

Munich Cancer Registry



- ▶ Survival
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- ▶ *Deutsch*

ICD-10 D09.0, D41.4: Bladder tumor

Incidence and Mortality

Year of diagnosis	1998-2019
Patients	11,327
Diseases	11,337
Creation date	01/26/2021
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/bD0941E-ICD-10-D09.0-D41.4-Bladder-tumor-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
D09.0	Carcinoma in situ: Bladder
D41.4	Neoplasm of uncertain or unknown behaviour of urinary organs: Bladder

INCIDENCE

Table 1

Cases by year of diagnosis, proportions of further malignancies, deaths, and active follow-up (ALL PATIENTS)

Year of diagnosis	All cases n	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	285	9.8	23.9	69.8	96.1
1999	286	12.1	23.9	66.1	97.6
2000	284	13.0	23.6	68.3	96.5
2001	267	14.0	23.3	61.4	96.3
2002	447	15.0	23.1	61.3	98.2 #
2003	446	15.0	22.8	60.5	94.8
2004	557	15.5	22.5	59.8	95.2
2005	552	16.7	22.0	55.8	94.7
2006	514	17.0	21.5	51.4	94.0
2007	683	17.5	20.8	52.1	93.7 #
2008	634	18.1	20.0	48.3	97.9
2009	658	18.6	19.4	46.8	97.7
2010	700	19.2	18.5	41.4	96.0
2011	705	19.7	17.5	38.9	96.9
2012	706	20.4	16.8	37.5	97.0
2013	708	20.9	16.0	34.0	95.1
2014	669	21.3	15.4	30.6	95.8
2015	537	21.6	14.1	20.7	90.1
2016	500	21.8	13.1	17.8	97.6
2017	464	22.0	11.7	13.8	99.8
2018	454	22.3	9.2	9.7	98.5
2019	281	22.4	6.9	6.8	65.8 ##
1998-2019	11337	22.4	23.9	42.0	95.3

11,337 cases diagnosed 1998-2019 are related to a total of 11,327 patients. Currently, in 4,817 (42.5 %) of these 11,327 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 3,358 / 1,032 / 427 (29.6 % / 9.1 % / 3.8 %) 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 464 cases has been diagnosed, of which 22.0 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 11.7 % 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 by year of diagnosis, proportions of further malignancies, deaths, and active follow-up (MALES)

Year of diagnosis	Males n	Males %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	212	74.4	9.4	25.0	68.9	95.3
1999	203	71.0	11.3	24.9	66.0	97.5
2000	212	74.6	12.4	24.6	66.5	96.2
2001	199	74.5	13.8	24.2	65.3	97.5
2002	329	73.6	15.0	23.9	61.7	98.8 #
2003	335	75.1	15.2	23.5	61.8	94.6
2004	399	71.6	15.9	23.2	60.7	95.2
2005	419	75.9	17.1	22.7	57.0	94.5
2006	401	78.0	17.2	22.1	53.9	93.8
2007	538	78.8	17.3	21.3	53.5	94.4 #
2008	476	75.1	18.3	20.5	49.4	98.3
2009	494	75.1	18.9	19.7	48.4	98.4
2010	536	76.6	19.4	18.9	43.8	96.3
2011	537	76.2	19.8	17.8	39.5	97.4
2012	541	76.6	20.7	17.0	39.7	97.4
2013	560	79.1	21.1	16.1	34.6	95.4
2014	539	80.6	21.4	15.8	30.4	96.3
2015	423	78.8	21.7	14.4	22.0	91.5
2016	392	78.4	21.8	13.1	18.1	97.7
2017	372	80.2	22.2	11.8	15.3	99.7
2018	361	79.5	22.5	8.7	9.7	98.3
2019	225	80.1	22.5	6.8	7.1	66.7 ##
1998-2019	8703	76.8	22.5	25.0	42.7	95.6

8,703 cases diagnosed 1998-2019 are related to a total of 8,696 patients. Currently, in 3,814 (43.9 %) of these 8,696 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 2,649 / 814 / 351 (30.5 % / 9.4 % / 4.0 %) 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 372 cases has been diagnosed, of which 22.2 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 11.8 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1b

Cases by year of diagnosis, proportions of further malignancies, deaths, and active follow-up (FEMALES)

Year of diagnosis	Females n	Females %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	73	25.6	11.0	20.5	72.6	98.6
1999	83	29.0	14.1	20.5	66.3	97.6
2000	72	25.4	14.5	20.3	73.6	97.2
2001	68	25.5	14.5	20.4	50.0	92.6
2002	118	26.4	15.0	20.2	60.2	96.6 #
2003	111	24.9	14.5	20.4	56.8	95.5
2004	158	28.4	14.3	20.0	57.6	94.9
2005	133	24.1	15.6	19.4	51.9	95.5
2006	113	22.0	16.5	19.4	42.5	94.7
2007	145	21.2	17.9	19.1	46.9	91.0 #
2008	158	24.9	17.6	18.4	44.9	96.8
2009	164	24.9	17.8	18.3	42.1	95.7
2010	164	23.4	18.5	17.1	33.5	95.1
2011	168	23.8	19.3	16.6	36.9	95.2
2012	165	23.4	19.7	16.0	30.3	95.8
2013	148	20.9	20.2	15.8	31.8	93.9
2014	130	19.4	20.7	13.8	31.5	93.8
2015	114	21.2	21.1	12.7	15.8	85.1
2016	108	21.6	21.5	13.1	16.7	97.2
2017	92	19.8	21.5	11.6	7.6	100.0
2018	93	20.5	21.8	11.3	9.7	98.9
2019	56	19.9	22.1	7.4	5.4	62.5 ##
1998-2019	2634	23.2	22.1	20.5	40.1	94.5

