Munich Cancer Registry

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ICD-10 C64-C68: Urinary tract cancer

Incidence and Mortality

Year of diagnosis	1998-2020
Patients	28,339
Diseases	29,660
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/bC6468E-ICD-10-C64-C68-Urinary-tract-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
C64	Malignant neoplasm of kidney, except renal pelvis
C65	Malignant neoplasm of renal pelvis
C66	Malignant neoplasm of ureter
C67.-	Malignant neoplasm of bladder
C68.-	Malignant neoplasm of other and unspecified urinary 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	788	84	10.7	16.2	17.9	77.3	97.5
1999	753	72	9.6	15.6	17.8	76.8	96.7
2000	727	92	12.7	16.6	17.7	78.3	97.8
2001	731	74	10.1	17.0	17.6	78.0	97.4
2002	1344	189	14.1	18.5	17.6	81.8	98.7 #
2003	1330	154	11.6	18.6	17.5	76.9	96.6
2004	1311	154	11.7	19.0	17.4	74.0	97.5
2005	1359	105	7.7	19.4	17.1	70.8	96.7
2006	1405	104	7.4	19.5	16.9	72.1	94.4
2007	1523	133	8.7	19.8	16.5	69.3	93.6 #
2008	1599	144	9.0	20.5	16.1	68.5	98.0
2009	1594	132	8.3	21.2	15.8	66.8	98.2
2010	1606	129	8.0	21.8	15.5	63.8	97.6
2011	1566	115	7.3	22.2	15.1	63.1	98.2
2012	1593	120	7.5	22.6	14.7	62.2	98.2
2013	1606	127	7.9	23.2	14.0	58.1	97.8
2014	1599	125	7.8	23.6	13.6	56.2	97.3
2015	1536	159	10.4	24.0	13.0	55.0	94.4
2016	1419	144	10.1	24.4	12.7	54.1	99.3
2017	1411	123	8.7	25.0	12.1	46.5	99.4
2018	1250	55	4.4	25.4	11.4	35.0	99.1
2019	918	14	1.5	25.6	9.3	29.2	99.5
2020	692	1	0.1	25.8	7.3	25.4	99.6 ##
1998-2020	29660	2549	8.6	25.8	17.9	62.7	97.5

29,660 cases diagnosed 1998-2020 are related to a total of 28,339 patients. Currently, in 11,199 (39.5 %) of these 28,339 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 8,127 / 2,272 / 800 (28.7 % / 8.0 % / 2.8 %) 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 retreived from the respective headings.

How to interpret:
In 2018, a subgroup of 1,250 cases has been diagnosed, of which 25.4 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 11.4 % 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 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	511	64.8	46	9.0	16.4	20.2	77.1	97.7
1999	509	67.6	49	9.6	15.7	20.1	77.4	96.9
2000	481	66.2	56	11.6	16.7	20.0	77.5	97.3
2001	450	61.6	37	8.2	17.3	20.0	76.4	97.8
2002	880	65.5	105	11.9	18.9	19.9	81.4	99.0 #
2003	902	67.8	90	10.0	19.3	19.8	76.6	96.3
2004	867	66.1	79	9.1	19.5	19.7	74.7	97.2
2005	907	66.7	51	5.6	19.8	19.4	70.2	97.0
2006	938	66.8	48	5.1	19.9	19.1	72.1	94.5
2007	1020	67.0	65	6.4	20.3	18.7	68.9	92.8 #
2008	1080	67.5	76	7.0	21.1	18.2	68.2	98.1
2009	1073	67.3	83	7.7	22.0	17.8	66.5	98.1
2010	1079	67.2	60	5.6	22.6	17.6	63.4	97.9
2011	1065	68.0	76	7.1	23.1	17.0	64.4	98.3
2012	1103	69.2	62	5.6	23.6	16.5	62.1	98.1
2013	1114	69.4	67	6.0	24.3	15.8	58.4	97.8
2014	1093	68.4	70	6.4	24.7	15.4	56.1	97.3
2015	1061	69.1	96	9.0	25.1	14.9	54.0	94.7
2016	987	69.6	86	8.7	25.5	14.5	54.2	99.2
2017	964	68.3	65	6.7	26.2	14.0	44.6	99.3
2018	899	71.9	35	3.9	26.7	13.1	32.4	99.4
2019	648	70.6	5	0.8	26.9	11.3	28.7	99.2
2020	482	69.7	1	0.2	27.1	9.5	23.7	99.4 ##
1998-2020	20113	67.8	1408	7.0	27.1	20.2	62.0	97.5

20,113 cases diagnosed 1998-2020 are related to a total of 19,148 patients. Currently, in 8,216 (42.9 %) of these 19,148 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 5,892 / 1,684 / 640 (30.8 % / 8.8 % / 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 899 cases has been diagnosed, of which 26.7 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 13.1 % 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 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	277	35.2	38	13.7	15.9	13.2	77.6	97.1	
1999	244	32.4	23	9.4	15.5	13.1	75.4	96.3	
2000	246	33.8	36	14.6	16.4	12.9	79.7	98.8	
2001	281	38.4	37	13.2	16.6	12.7	80.4	96.8	
2002	464	34.5	84	18.1	17.7	12.7	82.5	98.1	#
2003	428	32.2	64	15.0	17.5	12.6	77.6	97.2	
2004	444	33.9	75	16.9	18.2	12.5	72.5	98.0	
2005	452	33.3	54	11.9	18.6	12.3	71.9	96.0	
2006	467	33.2	56	12.0	18.6	12.1	72.2	94.2	
2007	503	33.0	68	13.5	18.6	11.8	70.2	95.0	#
2008	519	32.5	68	13.1	19.1	11.7	69.2	97.7	
2009	521	32.7	49	9.4	19.5	11.4	67.2	98.5	
2010	527	32.8	69	13.1	20.2	11.0	64.7	97.2	
2011	501	32.0	39	7.8	20.5	11.0	60.3	98.0	
2012	490	30.8	58	11.8	20.8	10.6	62.4	98.4	
2013	492	30.6	60	12.2	21.1	10.1	57.3	97.8	
2014	506	31.6	55	10.9	21.4	9.7	56.5	97.2	
2015	475	30.9	63	13.3	21.8	8.8	57.3	93.7	
2016	432	30.4	58	13.4	22.0	8.6	53.9	99.5	
2017	447	31.7	58	13.0	22.4	7.8	50.6	99.6	
2018	351	28.1	20	5.7	22.8	7.3	41.6	98.3	
2019	270	29.4	9	3.3	23.0	4.5	30.4	100.0	
2020	210	30.3			23.1	2.5	29.5	100.0	##
1998-2020	9547	32.2	1141	12.0	23.1	13.2	64.1	97.4	

9,547 cases diagnosed 1998-2020 are related to a total of 9,191 patients. Currently, in 2,983 (32.5 %) of these 9,191 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 2,235 / 588 / 160 (24.3 % / 6.4 % / 1.7 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:
In 2018, a subgroup of 351 cases has been diagnosed, of which 22.8 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 7.3 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 2

Incidence measures by year of diagnosis including DCO cases
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.94 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	511	277	46.1	23.5	28.3	10.4	42.2	15.4	54.8	19.8
1999	509	244	45.5	20.6	27.4	9.8	40.9	14.1	52.9	17.6
2000	481	246	42.2	20.5	25.2	8.5	37.7	12.9	49.6	16.9
2001	450	281	38.8	23.1	22.9	9.9	34.2	14.9	43.8	19.3
2002	880	464	47.2	23.7	26.0	10.0	39.8	14.8	53.2	19.3
2003	902	428	48.1	21.7	26.7	8.9	39.9	13.2	52.3	17.3
2004	867	444	46.1	22.5	25.2	9.2	37.5	13.8	49.2	18.1
2005	907	452	47.9	22.7	25.6	9.6	38.2	14.0	49.4	18.1
2006	938	467	49.0	23.2	25.9	10.2	38.5	14.7	50.4	18.6
2007	1020	503	46.0	21.8	24.1	8.9	35.8	13.1	46.1	17.2
2008	1080	519	48.5	22.4	24.8	9.5	37.2	13.8	48.1	17.9
2009	1073	521	48.1	22.4	24.1	9.2	36.1	13.4	47.4	17.6
2010	1079	527	47.9	22.5	23.6	8.3	35.2	12.7	45.6	16.7
2011	1065	501	47.6	21.4	23.3	9.4	34.7	13.2	44.8	16.6
2012	1103	490	48.6	20.8	22.9	7.8	34.5	11.9	45.6	15.9
2013	1114	492	48.4	20.6	22.8	8.2	34.1	12.0	44.6	15.5
2014	1093	506	46.9	21.0	22.0	8.3	33.0	12.3	42.5	15.9
2015	1061	475	44.6	19.5	19.8	7.8	30.2	11.2	40.3	14.4
2016	987	432	41.1	17.6	18.5	6.9	28.0	10.0	36.9	12.8
2017	964	447	39.9	18.1	17.7	6.5	26.7	9.8	35.5	13.1
2018	899	351	36.9	14.1	16.6	5.2	25.0	7.8	32.5	10.3
2019	648	270	26.6	10.9	12.1	4.1	18.2	6.1	23.4	8.1
2020	482	210	19.8	8.5	8.8	3.5	13.3	5.1	17.4	6.5
1998–2020	20113	9547	43.2	19.8	21.5	8.0	32.1	11.8	41.7	15.2

