Munich Cancer Registry

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ICD-10 C67: Bladder cancer

Incidence and Mortality

Year of diagnosis	1998-2020
Patients	12,943
Diseases	12,950
Creation date	12/21/2021
Database export	12/20/2021
Population	4.95 m

Munich Cancer Registry
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https://www.tumorregister-muenchen.de/en

https://www.tumorregister-muenchen.de/en/facts/base/bC67__E-ICD-10-C67-Bladder-cancer-incidence-and-mortality.pdf

Index of figures and tables

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

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

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

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

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

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

Munich Cancer Registry, December 2021

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

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

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

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

Code	Description
C67.-	Malignant neoplasm of bladder
C67.0	Trigone of bladder
C67.1	Dome of bladder
C67.2	Lateral wall of bladder
C67.3	Anterior wall of bladder
C67.4	Posterior wall of bladder
C67.5	Bladder neck
C67.6	Ureteric orifice
C67.7	Urachus
C67.8	Overlapping lesion of bladder
C67.9	Bladder, unspecified

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	299	29	9.7	15.7	18.8	85.6	98.7
1999	285	22	7.7	14.6	18.9	86.0	97.9
2000	291	39	13.4	15.4	18.7	88.0	98.6
2001	300	24	8.0	16.3	18.7	84.3	98.3
2002	610	83	13.6	18.0	18.5	88.0	98.9 #
2003	596	74	12.4	18.8	18.5	84.2	98.0
2004	570	68	11.9	19.1	18.4	82.1	98.4
2005	533	57	10.7	18.9	18.3	77.3	97.2
2006	599	52	8.7	19.0	18.1	82.0	96.2
2007	619	50	8.1	19.5	18.0	77.2	94.8 #
2008	668	64	9.6	20.4	17.9	80.4	98.8
2009	671	54	8.0	21.3	17.7	77.5	99.0
2010	672	62	9.2	21.9	17.7	75.3	97.3
2011	684	52	7.6	22.5	17.3	74.1	98.8
2012	705	54	7.7	22.9	17.1	71.3	98.2
2013	762	61	8.0	23.5	16.4	67.6	98.2
2014	665	50	7.5	23.8	16.0	66.6	97.4
2015	702	73	10.4	24.1	15.1	66.7	96.0
2016	663	65	9.8	24.4	15.2	63.7	99.8
2017	703	61	8.7	25.0	15.2	57.0	99.4
2018	610	19	3.1	25.6	15.1	41.0	98.9
2019	438	6	1.4	25.8	12.1	41.1	100.0
2020	305			26.1	9.2	31.5	100.0 ##
1998-2020	12950	1119	8.6	26.1	18.8	71.4	98.1

12,950 cases diagnosed 1998-2020 are related to a total of 12,943 patients. Currently, in 5,724 (44.2 %) of these 12,943 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 4,125 / 1,169 / 430 (31.9 % / 9.0 % / 3.3 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:
In 2018, a subgroup of 610 cases has been diagnosed, of which 25.6 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 15.1 % 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	209	69.9	19	9.1	17.7	22.0	84.2	98.6
1999	219	76.8	19	8.7	14.7	22.1	85.8	98.2
2000	198	68.0	20	10.1	15.8	22.0	84.3	98.5
2001	199	66.3	12	6.0	16.7	22.0	82.4	98.5
2002	435	71.3	47	10.8	18.3	21.8	87.8	98.9 #
2003	440	73.8	47	10.7	19.1	21.8	83.9	98.2
2004	406	71.2	36	8.9	19.3	21.8	80.5	98.3
2005	373	70.0	28	7.5	19.0	21.7	76.7	97.1
2006	430	71.8	27	6.3	19.1	21.4	80.7	95.6
2007	436	70.4	26	6.0	19.7	21.3	75.0	93.6 #
2008	484	72.5	38	7.9	20.7	21.1	81.2	99.2
2009	494	73.6	37	7.5	21.6	21.0	76.9	98.6
2010	479	71.3	35	7.3	22.2	21.1	74.1	96.9
2011	495	72.4	33	6.7	22.9	20.4	74.7	98.8
2012	525	74.5	28	5.3	23.3	20.4	71.2	97.9
2013	558	73.2	35	6.3	24.0	19.6	67.6	98.0
2014	483	72.6	29	6.0	24.4	19.2	65.8	97.3
2015	496	70.7	49	9.9	24.7	18.1	65.5	95.6
2016	475	71.6	43	9.1	25.0	18.2	61.9	100.0
2017	497	70.7	32	6.4	25.7	18.5	52.9	99.4
2018	453	74.3	11	2.4	26.3	18.4	37.5	99.6
2019	327	74.7	2	0.6	26.6	14.7	38.2	100.0
2020	229	75.1			26.9	11.5	27.5	100.0 ##
1998-2020	9340	72.1	653	7.0	26.9	22.0	70.0	98.0

9,340 cases diagnosed 1998-2020 are related to a total of 9,335 patients. Currently, in 4,514 (48.4 %) of these 9,335 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 3,241 / 913 / 360 (34.7 % / 9.8 % / 3.9 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:
In 2018, a subgroup of 453 cases has been diagnosed, of which 26.3 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 18.4 % 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 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	90	30.1	10	11.1	11.1	11.0	88.9	98.9	
1999	66	23.2	3	4.5	14.1	10.9	86.4	97.0	
2000	93	32.0	19	20.4	14.5	10.6	95.7	98.9	
2001	101	33.7	12	11.9	15.1	10.5	88.1	98.0	
2002	175	28.7	36	20.6	17.3	10.4	88.6	98.9	#
2003	156	26.2	27	17.3	17.9	10.3	85.3	97.4	
2004	164	28.8	32	19.5	18.7	10.1	86.0	98.8	
2005	160	30.0	29	18.1	18.7	10.0	78.8	97.5	
2006	169	28.2	25	14.8	18.8	9.8	85.2	97.6	
2007	183	29.6	24	13.1	19.1	9.9	82.5	97.8	#
2008	184	27.5	26	14.1	19.7	9.7	78.3	97.8	
2009	177	26.4	17	9.6	20.5	9.6	79.1	100.0	
2010	193	28.7	27	14.0	21.2	9.2	78.2	98.4	
2011	189	27.6	19	10.1	21.5	9.2	72.5	98.9	
2012	180	25.5	26	14.4	21.8	8.7	71.7	98.9	
2013	204	26.8	26	12.7	22.1	8.2	67.6	98.5	
2014	182	27.4	21	11.5	22.2	8.1	68.7	97.8	
2015	206	29.3	24	11.7	22.6	7.6	69.4	97.1	
2016	188	28.4	22	11.7	22.8	7.7	68.1	99.5	
2017	206	29.3	29	14.1	23.1	6.8	67.0	99.5	
2018	157	25.7	8	5.1	23.7	6.1	51.0	96.8	
2019	111	25.3	4	3.6	23.7	4.8	49.5	100.0	
2020	76	24.9			23.8	2.6	43.4	100.0	##
1998-2020	3610	27.9	466	12.9	23.8	11.0	75.0	98.4	

3,610 cases diagnosed 1998-2020 are related to a total of 3,608 patients. Currently, in 1,210 (33.5 %) of these 3,608 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 884 / 256 / 70 (24.5 % / 7.1 % / 1.9 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:
In 2018, a subgroup of 157 cases has been diagnosed, of which 23.7 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 6.1 % 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 2

Incidence measures by year of diagnosis including DCO cases
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.94 m as of 2007, respectively)

Year of diagnosis	Males n	Females n	Males Inc. raw	Fem. Inc. raw	Males Inc. WS	Fem. Inc. WS	Males Inc. ES	Fem. Inc. ES	Males Inc. BRD-S	Fem. Inc. BRD-S
1998	209	90	18.9	7.7	11.2	2.9	17.5	4.6	24.1	6.1
1999	219	66	19.6	5.6	11.4	2.2	17.7	3.4	24.0	4.7
2000	198	93	17.4	7.7	9.6	2.7	15.4	4.3	22.1	6.0
2001	199	101	17.2	8.3	10.0	3.1	15.4	4.8	20.0	6.6
2002	435	175	23.3	8.9	12.2	3.2	19.5	5.0	27.4	6.9
2003	440	156	23.5	7.9	12.2	2.8	19.3	4.4	26.7	6.0
2004	406	164	21.6	8.3	11.0	2.8	17.3	4.5	23.9	6.3
2005	373	160	19.7	8.0	9.8	2.9	15.4	4.5	21.2	6.0
2006	430	169	22.5	8.4	11.1	3.2	17.4	4.9	24.1	6.5
2007	436	183	19.7	7.9	9.6	2.8	15.0	4.4	20.2	6.1
2008	484	184	21.7	7.9	10.2	2.9	16.2	4.4	22.2	5.9
2009	494	177	22.1	7.6	10.2	2.6	16.1	4.0	22.3	5.5
2010	479	193	21.3	8.2	9.8	2.5	15.3	4.1	20.6	5.6
2011	495	189	22.1	8.1	10.0	3.0	15.7	4.6	21.1	5.9
2012	525	180	23.1	7.6	9.9	2.6	15.6	4.1	21.8	5.5
2013	558	204	24.2	8.6	10.5	3.1	16.4	4.6	22.4	6.1
2014	483	182	20.7	7.6	8.8	2.6	13.8	4.1	18.9	5.5
2015	496	206	20.8	8.5	8.2	3.0	13.2	4.6	18.9	6.1
2016	475	188	19.8	7.7	8.3	2.6	13.0	4.0	17.7	5.3
2017	497	206	20.6	8.4	8.2	2.7	12.9	4.2	18.1	5.8
2018	453	157	18.6	6.3	7.5	2.2	11.8	3.3	16.1	4.5
2019	327	111	13.4	4.5	5.4	1.4	8.6	2.2	11.6	3.1
2020	229	76	9.4	3.1	3.7	1.0	5.9	1.6	8.1	2.2
1998–2020	9340	3610	20.1	7.5	9.1	2.6	14.4	4.0	19.7	5.4

