

Munich Cancer Registry



- ▶ Survival
- ▶ Selection Matrix
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- ▶ *Deutsch*

ICD-10 C15-C26: GI cancer

Incidence and Mortality

Year of diagnosis	1998-2019
Patients	111,769
Diseases	115,842
Creation date	01/25/2021
Database export	01/07/2021
Population	4.92 m





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

<https://www.tumorregister-muenchen.de/en/facts/base/bC1526E-ICD-10-C15-C26-GI-cancer-incidence-and-mortality.pdf>

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

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

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

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

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

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

Munich Cancer Registry, January 2021

- [#] Base data has been collected since 1998. An increase in new diseases is apparent, which is an effect of two extensions in the MCR catchment area (from a base population of 2.65 million to 4.10 in 2002, and to 4.69 million in 2007).
- ^{##} Due to the high frequency and good prognosis of non-malignant skin cancer (C44), no systematic ascertainment is performed for this diagnosis. C44 is not designated as a primary, but rather as a secondary tumor.
- ^{###} DCO (death certificate only) identifies a cancer case that first becomes available to the MCR through the death certificate.

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

Code	Description
C15	Oesophagus
C16	Stomach
C17	Small intestine
C18	Colon
C19	Rectosigmoid junction
C20	Rectum
C21	Anus and anal canal
C22	Liver and intrahepatic bile ducts
C23	Gallbladder
C24	Other and unspecified parts of biliary tract
C25	Pancreas
C26	Other and ill-defined digestive organs

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	3258	425	13.0	10.9	8.0	85.3	98.2
1999	3298	463	14.0	11.5	7.9	84.6	97.8
2000	3100	480	15.5	12.1	7.8	84.5	98.0
2001	3381	527	15.6	12.3	7.7	81.1	97.4
2002	5742	1145	19.9	12.5	7.6	84.5	98.3 #
2003	5520	911	16.5	12.7	7.4	80.9	97.9
2004	5573	815	14.6	12.9	7.2	80.2	97.8
2005	5505	773	14.0	13.4	7.0	80.6	97.7
2006	5654	630	11.1	13.8	6.7	77.6	96.5
2007	6384	749	11.7	14.0	6.4	76.7	95.5 #
2008	6394	728	11.4	14.4	6.2	75.0	98.7
2009	6377	694	10.9	14.7	5.8	73.5	98.7
2010	6116	666	10.9	15.0	5.4	72.4	98.6
2011	6102	633	10.4	15.4	5.1	71.5	98.5
2012	6188	646	10.4	15.6	4.8	68.6	98.3
2013	6034	611	10.1	15.9	4.4	66.0	98.2
2014	6010	655	10.9	16.2	4.1	65.5	97.8
2015	5966	630	10.6	16.4	3.7	62.5	96.9
2016	5793	676	11.7	16.6	3.3	59.2	99.4
2017	5418	621	11.5	16.9	2.7	51.4	99.4
2018	4271	124	2.9	17.1	2.2	36.7	99.6
2019	3758	42	1.1	17.2	1.6	27.8	77.6 ##
1998-2019	115842	13644	11.8	17.2	8.0	70.3	97.4

115,842 cases diagnosed 1998-2019 are related to a total of 111,769 patients. Currently, in 26,157 (23.4 %) of these 111,769 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 20,926 / 4,128 / 1,103 (18.7 % / 3.7 % / 1.0 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2017, a subgroup of 5,418 cases has been diagnosed, of which 16.9 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 2.7 % 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	1688	51.8	204	12.1	10.7	8.9	85.7	98.5
1999	1738	52.7	214	12.3	11.0	8.8	84.9	98.0
2000	1662	53.6	204	12.3	11.8	8.7	84.1	98.1
2001	1804	53.4	231	12.8	12.0	8.6	81.8	97.5
2002	3079	53.6	531	17.2	12.2	8.5	85.2	98.5 #
2003	2984	54.1	422	14.1	12.7	8.3	82.0	98.6
2004	3016	54.1	344	11.4	13.0	8.0	81.5	98.0
2005	2985	54.2	354	11.9	13.7	7.7	81.2	97.9
2006	3127	55.3	274	8.8	14.2	7.5	78.1	96.6
2007	3617	56.7	350	9.7	14.5	7.1	77.2	95.7 #
2008	3590	56.1	328	9.1	14.9	6.9	75.3	98.9
2009	3652	57.3	323	8.8	15.2	6.4	74.4	98.9
2010	3474	56.8	299	8.6	15.6	6.0	72.4	98.6
2011	3470	56.9	297	8.6	16.0	5.8	71.8	98.6
2012	3486	56.3	292	8.4	16.3	5.3	69.9	98.5
2013	3470	57.5	276	8.0	16.7	4.9	66.0	98.2
2014	3452	57.4	322	9.3	16.9	4.5	65.5	97.9
2015	3460	58.0	294	8.5	17.2	4.0	62.5	97.3
2016	3360	58.0	332	9.9	17.4	3.6	60.4	99.5
2017	3077	56.8	309	10.0	17.7	2.9	51.6	99.4
2018	2436	57.0	52	2.1	17.9	2.4	37.4	99.6
2019	2208	58.8	22	1.0	18.0	1.7	28.4	78.7 ##
1998-2019	64835	56.0	6274	9.7	18.0	8.9	70.5	97.6

64,835 cases diagnosed 1998-2019 are related to a total of 62,196 patients. Currently, in 15,401 (24.8 %) of these 62,196 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 12,186 / 2,485 / 730 (19.6 % / 4.0 % / 1.2 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2017, a subgroup of 3,077 cases has been diagnosed, of which 17.7 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 2.9 % 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	1570	48.2	221	14.1	11.1	6.8	84.8	97.8
1999	1560	47.3	249	16.0	12.1	6.7	84.2	97.5
2000	1438	46.4	276	19.2	12.5	6.7	85.0	98.0
2001	1577	46.6	296	18.8	12.7	6.6	80.3	97.3
2002	2663	46.4	614	23.1	12.7	6.5	83.8	98.0 #
2003	2536	45.9	489	19.3	12.7	6.3	79.7	97.1
2004	2557	45.9	471	18.4	12.7	6.1	78.8	97.5
2005	2520	45.8	419	16.6	13.1	6.0	79.9	97.5
2006	2527	44.7	356	14.1	13.3	5.7	76.9	96.4
2007	2767	43.3	399	14.4	13.5	5.5	76.0	95.2 #
2008	2804	43.9	400	14.3	13.8	5.3	74.6	98.5
2009	2725	42.7	371	13.6	14.0	4.9	72.3	98.5
2010	2642	43.2	367	13.9	14.3	4.6	72.4	98.7
2011	2632	43.1	336	12.8	14.6	4.3	71.0	98.4
2012	2702	43.7	354	13.1	14.8	4.0	67.0	98.0
2013	2564	42.5	335	13.1	15.0	3.8	65.9	98.3
2014	2558	42.6	333	13.0	15.3	3.6	65.4	97.6
2015	2506	42.0	336	13.4	15.5	3.2	62.5	96.4
2016	2433	42.0	344	14.1	15.7	2.8	57.5	99.3
2017	2341	43.2	312	13.3	15.9	2.4	51.1	99.3
2018	1835	43.0	72	3.9	16.1	1.9	35.7	99.6
2019	1550	41.2	20	1.3	16.2	1.5	26.8	76.2 ##
1998-2019	51007	44.0	7370	14.4	16.2	6.8	70.0	97.2

51,007 cases diagnosed 1998-2019 are related to a total of 49,573 patients. Currently, in 10,756 (21.7 %) of these 49,573 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 8,740 / 1,643 / 373 (17.6 % / 3.3 % / 0.8 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2017, a subgroup of 2,341 cases has been diagnosed, of which 15.9 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 2.4 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 2

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

Year of diagnosis	Males n	Females n	Males Inc. raw	Fem. Inc. raw	Males Inc. WS	Fem. Inc. WS	Males Inc. ES	Fem. Inc. ES	Males Inc. BRD-S	Fem. Inc. BRD-S
1998	1688	1570	152.3	133.5	91.6	55.6	138.3	84.4	181.1	111.8
1999	1738	1560	155.3	131.5	91.8	53.8	139.2	81.9	183.0	108.9
2000	1662	1438	145.9	119.7	85.6	48.0	129.7	73.9	168.0	98.4
2001	1804	1577	155.7	129.6	91.0	54.6	136.8	82.5	176.3	107.6
2002	3079	2663	165.3	136.0	92.6	54.0	139.7	82.3	181.5	109.0
2003	2984	2536	159.2	128.7	87.5	51.7	132.0	78.5	172.0	102.7
2004	3016	2557	160.3	129.4	86.4	53.0	130.3	79.5	169.7	103.2
2005	2985	2520	157.6	126.6	83.3	49.8	125.2	75.1	163.0	99.0
2006	3127	2527	163.3	125.8	85.8	50.1	128.4	75.4	166.3	98.8
2007	3617	2767	163.3	119.8	85.5	47.2	127.6	71.1	165.1	92.8
2008	3590	2804	161.3	120.8	82.2	47.3	122.9	71.2	159.4	92.7
2009	3652	2725	163.6	117.2	81.4	45.4	122.0	68.4	158.6	89.7
2010	3474	2642	154.1	112.9	76.4	42.8	114.4	64.7	147.8	85.4
2011	3470	2632	155.1	112.6	74.8	43.7	112.1	65.4	145.7	84.4
2012	3486	2702	153.6	114.5	74.5	45.3	111.1	67.0	142.6	86.8
2013	3470	2564	150.8	107.5	71.8	42.1	107.2	62.5	138.4	80.8
2014	3452	2558	148.1	106.2	69.8	41.3	104.3	61.3	134.7	78.7
2015	3460	2506	145.4	103.0	68.5	39.0	102.2	58.4	131.9	75.6
2016	3360	2433	139.8	99.1	65.9	37.8	97.6	56.5	126.2	73.2
2017	3077	2341	127.5	95.0	57.8	37.2	86.8	55.0	113.1	70.6
2018	2436	1835	100.1	73.9	47.4	31.0	69.7	45.1	88.7	56.6
2019	2208	1550	90.7	62.4	43.3	26.1	63.5	37.7	80.5	47.8
1998-2019	64835	51007	147.1	111.4	74.0	43.8	110.3	65.6	142.2	85.3

