Munich Cancer Registry

- Survival
- Selection Matrix
- Homepage
- *Deutsch*

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

Incidence and Mortality

Year of diagnosis	1998-2020
Patients	427,374
Diseases	477,498
Creation date	12/20/2021
Database export	12/20/2021
Population	4.95 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

Index of figures and tables

Fig./Tbl.		Page
1	Annual cases, DCO, mult. malignancies, follow-up / yr	4
2	Incidence by year of diagnosis	7
3	Age distribution parameters by year of diagnosis	8
4	Age distribution by 5-year age group and sex	11
5	Age-specific incidence, DCO rate, proportion malignancies	12
6	Age distribution and age-specific incidence (chart)	13
6a	Age-specific incidence internationally (chart)	14
7	Standardized incidence ratio of further malignancies	15
8a	Map of cancer incidence (BRD-S) by county (chart)	17
8b	Standardized incidence ratio (SIR) by county (chart)	18
9a	Pts incident cohorts and mortality / yr	19
9b	Incidence and mortality by year of diagnosis	20
9c	Cancer-related deaths, death certification available / yr	21
10	Medians of age at death / yr	22
11	Mortality by year of death	24
12	Distribution of age at death	26
13	Age-specific mortality	27
14	Further malignancies in deaths	28
15	Age-specific mortality (first primaries)	30
16	Age-specific mortality (single primaries)	31
17	Age distribution and age-specific mortality (chart)	32
18a	Map of cancer mortality (BRD-S) by county (chart)	33
18b	Standardized mortality ratio (SMR) by county (chart)	34

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
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	12406	1515	12.2	11.2	10.8	76.8	97.1
1999	12342	1438	11.7	11.5	10.6	75.2	96.8
2000	12370	1603	13.0	11.9	10.5	73.7	97.2
2001	12794	1598	12.5	12.1	10.4	71.9	96.5
2002	21845	3261	14.9	12.4	10.2	74.0	97.3 #
2003	21384	2716	12.7	12.6	10.0	71.8	97.0
2004	21603	2511	11.6	12.7	9.7	69.4	96.8
2005	21628	2238	10.3	13.1	9.4	68.1	96.2
2006	21695	1946	9.0	13.4	9.1	66.1	94.7
2007	25120	2353	9.4	13.6	8.8	64.5	93.4 #
2008	25546	2205	8.6	13.9	8.4	62.4	98.1
2009	25271	2047	8.1	14.3	8.0	61.1	98.1
2010	25122	2103	8.4	14.6	7.6	59.4	98.0
2011	25271	1993	7.9	15.0	7.1	57.7	97.9
2012	25427	1932	7.6	15.3	6.7	55.3	97.8
2013	25093	1923	7.7	15.6	6.2	53.6	97.7
2014	24534	1961	8.0	15.9	5.8	52.2	96.9
2015	23826	1998	8.4	16.2	5.3	50.9	95.9
2016	23005	2030	8.8	16.4	4.8	48.1	99.4
2017	22241	1885	8.5	16.7	4.2	42.7	99.4
2018	19231	984	5.1	17.0	3.7	33.8	99.4
2019	16423	134	0.8	17.1	2.9	26.8	99.5
2020	13321	18	0.1	17.2	2.1	20.4	99.6 ##
1998–2020	477498	42392	8.9	17.2	10.8	57.9	97.4

477,498 cases diagnosed 1998-2020 are related to a total of 427,374 patients. Currently, in 84,266 (19.7 %) of these 427,374 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 68,368 / 12,167 / 3,731 (16.0 % / 2.8 % / 0.9 %) 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 19,231 cases has been diagnosed, of which 17.0 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 3.7 % 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	6142	49.5	766	12.5	10.7	12.2	80.5	97.7
1999	6124	49.6	727	11.9	10.9	12.1	80.0	97.6
2000	6282	50.8	820	13.1	11.3	12.0	77.7	97.5
2001	6465	50.5	764	11.8	11.6	11.9	75.9	97.1
2002	11335	51.9	1577	13.9	12.1	11.7	77.1	97.8 #
2003	11178	52.3	1313	11.7	12.4	11.5	74.8	97.7
2004	11225	52.0	1159	10.3	12.6	11.2	72.7	97.4
2005	11150	51.6	1049	9.4	13.1	10.9	71.3	96.7
2006	11266	51.9	952	8.5	13.5	10.6	69.7	94.8
2007	13226	52.7	1170	8.8	13.7	10.2	67.5	93.2 #
2008	13077	51.2	1071	8.2	14.2	9.8	66.6	98.4
2009	12856	50.9	987	7.7	14.6	9.3	65.1	98.3
2010	12672	50.4	975	7.7	15.0	8.8	63.6	98.1
2011	12894	51.0	945	7.3	15.4	8.4	61.8	98.3
2012	13000	51.1	923	7.1	15.8	7.9	58.8	98.1
2013	12923	51.5	937	7.3	16.1	7.4	57.1	97.8
2014	12493	50.9	950	7.6	16.4	6.9	55.6	97.1
2015	11912	50.0	1003	8.4	16.7	6.3	55.6	96.1
2016	11427	49.7	1024	9.0	17.0	5.9	52.6	99.4
2017	10811	48.6	928	8.6	17.4	5.2	47.7	99.6
2018	9074	47.2	489	5.4	17.7	4.5	38.2	99.5
2019	7414	45.1	61	0.8	17.8	3.6	32.0	99.6
2020	5667	42.5	7	0.1	18.0	2.9	26.2	99.6 ##
1998-2020	240613	50.4	20597	8.6	18.0	12.2	62.3	97.6

240,613 cases diagnosed 1998-2020 are related to a total of 212,782 patients. Currently, in 44,004 (20.7 %) of these 212,782 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 34,905 / 6,688 / 2,411 (16.4 % / 3.1 % / 1.1 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:
In 2018, a subgroup of 9,074 cases has been diagnosed, of which 17.7 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 4.5 % 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	6264	50.5	749	12.0	11.7	9.3	73.1	96.5	
1999	6218	50.4	711	11.4	12.1	9.1	70.5	96.0	
2000	6088	49.2	783	12.9	12.4	9.0	69.7	97.0	
2001	6329	49.5	834	13.2	12.6	8.8	67.8	96.0	
2002	10510	48.1	1684	16.0	12.7	8.7	70.7	96.9	#
2003	10206	47.7	1403	13.7	12.7	8.4	68.5	96.3	
2004	10378	48.0	1352	13.0	12.8	8.2	65.8	96.2	
2005	10478	48.4	1189	11.3	13.1	8.0	64.8	95.7	
2006	10429	48.1	994	9.5	13.3	7.7	62.1	94.5	
2007	11894	47.3	1183	9.9	13.4	7.4	61.2	93.7	#
2008	12469	48.8	1134	9.1	13.6	7.1	58.0	97.8	
2009	12415	49.1	1060	8.5	13.9	6.7	56.8	97.8	
2010	12450	49.6	1128	9.1	14.2	6.3	55.2	97.8	
2011	12377	49.0	1048	8.5	14.5	5.9	53.4	97.6	
2012	12427	48.9	1009	8.1	14.8	5.5	51.6	97.4	
2013	12170	48.5	986	8.1	15.0	5.1	50.0	97.6	
2014	12041	49.1	1011	8.4	15.3	4.7	48.6	96.8	
2015	11914	50.0	995	8.4	15.6	4.3	46.2	95.7	
2016	11577	50.3	1006	8.7	15.8	3.8	43.6	99.3	
2017	11428	51.4	957	8.4	16.0	3.4	38.1	99.3	
2018	10157	52.8	495	4.9	16.2	3.0	29.9	99.4	
2019	9009	54.9	73	0.8	16.4	2.2	22.5	99.4	
2020	7654	57.5	11	0.1	16.5	1.6	16.0	99.6	##
1998-2020	236882	49.6	21795	9.2	16.5	9.3	53.5	97.2	

236,882 cases diagnosed 1998-2020 are related to a total of 214,589 patients. Currently, in 40,262 (18.8 %) of these 214,589 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 33,463 / 5,479 / 1,320 (15.6 % / 2.6 % / 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 retreived from the respective headings.

How to interpret:
In 2018, a subgroup of 10,157 cases has been diagnosed, of which 16.2 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 3.0 % 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	6142	6264	554.3	532.5	345.9	276.1	504.5	386.0	647.2	465.1
1999	6124	6218	547.2	524.0	335.7	272.7	490.5	379.6	624.1	456.5
2000	6282	6088	551.6	506.8	335.9	262.6	491.1	366.5	625.7	440.0
2001	6465	6329	557.8	520.3	337.2	270.6	491.6	378.0	621.0	452.5
2002	11335	10510	608.4	536.8	352.6	267.5	516.2	376.3	657.1	456.1
2003	11178	10206	596.3	518.1	341.8	260.6	498.5	364.2	632.2	437.8
2004	11225	10378	596.6	525.0	336.4	266.6	488.1	369.5	618.8	443.2
2005	11150	10478	588.6	526.6	328.6	263.3	473.4	366.6	598.1	440.2
2006	11266	10429	588.3	519.2	321.9	259.9	466.8	361.3	590.8	432.3
2007	13226	11894	597.1	515.1	327.1	258.3	471.6	359.1	594.9	429.0
2008	13077	12469	587.5	537.3	314.4	269.0	454.2	373.0	572.9	445.6
2009	12856	12415	576.0	533.8	303.4	266.7	438.4	370.2	552.8	441.3
2010	12672	12450	562.2	531.9	295.6	261.5	425.6	363.3	534.0	433.9
2011	12894	12377	576.3	529.5	295.4	260.9	426.4	360.7	538.2	429.8
2012	13000	12427	572.7	526.6	292.6	259.4	420.7	358.0	531.1	427.9
2013	12923	12170	561.5	510.5	285.2	251.2	409.6	346.8	515.9	413.1
2014	12493	12041	535.8	500.1	266.7	242.0	386.6	335.8	487.6	401.1
2015	11912	11914	500.7	489.5	246.3	234.6	358.9	326.7	455.9	391.6
2016	11427	11577	475.4	471.5	233.1	225.6	339.0	313.9	430.4	376.3
2017	10811	11428	448.0	463.6	213.1	221.0	312.6	308.2	400.1	369.4
2018	9074	10157	372.7	409.1	180.5	199.6	262.3	276.7	332.5	328.9
2019	7414	9009	304.5	362.9	148.1	179.7	214.8	248.8	271.9	294.4
2020	5667	7654	232.8	308.3	114.3	154.2	164.8	212.2	207.8	251.2
1998-2020	240613	236882	517.2	490.7	272.7	243.0	393.7	337.3	495.5	403.0

