

Munich Cancer Registry



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

Incidence and Mortality

Year of diagnosis	1998-2016
Patients	354,565
Diseases	391,736
Creation date	08/21/2018
Export date	08/09/2018
Population	4.81 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, August 2018

[#] 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	12402	1431	11.5	11.2	9.8	73.2	96.8
1999	12332	1362	11.0	11.5	9.7	70.9	96.4
2000	12362	1519	12.3	11.9	9.5	69.2	96.7
2001	12772	1503	11.8	12.1	9.3	67.4	96.0
2002	21802	3160	14.5	12.4	9.2	68.0	96.5 #
2003	21338	2632	12.3	12.6	8.9	65.6	96.0
2004	21561	2449	11.4	12.7	8.6	62.9	95.6
2005	21543	2151	10.0	13.1	8.3	61.2	94.6
2006	21637	1877	8.7	13.4	8.0	58.8	92.1
2007	25002	2263	9.1	13.6	7.6	57.2	78.6 #
2008	25395	2099	8.3	13.9	7.2	54.6	71.9
2009	25074	1969	7.9	14.3	6.7	53.2	71.6
2010	24901	2026	8.1	14.6	6.2	51.1	71.0
2011	25082	1923	7.7	15.0	5.7	48.7	70.2
2012	25086	1861	7.4	15.3	5.2	45.6	69.2
2013	24437	1869	7.6	15.6	4.6	43.1	69.4
2014	23427	1879	8.0	15.9	4.1	39.5	74.0
2015	19262	1912	9.9	16.1	3.5	36.7	97.9
2016	16321	1741	10.7	16.3	2.9	25.5	72.2 ##
1998-2016	391736	37626	9.6	16.3	9.8	54.2	82.7

391,736 cases diagnosed 1998-2016 are related to a total of 354,565 patients. Currently, in 66,724 (18.8 %) of these 354,565 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 55,002 / 9,160 / 2,562 (15.5 % / 2.6 % / 0.7 %) 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 2014, a subgroup of 23,427 cases has been diagnosed, of which 15.9 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 4.1 % 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	6146	49.6	721	11.7	10.8	11.1	76.8	97.5
1999	6116	49.6	692	11.3	11.0	11.0	75.6	97.4
2000	6278	50.8	772	12.3	11.4	10.8	72.8	97.1
2001	6457	50.6	713	11.0	11.7	10.7	70.7	96.5
2002	11316	51.9	1522	13.4	12.1	10.5	70.6	96.8 #
2003	11148	52.2	1264	11.3	12.4	10.2	67.6	96.4
2004	11198	51.9	1122	10.0	12.7	9.9	65.5	96.2
2005	11097	51.5	1004	9.0	13.1	9.5	63.6	94.9
2006	11229	51.9	912	8.1	13.5	9.2	61.9	92.1
2007	13134	52.5	1121	8.5	13.8	8.8	59.7	78.7 #
2008	12962	51.0	1007	7.8	14.2	8.3	58.2	73.6
2009	12717	50.7	948	7.5	14.6	7.7	57.1	73.5
2010	12532	50.3	937	7.5	15.0	7.1	54.6	72.7
2011	12772	50.9	909	7.1	15.4	6.6	51.9	71.8
2012	12807	51.1	874	6.8	15.8	6.0	48.4	70.5
2013	12521	51.2	904	7.2	16.2	5.4	46.0	70.0
2014	11854	50.6	914	7.7	16.4	4.9	42.4	73.3
2015	9316	48.4	950	10.2	16.7	4.1	41.2	98.2
2016	7614	46.7	876	11.5	16.9	3.7	29.5	74.9 ##
1998-2016	199214	50.9	18162	9.1	16.9	11.1	57.5	83.5

199,214 cases diagnosed 1998-2016 are related to a total of 178,349 patients. Currently, in 34,970 (19.6 %) of these 178,349 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 28,277 / 5,034 / 1,659 (15.9 % / 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 retrieved from the respective headings.

How to interpret:

In 2014, a subgroup of 11,854 cases has been diagnosed, of which 16.4 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 4.9 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 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	6256	50.4	710	11.3	11.7	8.5	69.6	96.1
1999	6216	50.4	670	10.8	12.1	8.3	66.2	95.5
2000	6084	49.2	747	12.3	12.4	8.1	65.4	96.4
2001	6315	49.4	790	12.5	12.6	8.0	64.0	95.4
2002	10486	48.1	1638	15.6	12.7	7.8	65.3	96.3 #
2003	10190	47.8	1368	13.4	12.7	7.5	63.4	95.5
2004	10363	48.1	1327	12.8	12.8	7.3	60.1	95.0
2005	10446	48.5	1147	11.0	13.1	7.0	58.5	94.3
2006	10408	48.1	965	9.3	13.3	6.7	55.4	92.1
2007	11868	47.5	1142	9.6	13.4	6.4	54.4	78.5 #
2008	12433	49.0	1092	8.8	13.6	6.0	50.9	70.1
2009	12357	49.3	1021	8.3	13.9	5.7	49.2	69.6
2010	12369	49.7	1089	8.8	14.2	5.2	47.5	69.2
2011	12310	49.1	1014	8.2	14.5	4.8	45.3	68.5
2012	12279	48.9	987	8.0	14.8	4.3	42.8	67.8
2013	11916	48.8	965	8.1	15.0	3.9	40.0	68.7
2014	11573	49.4	965	8.3	15.3	3.3	36.4	74.8
2015	9946	51.6	962	9.7	15.5	2.9	32.5	97.6
2016	8707	53.3	865	9.9	15.7	2.3	22.0	69.9 ##
1998-2016	192522	49.1	19464	10.1	15.7	8.5	50.7	81.8

192,522 cases diagnosed 1998-2016 are related to a total of 176,216 patients. Currently, in 31,754 (18.0 %) of these 176,216 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 26,725 / 4,126 / 903 (15.2 % / 2.3 % / 0.5 %) 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 2014, a subgroup of 11,573 cases has been diagnosed, of which 15.3 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 3.3 % 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 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 4.81 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	6146	6256	554.7	531.8	346.1	275.5	504.8	385.3	647.6	464.4
1999	6116	6216	546.4	523.8	335.0	272.4	489.8	379.3	623.4	456.3
2000	6278	6084	551.2	506.5	335.6	262.4	490.7	366.2	625.7	439.7
2001	6457	6315	557.2	519.1	336.7	269.5	491.0	376.7	620.6	451.2
2002	11316	10486	607.4	535.6	352.1	266.6	515.3	375.2	656.1	455.0
2003	11148	10190	594.7	517.3	340.8	259.6	497.2	363.2	630.6	436.9
2004	11198	10363	595.2	524.2	335.8	265.6	487.0	368.5	617.2	442.3
2005	11097	10446	585.8	525.0	327.1	261.9	471.3	364.9	595.6	438.6
2006	11229	10408	586.4	518.1	320.8	259.0	465.4	360.2	589.0	431.3
2007	13134	11868	592.9	513.9	324.8	257.4	468.3	358.0	590.8	427.9
2008	12962	12433	582.4	535.8	311.6	267.9	450.1	371.7	567.9	444.1
2009	12717	12357	569.8	531.3	299.6	264.9	433.4	367.9	546.8	439.0
2010	12532	12369	556.0	528.5	292.6	259.3	421.0	360.5	528.2	430.9
2011	12772	12310	570.8	526.6	292.5	259.0	422.3	358.3	533.1	427.1
2012	12807	12279	564.2	520.3	288.1	255.6	414.3	353.2	523.3	422.5
2013	12521	11916	544.0	499.8	276.2	245.3	396.9	339.0	499.9	404.1
2014	11854	11573	508.4	480.7	252.5	232.3	366.5	322.5	462.6	385.1
2015	9316	9946	391.6	408.7	188.8	193.3	278.2	271.0	355.9	325.5
2016	7614	8707	316.8	354.6	153.3	170.7	224.4	238.0	286.5	283.8
1998-2016	199214	192522	541.3	501.9	290.8	249.2	420.5	346.5	530.2	414.7

