.4	711	11.4	12.1	8.8	68.9	95.9
2000	6084	49.2	784	12.9	12.4	8.6	68.1	96.9
2001	6318	49.4	835	13.2	12.6	8.5	66.6	95.9
2002	10502	48.1	1685	16.0	12.7	8.3	69.3	96.9 #
2003	10200	47.7	1405	13.8	12.7	8.1	67.1	96.0
2004	10368	48.0	1352	13.0	12.9	7.8	64.3	96.0
2005	10465	48.5	1189	11.4	13.1	7.6	63.0	95.5
2006	10416	48.1	993	9.5	13.3	7.3	60.0	94.1
2007	11886	47.4	1184	10.0	13.4	7.0	59.2	93.2 #
2008	12455	48.9	1134	9.1	13.6	6.7	56.2	97.6
2009	12400	49.1	1062	8.6	13.9	6.3	54.9	97.7
2010	12424	49.6	1130	9.1	14.2	5.9	53.4	97.7
2011	12349	49.0	1047	8.5	14.5	5.5	51.2	97.3
2012	12395	48.9	1012	8.2	14.8	5.1	49.4	97.3
2013	12134	48.5	989	8.2	15.0	4.7	47.5	97.5
2014	11926	49.1	1012	8.5	15.3	4.2	45.9	96.6
2015	11756	50.2	1000	8.5	15.5	3.8	43.3	95.2
2016	11152	51.0	1012	9.1	15.7	3.3	40.0	99.3
2017	10861	52.4	970	8.9	16.0	2.8	33.3	99.2
2018	9267	55.0	202	2.2	16.1	2.4	20.7	99.3
2019	8262	58.6	69	0.8	16.3	1.8	13.7	74.6 ##
1998-2019	226092	49.6	21526	9.5	16.3	8.9	52.3	96.0

226,092 cases diagnosed 1998-2019 are related to a total of 205,447 patients. Currently, in 37,869 (18.4 %) of these 205,447 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 31,616 / 5,072 / 1,181 (15.4 % / 2.5 % / 0.6 %) patients exist having 2 / 3 / 4+ malignancies.

The increases of incident cases in 2002 and 2007 reflect the expansion to additional registry areas.

Please be aware that data of recent annual patient cohorts may not yet be fully processed. The years under evaluation can be retrieved from the respective headings.

How to interpret:

In 2017, a subgroup of 10,861 cases has been diagnosed, of which 16.0 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 2.8 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 2

Incidence measures by year of diagnosis including DCO cases
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.92 m as of 2007, respectively)

Year of diagnosis	Males n	Females n	Males Inc. raw	Fem. Inc. raw	Males Inc. WS	Fem. Inc. WS	Males Inc. ES	Fem. Inc. ES	Males Inc. BRD-S	Fem. Inc. BRD-S
1998	6140	6260	554.2	532.2	345.8	275.9	504.4	385.7	647.1	464.7
1999	6123	6212	547.1	523.5	335.6	272.4	490.4	379.1	624.0	456.1
2000	6280	6084	551.4	506.5	335.8	262.4	490.9	366.2	625.5	439.7
2001	6465	6318	557.8	519.4	337.2	270.0	491.6	377.2	621.0	451.6
2002	11328	10502	608.0	536.4	352.4	267.1	515.9	375.9	656.8	455.7
2003	11166	10200	595.7	517.8	341.5	260.3	498.0	363.9	631.5	437.5
2004	11218	10368	596.3	524.5	336.2	266.3	487.8	369.1	618.4	442.8
2005	11134	10465	587.8	525.9	328.1	262.8	472.7	366.0	597.4	439.6
2006	11257	10416	587.8	518.5	321.6	259.5	466.4	360.8	590.4	431.8
2007	13209	11886	596.3	514.7	326.7	258.0	471.0	358.8	594.1	428.6
2008	13039	12455	585.8	536.7	313.5	268.6	452.9	372.6	571.3	445.1
2009	12829	12400	574.8	533.2	302.3	266.3	437.3	369.7	551.7	440.9
2010	12635	12424	560.6	530.8	294.7	260.8	424.3	362.4	532.5	432.9
2011	12856	12349	574.6	528.3	294.5	260.2	425.1	359.7	536.7	428.7
2012	12946	12395	570.3	525.2	291.4	258.5	418.9	356.9	528.9	426.7
2013	12864	12134	558.9	508.9	284.0	250.3	407.8	345.6	513.6	411.8
2014	12347	11926	529.5	495.3	263.3	239.5	381.9	332.4	481.8	397.1
2015	11657	11756	490.0	483.1	240.7	231.1	350.9	322.3	446.1	386.2
2016	10714	11152	445.8	454.2	217.7	216.3	317.2	301.6	403.4	361.9
2017	9874	10861	409.2	440.6	193.9	209.9	285.1	293.2	365.3	351.3
2018	7576	9267	311.2	373.3	152.8	186.2	220.8	256.9	278.3	303.6
2019	5848	8262	240.2	332.8	116.1	165.9	168.9	229.3	214.3	270.7
1998-2019	229505	226092	520.6	493.8	275.6	244.6	397.9	339.7	501.0	406.1

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

Table 3

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	Median				
						10%	25%	50%	75%	90%
1998	12400	66.0	14.9	0.1	107	47.4	57.1	67.1	76.8	84.5
1999	12335	66.0	14.7	0.3	104	47.5	57.5	67.0	76.8	84.4
2000	12364	66.1	14.8	0.2	103	47.4	57.8	67.0	77.0	84.5
2001	12783	66.1	14.4	0.1	103	47.5	57.9	66.7	76.4	83.6
2002	21830	67.3	14.3	0.0	104	48.4	59.4	68.2	77.5	84.2
2003	21366	67.0	14.4	0.2	105	48.4	59.3	67.9	77.2	83.7
2004	21586	66.8	14.4	0.0	103	47.6	59.1	67.6	77.1	83.9
2005	21599	67.0	14.5	0.2	103	48.1	59.3	68.0	77.2	84.0
2006	21673	67.1	14.2	0.2	103	48.2	59.3	68.1	77.1	84.1
2007	25095	66.9	14.5	0.0	103	47.5	59.0	68.3	77.1	84.2
2008	25494	67.2	14.3	0.0	109	47.8	59.4	68.7	77.2	84.1
2009	25229	67.2	14.3	0.2	109	48.0	59.1	68.9	77.2	84.1
2010	25059	67.3	14.5	0.0	105	47.9	59.1	69.2	77.4	84.6
2011	25205	67.4	14.6	0.0	109	47.7	59.0	69.6	77.4	84.6
2012	25341	67.4	14.5	0.0	103	48.1	59.3	69.7	77.3	84.2
2013	24998	67.4	14.6	0.0	108	47.9	58.7	69.8	77.4	84.4
2014	24273	67.9	14.3	0.2	107	48.8	59.2	70.2	77.6	84.7
2015	23413	68.1	14.3	0.5	105	49.0	59.1	70.5	78.1	84.8
2016	21867	68.2	14.3	0.0	104	49.0	59.2	70.5	78.4	84.7
2017	20737	68.4	14.0	0.9	104	49.7	59.4	70.5	78.4	84.4
2018	16843	67.1	13.9	1.9	100	48.3	58.1	69.1	77.7	83.0
2019	14110	67.1	13.8	5.9	104	48.5	58.0	69.0	77.8	83.0
1998-2019	455600	67.2	14.4	0.0	109	48.2	58.9	68.9	77.5	84.2

Table 3a

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	Median				
						10%	25%	50%	75%	90%
1998	6140	65.8	14.1	0.4	99.8	49.1	57.9	66.9	75.4	82.9
1999	6123	66.1	13.6	0.3	99.5	50.5	58.6	67.0	75.2	82.4
2000	6280	66.3	13.7	0.2	99.7	50.4	59.1	67.1	75.5	82.2
2001	6465	66.1	13.2	0.1	102	50.5	59.3	66.7	75.0	81.4
2002	11328	67.1	13.3	0.1	102	51.2	60.6	68.0	75.8	82.2
2003	11166	67.0	13.1	0.3	101	51.5	60.6	67.9	75.6	82.1
2004	11218	66.9	13.2	0.0	101	50.6	60.6	67.7	75.9	82.2
2005	11134	67.0	13.4	0.2	102	50.9	60.9	68.0	75.8	82.3
2006	11257	67.4	12.9	0.2	102	51.8	61.2	68.3	76.0	82.2
2007	13209	67.1	13.5	0.0	101	50.1	60.7	68.4	76.1	82.2
2008	13039	67.6	13.1	0.0	105	51.5	61.3	69.1	76.2	82.4
2009	12829	67.7	13.1	0.2	105	50.6	61.1	69.3	76.3	82.5
2010	12635	67.7	13.5	0.0	102	50.8	60.9	69.5	76.5	83.0
2011	12856	68.1	13.4	0.0	109	50.6	61.5	70.1	76.6	83.2
2012	12946	68.2	13.4	0.0	103	51.6	61.7	70.3	76.8	83.0
2013	12864	68.1	13.7	0.0	103	50.6	61.1	70.6	76.9	83.2
2014	12347	68.8	13.2	0.2	104	52.0	61.6	70.9	77.4	83.8
2015	11657	69.1	13.3	0.5	105	52.0	61.7	71.3	78.1	84.0
2016	10714	69.2	13.1	0.0	104	52.4	61.8	71.5	78.2	84.0
2017	9874	69.8	12.7	0.9	102	53.5	62.3	72.0	78.5	83.6
2018	7576	68.7	12.7	1.9	99.4	52.5	61.3	70.5	77.9	82.7
2019	5848	69.0	12.5	5.9	98.7	53.0	61.6	71.1	78.1	82.8
1998-2019	229505	67.8	13.3	0.0	109	51.3	60.8	69.3	76.7	82.8