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

Table 3

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	299	72.5	12.8	26.3	96.1	55.0	65.1	73.4	83.1	88.1
1999	285	71.0	11.0	42.1	94.1	55.0	63.5	71.8	79.3	85.3
2000	291	73.5	10.4	39.3	99.7	59.8	65.2	74.6	80.8	86.6
2001	300	71.6	12.1	30.9	95.8	55.3	62.4	72.4	80.9	87.1
2002	610	74.0	10.7	36.1	99.5	60.6	66.8	74.8	81.7	88.2
2003	596	73.4	11.7	25.4	103	59.0	65.6	74.5	81.7	87.9
2004	570	73.5	11.5	33.3	99.0	58.8	64.8	75.3	81.4	87.9
2005	533	73.3	11.9	28.0	101	58.5	65.1	74.5	82.0	87.8
2006	599	73.2	12.1	3.0	101	57.5	66.0	74.2	81.8	87.0
2007	619	73.2	11.6	1.3	101	57.0	66.8	73.7	81.4	86.9
2008	668	73.9	11.7	6.6	100	57.8	66.7	74.5	82.6	87.7
2009	671	74.0	10.9	39.9	103	59.3	66.7	75.0	82.3	87.2
2010	672	74.2	11.8	31.5	100	57.1	67.1	75.2	83.3	88.3
2011	684	73.3	12.3	1.5	97.6	56.7	66.2	74.5	82.3	88.4
2012	705	74.2	10.5	37.0	103	59.6	68.3	75.2	81.4	87.2
2013	762	74.0	11.2	33.4	99.0	59.2	67.4	74.5	82.1	87.9
2014	665	74.0	10.9	36.9	107	58.3	67.7	75.0	81.7	87.6
2015	702	75.3	10.5	37.7	103	61.2	69.6	76.6	82.6	87.4
2016	663	74.5	11.3	35.4	98.8	58.2	67.2	76.5	82.9	87.8
2017	703	75.2	10.9	33.3	102	60.3	69.1	76.9	82.7	87.5
2018	610	74.7	10.7	43.3	97.6	59.4	67.1	76.4	82.2	87.9
2019	438	74.8	10.1	42.2	96.6	59.6	69.4	75.9	82.2	86.9
2020	305	74.9	10.8	35.7	95.3	60.1	68.3	76.8	82.4	87.3
1998-2020	12950	73.9	11.3	1.3	107	58.5	66.8	75.1	82.0	87.6

Table 3a

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	Median 10%	25%	50%	75%	90%
1998	209	71.4	12.6	26.3	95.6	55.1	64.3	72.5	80.4	87.1
1999	219	70.0	10.9	42.6	94.1	55.0	61.9	70.5	78.2	84.9
2000	198	71.8	10.3	39.3	99.7	58.3	64.2	73.7	79.2	84.9
2001	199	69.4	11.3	44.0	95.1	54.0	61.4	69.5	77.8	85.4
2002	435	73.0	10.2	37.0	97.6	60.2	66.0	73.5	80.3	86.1
2003	440	72.3	11.2	25.4	101	58.9	65.1	73.1	80.0	86.0
2004	406	71.9	11.1	37.8	98.8	58.2	63.7	73.1	79.8	85.2
2005	373	72.1	10.8	38.6	101	58.7	64.6	73.2	80.0	84.9
2006	430	72.7	11.3	3.0	101	58.3	65.8	73.3	80.5	86.0
2007	436	72.4	11.3	1.3	101	56.9	66.5	72.5	79.9	86.6
2008	484	73.4	11.4	37.5	100	57.5	66.4	74.0	81.4	87.4
2009	494	73.1	10.5	46.0	97.4	59.1	66.2	74.3	81.1	86.2
2010	479	72.4	11.6	31.5	99.1	56.2	65.7	72.7	81.1	86.9
2011	495	72.9	12.0	1.5	95.4	55.8	66.3	74.1	81.6	87.3
2012	525	73.6	10.0	39.9	103	59.8	68.3	74.5	80.4	85.2
2013	558	73.6	10.6	40.5	98.6	59.1	67.3	74.0	81.6	86.9
2014	483	73.6	10.6	42.0	95.2	58.1	67.1	74.6	81.1	86.6
2015	496	75.6	9.7	44.2	103	62.7	70.3	76.6	82.0	86.6
2016	475	74.1	10.8	35.4	98.8	58.9	66.9	75.9	81.7	87.0
2017	497	74.7	10.7	33.3	102	60.4	68.7	76.4	82.0	86.8
2018	453	74.4	10.7	43.3	97.6	59.0	66.9	76.1	82.1	87.1
2019	327	74.5	10.1	42.2	95.4	59.6	69.2	75.5	81.8	86.8
2020	229	74.6	10.8	35.7	95.3	60.0	67.9	76.5	82.5	87.2
1998–2020	9340	73.2	10.9	1.3	103	58.4	66.2	74.2	81.0	86.5

Table 3b

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	90	74.9	13.0	35.3	96.1	54.6	69.1	77.6	85.7	89.3
1999	66	74.3	10.8	42.1	91.3	56.4	70.4	76.5	80.8	86.4
2000	93	77.2	9.7	56.1	94.5	62.6	70.4	78.9	85.9	88.8
2001	101	75.9	12.6	30.9	95.8	56.7	68.2	77.8	84.7	90.1
2002	175	76.5	11.4	36.1	99.5	62.6	68.3	78.5	85.7	89.3
2003	156	76.4	12.6	25.4	103	60.9	69.2	78.6	85.1	90.7
2004	164	77.5	11.6	33.3	99.0	59.5	71.8	78.7	86.1	90.6
2005	160	76.1	13.7	28.0	98.8	57.5	66.4	79.5	85.7	91.7
2006	169	74.5	13.9	4.3	96.7	55.5	66.9	76.8	84.5	91.4
2007	183	75.1	12.0	34.4	98.4	57.9	69.0	77.9	83.8	87.8
2008	184	75.0	12.6	6.6	97.0	58.6	68.2	76.6	85.0	88.1
2009	177	76.3	11.5	39.9	103	59.7	68.9	78.6	84.6	89.2
2010	193	78.6	11.3	37.0	100	64.0	71.0	81.0	87.2	91.1
2011	189	74.4	13.1	12.3	97.6	57.2	65.4	75.5	84.2	90.6
2012	180	76.0	11.8	37.0	96.4	59.5	68.9	78.1	84.8	89.5
2013	204	75.1	12.6	33.4	99.0	60.5	68.3	76.1	85.0	90.9
2014	182	75.1	11.6	36.9	107	59.9	69.4	75.6	82.2	89.2
2015	206	74.7	12.4	37.7	96.7	57.2	67.6	76.2	83.8	89.6
2016	188	75.5	12.5	41.3	97.5	56.1	69.0	77.8	85.9	89.3
2017	206	76.4	11.3	43.7	97.7	60.2	70.1	78.4	84.5	89.5
2018	157	75.5	10.8	45.2	96.3	61.4	68.4	77.2	82.7	89.2
2019	111	75.9	10.3	50.2	96.6	59.6	70.5	77.6	83.1	87.0
2020	76	75.5	10.7	41.0	93.1	61.9	69.5	77.6	81.4	88.1
1998-2020	3610	75.8	12.1	4.3	107	58.9	68.8	77.6	84.7	89.7

Table 4

Age distribution by 5-year age group and sex for period 2007-2020 (incl. DCO)

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	2	0.0	0.0	2	0.0	0.0			0.0
5-9	1	0.0	0.0			0.0	1	0.0	0.0
10-14	1	0.0	0.0			0.0	1	0.0	0.1
15-19	0	0.0	0.0			0.0			0.1
20-24	0	0.0	0.0			0.0			0.1
25-29	0	0.0	0.0			0.0			0.1
30-34	4	0.0	0.1	2	0.0	0.1	2	0.1	0.2
35-39	15	0.2	0.3	8	0.1	0.2	7	0.3	0.5
40-44	61	0.7	0.9	39	0.6	0.8	22	0.9	1.4
45-49	152	1.7	2.7	111	1.7	2.5	41	1.7	3.0
50-54	299	3.4	6.0	224	3.5	6.0	75	3.1	6.1
55-59	474	5.3	11.4	351	5.5	11.5	123	5.0	11.2
60-64	723	8.2	19.5	553	8.6	20.1	170	7.0	18.1
65-69	1072	12.1	31.6	842	13.1	33.2	230	9.4	27.6
70-74	1478	16.7	48.3	1095	17.0	50.2	383	15.7	43.3
75-79	1644	18.5	66.8	1254	19.5	69.7	390	16.0	59.3
80-84	1466	16.5	83.4	1042	16.2	85.9	424	17.4	76.7
85+	1475	16.6	100.0	908	14.1	100.0	567	23.3	100.0
All ages	8867	100.0		6431	100.0		2436	100.0	