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

Table 3

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min. Max.		Median				
				10%	25%	50%	75%	90%		
1998	3258	70.3	12.7	13.2	102	53.5	61.1	71.6	79.4	86.3
1999	3298	70.7	12.6	10.8	102	54.6	62.1	71.7	79.7	86.6
2000	3100	70.7	12.5	21.7	103	54.3	61.8	71.8	79.6	87.0
2001	3381	70.2	12.7	14.5	103	54.0	61.7	70.7	79.6	86.7
2002	5742	71.1	12.3	17.7	104	55.1	62.7	72.0	80.2	87.0
2003	5520	71.1	12.1	8.4	101	55.6	63.1	71.8	80.2	86.2
2004	5573	70.7	12.3	3.1	101	54.7	62.9	71.1	79.9	85.5
2005	5505	71.3	12.3	1.0	100	55.9	63.7	71.6	80.3	85.9
2006	5654	70.8	12.2	12.3	102	54.9	63.2	71.4	80.0	85.6
2007	6384	70.8	12.5	0.3	103	54.2	63.4	71.4	80.2	86.0
2008	6394	71.2	12.4	1.1	105	54.9	63.8	71.8	80.3	86.3
2009	6377	71.2	12.3	1.4	102	54.5	63.8	72.0	80.3	86.3
2010	6116	71.3	12.4	0.8	103	54.6	63.6	72.1	80.7	86.1
2011	6102	71.4	12.6	0.7	101	54.2	63.9	72.4	80.7	86.7
2012	6188	71.0	12.6	0.0	101	54.4	63.5	72.4	79.9	86.1
2013	6034	71.1	12.7	0.6	105	54.1	63.5	72.8	79.8	86.2
2014	6010	71.4	12.7	0.4	103	54.0	63.8	73.2	80.2	86.6
2015	5966	71.5	12.7	7.0	105	53.9	63.7	73.4	80.2	86.5
2016	5793	71.4	12.8	3.0	104	53.7	63.6	73.4	80.3	86.2
2017	5418	71.5	12.5	14.5	99.7	54.3	63.7	73.6	80.1	86.1
2018	4271	70.0	12.2	17.8	100	53.7	61.6	71.6	79.0	84.1
2019	3758	69.8	12.6	17.7	100	52.7	61.6	71.8	79.2	84.1
1998-2019	115842	71.0	12.5	0.0	105	54.4	63.1	72.2	80.1	86.2

Table 3a

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

Year of diagnosis	Cases n	Std.		Median						
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	1688	67.9	12.1	16.5	98.1	52.3	58.9	68.6	76.7	84.0
1999	1738	68.3	11.9	10.8	97.4	53.9	60.2	68.9	76.9	83.7
2000	1662	68.4	11.6	25.1	97.8	53.8	60.4	68.6	76.8	84.3
2001	1804	68.1	11.8	14.5	102	53.6	60.6	67.9	76.7	83.5
2002	3079	68.9	11.3	20.9	98.5	54.4	61.6	69.2	76.7	82.7
2003	2984	69.2	11.3	8.4	99.4	55.0	62.4	69.4	76.9	83.0
2004	3016	69.1	11.3	22.5	101	54.4	62.0	69.2	77.1	83.7
2005	2985	69.2	11.3	19.0	99.6	55.0	62.5	69.3	77.3	83.4
2006	3127	69.0	11.3	12.3	102	54.7	62.2	69.3	77.1	83.0
2007	3617	68.9	11.7	0.3	99.4	53.7	62.0	69.4	77.5	83.2
2008	3590	69.4	11.4	6.5	105	54.5	62.7	70.1	77.7	83.4
2009	3652	69.6	11.5	1.4	102	54.1	62.7	70.8	77.8	83.4
2010	3474	69.6	11.6	0.8	98.9	54.3	62.1	70.6	78.1	83.8
2011	3470	70.1	11.6	0.8	97.3	54.2	63.4	71.3	78.2	84.2
2012	3486	69.9	11.5	0.0	101	54.9	62.7	71.2	77.8	83.8
2013	3470	70.1	11.9	0.6	99.8	54.3	62.9	71.8	78.2	84.2
2014	3452	70.4	12.0	18.4	102	54.0	63.0	72.1	78.7	84.9
2015	3460	70.2	12.0	9.2	105	53.4	62.7	72.1	78.7	84.3
2016	3360	70.3	12.4	9.4	104	53.5	62.8	72.2	79.2	84.5
2017	3077	71.0	11.7	19.1	99.7	54.4	63.2	73.0	79.3	84.3
2018	2436	69.6	11.7	17.8	98.1	54.1	61.3	70.9	78.6	83.1
2019	2208	69.3	12.1	17.9	98.2	53.2	61.2	71.3	78.1	83.3
1998-2019	64835	69.5	11.7	0.0	105	54.1	62.1	70.5	77.9	83.7

Table 3b

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

Year of diagnosis	Cases n	Std.		Median						
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	1570	72.9	12.8	13.2	102	54.6	64.3	75.0	82.9	87.6
1999	1560	73.4	12.9	18.8	102	55.9	64.7	75.3	82.9	88.5
2000	1438	73.2	13.0	21.7	103	55.5	64.1	75.8	82.4	88.5
2001	1577	72.6	13.3	26.4	103	54.9	63.4	74.7	81.8	89.0
2002	2663	73.6	12.9	17.7	104	55.9	65.0	76.0	82.4	89.0
2003	2536	73.3	12.6	10.9	101	56.3	64.4	75.3	82.7	88.6
2004	2557	72.6	13.1	3.1	100	55.1	64.3	74.4	82.8	88.0
2005	2520	73.7	13.0	1.0	100	57.1	65.4	75.5	83.1	89.6
2006	2527	73.0	12.9	20.4	99.2	55.0	64.9	75.0	83.1	87.4
2007	2767	73.2	12.9	13.4	103	55.1	65.7	74.7	83.2	87.7
2008	2804	73.4	13.3	1.1	102	55.4	65.3	74.6	83.7	88.3
2009	2725	73.3	13.1	15.9	102	55.1	65.5	75.0	83.3	88.2
2010	2642	73.5	13.0	14.9	103	55.4	66.4	75.2	83.3	88.1
2011	2632	73.0	13.6	0.7	101	54.3	64.9	74.5	83.5	88.7
2012	2702	72.4	13.8	1.5	101	53.7	64.9	74.4	82.8	88.3
2013	2564	72.5	13.6	2.7	105	53.7	64.9	74.4	82.5	88.4
2014	2558	72.8	13.5	0.4	103	54.0	65.2	74.7	82.7	88.7
2015	2506	73.2	13.4	7.0	101	54.6	65.9	75.3	82.6	89.1
2016	2433	72.9	13.2	3.0	102	54.0	64.7	75.3	82.0	88.2
2017	2341	72.2	13.4	14.5	99.0	54.1	64.1	74.6	81.5	87.6
2018	1835	70.6	12.9	19.3	100	52.7	62.0	72.3	79.7	85.6
2019	1550	70.6	13.3	17.7	100	51.8	62.2	73.0	80.3	85.3
1998-2019	51007	72.9	13.2	0.4	105	54.7	64.7	74.8	82.6	88.2

Table 4

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

Age at diagnosis Years	Cases			Males			Females		
	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4	20	0.0	0.0	10	0.0	0.0	10	0.0	0.0
5-9	8	0.0	0.0	7	0.0	0.0	1	0.0	0.0
10-14	7	0.0	0.0	1	0.0	0.0	6	0.0	0.1
15-19	58	0.1	0.1	17	0.0	0.1	41	0.1	0.2
20-24	90	0.1	0.2	45	0.1	0.2	45	0.1	0.3
25-29	149	0.2	0.4	71	0.2	0.4	78	0.2	0.6
30-34	298	0.4	0.8	156	0.4	0.7	142	0.4	1.0
35-39	496	0.7	1.5	261	0.6	1.3	235	0.7	1.7
40-44	1034	1.4	2.9	568	1.3	2.7	466	1.5	3.2
45-49	2238	3.0	5.9	1295	3.0	5.7	943	2.9	6.1
50-54	3895	5.2	11.1	2379	5.6	11.3	1516	4.7	10.9
55-59	5526	7.4	18.5	3510	8.2	19.5	2016	6.3	17.2
60-64	7443	9.9	28.4	4855	11.4	30.8	2588	8.1	25.2
65-69	10024	13.4	41.8	6418	15.0	45.8	3606	11.2	36.5
70-74	12371	16.5	58.4	7613	17.8	63.6	4758	14.8	51.3
75-79	12215	16.3	74.7	7081	16.6	80.2	5134	16.0	67.3
80-84	9726	13.0	87.7	5049	11.8	92.0	4677	14.6	81.9
85+	9213	12.3	100.0	3416	8.0	100.0	5797	18.1	100.0
All ages	74811	100.0		42752	100.0		32059	100.0	