Table 3b

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	Median				
						10%	25%	50%	75%	90%
1998	6260	66.2	15.6	0.1	107	46.2	56.1	67.3	78.0	85.5
1999	6212	66.0	15.8	0.7	104	45.1	56.2	67.1	78.0	85.7
2000	6084	66.0	15.9	0.4	103	44.5	55.9	66.7	78.3	85.9
2001	6318	66.0	15.6	0.5	103	45.1	56.3	66.7	78.0	86.0
2002	10502	67.4	15.4	0.0	104	46.4	58.0	68.5	79.4	86.6
2003	10200	67.0	15.6	0.2	105	45.6	57.2	67.8	79.2	85.8
2004	10368	66.6	15.7	0.0	103	45.5	56.9	67.4	78.7	84.9
2005	10465	67.0	15.5	0.3	103	45.7	57.5	68.0	79.0	85.5
2006	10416	66.8	15.5	0.2	103	45.3	57.1	67.8	78.8	85.5
2007	11886	66.7	15.6	0.2	103	45.2	57.0	68.1	78.6	85.7
2008	12455	66.7	15.5	0.1	109	45.4	56.9	68.2	78.6	85.7
2009	12400	66.6	15.4	0.2	109	45.7	56.6	68.1	78.4	85.7
2010	12424	66.9	15.5	0.2	105	45.8	56.7	68.8	78.7	86.1
2011	12349	66.7	15.7	0.0	102	45.7	56.2	68.9	78.3	86.1
2012	12395	66.7	15.6	0.0	102	45.8	56.5	68.9	77.9	85.7
2013	12134	66.6	15.6	0.0	108	45.8	55.9	68.7	78.0	85.7
2014	11926	66.9	15.3	0.4	107	46.2	56.4	69.3	77.9	85.7
2015	11756	67.2	15.2	0.6	102	46.8	56.2	69.2	78.2	85.9
2016	11152	67.2	15.3	0.0	103	46.7	56.4	69.3	78.6	85.5
2017	10861	67.1	15.0	4.1	104	47.1	56.5	68.9	78.4	85.1
2018	9267	65.8	14.7	6.1	100	45.6	55.1	67.5	77.4	83.4
2019	8262	65.7	14.5	10.1	104	46.1	55.3	67.1	77.4	83.1
1998-2019	226092	66.7	15.4	0.0	109	45.8	56.5	68.3	78.4	85.5

Table 4

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

Age at diagnosis Years	Cases			Males			Females		
	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4	377	0.1	0.1	215	0.1	0.1	162	0.1	0.1
5-9	207	0.1	0.2	114	0.1	0.2	93	0.1	0.2
10-14	252	0.1	0.3	133	0.1	0.3	119	0.1	0.3
15-19	546	0.2	0.5	299	0.2	0.5	247	0.2	0.4
20-24	1067	0.4	0.8	591	0.4	0.9	476	0.3	0.7
25-29	2008	0.7	1.5	891	0.6	1.5	1117	0.7	1.5
30-34	3223	1.1	2.6	1217	0.8	2.3	2006	1.3	2.8
35-39	5045	1.7	4.3	1727	1.2	3.5	3318	2.2	5.1
40-44	8489	2.9	7.1	2637	1.8	5.3	5852	3.9	9.0
45-49	13906	4.7	11.8	4900	3.3	8.6	9006	6.0	15.0
50-54	19941	6.7	18.5	8050	5.4	14.0	11891	8.0	23.0
55-59	24774	8.3	26.8	12104	8.2	22.2	12670	8.5	31.5
60-64	31810	10.7	37.5	16852	11.4	33.5	14958	10.0	41.5
65-69	42051	14.1	51.6	23659	15.9	49.5	18392	12.3	53.8
70-74	46200	15.5	67.2	26866	18.1	67.6	19334	13.0	66.8
75-79	41941	14.1	81.2	23061	15.5	83.1	18880	12.6	79.4
80-84	29589	9.9	91.2	14836	10.0	93.1	14753	9.9	89.3
85+	26235	8.8	100.0	10242	6.9	100.0	15993	10.7	100.0
All ages	297661	100.0		148394	100.0		149267	100.0	

Table 5

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

Age at diagnosis Years	Males n	Females n	Males Age- spec. incid.	Females Age- spec. incid.	Males DCO rate n=10617 %	Females DCO rate n=11354 %	Males	Females
							Prop.all cancers %	Prop.all cancers %
0- 4	211	161	14.1	11.3	1.9	5.0	100.0	100.0
5- 9	114	93	7.9	6.8	1.8		100.0	100.0
10-14	133	117	9.0	8.3	0.8	0.9	100.0	100.0
15-19	299	247	18.8	16.6	0.7	0.4	100.0	100.0
20-24	588	474	31.5	26.9	0.9	0.4	100.0	100.0
25-29	878	1108	41.9	53.4	0.3	0.3	100.0	100.0
30-34	1200	1985	56.3	94.2	0.5	0.5	100.0	100.0
35-39	1706	3275	79.8	155.7	0.9	0.6	100.0	100.0
40-44	2598	5756	111.0	254.4	0.8	0.6	100.0	100.0
45-49	4789	8799	190.8	361.8	1.2	0.9	100.0	100.0
50-54	7844	11595	334.8	501.6	2.3	1.0	100.0	100.0
55-59	11780	12353	605.9	617.9	2.3	1.6	100.0	100.0
60-64	16325	14528	1001.0	827.6	3.1	2.2	100.0	100.0
65-69	22759	17789	1496.6	1055.9	3.8	3.1	100.0	100.0
70-74	25763	18654	1838.4	1161.5	5.0	4.8	100.0	100.0
75-79	22095	18114	1995.7	1315.5	7.9	7.5	100.0	100.0
80-84	14143	14201	2154.2	1458.9	15.3	15.9	100.0	100.0
85+	9838	15475	2307.1	1603.1	35.5	35.6	100.0	100.0
All ages	143063	144724			7.4	7.8	100.0	100.0
Incidence								
Raw			474.8	465.3				
WS			242.1	228.9				
ES			348.8	316.9				
BRD-S			438.5	377.3				

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).

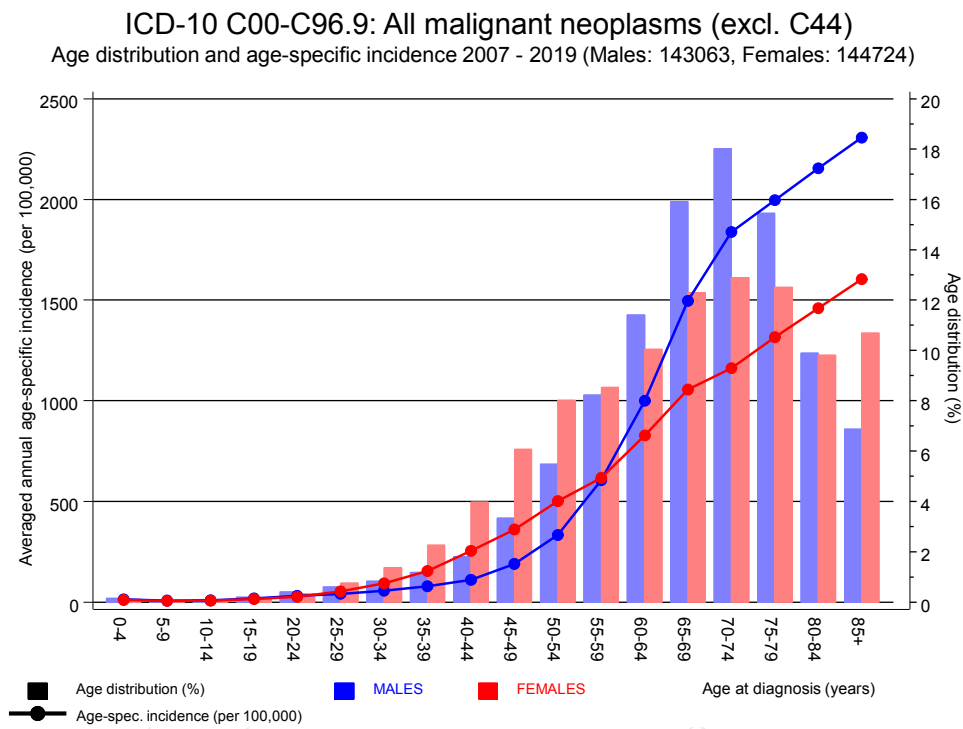


Figure 6. Age distribution (males: mean=68.2 yrs, median=70.1 yrs; females: mean=66.6 yrs, median=68.4 yrs) and age-specific incidence.