2,634 cases diagnosed 1998-2019 are related to a total of 2,631 patients. Currently, in 1,003 (38.1 %) of these 2,631 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 709 / 218 / 76 (26.9 % / 8.3 % / 2.9 %) 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 2017, a subgroup of 92 cases has been diagnosed, of which 21.5 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 11.6 % 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
(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	212	73	19.1	6.2	11.7	2.8	17.5	4.1	23.2	5.4
1999	203	83	18.1	7.0	10.8	3.0	16.2	4.6	21.9	5.9
2000	212	72	18.6	6.0	10.8	2.5	16.5	3.9	22.0	5.2
2001	199	68	17.2	5.6	9.7	2.8	15.1	4.1	20.7	5.2
2002	329	118	17.7	6.0	9.9	2.7	14.9	4.1	19.6	5.2
2003	335	111	17.9	5.6	10.0	2.7	14.8	3.8	18.9	4.7
2004	399	158	21.2	8.0	11.4	3.5	17.2	5.1	22.6	6.5
2005	419	133	22.1	6.7	11.5	3.0	17.6	4.4	23.6	5.5
2006	401	113	20.9	5.6	11.0	2.2	16.4	3.4	21.3	4.5
2007	538	145	24.3	6.3	12.4	2.8	18.7	4.1	24.6	5.1
2008	476	158	21.4	6.8	10.6	3.0	15.9	4.4	21.0	5.5
2009	494	164	22.1	7.1	11.2	3.0	16.6	4.4	21.5	5.8
2010	536	164	23.8	7.0	11.3	3.0	17.2	4.4	23.0	5.5
2011	537	168	24.0	7.2	10.9	3.1	16.7	4.6	22.4	5.7
2012	541	165	23.8	7.0	11.0	2.9	16.8	4.3	22.1	5.4
2013	560	148	24.3	6.2	11.2	2.5	17.0	3.7	22.5	4.7
2014	539	130	23.1	5.4	10.5	2.1	15.9	3.2	20.9	4.2
2015	423	114	17.8	4.7	7.8	2.0	11.9	2.9	16.1	3.7
2016	392	108	16.3	4.4	7.5	1.8	11.3	2.7	14.7	3.4
2017	372	92	15.4	3.7	6.8	1.5	10.3	2.3	13.7	2.9
2018	361	93	14.8	3.7	6.2	1.7	9.6	2.4	12.9	2.9
2019	225	56	9.2	2.3	4.1	0.8	6.2	1.3	8.2	1.6
1998-2019	8703	2634	19.7	5.8	9.7	2.5	14.6	3.6	19.2	4.6

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)

Year of diagnosis	Cases n	Std.		Min.	Max.	Median				
		Mean	dev.			10%	25%	50%	75%	90%
1998	285	68.0	13.0	22.9	98.1	50.7	58.9	69.6	77.7	84.0
1999	286	68.8	12.5	18.9	96.7	54.6	60.2	69.9	78.0	84.1
2000	284	69.6	11.2	34.0	94.0	54.0	62.0	71.7	77.5	84.1
2001	267	69.6	10.7	28.4	90.7	55.0	62.3	71.1	77.5	82.5
2002	447	68.9	11.6	28.3	93.8	54.1	61.3	70.6	77.3	82.6
2003	446	67.9	11.8	28.8	92.0	52.1	61.6	68.6	75.8	82.2
2004	557	69.3	11.8	23.3	93.9	53.7	62.3	69.8	77.7	83.6
2005	552	69.8	11.9	18.4	95.3	56.3	62.7	71.0	78.0	84.0
2006	514	70.0	10.9	24.7	97.4	57.1	63.4	69.7	78.0	83.6
2007	683	69.5	11.9	21.7	96.5	54.2	63.0	70.3	78.4	83.4
2008	634	70.0	11.1	23.8	94.9	54.4	64.1	70.4	78.3	83.4
2009	658	69.7	11.9	28.5	95.9	53.8	62.8	71.1	78.2	83.3
2010	700	70.5	11.2	22.4	96.9	55.2	64.0	71.8	78.5	83.7
2011	705	71.4	10.7	28.4	97.8	57.0	65.5	72.0	78.7	84.8
2012	706	71.0	11.6	32.6	97.7	54.7	64.5	72.3	79.4	85.3
2013	708	71.3	11.9	18.3	99.0	55.2	64.4	72.7	80.1	85.2
2014	669	71.7	11.1	20.9	101	56.7	66.0	72.8	79.6	84.9
2015	537	71.4	11.0	33.3	96.6	55.3	65.2	73.3	78.5	84.0
2016	500	71.3	11.8	20.5	95.5	55.1	64.8	73.0	79.3	85.2
2017	464	71.6	11.4	16.4	96.5	55.9	65.4	73.4	79.9	84.3
2018	454	72.0	11.5	35.5	103	56.0	64.0	74.4	80.3	85.0
2019	281	72.3	11.5	24.8	94.5	58.8	64.3	74.3	79.5	86.8
1998-2019	11337	70.4	11.6	16.4	103	55.0	63.4	71.7	78.6	84.1

Table 3a

Age distribution parameters by year of diagnosis (MALES)