Table 5

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

Age at diagnosis Years	Males n	Females n	Males Age- spec. incid.	Females Age- spec. incid.	Males DCO rate n=3422 %	Females DCO rate n=3935 %	Males	Females
							Prop.all cancers n=143063 %	Prop.all cancers n=144724 %
0- 4	10	10	0.7	0.7	10.0	30.0	4.7	6.2
5- 9	7	1	0.5	0.1			6.1	1.1
10-14	1	6	0.1	0.4			0.8	5.1
15-19	17	41	1.1	2.8			5.7	16.6
20-24	45	45	2.4	2.6	4.4		7.7	9.5
25-29	68	78	3.2	3.8			7.7	7.0
30-34	156	141	7.3	6.7	0.6	2.1	13.0	7.1
35-39	255	232	11.9	11.0	2.0	3.0	14.9	7.1
40-44	565	464	24.1	20.5	0.5	0.9	21.7	8.1
45-49	1277	931	50.9	38.3	1.8	0.8	26.7	10.6
50-54	2339	1506	99.8	65.2	3.9	2.3	29.8	13.0
55-59	3456	1991	177.8	99.6	3.2	2.2	29.3	16.1
60-64	4752	2554	291.4	145.5	4.1	4.0	29.1	17.6
65-69	6250	3541	411.0	210.2	5.3	4.5	27.5	19.9
70-74	7401	4667	528.1	290.6	6.1	6.0	28.7	25.0
75-79	6900	5026	623.2	365.0	8.7	9.1	31.2	27.7
80-84	4892	4609	745.1	473.5	13.9	17.1	34.6	32.5
85+	3338	5708	782.8	591.3	27.9	35.9	33.9	36.9
All ages	41729	31551			8.2	12.5	29.2	21.8
Incidence								
Raw			138.5	101.4				
WS			66.9	39.6				
ES			99.4	59.0				
BRD-S			127.9	76.1				

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).

ICD-10 C15-C26: Malignant neoplasms of digestive organs
 Age distribution and age-specific incidence 2007 - 2019 (Males: 41729, Females: 31551)

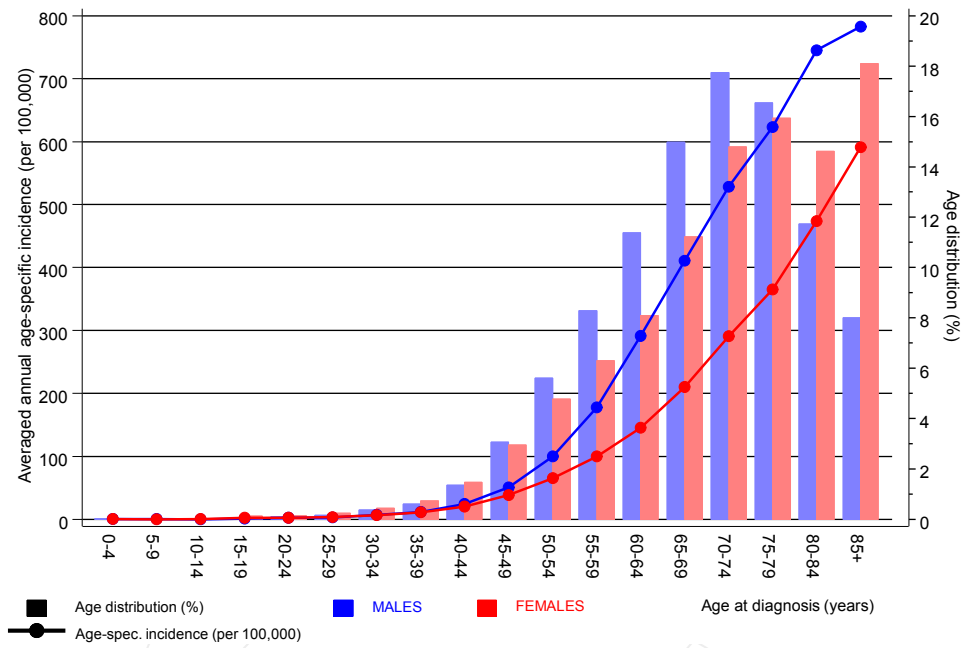


Figure 6. Age distribution (males: mean=69.8 yrs, median=71.1 yrs; females: mean=72.7 yrs, median=74.6 yrs) and age-specific incidence.

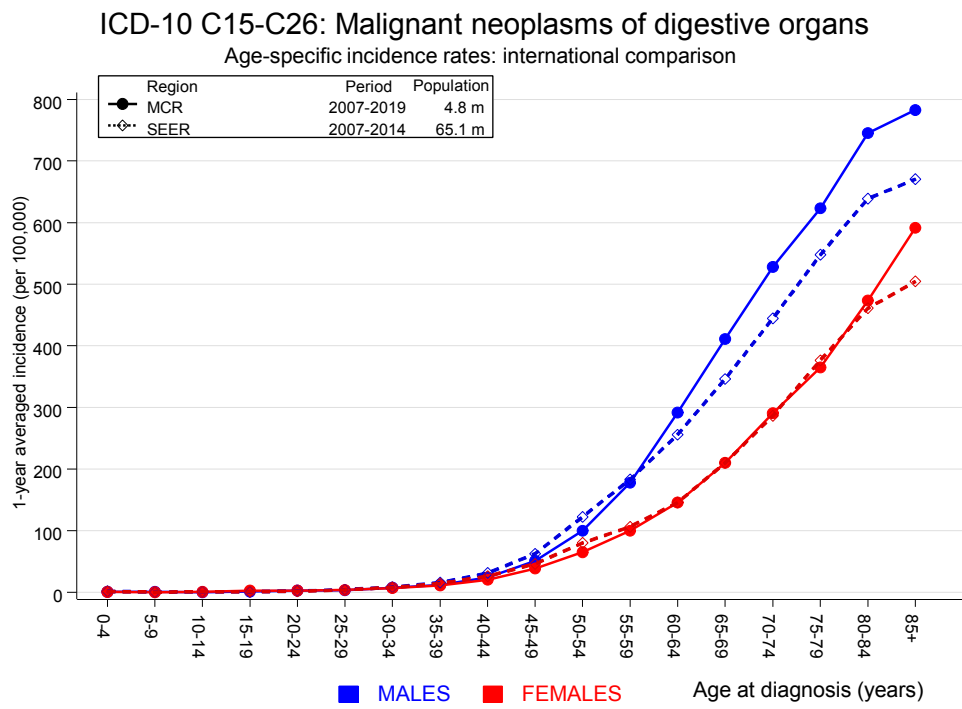


Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 18 Regs Research Data, released April 2019, based on the November 2018 submission. <http://www.seer.cancer.gov>.

Table 7a

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

MALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C00 Lip	8	3.3	2.4	1.1	4.8 #	0.3	
C03–C06 Oral cavity	56	21.0	2.7	2.0	3.5 #	2.2	3.6
C07–C08 Salivary gland	9	6.5	1.4	0.6	2.6	0.2	
C09–C10 Oropharynx	76	25.5	3.0	2.3	3.7 #	3.2	2.6
C12–C13 Hypopharynx	49	13.9	3.5	2.6	4.7 #	2.3	4.1
C15 Oesophagus	156	51.6	3.0	2.6	3.5 #	6.7	8.3
C16 Stomach	325	116.1	2.8	2.5	3.1 #	13.4	8.3
C17 Small intestine	135	16.0	8.5	7.1	10.0 #	7.6	0.7
C18 Colon	976	279.8	3.5	3.3	3.7 #	44.7	3.6
C19–C20 Rectum	386	146.7	2.6	2.4	2.9 #	15.4	2.8
C21 Anus/canal	20	6.3	3.2	1.9	4.9 #	0.9	5.0
C22 Liver	218	79.6	2.7	2.4	3.1 #	8.9	16.5
C23–C24 Bile	75	29.7	2.5	2.0	3.2 #	2.9	14.7
C25 Pancreas	264	109.7	2.4	2.1	2.7 #	9.9	24.2
C30–C31 Sinuses	7	4.9	1.4	0.6	2.9	0.1	
C32 Larynx	63	26.6	2.4	1.8	3.0 #	2.3	9.5
C33–C34 Lung	834	327.5	2.5	2.4	2.7 #	32.5	15.2
C38,C45 Mesothelioma	31	19.4	1.6	1.1	2.3 #	0.7	9.7
C43 Malign. melanoma	224	119.1	1.9	1.6	2.1 #	6.7	2.2
C46,C49 Soft tissue	34	15.8	2.2	1.5	3.0 #	1.2	2.9
C50 Breast	22	7.6	2.9	1.8	4.4 #	0.9	22.7
C60 Penis	15	7.1	2.1	1.2	3.5 #	0.5	13.3
C61 Prostate	1337	798.4	1.7	1.6	1.8 #	34.6	9.3
C62 Testis	14	5.6	2.5	1.4	4.2 #	0.5	14.3
C64 Kidney	296	94.5	3.1	2.8	3.5 #	12.9	8.8
C65 Renal pelvis	38	12.7	3.0	2.1	4.1 #	1.6	
C66 Ureter	21	7.4	2.8	1.8	4.3 #	0.9	
C67 Bladder	287	136.8	2.1	1.9	2.4 #	9.6	9.1
C68 Urethra	8	2.5	3.2	1.4	6.3 #	0.4	
C70–C72 CNS cancer	62	34.3	1.8	1.4	2.3 #	1.8	22.6
C73 Thyroid	41	16.3	2.5	1.8	3.4 #	1.6	7.3
C76–C79 CUP	82	48.4	1.7	1.3	2.1 #	2.2	1.2
C81 Hodgkin lymphoma	13	6.0	2.2	1.2	3.7 #	0.5	7.7
C82–C85 NHL	251	119.9	2.1	1.8	2.4 #	8.4	6.4
C90 Mult. myeloma	65	37.7	1.7	1.3	2.2 #	1.8	21.5
C91–C96 Leukaemia	88	44.0	2.0	1.6	2.5 #	2.8	26.1
Others, specified	42	27.6	1.5	1.1	2.1 #	0.9	31.0
Not observed	0	0.9	0.0	0.0	4.3	-0.1	
All further malignancies	6628	2826.5	2.3	2.3	2.4 #	244.0	9.3

Patients 56642
 Median age at next malignancy (years) 73.6
 Person-years 155779
 Mean observation time (years) 2.8
 Median observation time (years) 1.2

The occurrence of further specified malignancy is statistically significant.