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	788	68.9	13.5	2.8	99.7	51.7	61.3	70.0	78.1	85.5
1999	753	67.9	12.7	1.1	94.3	52.6	59.6	68.5	77.3	84.1
2000	727	69.4	12.6	0.3	99.7	53.7	61.6	70.2	78.4	85.6
2001	731	69.2	12.3	1.9	96.4	53.5	61.5	69.4	78.3	84.9
2002	1344	70.9	12.4	0.1	99.5	55.2	63.3	72.2	79.5	85.9
2003	1330	70.3	13.0	0.4	103	54.3	63.2	71.2	79.2	85.4
2004	1311	70.0	13.1	0.0	99.0	53.9	62.7	71.1	79.1	85.1
2005	1359	69.8	13.0	0.7	101	54.4	62.6	70.8	79.0	84.6
2006	1405	69.9	13.5	0.2	101	53.6	63.1	71.2	78.8	85.1
2007	1523	70.2	13.3	1.2	101	53.4	63.9	71.3	79.3	85.1
2008	1599	70.4	13.1	0.2	100	53.2	63.4	71.5	79.6	85.7
2009	1594	70.5	13.2	0.5	103	53.6	63.6	71.9	79.8	85.0
2010	1606	71.0	12.8	5.4	100	53.8	63.4	72.2	80.5	86.4
2011	1566	70.5	13.8	0.5	97.6	53.2	63.3	72.0	79.8	86.4
2012	1593	71.4	12.3	1.3	103	55.1	64.5	72.9	80.0	85.0
2013	1606	71.2	12.9	0.3	101	54.4	64.6	72.6	80.2	85.7
2014	1599	71.1	12.5	1.2	107	55.2	63.5	72.9	79.6	85.8
2015	1536	72.2	12.9	0.5	103	54.9	65.7	74.4	80.6	86.3
2016	1419	72.1	12.5	2.4	98.8	55.0	64.3	74.4	80.7	86.7
2017	1411	72.5	12.3	0.9	102	56.0	65.7	74.8	81.1	86.0
2018	1250	71.9	12.1	2.8	97.6	55.1	64.2	74.2	80.2	85.7
2019	918	71.4	11.7	23.8	96.6	54.9	63.5	73.1	79.9	84.8
2020	692	71.3	12.0	18.4	95.3	54.4	63.6	73.0	80.1	84.7
1998–2020	29660	70.8	12.9	0.0	107	54.3	63.4	72.3	79.7	85.6

Table 3a

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	511	67.7	13.5	5.0	95.6	50.8	60.2	69.0	76.7	84.3
1999	509	67.2	12.3	2.3	94.1	52.4	59.5	67.2	76.0	83.0
2000	481	67.8	12.6	0.3	99.7	52.7	60.8	68.7	76.7	82.1
2001	450	67.5	11.2	1.9	95.1	53.3	60.7	67.4	75.8	81.4
2002	880	69.8	12.0	0.1	97.6	54.7	62.6	70.9	78.2	83.7
2003	902	69.0	12.8	0.4	101	52.8	62.1	69.6	77.6	83.6
2004	867	68.7	12.9	0.0	98.8	53.4	61.5	69.7	77.6	82.8
2005	907	68.7	11.7	0.7	101	54.6	61.7	69.0	77.0	82.9
2006	938	69.2	12.6	0.8	101	54.0	62.6	70.0	77.8	83.6
2007	1020	69.0	12.6	1.3	101	53.2	62.8	70.1	77.2	83.6
2008	1080	69.7	12.7	0.2	100	52.6	62.8	70.7	78.5	85.0
2009	1073	69.7	12.8	0.5	97.4	53.2	62.9	70.9	78.4	84.1
2010	1079	69.4	12.5	5.4	99.1	52.5	61.3	70.8	78.4	84.1
2011	1065	70.2	12.7	1.5	96.9	52.6	62.6	71.4	79.0	85.6
2012	1103	70.4	12.4	1.3	103	54.0	62.8	72.3	79.1	84.1
2013	1114	70.6	12.3	0.9	98.6	54.0	64.1	71.9	79.2	84.8
2014	1093	70.6	12.4	1.2	97.0	54.9	62.9	72.2	79.2	85.2
2015	1061	72.0	12.0	0.7	103	55.7	65.5	74.2	79.8	85.3
2016	987	71.8	11.8	13.7	98.8	55.4	63.8	73.8	80.2	86.1
2017	964	71.8	12.1	0.9	102	56.0	65.2	74.0	80.1	84.7
2018	899	71.3	12.1	2.8	97.6	54.5	63.5	73.7	79.3	85.1
2019	648	71.0	11.6	23.8	95.4	54.9	62.9	72.5	79.4	84.8
2020	482	71.5	11.9	18.4	95.3	55.5	63.6	73.6	80.3	84.7
1998–2020	20113	69.9	12.4	0.0	103	53.9	62.6	71.3	78.6	84.4

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	277	71.0	13.5	2.8	99.7	56.2	63.0	72.6	80.1	86.3
1999	244	69.5	13.5	1.1	94.3	52.6	60.9	71.6	78.7	85.7
2000	246	72.6	11.9	37.2	94.5	58.8	63.7	74.3	81.5	87.6
2001	281	71.9	13.4	30.6	96.4	54.2	64.1	73.7	81.1	88.2
2002	464	72.8	12.8	2.4	99.5	57.9	65.3	74.2	81.9	87.7
2003	428	73.2	13.0	2.5	103	56.7	65.6	75.0	82.5	87.9
2004	444	72.6	13.3	18.5	99.0	56.4	64.8	74.5	82.0	87.9
2005	452	72.1	15.0	3.8	98.8	54.0	64.2	74.8	82.1	88.5
2006	467	71.3	15.0	0.2	96.7	52.5	64.6	74.0	81.8	87.5
2007	503	72.4	14.5	1.2	99.1	55.7	67.0	74.7	82.2	87.1
2008	519	71.8	13.8	0.6	97.0	55.7	64.5	73.7	82.0	86.9
2009	521	72.2	14.0	1.7	103	55.5	66.0	74.3	82.1	86.8
2010	527	74.4	12.8	5.4	100	56.0	67.8	75.3	84.0	89.5
2011	501	71.2	15.9	0.5	97.6	53.6	64.9	73.8	81.5	87.9
2012	490	73.6	11.8	9.7	96.4	58.3	67.4	75.2	82.1	87.4
2013	492	72.7	14.0	0.3	101	55.1	66.5	74.5	81.8	88.1
2014	506	72.3	12.8	2.5	107	55.6	65.1	74.5	81.0	87.2
2015	475	72.6	14.9	0.5	98.0	53.4	66.2	75.0	82.3	88.4
2016	432	72.9	14.0	2.4	97.5	53.7	65.9	76.0	82.3	88.2
2017	447	74.1	12.7	1.8	97.7	56.0	67.3	76.4	82.6	88.7
2018	351	73.6	11.9	27.4	96.3	57.9	66.1	76.2	81.7	87.4
2019	270	72.5	11.8	28.5	96.6	55.2	65.4	74.8	80.6	84.8
2020	210	70.8	12.2	37.0	95.2	52.7	63.8	72.3	80.0	85.0
1998–2020	9547	72.5	13.6	0.2	107	55.4	65.3	74.5	81.8	87.7

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	60	0.3	0.3	30	0.2	0.2	30	0.5	0.5
5-9	19	0.1	0.4	9	0.1	0.3	10	0.2	0.6
10-14	9	0.0	0.4	3	0.0	0.3	6	0.1	0.7
15-19	5	0.0	0.5	4	0.0	0.3	1	0.0	0.8
20-24	11	0.1	0.5	7	0.1	0.4	4	0.1	0.8
25-29	20	0.1	0.6	12	0.1	0.5	8	0.1	0.9
30-34	45	0.2	0.8	25	0.2	0.7	20	0.3	1.3
35-39	142	0.7	1.6	99	0.7	1.4	43	0.7	2.0
40-44	276	1.4	2.9	191	1.4	2.8	85	1.4	3.3
45-49	553	2.8	5.7	418	3.1	5.8	135	2.2	5.5
50-54	977	4.9	10.6	726	5.3	11.2	251	4.0	9.5
55-59	1368	6.9	17.5	1016	7.4	18.6	352	5.6	15.1
60-64	1860	9.3	26.8	1376	10.1	28.7	484	7.8	22.9
65-69	2686	13.5	40.3	1914	14.0	42.7	772	12.4	35.2
70-74	3346	16.8	57.1	2382	17.4	60.1	964	15.4	50.7
75-79	3496	17.6	74.7	2390	17.5	77.6	1106	17.7	68.4
80-84	2739	13.8	88.4	1765	12.9	90.5	974	15.6	84.0
85+	2300	11.6	100.0	1301	9.5	100.0	999	16.0	100.0
All ages	19912	100.0		13668	100.0		6244	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=820 %	Females DCO rate n=658 %	Males Prop.all cancers n=153686 %	Females Prop.all cancers n=155051 %
0- 4	27	28	1.7	1.8			12.3	16.4
5- 9	9	10	0.6	0.7			7.7	10.0
10-14	3	6	0.2	0.4		16.7	2.2	4.7
15-19	4	1	0.2	0.1			1.3	0.4
20-24	7	4	0.3	0.2			1.1	0.8
25-29	12	8	0.5	0.4			1.3	0.7
30-34	25	20	1.1	0.9			1.9	0.9
35-39	99	43	4.3	1.9			5.4	1.2
40-44	187	84	7.5	3.5	0.5		6.7	1.4
45-49	409	135	15.2	5.2	0.7	0.7	8.1	1.4
50-54	705	249	27.7	9.9	1.0	2.8	8.4	2.0
55-59	990	348	46.6	16.0	1.6	1.4	7.8	2.6
60-64	1336	479	75.6	25.2	2.0	2.5	7.6	3.1
65-69	1866	755	114.3	41.6	2.6	2.4	7.7	4.0
70-74	2307	945	153.9	55.0	3.6	4.6	8.4	4.8
75-79	2327	1083	192.3	72.1	6.4	5.5	9.7	5.5
80-84	1719	948	237.4	89.1	10.5	14.9	11.2	6.2
85+	1283	990	274.7	95.0	23.7	37.4	12.2	6.0
All ages	13315	6136			6.2	10.7	8.7	4.0
Incidence								
Raw			40.9	18.3				
WS			19.3	7.2				
ES			28.9	10.6				
BRD-S			37.6	13.7				