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	12406	66.0	14.9	0.1	107	47.4	57.1	67.1	76.8	84.5
1999	12342	66.0	14.7	0.3	104	47.5	57.5	67.0	76.8	84.4
2000	12370	66.1	14.8	0.2	103	47.4	57.8	66.9	77.0	84.5
2001	12794	66.1	14.4	0.1	103	47.5	57.9	66.6	76.4	83.6
2002	21845	67.2	14.3	0.0	104	48.4	59.4	68.2	77.5	84.2
2003	21384	67.0	14.4	0.2	105	48.4	59.3	67.9	77.2	83.7
2004	21603	66.8	14.4	0.0	103	47.6	59.1	67.6	77.1	83.9
2005	21628	67.0	14.5	0.2	103	48.1	59.3	68.0	77.2	84.0
2006	21695	67.1	14.2	0.2	103	48.2	59.3	68.1	77.1	84.1
2007	25120	66.9	14.5	0.0	103	47.5	59.1	68.3	77.1	84.2
2008	25546	67.2	14.3	0.0	109	47.8	59.4	68.7	77.2	84.1
2009	25271	67.1	14.3	0.2	109	47.9	59.1	68.9	77.2	84.1
2010	25122	67.3	14.5	0.0	105	47.9	59.0	69.2	77.4	84.6
2011	25271	67.4	14.6	0.0	109	47.7	59.0	69.6	77.3	84.6
2012	25427	67.4	14.5	0.0	103	48.1	59.3	69.7	77.3	84.2
2013	25093	67.4	14.6	0.0	108	47.9	58.7	69.8	77.4	84.3
2014	24534	67.8	14.4	0.2	107	48.7	59.2	70.2	77.6	84.7
2015	23826	68.1	14.3	0.0	105	49.0	59.1	70.5	78.1	84.7
2016	23005	68.1	14.3	0.0	104	48.9	59.2	70.3	78.3	84.6
2017	22241	68.4	14.1	0.9	104	49.7	59.4	70.6	78.5	84.4
2018	19231	67.8	14.0	1.3	105	48.8	58.8	69.8	78.1	83.7
2019	16423	67.2	13.8	4.4	104	48.7	58.3	69.3	77.8	83.0
2020	13321	66.9	13.9	0.0	104	48.2	58.0	68.7	77.9	82.9
1998-2020	477498	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	6142	65.8	14.1	0.4	99.8	49.1	57.9	66.9	75.4	82.9
1999	6124	66.1	13.6	0.3	99.5	50.5	58.6	67.0	75.2	82.4
2000	6282	66.3	13.7	0.2	99.7	50.5	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	11335	67.1	13.3	0.1	102	51.2	60.6	68.0	75.8	82.2
2003	11178	67.0	13.1	0.3	101	51.5	60.6	67.9	75.6	82.1
2004	11225	66.9	13.2	0.0	101	50.6	60.6	67.7	75.9	82.2
2005	11150	67.0	13.4	0.2	102	50.9	60.9	68.0	75.8	82.3
2006	11266	67.4	12.9	0.2	102	51.8	61.2	68.3	76.0	82.2
2007	13226	67.1	13.5	0.0	101	50.2	60.7	68.4	76.1	82.2
2008	13077	67.6	13.1	0.0	105	51.5	61.3	69.1	76.2	82.4
2009	12856	67.6	13.1	0.2	105	50.6	61.1	69.3	76.3	82.5
2010	12672	67.7	13.5	0.0	102	50.7	60.8	69.5	76.5	83.0
2011	12894	68.1	13.4	0.0	109	50.6	61.5	70.1	76.6	83.2
2012	13000	68.2	13.4	0.0	103	51.6	61.7	70.3	76.8	83.0
2013	12923	68.1	13.6	0.0	103	50.6	61.1	70.6	76.9	83.1
2014	12493	68.8	13.3	0.2	104	51.9	61.6	70.9	77.4	83.8
2015	11912	69.0	13.2	0.5	105	52.0	61.7	71.3	78.0	84.0
2016	11427	69.1	13.1	0.0	104	52.3	61.8	71.4	78.1	83.8
2017	10811	69.7	12.9	0.9	102	53.4	62.2	71.9	78.5	83.6
2018	9074	69.2	12.8	1.9	99.4	52.9	61.7	71.2	78.2	83.3
2019	7414	68.9	12.7	5.9	98.9	52.8	61.5	70.9	78.1	82.8
2020	5667	68.6	12.6	16.8	100	52.6	61.2	70.3	78.2	82.6
1998-2020	240613	67.8	13.3	0.0	109	51.3	60.9	69.4	76.8	82.8

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	6264	66.2	15.6	0.1	107	46.1	56.1	67.3	77.9	85.5
1999	6218	66.0	15.8	0.7	104	45.1	56.1	67.1	78.0	85.7
2000	6088	65.9	15.9	0.4	103	44.5	55.9	66.7	78.3	85.9
2001	6329	66.0	15.6	0.5	103	45.0	56.3	66.6	78.0	86.0
2002	10510	67.4	15.4	0.0	104	46.4	57.9	68.5	79.4	86.5
2003	10206	67.0	15.6	0.2	105	45.6	57.2	67.8	79.2	85.8
2004	10378	66.6	15.7	0.0	103	45.4	56.9	67.4	78.7	84.9
2005	10478	67.0	15.6	0.3	103	45.7	57.4	68.0	79.0	85.5
2006	10429	66.8	15.5	0.2	103	45.3	57.1	67.8	78.8	85.5
2007	11894	66.7	15.6	0.2	103	45.2	57.0	68.1	78.6	85.6
2008	12469	66.7	15.5	0.0	109	45.4	56.9	68.2	78.6	85.7
2009	12415	66.6	15.4	0.2	109	45.7	56.5	68.1	78.4	85.7
2010	12450	66.9	15.5	0.2	105	45.7	56.7	68.7	78.6	86.1
2011	12377	66.7	15.7	0.0	102	45.6	56.2	68.9	78.3	86.1
2012	12427	66.7	15.6	0.0	102	45.8	56.4	68.9	77.9	85.6
2013	12170	66.6	15.6	0.0	108	45.8	55.9	68.7	78.0	85.7
2014	12041	66.9	15.4	0.4	107	46.2	56.3	69.3	77.9	85.7
2015	11914	67.2	15.2	0.0	102	46.8	56.2	69.2	78.2	85.8
2016	11577	67.1	15.4	0.0	103	46.6	56.3	69.2	78.5	85.4
2017	11428	67.2	15.1	1.8	104	47.2	56.6	69.0	78.4	85.1
2018	10157	66.5	14.9	1.3	105	46.1	55.8	68.3	78.1	84.3
2019	9009	65.9	14.6	4.4	104	46.3	55.5	67.4	77.5	83.2
2020	7654	65.7	14.7	0.0	104	45.6	55.5	67.3	77.6	83.1
1998-2020	236882	66.7	15.4	0.0	109	45.8	56.5	68.3	78.4	85.4