Year of diagnosis	Cases n	Std.		Min.	Max.	Median				
		Mean	dev.			10%	25%	50%	75%	90%
1998	212	66.9	12.1	28.9	91.4	51.3	58.2	68.5	76.3	82.1
1999	203	68.0	12.4	18.9	92.9	54.5	60.5	68.9	77.0	83.4
2000	212	68.8	10.9	40.8	94.0	53.3	61.5	70.7	76.4	83.8
2001	199	69.9	10.6	28.4	90.7	55.7	62.3	71.1	77.6	83.5
2002	329	68.5	11.3	28.3	93.0	55.2	61.3	69.7	76.7	81.9
2003	335	67.8	11.3	30.2	92.0	52.8	60.9	68.4	75.5	81.8
2004	399	68.7	11.9	23.3	93.9	52.7	61.5	69.4	77.0	83.4
2005	419	69.8	11.6	18.4	95.3	56.4	62.8	71.5	77.5	83.2
2006	401	69.2	11.1	24.7	94.9	55.6	62.8	69.0	77.5	83.5
2007	538	69.4	11.6	21.7	93.9	53.4	63.0	70.3	78.0	83.0
2008	476	69.8	11.0	29.6	94.2	54.3	64.4	70.3	78.0	83.0
2009	494	69.2	11.9	28.5	95.2	53.8	62.3	70.5	78.0	83.1
2010	536	70.4	10.9	25.6	90.8	55.3	64.0	72.0	78.2	83.3
2011	537	71.7	10.6	28.4	93.7	56.5	66.7	72.5	79.0	84.7
2012	541	70.9	11.4	32.6	97.0	55.4	64.6	72.2	79.2	84.7
2013	560	71.2	11.8	18.3	99.0	55.3	64.5	72.8	80.0	84.9
2014	539	71.5	11.1	20.9	98.5	56.7	66.0	72.7	79.1	84.9
2015	423	71.6	11.0	33.3	96.6	55.8	65.7	73.7	78.6	84.3
2016	392	71.3	11.7	20.5	95.5	55.1	64.8	73.0	79.2	84.5
2017	372	71.8	11.5	16.4	96.5	55.4	65.8	73.4	79.9	84.4
2018	361	72.6	11.5	35.5	103	56.8	64.6	74.9	80.6	86.0
2019	225	71.7	11.8	24.8	93.2	57.9	63.3	74.2	79.4	85.9
1998-2019	8703	70.2	11.5	16.4	103	55.0	63.4	71.6	78.3	83.8

Table 3b

Age distribution parameters by year of diagnosis (FEMALES)

Year of diagnosis	Cases n	Std.		Median						
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	73	71.1	14.8	22.9	98.1	46.9	65.0	74.4	81.5	86.0
1999	83	70.8	12.4	43.4	96.7	55.9	59.8	71.8	79.7	85.1
2000	72	71.9	11.8	34.0	91.8	55.4	65.3	74.3	79.7	85.6
2001	68	68.7	10.8	45.2	87.5	52.8	61.8	71.5	76.2	81.8
2002	118	70.2	12.4	38.7	93.8	52.5	61.4	72.1	79.4	85.2
2003	111	68.3	13.2	28.8	90.4	49.6	61.8	69.8	78.4	82.9
2004	158	70.6	11.7	36.9	92.6	55.5	63.6	70.3	79.9	85.0
2005	133	69.6	12.8	32.0	94.6	54.4	61.0	69.4	79.6	85.1
2006	113	72.9	9.9	47.0	97.4	59.7	65.4	72.8	80.9	83.9
2007	145	69.8	13.0	22.2	96.5	54.5	63.5	70.5	79.3	84.3
2008	158	70.5	11.7	23.8	94.9	54.4	62.1	71.2	80.2	84.9
2009	164	71.2	11.7	36.0	95.9	54.8	64.6	72.1	78.6	84.9
2010	164	70.9	12.1	22.4	96.9	55.0	64.0	71.6	79.5	85.1
2011	168	70.3	11.1	30.4	97.8	58.0	63.0	70.6	77.6	85.0
2012	165	71.3	12.1	40.2	97.7	53.1	64.1	72.4	79.8	86.9
2013	148	71.6	12.3	40.6	95.2	55.0	63.2	72.4	81.5	86.2
2014	130	72.6	10.9	45.2	101	58.1	65.3	73.6	80.2	85.2
2015	114	70.6	11.1	44.8	95.4	54.9	63.0	71.9	78.3	83.6
2016	108	71.2	12.2	29.7	93.5	55.4	63.6	72.9	79.8	86.1
2017	92	70.9	11.4	27.3	88.3	57.4	63.7	73.5	80.0	82.5
2018	93	69.9	11.1	37.4	93.8	55.1	62.5	71.6	78.1	84.0
2019	56	74.7	10.2	50.3	94.5	60.0	68.2	75.3	81.6	89.2
1998-2019	2634	70.8	11.9	22.2	101	55.1	63.3	71.9	79.6	85.0

Table 4

Age distribution by 5-year age group and sex for period 2007-2019

Age at diagnosis Years	Cases			Males			Females		
	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4									
5-9									
10-14									
15-19	2	0.0	0.0	2	0.0	0.0			0.0
20-24	9	0.1	0.1	5	0.1	0.1	4	0.2	0.2
25-29	12	0.2	0.3	9	0.2	0.3	3	0.2	0.4
30-34	25	0.3	0.6	22	0.4	0.6	3	0.2	0.6
35-39	43	0.6	1.2	37	0.6	1.3	6	0.4	0.9
40-44	103	1.3	2.5	81	1.4	2.6	22	1.3	2.2
45-49	189	2.5	5.0	149	2.5	5.1	40	2.3	4.6
50-54	349	4.5	9.5	266	4.4	9.5	83	4.9	9.4
55-59	555	7.2	16.7	422	7.0	16.6	133	7.8	17.2
60-64	753	9.8	26.5	570	9.5	26.1	183	10.7	28.0
65-69	1143	14.8	41.3	899	15.0	41.1	244	14.3	42.3
70-74	1484	19.3	60.6	1157	19.3	60.4	327	19.2	61.5
75-79	1344	17.5	78.1	1086	18.1	78.5	258	15.1	76.6
80-84	998	13.0	91.0	777	13.0	91.5	221	13.0	89.6
85+	690	9.0	100.0	512	8.5	100.0	178	10.4	100.0
All ages	7699	100.0		5994	100.0		1705	100.0	

Table 5

Age-specific incidence
for period 2007-2019

Age at diagnosis Years	Males n	Females n	Males Age- spec. incid.	Females Age- spec. incid.
0- 4				
5- 9				
10-14				
15-19	2		0.1	
20-24	5	4	0.3	0.2
25-29	9	3	0.4	0.1
30-34	22	3	1.0	0.1
35-39	37	6	1.7	0.3
40-44	81	22	3.5	1.0
45-49	149	40	5.9	1.6
50-54	266	83	11.4	3.6
55-59	422	133	21.7	6.7
60-64	570	183	35.0	10.4
65-69	899	244	59.1	14.5
70-74	1157	327	82.6	20.4
75-79	1085	258	98.0	18.7
80-84	777	220	118.4	22.6
85+	512	178	120.1	18.4
All ages	5993	1704		
Incidence				
Raw			19.9	5.5
WS			9.2	2.3
ES			13.9	3.4
BRD-S			18.4	4.3