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).

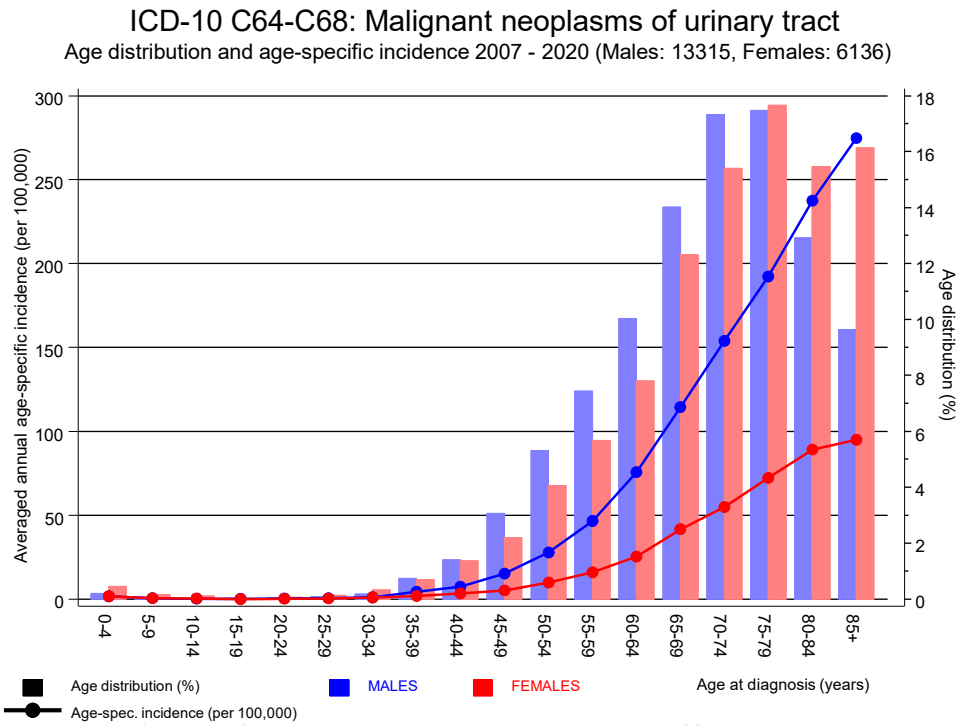


Figure 6. Age distribution (males: mean=70.6 yrs, median=72.1 yrs; females: mean=72.7 yrs, median=74.8 yrs) and age-specific incidence.

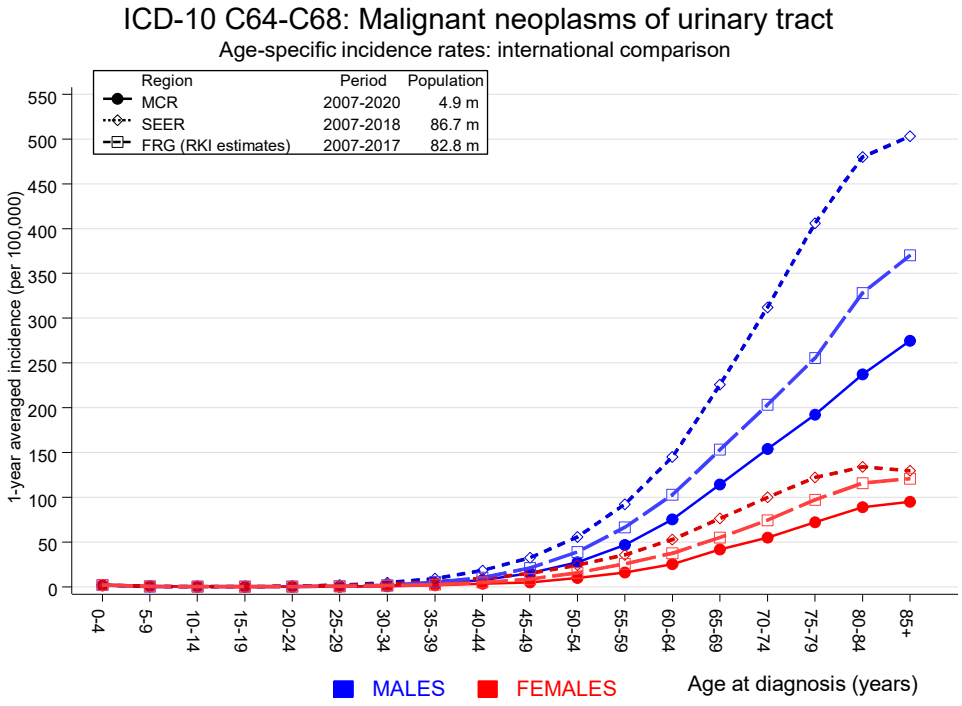


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, RKI estimates) and SEER (Surveillance, Epidemiology, and End Results, USA).

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	21	8.7	2.4	1.5	3.7	#	1.9	4.8
C07–C08	Salivary gland	6	2.9	2.0	0.7	4.4		0.5	
C09–C10	Oropharynx	26	10.4	2.5	1.6	3.7	#	2.4	
C12–C13	Hypopharynx	13	5.7	2.3	1.2	3.9	#	1.1	
C15	Oesophagus	54	22.1	2.4	1.8	3.2	#	4.9	7.4
C16	Stomach	98	48.7	2.0	1.6	2.5	#	7.5	8.2
C17	Small intestine	26	7.0	3.7	2.4	5.5	#	2.9	
C18	Colon	257	118.8	2.2	1.9	2.4	#	21.1	7.4
C19–C20	Rectum	112	61.1	1.8	1.5	2.2	#	7.8	2.7
C22	Liver	86	33.7	2.5	2.0	3.1	#	8.0	10.5
C23–C24	Bile	24	12.8	1.9	1.2	2.8	#	1.7	16.7
C25	Pancreas	116	47.2	2.5	2.0	2.9	#	10.5	19.8
C32	Larynx	26	10.9	2.4	1.6	3.5	#	2.3	3.8
C33–C34	Lung	496	136.8	3.6	3.3	4.0	#	54.8	12.1
C38,C45	Mesothelioma	15	8.4	1.8	1.0	3.0	#	1.0	13.3
C43	Malign. melanoma	116	52.2	2.2	1.8	2.7	#	9.7	3.4
C46,C49	Soft tissue	21	6.9	3.1	1.9	4.7	#	2.2	
C48	Peritoneal	8	0.9	8.7	3.8	17.2	#	1.1	25.0
C50	Breast	5	3.3	1.5	0.5	3.6		0.3	20.0
C60	Penis	11	3.0	3.6	1.8	6.5	#	1.2	
C61	Prostate	1879	332.1	5.7	5.4	5.9	#	235.8	4.2
C62	Testis	12	2.3	5.2	2.7	9.1	#	1.5	
C64	Kidney	314	39.5	7.9	7.1	8.9	#	41.8	8.6
C65	Renal pelvis	133	5.5	24.3	20.3	28.7	#	19.4	0.8
C66	Ureter	120	3.3	36.7	30.4	43.9	#	17.8	
C67	Bladder	264	59.2	4.5	3.9	5.0	#	31.2	9.5
C68	Urethra	92	1.2	79.4	64.0	97.4	#	13.8	
C68	Urinary org.	31	0.9	35.0	23.8	49.7	#	4.6	80.6
C70–C72	CNS cancer	32	14.4	2.2	1.5	3.1	#	2.7	9.4
C73	Thyroid	20	6.7	3.0	1.8	4.6	#	2.0	10.0
C76–C79	CUP	51	20.5	2.5	1.9	3.3	#	4.7	5.9
C81	Hodgkin lymphoma	7	2.5	2.8	1.1	5.7	#	0.7	
C82–C85	NHL	125	51.0	2.5	2.0	2.9	#	11.3	8.0
C90	Mult. myeloma	29	15.9	1.8	1.2	2.6	#	2.0	17.2
C91–C96	Leukaemia	35	18.8	1.9	1.3	2.6	#	2.5	28.6
Others, specified		26	14.6	1.8	1.2	2.6	#	1.7	11.5
Not observed		0	1.7	0.0	0.0	2.1		−0.3	
All further malignancies		4707	1191.6	4.0	3.8	4.1	#	535.9	7.1

Patients	18002
Median age at next malignancy (years)	73.0
Person-years	65602
Mean observation time (years)	3.6
Median observation time (years)	1.8

The occurrence of further specified malignancy is statistically significant.