Further observed malignancies with count 1 to 6 are pooled in category "Others, specified".

Table 7b

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

FEMALES

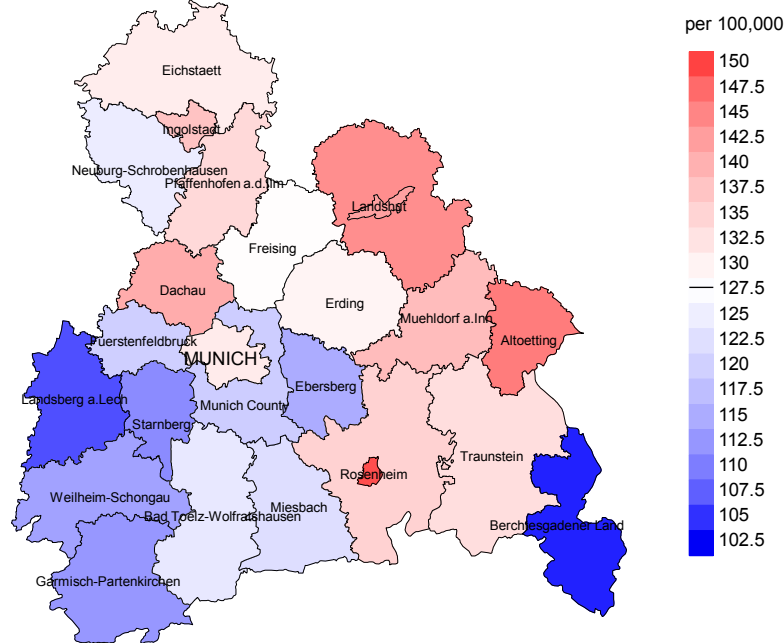
Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C03-C06 Oral cavity	18	8.6	2.1	1.2	3.3 #	0.8	
C09-C10 Oropharynx	24	5.4	4.5	2.9	6.6 #	1.5	4.2
C12-C13 Hypopharynx	7	1.4	4.9	2.0	10.1 #	0.5	14.3
C15 Oesophagus	25	9.7	2.6	1.7	3.8 #	1.3	20.0
C16 Stomach	167	61.4	2.7	2.3	3.2 #	8.6	15.6
C17 Small intestine	72	7.8	9.3	7.3	11.7 #	5.3	1.4
C18 Colon	607	169.8	3.6	3.3	3.9 #	35.8	6.6
C19-C20 Rectum	180	66.7	2.7	2.3	3.1 #	9.3	5.0
C21 Anus/canal	19	8.3	2.3	1.4	3.6 #	0.9	
C22 Liver	60	20.3	3.0	2.3	3.8 #	3.2	31.7
C23-C24 Bile	52	25.0	2.1	1.6	2.7 #	2.2	15.4
C25 Pancreas	197	79.4	2.5	2.1	2.9 #	9.6	28.4
C26 GI cancer	7	3.6	1.9	0.8	4.0	0.3	57.1
C32 Larynx	10	2.6	3.9	1.9	7.1 #	0.6	
C33-C34 Lung	390	111.7	3.5	3.2	3.9 #	22.8	12.1
C43 Malign. melanoma	120	54.4	2.2	1.8	2.6 #	5.4	3.3
C46,C49 Soft tissue	19	9.0	2.1	1.3	3.3 #	0.8	
C48 Peritoneal	21	5.7	3.7	2.3	5.6 #	1.2	28.6
C50 Breast	900	441.7	2.0	1.9	2.2 #	37.5	8.3
C51 Vulva	44	17.8	2.5	1.8	3.3 #	2.1	2.3
C52 Vagina	10	3.2	3.2	1.5	5.8 #	0.6	10.0
C53 Cervix uteri	46	17.9	2.6	1.9	3.4 #	2.3	23.9
C54 Corpus uteri	174	82.6	2.1	1.8	2.4 #	7.5	4.0
C55,C57 Fem. genitals un	8	4.5	1.8	0.8	3.5	0.3	37.5
C56 Ovary	195	62.2	3.1	2.7	3.6 #	10.9	26.7
C64 Kidney	135	37.8	3.6	3.0	4.2 #	8.0	16.3
C65 Renal pelvis	14	5.2	2.7	1.5	4.5 #	0.7	
C66 Ureter	9	2.7	3.3	1.5	6.3 #	0.5	11.1
C67 Bladder	76	34.8	2.2	1.7	2.7 #	3.4	21.1
C70-C72 CNS cancer	26	20.0	1.3	0.9	1.9	0.5	42.3
C73 Thyroid	40	20.5	1.9	1.4	2.7 #	1.6	7.5
C76-C79 CUP	39	32.8	1.2	0.8	1.6	0.5	5.1
C81 Hodgkin lymphoma	7	2.6	2.7	1.1	5.5 #	0.4	14.3
C82-C85 NHL	133	63.9	2.1	1.7	2.5 #	5.7	12.8
C90 Mult. myeloma	39	20.4	1.9	1.4	2.6 #	1.5	23.1
C91-C96 Leukaemia	60	24.4	2.5	1.9	3.2 #	2.9	46.7
Others, specified	41	23.3	1.8	1.3	2.4 #	1.4	17.1
Not observed	0	1.2	0.0	0.0	3.1	-0.1	
All further malignancies	3991	1570.0	2.5	2.5	2.6 #	198.0	12.4

Patients	43540
Median age at next malignancy (years)	75.8
Person-years	122280
Mean observation time (years)	2.8
Median observation time (years)	1.1

The occurrence of further specified malignancy is statistically significant.

Further observed malignancies with count 1 to 6 are pooled in category "Others, specified".

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



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

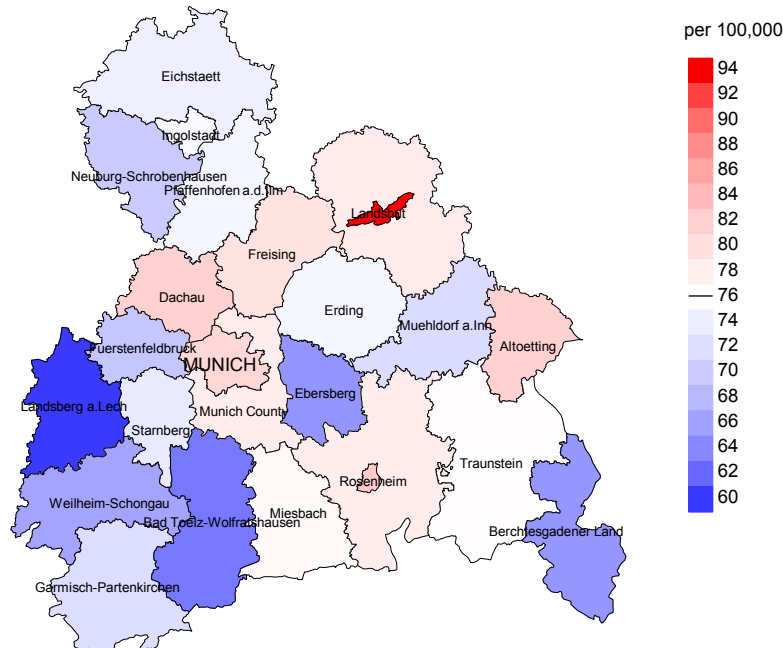
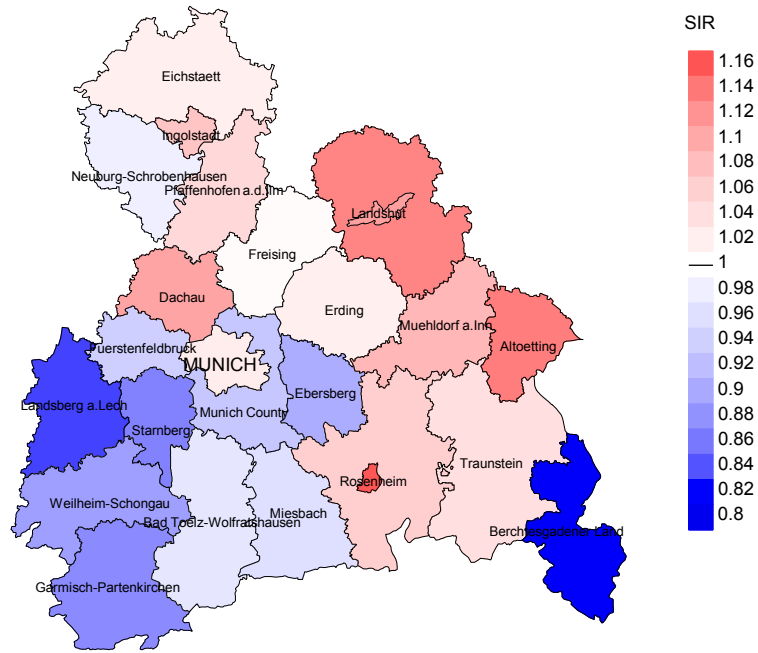


Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 127.9/100,000 WS N=41,729, females 76.1/100,000 WS N=31,551).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,462 female residents (averaged) in the period from 2007 to 2019 a total of 720 women were identified with newly diagnosed GI cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 65.0/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 58.8 and 71.6/100,000.