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	398	0.1	0.1	225	0.1	0.1	173	0.1	0.1
5-9	217	0.1	0.2	117	0.1	0.2	100	0.1	0.2
10-14	267	0.1	0.3	137	0.1	0.3	130	0.1	0.3
15-19	584	0.2	0.5	319	0.2	0.5	265	0.2	0.4
20-24	1154	0.4	0.8	634	0.4	0.9	520	0.3	0.7
25-29	2161	0.7	1.5	967	0.6	1.5	1194	0.7	1.5
30-34	3487	1.1	2.6	1314	0.8	2.3	2173	1.4	2.8
35-39	5412	1.7	4.3	1853	1.2	3.5	3559	2.2	5.1
40-44	9093	2.8	7.1	2835	1.8	5.3	6258	3.9	9.0
45-49	14760	4.6	11.8	5170	3.2	8.5	9590	6.0	15.0
50-54	21452	6.7	18.5	8661	5.4	13.9	12791	8.0	23.0
55-59	26720	8.4	26.8	13052	8.2	22.1	13668	8.5	31.5
60-64	34226	10.7	37.5	18161	11.4	33.5	16065	10.0	41.6
65-69	44819	14.0	51.6	25231	15.8	49.3	19588	12.2	53.8
70-74	49197	15.4	67.0	28594	17.9	67.3	20603	12.9	66.7
75-79	45449	14.2	81.2	25100	15.7	83.0	20349	12.7	79.4
80-84	32163	10.1	91.3	16129	10.1	93.1	16034	10.0	89.4
85+	27869	8.7	100.0	10947	6.9	100.0	16922	10.6	100.0
All ages	319428	100.0		159446	100.0		159982	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=10871 %	Females DCO rate n=11611 %	Males Prop.all cancers n=153686 %	Females Prop.all cancers n=155051 %
0– 4	220	171	13.5	11.1	1.8	4.7	100.0	100.0
5– 9	117	100	7.5	6.7	1.7		100.0	100.0
10–14	137	128	8.6	8.5	0.7	0.8	100.0	100.0
15–19	319	265	18.6	16.6	0.6	0.4	100.0	100.0
20–24	629	518	31.2	27.3	0.8	0.4	100.0	100.0
25–29	953	1185	41.9	52.9	0.3	0.3	100.0	100.0
30–34	1296	2147	56.1	94.2	0.5	0.4	100.0	100.0
35–39	1831	3513	79.3	154.5	0.9	0.6	100.0	100.0
40–44	2792	6155	111.7	254.3	0.8	0.5	100.0	100.0
45–49	5049	9366	188.0	359.7	1.1	0.8	100.0	100.0
50–54	8443	12470	331.3	496.5	2.3	1.0	100.0	100.0
55–59	12699	13317	598.2	611.5	2.2	1.6	100.0	100.0
60–64	17593	15586	995.1	820.9	3.0	2.1	100.0	100.0
65–69	24273	18952	1487.1	1045.2	3.6	2.9	100.0	100.0
70–74	27438	19885	1830.1	1156.5	4.8	4.6	100.0	100.0
75–79	24030	19515	1985.9	1299.7	7.4	7.2	100.0	100.0
80–84	15367	15411	2122.1	1447.7	14.4	14.9	100.0	100.0
85+	10500	16367	2248.4	1569.9	34.1	34.5	100.0	100.0
All ages	153686	155051			7.1	7.5	100.0	100.0
Incidence								
Raw			471.9	461.6				
WS			240.0	227.1				
ES			345.7	314.3				
BRD-S			434.6	374.1				

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).

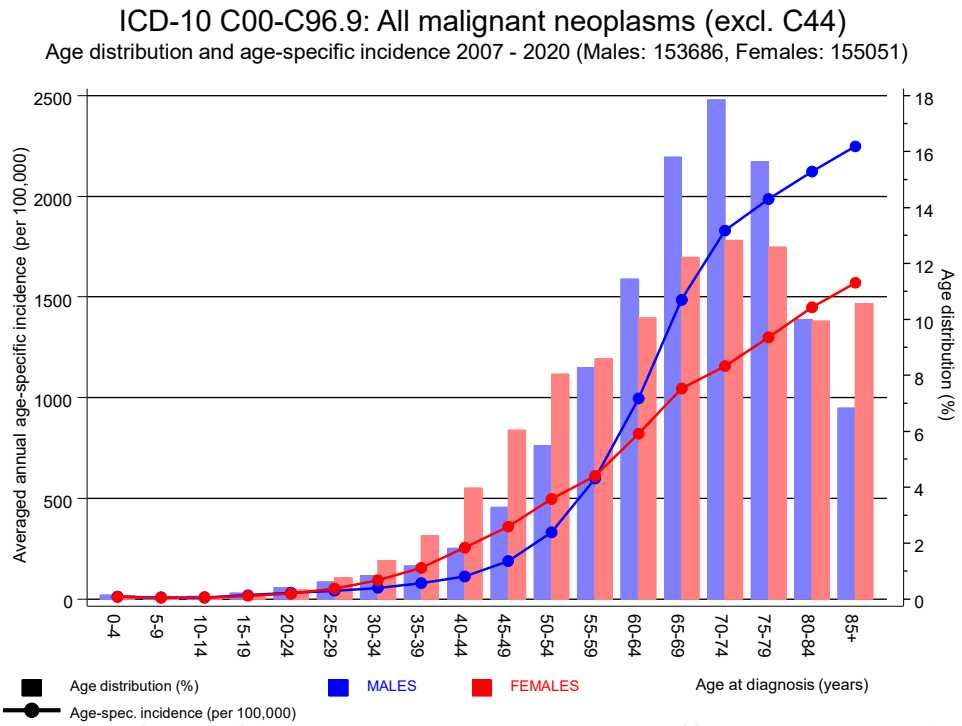


Figure 6. Age distribution (males: mean=68.2 yrs, median=70.1 yrs; females: mean=66.6 yrs, median=68.4 yrs) and age-specific incidence.

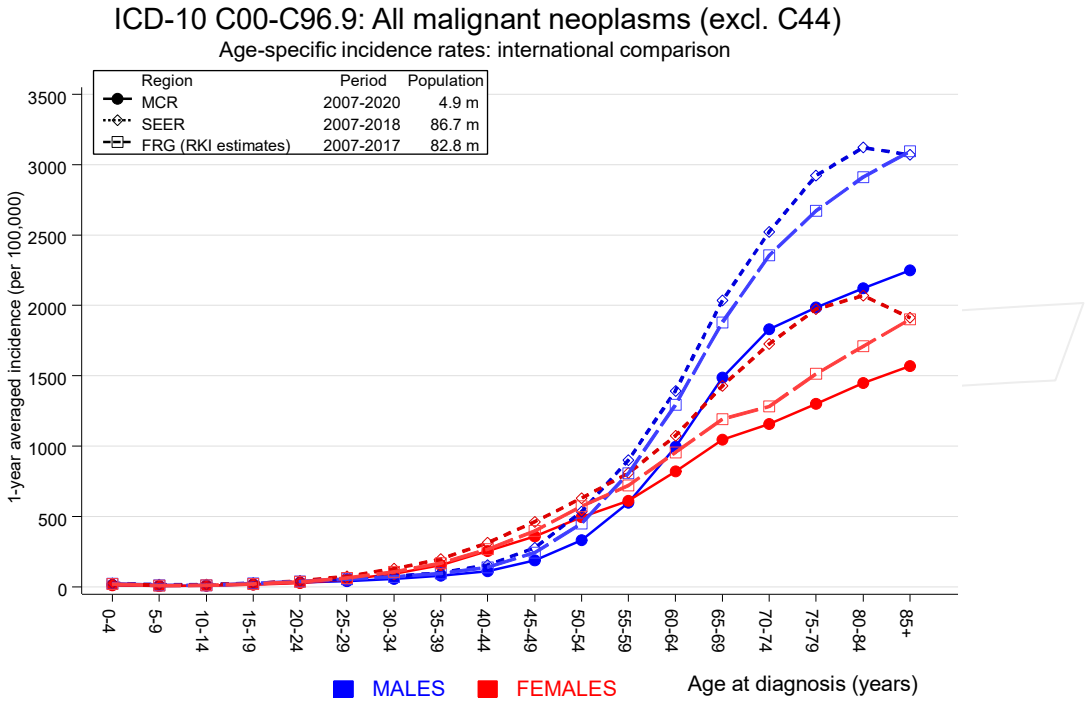


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, RKI estimates) and SEER (Surveillance, Epidemiology, and End Results, USA).

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 %
C03–C06	Oral cavity	321	94.2	3.4	3.0	3.8	#	3.1	5.9
C07–C08	Salivary gland	74	29.8	2.5	1.9	3.1	#	0.6	5.4
C09–C10	Oropharynx	396	114.2	3.5	3.1	3.8	#	3.9	2.5
C12–C13	Hypopharynx	228	62.2	3.7	3.2	4.2	#	2.3	6.6
C15	Oesophagus	716	234.8	3.0	2.8	3.3	#	6.6	7.0
C16	Stomach	1036	498.6	2.1	2.0	2.2	#	7.4	7.2
C17	Small intestine	303	72.7	4.2	3.7	4.7	#	3.2	2.6
C18	Colon	2681	1221.2	2.2	2.1	2.3	#	20.0	4.7
C19–C20	Rectum	1230	646.7	1.9	1.8	2.0	#	8.0	3.0
C21	Anus/canal	74	28.4	2.6	2.0	3.3	#	0.6	2.7
C22	Liver	714	355.0	2.0	1.9	2.2	#	4.9	14.7
C23–C24	Bile	257	132.0	1.9	1.7	2.2	#	1.7	12.1
C25	Pancreas	1089	486.3	2.2	2.1	2.4	#	8.3	23.2
C30–C31	Sinuses	44	22.1	2.0	1.4	2.7	#	0.3	6.8
C32	Larynx	326	117.6	2.8	2.5	3.1	#	2.9	12.6
C33–C34	Lung	3584	1439.4	2.5	2.4	2.6	#	29.5	11.5
C38,C45	Mesothelioma	182	86.9	2.1	1.8	2.4	#	1.3	6.0
C43	Malign. melanoma	1806	549.4	3.3	3.1	3.4	#	17.3	1.6
C46,C49	Soft tissue	185	71.1	2.6	2.2	3.0	#	1.6	2.2
C50	Breast	89	33.7	2.6	2.1	3.2	#	0.8	12.4
C60	Penis	73	31.2	2.3	1.8	2.9	#	0.6	5.5
C61	Prostate	4495	3522.9	1.3	1.2	1.3	#	13.4	6.3
C62	Testis	167	30.3	5.5	4.7	6.4	#	1.9	4.2
C64	Kidney	1383	419.1	3.3	3.1	3.5	#	13.2	7.1
C65	Renal pelvis	253	56.5	4.5	3.9	5.1	#	2.7	0.8
C66	Ureter	174	33.4	5.2	4.5	6.0	#	1.9	
C67	Bladder	1480	599.5	2.5	2.3	2.6	#	12.1	6.7
C68	Urethra	116	11.7	9.9	8.2	11.9	#	1.4	
C68	Urinary org.	49	8.5	5.8	4.3	7.6	#	0.6	75.5
C70–C72	CNS cancer	306	153.2	2.0	1.8	2.2	#	2.1	15.0
C73	Thyroid	228	73.3	3.1	2.7	3.5	#	2.1	3.1
C76–C79	CUP	416	210.1	2.0	1.8	2.2	#	2.8	2.9
C81	Hodgkin lymphoma	80	27.8	2.9	2.3	3.6	#	0.7	3.8
C82–C85	NHL	1308	528.1	2.5	2.3	2.6	#	10.7	6.3
C90	Mult. myeloma	306	165.1	1.9	1.7	2.1	#	1.9	14.1
C91–C96	Leukaemia	495	192.5	2.6	2.4	2.8	#	4.2	24.6
Others, specified		287	127.1	2.3	2.0	2.5	#	2.2	16.7
Not observed		0	0.9	0.0	0.0	4.2		−0.0	
All further malignancies		26951	12488	2.2	2.1	2.2	#	198.6	7.9

Patients	196907
Median age at next malignancy (years)	73.2
Person-years	728076
Mean observation time (years)	3.7
Median observation time (years)	1.8

The occurrence of further specified malignancy is statistically significant.