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

Table 3

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

Year of diagnosis	Cases n	Std. dev.		Min.	Max.	10%	25%	Median		
		Mean	dev.					50%	75%	90%
1998	12402	66.0	14.9	0.1	107	47.4	57.1	67.1	76.9	84.5
1999	12332	66.1	14.7	0.3	104	47.5	57.5	67.1	76.8	84.4
2000	12362	66.1	14.8	0.2	103	47.4	57.8	67.0	77.0	84.5
2001	12772	66.1	14.4	0.1	103	47.6	57.9	66.7	76.4	83.6
2002	21802	67.3	14.4	0.0	104	48.4	59.4	68.2	77.5	84.3
2003	21338	67.0	14.4	0.2	105	48.5	59.3	67.9	77.3	83.7
2004	21561	66.8	14.4	0.0	103	47.6	59.1	67.6	77.1	83.9
2005	21543	67.0	14.5	0.0	103	48.2	59.4	68.0	77.2	84.0
2006	21637	67.1	14.2	0.2	103	48.2	59.3	68.1	77.1	84.1
2007	25002	66.9	14.5	0.0	103	47.5	59.1	68.3	77.2	84.2
2008	25395	67.2	14.3	0.0	109	47.8	59.4	68.7	77.2	84.1
2009	25074	67.2	14.3	0.2	109	48.0	59.1	68.9	77.2	84.2
2010	24901	67.3	14.5	0.0	105	47.9	59.1	69.2	77.5	84.6
2011	25082	67.4	14.6	0.0	109	47.7	59.0	69.6	77.4	84.7
2012	25086	67.5	14.5	0.0	103	48.2	59.3	69.8	77.3	84.2
2013	24437	67.4	14.6	0.0	108	47.9	58.8	69.8	77.4	84.4
2014	23427	67.9	14.3	0.2	107	48.8	59.2	70.2	77.6	84.8
2015	19262	68.6	14.0	0.7	105	49.5	59.5	70.8	78.4	85.2
2016	16321	68.1	14.2	0.0	103	48.8	58.9	70.2	78.3	84.7
1998-2016	391736	67.2	14.4	0.0	109	48.1	58.9	68.8	77.4	84.3

Table 3a

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

Year of diagnosis	Cases n	Std. dev.		Min.	Max.	10%	25%	Median		
		Mean	dev.					50%	75%	90%
1998	6146	65.8	14.1	0.4	99.8	49.1	57.9	66.9	75.4	82.9
1999	6116	66.1	13.5	0.3	99.5	50.6	58.7	67.0	75.2	82.4
2000	6278	66.3	13.7	0.2	99.7	50.4	59.1	67.1	75.6	82.3
2001	6457	66.1	13.2	0.1	102	50.5	59.4	66.7	75.0	81.4
2002	11316	67.1	13.3	0.1	102	51.2	60.6	68.0	75.8	82.2
2003	11148	67.0	13.1	0.3	101	51.6	60.6	67.9	75.7	82.1
2004	11198	66.9	13.2	0.0	101	50.6	60.6	67.7	75.9	82.2
2005	11097	67.0	13.4	0.0	102	51.0	60.9	68.0	75.8	82.3
2006	11229	67.4	13.0	0.2	102	51.7	61.2	68.3	76.0	82.2
2007	13134	67.1	13.5	0.0	101	50.2	60.7	68.4	76.1	82.2
2008	12962	67.6	13.1	0.0	105	51.4	61.3	69.1	76.2	82.5
2009	12717	67.7	13.1	0.2	105	50.6	61.1	69.3	76.3	82.6
2010	12532	67.7	13.5	0.0	102	50.7	60.8	69.5	76.5	83.1
2011	12772	68.1	13.4	0.0	109	50.6	61.5	70.1	76.6	83.2
2012	12807	68.2	13.3	0.0	103	51.7	61.7	70.3	76.8	83.0
2013	12521	68.1	13.7	0.0	103	50.6	61.1	70.6	77.0	83.2
2014	11854	68.8	13.2	0.2	104	52.0	61.6	70.9	77.4	83.9
2015	9316	69.7	12.8	0.9	105	53.0	62.4	71.8	78.4	84.4
2016	7614	69.6	13.0	4.0	103	52.8	62.1	71.8	78.4	84.3
1998-2016	199214	67.6	13.3	0.0	109	51.1	60.8	69.1	76.5	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		
				Min.	Max.	10%	25%	50%	75%	90%
1998	6256	66.2	15.6	0.1	107	46.2	56.1	67.3	78.0	85.5
1999	6216	66.0	15.8	0.7	104	45.1	56.2	67.2	78.0	85.7
2000	6084	66.0	15.9	0.4	103	44.5	55.9	66.8	78.3	85.9
2001	6315	66.1	15.6	0.5	103	45.1	56.4	66.7	78.1	86.0
2002	10486	67.4	15.4	0.0	104	46.4	58.0	68.5	79.4	86.6
2003	10190	67.0	15.6	0.2	105	45.7	57.3	67.9	79.2	85.8
2004	10363	66.6	15.6	0.0	103	45.6	57.0	67.5	78.8	85.0
2005	10446	67.1	15.5	0.3	103	45.8	57.5	68.0	79.1	85.5
2006	10408	66.8	15.5	0.2	103	45.3	57.1	67.9	78.8	85.5
2007	11868	66.7	15.6	0.2	103	45.2	57.0	68.1	78.7	85.7
2008	12433	66.7	15.5	0.1	109	45.4	56.9	68.2	78.6	85.7
2009	12357	66.7	15.4	0.2	109	45.7	56.6	68.1	78.4	85.7
2010	12369	66.9	15.5	0.2	105	45.9	56.7	68.8	78.7	86.1
2011	12310	66.8	15.7	0.0	102	45.7	56.2	68.9	78.4	86.2
2012	12279	66.8	15.6	0.0	102	45.9	56.5	68.9	77.9	85.7
2013	11916	66.7	15.5	0.0	108	45.9	55.9	68.8	78.0	85.7
2014	11573	67.0	15.4	0.4	107	46.2	56.4	69.3	77.9	85.8
2015	9946	67.5	15.0	0.7	102	47.2	56.5	69.4	78.4	86.2
2016	8707	66.8	15.1	0.0	103	46.5	55.7	68.8	78.2	85.2
1998-2016	192522	66.8	15.5	0.0	109	45.8	56.7	68.3	78.5	85.8

Table 4

Age distribution by 5-year age group and sex for period 2007-2016
(incl. DCO)

Age at diagnosis Years	Cases n	Males			Females				
		%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4	349	0.1	0.1	200	0.2	0.2	149	0.1	0.1
5-9	188	0.1	0.2	104	0.1	0.3	84	0.1	0.2
10-14	218	0.1	0.3	115	0.1	0.4	103	0.1	0.3
15-19	460	0.2	0.5	253	0.2	0.6	207	0.2	0.5
20-24	841	0.4	0.9	462	0.4	1.0	379	0.3	0.8
25-29	1539	0.7	1.5	694	0.6	1.5	845	0.7	1.5
30-34	2458	1.1	2.6	964	0.8	2.4	1494	1.3	2.8
35-39	3928	1.7	4.3	1396	1.2	3.5	2532	2.2	5.0
40-44	6821	2.9	7.2	2198	1.9	5.4	4623	4.0	9.0
45-49	11065	4.7	11.9	4030	3.4	8.8	7035	6.1	15.1
50-54	15228	6.5	18.4	6326	5.4	14.2	8902	7.7	22.8
55-59	19062	8.1	26.6	9481	8.0	22.2	9581	8.3	31.0
60-64	25201	10.8	37.3	13580	11.5	33.7	11621	10.0	41.1
65-69	33907	14.5	51.8	19414	16.4	50.1	14493	12.5	53.6
70-74	37222	15.9	67.7	21927	18.5	68.6	15295	13.2	66.8
75-79	31188	13.3	81.1	17287	14.6	83.3	13901	12.0	78.8
80-84	22888	9.8	90.8	11545	9.8	93.0	11343	9.8	88.6
85+	21424	9.2	100.0	8253	7.0	100.0	13171	11.4	100.0
All ages	233987	100.0		118229	100.0		115758	100.0	

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 2007-2016

Age at diagnosis Years	Males n	Females n	Males Age- spec. incid.	Females Age- spec. incid.	Males DCO rate n=8964 %	Females DCO rate n=9724 %	Males	Females
							Prop.all cancers %	Prop.all cancers %
0- 4	196	149	17.5	14.0	2.0	4.7	100.0	100.0
5- 9	104	84	9.5	8.0	1.9		100.0	100.0
10-14	115	101	10.1	9.3		1.0	100.0	100.0
15-19	253	207	20.6	18.0	0.8		100.0	100.0
20-24	460	377	32.7	27.8	0.9	0.8	100.0	100.0
25-29	684	837	43.6	53.2	0.3	0.4	100.0	100.0
30-34	953	1477	59.8	92.6	0.6	0.5	100.0	100.0
35-39	1382	2499	84.9	156.6	1.0	0.8	100.0	100.0
40-44	2167	4548	116.2	253.9	0.9	0.6	100.0	100.0
45-49	3933	6869	199.1	359.8	1.1	0.9	100.0	100.0
50-54	6153	8676	356.1	507.0	2.6	1.2	100.0	100.0
55-59	9222	9338	651.5	635.3	2.5	1.8	100.0	100.0
60-64	13158	11279	1074.1	848.4	3.2	2.4	100.0	100.0
65-69	18698	14018	1577.9	1079.2	3.9	3.3	100.0	100.0
70-74	21043	14777	1902.1	1167.5	5.3	5.1	100.0	100.0
75-79	16546	13342	2076.6	1332.1	8.7	8.4	100.0	100.0
80-84	10992	10936	2389.9	1545.7	16.7	17.8	100.0	100.0
85+	7919	12739	2586.4	1735.7	37.0	37.3	100.0	100.0
All ages	113978	112253			7.9	8.7	100.0	100.0
Incidence								
Raw			498.8	474.2				
WS			257.4	233.4				
ES			370.9	323.4				
BRD-S			466.6	385.5				