Standardized incidence ratio (SIR) 2007 - 2019: Males



Standardized incidence ratio (SIR) 2007 - 2019: Females

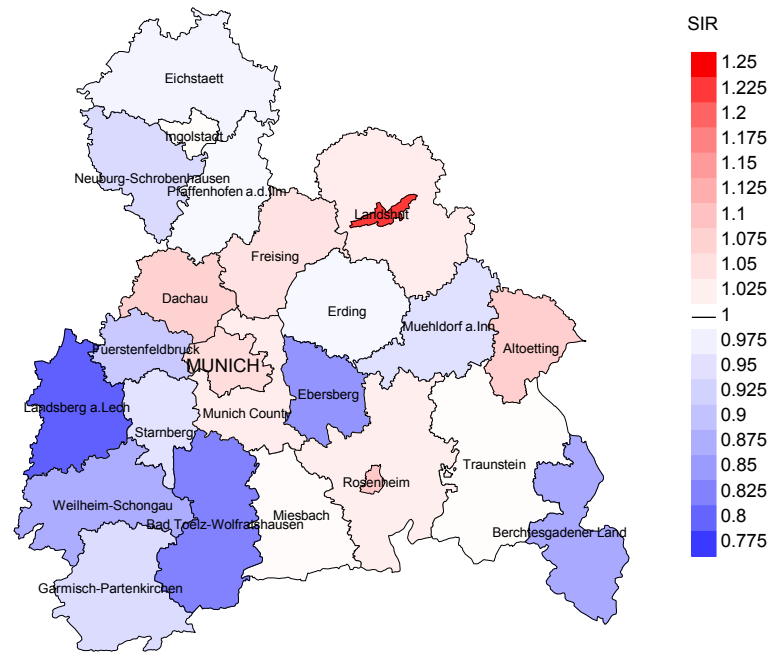


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=41,729, females N=31,551).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2019 a total of 720 women were identified with newly diagnosed GI cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.84. Though, the value of this parameter may vary with an underlying probability of 99% between 0.77 and 0.93.

MORTALITY

Table 9a

Annual cohorts: Incident cancers, follow-up status, proportion of DCO, deaths among the annual cohorts and proportion of available death certificates (with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.92 m as of 2007, respectively)

Year of diagnosis	Incident cases n	Prop. actively followed %	Prop. DCO %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	3258	98.2	13.0	2778	85.3	93.5
1999	3298	97.8	14.0	2789	84.6	94.5
2000	3100	98.0	15.5	2619	84.5	96.2
2001	3381	97.4	15.6	2743	81.1	95.6
2002	5742	98.3	19.9	4853	84.5	96.8
2003	5520	97.9	16.5	4468	80.9	96.7
2004	5573	97.8	14.6	4472	80.2	96.4
2005	5505	97.7	14.0	4438	80.6	97.1
2006	5654	96.5	11.1	4385	77.6	97.3
2007	6384	95.5	11.7	4897	76.7	97.0
2008	6394	98.7	11.4	4794	75.0	96.3
2009	6377	98.7	10.9	4689	73.5	96.4
2010	6116	98.6	10.9	4428	72.4	95.6
2011	6102	98.5	10.4	4361	71.5	95.9
2012	6188	98.3	10.4	4247	68.6	95.2
2013	6034	98.2	10.1	3980	66.0	94.5
2014	6010	97.8	10.9	3935	65.5	93.4
2015	5966	96.9	10.6	3726	62.5	91.4
2016	5793	99.4	11.7	3429	59.2	88.6
2017	5418	99.4	11.5	2784	51.4	76.4
2018	4271	99.6	2.9	1567	36.7	46.4
2019	3758	77.6	1.1	1044	27.8	80.6
1998-2019	115842	97.4	11.8	81426	70.3	93.6

Table 9b

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

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

Year of diagnosis/ death	Incident cases n	Deaths n	Prop. deaths with death certific. %	Deaths in same year n	Prop. deaths in same year %
1998	3258	2178	92.5	974	29.9
1999	3298	2262	92.1	1011	30.7
2000	3100	2205	95.1	922	29.7
2001	3381	2356	95.5	1004	29.7
2002	5742	3373	98.2	1968	34.3
2003	5520	3456	97.8	1680	30.4
2004	5573	3519	98.1	1613	28.9
2005	5505	3716	97.0	1606	29.2
2006	5654	3870	97.7	1606	28.4
2007	6384	4098	98.0	1759	27.6
2008	6394	4257	98.6	1830	28.6
2009	6377	4323	98.7	1714	26.9
2010	6116	4438	98.7	1675	27.4
2011	6102	4500	98.3	1707	28.0
2012	6188	4560	98.4	1735	28.0
2013	6034	4430	98.0	1577	26.1
2014	6010	4489	98.2	1680	28.0
2015	5966	4707	98.3	1659	27.8
2016	5793	4641	98.9	1730	29.9
2017	5418	4577	97.4	1543	28.5
2018	4271	3264	32.6	693	16.2
2019	3758	2838	51.7	606	16.1
1998–2019	115842	82057	93.5	32292	27.9

Table 9c

Annual cohorts of deaths, proportion of cancer-related and non-cancer-related deaths, and cancer recorded on death certificates
(incl. DCO)

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

Year of death	Deaths n	Prop. cancer- related %	Prop. non-cancer- related %	Prop. cancer recorded on death certificate %
1998	2178	76.3	23.7	91.3
1999	2262	80.0	20.0	91.6
2000	2205	81.7	18.3	91.2
2001	2356	78.4	21.6	91.0
2002	3373	82.9	17.1	91.8
2003	3456	81.9	18.1	91.2
2004	3519	83.4	16.6	91.1
2005	3716	81.3	18.7	89.1
2006	3870	81.4	18.6	89.6
2007	4098	80.8	19.2	89.2
2008	4257	81.3	18.7	88.5
2009	4323	79.9	20.1	87.5
2010	4438	78.2	21.8	86.6
2011	4500	78.1	21.9	86.7
2012	4560	77.5	22.5	86.1
2013	4430	75.6	24.4	83.4
2014	4489	75.8	24.2	84.8
2015	4707	74.1	25.9	82.9
2016	4641	73.1	26.9	82.9
2017	4577	73.0	27.0	81.1
2018	3264	52.1	47.9	74.0
2019	2838	57.9	42.1	75.3
1998–2019	82057	76.7	23.3	86.8

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	1104	72.5	70.8	78.4	72.2
1999	1183	72.3	70.6	77.9	71.8
2000	1157	72.8	70.9	80.7	71.9
2001	1222	71.9	70.1	79.5	71.1
2002	1793	72.3	70.7	79.9	71.7
2003	1887	72.6	71.2	78.9	72.2
2004	1880	73.6	71.8	80.5	72.7
2005	2029	73.0	71.2	80.3	71.6
2006	2151	73.7	71.8	80.1	72.6
2007	2281	73.2	72.0	80.2	72.5
2008	2376	74.2	72.7	80.5	73.2
2009	2431	73.6	71.9	80.0	72.5
2010	2472	74.2	72.8	81.2	73.5
2011	2576	74.2	72.5	81.8	73.3
2012	2569	74.9	73.2	81.0	73.8
2013	2498	75.7	73.6	82.8	74.4
2014	2544	75.7	74.5	81.3	75.0
2015	2684	76.6	74.5	82.6	75.2
2016	2735	76.8	74.9	82.3	75.7
2017	2626	77.4	75.3	83.5	75.9
2018	1942	77.2	74.3	80.6	76.7
2019	1734	77.9	74.0	81.6	75.6
1998-2019	45874	74.7	72.8	81.1	73.6

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

Table 10b

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

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	1074	78.2	76.3	84.3	78.3
1999	1079	79.5	78.0	84.9	79.2
2000	1048	79.2	78.0	85.3	78.8
2001	1134	79.4	77.2	86.6	78.7
2002	1580	79.8	78.6	85.8	79.3
2003	1569	79.6	77.8	85.6	78.7
2004	1639	79.7	78.2	84.8	78.8
2005	1687	79.8	78.1	84.9	78.8
2006	1719	80.2	78.4	85.8	79.2
2007	1817	80.0	77.8	86.4	78.9
2008	1881	80.3	78.1	86.4	79.1
2009	1892	80.7	78.2	86.9	79.0
2010	1966	80.9	78.2	86.7	79.4
2011	1924	80.8	77.8	87.6	78.8
2012	1991	80.5	77.3	87.7	78.2
2013	1932	80.6	77.2	87.8	78.6
2014	1945	80.4	77.5	87.3	78.7
2015	2023	80.1	77.4	88.3	78.2
2016	1906	80.3	77.7	88.0	78.6
2017	1951	80.8	78.3	88.4	79.0
2018	1322	79.8	75.3	85.0	77.8
2019	1104	79.5	76.2	84.1	77.7
1998-2019	36183	80.1	77.7	86.6	78.8