Further observed malignancies with count 1 to 35 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	131	46.3	2.8	2.4	3.4	#	1.1	0.8
C07–C08	Salivary gland	42	12.9	3.2	2.3	4.4	#	0.4	4.8
C09–C10	Oropharynx	166	33.8	4.9	4.2	5.7	#	1.7	3.0
C12–C13	Hypopharynx	42	8.7	4.8	3.5	6.5	#	0.4	14.3
C15	Oesophagus	187	52.5	3.6	3.1	4.1	#	1.8	11.2
C16	Stomach	601	266.1	2.3	2.1	2.4	#	4.4	11.1
C17	Small intestine	176	42.7	4.1	3.5	4.8	#	1.7	1.7
C18	Colon	1798	759.6	2.4	2.3	2.5	#	13.6	7.8
C19–C20	Rectum	577	311.8	1.9	1.7	2.0	#	3.5	5.5
C21	Anus/canal	110	44.8	2.5	2.0	3.0	#	0.9	1.8
C22	Liver	225	97.3	2.3	2.0	2.6	#	1.7	22.2
C23–C24	Bile	229	110.1	2.1	1.8	2.4	#	1.6	17.5
C25	Pancreas	837	364.0	2.3	2.1	2.5	#	6.2	24.3
C32	Larynx	48	14.5	3.3	2.4	4.4	#	0.4	10.4
C33–C34	Lung	1883	600.0	3.1	3.0	3.3	#	16.8	10.9
C43	Malign. melanoma	994	310.8	3.2	3.0	3.4	#	8.9	3.2
C46,C49	Soft tissue	140	45.4	3.1	2.6	3.6	#	1.2	3.6
C48	Peritoneal	109	32.5	3.4	2.8	4.0	#	1.0	10.1
C50	Breast	7011	2471.6	2.8	2.8	2.9	#	59.4	2.6
C51	Vulva	201	83.7	2.4	2.1	2.8	#	1.5	3.0
C52	Vagina	43	14.8	2.9	2.1	3.9	#	0.4	2.3
C53	Cervix uteri	256	108.5	2.4	2.1	2.7	#	1.9	15.2
C54	Corpus uteri	1012	438.4	2.3	2.2	2.5	#	7.5	4.2
C55,C57	Fem. genitals un	50	17.1	2.9	2.2	3.9	#	0.4	56.0
C56	Ovary	976	316.0	3.1	2.9	3.3	#	8.6	18.1
C64	Kidney	553	182.3	3.0	2.8	3.3	#	4.9	10.8
C65	Renal pelvis	103	24.4	4.2	3.4	5.1	#	1.0	1.0
C66	Ureter	76	13.0	5.9	4.6	7.3	#	0.8	1.3
C67	Bladder	420	154.2	2.7	2.5	3.0	#	3.5	10.2
C70–C72	CNS cancer	182	102.4	1.8	1.5	2.1	#	1.0	23.1
C73	Thyroid	347	135.2	2.6	2.3	2.9	#	2.8	4.0
C76–C79	CUP	239	142.6	1.7	1.5	1.9	#	1.3	4.6
C81	Hodgkin lymphoma	43	14.8	2.9	2.1	3.9	#	0.4	4.7
C82–C85	NHL	789	307.2	2.6	2.4	2.8	#	6.3	5.4
C90	Mult. myeloma	182	95.5	1.9	1.6	2.2	#	1.1	16.5
C91–C96	Leukaemia	390	115.0	3.4	3.1	3.7	#	3.6	20.0
Others, specified		295	110.9	2.7	2.4	3.0	#	2.4	19.3
Not observed		0	0.0	0.0	0.0	114.1		−0.0	
All further malignancies		21463	8001.4	2.7	2.6	2.7	#	176.2	7.9

Patients	197480
Median age at next malignancy (years)	71.8
Person-years	764182
Mean observation time (years)	3.9
Median observation time (years)	1.9

The occurrence of further specified malignancy is statistically significant.

Further observed malignancies with count 1 to 33 are pooled in category “Others, specified”.

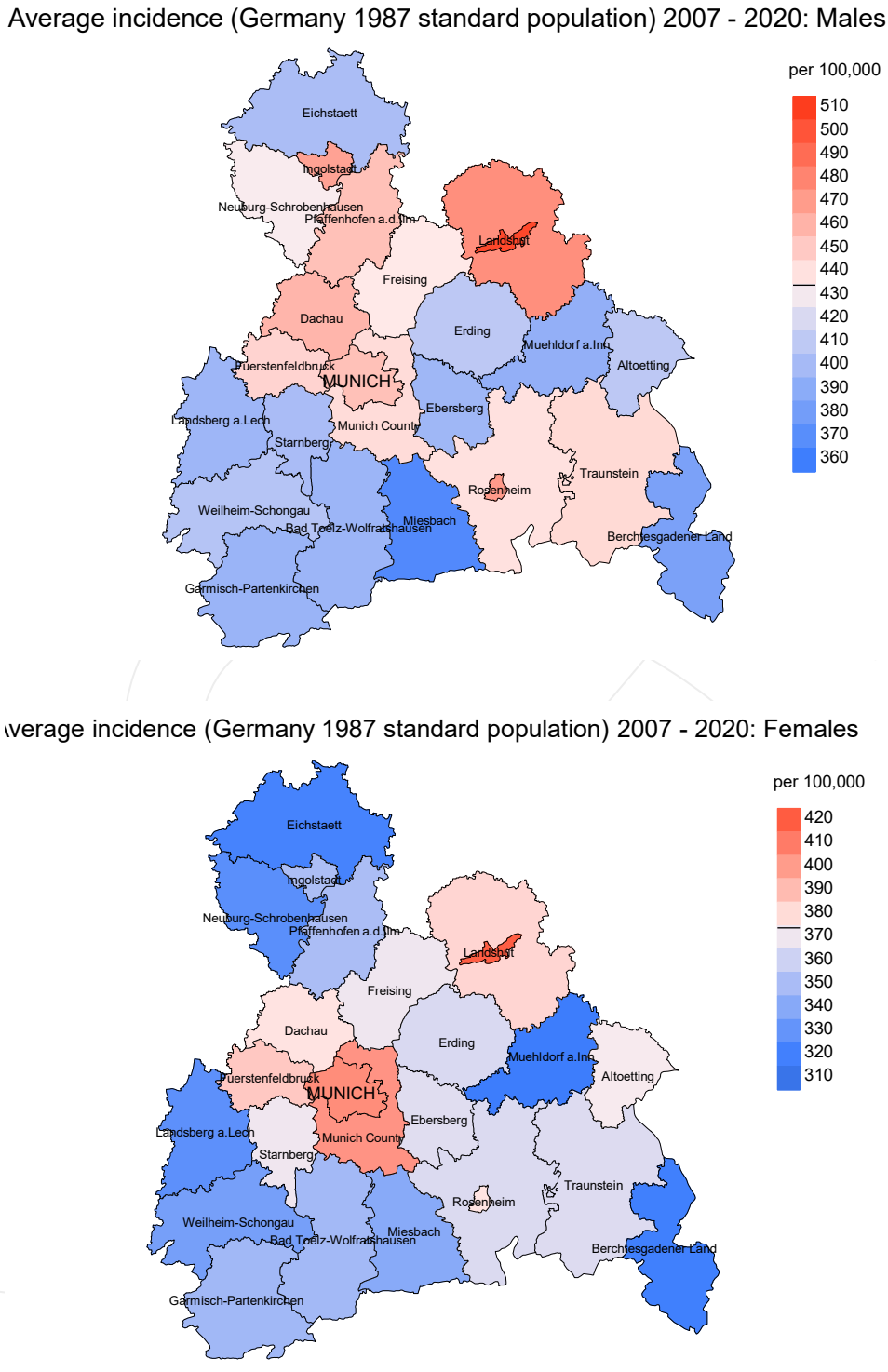
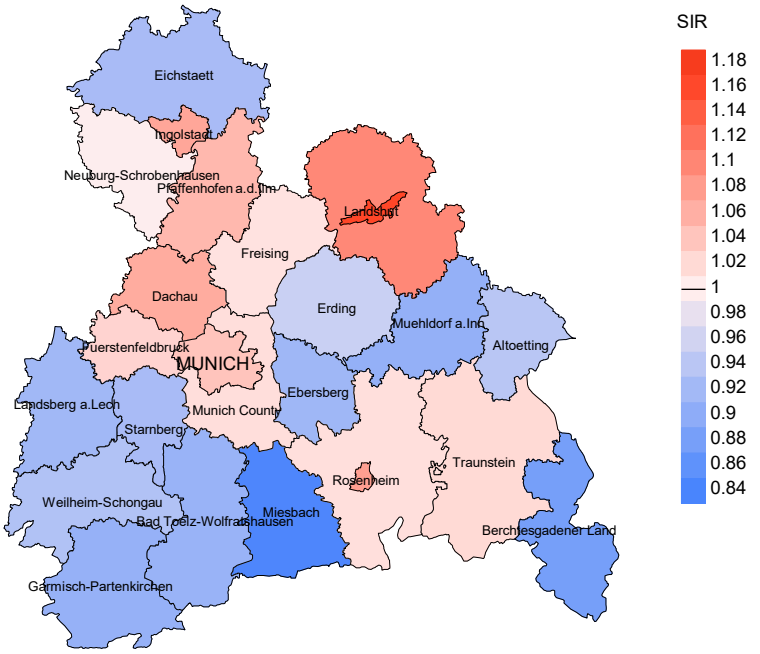


Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 434.6/100,000 WS N=153,686, females 374.1/100,000 WS N=155,051).