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

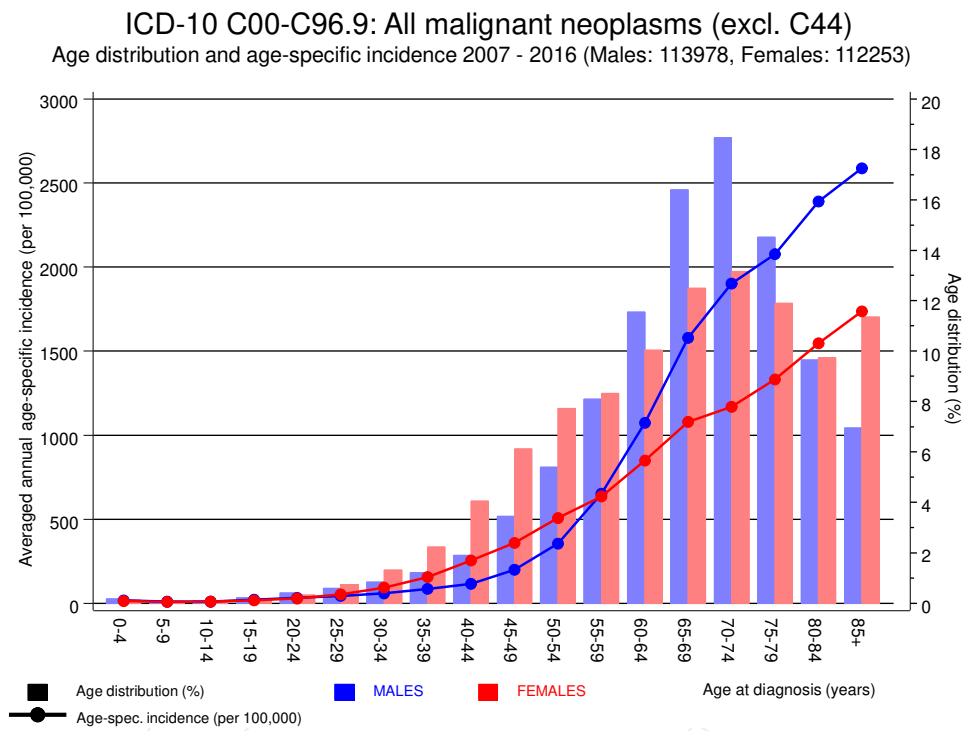


Figure 6. Age distribution (males: mean=68.0 yrs, median=69.9 yrs; females: mean=66.7 yrs, median=68.6 yrs) and age-specific incidence.

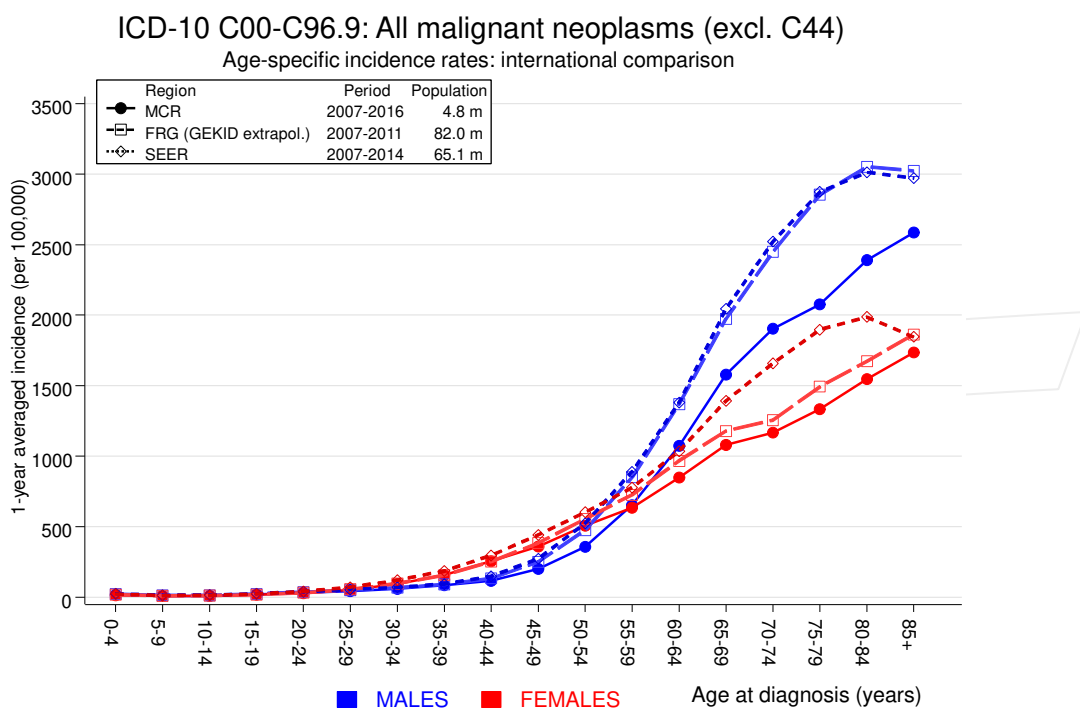


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).

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 2014, based on the November 2013 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 1998–2016

MALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C03-C06 Oral cavity	235	70.7	3.3	2.9	3.8 #	3.2	6.8
C07-C08 Salivary gland	49	21.0	2.3	1.7	3.1 #	0.5	8.2
C09-C10 Oropharynx	295	86.5	3.4	3.0	3.8 #	4.0	2.4
C12-C13 Hypopharynx	174	47.5	3.7	3.1	4.3 #	2.4	8.0
C15 Oesophagus	505	164.7	3.1	2.8	3.3 #	6.5	9.5
C16 Stomach	772	377.0	2.0	1.9	2.2 #	7.6	8.3
C17 Small intestine	204	48.4	4.2	3.7	4.8 #	3.0	2.9
C18 Colon	1996	901.0	2.2	2.1	2.3 #	21.0	5.2
C19-C20 Rectum	936	486.9	1.9	1.8	2.0 #	8.6	3.5
C21 Anus/canal	55	19.3	2.8	2.1	3.7 #	0.7	3.6
C22 Liver	531	257.6	2.1	1.9	2.2 #	5.2	16.9
C23-C24 Bile	158	91.0	1.7	1.5	2.0 #	1.3	15.2
C25 Pancreas	785	342.7	2.3	2.1	2.5 #	8.5	26.2
C30-C31 Sinuses	35	15.9	2.2	1.5	3.1 #	0.4	8.6
C32 Larynx	255	90.5	2.8	2.5	3.2 #	3.2	15.7
C33-C34 Lung	2687	1075.3	2.5	2.4	2.6 #	30.9	13.0
C38,C45 Mesothelioma	131	62.3	2.1	1.8	2.5 #	1.3	6.9
C43 Malign. melanoma	1372	383.1	3.6	3.4	3.8 #	19.0	1.6
C46,C49 Soft tissue	137	50.6	2.7	2.3	3.2 #	1.7	2.9
C50 Breast	57	23.3	2.4	1.9	3.2 #	0.6	15.8
C60 Penis	46	21.4	2.2	1.6	2.9 #	0.5	4.3
C61 Prostate	3336	2664.3	1.3	1.2	1.3 #	12.9	7.2
C62 Testis	123	22.0	5.6	4.6	6.7 #	1.9	4.9
C64 Kidney	1066	314.6	3.4	3.2	3.6 #	14.4	7.7
C65 Renal pelvis	183	40.0	4.6	3.9	5.3 #	2.7	0.5
C66 Ureter	115	22.4	5.1	4.2	6.2 #	1.8	
C67 Bladder	1059	423.2	2.5	2.4	2.7 #	12.2	8.4
C68 Urethra	74	7.0	10.5	8.3	13.2 #	1.3	
C68 Urinary org.	36	6.1	5.9	4.2	8.2 #	0.6	69.4
C70-C72 CNS cancer	239	116.2	2.1	1.8	2.3 #	2.4	18.4
C73 Thyroid	181	55.4	3.3	2.8	3.8 #	2.4	3.9
C76-C79 CUP	293	155.9	1.9	1.7	2.1 #	2.6	3.4
C81 Hodgkin lymphoma	60	20.1	3.0	2.3	3.8 #	0.8	5.0
C82-C85 NHL	900	375.2	2.4	2.2	2.6 #	10.1	7.2
C90 Mult. myeloma	227	120.6	1.9	1.6	2.1 #	2.0	15.9
C91-C96 Leukaemia	404	153.3	2.6	2.4	2.9 #	4.8	29.0
Others, specified	207	91.8	2.3	2.0	2.6 #	2.2	21.3
Not observed	0	0.7	0.0	0.0	5.4	-0.0	
All further malignancies	19918	9225.3	2.2	2.1	2.2 #	205.1	9.2

Patients	158558
Median age at next malignancy (years)	72.5
Person-years	521350
Mean observation time (years)	3.3
Median observation time (years)	1.7

The occurrence of further malignancy listed is statistically significant.