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 2007–2020

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males DCO rate n=398 %	Females DCO rate n=273 %	Males Prop.all cancers n=153686 %	Females Prop.all cancers n=155051 %
0- 4	2		0.1				0.9	
5- 9		1		0.1				1.0
10-14		1		0.1				0.8
15-19								
20-24								
25-29								
30-34	2	2	0.1	0.1			0.2	0.1
35-39	8	7	0.3	0.3			0.4	0.2
40-44	39	22	1.6	0.9			1.4	0.4
45-49	111	41	4.1	1.6			2.2	0.4
50-54	224	75	8.8	3.0	0.4	5.3	2.7	0.6
55-59	351	123	16.5	5.6	1.1	0.8	2.8	0.9
60-64	553	170	31.3	9.0	2.4	4.7	3.1	1.1
65-69	841	230	51.5	12.7	2.6	2.2	3.5	1.2
70-74	1095	382	73.0	22.2	3.5	4.7	4.0	1.9
75-79	1254	390	103.6	26.0	6.3	3.6	5.2	2.0
80-84	1041	424	143.8	39.8	7.6	13.2	6.8	2.8
85+	908	567	194.4	54.4	17.8	29.5	8.6	3.5
All ages	6429	2435			6.2	11.2	4.2	1.6
Incidence								
Raw			19.7	7.2				
WS			8.5	2.5				
ES			13.3	3.8				
BRD-S			18.2	5.2				

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).

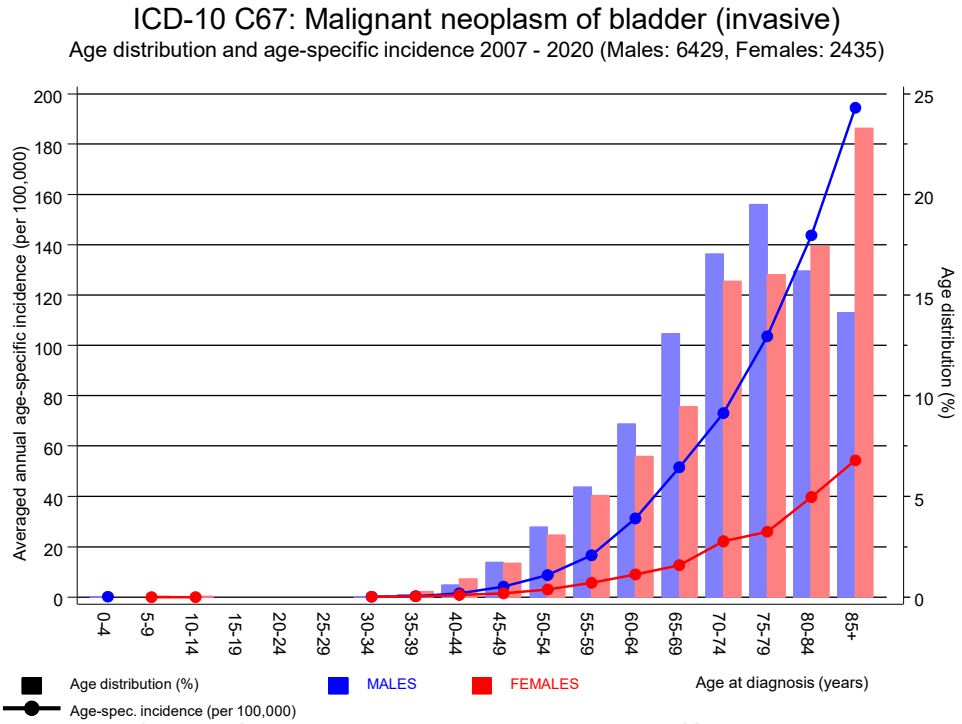


Figure 6. Age distribution (males: mean=73.7 yrs, median=74.9 yrs; females: mean=75.7 yrs, median=77.3 yrs) and age-specific incidence.

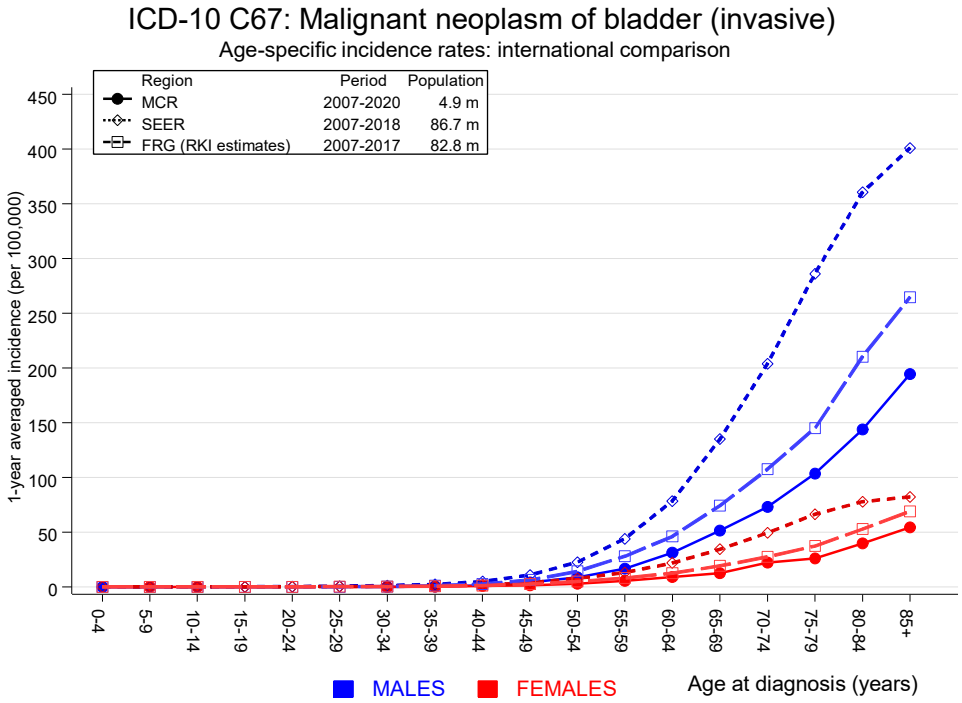


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, RKI estimates) and SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

Estimated age-specific patient population of Germany, latest update: 16 March 2021. German Centre for Cancer Registry Data, Robert Koch Institute (RKI), based on data of the population based cancer registries. http://www.krebsdaten.de. Last access: 08/17/2021
Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 21 Regs Research Data, released April 2021, based on the November 2020 submission. http://www.seer.cancer.gov.

Table 7a

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of further malignancies for period 1998–2020

MALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C03–C06	Oral cavity	9	3.6	2.5	1.1	4.7	#	1.9	11.1
C07–C08	Salivary gland	4	1.4	2.9	0.8	7.3		0.9	
C09–C10	Oropharynx	9	4.3	2.1	1.0	4.0		1.7	
C12–C13	Hypopharynx	5	2.3	2.2	0.7	5.0		1.0	
C15	Oesophagus	27	9.8	2.8	1.8	4.0	#	6.2	7.4
C16	Stomach	56	23.2	2.4	1.8	3.1	#	11.8	7.1
C17	Small intestine	8	3.2	2.5	1.1	4.9	#	1.7	
C18	Colon	117	56.2	2.1	1.7	2.5	#	21.9	6.0
C19–C20	Rectum	58	27.6	2.1	1.6	2.7	#	10.9	3.4
C22	Liver	37	15.3	2.4	1.7	3.3	#	7.8	10.8
C23–C24	Bile	11	6.1	1.8	0.9	3.2		1.8	9.1
C25	Pancreas	49	22.1	2.2	1.6	2.9	#	9.7	20.4
C32	Larynx	10	4.7	2.1	1.0	3.9	#	1.9	
C33–C34	Lung	272	62.2	4.4	3.9	4.9	#	75.5	11.0
C38,C45	Mesothelioma	7	3.9	1.8	0.7	3.7		1.1	14.3
C43	Malign. melanoma	40	23.6	1.7	1.2	2.3	#	5.9	
C46,C49	Soft tissue	6	3.2	1.9	0.7	4.1		1.0	
C48	Peritoneal	4	0.4	9.6	2.6	24.7	#	1.3	25.0
C60	Penis	5	1.4	3.5	1.1	8.2	#	1.3	
C61	Prostate	1336	151.5	8.8	8.4	9.3	#	426.3	4.3
C64	Kidney	82	17.7	4.6	3.7	5.7	#	23.1	22.0
C65	Renal pelvis	92	2.6	35.8	28.8	43.9	#	32.2	1.1
C66	Ureter	79	1.5	51.1	40.5	63.7	#	27.9	
C67	Bladder	4	28.6	0.1	0.0	0.4	#	−8.9	25.0
C68	Urethra	87	0.5	160.9	128.9	198.5	#	31.1	
C68	Urinary org.	16	0.5	35.5	20.3	57.6	#	5.6	87.5
C70–C72	CNS cancer	11	6.4	1.7	0.9	3.1		1.7	9.1
C73	Thyroid	3	2.8	1.1	0.2	3.2		0.1	
C76–C79	CUP	32	9.7	3.3	2.3	4.7	#	8.0	6.3
C81	Hodgkin lymphoma	5	1.1	4.5	1.5	10.6	#	1.4	
C82–C85	NHL	42	23.7	1.8	1.3	2.4	#	6.6	14.3
C90	Mult. myeloma	10	7.4	1.4	0.6	2.5		0.9	10.0
C91–C96	Leukaemia	14	9.0	1.6	0.9	2.6		1.8	42.9
Others, specified		12	7.5	1.6	0.8	2.8		1.6	16.7
Not observed		0	2.5	0.0	0.0	1.5		−0.9	
All further malignancies		2559	547.7	4.7	4.5	4.9	#	723.9	6.8