Further observed malignancies with count 1 to 4 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	8	2.4	3.3	1.4	6.6	#	1.9	25.0
C16	Stomach	29	14.1	2.1	1.4	3.0	#	5.0	3.4
C17	Small intestine	10	1.9	5.2	2.5	9.6	#	2.7	
C18	Colon	83	39.8	2.1	1.7	2.6	#	14.6	7.2
C19-C20	Rectum	32	15.6	2.1	1.4	2.9	#	5.6	6.3
C21	Anus/canal	3	2.0	1.5	0.3	4.4		0.3	
C22	Liver	13	4.9	2.6	1.4	4.5	#	2.7	15.4
C23-C24	Bile	18	5.9	3.1	1.8	4.8	#	4.1	16.7
C25	Pancreas	58	19.1	3.0	2.3	3.9	#	13.2	27.6
C32	Larynx	3	0.6	4.8	1.0	14.2		0.8	
C33-C34	Lung	126	27.5	4.6	3.8	5.5	#	33.3	13.5
C38,C45	Mesothelioma	3	0.7	4.0	0.8	11.8		0.8	
C43	Malign. melanoma	22	13.5	1.6	1.0	2.5	#	2.9	9.1
C46,C49	Soft tissue	5	2.2	2.3	0.7	5.3		1.0	
C50	Breast	259	106.6	2.4	2.1	2.7	#	51.6	6.6
C51	Vulva	10	4.3	2.3	1.1	4.3	#	1.9	10.0
C52	Vagina	4	0.8	5.3	1.4	13.6	#	1.1	
C53	Cervix uteri	20	4.1	4.9	3.0	7.5	#	5.4	5.0
C54	Corpus uteri	44	20.2	2.2	1.6	2.9	#	8.1	4.5
C55,C57	Fem. genitals un	5	1.0	5.2	1.7	12.2	#	1.4	40.0
C56	Ovary	27	14.9	1.8	1.2	2.6	#	4.1	25.9
C64	Kidney	124	9.2	13.5	11.3	16.1	#	38.8	13.7
C65	Renal pelvis	46	1.3	35.9	26.3	47.9	#	15.1	
C66	Ureter	45	0.7	64.5	47.0	86.3	#	15.0	
C67	Bladder	118	8.2	14.3	11.9	17.1	#	37.1	11.0
C68	Urethra	8	0.1	74.9	32.3	147.5	#	2.7	
C68	Urinary org.	8	0.2	45.9	19.8	90.5	#	2.6	62.5
C70-C72	CNS cancer	9	4.8	1.9	0.9	3.6		1.4	33.3
C73	Thyroid	28	4.8	5.8	3.9	8.4	#	7.8	3.6
C76-C79	CUP	17	7.6	2.2	1.3	3.6	#	3.2	5.9
C82-C85	NHL	41	15.3	2.7	1.9	3.6	#	8.7	14.6
C90	Mult. myeloma	9	4.9	1.8	0.8	3.5		1.4	11.1
C91-C96	Leukaemia	23	5.8	3.9	2.5	5.9	#	5.8	17.4
Others, specified		17	9.7	1.7	1.0	2.8	#	2.5	11.8
Not observed		0	1.4	0.0	0.0	2.6		-0.5	
All further malignancies		1275	376.1	3.4	3.2	3.6	#	304.0	10.5

Patients	8304
Median age at next malignancy (years)	75.5
Person-years	29566
Mean observation time (years)	3.6
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”.

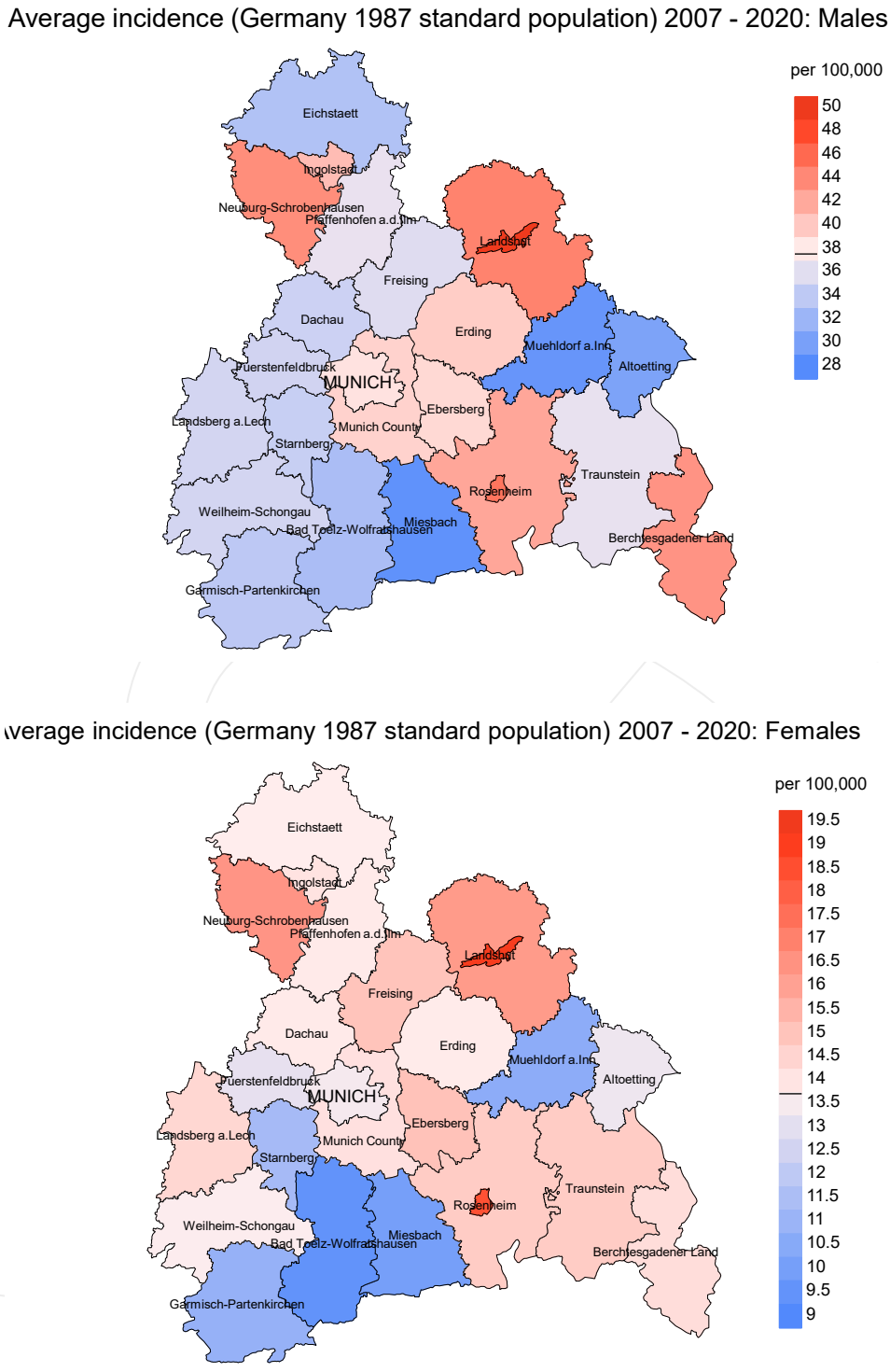
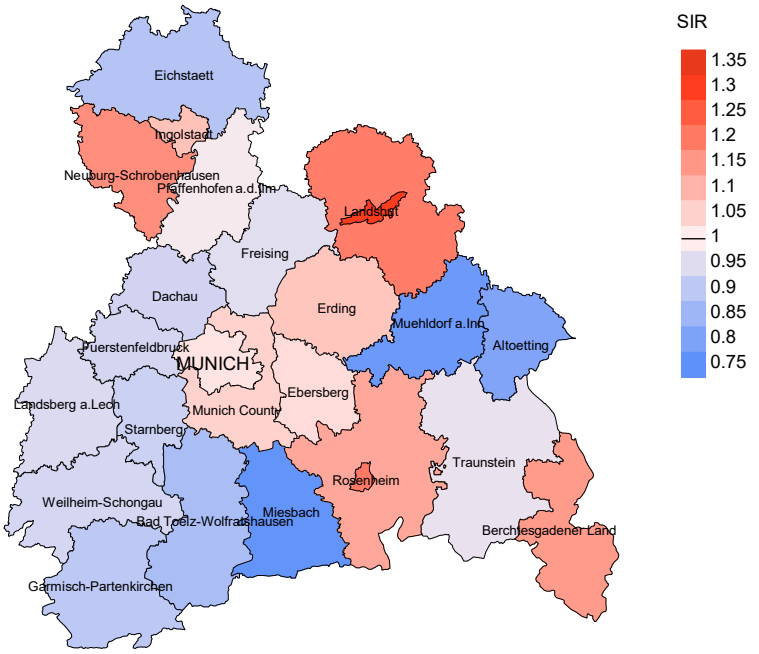


Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 37.6/100,000 WS N=13,315, females 13.7/100,000 WS N=6,136).