Observed further malignancies with count 1 to 31 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 1998–2016

FEMALES

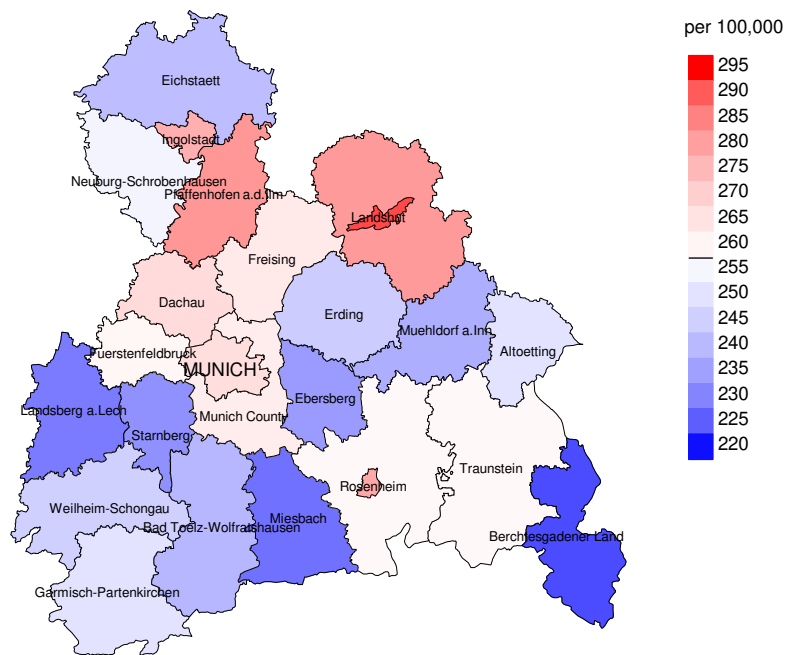
Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C03-C06 Oral cavity	83	34.6	2.4	1.9	3.0 #	0.9	
C07-C08 Salivary gland	32	9.6	3.3	2.3	4.7 #	0.4	6.3
C09-C10 Oropharynx	112	24.4	4.6	3.8	5.5 #	1.6	1.8
C12-C13 Hypopharynx	31	6.6	4.7	3.2	6.6 #	0.4	19.4
C15 Oesophagus	121	36.7	3.3	2.7	3.9 #	1.5	12.4
C16 Stomach	449	204.0	2.2	2.0	2.4 #	4.4	13.6
C17 Small intestine	126	29.2	4.3	3.6	5.1 #	1.8	2.4
C18 Colon	1329	566.7	2.3	2.2	2.5 #	13.8	9.0
C19-C20 Rectum	450	240.1	1.9	1.7	2.1 #	3.8	6.9
C21 Anus/canal	75	31.4	2.4	1.9	3.0 #	0.8	1.3
C22 Liver	159	69.9	2.3	1.9	2.7 #	1.6	27.7
C23-C24 Bile	169	82.1	2.1	1.8	2.4 #	1.6	20.1
C25 Pancreas	600	261.2	2.3	2.1	2.5 #	6.1	27.8
C26 GI cancer	29	10.6	2.7	1.8	3.9 #	0.3	51.7
C32 Larynx	34	10.9	3.1	2.2	4.4 #	0.4	14.7
C33-C34 Lung	1301	430.8	3.0	2.9	3.2 #	15.8	13.9
C43 Malign. melanoma	696	222.4	3.1	2.9	3.4 #	8.6	3.0
C46,C49 Soft tissue	111	33.6	3.3	2.7	4.0 #	1.4	4.5
C48 Peritoneal	64	22.0	2.9	2.2	3.7 #	0.8	10.9
C50 Breast	4875	1788.5	2.7	2.6	2.8 #	56.0	3.2
C51 Vulva	147	58.7	2.5	2.1	2.9 #	1.6	4.1
C52 Vagina	35	11.0	3.2	2.2	4.4 #	0.4	2.9
C53 Cervix uteri	193	80.7	2.4	2.1	2.8 #	2.0	18.7
C54 Corpus uteri	725	321.0	2.3	2.1	2.4 #	7.3	5.5
C55,C57 Fem. genitals un	38	13.6	2.8	2.0	3.8 #	0.4	50.0
C56 Ovary	731	237.1	3.1	2.9	3.3 #	9.0	21.2
C64 Kidney	429	140.8	3.0	2.8	3.3 #	5.2	12.8
C65 Renal pelvis	84	17.8	4.7	3.8	5.8 #	1.2	1.2
C66 Ureter	52	8.8	5.9	4.4	7.7 #	0.8	1.9
C67 Bladder	313	110.0	2.8	2.5	3.2 #	3.7	11.5
C70-C72 CNS cancer	144	79.5	1.8	1.5	2.1 #	1.2	26.4
C73 Thyroid	269	105.0	2.6	2.3	2.9 #	3.0	4.8
C76-C79 CUP	170	105.7	1.6	1.4	1.9 #	1.2	5.9
C82-C85 NHL	546	226.0	2.4	2.2	2.6 #	5.8	7.1
C90 Mult. myeloma	138	71.6	1.9	1.6	2.3 #	1.2	18.8
C91-C96 Leukaemia	321	93.4	3.4	3.1	3.8 #	4.1	21.2
Others, specified	205	83.1	2.5	2.1	2.8 #	2.2	14.1
Not observed	0	0.0	0.0	0.0	128.7	-0.0	
All further malignancies	15386	5879.3	2.6	2.6	2.7 #	172.5	9.4

Patients 154334
 Median age at next malignancy (years) 71.3
 Person-years 551068
 Mean observation time (years) 3.6
 Median observation time (years) 1.9

The occurrence of further malignancy listed is statistically significant.

Observed further malignancies with count 1 to 28 are pooled in category "Others, specified".

Average incidence (world standard population) 2007 - 2016: Males



Average incidence (world standard population) 2007 - 2016: Females

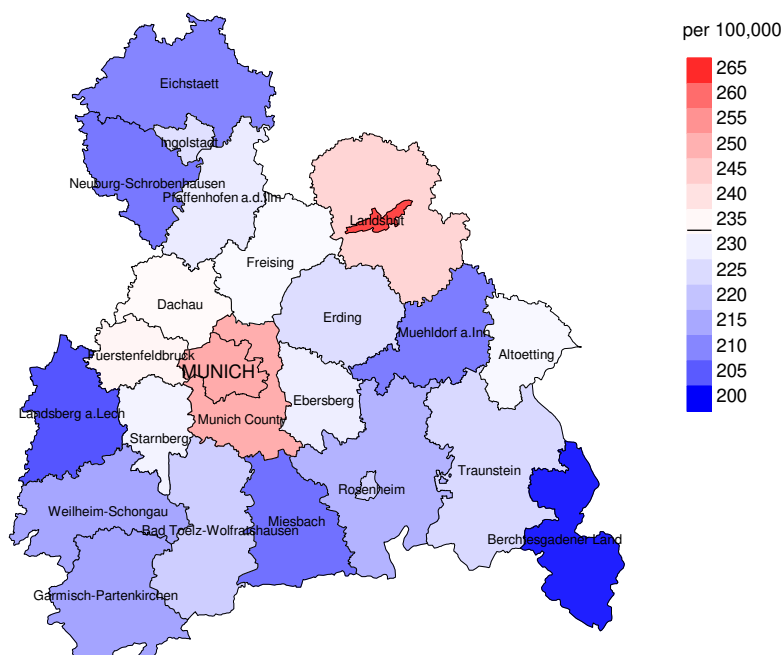
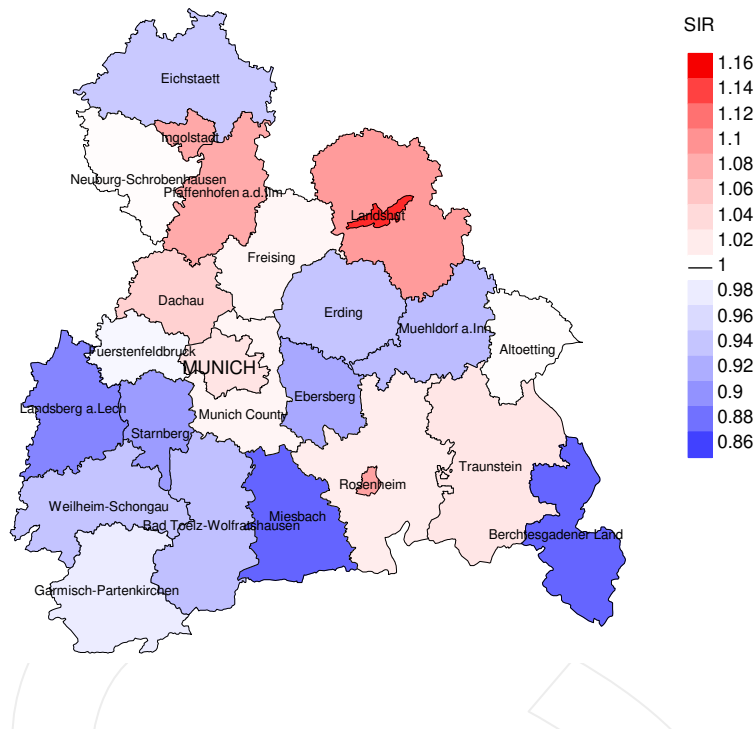


Figure 8a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 257.4/100,000 WS N=113,978, females 233.4/100,000 WS N=112,253).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 2,984 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 229.6/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 217.6 and 242.1/100,000.