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

ICD-10 D09.0, D41.4: Neoplasm of bladder (non-invasive only)

Age distribution and age-specific incidence 2007 - 2019 (Males: 5993, Females: 1704)

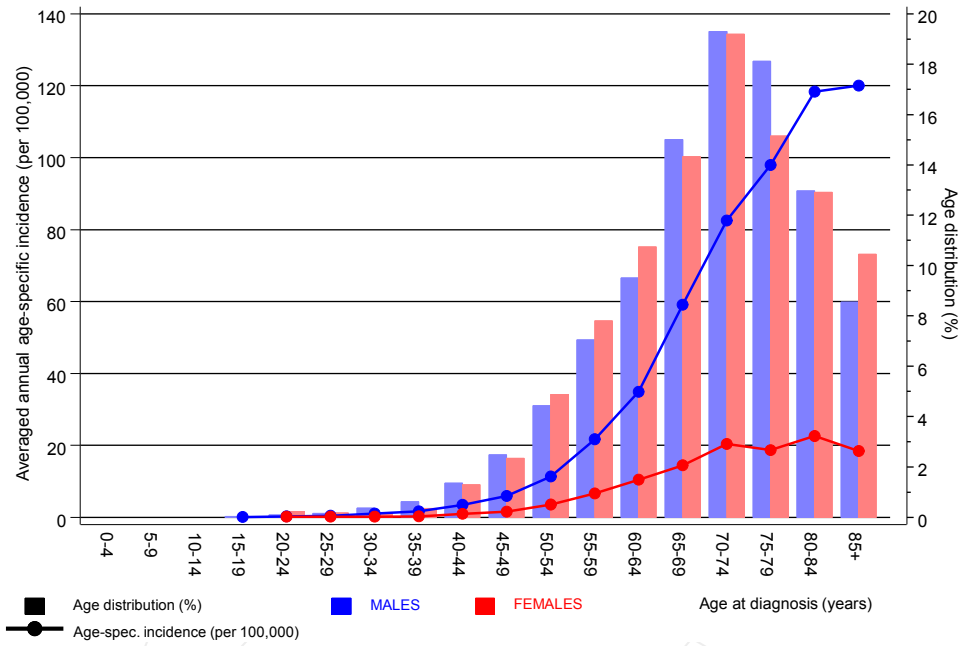


Figure 6. Age distribution (males: mean=70.9 yrs, median=72.4 yrs; females: mean=71.0 yrs, median=71.9 yrs) and age-specific incidence.