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 184 women were identified with newly diagnosed urinary tract cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 15.1/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 12.3 and 18.2/100,000.

Standardized incidence ratio (SIR) 2007 - 2020: Males



Standardized incidence ratio (SIR) 2007 - 2020: Females

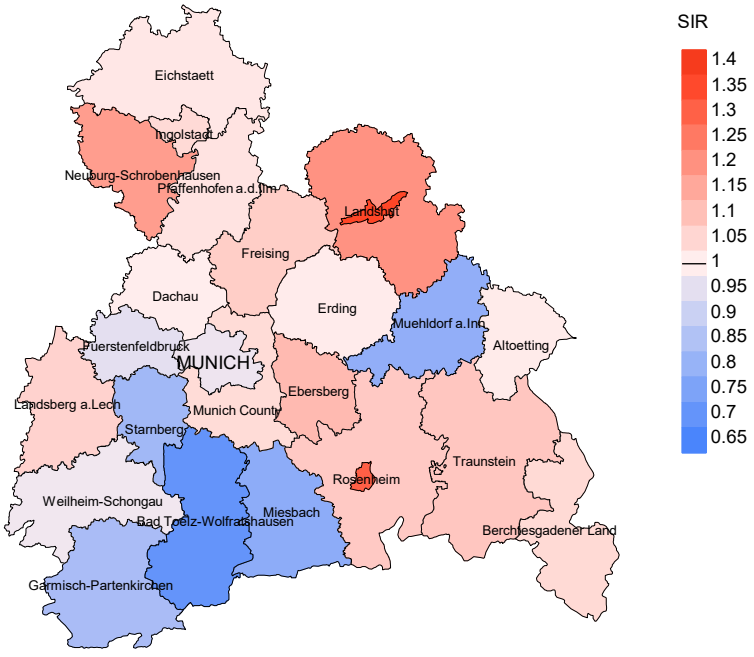


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=13,315, females N=6,136).

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 184 women were identified with newly diagnosed urinary tract cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.11. Though, the value of this parameter may vary with an underlying probability of 99% between 0.91 and 1.34, 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	788	97.5	10.7	609	77.3	93.3
1999	753	96.7	9.6	578	76.8	94.6
2000	727	97.8	12.7	569	78.3	94.6
2001	731	97.4	10.1	570	78.0	95.6
2002	1344	98.7	14.1	1099	81.8	96.5
2003	1330	96.6	11.6	1023	76.9	96.0
2004	1311	97.5	11.7	970	74.0	96.1
2005	1359	96.7	7.7	962	70.8	95.7
2006	1405	94.4	7.4	1013	72.1	94.9
2007	1523	93.6	8.7	1056	69.3	95.6
2008	1599	98.0	9.0	1096	68.5	96.2
2009	1594	98.2	8.3	1064	66.8	95.7
2010	1606	97.6	8.0	1025	63.8	96.1
2011	1566	98.2	7.3	988	63.1	94.5
2012	1593	98.2	7.5	991	62.2	94.2
2013	1606	97.8	7.9	933	58.1	94.7
2014	1599	97.3	7.8	899	56.2	92.7
2015	1536	94.4	10.4	845	55.0	91.7
2016	1419	99.3	10.1	768	54.1	90.9
2017	1411	99.4	8.7	656	46.5	85.1
2018	1250	99.1	4.4	437	35.0	66.6
2019	918	99.5	1.5	268	29.2	82.5
2020	692	99.6	0.1	176	25.4	95.5
1998-2020	29660	97.5	8.6	18595	62.7	93.7

Table 9b

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

Year of diagnosis/ death	Incident cases n	Deaths n	Prop. deaths with death certific. %	Deaths in same year n	Prop. deaths in same year %
1998	788	487	92.6	147	18.7
1999	753	458	95.2	156	20.7
2000	727	471	95.1	147	20.2
2001	731	477	95.8	128	17.5
2002	1344	702	96.6	301	22.4
2003	1330	811	96.8	290	21.8
2004	1311	793	97.0	265	20.2
2005	1359	785	96.6	219	16.1
2006	1405	835	97.4	237	16.9
2007	1523	949	97.8	274	18.0
2008	1599	949	98.8	278	17.4
2009	1594	1027	99.1	324	20.3
2010	1606	1069	98.7	296	18.4
2011	1566	1020	98.4	285	18.2
2012	1593	1112	98.3	304	19.1
2013	1606	1089	99.1	284	17.7
2014	1599	1124	98.0	287	17.9
2015	1536	1233	98.4	319	20.8
2016	1419	1249	99.2	324	22.8
2017	1411	1151	96.2	278	19.7
2018	1250	965	72.1	165	13.2
2019	918	883	47.8	105	11.4
2020	692	973	89.9	105	15.2
1998–2020	29660	20612	93.9	5518	18.6

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	487	64.7	35.3	81.4
1999	458	70.1	29.9	83.0
2000	471	69.0	31.0	83.7
2001	477	70.0	30.0	85.1
2002	702	71.4	28.6	85.7
2003	811	70.7	29.3	84.5
2004	793	70.5	29.5	84.1
2005	785	71.2	28.8	83.1
2006	835	71.3	28.7	80.9
2007	949	72.9	27.1	82.5
2008	949	71.4	28.6	82.2
2009	1027	71.9	28.1	83.0
2010	1069	68.7	31.3	80.3
2011	1020	68.5	31.5	82.5
2012	1112	65.5	34.5	77.2
2013	1089	65.9	34.1	78.1
2014	1124	67.0	33.0	78.0
2015	1233	66.1	33.9	77.4
2016	1249	64.1	35.9	77.5
2017	1151	60.2	39.8	74.3
2018	965	52.6	47.4	63.6
2019	883	42.9	57.1	69.4
2020	973	44.7	55.3	63.2
1998-2020	20612	65.3	34.7	78.9

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	321	76.0	74.5	78.0	75.6
1999	301	76.5	74.3	81.1	75.4
2000	310	76.8	73.7	80.4	76.5
2001	313	76.1	73.7	80.7	75.0
2002	443	76.4	75.1	78.9	76.0
2003	548	76.1	74.9	80.5	75.7
2004	508	76.7	75.6	79.9	76.3
2005	514	76.8	75.4	80.0	76.0
2006	536	75.8	74.1	79.7	75.0
2007	627	76.8	75.4	79.9	75.9
2008	643	77.2	75.7	80.3	76.2
2009	694	77.3	75.0	81.4	75.9
2010	693	77.8	76.1	81.9	77.1
2011	686	77.2	75.0	82.0	76.3
2012	735	79.0	77.3	82.2	78.0
2013	732	78.3	76.5	81.5	77.4
2014	772	78.5	75.8	83.5	76.9
2015	844	78.9	77.4	83.3	78.0
2016	855	79.5	77.9	83.0	78.6
2017	792	80.3	78.1	83.2	79.0
2018	679	79.7	78.0	81.9	79.5
2019	602	80.4	76.4	83.0	79.3
2020	695	81.1	78.7	83.1	79.7
1998-2020	13843	78.2	76.1	81.7	77.1

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	166	81.7	79.6	82.7	81.8
1999	157	78.9	78.7	79.9	79.2
2000	161	78.7	78.6	80.4	78.9
2001	164	80.7	79.0	87.3	80.3
2002	259	79.8	78.5	83.4	79.4
2003	263	80.1	79.3	80.9	80.0
2004	285	81.2	80.0	83.7	80.8
2005	271	81.3	79.1	83.4	80.4
2006	299	81.1	79.7	84.0	80.0
2007	322	80.8	79.8	84.0	80.6
2008	306	80.8	79.0	85.6	80.0
2009	333	80.9	78.8	84.3	79.6
2010	376	82.2	80.2	85.7	81.2
2011	334	82.2	79.5	87.7	80.5
2012	377	81.4	78.4	85.5	79.7
2013	357	80.6	78.5	85.0	79.4
2014	352	82.1	80.0	87.2	80.7
2015	389	81.4	79.5	87.3	80.2
2016	394	82.0	78.4	86.7	79.8
2017	359	82.9	80.2	87.4	81.3
2018	286	82.6	81.4	85.8	81.7
2019	281	80.6	77.5	84.3	78.2
2020	278	84.3	80.3	86.2	80.6
1998–2020	6769	81.3	79.3	85.4	80.2