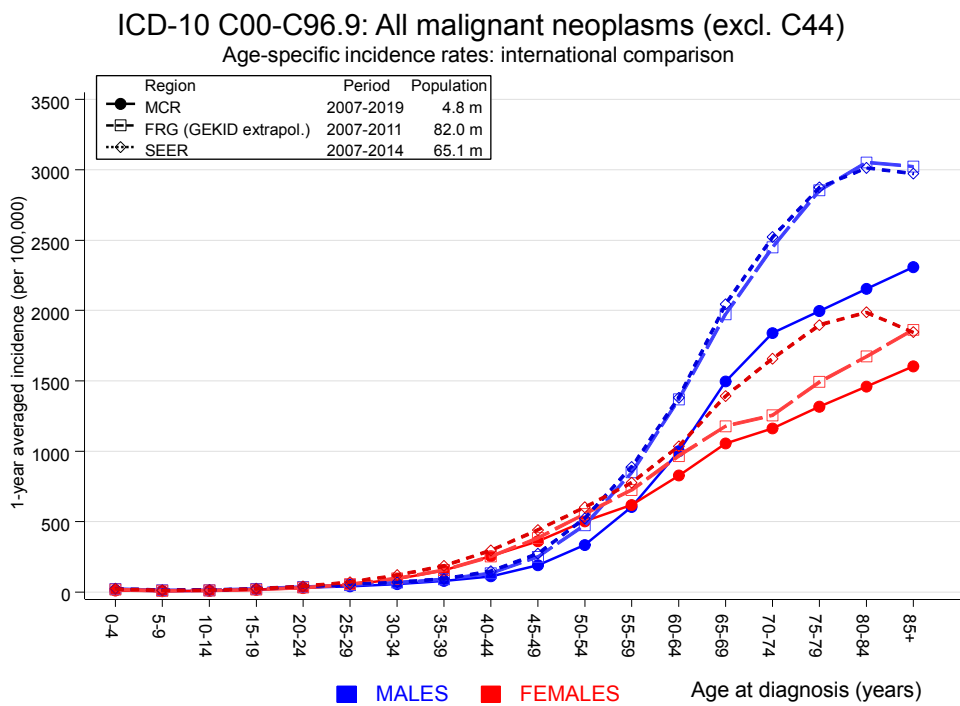


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

Extrapolated age-specific patient population of Germany, data status middle of 2010. Association of Population-based Cancer Registries in Germany (GEKID e.V.). Berlin, 2014. <http://www.gekid.de>. Last access: 02/11/2015
 Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 18 Regs Research Data, released April 2019, based on the November 2018 submission. <http://www.seer.cancer.gov>.

Table 7a

Standardized incidence ratio (SIR, with 95% confidence limits),
excess absolute risk (EAR) and DCO rate of further malignancies
for period 1998–2019

MALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C03-C06 Oral cavity	296	86.6	3.4	3.0	3.8 #	3.2	6.1
C07-C08 Salivary gland	61	26.1	2.3	1.8	3.0 #	0.5	6.6
C09-C10 Oropharynx	366	105.2	3.5	3.1	3.9 #	4.0	2.5
C12-C13 Hypopharynx	210	57.7	3.6	3.2	4.2 #	2.3	7.1
C15 Oesophagus	658	209.8	3.1	2.9	3.4 #	6.8	7.6
C16 Stomach	971	459.2	2.1	2.0	2.3 #	7.8	7.6
C17 Small intestine	281	64.5	4.4	3.9	4.9 #	3.3	2.5
C18 Colon	2489	1113.2	2.2	2.1	2.3 #	21.0	5.0
C19-C20 Rectum	1137	593.6	1.9	1.8	2.0 #	8.3	3.1
C21 Anus/canal	70	25.4	2.8	2.1	3.5 #	0.7	2.9
C22 Liver	657	322.4	2.0	1.9	2.2 #	5.1	15.5
C23-C24 Bile	237	118.1	2.0	1.8	2.3 #	1.8	12.2
C25 Pancreas	1003	437.7	2.3	2.2	2.4 #	8.6	24.6
C30-C31 Sinuses	44	20.1	2.2	1.6	2.9 #	0.4	6.8
C32 Larynx	303	109.0	2.8	2.5	3.1 #	3.0	13.5
C33-C34 Lung	3363	1324.5	2.5	2.5	2.6 #	31.1	11.9
C38,C45 Mesothelioma	163	78.9	2.1	1.8	2.4 #	1.3	6.1
C43 Malign. melanoma	1625	486.0	3.3	3.2	3.5 #	17.4	1.6
C46,C49 Soft tissue	165	63.3	2.6	2.2	3.0 #	1.6	2.4
C50 Breast	79	30.4	2.6	2.1	3.2 #	0.7	12.7
C60 Penis	66	28.2	2.3	1.8	3.0 #	0.6	6.1
C61 Prostate	4147	3237.1	1.3	1.2	1.3 #	13.9	6.6
C62 Testis	152	27.5	5.5	4.7	6.5 #	1.9	3.9
C64 Kidney	1300	384.9	3.4	3.2	3.6 #	13.9	7.1
C65 Renal pelvis	234	50.9	4.6	4.0	5.2 #	2.8	0.9
C66 Ureter	153	29.5	5.2	4.4	6.1 #	1.9	
C67 Bladder	1355	539.5	2.5	2.4	2.6 #	12.4	7.5
C68 Urethra	103	9.9	10.4	8.5	12.6 #	1.4	
C68 Urinary org.	45	7.8	5.8	4.2	7.7 #	0.6	73.3
C70-C72 CNS cancer	289	140.6	2.1	1.8	2.3 #	2.3	15.6
C73 Thyroid	218	67.6	3.2	2.8	3.7 #	2.3	3.2
C76-C79 CUP	379	192.6	2.0	1.8	2.2 #	2.8	3.2
C81 Hodgkin lymphoma	74	25.3	2.9	2.3	3.7 #	0.7	4.1
C82-C85 NHL	1188	481.4	2.5	2.3	2.6 #	10.8	6.6
C90 Mult. myeloma	284	151.6	1.9	1.7	2.1 #	2.0	14.4
C91-C96 Leukaemia	452	175.6	2.6	2.3	2.8 #	4.2	25.9
Others, specified	266	116.8	2.3	2.0	2.6 #	2.3	17.7
Not observed	0	0.8	0.0	0.0	4.5	-0.0	
All further malignancies	24883	11399	2.2	2.2	2.2 #	205.5	8.3

Patients 185620
 Median age at next malignancy (years) 73.0
 Person-years 656045
 Mean observation time (years) 3.5
 Median observation time (years) 1.7

The occurrence of further specified malignancy is statistically significant.

Further observed malignancies with count 1 to 34 are pooled in category "Others, specified".

Table 7b

Standardized incidence ratio (SIR, with 95% confidence limits),
excess absolute risk (EAR) and DCO rate of further malignancies
for period 1998–2019

