Munich Cancer Registry

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ICD-10 C65: Renal pelvis cancer

Incidence and Mortality

Year of diagnosis	1998-2020
Patients	1,468
Diseases	1,482
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/bC65__E-ICD-10-C65-Renal-pelvis-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
C65	Malignant neoplasm of renal pelvis

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	33	1	3.0	33.3	28.4	87.9	97.0
1999	36			33.3	28.4	88.9	100.0
2000	33	1	3.0	30.4	28.3	84.8	100.0
2001	34			28.7	27.9	85.3	100.0
2002	65	2	3.1	29.9	27.9	86.2	100.0 #
2003	55	4	7.3	31.3	27.9	81.8	94.5
2004	53	4	7.5	31.1	27.8	83.0	98.1
2005	70			33.5	27.5	88.6	100.0
2006	69	1	1.4	33.7	27.0	76.8	92.8
2007	72			34.0	27.1	87.5	97.2 #
2008	77	1	1.3	34.5	26.6	80.5	97.4
2009	72			35.1	26.5	79.2	98.6
2010	84	1	1.2	36.5	26.2	86.9	100.0
2011	83	4	4.8	37.4	26.8	71.1	100.0
2012	88	1	1.1	38.1	25.3	78.4	100.0
2013	90	2	2.2	38.9	24.3	73.3	96.7
2014	84	1	1.2	39.6	23.3	75.0	98.8
2015	85	2	2.4	39.7	23.0	75.3	96.5
2016	71	2	2.8	40.4	22.8	74.6	100.0
2017	71	1	1.4	40.4	22.3	60.6	100.0
2018	58			40.4	22.1	53.4	98.3
2019	53			40.6	19.8	28.3	100.0
2020	46			40.8	16.3	43.5	100.0 ##
1998–2020	1482	28	1.9	40.8	28.4	75.3	98.4

1,482 cases diagnosed 1998-2020 are related to a total of 1,468 patients. Currently, in 936 (63.8 %) of these 1,468 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 530 / 265 / 141 (36.1 % / 18.1 % / 9.6 %) 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 58 cases has been diagnosed, of which 40.4 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 22.1 % 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	20	60.6	1	5.0	40.0	28.6	90.0	100.0	
1999	23	63.9			39.5	28.5	91.3	100.0	
2000	19	57.6	1	5.3	35.5	28.1	94.7	100.0	
2001	18	52.9			36.3	27.8	83.3	100.0	
2002	41	63.1	1	2.4	38.0	27.9	87.8	100.0	#
2003	37	67.3	4	10.8	39.2	27.8	78.4	91.9	
2004	31	58.5	1	3.2	39.2	27.8	87.1	100.0	
2005	43	61.4			39.7	27.6	90.7	100.0	
2006	33	47.8			38.9	27.1	84.8	97.0	
2007	49	68.1			37.9	27.1	83.7	95.9	#
2008	46	59.7			38.9	26.6	76.1	97.8	
2009	45	62.5			39.3	26.7	80.0	97.8	
2010	50	59.5	1	2.0	40.2	26.7	90.0	100.0	
2011	51	61.4	2	3.9	41.7	26.7	76.5	100.0	
2012	49	55.7	1	2.0	42.7	25.6	81.6	100.0	
2013	64	71.1	1	1.6	43.8	24.3	70.3	95.3	
2014	49	58.3	1	2.0	44.8	23.1	77.6	98.0	
2015	51	60.0			44.9	24.3	70.6	96.1	
2016	50	70.4	1	2.0	45.6	24.5	80.0	100.0	
2017	45	63.4	1	2.2	45.5	23.5	68.9	100.0	
2018	31	53.4			45.7	22.2	35.5	100.0	
2019	36	67.9			46.1	22.0	30.6	100.0	
2020	28	60.9			46.3	22.2	39.3	100.0	##
1998-2020	909	61.3	16	1.8	46.3	28.6	75.9	98.5	