Patients	8762
Median age at next malignancy (years)	73.6
Person-years	27784
Mean observation time (years)	3.2
Median observation time (years)	1.5

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

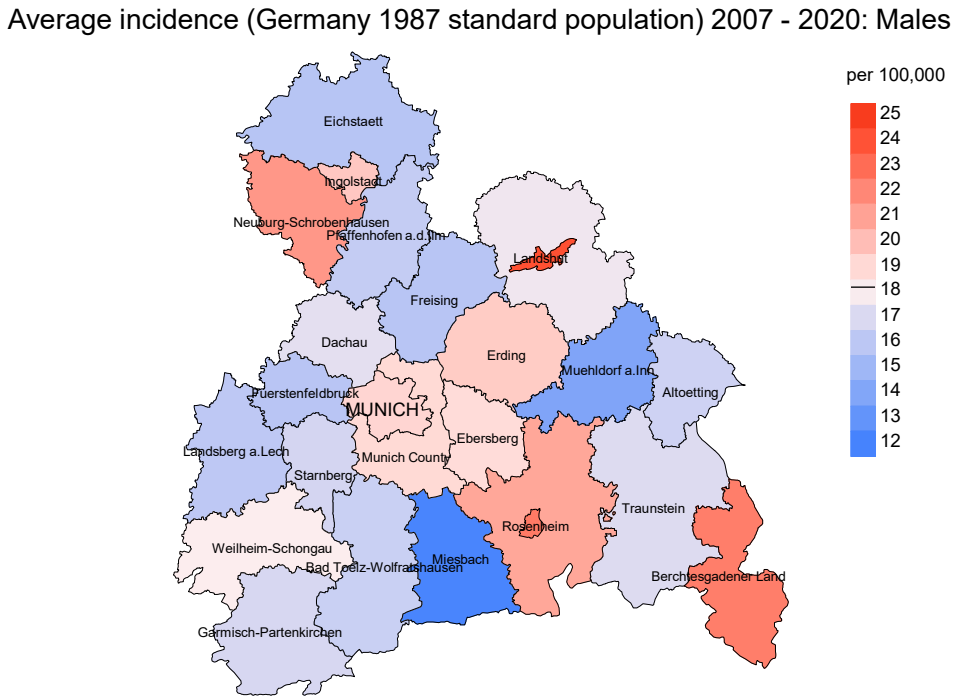
Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of further malignancies for period 1998–2020
FEMALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C15	Oesophagus	5	0.8	6.5	2.1	15.2	#	4.7	40.0
C16	Stomach	8	4.8	1.7	0.7	3.3		3.6	12.5
C17	Small intestine	6	0.6	10.0	3.7	21.7	#	6.0	
C18	Colon	27	13.4	2.0	1.3	2.9	#	15.1	11.1
C19–C20	Rectum	16	5.1	3.2	1.8	5.1	#	12.2	6.3
C21	Anus/canal	2	0.6	3.1	0.4	11.4		1.5	
C22	Liver	4	1.6	2.5	0.7	6.3		2.7	25.0
C23–C24	Bile	3	2.0	1.5	0.3	4.4		1.1	33.3
C25	Pancreas	24	6.4	3.8	2.4	5.6	#	19.6	33.3
C33–C34	Lung	50	8.6	5.8	4.3	7.7	#	46.0	18.0
C38,C45	Mesothelioma	2	0.2	8.4	1.0	30.3	#	2.0	
C43	Malign. melanoma	3	4.2	0.7	0.1	2.1		−1.3	33.3
C50	Breast	81	33.1	2.4	1.9	3.0	#	53.2	11.1
C51	Vulva	4	1.4	2.8	0.8	7.1		2.9	
C52	Vagina	4	0.3	15.9	4.3	40.6	#	4.2	
C53	Cervix uteri	15	1.3	11.8	6.6	19.4	#	15.3	6.7
C54	Corpus uteri	14	6.2	2.2	1.2	3.8	#	8.6	7.1
C55,C57	Fem. genitals un	4	0.4	11.0	3.0	28.0	#	4.0	25.0
C56	Ovary	12	4.7	2.6	1.3	4.5	#	8.1	41.7
C64	Kidney	23	2.9	8.0	5.1	12.0	#	22.4	30.4
C65	Renal pelvis	32	0.4	77.5	53.0	109.4	#	35.1	
C66	Ureter	24	0.2	107.2	68.7	159.5	#	26.4	
C67	Bladder	3	2.8	1.1	0.2	3.1		0.2	
C68	Urethra	8	0.0	236.3	102.0	465.6	#	8.9	
C68	Urinary org.	3	0.1	44.7	9.2	130.7	#	3.3	100.0
C70–C72	CNS cancer	2	1.5	1.3	0.2	4.9		0.6	50.0
C76–C79	CUP	7	2.6	2.7	1.1	5.6	#	4.9	
C82–C85	NHL	17	4.9	3.4	2.0	5.5	#	13.4	23.5
C90	Mult. myeloma	2	1.6	1.3	0.2	4.6		0.5	
C91–C96	Leukaemia	11	1.9	5.7	2.9	10.3	#	10.1	27.3
Others, specified		10	4.2	2.4	1.1	4.4	#	6.5	10.0
Not observed		0	1.7	0.0	0.0	2.1		−1.9	
All further malignancies		426	120.5	3.5	3.2	3.9	#	339.7	14.8

Patients	3250
Median age at next malignancy (years)	77.2
Person-years	8993
Mean observation time (years)	2.8
Median observation time (years)	1.0

The occurrence of further specified malignancy is statistically significant.

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



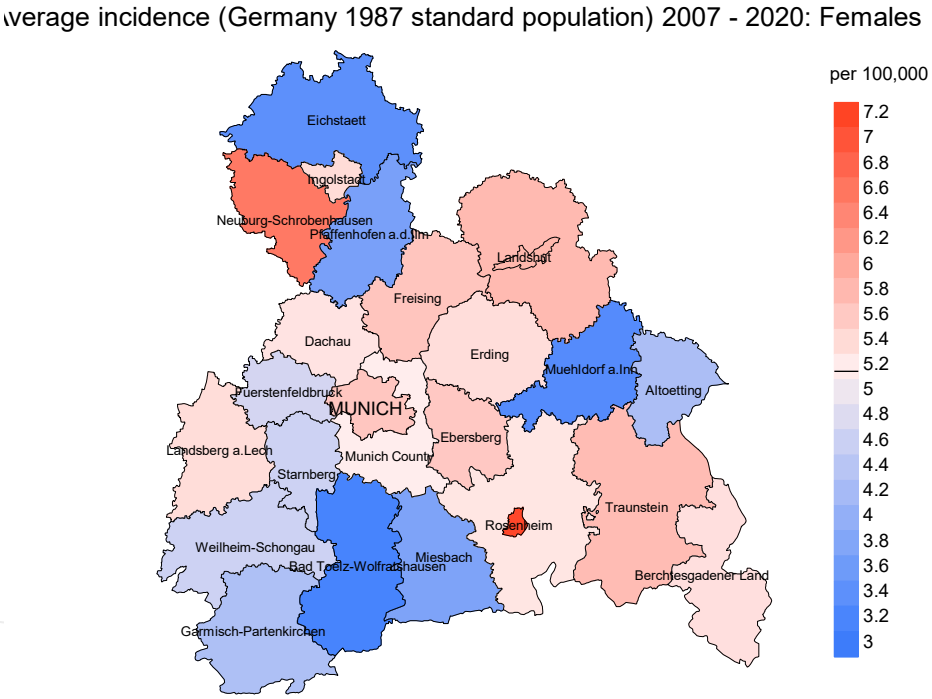
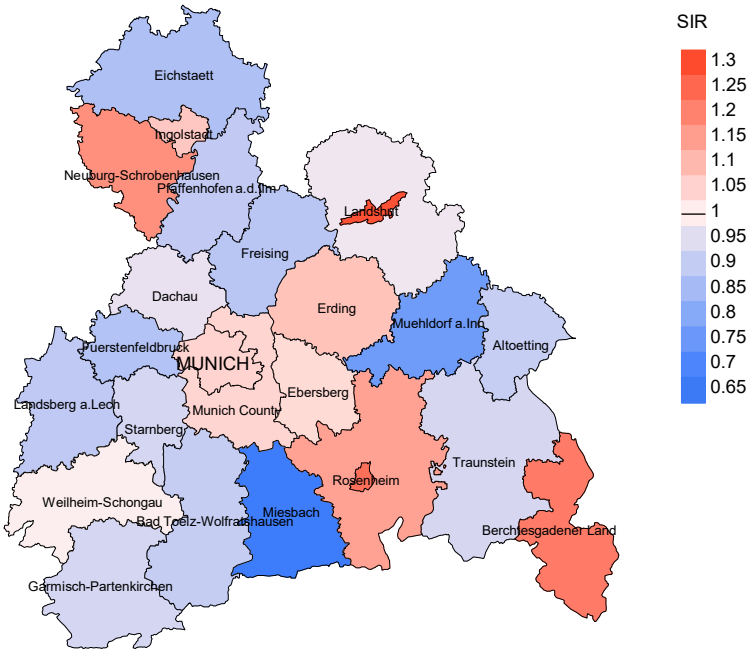


Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 18.2/100,000 WS N=6,429, females 5.2/100,000 WS N=2,435).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,727 female residents (averaged) in the period from 2007 to 2020 a total of 71 women were identified with newly diagnosed bladder cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 5.6/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 4.0 and 7.6/100,000.