Standardized incidence ratio (SIR) 2007 - 2016: Males



Standardized incidence ratio (SIR) 2007 - 2016: Females

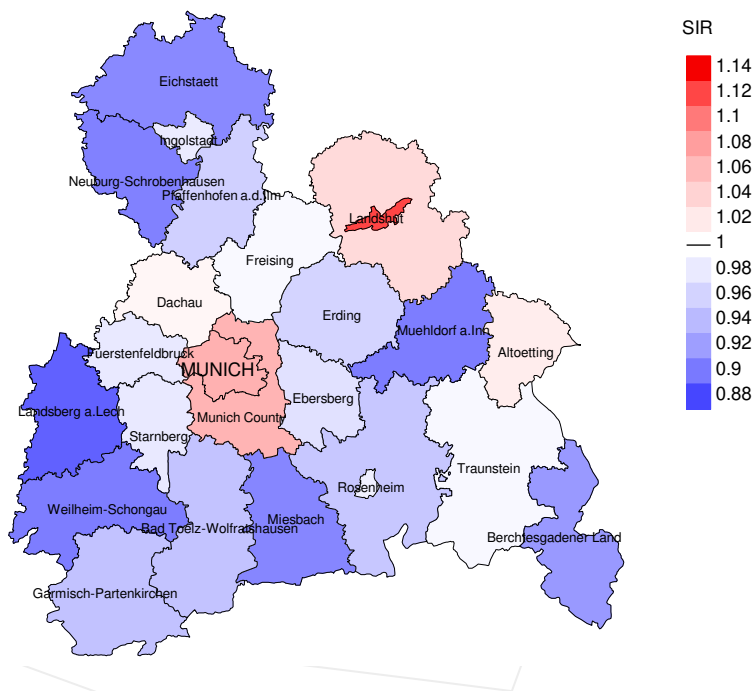


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=113,978, females N=112,253).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 2,984 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 0.97. Though, the value of this parameter may vary with an underlying probability of 99% between 0.93 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 4.81 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	12402	96.8	11.5	9079	73.2	94.2
1999	12332	96.4	11.0	8743	70.9	95.0
2000	12362	96.7	12.3	8551	69.2	96.3
2001	12772	96.0	11.8	8605	67.4	96.2
2002	21802	96.5	14.5	14829	68.0	97.5
2003	21338	96.0	12.3	13992	65.6	97.8
2004	21561	95.6	11.4	13565	62.9	97.8
2005	21543	94.6	10.0	13175	61.2	98.1
2006	21637	92.1	8.7	12712	58.8	98.5
2007	25002	78.6	9.1	14297	57.2	98.2
2008	25395	71.9	8.3	13872	54.6	98.4
2009	25074	71.6	7.9	13348	53.2	98.3
2010	24901	71.0	8.1	12720	51.1	98.2
2011	25082	70.2	7.7	12208	48.7	97.7
2012	25086	69.2	7.4	11449	45.6	97.3
2013	24437	69.4	7.6	10527	43.1	96.9
2014	23427	74.0	8.0	9242	39.5	96.8
2015	19262	97.9	9.9	7064	36.7	95.4
2016	16321	72.2	10.7	4161	25.5	86.9
1998-2016	391736	82.7	9.6	212139	54.2	97.1

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 4.81 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	12402	6517	92.0	2804	22.6
1999	12332	6607	92.0	2689	21.8
2000	12362	6606	94.1	2651	21.4
2001	12772	6806	93.9	2710	21.2
2002	21802	9826	97.1	5204	23.9
2003	21338	10383	97.2	4714	22.1
2004	21561	10577	97.5	4510	20.9
2005	21543	10780	97.1	4372	20.3
2006	21637	11151	97.3	4259	19.7
2007	25002	12245	97.9	4889	19.6
2008	25395	12574	98.6	4887	19.2
2009	25074	12840	98.6	4663	18.6
2010	24901	13294	98.5	4803	19.3
2011	25082	13586	98.5	4879	19.5
2012	25086	13641	98.0	4762	19.0
2013	24437	13891	98.2	4658	19.1
2014	23427	13826	98.2	4669	19.9
2015	19262	14349	98.5	4631	24.0
2016	16321	12046	98.1	3690	22.6
1998-2016	391736	211545	97.4	80444	20.5

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 4.81 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer- related %	Prop. non-cancer- related %	Prop. cancer recorded on death certificate %
1998	6517	72.4	27.6	89.0
1999	6607	76.2	23.8	89.2
2000	6606	77.6	22.4	88.6
2001	6806	74.7	25.3	88.4
2002	9826	78.7	21.3	89.1
2003	10383	78.5	21.5	88.4
2004	10577	79.9	20.1	88.2
2005	10780	78.5	21.5	86.5
2006	11151	77.9	22.1	86.4
2007	12245	78.0	22.0	86.0
2008	12574	77.5	22.5	84.6
2009	12840	76.4	23.6	84.3
2010	13294	76.2	23.8	84.2
2011	13586	75.1	24.9	83.3
2012	13641	74.7	25.3	82.6
2013	13891	72.6	27.4	80.8
2014	13826	72.7	27.3	81.5
2015	14349	71.3	28.7	79.2
2016	12046	68.4	31.6	78.2
1998-2016	211545	75.5	24.5	84.5

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	3272	72.4	70.0	77.9	71.8
1999	3403	72.1	70.3	78.1	71.4
2000	3352	72.5	70.3	79.2	71.5
2001	3456	72.0	69.9	78.8	71.3
2002	5024	72.5	70.8	79.0	71.6
2003	5348	72.6	70.8	79.0	71.7
2004	5392	73.3	71.3	80.2	72.3
2005	5530	73.5	71.2	80.5	72.0
2006	5842	73.1	71.3	79.7	72.0
2007	6466	73.4	71.9	80.0	72.5
2008	6629	74.0	72.0	80.9	72.6
2009	6804	74.2	72.0	80.9	72.8
2010	6999	74.5	72.6	81.1	73.3
2011	7198	74.9	72.8	81.5	73.3
2012	7221	75.4	73.4	81.5	74.0
2013	7270	76.0	73.7	82.3	74.4
2014	7347	76.1	74.3	82.4	74.9
2015	7621	76.9	74.6	82.6	75.4
2016	6398	78.0	75.8	82.3	76.6
1998-2016	110572	74.6	72.5	80.9	73.3

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	3245	76.8	74.3	82.9	76.7
1999	3204	77.1	75.0	83.7	76.8
2000	3254	77.1	74.9	84.0	76.2
2001	3350	77.6	74.7	84.0	76.5
2002	4802	77.6	75.1	84.4	76.5
2003	5035	77.1	74.2	84.2	75.6
2004	5185	77.4	75.0	84.1	76.2
2005	5250	77.8	74.3	84.7	75.7
2006	5309	77.9	75.1	84.9	76.1
2007	5779	77.9	74.3	85.6	75.8
2008	5945	78.2	74.6	85.9	75.8
2009	6036	78.0	74.2	85.9	75.4
2010	6295	78.2	74.6	85.8	75.9
2011	6388	78.0	74.4	86.4	75.6
2012	6420	78.0	74.7	86.8	75.8
2013	6621	78.5	75.0	86.7	76.3
2014	6479	78.4	75.2	86.5	76.4
2015	6727	78.7	75.7	86.5	76.7
2016	5648	78.8	75.9	86.4	77.1
1998-2016	100972	78.0	74.8	85.6	76.2