FEMALES

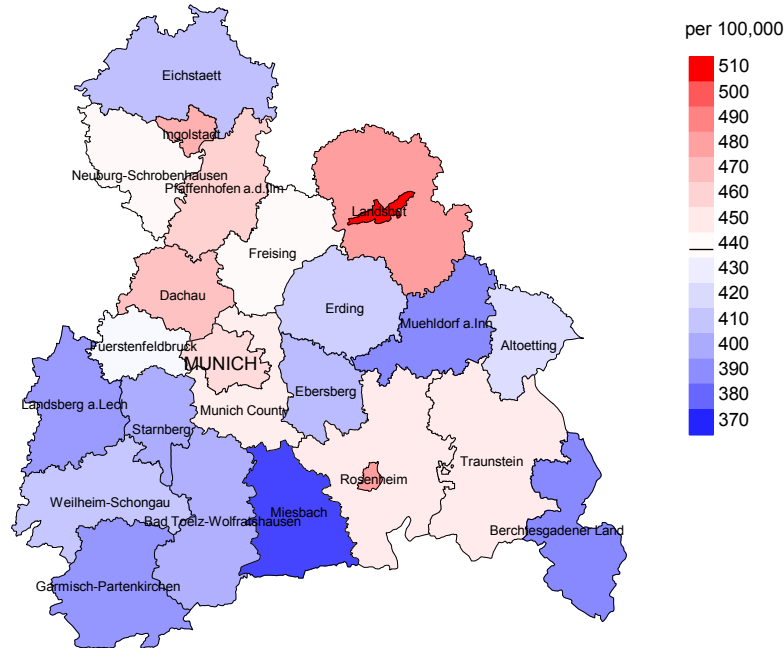
Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C03–C06 Oral cavity	113	42.3	2.7	2.2	3.2 #	1.0	0.9
C07–C08 Salivary gland	39	11.7	3.3	2.4	4.6 #	0.4	5.1
C09–C10 Oropharynx	145	30.5	4.8	4.0	5.6 #	1.7	2.8
C12–C13 Hypopharynx	40	8.1	4.9	3.5	6.7 #	0.5	15.0
C15 Oesophagus	164	46.6	3.5	3.0	4.1 #	1.7	11.0
C16 Stomach	568	245.2	2.3	2.1	2.5 #	4.7	11.6
C17 Small intestine	158	38.2	4.1	3.5	4.8 #	1.7	1.9
C18 Colon	1679	693.3	2.4	2.3	2.5 #	14.3	8.4
C19–C20 Rectum	535	287.9	1.9	1.7	2.0 #	3.6	6.2
C21 Anus/canal	98	40.0	2.5	2.0	3.0 #	0.8	2.0
C22 Liver	215	87.7	2.5	2.1	2.8 #	1.8	23.3
C23–C24 Bile	214	101.0	2.1	1.8	2.4 #	1.6	17.8
C25 Pancreas	771	329.5	2.3	2.2	2.5 #	6.4	25.9
C32 Larynx	41	13.2	3.1	2.2	4.2 #	0.4	12.2
C33–C34 Lung	1708	542.9	3.1	3.0	3.3 #	16.9	11.7
C43 Malign. melanoma	878	276.3	3.2	3.0	3.4 #	8.7	3.1
C46,C49 Soft tissue	129	40.9	3.2	2.6	3.7 #	1.3	3.9
C48 Peritoneal	96	28.6	3.4	2.7	4.1 #	1.0	10.4
C50 Breast	6448	2242.5	2.9	2.8	2.9 #	61.1	2.8
C51 Vulva	191	75.3	2.5	2.2	2.9 #	1.7	3.1
C52 Vagina	39	13.5	2.9	2.1	4.0 #	0.4	2.6
C53 Cervix uteri	242	99.3	2.4	2.1	2.8 #	2.1	16.9
C54 Corpus uteri	939	400.3	2.3	2.2	2.5 #	7.8	4.7
C55,C57 Fem. genitals un	45	15.8	2.8	2.1	3.8 #	0.4	55.6
C56 Ovary	906	290.4	3.1	2.9	3.3 #	8.9	19.4
C64 Kidney	516	168.4	3.1	2.8	3.3 #	5.0	11.8
C65 Renal pelvis	95	22.2	4.3	3.5	5.2 #	1.1	1.1
C66 Ureter	69	11.5	6.0	4.7	7.6 #	0.8	1.4
C67 Bladder	383	139.1	2.8	2.5	3.0 #	3.5	10.2
C70–C72 CNS cancer	171	94.4	1.8	1.5	2.1 #	1.1	25.1
C73 Thyroid	328	125.7	2.6	2.3	2.9 #	2.9	4.3
C76–C79 CUP	223	131.3	1.7	1.5	1.9 #	1.3	4.9
C81 Hodgkin lymphoma	40	13.6	2.9	2.1	4.0 #	0.4	5.0
C82–C85 NHL	712	281.1	2.5	2.4	2.7 #	6.3	5.9
C90 Mult. myeloma	165	88.3	1.9	1.6	2.2 #	1.1	18.2
C91–C96 Leukaemia	357	104.9	3.4	3.1	3.8 #	3.7	20.7
Others, specified	269	102.4	2.6	2.3	3.0 #	2.4	19.7
Not observed	0	0.0	0.0	0.0	119.0	-0.0	
All further malignancies	19729	7284.0	2.7	2.7	2.7 #	180.8	8.4

Patients	184843
Median age at next malignancy (years)	71.7
Person-years	688494
Mean observation time (years)	3.7
Median observation time (years)	1.9

The occurrence of further specified malignancy is statistically significant.

Further observed malignancies with count 1 to 32 are pooled in category "Others, specified".

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



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

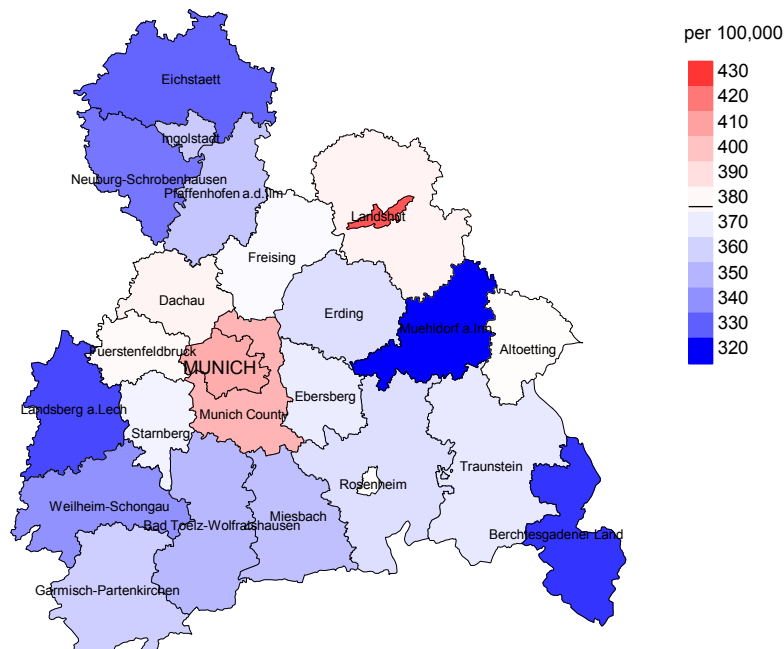
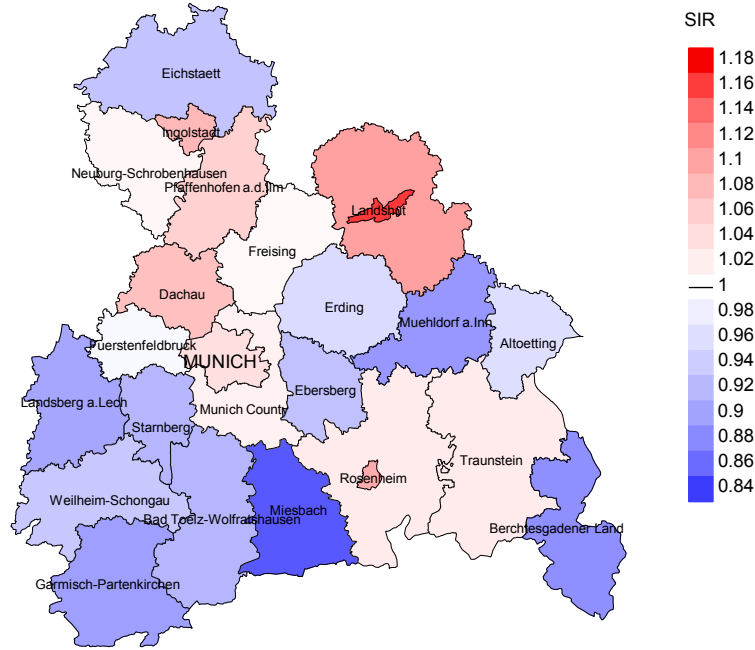


Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 438.5/100,000 WS N=143,063, females 377.3/100,000 WS N=144,724).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,462 female residents (averaged) in the period from 2007 to 2019 a total of 3,891 women were identified with newly diagnosed all cancers (excl. C44). Therefore, the mean incidence rate for this cancer type in this area can be calculated at 369.9/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 354.6 and 385.8/100,000.

Standardized incidence ratio (SIR) 2007 - 2019: Males



Standardized incidence ratio (SIR) 2007 - 2019: Females

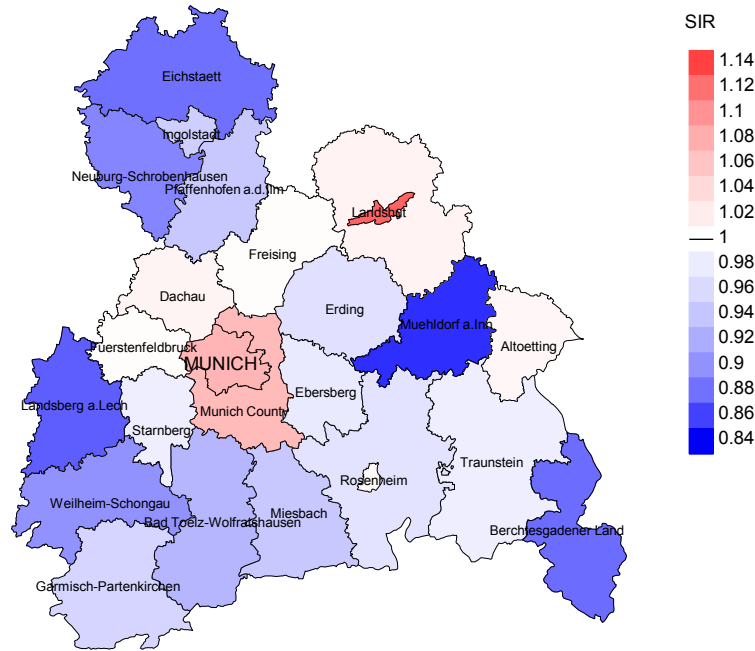


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=143,063, females N=144,724).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2019 a total of 3,891 women were identified with newly diagnosed all cancers (excl. C44). Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.98. Though, the value of this parameter may vary with an underlying probability of 99% between 0.94 and 1.02, 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 4.92 m as of 2007, respectively)