Standardized incidence ratio (SIR) 2007 - 2020: Males



Standardized incidence ratio (SIR) 2007 - 2020: Females

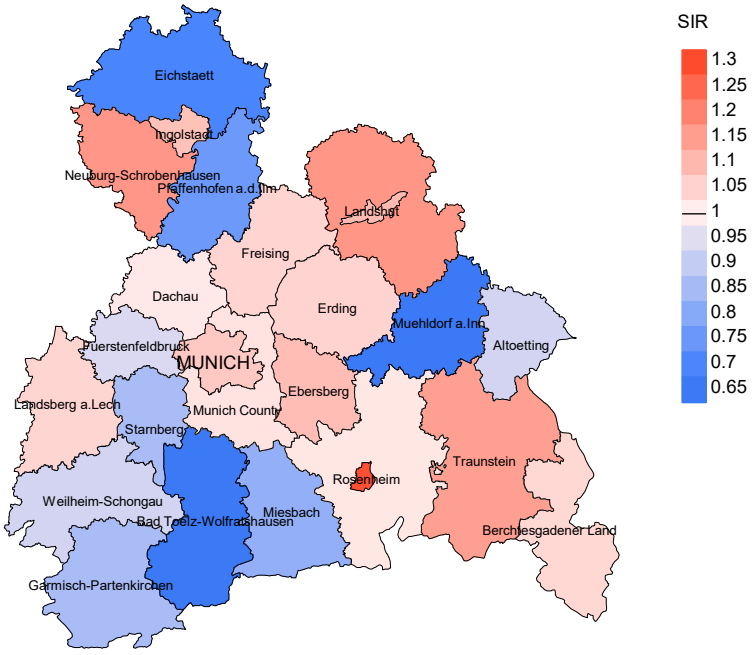


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=6,429, females N=2,435).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2020 a total of 71 women were identified with newly diagnosed bladder cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.09. Though, the value of this parameter may vary with an underlying probability of 99% between 0.79 and 1.47, and is therefore not statistically striking.

MORTALITY

Table 9a

Annual cohorts: Incident cancers, follow-up status, proportion of DCO, deaths among the annual cohorts and proportion of available death certificates (with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.94 m as of 2007, respectively)

Year of diagnosis	Incident cases n	Prop. actively followed %	Prop. DCO %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	299	98.7	9.7	256	85.6	92.2
1999	285	97.9	7.7	245	86.0	95.5
2000	291	98.6	13.4	256	88.0	95.7
2001	300	98.3	8.0	253	84.3	93.7
2002	610	98.9	13.6	537	88.0	97.4
2003	596	98.0	12.4	502	84.2	96.6
2004	570	98.4	11.9	468	82.1	97.4
2005	533	97.2	10.7	412	77.3	96.1
2006	599	96.2	8.7	491	82.0	96.3
2007	619	94.8	8.1	478	77.2	96.9
2008	668	98.8	9.6	537	80.4	96.5
2009	671	99.0	8.0	520	77.5	96.7
2010	672	97.3	9.2	506	75.3	96.6
2011	684	98.8	7.6	507	74.1	95.3
2012	705	98.2	7.7	503	71.3	95.2
2013	762	98.2	8.0	515	67.6	95.1
2014	665	97.4	7.5	443	66.6	94.4
2015	702	96.0	10.4	468	66.7	91.7
2016	663	99.8	9.8	422	63.7	92.4
2017	703	99.4	8.7	401	57.0	84.3
2018	610	98.9	3.1	250	41.0	63.2
2019	438	100.0	1.4	180	41.1	82.8
2020	305	100.0		96	31.5	95.8
1998-2020	12950	98.1	8.6	9246	71.4	93.9

Table 9b

Annual cohorts of incident cancers and deaths, proportion of death certificates and cases deceased within the same year of being diagnosed with cancer (incl. DCO)
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.94 m as of 2007, respectively)

Year of diagnosis/ death	Incident cases n	Deaths n	Prop. deaths with death certific. %	Deaths in same year n	Prop. deaths in same year %
1998	299	245	91.4	67	22.4
1999	285	219	94.5	66	23.2
2000	291	223	95.1	71	24.4
2001	300	217	96.3	52	17.3
2002	610	333	96.1	151	24.8
2003	596	412	97.3	149	25.0
2004	570	404	97.5	135	23.7
2005	533	412	97.6	114	21.4
2006	599	420	97.6	132	22.0
2007	619	488	97.5	132	21.3
2008	668	463	98.5	142	21.3
2009	671	535	99.1	171	25.5
2010	672	551	98.7	155	23.1
2011	684	504	98.6	141	20.6
2012	705	559	98.4	149	21.1
2013	762	550	99.1	154	20.2
2014	665	579	97.8	143	21.5
2015	702	599	98.3	176	25.1
2016	663	638	98.9	184	27.8
2017	703	612	96.4	158	22.5
2018	610	481	71.3	86	14.1
2019	438	465	49.7	70	16.0
2020	305	480	90.6	57	18.7
1998–2020	12950	10389	94.0	2855	22.0

Table 9c

Annual cohorts of deaths, proportion of cancer-related and non-cancer-related deaths, and cancer recorded on death certificates (incl. DCO)
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.94 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. non-cancer-related %	Prop. cancer recorded on death certificate %
1998	245	64.5	35.5	83.9
1999	219	64.8	35.2	81.2
2000	223	66.8	33.2	84.9
2001	217	68.2	31.8	84.7
2002	333	72.7	27.3	86.3
2003	412	67.7	32.3	84.5
2004	404	71.8	28.2	86.8
2005	412	69.9	30.1	84.1
2006	420	72.4	27.6	83.7
2007	488	74.2	25.8	84.9
2008	463	71.7	28.3	84.0
2009	535	71.6	28.4	85.5
2010	551	70.1	29.9	84.0
2011	504	69.0	31.0	84.5
2012	559	69.8	30.2	82.5
2013	550	69.8	30.2	82.2
2014	579	69.8	30.2	82.5
2015	599	70.1	29.9	83.2
2016	638	68.5	31.5	81.8
2017	612	63.9	36.1	78.8
2018	481	53.2	46.8	69.4
2019	465	41.3	58.7	73.2
2020	480	44.4	55.6	72.0
1998-2020	10389	66.4	33.6	82.2

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	165	79.7	79.6	79.8	80.4
1999	154	79.5	77.4	81.4	78.3
2000	158	78.5	76.6	80.8	77.6
2001	142	79.5	77.8	82.1	78.5
2002	231	77.6	76.5	79.9	77.1
2003	310	77.4	75.7	80.7	77.0
2004	281	79.2	78.2	81.5	78.3
2005	291	78.6	77.8	80.0	78.6
2006	282	77.1	76.1	80.6	76.7
2007	341	79.0	78.3	80.4	78.3
2008	331	78.7	77.3	81.7	77.6
2009	386	79.3	77.0	82.9	78.0
2010	386	79.7	77.8	83.4	79.1
2011	354	79.2	76.5	81.8	78.2
2012	413	80.0	79.1	82.7	79.2
2013	404	78.4	77.3	80.4	78.3
2014	427	78.9	76.4	84.4	77.3
2015	440	80.1	79.2	83.4	79.5
2016	469	80.9	78.9	84.7	79.7
2017	431	81.5	79.1	84.3	80.1
2018	362	80.2	78.9	82.2	79.9
2019	329	81.3	77.0	83.3	80.1
2020	368	81.8	80.0	83.2	80.1
1998–2020	7455	79.6	77.9	82.4	78.7

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

Table 10b

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

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	80	82.3	81.3	85.7	82.3
1999	65	80.0	80.1	79.9	80.1
2000	65	82.0	81.1	84.7	82.0
2001	75	84.0	81.2	88.3	84.0
2002	102	81.5	80.9	86.3	81.7
2003	102	81.5	81.4	82.1	81.0
2004	123	83.1	80.2	89.0	81.4
2005	121	83.1	82.6	84.5	83.0
2006	138	81.9	81.2	87.4	81.8
2007	147	81.8	81.0	87.2	81.2
2008	132	81.8	80.0	85.7	81.5
2009	149	80.9	79.5	83.5	80.3
2010	165	83.3	82.2	86.5	82.7
2011	150	82.3	79.6	88.7	80.8
2012	146	83.8	80.4	89.0	82.9
2013	146	81.2	79.6	85.4	80.0
2014	152	82.3	80.2	87.7	81.9
2015	159	82.6	80.6	89.4	81.0
2016	169	81.2	77.6	87.7	79.5
2017	181	82.7	79.9	88.2	80.8
2018	119	81.4	79.3	85.5	80.6
2019	136	80.6	76.6	85.4	77.4
2020	112	83.3	80.6	85.9	81.0
1998–2020	2934	82.2	80.3	86.6	81.3

By 2018, Bavarians' life expectancy at birth is estimated at 79.3 years for boys and 83.8 years for girls.