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	209	18.9	0.41	10.6	0.38	17.4	0.42	24.8	0.46
1999	206	18.4	0.41	10.3	0.38	16.8	0.42	24.5	0.47
2000	206	18.1	0.44	10.0	0.41	16.3	0.44	23.3	0.48
2001	222	19.2	0.50	10.5	0.46	16.9	0.50	23.8	0.55
2002	315	16.9	0.36	8.7	0.34	14.3	0.36	20.4	0.39
2003	383	20.4	0.43	10.5	0.40	16.8	0.43	23.9	0.46
2004	356	18.9	0.42	9.3	0.37	15.2	0.41	21.8	0.45
2005	357	18.8	0.40	9.0	0.36	14.6	0.39	21.1	0.44
2006	389	20.3	0.42	9.8	0.38	15.6	0.41	21.8	0.44
2007	466	21.0	0.47	9.8	0.42	16.0	0.46	22.5	0.50
2008	457	20.5	0.43	9.0	0.37	14.9	0.41	21.6	0.46
2009	498	22.3	0.48	9.8	0.42	15.8	0.45	22.3	0.48
2010	481	21.3	0.46	9.1	0.40	14.8	0.43	21.2	0.48
2011	486	21.7	0.46	9.3	0.41	15.0	0.44	20.7	0.47
2012	486	21.4	0.45	8.7	0.39	14.4	0.43	20.3	0.46
2013	493	21.4	0.45	8.7	0.39	14.1	0.42	19.9	0.46
2014	515	22.1	0.48	9.0	0.42	14.5	0.45	20.0	0.48
2015	565	23.7	0.54	9.0	0.46	14.8	0.50	21.4	0.54
2016	563	23.4	0.59	8.9	0.50	14.6	0.54	20.7	0.58
2017	479	19.9	0.52	7.5	0.44	12.2	0.48	17.3	0.51
2018	353	14.5	0.41	5.5	0.34	8.9	0.37	12.4	0.40
2019	257	10.6	0.41	4.2	0.36	6.7	0.38	9.2	0.40
2020	310	12.7	0.66	4.7	0.55	7.7	0.60	10.8	0.64
1998-2020	9052	19.5	0.46	8.4	0.40	13.6	0.44	19.2	0.47

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	107	9.1	0.39	3.0	0.29	4.9	0.32	7.2	0.37
1999	115	9.7	0.48	3.4	0.36	5.6	0.40	7.8	0.45
2000	119	9.9	0.48	3.4	0.40	5.5	0.43	7.9	0.47
2001	112	9.2	0.40	3.1	0.31	5.0	0.34	7.3	0.39
2002	186	9.5	0.41	3.3	0.34	5.3	0.36	7.3	0.39
2003	190	9.6	0.45	3.2	0.36	5.2	0.40	7.3	0.43
2004	203	10.3	0.47	3.2	0.36	5.2	0.39	7.5	0.42
2005	203	10.2	0.46	3.3	0.36	5.3	0.39	7.5	0.42
2006	207	10.3	0.45	3.4	0.33	5.4	0.37	7.6	0.41
2007	227	9.8	0.45	3.0	0.34	5.0	0.38	7.3	0.43
2008	222	9.6	0.44	3.1	0.33	5.0	0.37	7.0	0.40
2009	242	10.4	0.47	3.4	0.38	5.4	0.41	7.6	0.44
2010	254	10.9	0.49	3.3	0.40	5.3	0.43	7.7	0.47
2011	214	9.2	0.44	2.9	0.32	4.7	0.37	6.6	0.41
2012	243	10.3	0.51	3.2	0.42	5.2	0.45	7.4	0.48
2013	225	9.4	0.46	3.0	0.36	4.7	0.40	6.6	0.43
2014	240	10.0	0.48	3.0	0.36	4.8	0.40	6.9	0.44
2015	251	10.3	0.54	3.0	0.40	4.9	0.44	7.0	0.50
2016	238	9.7	0.56	3.1	0.47	4.9	0.50	6.7	0.53
2017	217	8.8	0.49	2.4	0.37	4.0	0.41	5.7	0.44
2018	157	6.3	0.46	1.8	0.34	2.8	0.37	4.1	0.41
2019	126	5.1	0.47	1.5	0.38	2.5	0.41	3.6	0.45
2020	127	5.1	0.61	1.5	0.43	2.4	0.48	3.3	0.51
1998-2020	4425	9.2	0.47	2.9	0.36	4.6	0.40	6.5	0.44

Table 12

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

Age at death	Cases			Males			Females		
Years	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4									
5-9	3	0.0	0.0	3	0.0	0.0			0.0
10-14	3	0.0	0.1			0.0	3	0.1	0.1
15-19	1	0.0	0.1	1	0.0	0.1			0.1
20-24	2	0.0	0.1	1	0.0	0.1	1	0.0	0.1
25-29	3	0.0	0.1	2	0.0	0.1	1	0.0	0.2
30-34	2	0.0	0.1	2	0.0	0.1			0.2
35-39	14	0.1	0.3	6	0.1	0.2	8	0.3	0.4
40-44	36	0.4	0.7	22	0.3	0.6	14	0.5	0.9
45-49	106	1.1	1.8	70	1.1	1.7	36	1.2	2.1
50-54	228	2.4	4.2	156	2.4	4.1	72	2.4	4.5
55-59	375	4.0	8.2	281	4.4	8.5	94	3.2	7.7
60-64	599	6.4	14.6	464	7.2	15.7	135	4.5	12.2
65-69	942	10.0	24.6	670	10.5	26.2	272	9.1	21.3
70-74	1482	15.8	40.4	1102	17.2	43.4	380	12.7	34.1
75-79	1833	19.5	59.9	1264	19.7	63.1	569	19.1	53.1
80-84	1824	19.4	79.4	1189	18.6	81.7	635	21.3	74.4
85+	1939	20.6	100.0	1176	18.3	100.0	763	25.6	100.0
All ages	9392	100.0		6409	100.0		2983	100.0	

Table 13

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

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9	3		0.2	0.33			10.7	
10-14		3			0.2	0.50		13.0
15-19	1		0.1	0.25			2.1	
20-24	1	1	0.0	0.14	0.1	0.25	1.4	2.3
25-29	2	1	0.1	0.17	0.0	0.13	2.2	1.0
30-34	2		0.1	0.08			1.4	
35-39	6	8	0.3	0.06	0.4	0.19	2.2	2.0
40-44	22	14	0.9	0.12	0.6	0.17	3.6	1.6
45-49	70	36	2.6	0.17	1.4	0.27	4.9	2.2
50-54	156	72	6.1	0.22	2.9	0.29	5.9	2.7
55-59	281	94	13.2	0.28	4.3	0.27	6.4	2.5
60-64	464	135	26.2	0.35	7.1	0.28	7.2	2.7
65-69	670	272	41.0	0.36	15.0	0.36	7.3	3.9
70-74	1102	380	73.5	0.48	22.1	0.40	9.3	4.3
75-79	1264	569	104.5	0.54	37.9	0.53	10.1	5.8
80-84	1189	635	164.2	0.69	59.7	0.67	11.3	6.8
85+	1176	763	251.8	0.92	73.2	0.77	12.9	6.4
All ages	6409	2983					9.2	4.8
Mortality								
Raw			19.7	0.48	8.9	0.49		
WS			8.0	0.41	2.7	0.38		
ES			12.9	0.45	4.3	0.41		
BRD-S			18.2	0.48	6.2	0.45		
PYLL-70								
per 100,000			49.6		20.7			
ES			42.4		17.3			
AYLL-70			8.5		9.2			

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 ←%
C03–C06	Oral cavity	43	0.7	20	46.5	3	7.0	20	46.5
C07–C08	Salivary gland	9	0.2	5	55.6			4	44.4
C09–C10	Oropharynx	56	1.0	30	53.6	2	3.6	24	42.9
C12–C13	Hypopharynx	26	0.4	13	50.0	1	3.8	12	46.2
C15	Oesophagus	77	1.3	22	28.6	2	2.6	53	68.8
C16	Stomach	157	2.7	53	33.8	12	7.6	92	58.6
C17	Small intestine	25	0.4	13	52.0	1	4.0	11	44.0
C18	Colon	421	7.2	215	51.1	52	12.4	154	36.6
C19–C20	Rectum	209	3.6	102	48.8	29	13.9	78	37.3
C21	Anus/canal	10	0.2	5	50.0	2	20.0	3	30.0
C22	Liver	97	1.7	17	17.5	16	16.5	64	66.0
C23–C24	Bile	35	0.6	4	11.4	5	14.3	26	74.3
C25	Pancreas	141	2.4	8	5.7	21	14.9	112	79.4
C32	Larynx	63	1.1	43	68.3	1	1.6	19	30.2
C33–C34	Lung	654	11.2	107	16.4	57	8.7	490	74.9
C38,C45	Mesothelioma	19	0.3	1	5.3	2	10.5	16	84.2
C43	Malign. melanoma	162	2.8	104	64.2	8	4.9	50	30.9
C44	Skin others	286	4.9	137	47.9	10	3.5	139	48.6
C46,C49	Soft tissue	35	0.6	14	40.0	3	8.6	18	51.4
C48	Peritoneal	9	0.2	3	33.3			6	66.7
C60	Penis	12	0.2	5	41.7	1	8.3	6	50.0
C61	Prostate	1725	29.7	656	38.0	387	22.4	682	39.5
C62	Testis	28	0.5	27	96.4			1	3.6
C64	Kidney	234	4.0	73	31.2	54	23.1	107	45.7
C65	Renal pelvis	111	1.9	60	54.1	36	32.4	15	13.5
C66	Ureter	106	1.8	65	61.3	20	18.9	21	19.8
C67	Bladder	561	9.6	216	38.5	50	8.9	295	52.6
C68	Urethra	21	0.4	11	52.4	3	14.3	7	33.3
C68	Urinary org.	16	0.3	6	37.5	2	12.5	8	50.0
C70–C72	CNS cancer	45	0.8	8	17.8	4	8.9	33	73.3
C73	Thyroid	36	0.6	22	61.1			14	38.9
C76–C79	CUP	79	1.4	25	31.6	10	12.7	44	55.7
C82–C85	NHL	162	2.8	67	41.4	20	12.3	75	46.3
C90	Mult. myeloma	46	0.8	22	47.8	4	8.7	20	43.5
C91–C96	Leukaemia	48	0.8	6	12.5	4	8.3	38	79.2
Others, specified		52	0.9	31	59.6	3	5.8	18	34.6
All further malignancies		5816	100.0	2216	38.1	825	14.2	2775	47.7