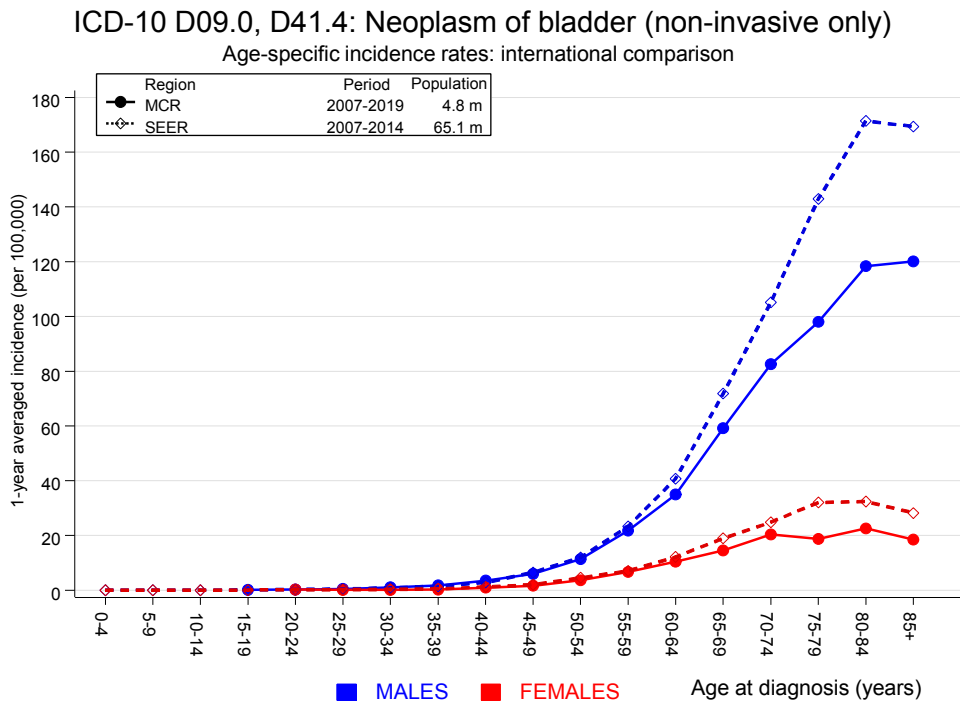


Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

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 %
C03-C06 Oral cavity	13	5.2	2.5	1.3	4.2 #	2.0	7.7
C09-C10 Oropharynx	11	6.2	1.8	0.9	3.2	1.2	9.1
C12-C13 Hypopharynx	6	3.4	1.8	0.7	3.9	0.7	
C15 Oesophagus	28	13.6	2.1	1.4	3.0 #	3.7	3.6
C16 Stomach	50	32.8	1.5	1.1	2.0 #	4.4	2.0
C17 Small intestine	11	4.4	2.5	1.2	4.5 #	1.7	9.1
C18 Colon	130	78.7	1.7	1.4	2.0 #	13.1	7.7
C19-C20 Rectum	50	39.1	1.3	0.9	1.7	2.8	
C21 Anus/canal	4	1.7	2.3	0.6	6.0	0.6	
C22 Liver	51	21.6	2.4	1.8	3.1 #	7.5	15.7
C23-C24 Bile	17	8.4	2.0	1.2	3.3 #	2.2	35.3
C25 Pancreas	61	31.1	2.0	1.5	2.5 #	7.6	19.7
C30-C31 Sinuses	4	1.3	3.0	0.8	7.7	0.7	
C32 Larynx	19	6.8	2.8	1.7	4.4 #	3.1	10.5
C33-C34 Lung	299	88.4	3.4	3.0	3.8 #	53.6	11.0
C38,C45 Mesothelioma	11	5.4	2.0	1.0	3.6 #	1.4	
C43 Malign. melanoma	57	32.6	1.7	1.3	2.3 #	6.2	
C46,C49 Soft tissue	6	4.5	1.3	0.5	2.9	0.4	
C50 Breast	6	2.1	2.9	1.1	6.3 #	1.0	
C60 Penis	7	2.0	3.5	1.4	7.2 #	1.3	28.6
C61 Prostate	757	213.4	3.5	3.3	3.8 #	138.4	5.3
C62 Testis	6	1.3	4.8	1.8	10.4 #	1.2	
C64 Kidney	79	25.2	3.1	2.5	3.9 #	13.7	13.9
C65 Renal pelvis	114	3.6	31.7	26.2	38.1 #	28.1	
C66 Ureter	84	2.1	39.5	31.5	48.9 #	20.8	
C67 Bladder	423	39.9	10.6	9.6	11.7 #	97.6	
C68 Urethra	31	0.7	42.5	28.8	60.3 #	7.7	
C68 Urinary org.	4	0.7	6.1	1.7	15.7 #	0.9	75.0
C70-C72 CNS cancer	18	9.2	2.0	1.2	3.1 #	2.3	11.1
C73 Thyroid	10	4.0	2.5	1.2	4.6 #	1.5	
C76-C79 CUP	21	13.8	1.5	0.9	2.3	1.8	
C81 Hodgkin lymphoma	4	1.6	2.5	0.7	6.5	0.6	25.0
C82-C85 NHL	64	33.7	1.9	1.5	2.4 #	7.7	9.4
C90 Mult. myeloma	14	10.6	1.3	0.7	2.2	0.9	28.6
C91-C96 Leukaemia	28	12.7	2.2	1.5	3.2 #	3.9	25.0
Others, specified	14	5.7	2.5	1.3	4.1 #	2.1	14.3
Not observed	0	4.6	0.0	0.0	0.8 #	-1.2	
All further malignancies	2512	772.0	3.3	3.1	3.4 #	443.1	6.1

Patients 8529
 Median age at next malignancy (years) 75.4
 Person-years 39271
 Mean observation time (years) 4.6
 Median observation time (years) 3.3

The occurrence of further specified malignancy is statistically significant.

Further observed malignancies with count 1 to 2 are pooled in category "Others, specified".

Table 7b

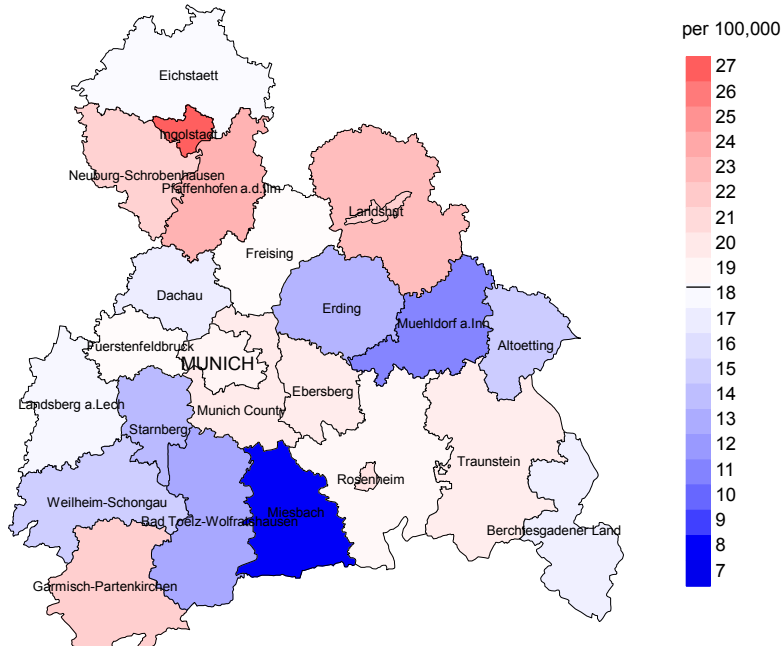
Standardized incidence ratio (SIR, with 95% confidence limits),
excess absolute risk (EAR) and DCO rate of further malignancies
for period 1998-2019

FEMALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C03-C06 Oral cavity	1	0.9	1.1	0.0	6.1	0.1	
C09-C10 Oropharynx	1	0.6	1.8	0.0	9.8	0.3	
C11 Nasopharynx	1	0.1	18.2	0.5	101.7	0.7	
C15 Oesophagus	3	1.1	2.8	0.6	8.2	1.5	
C16 Stomach	12	6.5	1.9	1.0	3.2	4.4	16.7
C17 Small intestine	4	0.8	4.8	1.3	12.2 #	2.5	
C18 Colon	23	18.1	1.3	0.8	1.9	3.9	
C19-C20 Rectum	10	7.0	1.4	0.7	2.6	2.3	
C21 Anus/canal	1	0.9	1.1	0.0	6.3	0.1	
C22 Liver	5	2.2	2.3	0.7	5.3	2.2	20.0
C23-C24 Bile	5	2.7	1.9	0.6	4.4	1.8	40.0
C25 Pancreas	21	8.6	2.4	1.5	3.7 #	9.8	33.3
C26 GI cancer	1	0.4	2.6	0.1	14.7	0.5	100.0
C30-C31 Sinuses	1	0.2	4.2	0.1	23.2	0.6	
C33-C34 Lung	64	12.1	5.3	4.1	6.7 #	41.0	4.7
C43 Malign. melanoma	13	5.8	2.2	1.2	3.8 #	5.7	
C48 Peritoneal	1	0.6	1.6	0.0	8.9	0.3	
C50 Breast	88	46.7	1.9	1.5	2.3 #	32.7	4.5
C51 Vulva	4	1.9	2.1	0.6	5.3	1.6	
C53 Cervix uteri	6	1.8	3.3	1.2	7.2 #	3.3	50.0
C54 Corpus uteri	16	8.8	1.8	1.0	2.9 #	5.7	6.3
C56 Ovary	8	6.6	1.2	0.5	2.4	1.1	
C64 Kidney	11	4.0	2.7	1.4	4.9 #	5.5	9.1
C65 Renal pelvis	35	0.6	61.8	43.0	85.9 #	27.2	
C66 Ureter	31	0.3	103.4	70.2	146.7 #	24.3	
C67 Bladder	105	3.8	27.9	22.8	33.8 #	80.0	
C68 Urethra	1	0.0	21.3	0.5	118.5	0.8	
C68 Urinary org.	1	0.1	11.8	0.3	65.7	0.7	100.0
C70-C72 CNS cancer	5	2.1	2.4	0.8	5.5	2.3	40.0
C73 Thyroid	2	2.1	1.0	0.1	3.5	-0.1	
C76-C79 CUP	5	3.5	1.4	0.5	3.3	1.2	
C82-C85 NHL	14	6.9	2.0	1.1	3.4 #	5.6	21.4
C90 Mult. myeloma	5	2.2	2.3	0.7	5.3	2.2	20.0
C91-C96 Leukaemia	3	2.6	1.1	0.2	3.3	0.3	33.3
Not observed	0	4.7	0.0	0.0	0.8 #	-3.7	
All further malignancies	507	167.4	3.0	2.8	3.3 #	268.5	6.5
Patients		2559					
Median age at next malignancy (years)		76.5					
Person-years		12647					
Mean observation time (years)		4.9					
Median observation time (years)		3.6					

The occurrence of further specified malignancy is statistically significant.

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



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

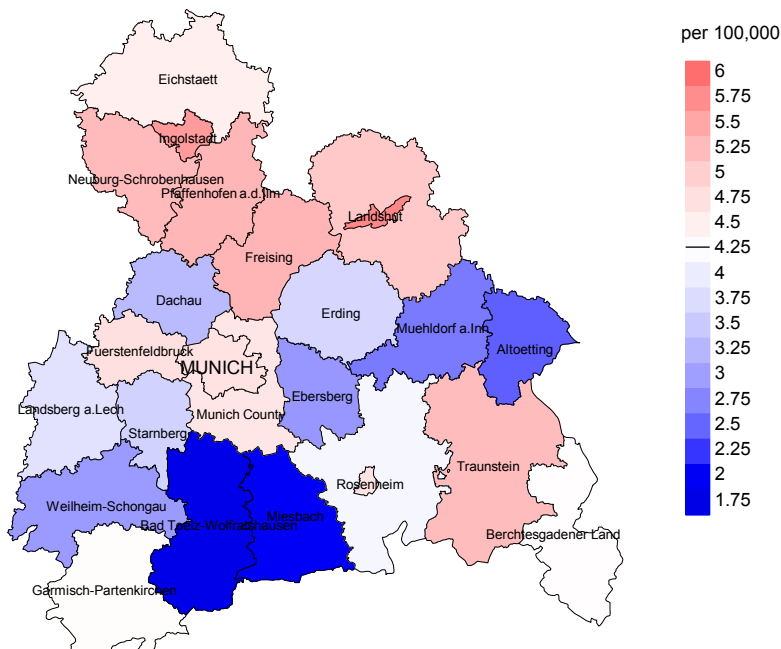
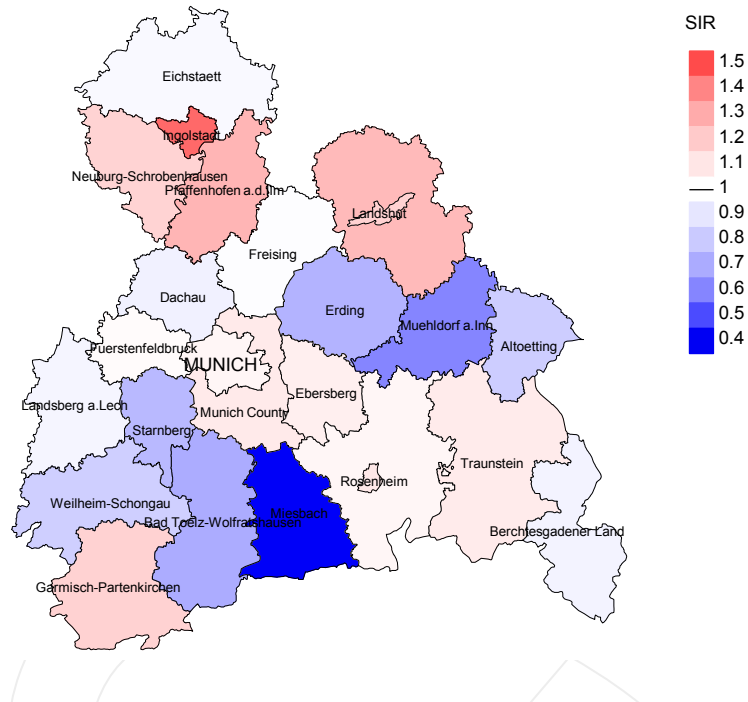


Figure 8a. Map of cancer incidence (german standard population) by county averaged for period 2007 to 2019. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 18.4/100,000 WS N=5,993, females 4.3/100,000 WS N=1,704).

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 32 women were identified with newly diagnosed bladder tumor. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 2.9/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 1.7 and 4.6/100,000.