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	846	76.4	0.51	44.8	0.49	69.7	0.51	94.2	0.53
1999	955	85.3	0.56	49.5	0.54	77.0	0.56	104.5	0.58
2000	949	83.3	0.58	47.6	0.56	74.3	0.58	100.0	0.60
2001	982	84.7	0.55	48.5	0.54	75.1	0.56	99.0	0.57
2002	1486	79.8	0.49	43.9	0.48	67.5	0.49	89.5	0.50
2003	1567	83.6	0.53	44.7	0.52	69.2	0.53	93.0	0.55
2004	1585	84.2	0.53	43.4	0.51	67.9	0.53	92.8	0.55
2005	1683	88.9	0.58	45.3	0.55	69.6	0.57	94.3	0.59
2006	1754	91.6	0.57	45.6	0.54	71.1	0.57	96.3	0.59
2007	1864	84.1	0.53	41.2	0.49	63.9	0.51	86.7	0.54
2008	1975	88.7	0.56	42.7	0.53	66.5	0.56	90.6	0.58
2009	1969	88.2	0.55	42.5	0.53	65.2	0.54	86.3	0.55
2010	1958	86.9	0.58	40.3	0.54	62.3	0.56	84.2	0.58
2011	2038	91.1	0.60	42.3	0.58	65.2	0.59	86.5	0.61
2012	2016	88.8	0.60	40.2	0.55	62.1	0.58	83.5	0.60
2013	1936	84.1	0.57	37.5	0.54	58.1	0.56	78.0	0.58
2014	1941	83.2	0.58	36.3	0.53	56.2	0.55	75.8	0.58
2015	1991	83.7	0.59	36.4	0.54	56.3	0.57	75.7	0.59
2016	2036	84.7	0.62	36.0	0.56	56.0	0.59	75.7	0.61
2017	1937	80.3	0.65	33.9	0.60	52.7	0.62	70.4	0.64
2018	1043	42.8	0.44	18.7	0.40	28.4	0.41	37.5	0.43
2019	1000	41.1	0.46	17.7	0.42	27.0	0.44	36.0	0.46
1998-2019	35511	80.6	0.56	38.2	0.53	58.9	0.55	78.8	0.57

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	818	69.5	0.53	26.9	0.49	42.0	0.50	57.5	0.52
1999	857	72.2	0.56	26.4	0.50	41.8	0.52	57.9	0.54
2000	853	71.0	0.60	25.9	0.54	41.1	0.56	56.0	0.58
2001	865	71.1	0.56	26.8	0.50	42.2	0.52	57.3	0.54
2002	1311	67.0	0.50	23.8	0.45	37.5	0.46	51.4	0.48
2003	1264	64.2	0.50	23.5	0.46	36.9	0.47	50.1	0.49
2004	1352	68.4	0.54	23.9	0.46	37.9	0.48	52.1	0.51
2005	1339	67.3	0.54	23.9	0.49	37.5	0.51	50.8	0.52
2006	1399	69.6	0.56	23.8	0.48	37.6	0.50	52.1	0.53
2007	1454	63.0	0.53	22.6	0.48	35.1	0.50	47.4	0.52
2008	1489	64.2	0.54	22.2	0.48	34.9	0.50	47.3	0.52
2009	1485	63.9	0.55	21.8	0.49	34.2	0.51	46.6	0.53
2010	1516	64.8	0.58	21.7	0.51	34.1	0.53	46.3	0.55
2011	1480	63.3	0.57	21.3	0.49	33.2	0.51	45.1	0.54
2012	1522	64.5	0.57	22.0	0.49	34.2	0.52	46.2	0.54
2013	1416	59.4	0.56	20.2	0.49	31.4	0.51	42.3	0.53
2014	1460	60.6	0.58	20.0	0.49	31.2	0.52	42.3	0.55
2015	1496	61.5	0.61	20.5	0.53	32.0	0.56	43.0	0.58
2016	1360	55.4	0.57	18.3	0.49	28.6	0.52	38.8	0.54
2017	1407	57.1	0.61	18.2	0.50	28.6	0.53	39.3	0.57
2018	671	27.0	0.37	10.0	0.33	15.1	0.34	19.9	0.36
2019	653	26.3	0.43	9.5	0.37	14.4	0.39	19.1	0.41
1998-2019	27467	60.0	0.55	20.7	0.48	32.3	0.50	43.8	0.52

Table 12

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

Age at death Years	Cases			Males			Females		
	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4	4	0.0	0.0	2	0.0	0.0	2	0.0	0.0
5-9	1	0.0	0.0	1	0.0	0.0			0.0
10-14	3	0.0	0.0	3	0.0	0.0			0.0
15-19	6	0.0	0.0	4	0.0	0.0	2	0.0	0.0
20-24	12	0.0	0.1	6	0.0	0.1	6	0.0	0.1
25-29	30	0.1	0.1	15	0.1	0.1	15	0.1	0.1
30-34	66	0.2	0.3	32	0.1	0.3	34	0.2	0.3
35-39	130	0.3	0.6	75	0.3	0.6	55	0.3	0.7
40-44	323	0.8	1.4	191	0.8	1.4	132	0.8	1.4
45-49	767	1.9	3.3	454	1.9	3.3	313	1.8	3.2
50-54	1467	3.6	6.8	942	4.0	7.3	525	3.0	6.2
55-59	2412	5.9	12.7	1589	6.7	14.0	823	4.7	11.0
60-64	3488	8.5	21.2	2331	9.8	23.8	1157	6.6	17.6
65-69	5052	12.3	33.5	3317	14.0	37.8	1735	10.0	27.6
70-74	6701	16.3	49.8	4186	17.7	55.5	2515	14.4	42.0
75-79	7200	17.5	67.3	4294	18.1	73.6	2906	16.7	58.7
80-84	6431	15.6	82.9	3459	14.6	88.2	2972	17.1	75.8
85+	7020	17.1	100.0	2803	11.8	100.0	4217	24.2	100.0
All ages	41113	100.0		23704	100.0		17409	100.0	

Table 13

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

Age at death Years	Males		Males		Females		Females	
	n	n	Age- spec. mortal.	MI-index	Age- spec. mortal.	MI-index	Prop.all cancers %	Prop.all cancers %
0- 4	2	2	0.1	0.20	0.1	0.20	10.5	12.5
5- 9	1		0.1	0.14			4.0	
10-14	3		0.2	3.00			11.1	
15-19	4	2	0.3	0.24	0.1	0.05	8.5	8.0
20-24	6	6	0.3	0.13	0.3	0.13	9.0	15.4
25-29	15	15	0.7	0.22	0.7	0.19	17.6	16.1
30-34	32	34	1.5	0.21	1.6	0.24	25.0	21.3
35-39	75	55	3.5	0.29	2.6	0.24	30.9	15.1
40-44	191	132	8.2	0.34	5.8	0.28	33.3	16.5
45-49	454	313	18.1	0.36	12.9	0.34	33.8	19.8
50-54	942	525	40.2	0.40	22.7	0.35	37.5	21.4
55-59	1589	823	81.7	0.46	41.2	0.41	38.6	23.3
60-64	2331	1157	142.9	0.49	65.9	0.45	39.1	25.1
65-69	3317	1735	218.1	0.53	103.0	0.49	38.6	26.8
70-74	4186	2515	298.7	0.57	156.6	0.54	37.8	30.8
75-79	4294	2906	387.8	0.62	211.0	0.58	37.6	32.3
80-84	3459	2972	526.9	0.71	305.3	0.64	36.7	35.0
85+	2803	4217	657.3	0.84	436.9	0.74	34.1	38.3
All ages	23704	17409					37.1	30.6
Mortality								
Raw			78.7	0.57	56.0	0.55		
WS			35.3	0.53	19.0	0.48		
ES			54.5	0.55	29.5	0.50		
BRD-S			72.9	0.57	39.9	0.52		
PYLL-70								
per 100,000			311.7		181.0			
ES			266.7		150.5			
AYLL-70			9.2		9.9			