Further malignancies with number of cases 1 to 8 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	7	0.3	4	57.1			3	42.9
C09–C10	Oropharynx	8	0.4	5	62.5			3	37.5
C15	Oesophagus	13	0.6	1	7.7	1	7.7	11	84.6
C16	Stomach	51	2.5	17	33.3	9	17.6	25	49.0
C17	Small intestine	8	0.4	4	50.0	1	12.5	3	37.5
C18	Colon	147	7.3	67	45.6	13	8.8	67	45.6
C19–C20	Rectum	71	3.5	35	49.3	7	9.9	29	40.8
C21	Anus/canal	6	0.3	3	50.0	1	16.7	2	33.3
C22	Liver	15	0.7	2	13.3	5	33.3	8	53.3
C23–C24	Bile	23	1.1	1	4.3	4	17.4	18	78.3
C25	Pancreas	77	3.8	4	5.2	8	10.4	65	84.4
C33–C34	Lung	177	8.7	25	14.1	24	13.6	128	72.3
C38,C45	Mesothelioma	5	0.2					5	100.0
C43	Malign. melanoma	43	2.1	30	69.8	3	7.0	10	23.3
C44	Skin others	76	3.7	38	50.0	5	6.6	33	43.4
C46,C49	Soft tissue	14	0.7	6	42.9	2	14.3	6	42.9
C48	Peritoneal	5	0.2	2	40.0	1	20.0	2	40.0
C50	Breast	429	21.2	271	63.2	27	6.3	131	30.5
C51	Vulva	18	0.9	12	66.7	1	5.6	5	27.8
C52	Vagina	7	0.3	3	42.9			4	57.1
C53	Cervix uteri	95	4.7	74	77.9	9	9.5	12	12.6
C54	Corpus uteri	103	5.1	75	72.8	13	12.6	15	14.6
C55,C57	Fem. genitals un	12	0.6	7	58.3	2	16.7	3	25.0
C56	Ovary	67	3.3	29	43.3	7	10.4	31	46.3
C64	Kidney	90	4.4	19	21.1	22	24.4	49	54.4
C65	Renal pelvis	51	2.5	28	54.9	15	29.4	8	15.7
C66	Ureter	35	1.7	26	74.3	7	20.0	2	5.7
C67	Bladder	149	7.4	50	33.6	14	9.4	85	57.0
C68	Urinary org.	6	0.3	4	66.7			2	33.3
C70–C72	CNS cancer	17	0.8	5	29.4	2	11.8	10	58.8
C73	Thyroid	42	2.1	22	52.4	2	4.8	18	42.9
C74–C80	Cancer others	5	0.2	2	40.0	2	40.0	1	20.0
C76–C79	CUP	39	1.9	6	15.4	2	5.1	31	79.5
C82–C85	NHL	60	3.0	27	45.0	10	16.7	23	38.3
C90	Mult. myeloma	14	0.7	5	35.7	1	7.1	8	57.1
C91–C96	Leukaemia	20	1.0	2	10.0	4	20.0	14	70.0
Others, specified		22	1.1	11	50.0	4	18.2	7	31.8
All further malignancies		2027	100.0	922	45.5	228	11.2	877	43.3

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 15

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

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9	3		0.2	0.33			11.1	
10-14		1			0.1	0.25		5.3
15-19	1		0.1	0.25			2.2	
20-24	1	1	0.0	0.17	0.1	0.25	1.5	2.4
25-29	2	1	0.1	0.18	0.0	0.13	2.4	1.1
30-34	2		0.1	0.09			1.4	
35-39	5	8	0.2	0.06	0.4	0.20	2.0	2.2
40-44	19	13	0.8	0.11	0.5	0.18	3.4	1.7
45-49	62	30	2.3	0.17	1.2	0.26	4.8	2.1
50-54	120	54	4.7	0.20	2.1	0.26	5.1	2.4
55-59	212	71	10.0	0.27	3.3	0.26	5.5	2.2
60-64	345	92	19.5	0.34	4.8	0.25	6.4	2.3
65-69	461	203	28.2	0.37	11.2	0.36	6.3	3.7
70-74	700	261	46.7	0.47	15.2	0.40	7.7	3.9
75-79	772	401	63.8	0.56	26.7	0.52	8.5	5.3
80-84	705	449	97.4	0.74	42.2	0.70	9.5	6.2
85+	695	581	148.8	0.93	55.7	0.79	10.7	6.2
All ages	4105	2166					7.7	4.4
Mortality								
Raw			12.6	0.46	6.4	0.48		
WS			5.3	0.39	2.0	0.36		
ES			8.4	0.42	3.2	0.40		
BRD-S			11.7	0.46	4.5	0.44		
PYLL-70								
per 100,000			38.4		15.8			
ES			33.0		13.2			
AYLL-70			8.9		9.4			

* See corresponding tables with multiple malignancies.

Table 16

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

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9	3		0.2	0.33			11.1	
10-14		1			0.1	0.25		5.3
15-19	1		0.1	0.25			2.2	
20-24	1	1	0.0	0.17	0.1	0.25	1.5	2.5
25-29	2	1	0.1	0.18	0.0	0.13	2.4	1.1
30-34	2		0.1	0.10			1.5	
35-39	5	6	0.2	0.06	0.3	0.15	2.0	1.6
40-44	19	11	0.8	0.12	0.5	0.16	3.4	1.5
45-49	55	27	2.0	0.16	1.0	0.26	4.3	1.9
50-54	106	49	4.2	0.21	2.0	0.26	4.6	2.2
55-59	174	65	8.2	0.27	3.0	0.27	4.6	2.1
60-64	280	76	15.8	0.36	4.0	0.24	5.3	1.9
65-69	324	175	19.8	0.34	9.7	0.36	4.5	3.2
70-74	479	202	31.9	0.43	11.7	0.36	5.5	3.1
75-79	523	313	43.2	0.48	20.8	0.47	6.0	4.3
80-84	480	366	66.3	0.61	34.4	0.64	6.9	5.3
85+	482	480	103.2	0.72	46.0	0.68	8.1	5.3
All ages	2936	1773					5.7	3.7
Mortality								
Raw			9.0	0.41	5.3	0.44		
WS			3.9	0.35	1.6	0.33		
ES			6.1	0.38	2.6	0.37		
BRD-S			8.3	0.41	3.6	0.41		
PYLL-70								
per 100,000			32.5		13.9			
ES			28.0		11.6			
AYLL-70			9.6		9.5			

* See corresponding tables with multiple malignancies.