Standardized incidence ratio (SIR) 2007 - 2019: Males



Standardized incidence ratio (SIR) 2007 - 2019: Females

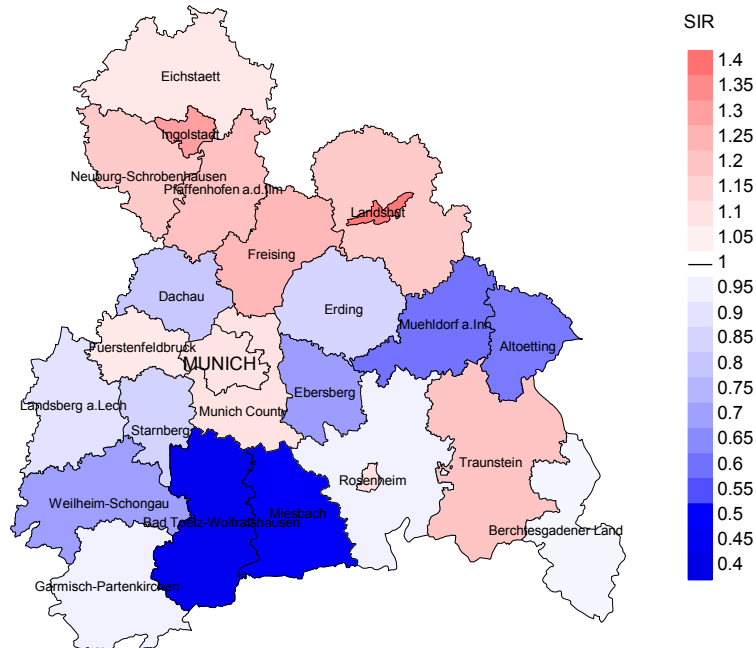


Figure 8b. Map of standardized incidence ratio (SIR) by county averaged for period 2007 to 2019. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=5,993, females N=1,704).

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 32 women were identified with newly diagnosed bladder tumor. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.69. Though, the value of this parameter may vary with an underlying probability of 99% between 0.42 and 1.07, and is therefore not statistically striking.

MORTALITY

Table 9a

Annual cohorts: Incident cancers, follow-up status,
and deaths among the annual cohorts

(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 %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	285	96.1	199	69.8	91.5
1999	286	97.6	189	66.1	96.3
2000	284	96.5	194	68.3	92.8
2001	267	96.3	164	61.4	95.7
2002	447	98.2	274	61.3	92.7
2003	446	94.8	270	60.5	91.9
2004	557	95.2	333	59.8	93.4
2005	552	94.7	308	55.8	93.5
2006	514	94.0	264	51.4	90.9
2007	683	93.7	356	52.1	91.0
2008	634	97.9	306	48.3	88.9
2009	658	97.7	308	46.8	91.2
2010	700	96.0	290	41.4	88.3
2011	705	96.9	274	38.9	86.1
2012	706	97.0	265	37.5	86.8
2013	708	95.1	241	34.0	87.1
2014	669	95.8	205	30.6	85.9
2015	537	90.1	111	20.7	82.0
2016	500	97.6	89	17.8	84.3
2017	464	99.8	64	13.8	73.4
2018	454	98.5	44	9.7	45.5
2019	281	65.8	19	6.8	73.7
1998-2019	11337	95.3	4767	42.0	89.7

Table 9b

Annual cohorts of incident cancers and deaths,
and cases deceased within the same year of being diagnosed with cancer

(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	Deaths in same year n	Prop. deaths in same year %
1998	285	96	6	2.1
1999	286	102	8	2.8
2000	284	103	4	1.4
2001	267	124	7	2.6
2002	447	167	7	1.6
2003	446	184	7	1.6
2004	557	211	14	2.5
2005	552	211	17	3.1
2006	514	221	11	2.1
2007	683	264	12	1.8
2008	634	261	14	2.2
2009	658	280	18	2.7
2010	700	320	10	1.4
2011	705	375	27	3.8
2012	706	394	29	4.1
2013	708	389	23	3.2
2014	669	435	24	3.6
2015	537	433	15	2.8
2016	500	432	24	4.8
2017	464	493	19	4.1
2018	454	353	11	2.4
2019	281	341	9	3.2
1998-2019	11337	6189	316	2.8

Table 9c

Annual cohorts of deaths, and proportion of cancer-related and non-cancer-related deaths

(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	96	41.7	58.3	59.3
1999	102	30.4	69.6	51.6
2000	103	43.7	56.3	50.5
2001	124	37.9	62.1	53.1
2002	167	46.1	53.9	60.2
2003	184	38.0	62.0	59.3
2004	211	44.5	55.5	60.2
2005	211	50.2	49.8	58.7
2006	221	52.5	47.5	64.3
2007	264	45.8	54.2	61.2
2008	261	46.0	54.0	55.8
2009	280	43.2	56.8	55.3
2010	320	41.6	58.4	54.1
2011	375	44.5	55.5	62.1
2012	394	46.7	53.3	60.4
2013	389	43.7	56.3	57.7
2014	435	42.8	57.2	59.1
2015	433	41.8	58.2	56.2
2016	432	46.8	53.2	59.3
2017	493	42.8	57.2	53.1
2018	353	18.4	81.6	54.0
2019	341	13.2	86.8	49.1
1998–2019	6189	40.9	59.1	57.5

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	74	82.5	82.8	82.5	82.6
1999	64	78.1	79.2	76.5	78.1
2000	78	79.6	75.7	81.0	76.5
2001	89	80.4	79.5	81.3	79.6
2002	138	81.3	77.2	82.8	79.1
2003	138	79.4	76.7	81.2	77.8
2004	147	80.4	78.9	83.8	79.8
2005	147	81.4	79.1	83.4	80.6
2006	163	79.1	78.0	80.2	77.3
2007	191	80.7	78.6	81.6	80.0
2008	198	80.8	79.4	82.1	80.0
2009	213	81.1	80.8	81.2	81.4
2010	252	83.8	81.2	84.8	82.4
2011	285	82.0	80.7	82.9	81.3
2012	313	81.9	80.4	83.4	80.5
2013	310	83.3	79.6	85.0	81.0
2014	343	82.6	82.1	82.8	81.4
2015	322	83.1	80.1	84.3	80.7
2016	330	83.4	80.5	84.5	80.9
2017	383	82.9	80.7	84.7	81.2
2018	282	83.0	81.1	83.4	80.5
2019	270	83.8	80.9	84.1	83.5
1998-2019	4730	82.0	79.9	83.4	80.5