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 4,165 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 365.7/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 351.0 and 380.8/100,000.

Standardized incidence ratio (SIR) 2007 - 2020: Males



Standardized incidence ratio (SIR) 2007 - 2020: Females

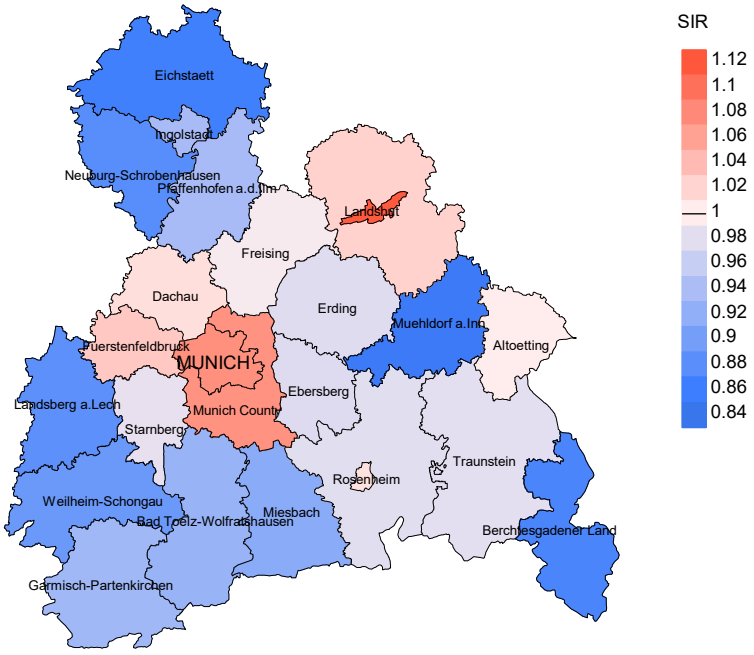


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=153,686, females N=155,051).

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 4,165 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 4.94 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	12406	97.1	12.2	9527	76.8	93.3
1999	12342	96.8	11.7	9282	75.2	93.8
2000	12370	97.2	13.0	9122	73.7	95.0
2001	12794	96.5	12.5	9203	71.9	95.0
2002	21845	97.3	14.9	16176	74.0	95.9
2003	21384	97.0	12.7	15361	71.8	96.0
2004	21603	96.8	11.6	14991	69.4	96.1
2005	21628	96.2	10.3	14738	68.1	96.3
2006	21695	94.7	9.0	14337	66.1	96.1
2007	25120	93.4	9.4	16208	64.5	96.0
2008	25546	98.1	8.6	15952	62.4	95.9
2009	25271	98.1	8.1	15429	61.1	95.8
2010	25122	98.0	8.4	14935	59.4	95.6
2011	25271	97.9	7.9	14579	57.7	95.2
2012	25427	97.8	7.6	14051	55.3	94.6
2013	25093	97.7	7.7	13457	53.6	94.0
2014	24534	96.9	8.0	12807	52.2	93.4
2015	23826	95.9	8.4	12127	50.9	92.1
2016	23005	99.4	8.8	11058	48.1	90.3
2017	22241	99.4	8.5	9508	42.7	84.5
2018	19231	99.4	5.1	6506	33.8	67.8
2019	16423	99.5	0.8	4401	26.8	81.6
2020	13321	99.6	0.1	2712	20.4	93.7
1998-2020	477498	97.4	8.9	276467	57.9	93.7

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	12406	6511	92.0	2803	22.6
1999	12342	6599	92.0	2684	21.7
2000	12370	6605	94.1	2647	21.4
2001	12794	6797	93.9	2706	21.2
2002	21845	9820	97.1	5203	23.8
2003	21384	10366	97.3	4702	22.0
2004	21603	10558	97.5	4493	20.8
2005	21628	10765	97.0	4352	20.1
2006	21695	11135	97.3	4238	19.5
2007	25120	12241	97.9	4884	19.4
2008	25546	12554	98.5	4876	19.1
2009	25271	12824	98.6	4640	18.4
2010	25122	13276	98.5	4789	19.1
2011	25271	13571	98.5	4867	19.3
2012	25427	13625	98.0	4742	18.6
2013	25093	13871	98.2	4640	18.5
2014	24534	13865	98.2	4699	19.2
2015	23826	14470	98.4	4712	19.8
2016	23005	14581	98.6	4753	20.7
2017	22241	14580	97.1	4416	19.9
2018	19231	11884	69.3	2725	14.2
2019	16423	10355	45.4	1732	10.5
2020	13321	12022	89.3	1548	11.6
1998–2020	477498	262875	93.7	91851	19.2

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	6511	72.3	27.7	88.9
1999	6599	76.3	23.7	89.2
2000	6605	77.7	22.3	88.6
2001	6797	74.8	25.2	88.4
2002	9820	78.7	21.3	89.1
2003	10366	78.5	21.5	88.4
2004	10558	80.0	20.0	88.2
2005	10765	78.5	21.5	86.5
2006	11135	78.0	22.0	86.4
2007	12241	78.0	22.0	86.0
2008	12554	77.5	22.5	84.7
2009	12824	76.5	23.5	84.3
2010	13276	76.3	23.7	84.2
2011	13571	75.1	24.9	83.2
2012	13625	74.8	25.2	82.6
2013	13871	72.7	27.3	80.8
2014	13865	72.9	27.1	81.5
2015	14470	71.5	28.5	79.2
2016	14581	70.9	29.1	79.2
2017	14580	68.4	31.6	76.9
2018	11884	60.7	39.3	67.1
2019	10355	54.1	45.9	70.7
2020	12022	58.1	41.9	67.3
1998-2020	262875	72.9	27.1	82.5

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	3355	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	6798	74.2	72.1	81.0	72.8
2010	6991	74.5	72.6	81.1	73.3
2011	7195	74.9	72.8	81.5	73.4
2012	7212	75.4	73.4	81.5	74.0
2013	7264	76.0	73.7	82.3	74.4
2014	7375	76.2	74.3	82.5	75.0
2015	7685	76.9	74.7	82.7	75.4
2016	7821	77.6	75.6	82.3	76.2
2017	7717	78.0	75.7	83.1	76.3
2018	6373	78.1	75.7	81.4	76.6
2019	5554	78.9	75.4	82.0	76.6
2020	6416	79.6	76.3	83.2	76.6
1998–2020	138060	75.5	73.0	81.4	73.7

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	5024	77.1	74.2	84.2	75.6
2004	5171	77.4	75.0	84.1	76.2
2005	5245	77.8	74.3	84.7	75.7
2006	5306	77.9	75.1	84.9	76.2
2007	5776	77.9	74.3	85.6	75.8
2008	5934	78.2	74.6	85.9	75.8
2009	6026	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	6607	78.5	75.0	86.7	76.3
2014	6490	78.4	75.2	86.6	76.4
2015	6784	78.7	75.8	86.5	76.7
2016	6760	78.6	75.8	86.7	76.8
2017	6863	79.5	76.6	86.8	77.4
2018	5511	79.2	75.5	84.8	76.7
2019	4801	78.9	74.6	83.7	76.1
2020	5605	80.4	76.1	85.7	76.8
1998–2020	124813	78.3	75.0	85.6	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	2602	228.5	0.43	132.7	0.41	204.8	0.43	274.1	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	5230	234.3	0.42	112.8	0.38	172.7	0.41	230.4	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	0.42	233.7	0.45
2012	5404	238.1	0.43	108.1	0.38	166.4	0.41	223.7	0.44
2013	5342	232.1	0.43	104.2	0.38	160.3	0.41	214.9	0.43
2014	5388	231.1	0.45	101.3	0.39	156.5	0.42	209.6	0.45
2015	5469	229.9	0.48	100.3	0.42	154.8	0.45	207.8	0.47
2016	5502	228.9	0.50	96.8	0.43	150.6	0.46	204.6	0.49
2017	5288	219.1	0.51	90.9	0.44	142.1	0.47	191.9	0.50
2018	3863	158.7	0.44	65.8	0.38	102.2	0.40	137.8	0.43
2019	2969	121.9	0.42	50.6	0.35	78.3	0.38	106.5	0.41
2020	3721	152.8	0.68	62.1	0.56	97.1	0.61	132.5	0.66
1998-2020	101096	217.3	0.44	103.1	0.39	158.3	0.42	211.6	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	3888	197.4	0.39	83.5	0.33	124.7	0.35	160.2	0.38
2004	4141	209.5	0.41	85.4	0.33	128.0	0.36	166.7	0.39
2005	4095	205.8	0.40	84.5	0.33	126.1	0.35	162.0	0.38
2006	4121	205.1	0.41	81.5	0.32	122.8	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	4555	196.3	0.38	78.0	0.30	116.9	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	4780	200.5	0.41	76.2	0.31	114.3	0.34	148.4	0.37
2014	4764	197.9	0.41	73.7	0.31	110.7	0.34	144.6	0.37
2015	4915	202.0	0.43	73.4	0.32	111.6	0.35	146.8	0.39
2016	4875	198.6	0.43	74.6	0.34	111.8	0.37	145.0	0.40
2017	4744	192.5	0.43	68.6	0.32	104.2	0.35	137.4	0.38
2018	3492	140.7	0.36	52.5	0.27	78.7	0.29	102.1	0.32
2019	2811	113.2	0.32	43.9	0.25	65.1	0.27	83.8	0.29
2020	3357	135.2	0.46	49.8	0.33	74.7	0.36	97.2	0.40
1998-2020	91518	189.6	0.40	74.0	0.31	110.9	0.34	143.9	0.37