Table 14a

Further malignancies in deaths in period 1998–2019

MALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C00 Lip	20	0.2	13	65.0			7	35.0
C03–C06 Oral cavity	207	2.0	155	74.9	15	7.2	37	17.9
C09–C10 Oropharynx	213	2.0	137	64.3	30	14.1	46	21.6
C12–C13 Hypopharynx	130	1.2	79	60.8	17	13.1	34	26.2
C15 Oesophagus	102	1.0	44	43.1	42	41.2	16	15.7
C16 Stomach	264	2.5	171	64.8	73	27.7	20	7.6
C17 Small intestine	42	0.4	21	50.0	15	35.7	6	14.3
C18 Colon	974	9.3	490	50.3	307	31.5	177	18.2
C19–C20 Rectum	452	4.3	317	70.1	114	25.2	21	4.6
C22 Liver	87	0.8	36	41.4	27	31.0	24	27.6
C23–C24 Bile	41	0.4	19	46.3	8	19.5	14	34.1
C25 Pancreas	104	1.0	35	33.7	33	31.7	36	34.6
C30–C31 Sinuses	27	0.3	23	85.2	1	3.7	3	11.1
C32 Larynx	230	2.2	174	75.7	18	7.8	38	16.5
C33–C34 Lung	1178	11.3	285	24.2	219	18.6	674	57.2
C38,C45 Mesothelioma	45	0.4	3	6.7	6	13.3	36	80.0
C43 Malign. melanoma	399	3.8	289	72.4	14	3.5	96	24.1
C44 Skin others	805	7.7	484	60.1	48	6.0	273	33.9
C46,C49 Soft tissue	56	0.5	25	44.6	4	7.1	27	48.2
C50 Breast	36	0.3	20	55.6			16	44.4
C60 Penis	26	0.2	16	61.5			10	38.5
C61 Prostate	2702	25.9	1885	69.8	179	6.6	638	23.6
C62 Testis	97	0.9	88	90.7	2	2.1	7	7.2
C64 Kidney	471	4.5	264	56.1	85	18.0	122	25.9
C65 Renal pelvis	51	0.5	19	37.3	2	3.9	30	58.8
C66 Ureter	28	0.3	13	46.4	2	7.1	13	46.4
C67 Bladder	540	5.2	276	51.1	53	9.8	211	39.1
C70–C72 CNS cancer	80	0.8	16	20.0	7	8.8	57	71.3
C73 Thyroid	66	0.6	47	71.2	3	4.5	16	24.2
C76–C79 CUP	145	1.4	57	39.3	28	19.3	60	41.4
C81 Hodgkin lymphoma	50	0.5	43	86.0	2	4.0	5	10.0
C82–C85 NHL	424	4.1	227	53.5	66	15.6	131	30.9
C90 Mult. myeloma	96	0.9	42	43.8	9	9.4	45	46.9
C91–C96 Leukaemia	132	1.3	39	29.5	12	9.1	81	61.4
Others, specified	128	1.2	72	56.3	16	12.5	40	31.3
All further malignancies	10448	100.0	5924	56.7	1457	13.9	3067	29.4

Further malignancies with number of cases 1 to 18 are pooled in category “Others, specified”.

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

Table 14b

Further malignancies in deaths in period 1998-2019
FEMALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C03-C06 Oral cavity	63	0.9	49	77.8	4	6.3	10	15.9
C09-C10 Oropharynx	59	0.8	36	61.0	8	13.6	15	25.4
C12-C13 Hypopharynx	18	0.3	9	50.0	8	44.4	1	5.6
C16 Stomach	170	2.4	101	59.4	46	27.1	23	13.5
C17 Small intestine	23	0.3	12	52.2	10	43.5	1	4.3
C18 Colon	642	9.1	310	48.3	183	28.5	149	23.2
C19-C20 Rectum	227	3.2	155	68.3	58	25.6	14	6.2
C21 Anus/canal	31	0.4	24	77.4	6	19.4	1	3.2
C22 Liver	22	0.3	5	22.7	8	36.4	9	40.9
C23-C24 Bile	39	0.6	25	64.1	7	17.9	7	17.9
C25 Pancreas	82	1.2	28	34.1	25	30.5	29	35.4
C32 Larynx	27	0.4	17	63.0	3	11.1	7	25.9
C33-C34 Lung	469	6.6	106	22.6	64	13.6	299	63.8
C43 Malign. melanoma	225	3.2	176	78.2	8	3.6	41	18.2
C44 Skin others	332	4.7	232	69.9	16	4.8	84	25.3
C46,C49 Soft tissue	27	0.4	15	55.6	3	11.1	9	33.3
C48 Peritoneal	25	0.4	6	24.0	11	44.0	8	32.0
C50 Breast	2210	31.2	1667	75.4	154	7.0	389	17.6
C51 Vulva	63	0.9	40	63.5	2	3.2	21	33.3
C52 Vagina	22	0.3	10	45.5	3	13.6	9	40.9
C53 Cervix uteri	224	3.2	178	79.5	10	4.5	36	16.1
C54 Corpus uteri	462	6.5	349	75.5	24	5.2	89	19.3
C55,C57 Fem. genitals un	34	0.5	24	70.6	5	14.7	5	14.7
C56 Ovary	403	5.7	173	42.9	74	18.4	156	38.7
C64 Kidney	196	2.8	118	60.2	34	17.3	44	22.4
C65 Renal pelvis	18	0.3	6	33.3	1	5.6	11	61.1
C66 Ureter	19	0.3	6	31.6	1	5.3	12	63.2
C67 Bladder	174	2.5	92	52.9	9	5.2	73	42.0
C70-C72 CNS cancer	43	0.6	13	30.2	5	11.6	25	58.1
C73 Thyroid	106	1.5	79	74.5	4	3.8	23	21.7
C76-C79 CUP	95	1.3	36	37.9	27	28.4	32	33.7
C81 Hodgkin lymphoma	29	0.4	26	89.7	1	3.4	2	6.9
C82-C85 NHL	252	3.6	151	59.9	34	13.5	67	26.6
C90 Mult. myeloma	67	0.9	24	35.8	11	16.4	32	47.8
C91-C96 Leukaemia	75	1.1	16	21.3	10	13.3	49	65.3
Others, specified	117	1.7	67	57.3	12	10.3	38	32.5
All further malignancies	7090	100.0	4381	61.8	889	12.5	1820	25.7

Further malignancies with number of cases 1 to 17 are pooled in category "Others, specified".

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

Table 15

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

Age at death Years	Males		Males		Females		Females	
	n	n	Age- spec. mortal.	MI-index	Age- spec. mortal.	MI-index	Prop.all cancers %	Prop.all cancers %
0- 4	2	2	0.1	0.20	0.1	0.20	10.5	13.3
5- 9	1		0.1	0.14			4.2	
10-14	3		0.2	3.00			11.1	
15-19	4	2	0.3	0.24	0.1	0.05	8.9	8.7
20-24	5	6	0.3	0.12	0.3	0.13	8.3	16.2
25-29	15	14	0.7	0.23	0.7	0.19	19.5	16.3
30-34	32	29	1.5	0.21	1.4	0.22	25.8	20.9
35-39	72	49	3.4	0.31	2.3	0.23	31.7	14.8
40-44	182	119	7.8	0.34	5.3	0.29	34.5	16.9
45-49	420	277	16.7	0.36	11.4	0.33	34.3	20.5
50-54	845	469	36.1	0.40	20.3	0.35	38.1	22.5
55-59	1406	707	72.3	0.46	35.4	0.41	39.1	23.8
60-64	2001	962	122.7	0.49	54.8	0.45	40.1	25.5
65-69	2698	1387	177.4	0.54	82.3	0.49	39.2	27.0
70-74	3297	1983	235.3	0.58	123.5	0.54	38.8	31.3
75-79	3183	2254	287.5	0.64	163.7	0.58	38.0	32.6
80-84	2490	2339	379.3	0.73	240.3	0.63	36.8	35.6
85+	2026	3365	475.1	0.87	348.6	0.74	34.1	38.6
All ages	18682	13964					37.7	30.9
Mortality								
Raw			62.0	0.57	44.9	0.55		
WS			28.7	0.52	15.5	0.47		
ES			43.6	0.54	24.0	0.49		
BRD-S			57.3	0.57	32.1	0.52		
PYLL-70								
per 100,000			277.2		156.7			
ES			237.5		130.7			
AYLL-70			9.6		10.2			

* See corresponding tables with multiple malignancies.

Table 16

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

Age at death Years	Males		Males		Females		Females	
	n	n	Age- spec. mortal.	MI-index	Age- spec. mortal.	MI-index	Prop.all cancers %	Prop.all cancers %
0- 4	2	2	0.1	0.20	0.1	0.20	10.5	13.3
5- 9	1		0.1	0.14			4.2	
10-14	3		0.2	3.00			11.1	
15-19	4	2	0.3	0.24	0.1	0.05	8.9	9.1
20-24	5	6	0.3	0.12	0.3	0.14	8.3	16.7
25-29	15	14	0.7	0.25	0.7	0.19	19.5	16.7
30-34	32	29	1.5	0.21	1.4	0.22	26.0	21.2
35-39	71	47	3.3	0.31	2.2	0.23	31.6	14.4
40-44	180	115	7.7	0.35	5.1	0.30	34.3	16.5
45-49	418	273	16.7	0.37	11.2	0.34	34.5	20.5
50-54	823	459	35.1	0.41	19.9	0.37	37.6	22.5
55-59	1354	674	69.6	0.47	33.7	0.42	38.2	23.1
60-64	1911	910	117.2	0.50	51.8	0.46	39.0	24.6
65-69	2528	1289	166.2	0.55	76.5	0.49	37.7	25.7
70-74	3002	1860	214.2	0.58	115.8	0.54	36.6	30.3
75-79	2856	2103	258.0	0.62	152.7	0.57	35.8	31.5
80-84	2141	2144	326.1	0.68	220.3	0.61	33.8	34.0
85+	1712	3106	401.5	0.76	321.8	0.70	31.5	37.3
All ages	17058	13033					35.8	29.7
Mortality								
Raw			56.6	0.56	41.9	0.54		
WS			26.6	0.52	14.6	0.47		
ES			40.2	0.54	22.5	0.49		
BRD-S			52.3	0.56	30.0	0.51		
PYLL-70								
per 100,000			268.6		151.0			
ES			230.3		126.1			
AYLL-70			9.7		10.4			

* See corresponding tables with multiple malignancies.