909 cases diagnosed 1998-2020 are related to a total of 900 patients. Currently, in 617 (68.6 %) of these 900 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 332 / 175 / 110 (36.9 % / 19.4 % / 12.2 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:
In 2018, a subgroup of 31 cases has been diagnosed, of which 45.7 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 22.2 % 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	13	39.4			23.1	28.2	84.6	92.3	
1999	13	36.1			23.1	28.1	84.6	100.0	
2000	14	42.4			22.5	28.5	71.4	100.0	
2001	16	47.1			17.9	28.0	87.5	100.0	
2002	24	36.9	1	4.2	17.5	28.0	83.3	100.0	#
2003	18	32.7			18.4	28.2	88.9	100.0	
2004	22	41.5	3	13.6	18.3	27.8	77.3	95.5	
2005	27	38.6			23.8	27.3	85.2	100.0	
2006	36	52.2	1	2.8	26.2	27.0	69.4	88.9	
2007	23	31.9			28.2	26.9	95.7	100.0	#
2008	31	40.3	1	3.2	27.8	26.6	87.1	96.8	
2009	27	37.5			28.8	26.2	77.8	100.0	
2010	34	40.5			30.9	25.5	82.4	100.0	
2011	32	38.6	2	6.3	30.9	27.0	62.5	100.0	
2012	39	44.3			31.2	24.8	74.4	100.0	
2013	26	28.9	1	3.8	31.1	24.2	80.8	100.0	
2014	35	41.7			31.6	23.6	71.4	100.0	
2015	34	40.0	2	5.9	31.7	20.9	82.4	97.1	
2016	21	29.6	1	4.8	32.2	20.0	61.9	100.0	
2017	26	36.6			32.3	20.5	46.2	100.0	
2018	27	46.6			32.2	22.0	74.1	96.3	
2019	17	32.1			31.9	15.6	23.5	100.0	
2020	18	39.1			31.9	6.3	50.0	100.0	##
1998-2020	573	38.7	12	2.1	31.9	28.2	74.3	98.4	

573 cases diagnosed 1998-2020 are related to a total of 568 patients. Currently, in 319 (56.2 %) of these 568 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 198 / 90 / 31 (34.9 % / 15.8 % / 5.5 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:
In 2018, a subgroup of 27 cases has been diagnosed, of which 32.2 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 22.0 % 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	20	13	1.8	1.1	1.0	0.5	1.7	0.8	2.4	1.0
1999	23	13	2.1	1.1	1.4	0.5	1.9	0.8	2.2	1.0
2000	19	14	1.7	1.2	0.9	0.6	1.5	0.8	2.1	1.0
2001	18	16	1.6	1.3	0.9	0.6	1.3	0.9	1.7	1.1
2002	41	24	2.2	1.2	1.2	0.5	1.8	0.7	2.6	1.0
2003	37	18	2.0	0.9	1.0	0.3	1.6	0.5	2.2	0.7
2004	31	22	1.6	1.1	0.9	0.4	1.3	0.6	1.8	0.9
2005	43	27	2.3	1.4	1.2	0.5	1.8	0.8	2.3	1.1
2006	33	36	1.7	1.8	0.8	0.8	1.3	1.1	1.9	1.5
2007	49	23	2.2	1.0	1.1	0.4	1.7	0.5	2.3	0.8
2008	46	31	2.1	1.3	1.0	0.5	1.5	0.7	2.0	1.1
2009	45	27	2.0	1.2	1.0	0.4	1.5	0.6	1.9	0.9
2010	50	34	2.2	1.5	1.0	0.6	1.5	0.9	2.1	1.2
2011	51	32	2.3	1.4	1.0	0.6	1.5	0.8	2.1	1.0
2012	49	39	2.2	1.7	1.0	0.6	1.5	0.9	2.0	1.3
2013	64	26	2.8	1.1	1.2	0.3	1.8	0.5	2.6	0.8
2014	49	35	2.1	1.5	0.9	0.5	1.4	0.8	1.9	1.1
2015	51	34	2.1	1.4	0.9	0.4	1.4	0.7	1.9	0.9
2016	50	21	2.1	0.9	0.8	0.3	1.3	0.5	1.9	0.6
2017	45	26	1.9	1.1	0.8	0.3	1.2	0.5	1.6	0.8
2018	31	27	1.3	1.1	0.6	0.3	0.9	0.5	1.1	0.8
2019	36	17	1.5	0.7	0.6	0.2	0.9	0.3	1.3	0.5
2020	28	18	1.2	0.7	0.4	0.3	0.7	0.4	1.0	0.6
1998–2020	909	573	2.0	1.2	0.9	0.4	1.4	0.7	1.9	0.9