Year of diagnosis	Incident cases n	Prop. actively followed %	Prop. DCO %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	12400	97.0	12.2	9397	75.8	93.7
1999	12335	96.7	11.7	9080	73.6	94.3
2000	12364	97.1	13.0	8928	72.2	95.4
2001	12783	96.4	12.5	9018	70.5	95.5
2002	21830	97.2	14.9	15809	72.4	95.8
2003	21366	96.8	12.7	14963	70.0	96.0
2004	21586	96.6	11.6	14590	67.6	95.9
2005	21599	96.0	10.4	14277	66.1	96.0
2006	21673	94.3	9.0	13838	63.8	96.1
2007	25095	92.9	9.4	15676	62.5	95.8
2008	25494	97.9	8.6	15367	60.3	95.5
2009	25229	97.9	8.1	14864	58.9	95.3
2010	25059	97.8	8.4	14362	57.3	95.2
2011	25205	97.8	7.9	13930	55.3	94.8
2012	25341	97.6	7.6	13368	52.8	93.9
2013	24998	97.5	7.7	12767	51.1	93.2
2014	24273	96.6	8.1	11975	49.3	92.2
2015	23413	95.3	8.6	11214	47.9	90.5
2016	21867	99.3	9.4	9803	44.8	87.2
2017	20737	99.4	9.1	7785	37.5	76.8
2018	16843	99.4	2.4	4120	24.5	47.8
2019	14110	75.0	1.0	2423	17.2	80.8
1998-2019	455600	96.3	9.2	257554	56.5	93.1

Table 9b

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

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.92 m as of 2007, respectively)

Year of diagnosis/ death	Incident cases n	Deaths n	Prop. deaths with death certific. %	Deaths in same year n	Prop. deaths in same year %
1998	12400	6511	92.0	2803	22.6
1999	12335	6599	92.0	2684	21.8
2000	12364	6603	94.1	2648	21.4
2001	12783	6797	93.9	2707	21.2
2002	21830	9820	97.1	5205	23.8
2003	21366	10367	97.3	4703	22.0
2004	21586	10560	97.5	4493	20.8
2005	21599	10764	97.0	4352	20.1
2006	21673	11134	97.3	4239	19.6
2007	25095	12240	97.9	4885	19.5
2008	25494	12552	98.5	4877	19.1
2009	25229	12821	98.6	4642	18.4
2010	25059	13275	98.5	4792	19.1
2011	25205	13572	98.5	4867	19.3
2012	25341	13626	98.0	4745	18.7
2013	24998	13875	98.2	4645	18.6
2014	24273	13841	98.3	4681	19.3
2015	23413	14450	98.5	4698	20.1
2016	21867	14534	98.8	4728	21.6
2017	20737	14265	96.9	4236	20.4
2018	16843	10080	33.8	1841	10.9
2019	14110	8536	52.1	1379	9.8
1998–2019	455600	246822	93.2	88850	19.5

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 4.92 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer- related %	Prop. non-cancer- related %	Prop. cancer recorded on death certificate %
1998	6511	72.3	27.7	88.9
1999	6599	76.3	23.7	89.2
2000	6603	77.6	22.4	88.6
2001	6797	74.8	25.2	88.4
2002	9820	78.7	21.3	89.1
2003	10367	78.5	21.5	88.4
2004	10560	80.0	20.0	88.2
2005	10764	78.5	21.5	86.5
2006	11134	78.0	22.0	86.4
2007	12240	78.1	21.9	86.0
2008	12552	77.5	22.5	84.7
2009	12821	76.5	23.5	84.3
2010	13275	76.3	23.7	84.2
2011	13572	75.1	24.9	83.2
2012	13626	74.8	25.2	82.6
2013	13875	72.7	27.3	80.8
2014	13841	72.9	27.1	81.5
2015	14450	71.5	28.5	79.2
2016	14534	70.8	29.2	79.2
2017	14265	67.9	32.1	76.5
2018	10080	52.2	47.8	69.1
2019	8536	55.4	44.6	70.2
1998–2019	246822	73.5	26.5	83.5

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	3267	72.4	70.0	77.8	71.8
1999	3399	72.1	70.3	78.1	71.4
2000	3353	72.5	70.3	79.2	71.5
2001	3451	72.0	69.9	78.8	71.3
2002	5024	72.6	70.8	79.0	71.7
2003	5342	72.6	70.8	79.0	71.7
2004	5387	73.3	71.3	80.2	72.3
2005	5520	73.5	71.2	80.5	72.0
2006	5829	73.1	71.3	79.7	72.0
2007	6465	73.4	71.9	80.0	72.5
2008	6620	74.0	72.0	80.9	72.6
2009	6796	74.2	72.1	81.0	72.8
2010	6990	74.5	72.6	81.1	73.3
2011	7196	74.9	72.8	81.5	73.4
2012	7213	75.4	73.4	81.5	74.0
2013	7264	76.0	73.7	82.3	74.4
2014	7360	76.2	74.3	82.5	74.9
2015	7675	76.9	74.6	82.7	75.4
2016	7792	77.7	75.6	82.4	76.2
2017	7508	78.1	75.8	83.1	76.5
2018	5437	77.9	74.7	80.7	76.7
2019	4545	79.0	75.7	82.2	76.8
1998-2019	129433	75.2	72.8	81.2	73.6

Deaths of patients are considered to be cancer-related, in case that fact was recorded on the death certificate, or patients had suffered from metastasis or recurrence.

Table 10b

Medians of age at death according to the grouping in Table 9

FEMALES

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	3244	76.8	74.3	82.9	76.7
1999	3200	77.0	74.9	83.7	76.8
2000	3250	77.1	74.9	84.0	76.3
2001	3346	77.6	74.7	84.0	76.5
2002	4796	77.6	75.1	84.4	76.5
2003	5025	77.1	74.2	84.2	75.6
2004	5173	77.4	75.0	84.1	76.2
2005	5244	77.8	74.3	84.7	75.7
2006	5305	77.9	75.1	84.9	76.1
2007	5775	77.9	74.3	85.6	75.8
2008	5932	78.2	74.6	85.9	75.8
2009	6025	78.0	74.1	85.9	75.4
2010	6285	78.2	74.6	85.8	75.9
2011	6376	78.0	74.4	86.3	75.5
2012	6413	77.9	74.7	86.8	75.8
2013	6611	78.5	75.0	86.7	76.3
2014	6481	78.4	75.2	86.6	76.4
2015	6774	78.7	75.8	86.5	76.7
2016	6742	78.6	75.7	86.7	76.8
2017	6757	79.7	76.6	86.9	77.5
2018	4643	78.6	73.8	83.4	77.3
2019	3991	78.8	74.8	83.6	76.2
1998-2019	117388	78.1	74.9	85.5	76.3

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	2361	213.1	0.39	127.5	0.38	195.3	0.40	261.8	0.42
1999	2612	233.4	0.44	137.5	0.42	211.6	0.44	283.7	0.47
2000	2600	228.3	0.43	132.6	0.41	204.7	0.43	273.9	0.45
2001	2634	227.3	0.42	131.5	0.40	202.1	0.42	267.5	0.44
2002	3981	213.7	0.36	118.3	0.35	181.7	0.36	241.2	0.38
2003	4264	227.5	0.39	123.1	0.37	188.9	0.39	252.2	0.41
2004	4327	230.0	0.40	121.4	0.37	187.1	0.40	251.7	0.42
2005	4379	231.2	0.41	119.0	0.37	182.3	0.40	246.5	0.43
2006	4576	239.0	0.42	121.6	0.39	186.4	0.41	249.3	0.44
2007	5135	231.8	0.40	115.7	0.36	178.4	0.39	240.3	0.42
2008	5203	233.8	0.41	114.6	0.38	176.1	0.40	236.8	0.43
2009	5229	234.3	0.42	112.8	0.39	172.7	0.41	230.3	0.43
2010	5357	237.7	0.44	111.7	0.39	171.5	0.42	230.2	0.45
2011	5489	245.3	0.44	113.7	0.40	175.1	0.43	233.7	0.45
2012	5405	238.1	0.43	108.1	0.38	166.4	0.41	223.8	0.44
2013	5342	232.1	0.43	104.2	0.38	160.3	0.41	214.9	0.44
2014	5380	230.7	0.45	101.2	0.40	156.3	0.42	209.3	0.45
2015	5459	229.5	0.49	100.2	0.43	154.6	0.46	207.5	0.48
2016	5473	227.7	0.53	96.3	0.46	149.7	0.49	203.6	0.52
2017	5106	211.6	0.54	87.4	0.47	137.0	0.50	185.3	0.53
2018	2852	117.1	0.39	49.7	0.34	76.6	0.36	102.2	0.38
2019	2480	101.9	0.44	42.1	0.38	65.3	0.40	88.8	0.43
1998-2019	95644	217.0	0.43	103.7	0.39	159.2	0.41	212.6	0.44