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	35	0.0	0.0	19	0.0	0.0	16	0.0	0.0
5-9	53	0.0	0.1	28	0.0	0.1	25	0.0	0.1
10-14	51	0.0	0.1	28	0.0	0.1	23	0.0	0.1
15-19	73	0.1	0.2	48	0.1	0.2	25	0.0	0.1
20-24	116	0.1	0.3	73	0.1	0.3	43	0.1	0.2
25-29	192	0.1	0.4	93	0.1	0.4	99	0.2	0.4
30-34	324	0.2	0.6	143	0.2	0.6	181	0.3	0.7
35-39	675	0.5	1.2	267	0.4	1.0	408	0.7	1.3
40-44	1461	1.1	2.3	606	0.9	1.9	855	1.4	2.7
45-49	3087	2.4	4.6	1415	2.0	3.9	1672	2.7	5.4
50-54	5303	4.0	8.7	2658	3.8	7.8	2645	4.3	9.7
55-59	8242	6.3	15.0	4424	6.4	14.1	3818	6.2	15.9
60-64	11404	8.7	23.7	6411	9.2	23.4	4993	8.1	24.0
65-69	16165	12.3	36.0	9196	13.3	36.6	6969	11.3	35.3
70-74	20617	15.7	51.7	11870	17.1	53.7	8747	14.2	49.5
75-79	22331	17.0	68.8	12508	18.0	71.8	9823	15.9	65.4
80-84	19870	15.2	83.9	10479	15.1	86.9	9391	15.2	80.6
85+	21060	16.1	100.0	9094	13.1	100.0	11966	19.4	100.0
All ages	131059	100.0		69360	100.0		61699	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	19	16	1.2	0.09	1.0	0.09	100.0	100.0
5- 9	28	25	1.8	0.24	1.7	0.25	100.0	100.0
10-14	28	23	1.8	0.20	1.5	0.18	100.0	100.0
15-19	48	25	2.8	0.15	1.6	0.09	100.0	100.0
20-24	73	43	3.6	0.12	2.3	0.08	100.0	100.0
25-29	93	99	4.1	0.10	4.4	0.08	100.0	100.0
30-34	143	181	6.2	0.11	7.9	0.08	100.0	100.0
35-39	267	408	11.6	0.15	17.9	0.12	100.0	100.0
40-44	606	855	24.2	0.22	35.3	0.14	100.0	100.0
45-49	1415	1672	52.7	0.28	64.2	0.18	100.0	100.0
50-54	2658	2645	104.3	0.31	105.3	0.21	100.0	100.0
55-59	4424	3818	208.4	0.35	175.3	0.29	100.0	100.0
60-64	6411	4993	362.6	0.36	263.0	0.32	100.0	100.0
65-69	9196	6969	563.4	0.38	384.3	0.37	100.0	100.0
70-74	11870	8747	791.7	0.43	508.7	0.44	100.0	100.0
75-79	12508	9823	1033.7	0.52	654.2	0.50	100.0	100.0
80-84	10479	9391	1447.1	0.68	882.2	0.61	100.0	100.0
85+	9094	11966	1947.3	0.87	1147.8	0.73	100.0	100.0
All ages	69360	61699					100.0	100.0
Mortality								
Raw			213.0	0.45	183.7	0.40		
WS			95.1	0.40	69.8	0.31		
ES			146.5	0.42	104.7	0.33		
BRD-S			196.5	0.45	136.0	0.36		
PYLL-70								
per 100,000			872.1		854.9			
ES			757.3		724.6			
AYLL-70			9.8		11.1			

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	55	0.2	49	89.1	1	1.8	5	9.1
C03–C06	Oral cavity	572	2.2	475	83.0	64	11.2	33	5.8
C07–C08	Salivary gland	57	0.2	48	84.2	7	12.3	2	3.5
C09–C10	Oropharynx	563	2.1	445	79.0	75	13.3	43	7.6
C12–C13	Hypopharynx	289	1.1	226	78.2	48	16.6	15	5.2
C15	Oesophagus	365	1.4	217	59.5	101	27.7	47	12.9
C16	Stomach	679	2.6	485	71.4	136	20.0	58	8.5
C17	Small intestine	130	0.5	84	64.6	25	19.2	21	16.2
C18	Colon	2342	8.9	1614	68.9	447	19.1	281	12.0
C19–C20	Rectum	1253	4.8	967	77.2	215	17.2	71	5.7
C21	Anus/canal	62	0.2	55	88.7	5	8.1	2	3.2
C22	Liver	274	1.0	137	50.0	61	22.3	76	27.7
C23–C24	Bile	107	0.4	58	54.2	19	17.8	30	28.0
C25	Pancreas	337	1.3	115	34.1	82	24.3	140	41.5
C30–C31	Sinuses	70	0.3	62	88.6	4	5.7	4	5.7
C32	Larynx	671	2.6	568	84.6	61	9.1	42	6.3
C33–C34	Lung	1550	5.9	731	47.2	350	22.6	469	30.3
C43	Malign. melanoma	1211	4.6	905	74.7	85	7.0	221	18.2
C44	Skin others	3273	12.5	1675	51.2	274	8.4	1324	40.5
C46,C49	Soft tissue	128	0.5	106	82.8	9	7.0	13	10.2
C50	Breast	73	0.3	56	76.7	8	11.0	9	12.3
C61	Prostate	5566	21.2	4895	87.9	372	6.7	299	5.4
C62	Testis	274	1.0	252	92.0	10	3.6	12	4.4
C64	Kidney	1135	4.3	852	75.1	136	12.0	147	13.0
C65	Renal pelvis	177	0.7	118	66.7	40	22.6	19	10.7
C66	Ureter	148	0.6	100	67.6	24	16.2	24	16.2
C67	Bladder	1916	7.3	1304	68.1	279	14.6	333	17.4
C70–C72	CNS cancer	139	0.5	68	48.9	16	11.5	55	39.6
C73	Thyroid	183	0.7	161	88.0	11	6.0	11	6.0
C76–C79	CUP	270	1.0	212	78.5	50	18.5	8	3.0
C81	Hodgkin lymphoma	173	0.7	161	93.1	6	3.5	6	3.5
C82–C85	NHL	1095	4.2	809	73.9	98	8.9	188	17.2
C90	Mult. myeloma	266	1.0	170	63.9	30	11.3	66	24.8
C91–C96	Leukaemia	433	1.7	120	27.7	82	18.9	231	53.3
Others, specified		399	1.5	278	69.7	62	15.5	59	14.8
All further malignancies		26235	100.0	18578	70.8	3293	12.6	4364	16.6

Further malignancies with number of cases 1 to 54 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	224	1.1	182	81.3	21	9.4	21	9.4
C09–C10	Oropharynx	155	0.8	121	78.1	21	13.5	13	8.4
C15	Oesophagus	75	0.4	45	60.0	15	20.0	15	20.0
C16	Stomach	420	2.1	273	65.0	93	22.1	54	12.9
C17	Small intestine	70	0.3	44	62.9	19	27.1	7	10.0
C18	Colon	1562	7.6	1016	65.0	299	19.1	247	15.8
C19–C20	Rectum	647	3.2	490	75.7	114	17.6	43	6.6
C21	Anus/canal	118	0.6	97	82.2	11	9.3	10	8.5
C22	Liver	79	0.4	33	41.8	24	30.4	22	27.8
C23–C24	Bile	102	0.5	59	57.8	16	15.7	27	26.5
C25	Pancreas	275	1.3	95	34.5	64	23.3	116	42.2
C32	Larynx	78	0.4	64	82.1	6	7.7	8	10.3
C33–C34	Lung	704	3.4	322	45.7	135	19.2	247	35.1
C43	Malign. melanoma	767	3.7	596	77.7	37	4.8	134	17.5
C44	Skin others	1478	7.2	794	53.7	126	8.5	558	37.8
C46,C49	Soft tissue	85	0.4	66	77.6	7	8.2	12	14.1
C48	Peritoneal	75	0.4	54	72.0	19	25.3	2	2.7
C50	Breast	7199	35.2	4430	61.5	1047	14.5	1722	23.9
C51	Vulva	163	0.8	128	78.5	13	8.0	22	13.5
C53	Cervix uteri	709	3.5	637	89.8	36	5.1	36	5.1
C54	Corpus uteri	1183	5.8	998	84.4	121	10.2	64	5.4
C55,C57	Fem. genitals un	103	0.5	79	76.7	11	10.7	13	12.6
C56	Ovary	749	3.7	471	62.9	145	19.4	133	17.8
C64	Kidney	524	2.6	370	70.6	62	11.8	92	17.6
C65	Renal pelvis	87	0.4	62	71.3	12	13.8	13	14.9
C67	Bladder	453	2.2	291	64.2	47	10.4	115	25.4
C69	Eye melanoma	54	0.3	47	87.0	6	11.1	1	1.9
C70–C72	CNS cancer	125	0.6	60	48.0	15	12.0	50	40.0
C73	Thyroid	355	1.7	319	89.9	17	4.8	19	5.4
C76–C79	CUP	209	1.0	165	78.9	37	17.7	7	3.3
C81	Hodgkin lymphoma	121	0.6	115	95.0	5	4.1	1	0.8
C82–C85	NHL	699	3.4	509	72.8	39	5.6	151	21.6
C90	Mult. myeloma	153	0.7	84	54.9	13	8.5	56	36.6
C91–C96	Leukaemia	318	1.6	77	24.2	65	20.4	176	55.3
Others, specified		359	1.8	258	71.9	47	13.1	54	15.0
All further malignancies		20477	100.0	13451	65.7	2765	13.5	4261	20.8