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	22	86.6	83.6	87.0	82.7
1999	38	82.4	77.9	83.2	79.2
2000	25	87.6	86.2	89.3	86.2
2001	35	83.4	82.0	84.5	82.0
2002	29	87.4	82.5	88.8	86.6
2003	46	86.2	80.3	89.1	82.6
2004	64	85.2	81.8	85.9	84.4
2005	64	82.3	79.0	84.1	79.8
2006	58	83.3	80.4	83.9	80.8
2007	73	83.1	81.4	86.6	81.6
2008	63	85.1	82.1	86.7	82.6
2009	67	85.3	79.4	87.0	82.7
2010	68	84.9	80.0	87.4	80.0
2011	90	84.0	80.8	85.7	81.2
2012	81	84.7	78.6	88.9	79.5
2013	79	84.8	80.2	88.0	81.3
2014	92	87.8	83.3	88.3	84.0
2015	111	85.5	79.8	86.7	81.9
2016	102	86.4	82.3	88.0	82.5
2017	110	87.0	82.0	90.3	82.5
2018	71	86.4	77.1	86.6	77.9
2019	71	85.4	82.9	85.7	82.9
1998-2019	1459	85.1	81.3	87.0	82.2

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	33	3.0	0.16	1.6	0.14	2.8	0.16	4.3	0.19
1999	21	1.9	0.10	1.0	0.09	1.8	0.11	2.6	0.12
2000	37	3.2	0.17	1.8	0.16	2.9	0.18	4.4	0.20
2001	33	2.8	0.17	1.5	0.16	2.6	0.17	3.7	0.18
2002	68	3.6	0.21	1.8	0.19	3.1	0.21	4.5	0.23
2003	56	3.0	0.17	1.5	0.15	2.5	0.17	3.6	0.19
2004	71	3.8	0.18	1.7	0.15	3.0	0.17	4.7	0.21
2005	75	4.0	0.18	1.8	0.15	3.0	0.17	4.6	0.20
2006	90	4.7	0.22	2.0	0.18	3.5	0.21	5.5	0.26
2007	88	4.0	0.16	1.7	0.14	3.0	0.16	4.4	0.18
2008	96	4.3	0.20	1.7	0.16	3.0	0.19	4.8	0.23
2009	92	4.1	0.19	1.6	0.15	2.9	0.17	4.3	0.20
2010	103	4.6	0.19	1.8	0.16	3.1	0.18	4.6	0.20
2011	128	5.7	0.24	2.1	0.19	3.8	0.23	5.6	0.25
2012	156	6.9	0.29	2.5	0.22	4.4	0.26	6.6	0.30
2013	132	5.7	0.24	2.0	0.18	3.6	0.21	5.4	0.24
2014	156	6.7	0.29	2.3	0.22	4.1	0.26	6.0	0.29
2015	144	6.1	0.34	2.1	0.27	3.7	0.31	5.4	0.33
2016	160	6.7	0.41	2.2	0.29	3.9	0.35	5.8	0.39
2017	161	6.7	0.43	2.3	0.33	3.9	0.38	5.7	0.42
2018	52	2.1	0.14	0.7	0.11	1.2	0.13	1.8	0.14
2019	38	1.6	0.17	0.5	0.13	0.9	0.14	1.3	0.16
1998-2019	1990	4.5	0.23	1.8	0.18	3.1	0.21	4.6	0.24

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	7	0.6	0.10	0.2	0.06	0.3	0.07	0.4	0.08
1999	10	0.8	0.12	0.3	0.10	0.5	0.11	0.6	0.11
2000	8	0.7	0.11	0.1	0.05	0.3	0.07	0.4	0.08
2001	14	1.2	0.21	0.3	0.12	0.6	0.14	0.8	0.16
2002	9	0.5	0.08	0.1	0.04	0.2	0.05	0.3	0.06
2003	14	0.7	0.13	0.2	0.08	0.4	0.09	0.5	0.10
2004	23	1.2	0.15	0.3	0.10	0.6	0.11	0.8	0.12
2005	31	1.6	0.23	0.5	0.17	0.8	0.19	1.2	0.21
2006	26	1.3	0.23	0.4	0.17	0.6	0.19	0.9	0.20
2007	33	1.4	0.23	0.4	0.14	0.7	0.16	1.0	0.19
2008	24	1.0	0.15	0.2	0.08	0.4	0.10	0.7	0.13
2009	29	1.2	0.18	0.3	0.11	0.6	0.13	0.9	0.15
2010	30	1.3	0.18	0.3	0.12	0.6	0.13	0.9	0.16
2011	39	1.7	0.23	0.5	0.14	0.8	0.17	1.1	0.19
2012	28	1.2	0.17	0.4	0.13	0.6	0.14	0.8	0.16
2013	38	1.6	0.26	0.4	0.18	0.7	0.20	1.0	0.22
2014	30	1.2	0.23	0.3	0.14	0.5	0.16	0.8	0.18
2015	37	1.5	0.32	0.4	0.19	0.6	0.22	1.0	0.27
2016	42	1.7	0.39	0.4	0.24	0.7	0.28	1.1	0.32
2017	50	2.0	0.54	0.5	0.34	0.9	0.40	1.3	0.44
2018	13	0.5	0.14	0.2	0.09	0.2	0.10	0.3	0.12
2019	8	0.3	0.14	0.0	0.06	0.1	0.08	0.2	0.11
1998-2019	543	1.2	0.21	0.3	0.13	0.5	0.15	0.8	0.17

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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