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	2370	201.5	0.39	86.5	0.32	129.4	0.34	168.2	0.37
1999	2440	205.6	0.40	86.6	0.33	130.3	0.35	171.1	0.39
2000	2542	211.6	0.43	89.7	0.35	134.6	0.38	174.0	0.41
2001	2468	202.9	0.40	86.1	0.33	129.4	0.35	168.0	0.38
2002	3754	191.7	0.37	79.7	0.31	119.3	0.33	154.4	0.35
2003	3889	197.4	0.39	83.5	0.33	124.7	0.35	160.2	0.38
2004	4142	209.5	0.41	85.4	0.33	128.0	0.36	166.8	0.39
2005	4095	205.8	0.40	84.5	0.33	126.1	0.35	162.0	0.38
2006	4120	205.1	0.41	81.5	0.32	122.7	0.35	160.7	0.38
2007	4456	193.0	0.38	77.5	0.31	116.3	0.33	150.8	0.36
2008	4554	196.2	0.38	78.0	0.30	116.8	0.32	151.3	0.35
2009	4603	197.9	0.38	78.7	0.30	117.6	0.33	151.7	0.35
2010	4797	205.0	0.40	79.4	0.31	118.9	0.34	154.8	0.37
2011	4741	202.8	0.40	78.7	0.31	117.7	0.34	152.2	0.37
2012	4809	203.8	0.40	77.9	0.31	117.1	0.34	151.7	0.37
2013	4783	200.6	0.41	76.2	0.31	114.3	0.34	148.5	0.37
2014	4757	197.6	0.41	73.6	0.32	110.6	0.34	144.3	0.37
2015	4909	201.7	0.43	73.4	0.33	111.5	0.36	146.7	0.39
2016	4857	197.8	0.45	74.4	0.35	111.4	0.38	144.5	0.41
2017	4645	188.4	0.44	67.1	0.33	102.0	0.36	134.5	0.40
2018	2592	104.4	0.29	41.7	0.23	61.4	0.25	78.4	0.27
2019	2381	95.9	0.30	36.9	0.23	54.9	0.25	70.9	0.27
1998-2019	86704	189.4	0.40	74.3	0.31	111.3	0.34	144.3	0.37

Table 12

Age distribution of age at death (cancer-related) for period 2007-2019
(incl. multiple malignancies)

Age at death Years	Cases			Males			Females		
	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4	35	0.0	0.0	19	0.0	0.0	16	0.0	0.0
5-9	48	0.0	0.1	25	0.0	0.1	23	0.0	0.1
10-14	50	0.0	0.1	27	0.0	0.1	23	0.0	0.1
15-19	72	0.1	0.2	47	0.1	0.2	25	0.0	0.2
20-24	106	0.1	0.3	67	0.1	0.3	39	0.1	0.2
25-29	178	0.1	0.4	85	0.1	0.4	93	0.2	0.4
30-34	288	0.2	0.6	128	0.2	0.6	160	0.3	0.7
35-39	608	0.5	1.1	243	0.4	1.0	365	0.6	1.3
40-44	1374	1.1	2.3	573	0.9	1.9	801	1.4	2.7
45-49	2921	2.4	4.7	1342	2.1	4.0	1579	2.8	5.5
50-54	4959	4.1	8.8	2510	3.9	7.9	2449	4.3	9.8
55-59	7653	6.3	15.1	4121	6.4	14.4	3532	6.2	16.0
60-64	10576	8.8	23.9	5965	9.3	23.7	4611	8.1	24.1
65-69	15077	12.5	36.4	8592	13.4	37.2	6485	11.4	35.5
70-74	19259	15.9	52.3	11082	17.3	54.5	8177	14.4	49.9
75-79	20435	16.9	69.2	11435	17.9	72.4	9000	15.8	65.7
80-84	17927	14.8	84.1	9432	14.8	87.1	8495	14.9	80.6
85+	19228	15.9	100.0	8217	12.9	100.0	11011	19.4	100.0
All ages	120794	100.0		63910	100.0		56884	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2019
(incl. multiple malignancies)

Age at death Years	Males		Females		Males		Females	
	n	n	Age- spec. mortal.	MI-index	Age- spec. mortal.	MI-index	Prop.all cancers %	Prop.all cancers %
0- 4	19	16	1.3	0.09	1.1	0.10	100.0	100.0
5- 9	25	23	1.7	0.22	1.7	0.25	100.0	100.0
10-14	27	23	1.8	0.20	1.6	0.20	100.0	100.0
15-19	47	25	2.9	0.16	1.7	0.10	100.0	100.0
20-24	67	39	3.6	0.11	2.2	0.08	100.0	100.0
25-29	85	93	4.1	0.10	4.5	0.08	100.0	100.0
30-34	128	160	6.0	0.11	7.6	0.08	100.0	100.0
35-39	243	365	11.4	0.14	17.4	0.11	100.0	100.0
40-44	573	801	24.5	0.22	35.4	0.14	100.0	100.0
45-49	1342	1579	53.5	0.28	64.9	0.18	100.0	100.0
50-54	2510	2449	107.1	0.32	105.9	0.21	100.0	100.0
55-59	4121	3532	212.0	0.35	176.7	0.29	100.0	100.0
60-64	5965	4611	365.8	0.37	262.7	0.32	100.0	100.0
65-69	8592	6485	565.0	0.38	384.9	0.36	100.0	100.0
70-74	11082	8177	790.8	0.43	509.1	0.44	100.0	100.0
75-79	11435	9000	1032.8	0.52	653.6	0.50	100.0	100.0
80-84	9432	8495	1436.7	0.67	872.7	0.60	100.0	100.0
85+	8217	11011	1927.0	0.84	1140.7	0.71	100.0	100.0
All ages	63910	56884					100.0	100.0
Mortality								
Raw			212.1	0.45	182.9	0.39		
WS			95.5	0.39	69.9	0.31		
ES			146.9	0.42	104.7	0.33		
BRD-S			196.7	0.45	135.8	0.36		
PYLL-70								
per 100,000			881.5		856.2			
ES			767.1		726.8			
AYLL-70			9.9		11.1			

Table 14a

Further malignancies in deaths in period 1998–2019
MALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C00 Lip	50	0.2	44	88.0	1	2.0	5	10.0
C03–C06 Oral cavity	547	2.3	458	83.7	62	11.3	27	4.9
C07–C08 Salivary gland	54	0.2	46	85.2	6	11.1	2	3.7
C09–C10 Oropharynx	531	2.2	416	78.3	73	13.7	42	7.9
C12–C13 Hypopharynx	274	1.1	215	78.5	45	16.4	14	5.1
C15 Oesophagus	331	1.4	198	59.8	92	27.8	41	12.4
C16 Stomach	640	2.6	451	70.5	131	20.5	58	9.1
C17 Small intestine	118	0.5	77	65.3	21	17.8	20	16.9
C18 Colon	2189	9.0	1504	68.7	423	19.3	262	12.0
C19–C20 Rectum	1167	4.8	903	77.4	196	16.8	68	5.8
C21 Anus/canal	57	0.2	50	87.7	5	8.8	2	3.5
C22 Liver	253	1.0	125	49.4	58	22.9	70	27.7
C23–C24 Bile	92	0.4	50	54.3	14	15.2	28	30.4
C25 Pancreas	318	1.3	108	34.0	75	23.6	135	42.5
C30–C31 Sinuses	68	0.3	60	88.2	4	5.9	4	5.9
C32 Larynx	636	2.6	533	83.8	61	9.6	42	6.6
C33–C34 Lung	1471	6.1	692	47.0	330	22.4	449	30.5
C43 Malign. melanoma	1089	4.5	819	75.2	74	6.8	196	18.0
C44 Skin others	2967	12.2	1527	51.5	255	8.6	1185	39.9
C46,C49 Soft tissue	122	0.5	97	79.5	10	8.2	15	12.3
C50 Breast	66	0.3	51	77.3	8	12.1	7	10.6
C61 Prostate	5137	21.2	4506	87.7	350	6.8	281	5.5
C62 Testis	253	1.0	232	91.7	10	4.0	11	4.3
C64 Kidney	1050	4.3	781	74.4	136	13.0	133	12.7
C65 Renal pelvis	162	0.7	107	66.0	37	22.8	18	11.1
C66 Ureter	127	0.5	87	68.5	22	17.3	18	14.2
C67 Bladder	1778	7.3	1216	68.4	260	14.6	302	17.0
C70–C72 CNS cancer	129	0.5	63	48.8	16	12.4	50	38.8
C73 Thyroid	161	0.7	143	88.8	7	4.3	11	6.8
C76–C79 CUP	258	1.1	204	79.1	46	17.8	8	3.1
C81 Hodgkin lymphoma	163	0.7	150	92.0	6	3.7	7	4.3
C82–C85 NHL	1003	4.1	737	73.5	94	9.4	172	17.1
C90 Mult. myeloma	242	1.0	153	63.2	26	10.7	63	26.0
C91–C96 Leukaemia	396	1.6	108	27.3	80	20.2	208	52.5
Others, specified	365	1.5	259	71.0	54	14.8	52	14.2
All further malignancies	24264	100.0	17170	70.8	3088	12.7	4006	16.5

Further malignancies with number of cases 1 to 49 are pooled in category “Others, specified”.