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

Table 11a

Mortality measures (cancer-related death) and mortality-incidence-index
by year of death
MALES

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	98	8.8	0.47	4.7	0.42	8.3	0.47	12.6	0.52
1999	95	8.5	0.43	4.6	0.40	7.9	0.45	12.1	0.50
2000	99	8.7	0.50	4.7	0.49	7.9	0.51	11.8	0.53
2001	98	8.5	0.49	4.4	0.44	7.6	0.50	11.6	0.58
2002	164	8.8	0.38	4.4	0.36	7.4	0.38	10.8	0.40
2003	205	10.9	0.47	5.4	0.44	9.0	0.47	13.0	0.49
2004	197	10.5	0.49	4.9	0.45	8.4	0.49	12.5	0.52
2005	199	10.5	0.53	4.7	0.49	8.1	0.53	12.3	0.58
2006	203	10.6	0.47	4.9	0.44	8.1	0.47	11.7	0.49
2007	251	11.3	0.58	5.0	0.52	8.5	0.57	12.5	0.62
2008	235	10.6	0.49	4.4	0.44	7.6	0.47	11.3	0.51
2009	272	12.2	0.55	5.2	0.51	8.6	0.53	12.3	0.55
2010	275	12.2	0.58	5.0	0.51	8.4	0.55	12.2	0.59
2011	248	11.1	0.50	4.6	0.46	7.6	0.48	10.6	0.50
2012	286	12.6	0.54	5.1	0.52	8.5	0.55	12.1	0.56
2013	281	12.2	0.50	4.8	0.46	7.9	0.48	11.3	0.51
2014	300	12.9	0.62	5.2	0.59	8.5	0.61	11.6	0.62
2015	299	12.6	0.60	4.5	0.55	7.6	0.58	11.3	0.60
2016	317	13.2	0.67	4.7	0.56	7.9	0.61	11.6	0.66
2017	268	11.1	0.54	4.1	0.50	6.7	0.52	9.6	0.53
2018	183	7.5	0.40	2.7	0.37	4.5	0.38	6.4	0.40
2019	127	5.2	0.39	2.0	0.36	3.2	0.37	4.5	0.39
2020	158	6.5	0.69	2.3	0.61	3.8	0.65	5.5	0.67
1998-2020	4858	10.4	0.52	4.3	0.47	7.2	0.50	10.4	0.53

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	60	5.1	0.67	1.6	0.54	2.7	0.58	4.0	0.65
1999	47	4.0	0.71	1.2	0.57	2.1	0.61	3.0	0.64
2000	50	4.2	0.54	1.3	0.47	2.1	0.50	3.1	0.52
2001	50	4.1	0.50	1.2	0.38	2.0	0.41	3.1	0.47
2002	78	4.0	0.45	1.3	0.40	2.1	0.41	2.9	0.43
2003	74	3.8	0.47	1.1	0.40	1.9	0.43	2.7	0.45
2004	93	4.7	0.57	1.4	0.51	2.4	0.52	3.3	0.52
2005	89	4.5	0.56	1.2	0.41	2.1	0.46	3.1	0.52
2006	101	5.0	0.60	1.6	0.48	2.5	0.52	3.6	0.55
2007	111	4.8	0.61	1.4	0.51	2.4	0.53	3.4	0.56
2008	97	4.2	0.53	1.3	0.45	2.2	0.48	3.0	0.51
2009	111	4.8	0.63	1.5	0.58	2.4	0.60	3.4	0.62
2010	111	4.7	0.58	1.3	0.54	2.2	0.55	3.2	0.56
2011	100	4.3	0.53	1.4	0.46	2.2	0.49	3.1	0.53
2012	104	4.4	0.58	1.4	0.53	2.2	0.54	3.0	0.55
2013	103	4.3	0.51	1.4	0.44	2.1	0.46	3.0	0.49
2014	104	4.3	0.57	1.3	0.48	2.1	0.50	2.9	0.53
2015	121	5.0	0.59	1.4	0.48	2.3	0.50	3.3	0.54
2016	120	4.9	0.64	1.6	0.63	2.6	0.63	3.3	0.63
2017	123	5.0	0.60	1.3	0.49	2.2	0.52	3.2	0.55
2018	73	2.9	0.46	0.9	0.43	1.4	0.43	2.0	0.45
2019	65	2.6	0.59	0.9	0.64	1.4	0.62	1.9	0.62
2020	55	2.2	0.72	0.6	0.65	1.0	0.67	1.4	0.66
1998-2020	2040	4.2	0.57	1.3	0.49	2.1	0.51	2.9	0.54

Table 12

Age distribution of age at death (cancer-related) for period 2007-2020
(**incl. multiple malignancies**)

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4									
5-9									
10-14	1	0.0	0.0			0.0	1	0.1	0.1
15-19	0	0.0	0.0			0.0			0.1
20-24	0	0.0	0.0			0.0			0.1
25-29	0	0.0	0.0			0.0			0.1
30-34	0	0.0	0.0			0.0			0.1
35-39	5	0.1	0.1	1	0.0	0.0	4	0.3	0.4
40-44	13	0.3	0.4	7	0.2	0.2	6	0.4	0.8
45-49	56	1.1	1.5	31	0.9	1.1	25	1.8	2.6
50-54	111	2.3	3.8	71	2.0	3.1	40	2.9	5.4
55-59	178	3.6	7.4	130	3.7	6.9	48	3.4	8.9
60-64	271	5.5	13.0	205	5.9	12.7	66	4.7	13.6
65-69	426	8.7	21.7	325	9.3	22.0	101	7.2	20.8
70-74	737	15.0	36.7	558	15.9	37.9	179	12.8	33.6
75-79	917	18.7	55.4	676	19.3	57.3	241	17.2	50.9
80-84	973	19.9	75.3	700	20.0	77.3	273	19.5	70.4
85+	1210	24.7	100.0	796	22.7	100.0	414	29.6	100.0
All ages	4898	100.0		3500	100.0		1398	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**incl. multiple malignancies**)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	Males MI-index	Females Age-spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14		1			0.1	1.00		4.3
15-19								
20-24								
25-29								
30-34								
35-39	1	4	0.0	0.13	0.2	0.57	0.4	1.0
40-44	7	6	0.3	0.18	0.2	0.27	1.2	0.7
45-49	31	25	1.2	0.28	1.0	0.61	2.2	1.5
50-54	71	40	2.8	0.32	1.6	0.53	2.7	1.5
55-59	130	48	6.1	0.37	2.2	0.39	2.9	1.3
60-64	205	66	11.6	0.37	3.5	0.39	3.2	1.3
65-69	325	101	19.9	0.39	5.6	0.44	3.5	1.4
70-74	558	179	37.2	0.51	10.4	0.47	4.7	2.0
75-79	676	241	55.9	0.54	16.1	0.62	5.4	2.5
80-84	700	273	96.7	0.67	25.6	0.64	6.7	2.9
85+	796	414	170.5	0.88	39.7	0.73	8.8	3.5
All ages	3500	1398					5.0	2.3
Mortality								
Raw			10.7	0.54	4.2	0.57		
WS			4.2	0.49	1.3	0.51		
ES			6.9	0.52	2.0	0.53		
BRD-S			9.9	0.55	2.8	0.55		
PYLL-70								
per 100,000			21.4		10.5			
ES			18.1		8.7			
AYLL-70			8.0		10.2			