Further malignancies with number of cases 1 to 53 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	19	15	1.2	0.09	1.0	0.09	100.0	100.0
5- 9	27	25	1.7	0.23	1.7	0.26	100.0	100.0
10-14	28	19	1.8	0.21	1.3	0.16	100.0	100.0
15-19	46	23	2.7	0.15	1.4	0.09	100.0	100.0
20-24	66	41	3.3	0.11	2.2	0.08	100.0	100.0
25-29	85	91	3.7	0.09	4.1	0.08	100.0	100.0
30-34	138	159	6.0	0.11	7.0	0.08	100.0	100.0
35-39	249	369	10.8	0.14	16.2	0.11	100.0	100.0
40-44	559	754	22.4	0.21	31.2	0.13	100.0	100.0
45-49	1293	1436	48.1	0.28	55.2	0.17	100.0	100.0
50-54	2343	2245	91.9	0.31	89.4	0.21	100.0	100.0
55-59	3857	3191	181.7	0.34	146.5	0.28	100.0	100.0
60-64	5359	4075	303.1	0.35	214.6	0.32	100.0	100.0
65-69	7341	5536	449.7	0.37	305.3	0.36	100.0	100.0
70-74	9063	6767	604.5	0.42	393.6	0.44	100.0	100.0
75-79	9118	7517	753.5	0.52	500.6	0.51	100.0	100.0
80-84	7446	7232	1028.3	0.70	679.4	0.61	100.0	100.0
85+	6505	9412	1392.9	0.89	902.8	0.73	100.0	100.0
All ages	53542	48907					100.0	100.0
Mortality								
Raw			164.4	0.43	145.6	0.39		
WS			75.7	0.38	56.5	0.29		
ES			115.0	0.41	84.1	0.32		
BRD-S			151.6	0.43	108.3	0.35		
PYLL-70								
per 100,000			764.8		726.4			
ES			666.0		617.9			
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 2007-2020
(**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	19	15	1.2	0.09	1.0	0.09	100.0	100.0
5- 9	27	25	1.7	0.23	1.7	0.27	100.0	100.0
10-14	28	19	1.8	0.21	1.3	0.16	100.0	100.0
15-19	46	22	2.7	0.15	1.4	0.09	100.0	100.0
20-24	66	40	3.3	0.11	2.1	0.08	100.0	100.0
25-29	85	88	3.7	0.10	3.9	0.08	100.0	100.0
30-34	137	157	5.9	0.11	6.9	0.08	100.0	100.0
35-39	248	364	10.7	0.15	16.0	0.12	100.0	100.0
40-44	556	746	22.2	0.22	30.8	0.14	100.0	100.0
45-49	1278	1419	47.6	0.29	54.5	0.18	100.0	100.0
50-54	2313	2206	90.8	0.33	87.8	0.22	100.0	100.0
55-59	3803	3137	179.2	0.37	144.0	0.30	100.0	100.0
60-64	5267	3994	297.9	0.39	210.4	0.34	100.0	100.0
65-69	7154	5398	438.3	0.41	297.7	0.39	100.0	100.0
70-74	8739	6564	582.9	0.47	381.8	0.47	100.0	100.0
75-79	8695	7265	718.6	0.56	483.8	0.54	100.0	100.0
80-84	6967	6938	962.1	0.73	651.7	0.62	100.0	100.0
85+	5952	8993	1274.5	0.86	862.6	0.72	100.0	100.0
All ages	51380	47390					100.0	100.0
Mortality								
Raw			157.8	0.46	141.1	0.40		
WS			73.3	0.40	55.0	0.31		
ES			110.8	0.43	81.9	0.34		
BRD-S			145.4	0.46	105.2	0.37		
PYLL-70								
per 100,000			754.8		714.4			
ES			657.7		607.9			
AYLL-70			10.3		11.5			

* See corresponding tables with multiple malignancies.

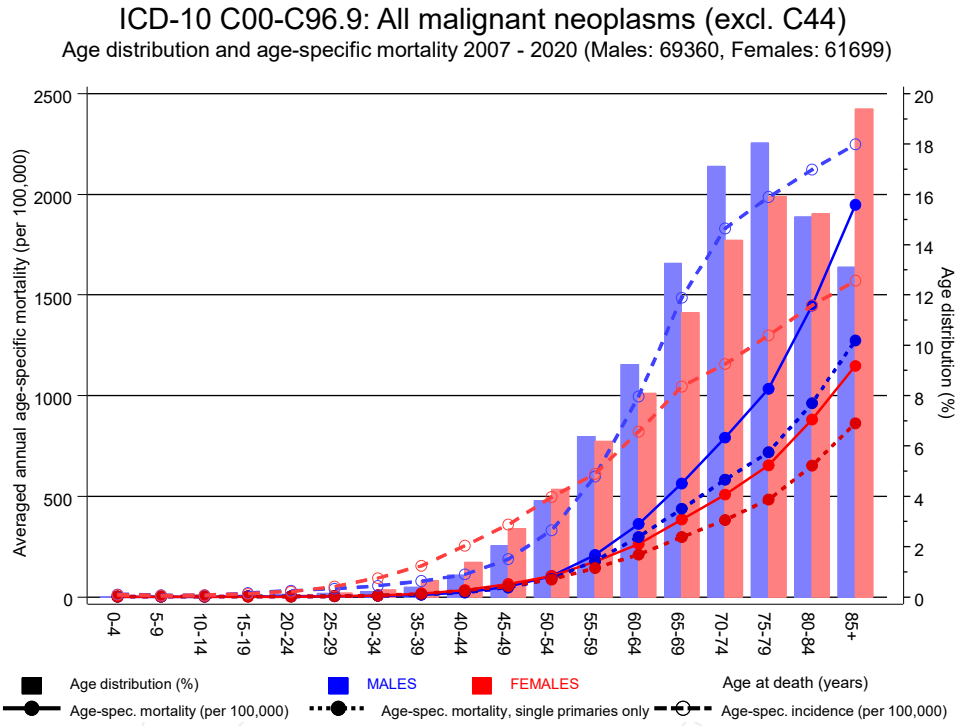
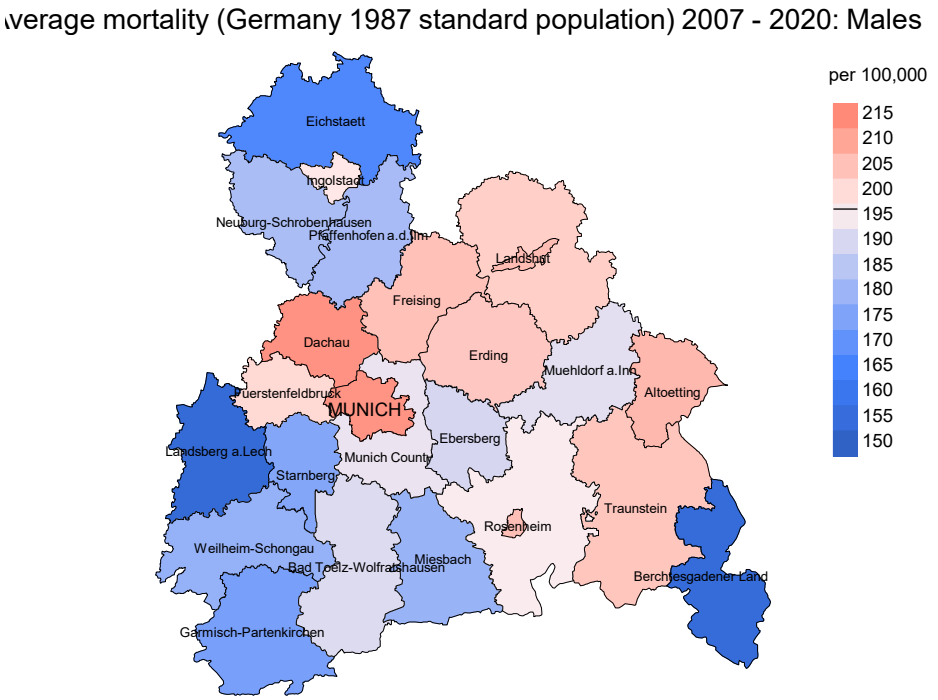


Figure 17. Distribution of age at death (bars; males: mean=69.8 yrs, median=71.0 yrs; females: mean=70.1 yrs, median=71.8 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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