By 2010, life expectancy at birth was 77.5 years for boys and 82.6 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	2367	213.6	0.40	127.8	0.38	195.7	0.40	262.3	0.42
1999	2614	233.6	0.44	137.6	0.42	211.7	0.44	283.9	0.47
2000	2599	228.2	0.43	132.5	0.41	204.6	0.43	273.8	0.45
2001	2637	227.5	0.42	131.6	0.40	202.3	0.42	267.8	0.44
2002	3982	213.7	0.36	118.4	0.35	181.7	0.36	241.2	0.38
2003	4267	227.6	0.40	123.2	0.37	189.0	0.39	252.4	0.41
2004	4326	229.9	0.40	121.4	0.37	187.1	0.40	251.6	0.42
2005	4388	231.7	0.41	119.2	0.38	182.7	0.40	247.1	0.43
2006	4583	239.3	0.42	121.8	0.39	186.7	0.42	249.7	0.44
2007	5134	231.8	0.40	115.7	0.37	178.3	0.39	240.2	0.42
2008	5209	234.0	0.42	114.7	0.38	176.3	0.41	237.1	0.43
2009	5235	234.6	0.43	112.9	0.39	172.8	0.41	230.6	0.44
2010	5362	237.9	0.44	111.8	0.40	171.7	0.42	230.4	0.45
2011	5492	245.5	0.45	113.7	0.40	175.2	0.43	233.8	0.46
2012	5404	238.1	0.44	108.1	0.39	166.4	0.42	223.7	0.44
2013	5337	231.9	0.44	104.0	0.39	160.1	0.42	214.7	0.45
2014	5356	229.7	0.47	100.6	0.41	155.5	0.44	208.3	0.47
2015	5405	227.2	0.60	99.2	0.54	153.1	0.57	205.4	0.60
2016	4336	180.4	0.59	75.3	0.51	117.8	0.54	161.2	0.58
1998-2016	84033	228.3	0.44	111.7	0.40	171.7	0.42	229.7	0.45

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	2371	201.6	0.39	86.5	0.32	129.4	0.34	168.3	0.37
1999	2442	205.8	0.40	86.6	0.33	130.4	0.35	171.3	0.39
2000	2544	211.8	0.43	89.7	0.35	134.7	0.38	174.1	0.41
2001	2468	202.9	0.40	86.1	0.33	129.4	0.35	168.0	0.38
2002	3758	191.9	0.37	79.8	0.31	119.4	0.33	154.6	0.35
2003	3896	197.8	0.39	83.6	0.33	125.0	0.35	160.6	0.38
2004	4152	210.0	0.41	85.5	0.33	128.3	0.36	167.2	0.39
2005	4097	205.9	0.40	84.6	0.33	126.2	0.36	162.1	0.38
2006	4123	205.2	0.41	81.6	0.32	122.8	0.35	160.8	0.38
2007	4460	193.1	0.39	77.5	0.31	116.4	0.33	150.9	0.36
2008	4556	196.3	0.38	78.0	0.30	116.9	0.32	151.3	0.35
2009	4608	198.1	0.38	78.8	0.30	117.7	0.33	151.8	0.36
2010	4798	205.0	0.40	79.4	0.31	118.9	0.34	154.9	0.37
2011	4748	203.1	0.40	78.8	0.31	117.9	0.34	152.4	0.37
2012	4809	203.8	0.40	77.9	0.31	117.0	0.34	151.7	0.37
2013	4786	200.7	0.41	76.3	0.32	114.4	0.35	148.6	0.38
2014	4738	196.8	0.42	73.3	0.32	110.1	0.35	143.8	0.38
2015	4869	200.1	0.51	72.8	0.39	110.6	0.42	145.5	0.46
2016	3947	160.8	0.47	60.1	0.36	90.4	0.39	117.1	0.43
1998-2016	76170	198.6	0.41	78.5	0.32	117.7	0.35	152.8	0.38

Table 12

Age distribution of age at death (cancer-related) for period 2007-2016
(incl. multiple malignancies)

Age at death Years	Cases			Males			Females		
	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4	30	0.0	0.0	15	0.0	0.0	15	0.0	0.0
5-9	42	0.0	0.1	24	0.0	0.1	18	0.0	0.1
10-14	47	0.0	0.1	23	0.0	0.1	24	0.1	0.1
15-19	66	0.1	0.2	44	0.1	0.2	22	0.0	0.2
20-24	90	0.1	0.3	57	0.1	0.3	33	0.1	0.2
25-29	147	0.1	0.4	74	0.1	0.5	73	0.2	0.4
30-34	224	0.2	0.7	104	0.2	0.7	120	0.3	0.7
35-39	486	0.5	1.1	201	0.4	1.0	285	0.6	1.3
40-44	1164	1.2	2.3	493	0.9	2.0	671	1.4	2.7
45-49	2458	2.5	4.8	1149	2.2	4.2	1309	2.8	5.5
50-54	4032	4.1	8.9	2056	3.9	8.1	1976	4.3	9.8
55-59	6233	6.3	15.2	3383	6.5	14.6	2850	6.2	16.0
60-64	8739	8.9	24.1	4983	9.5	24.1	3756	8.1	24.1
65-69	12611	12.8	36.9	7286	13.9	38.1	5325	11.5	35.6
70-74	16101	16.3	53.2	9318	17.8	55.9	6783	14.6	50.2
75-79	15992	16.2	69.4	8987	17.2	73.1	7005	15.1	65.3
80-84	14367	14.6	84.0	7542	14.4	87.5	6825	14.7	80.1
85+	15760	16.0	100.0	6531	12.5	100.0	9229	19.9	100.0
All ages	98589	100.0		52270	100.0		46319	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2016
(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	15	15	1.3	0.08	1.4	0.10	100.0	100.0
5- 9	24	18	2.2	0.23	1.7	0.21	100.0	100.0
10-14	23	24	2.0	0.20	2.2	0.24	100.0	100.0
15-19	44	22	3.6	0.17	1.9	0.11	100.0	100.0
20-24	57	33	4.1	0.12	2.4	0.09	100.0	100.0
25-29	74	73	4.7	0.11	4.6	0.09	100.0	100.0
30-34	104	120	6.5	0.11	7.5	0.08	100.0	100.0
35-39	201	285	12.3	0.15	17.9	0.11	100.0	100.0
40-44	493	671	26.4	0.23	37.5	0.15	100.0	100.0
45-49	1149	1309	58.2	0.29	68.6	0.19	100.0	100.0
50-54	2056	1976	119.0	0.33	115.5	0.23	100.0	100.0
55-59	3383	2850	239.0	0.37	193.9	0.31	100.0	100.0
60-64	4983	3756	406.8	0.38	282.5	0.33	100.0	100.0
65-69	7286	5325	614.9	0.39	410.0	0.38	100.0	100.0
70-74	9318	6783	842.3	0.44	535.9	0.46	100.0	100.0
75-79	8987	7005	1127.9	0.54	699.4	0.53	100.0	100.0
80-84	7542	6825	1639.8	0.69	964.6	0.62	100.0	100.0
85+	6531	9229	2133.1	0.82	1257.5	0.72	100.0	100.0
All ages	52270	46319					100.0	100.0
Mortality								
Raw			228.8	0.46	195.7	0.41		
WS			105.0	0.41	75.1	0.32		
ES			161.7	0.44	112.7	0.35		
BRD-S			216.9	0.46	146.4	0.38		
PYLL-70								
per 100,000			969.7		915.1			
ES			851.9		782.1			
AYLL-70			9.8		11.1			

Table 14a

Further malignancies in deaths in period 1998–2016
MALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C03-C06 Oral cavity	244	1.2			18	7.4	226	92.6
C09-C10 Oropharynx	305	1.5			46	15.1	259	84.9
C12-C13 Hypopharynx	192	1.0			33	17.2	159	82.8
C15 Oesophagus	530	2.7			44	8.3	486	91.7
C16 Stomach	743	3.7			63	8.5	680	91.5
C17 Small intestine	116	0.6			18	15.5	98	84.5
C18 Colon	1502	7.5			222	14.8	1280	85.2
C19-C20 Rectum	812	4.1			164	20.2	648	79.8
C22 Liver	601	3.0			68	11.3	533	88.7
C23-C24 Bile	190	1.0			16	8.4	174	91.6
C25 Pancreas	944	4.7			74	7.8	870	92.2
C32 Larynx	229	1.1			23	10.0	206	90.0
C33-C34 Lung	3296	16.5			298	9.0	2998	91.0
C38,C45 Mesothelioma	156	0.8			4	2.6	152	97.4
C43 Malign. melanoma	551	2.8			58	10.5	493	89.5
C44 Skin others	2314	11.6	865	37.4	204	8.8	1245	53.8
C46,C49 Soft tissue	120	0.6			7	5.8	113	94.2
C61 Prostate	2216	11.1			359	16.2	1857	83.8
C64 Kidney	676	3.4			151	22.3	525	77.7
C65 Renal pelvis	188	0.9			22	11.7	166	88.3
C66 Ureter	113	0.6			18	15.9	95	84.1
C67 Bladder	1062	5.3			198	18.6	864	81.4
C70-C72 CNS cancer	300	1.5			24	8.0	276	92.0
C73 Thyroid	102	0.5			7	6.9	95	93.1
C76-C79 CUP	398	2.0			47	11.8	351	88.2
C82-C85 NHL	776	3.9			134	17.3	642	82.7
C90 Mult. myeloma	225	1.1			23	10.2	202	89.8
C91-C96 Leukaemia	450	2.3			44	9.8	406	90.2
Others, specified	591	3.0			58	9.8	533	90.2
All further malignancies	19942	100.0	865	4.3	2445	12.3	16632	83.4