ICD-10 C44 (Other malignant neoplasms of skin) is not systematically recorded by MCR and therefore not considered for evaluation as a particular primary but at least as a further malignancy.

Table 14b

Further malignancies in deaths in period 1998–2019
FEMALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C03–C06 Oral cavity	209	1.1	169	80.9	19	9.1	21	10.0
C09–C10 Oropharynx	154	0.8	120	77.9	21	13.6	13	8.4
C15 Oesophagus	68	0.4	42	61.8	14	20.6	12	17.6
C16 Stomach	406	2.1	266	65.5	89	21.9	51	12.6
C17 Small intestine	65	0.3	40	61.5	19	29.2	6	9.2
C18 Colon	1467	7.7	956	65.2	280	19.1	231	15.7
C19–C20 Rectum	604	3.2	460	76.2	106	17.5	38	6.3
C21 Anus/canal	113	0.6	92	81.4	11	9.7	10	8.8
C22 Liver	75	0.4	30	40.0	22	29.3	23	30.7
C23–C24 Bile	98	0.5	56	57.1	16	16.3	26	26.5
C25 Pancreas	262	1.4	88	33.6	59	22.5	115	43.9
C32 Larynx	72	0.4	60	83.3	6	8.3	6	8.3
C33–C34 Lung	642	3.4	286	44.5	128	19.9	228	35.5
C43 Malign. melanoma	708	3.7	550	77.7	36	5.1	122	17.2
C44 Skin others	1341	7.0	716	53.4	115	8.6	510	38.0
C46,C49 Soft tissue	77	0.4	57	74.0	7	9.1	13	16.9
C48 Peritoneal	78	0.4	58	74.4	17	21.8	3	3.8
C50 Breast	6723	35.1	4144	61.6	976	14.5	1603	23.8
C51 Vulva	142	0.7	113	79.6	12	8.5	17	12.0
C53 Cervix uteri	666	3.5	593	89.0	37	5.6	36	5.4
C54 Corpus uteri	1117	5.8	941	84.2	118	10.6	58	5.2
C55,C57 Fem. genitals un	99	0.5	77	77.8	11	11.1	11	11.1
C56 Ovary	714	3.7	453	63.4	137	19.2	124	17.4
C64 Kidney	502	2.6	353	70.3	59	11.8	90	17.9
C65 Renal pelvis	82	0.4	59	72.0	12	14.6	11	13.4
C66 Ureter	51	0.3	40	78.4	8	15.7	3	5.9
C67 Bladder	429	2.2	277	64.6	47	11.0	105	24.5
C69 Eye melanoma	51	0.3	44	86.3	6	11.8	1	2.0
C70–C72 CNS cancer	121	0.6	56	46.3	15	12.4	50	41.3
C73 Thyroid	328	1.7	295	89.9	15	4.6	18	5.5
C76–C79 CUP	197	1.0	155	78.7	35	17.8	7	3.6
C81 Hodgkin lymphoma	111	0.6	106	95.5	4	3.6	1	0.9
C82–C85 NHL	638	3.3	463	72.6	36	5.6	139	21.8
C90 Mult. myeloma	146	0.8	81	55.5	13	8.9	52	35.6
C91–C96 Leukaemia	295	1.5	69	23.4	64	21.7	162	54.9
Others, specified	289	1.5	205	70.9	38	13.1	46	15.9
All further malignancies	19140	100.0	12570	65.7	2608	13.6	3962	20.7

Further malignancies with number of cases 1 to 44 are pooled in category “Others, specified”.

ICD-10 C44 (Other malignant neoplasms of skin) is not systematically recorded by MCR and therefore not considered for evaluation as a particular primary but at least as a further malignancy.

Table 15

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2019
(First primaries only *)

Age at death Years	Males		Males		Females		Females	
	n	n	Age- spec. mortal.	MI-index	Age- spec. mortal.	MI-index	Prop.all cancers %	Prop.all cancers %
0- 4	19	15	1.3	0.09	1.1	0.09	100.0	100.0
5- 9	24	23	1.7	0.21	1.7	0.26	100.0	100.0
10-14	27	19	1.8	0.21	1.4	0.17	100.0	100.0
15-19	45	23	2.8	0.16	1.5	0.10	100.0	100.0
20-24	60	37	3.2	0.11	2.1	0.08	100.0	100.0
25-29	77	86	3.7	0.09	4.1	0.08	100.0	100.0
30-34	124	139	5.8	0.11	6.6	0.07	100.0	100.0
35-39	227	330	10.6	0.14	15.7	0.11	100.0	100.0
40-44	528	704	22.6	0.22	31.1	0.13	100.0	100.0
45-49	1226	1351	48.8	0.28	55.5	0.17	100.0	100.0
50-54	2215	2080	94.5	0.31	90.0	0.20	100.0	100.0
55-59	3593	2965	184.8	0.34	148.3	0.28	100.0	100.0
60-64	4990	3776	306.0	0.35	215.1	0.31	100.0	100.0
65-69	6876	5143	452.1	0.37	305.3	0.36	100.0	100.0
70-74	8489	6339	605.8	0.42	394.7	0.44	100.0	100.0
75-79	8375	6905	756.4	0.52	501.4	0.50	100.0	100.0
80-84	6760	6579	1029.7	0.68	675.9	0.60	100.0	100.0
85+	5936	8708	1392.0	0.86	902.1	0.71	100.0	100.0
All ages	49591	45222					100.0	100.0
Mortality								
Raw			164.6	0.43	145.4	0.38		
WS			76.3	0.38	56.6	0.29		
ES			115.8	0.40	84.3	0.32		
BRD-S			152.4	0.43	108.4	0.35		
PYLL-70								
per 100,000			773.3		727.6			
ES			674.8		619.9			
AYLL-70			10.2		11.4			

* See corresponding tables with multiple malignancies.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2019
(**Single primaries only** *)

Age at death Years	Males		Males		Females		Females	
	n	n	Age- spec. mortal.	MI-index	Age- spec. mortal.	MI-index	Prop.all cancers %	Prop.all cancers %
0- 4	19	15	1.3	0.09	1.1	0.10	100.0	100.0
5- 9	24	23	1.7	0.21	1.7	0.26	100.0	100.0
10-14	27	19	1.8	0.21	1.4	0.18	100.0	100.0
15-19	45	22	2.8	0.16	1.5	0.09	100.0	100.0
20-24	60	36	3.2	0.11	2.0	0.08	100.0	100.0
25-29	77	84	3.7	0.09	4.1	0.08	100.0	100.0
30-34	123	137	5.8	0.11	6.5	0.08	100.0	100.0
35-39	225	326	10.5	0.14	15.5	0.11	100.0	100.0
40-44	525	697	22.4	0.23	30.8	0.14	100.0	100.0
45-49	1212	1334	48.3	0.29	54.8	0.18	100.0	100.0
50-54	2186	2044	93.3	0.33	88.4	0.21	100.0	100.0
55-59	3542	2913	182.2	0.37	145.7	0.30	100.0	100.0
60-64	4905	3700	300.8	0.39	210.8	0.33	100.0	100.0
65-69	6697	5014	440.4	0.40	297.6	0.38	100.0	100.0
70-74	8192	6148	584.6	0.46	382.8	0.47	100.0	100.0
75-79	7985	6678	721.2	0.55	485.0	0.52	100.0	100.0
80-84	6325	6304	963.4	0.71	647.6	0.61	100.0	100.0
85+	5434	8316	1274.3	0.83	861.5	0.70	100.0	100.0
All ages	47603	43810					100.0	100.0
Mortality								
Raw			158.0	0.46	140.8	0.40		
WS			73.8	0.40	55.2	0.30		
ES			111.6	0.43	82.0	0.33		
BRD-S			146.2	0.46	105.3	0.36		
PYLL-70								
per 100,000			763.0		715.6			
ES			666.1		609.8			
AYLL-70			10.3		11.4			

* See corresponding tables with multiple malignancies.