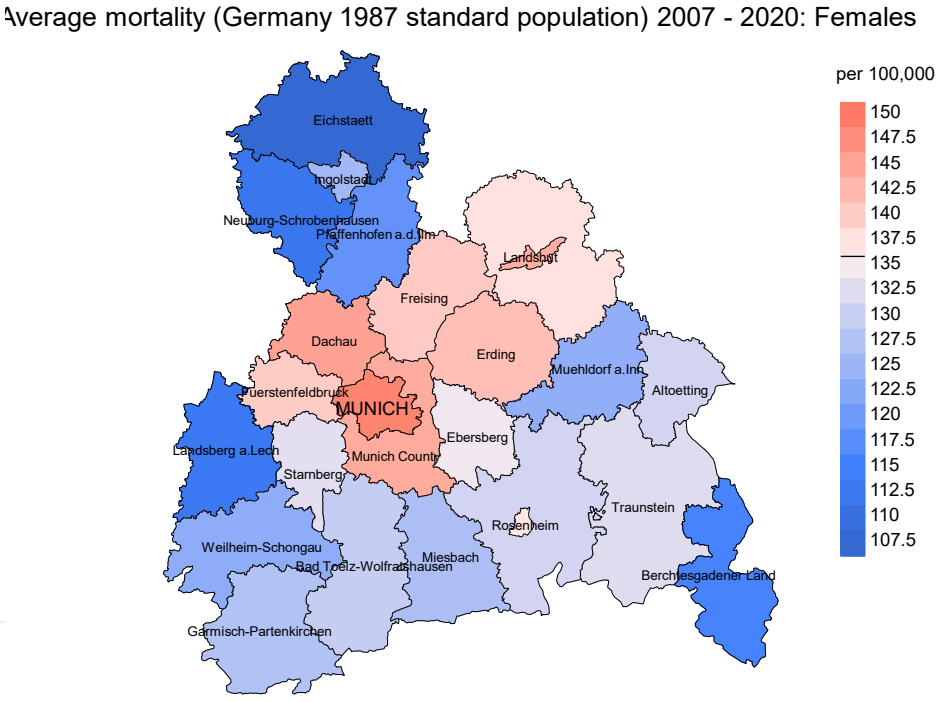


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2020. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 196.5/100,000 WS N=69,360, females 136.0/100,000 WS N=61,699).

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 1,659 women died from all cancers (excl. C44). Therefore, the mean mortality rate for this cancer type in this area can be calculated at 134.5/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 126.0 and 143.5/100,000.

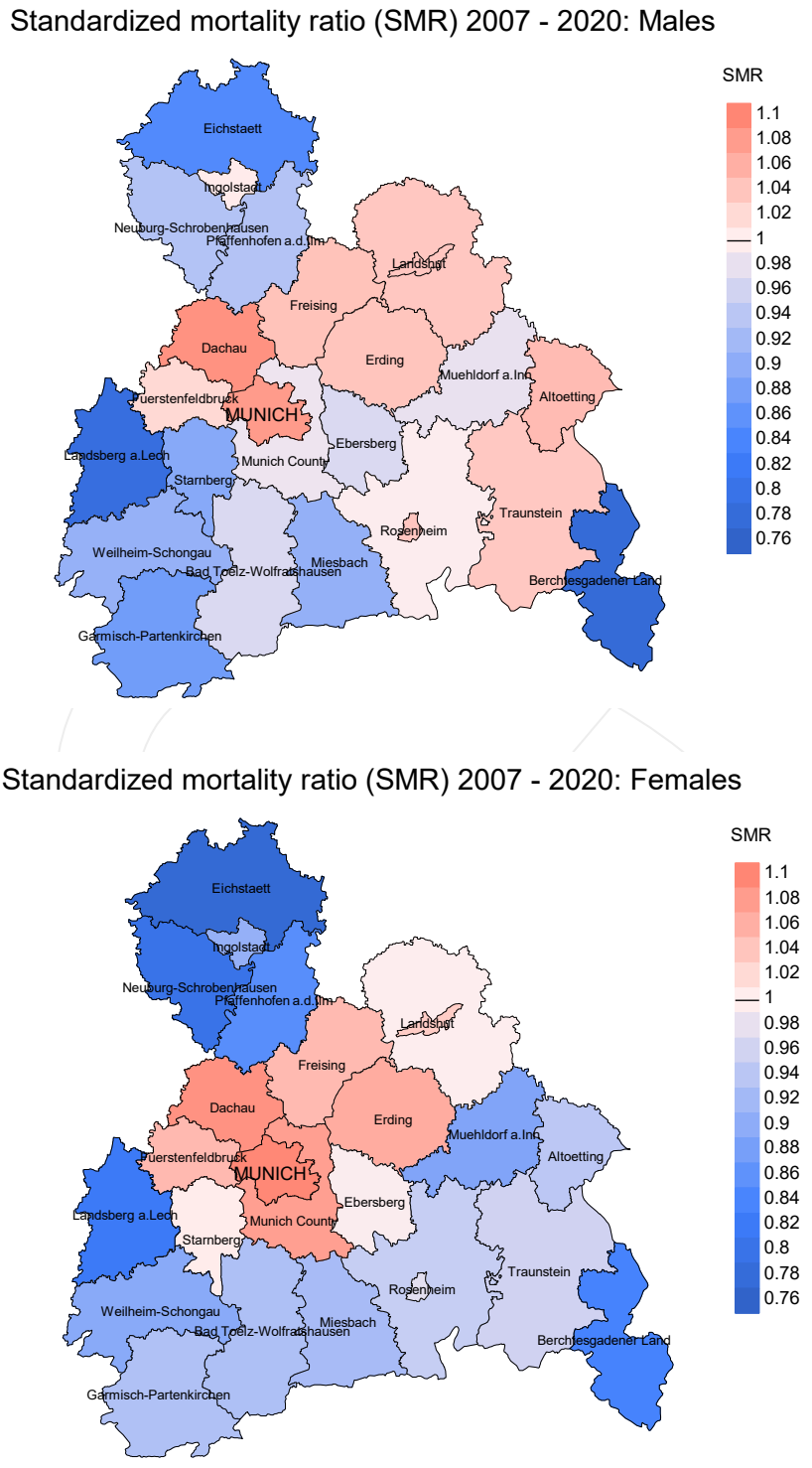


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=69,360, females N=61,699).

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 1,659 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 1.00. Though, the value of this parameter may vary with an underlying probability of 99% between 0.94 and 1.06, and is therefore not statistically striking.

Statistical Notes

In all tables and figures the respective reference values should be carefully considered. The incidence rates include diagnoses (with multiple primary), and death certificate only (DCO) cases, where applicable. For mortality statistics patients, diagnoses and progressive course of disease are presented. In the calculations, all courses of disease are considered whereby progressions occurred and/or death certificate identified progressive cancers were ascertained. Additionally there are three groups of disease course to consider:

1. **All multiple primaries included**

   The mortality statistic describes the tumor-specific death, independent of any malignancy. The patient perspective, induced secondary malignancies, and the problem of multiple malignancies from the same primary tumor all have reasons for their inclusion.

2. **First singular primary** (no information about other prior or synchronous malignancy)

   The mortality statistic describes the cancer-related death for patients who have no therapeutic restrictions due to a previous or synchronous cancer. These statistics are comparable to studies that have exclusion criteria based on a second malignancy.

3. **Single primary** (no information about other prior, syn- or metachronous malignancy)

   The mortality statistic describes the tumor-specific death that occurs without any impact through secondary primaries, earlier, synchronous, later or induced. Precisely the difference between disease group 1 and 2 highlight the magnitude of the problem of secondary malignancies.

For this reason differences appear concerning official mono-causal mortality statistics. To judge the maximum deviation, 2 further tables are presented. In the first table the distribution of secondary malignancies before, at or after the described cancer are shown, that could be an alternative cause of death. In the second table, the age-specific mortality rates for all courses of disease, without designation of secondary malignancies are shown.

A previously minimally acknowledged statistic is the **age at death**, which allows for a good assessment of the quality of classification of the apparent tumor-specific death. For assumed tumor-independent deaths, the age of death should be estimated from the age of diagnosis and the normal life expectancy, whereas tumor-dependent deaths can be estimated from the age of diagnosis plus the average tumor-specific life expectancy. The comparison of different tumors demonstrates this association, if the causes of cancer and the competing cause of death are independent of each other (e.g. breast and colon versus head&neck and lung).

The ratio of mortality and incidence (mortality-to-incidence ratio, **MIR**, **MI-Index**) is a statistical index that allows for the evaluation of the quality of data. For diseases with poor prognoses, comparable values are obtained from all age groups, because to a large extent, the numerator and denominator contain the same cases. For tumors with a good prognosis, increasing and decreasing incidence and age-specific differences in prognosis can more strongly alter the MIR. Additionally, attention should be paid to the confidence intervals where fewer cases are reported.

The complexity of problems identified here emphasizes the importance of relative survival data for the appropriate analysis of long term results.

As a measurement of the burden of disease, the number of potential life years loss due to premature deaths in a cohort can be calculated (**PYLL**, potential years of life lost, standardized per 100,000 persons or per European standard) as well as the average loss of life years per individual (**AYLL**, average years of life lost). Depending upon the analytic aim (health economy, prevention, health care research) different methods exist for the generation of these measurements. In the results presented here, the age for a premature death is considered to be before 70 years, according to the guidelines of the OECD and the WHO (as seen in the abbreviation PYLL-70 or AYLL-70).

Shortcuts

MCR	Munich Cancer Registry (Tumorregister München)
GEKID	Association of Population-based Cancer Registries in Germany (Gesellschaft der epidemiologischen Krebsregister in Deutschland e.V.)
SEER	Surveillance, Epidemiology, and End Results (USA)
DCO	Death certificate only
BRD-S	German (FRG) standard population
ES	European standard population (old)
WS	World standard population
SIR	Standardized incidence ratio
CI	Confidence interval
EAR	Excess absolute risk = excess cancer cases (O - E) per 10,000 person-years
PYLL-70	Potential years of life lost prior to age 70 given a person dies before that age
AYLL-70	Average years of life lost prior to age 70 given a person dies before that age
SMR	Standardized mortality ratio
MI-index	Ratio of mortality to incidence, MIR
FRG	Federal Republic of Germany

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