Further malignancies with number of cases 1 to 51 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 1998–2016
FEMALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C09–C10 Oropharynx	103	0.6			13	12.6	90	87.4
C15 Oesophagus	167	1.1			5	3.0	162	97.0
C16 Stomach	582	3.7			44	7.6	538	92.4
C18 Colon	1270	8.0			142	11.2	1128	88.8
C19–C20 Rectum	535	3.4			78	14.6	457	85.4
C22 Liver	205	1.3			18	8.8	187	91.2
C23–C24 Bile	224	1.4			16	7.1	208	92.9
C25 Pancreas	884	5.6			56	6.3	828	93.7
C33–C34 Lung	1720	10.9			111	6.5	1609	93.5
C43 Malign. melanoma	364	2.3			27	7.4	337	92.6
C44 Skin others	999	6.3	392	39.2	100	10.0	507	50.8
C46,C49 Soft tissue	114	0.7			7	6.1	107	93.9
C50 Breast	3540	22.3			814	23.0	2726	77.0
C51 Vulva	124	0.8			8	6.5	116	93.5
C53 Cervix uteri	177	1.1			28	15.8	149	84.2
C54 Corpus uteri	534	3.4			80	15.0	454	85.0
C56 Ovary	910	5.7			193	21.2	717	78.8
C64 Kidney	346	2.2			85	24.6	261	75.4
C67 Bladder	410	2.6			37	9.0	373	91.0
C70–C72 CNS cancer	213	1.3			14	6.6	199	93.4
C73 Thyroid	133	0.8			8	6.0	125	94.0
C76–C79 CUP	291	1.8			41	14.1	250	85.9
C82–C85 NHL	522	3.3			78	14.9	444	85.1
C90 Mult. myeloma	179	1.1			16	8.9	163	91.1
C91–C96 Leukaemia	371	2.3			32	8.6	339	91.4
Others, specified	933	5.9	1	0.1	127	13.6	805	86.3
All further malignancies	15850	100.0	393	2.5	2178	13.7	13279	83.8

Further malignancies with number of cases 1 to 87 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 2007-2016
(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	14	15	1.3	0.07	1.4	0.10	100.0	100.0
5- 9	23	18	2.1	0.22	1.7	0.22	100.0	100.0
10-14	23	21	2.0	0.21	1.9	0.22	100.0	100.0
15-19	42	20	3.4	0.17	1.7	0.10	100.0	100.0
20-24	51	31	3.6	0.12	2.3	0.09	100.0	100.0
25-29	67	67	4.3	0.10	4.3	0.08	100.0	100.0
30-34	102	106	6.4	0.11	6.6	0.08	100.0	100.0
35-39	189	257	11.6	0.14	16.1	0.11	100.0	100.0
40-44	457	595	24.5	0.23	33.2	0.14	100.0	100.0
45-49	1048	1133	53.1	0.29	59.4	0.18	100.0	100.0
50-54	1807	1677	104.6	0.33	98.0	0.22	100.0	100.0
55-59	2942	2389	207.8	0.36	162.5	0.30	100.0	100.0
60-64	4174	3066	340.7	0.37	230.6	0.33	100.0	100.0
65-69	5851	4232	493.8	0.38	325.8	0.37	100.0	100.0
70-74	7187	5305	649.6	0.43	419.1	0.46	100.0	100.0
75-79	6623	5425	831.2	0.54	541.7	0.53	100.0	100.0
80-84	5494	5327	1194.5	0.70	752.9	0.62	100.0	100.0
85+	4771	7338	1558.2	0.84	999.8	0.72	100.0	100.0
All ages	40865	37022					100.0	100.0
Mortality								
Raw			178.8	0.44	156.4	0.40		
WS			84.3	0.39	61.1	0.31		
ES			128.1	0.42	91.1	0.33		
BRD-S			169.1	0.45	117.4	0.37		
PYLL-70								
per 100,000			850.4		779.7			
ES			748.8		669.0			
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 2007-2016
(**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	14	15	1.3	0.07	1.4	0.10	100.0	100.0
5- 9	23	18	2.1	0.22	1.7	0.23	100.0	100.0
10-14	23	21	2.0	0.21	1.9	0.22	100.0	100.0
15-19	42	19	3.4	0.18	1.7	0.09	100.0	100.0
20-24	51	31	3.6	0.12	2.3	0.09	100.0	100.0
25-29	67	65	4.3	0.10	4.1	0.08	100.0	100.0
30-34	102	104	6.4	0.11	6.5	0.08	100.0	100.0
35-39	188	253	11.5	0.15	15.9	0.11	100.0	100.0
40-44	455	590	24.4	0.23	32.9	0.15	100.0	100.0
45-49	1037	1118	52.5	0.30	58.6	0.19	100.0	100.0
50-54	1783	1650	103.2	0.34	96.4	0.23	100.0	100.0
55-59	2900	2357	204.9	0.38	160.4	0.31	100.0	100.0
60-64	4109	3003	335.4	0.39	225.9	0.34	100.0	100.0
65-69	5704	4134	481.4	0.41	318.3	0.40	100.0	100.0
70-74	6949	5150	628.1	0.47	406.9	0.49	100.0	100.0
75-79	6345	5264	796.3	0.57	525.6	0.55	100.0	100.0
80-84	5162	5126	1122.3	0.73	724.5	0.63	100.0	100.0
85+	4408	7030	1439.7	0.82	957.9	0.71	100.0	100.0
All ages	39362	35948					100.0	100.0
Mortality								
Raw			172.3	0.46	151.8	0.41		
WS			81.7	0.41	59.6	0.32		
ES			123.8	0.44	88.8	0.35		
BRD-S			162.7	0.47	114.3	0.38		
PYLL-70								
per 100,000			839.9		767.7			
ES			739.8		658.8			
AYLL-70			10.3		11.5			

* See corresponding tables with multiple malignancies.

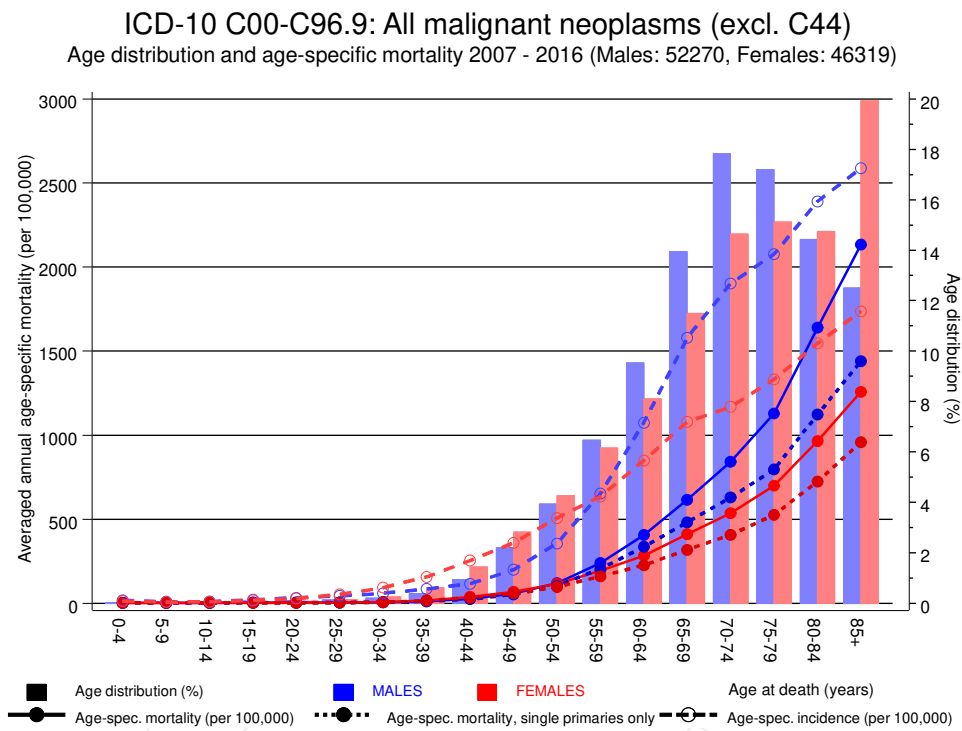
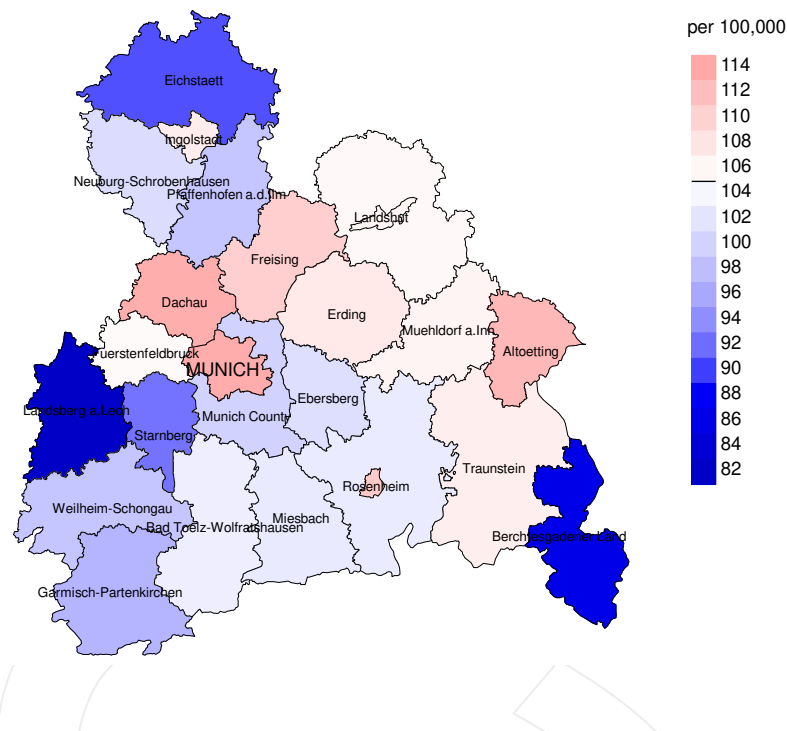