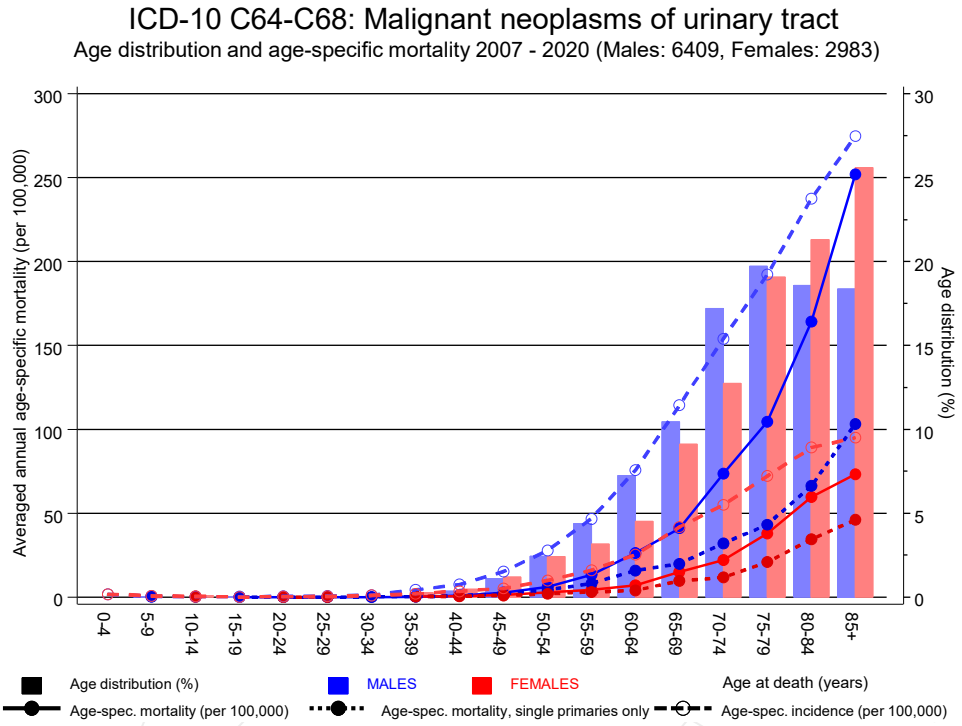


Figure 17. Distribution of age at death (bars; males: mean=71.2 yrs, median=72.2 yrs; females: mean=73.3 yrs, median=74.9 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

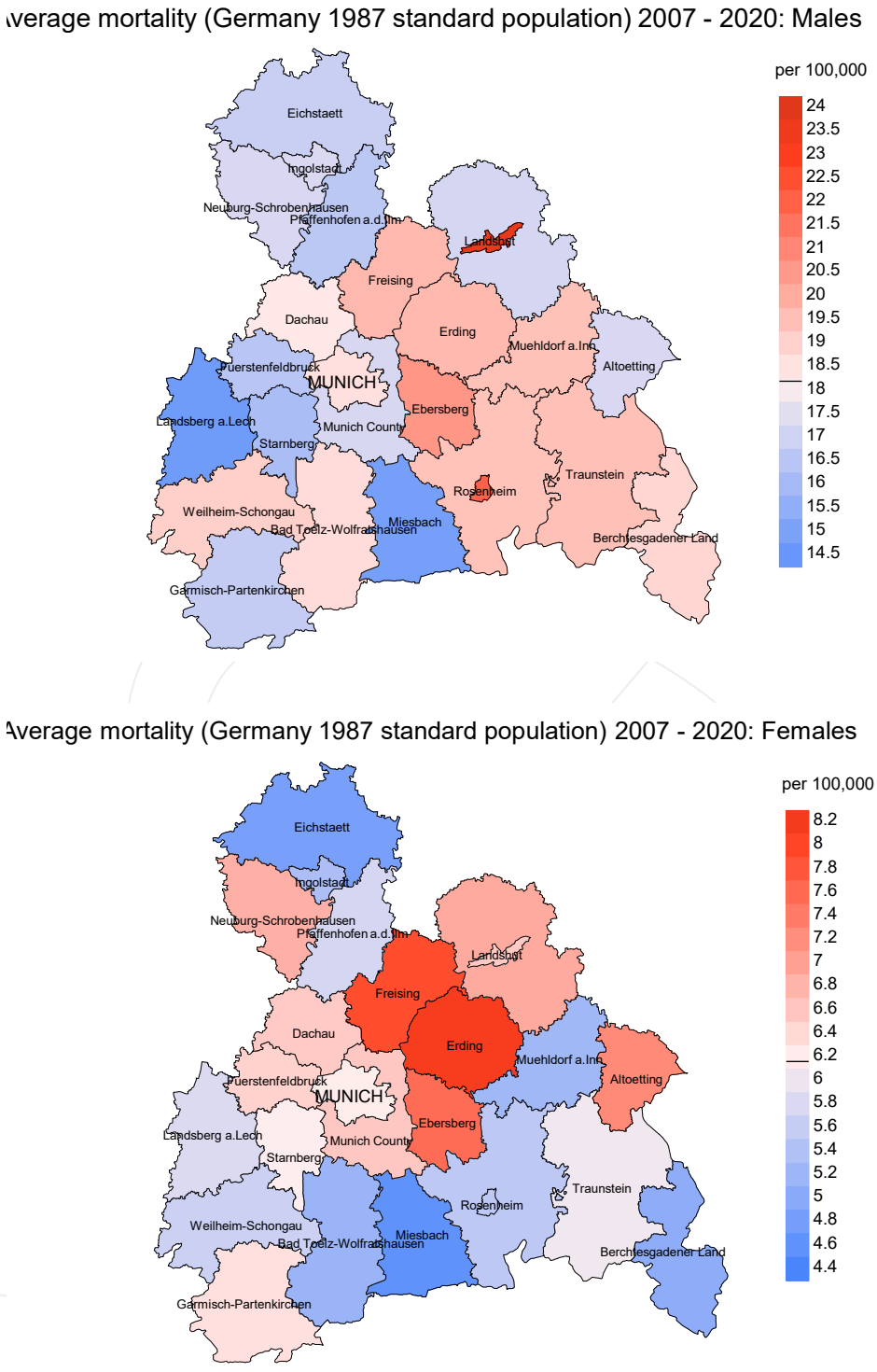


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2020. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 18.2/100,000 WS N=6,409, females 6.2/100,000 WS N=2,983).

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 101 women died from urinary tract cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 7.6/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 5.7 and 9.8/100,000.

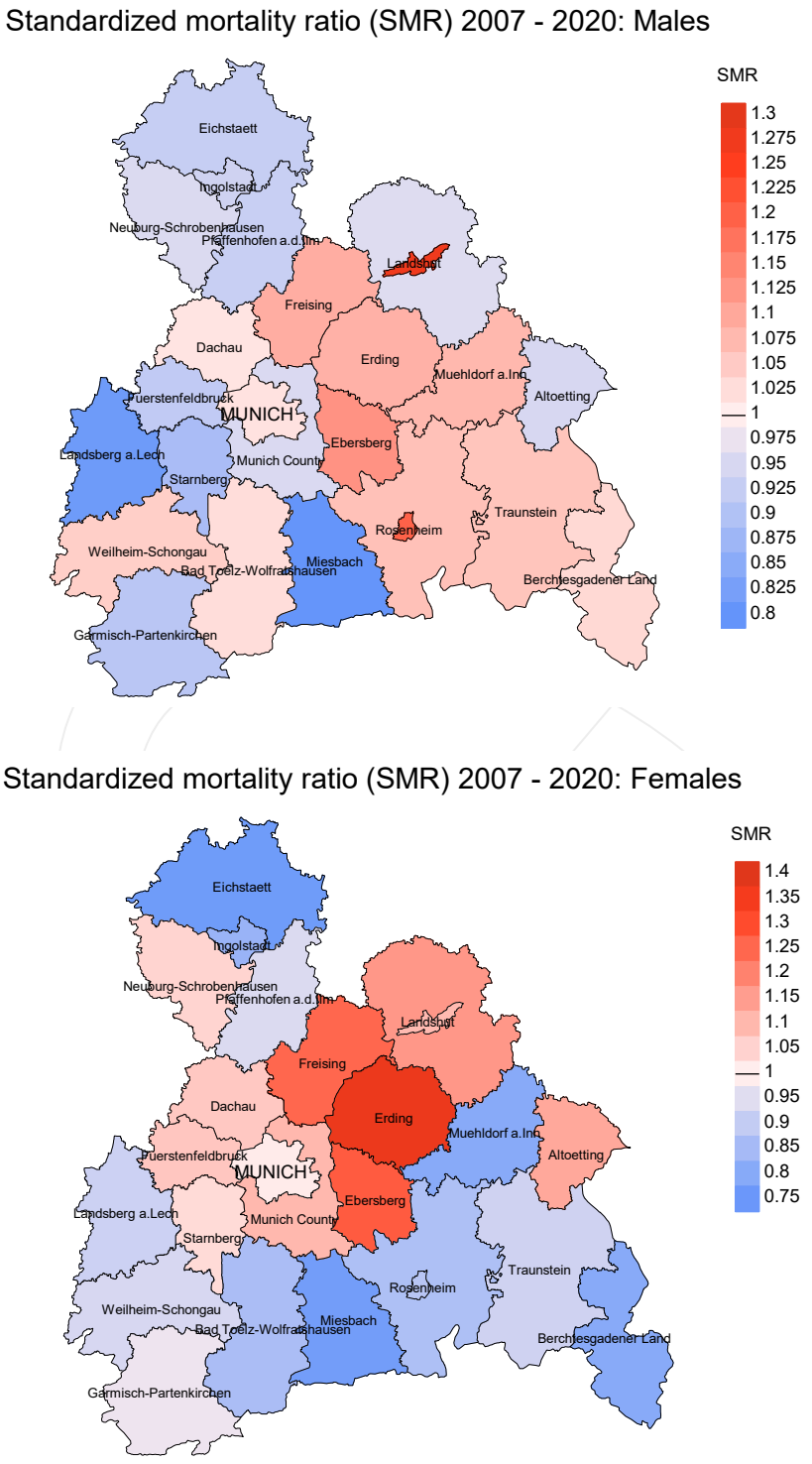


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=6,409, females N=2,983).

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 101 women died from urinary tract cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.27. Though, the value of this parameter may vary with an underlying probability of 99% between 0.97 and 1.64, 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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