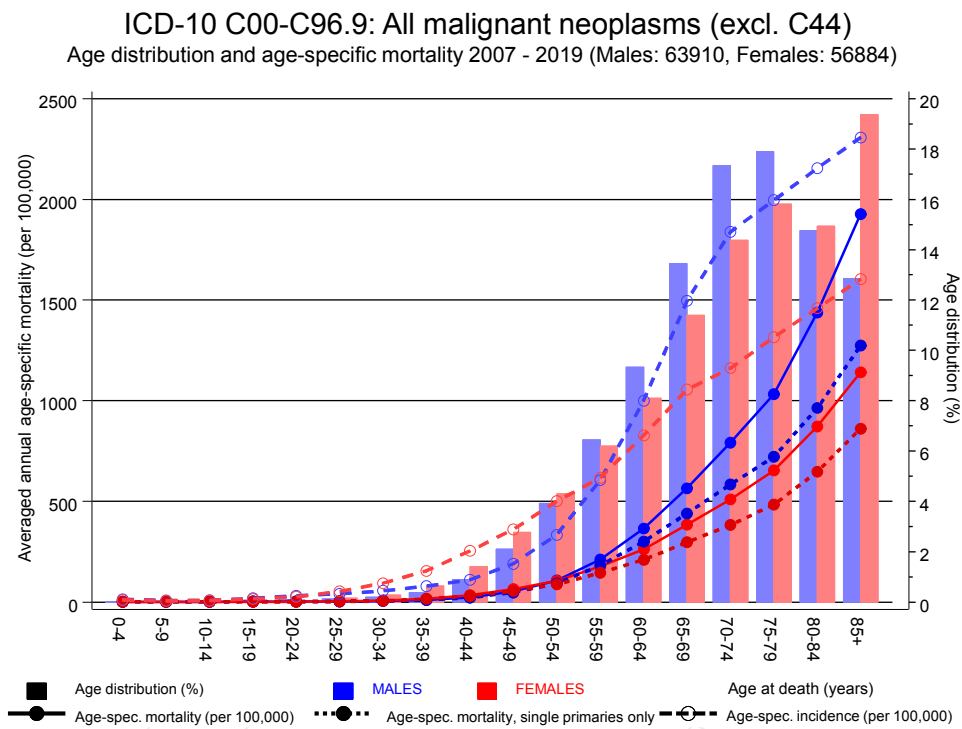
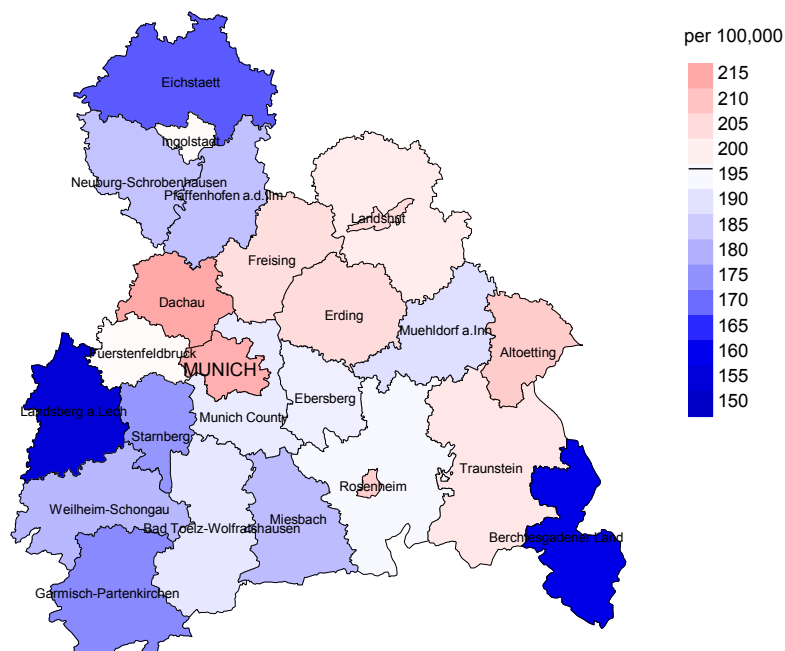


Figure 17. Distribution of age at death (bars; males: mean=69.7 yrs, median=70.9 yrs; females: mean=70.1 yrs, median=71.8 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

The difference between age at diagnosis (Table 3) and age at all cancers (excl. C44)-related death (see Table 10) should be considered.

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



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

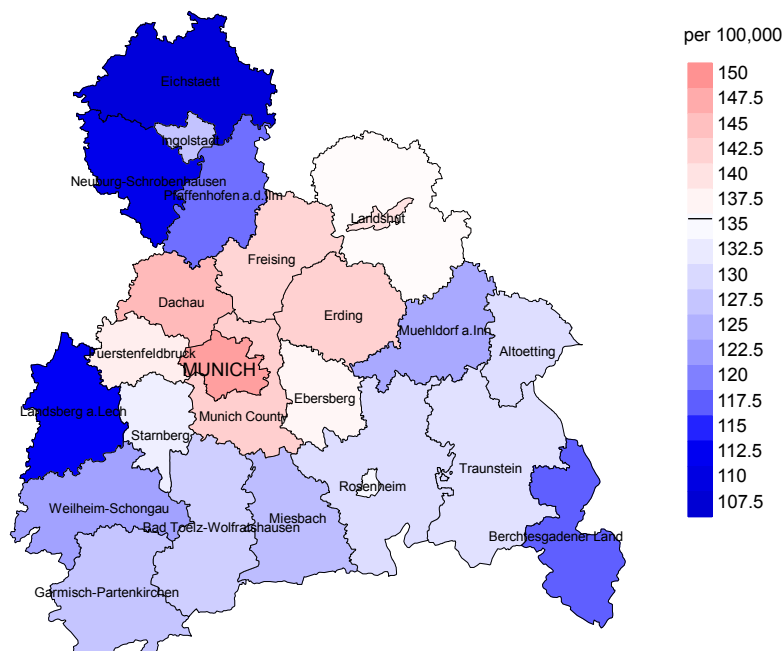
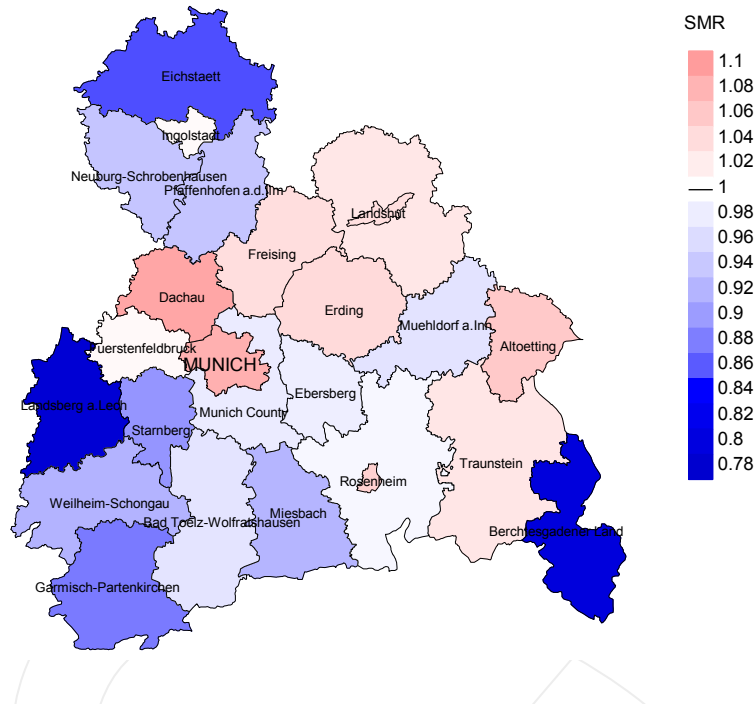


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2019. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 196.7/100,000 WS N=63,910, females 135.8/100,000 WS N=56,884).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,462 female residents (averaged) in the period from 2007 to 2019 a total of 1,557 women died from all cancers (excl. C44). Therefore, the mean mortality rate for this cancer type in this area can be calculated at 137.2/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 128.2 and 146.7/100,000.

Standardized mortality ratio (SMR) 2007 - 2019: Males



Standardized mortality ratio (SMR) 2007 - 2019: Females

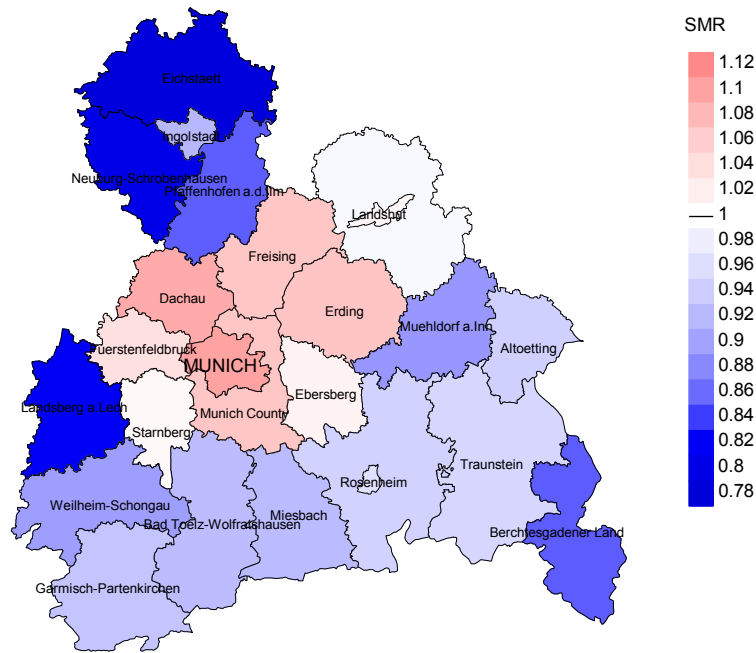


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=63,910, females N=56,884).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2019 a total of 1,557 women died from all cancers (excl. C44). Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.01. Though, the value of this parameter may vary with an underlying probability of 99% between 0.95 and 1.08, 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

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