Figure 17. Distribution of age at death (bars; males: mean=69.6 yrs, median=70.8 yrs; females: mean=70.2 yrs, median=71.9 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed 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 (world standard population) 2007 - 2016: Males



Average mortality (world standard population) 2007 - 2016: Females

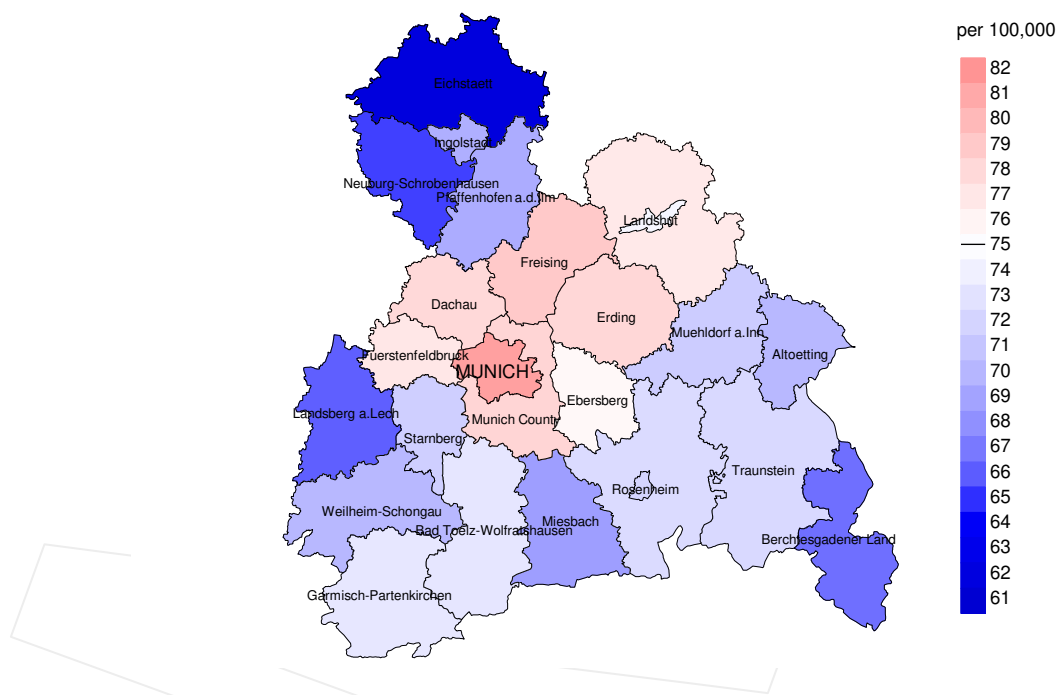
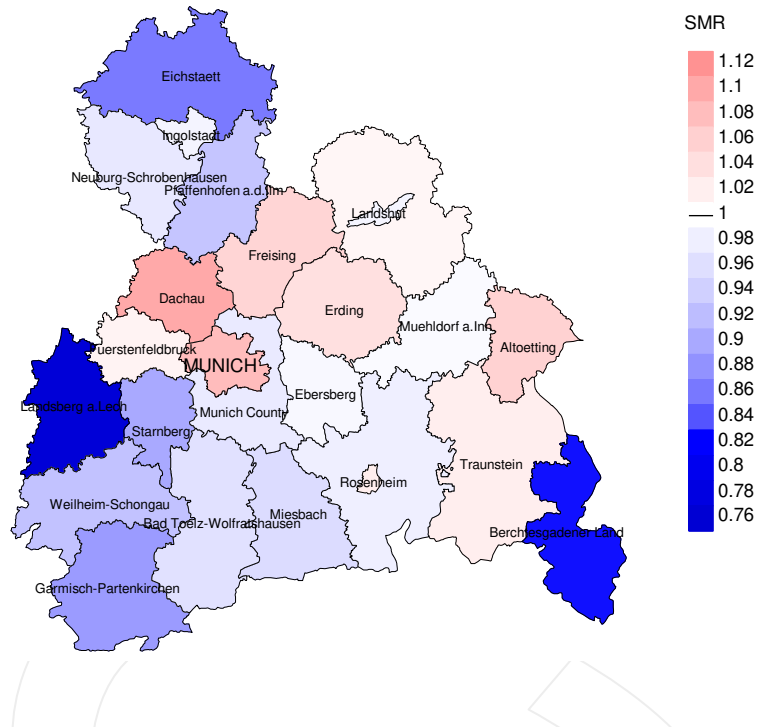


Figure 18a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2016. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 105.0/100,000 WS N=52,270, females 75.1/100,000 WS N=46,319).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 1,268 women died from all cancers (excl. C44). Therefore, the mean mortality rate for this cancer type in this area can be calculated at 75.6/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 69.3 and 82.3/100,000.

Standardized mortality ratio (SMR) 2007 - 2016: Males



Standardized mortality ratio (SMR) 2007 - 2016: Females

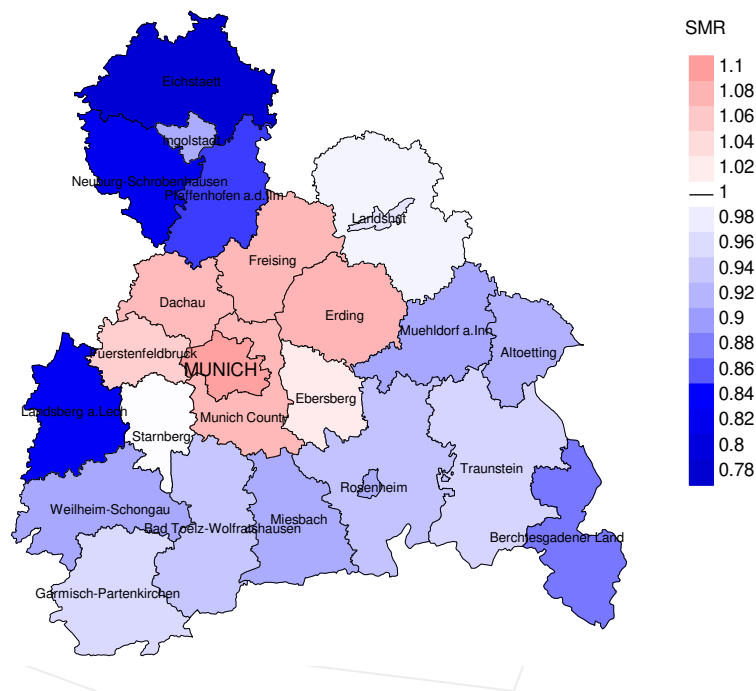


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=52,270, females N=46,319).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 1,268 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 1.02. Though, the value of this parameter may vary with an underlying probability of 99% between 0.95 and 1.10, 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 index from mortality and incidence (Mortality-Incidence ratio, **MI-index**) is a statistic 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 MI- index. 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 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 between mortality and incidence
FRG	Federal Republic of Germany

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