Table 14a

Further malignancies in deaths in period 1998–2020
MALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C00	Lip	4	0.1	3	75.0			1	25.0
C03–C06	Oral cavity	22	0.6	10	45.5	1	4.5	11	50.0
C07–C08	Salivary gland	8	0.2	4	50.0			4	50.0
C09–C10	Oropharynx	23	0.7	15	65.2			8	34.8
C12–C13	Hypopharynx	14	0.4	9	64.3			5	35.7
C15	Oesophagus	38	1.1	10	26.3	1	2.6	27	71.1
C16	Stomach	86	2.4	26	30.2	3	3.5	57	66.3
C17	Small intestine	11	0.3	6	54.5			5	45.5
C18	Colon	211	6.0	123	58.3	19	9.0	69	32.7
C19–C20	Rectum	119	3.4	73	61.3	10	8.4	36	30.3
C21	Anus/canal	4	0.1	2	50.0	1	25.0	1	25.0
C22	Liver	43	1.2	8	18.6	5	11.6	30	69.8
C23–C24	Bile	15	0.4	2	13.3	2	13.3	11	73.3
C25	Pancreas	62	1.8	5	8.1	9	14.5	48	77.4
C32	Larynx	33	0.9	24	72.7			9	27.3
C33–C34	Lung	367	10.4	52	14.2	25	6.8	290	79.0
C38,C45	Mesothelioma	6	0.2			1	16.7	5	83.3
C43	Malign. melanoma	80	2.3	52	65.0	2	2.5	26	32.5
C44	Skin others	166	4.7	89	53.6	5	3.0	72	43.4
C46,C49	Soft tissue	12	0.3	5	41.7	1	8.3	6	50.0
C48	Peritoneal	4	0.1	2	50.0			2	50.0
C60	Penis	7	0.2	4	57.1			3	42.9
C61	Prostate	1195	33.9	409	34.2	303	25.4	483	40.4
C62	Testis	13	0.4	13	100.0				
C64	Kidney	125	3.5	62	49.6	15	12.0	48	38.4
C65	Renal pelvis	137	3.9	44	32.1	17	12.4	76	55.5
C66	Ureter	120	3.4	43	35.8	19	15.8	58	48.3
C67	Bladder	305	8.7			3	1.0	302	99.0
C68	Urethra	60	1.7	6	10.0	20	33.3	34	56.7
C68	Urinary org.	29	0.8	3	10.3	4	13.8	22	75.9
C70–C72	CNS cancer	15	0.4	2	13.3	2	13.3	11	73.3
C73	Thyroid	10	0.3	8	80.0			2	20.0
C76–C79	CUP	43	1.2	9	20.9	3	7.0	31	72.1
C81	Hodgkin lymphoma	4	0.1	3	75.0			1	25.0
C82–C85	NHL	78	2.2	42	53.8	8	10.3	28	35.9
C90	Mult. myeloma	19	0.5	9	47.4	1	5.3	9	47.4
C91–C96	Leukaemia	23	0.7	3	13.0	3	13.0	17	73.9
Others, specified		15	0.4	8	53.3	1	6.7	6	40.0
All further malignancies		3526	100.0	1188	33.7	484	13.7	1854	52.6

Further malignancies with number of cases 1 to 3 are pooled in category “Others, specified”.

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

Table 14b

Further malignancies in deaths in period 1998–2020
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03–C06	Oral cavity	4	0.4	3	75.0			1	25.0
C09–C10	Oropharynx	6	0.6	4	66.7			2	33.3
C15	Oesophagus	7	0.7					7	100.0
C16	Stomach	17	1.8	8	47.1	1	5.9	8	47.1
C17	Small intestine	4	0.4	2	50.0	1	25.0	1	25.0
C18	Colon	74	7.7	40	54.1	4	5.4	30	40.5
C19–C20	Rectum	36	3.8	20	55.6	2	5.6	14	38.9
C21	Anus/canal	4	0.4	3	75.0			1	25.0
C22	Liver	3	0.3			1	33.3	2	66.7
C23–C24	Bile	5	0.5					5	100.0
C25	Pancreas	26	2.7	2	7.7	1	3.8	23	88.5
C33–C34	Lung	71	7.4	10	14.1	9	12.7	52	73.2
C38,C45	Mesothelioma	3	0.3					3	100.0
C43	Malign. melanoma	15	1.6	13	86.7			2	13.3
C44	Skin others	30	3.1	11	36.7	1	3.3	18	60.0
C46,C49	Soft tissue	4	0.4	2	50.0	1	25.0	1	25.0
C50	Breast	178	18.6	125	70.2	10	5.6	43	24.2
C51	Vulva	11	1.1	8	72.7	1	9.1	2	18.2
C52	Vagina	6	0.6	2	33.3			4	66.7
C53	Cervix uteri	63	6.6	52	82.5	8	12.7	3	4.8
C54	Corpus uteri	59	6.2	47	79.7	8	13.6	4	6.8
C55,C57	Fem. genitals un	5	0.5	2	40.0	2	40.0	1	20.0
C56	Ovary	29	3.0	15	51.7	1	3.4	13	44.8
C64	Kidney	35	3.7	15	42.9	8	22.9	12	34.3
C65	Renal pelvis	57	6.0	23	40.4	10	17.5	24	42.1
C66	Ureter	42	4.4	21	50.0	7	16.7	14	33.3
C67	Bladder	71	7.4			1	1.4	70	98.6
C68	Urethra	7	0.7	1	14.3	1	14.3	5	71.4
C68	Urinary org.	7	0.7	1	14.3			6	85.7
C70–C72	CNS cancer	6	0.6	5	83.3			1	16.7
C73	Thyroid	12	1.3	11	91.7			1	8.3
C74–C80	Cancer others	3	0.3	1	33.3	2	66.7		
C76–C79	CUP	16	1.7	2	12.5			14	87.5
C82–C85	NHL	20	2.1	11	55.0	2	10.0	7	35.0
C90	Mult. myeloma	3	0.3	3	100.0				
C91–C96	Leukaemia	10	1.0			1	10.0	9	90.0
Others, specified		8	0.8	3	37.5	2	25.0	3	37.5
All further malignancies		957	100.0	466	48.7	85	8.9	406	42.4

Further malignancies with number of cases 1 to 2 are pooled in category “Others, specified”.

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

Table 15

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**First primaries only** *)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	Males MI-index	Females Age-spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14		1			0.1	1.00		5.3
15-19								
20-24								
25-29								
30-34								
35-39	1	4	0.0	0.13	0.2	0.57	0.4	1.1
40-44	7	5	0.3	0.23	0.2	0.26	1.3	0.7
45-49	26	21	1.0	0.27	0.8	0.60	2.0	1.5
50-54	57	30	2.2	0.31	1.2	0.52	2.4	1.3
55-59	100	35	4.7	0.35	1.6	0.35	2.6	1.1
60-64	144	49	8.1	0.36	2.6	0.36	2.7	1.2
65-69	218	66	13.4	0.39	3.6	0.40	3.0	1.2
70-74	333	118	22.2	0.48	6.9	0.47	3.7	1.7
75-79	406	166	33.6	0.55	11.1	0.61	4.5	2.2
80-84	403	185	55.7	0.70	17.4	0.66	5.4	2.6
85+	467	308	100.0	0.87	29.5	0.72	7.2	3.3
All ages	2162	988					4.0	2.0
Mortality								
Raw			6.6	0.53	2.9	0.56		
WS			2.7	0.47	0.9	0.49		
ES			4.4	0.50	1.4	0.51		
BRD-S			6.1	0.53	2.0	0.54		
PYLL-70								
per 100,000			16.3		8.1			
ES			13.8		6.8			
AYLL-70			8.5		10.9			

* See corresponding tables with multiple malignancies.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**Single primaries only** *)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	Males MI-index	Females Age-spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14		1			0.1	1.00		5.3
15-19								
20-24								
25-29								
30-34								
35-39	1	4	0.0	0.13	0.2	0.57	0.4	1.1
40-44	7	5	0.3	0.27	0.2	0.26	1.3	0.7
45-49	23	19	0.9	0.28	0.7	0.61	1.8	1.3
50-54	47	27	1.8	0.33	1.1	0.55	2.0	1.2
55-59	73	31	3.4	0.34	1.4	0.34	1.9	1.0
60-64	101	41	5.7	0.35	2.2	0.34	1.9	1.0
65-69	130	57	8.0	0.34	3.1	0.41	1.8	1.1
70-74	194	95	12.9	0.39	5.5	0.43	2.2	1.4
75-79	264	137	21.8	0.47	9.1	0.56	3.0	1.9
80-84	266	157	36.7	0.57	14.7	0.61	3.8	2.3
85+	333	272	71.3	0.69	26.1	0.67	5.6	3.0
All ages	1439	846					2.8	1.8
Mortality								
Raw			4.4	0.46	2.5	0.53		
WS			1.8	0.42	0.8	0.47		
ES			2.9	0.44	1.2	0.49		
BRD-S			4.1	0.46	1.7	0.51		
PYLL-70								
per 100,000			12.4		7.3			
ES			10.5		6.2			
AYLL-70			9.3		11.1			

* See corresponding tables with multiple malignancies.