ICD-10 C15-C26: Malignant neoplasms of digestive organs
 Age distribution and age-specific mortality 2007 - 2019 (Males: 23704, Females: 17409)

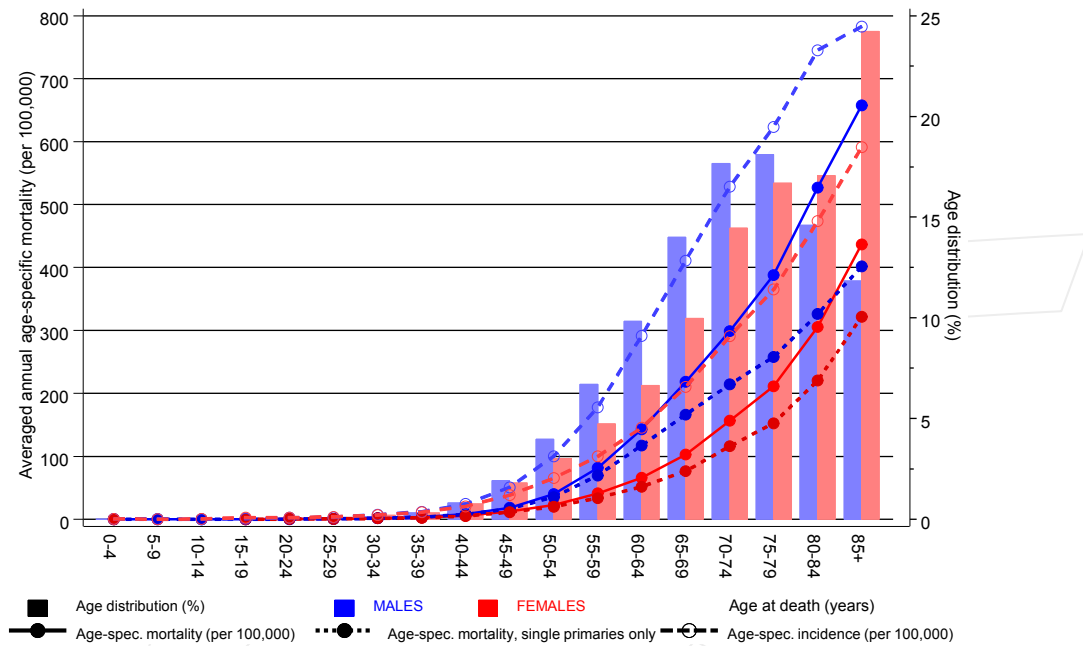
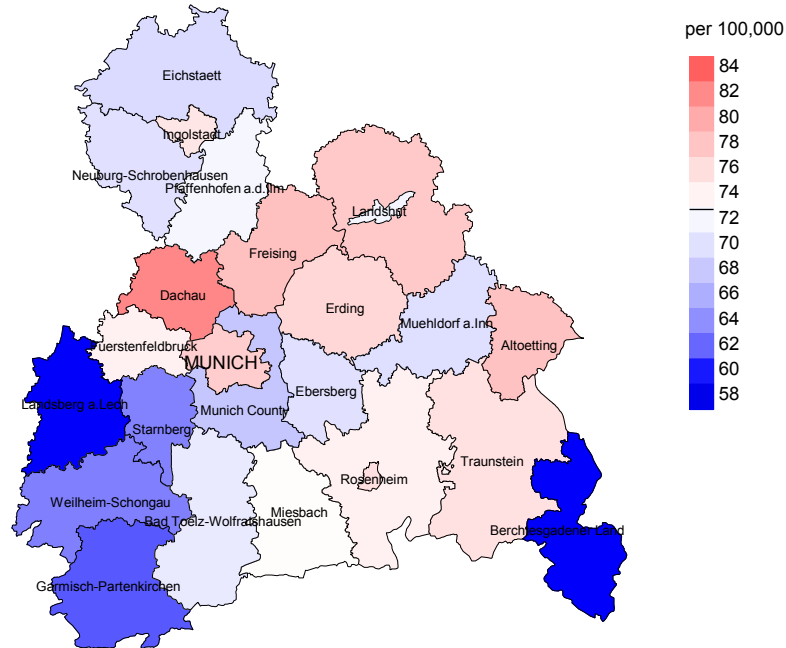


Figure 17. Distribution of age at death (bars; males: mean=70.0 yrs, median=71.0 yrs; females: mean=73.6 yrs, median=75.3 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

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



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

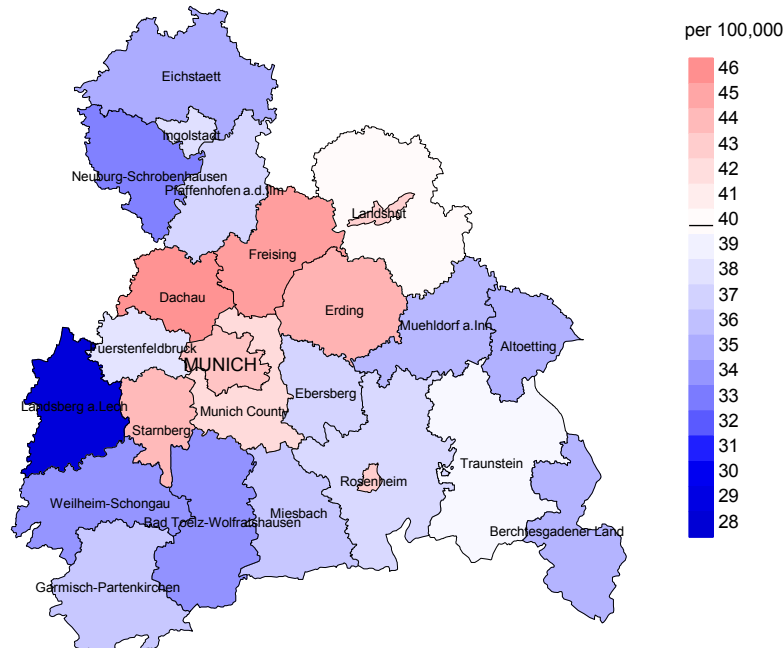
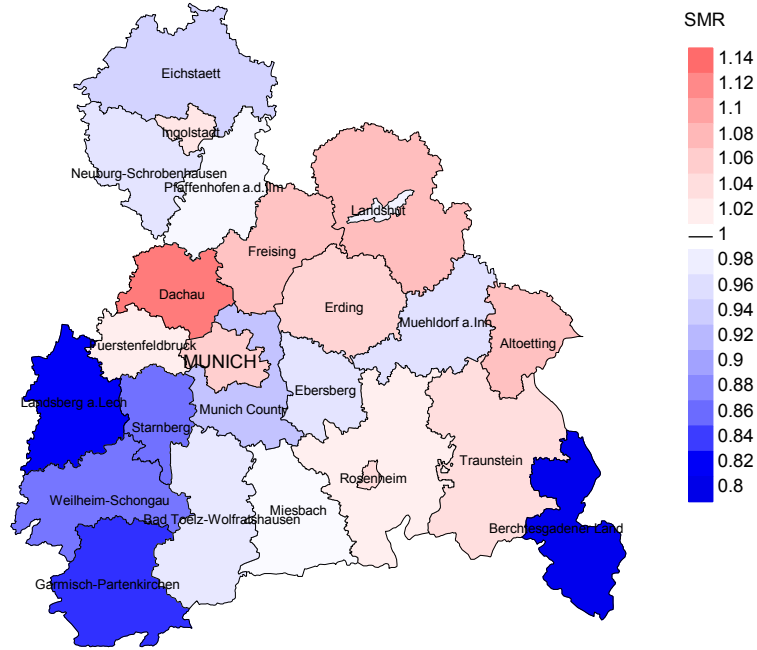


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2019. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 72.9/100,000 WS N=23,704, females 39.9/100,000 WS N=17,409).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,462 female residents (averaged) in the period from 2007 to 2019 a total of 437 women died from GI cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 37.2/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 32.6 and 42.1/100,000.

Standardized mortality ratio (SMR) 2007 - 2019: Males



Standardized mortality ratio (SMR) 2007 - 2019: Females

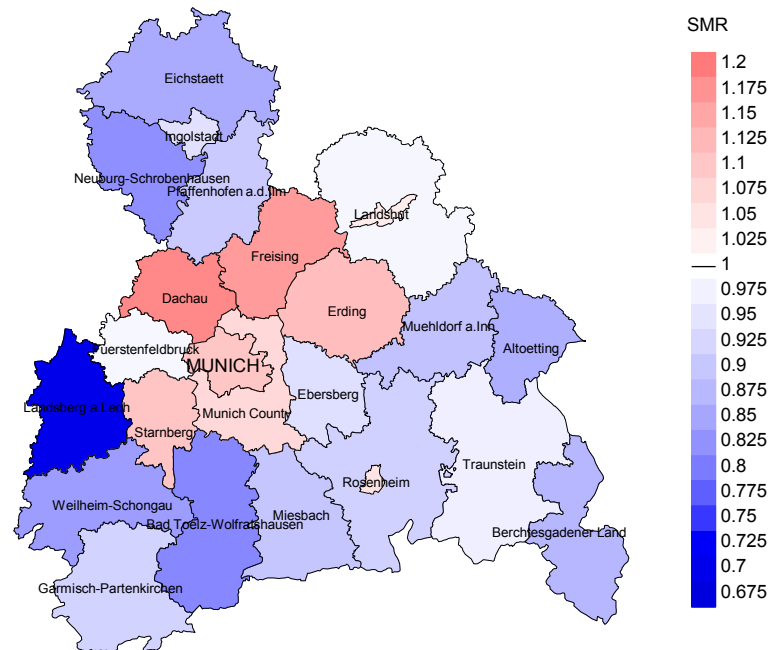


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=23,704, females N=17,409).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2019 a total of 437 women died from GI cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.94. Though, the value of this parameter may vary with an underlying probability of 99% between 0.83 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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