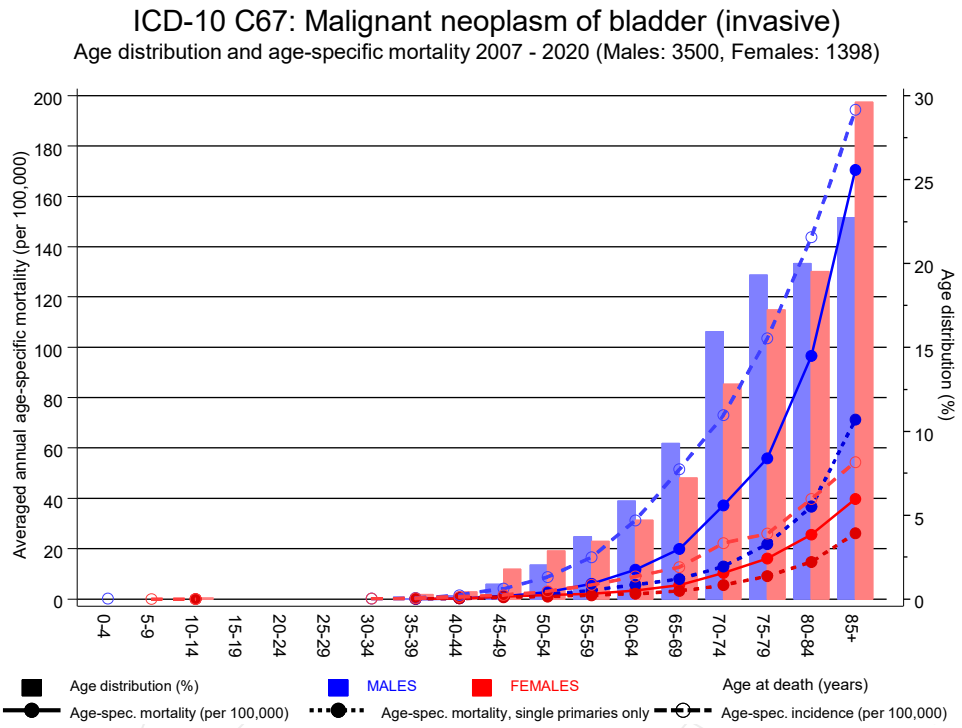
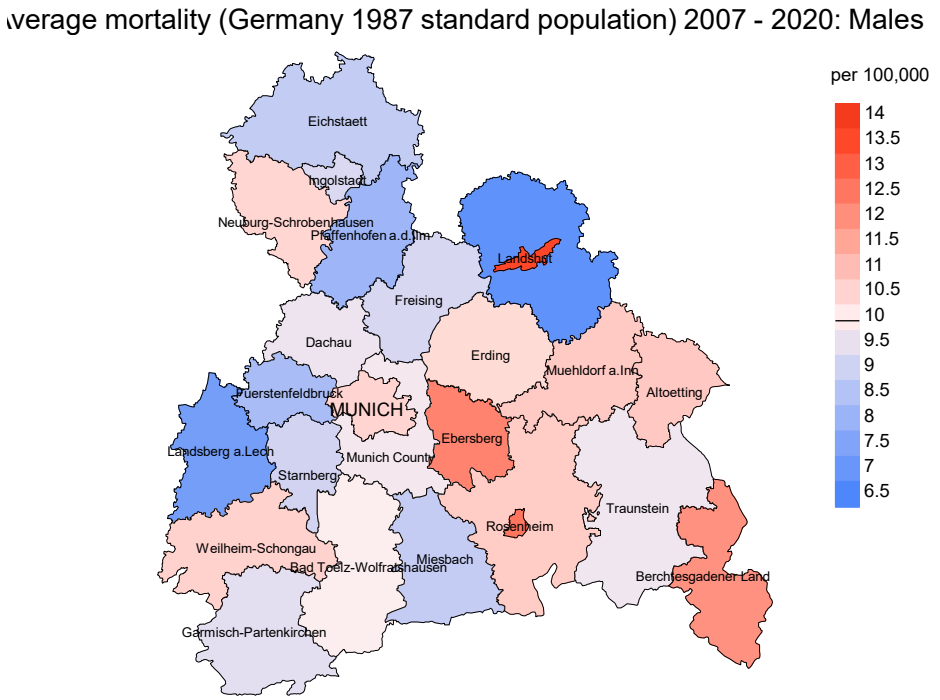


Figure 17. Distribution of age at death (bars; males: mean=73.3 yrs, median=74.4 yrs; females: mean=75.1 yrs, median=77.0 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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



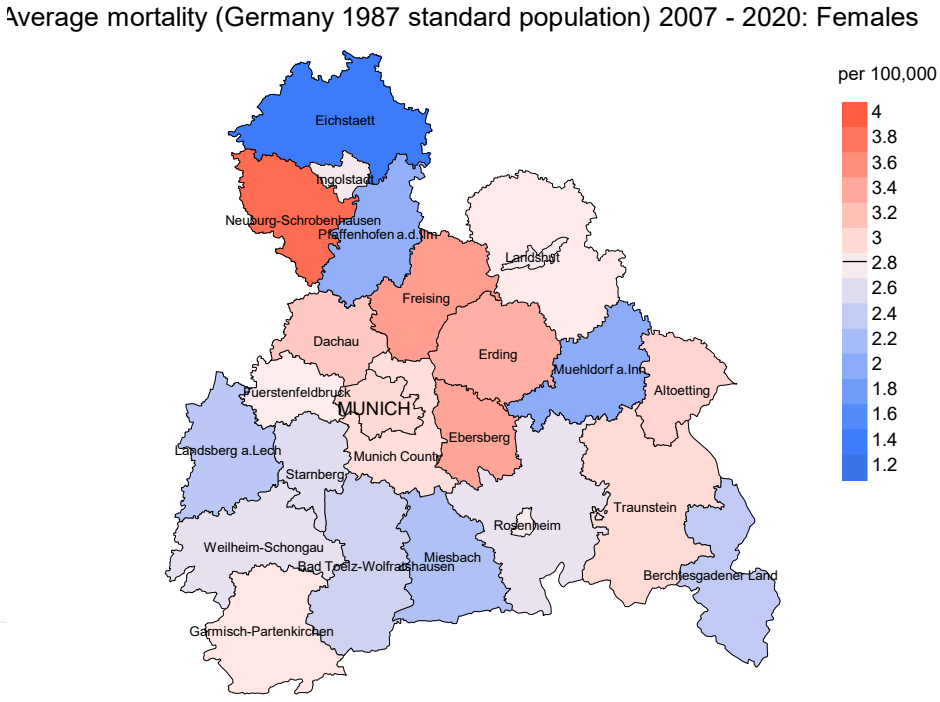
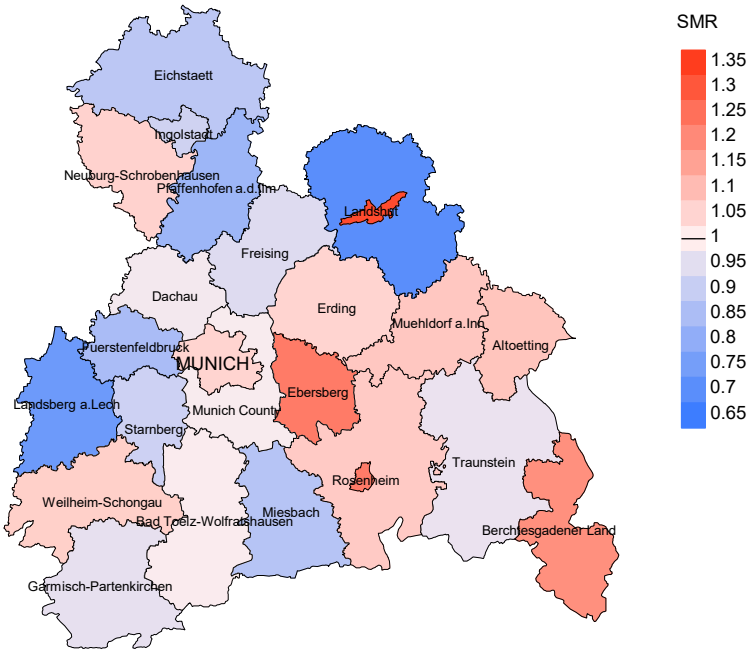


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2020. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 9.9/100,000 WS N=3,500, females 2.8/100,000 WS N=1,398).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,727 female residents (averaged) in the period from 2007 to 2020 a total of 45 women died from bladder cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 3.4/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 2.2 and 5.1/100,000.

Standardized mortality ratio (SMR) 2007 - 2020: Males



Standardized mortality ratio (SMR) 2007 - 2020: Females

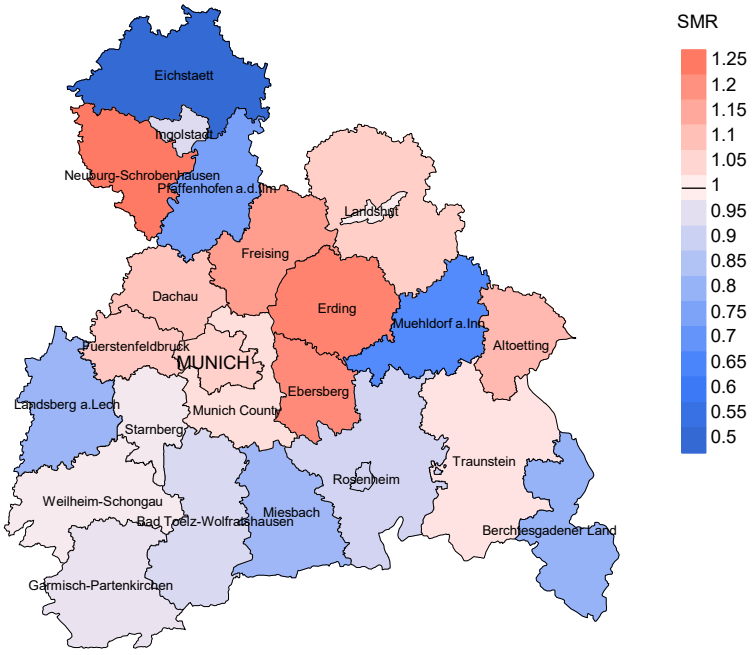


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=3,500, females N=1,398).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2020 a total of 45 women died from bladder cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.21. Though, the value of this parameter may vary with an underlying probability of 99% between 0.80 and 1.76, 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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