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	33	73.5	10.9	46.8	90.1	56.7	70.3	74.8	81.4	86.7
1999	36	66.7	11.4	41.5	88.2	49.1	62.1	69.2	74.4	78.2
2000	33	70.6	10.6	37.3	88.4	58.2	65.5	71.6	77.2	82.5
2001	34	70.4	9.8	51.1	86.8	61.0	63.7	69.8	79.2	84.6
2002	65	71.9	11.7	46.0	96.4	56.3	62.6	72.9	81.0	83.8
2003	55	72.7	12.0	38.4	97.3	60.2	65.6	74.2	81.3	84.7
2004	53	72.1	10.1	50.6	87.9	57.6	63.1	74.7	79.9	83.5
2005	70	70.8	12.0	37.7	92.1	55.3	64.4	71.4	80.2	84.7
2006	69	73.6	9.9	52.1	91.8	59.6	66.7	74.5	81.0	85.9
2007	72	72.2	10.9	40.5	90.5	59.0	66.7	73.8	79.2	85.2
2008	77	72.8	11.1	20.5	91.1	60.3	67.6	73.5	81.5	84.4
2009	72	71.4	11.0	41.3	95.9	57.0	65.8	72.9	78.8	84.8
2010	84	73.3	9.2	51.6	92.9	60.4	67.9	73.6	80.2	84.7
2011	83	73.0	10.1	42.2	96.9	62.0	67.5	71.9	80.6	85.6
2012	88	73.3	10.2	41.4	90.9	59.7	67.7	75.2	80.5	85.3
2013	90	73.5	10.2	35.6	91.2	60.1	69.1	74.2	81.0	84.1
2014	84	73.2	9.7	48.7	93.5	57.8	68.7	74.4	79.8	85.2
2015	85	75.6	8.7	52.2	95.6	64.1	70.9	76.6	80.7	86.8
2016	71	75.3	9.1	50.8	93.0	62.1	69.6	77.3	81.5	85.3
2017	71	74.5	8.8	51.7	93.7	61.7	69.2	75.8	79.2	84.5
2018	58	74.5	8.4	56.0	90.7	61.7	69.7	75.8	81.1	84.5
2019	53	74.7	9.1	49.9	93.4	60.9	69.6	77.1	80.2	84.8
2020	46	73.7	9.5	54.4	91.5	62.2	65.1	75.8	81.8	84.8
1998-2020	1482	73.0	10.3	20.5	97.3	59.3	67.4	74.0	80.3	84.8

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	20	76.4	9.7	56.1	90.1	60.7	72.8	76.7	84.9	88.2
1999	23	63.8	12.1	41.5	78.2	41.9	53.8	68.8	74.0	76.3
2000	19	73.2	8.7	56.3	88.4	61.2	67.2	73.0	80.9	85.5
2001	18	71.2	9.3	51.7	86.8	61.0	64.0	70.7	78.3	86.5
2002	41	70.8	10.2	46.0	88.2	58.4	62.6	72.7	79.0	82.5
2003	37	71.1	12.9	38.4	97.3	50.7	64.1	73.8	81.1	83.4
2004	31	70.1	10.0	50.6	83.8	54.7	60.6	73.1	78.9	81.2
2005	43	69.5	12.0	37.7	92.1	54.6	63.3	69.1	79.1	84.2
2006	33	74.7	9.6	53.4	87.6	56.5	70.3	77.6	82.9	85.0
2007	49	70.8	10.3	42.8	89.3	54.0	66.0	72.3	78.3	82.4
2008	46	71.0	9.3	49.3	90.0	58.0	65.9	71.4	75.9	83.5
2009	45	69.0	10.3	44.8	87.9	55.9	63.5	70.6	74.7	80.8
2010	50	73.2	8.7	51.6	92.9	60.6	68.1	72.6	78.7	83.8
2011	51	73.5	9.6	48.1	96.9	62.0	68.5	72.4	80.8	84.6
2012	49	72.3	11.1	41.4	89.6	53.2	64.8	74.5	79.7	87.1
2013	64	72.0	10.6	35.6	88.6	55.8	67.7	73.8	80.4	83.0
2014	49	74.0	9.8	50.4	93.5	57.8	69.2	74.5	80.4	86.1
2015	51	74.2	6.8	58.6	85.5	64.1	69.4	74.8	78.3	81.7
2016	50	75.4	8.8	50.8	93.0	61.8	71.6	77.0	81.4	84.8
2017	45	73.4	9.5	51.7	91.4	59.9	65.8	74.6	79.6	84.7
2018	31	72.3	8.1	56.0	90.7	62.3	65.5	74.2	77.8	79.2
2019	36	74.6	8.3	56.5	90.5	62.9	69.0	75.5	79.4	84.8
2020	28	74.4	9.9	54.4	85.7	60.2	63.8	77.3	82.9	85.4
1998-2020	909	72.3	10.0	35.6	97.3	58.3	66.9	73.3	79.3	84.0

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	13	68.9	11.5	46.8	86.0	53.6	59.3	72.2	74.8	82.5
1999	13	71.9	8.2	61.4	88.2	63.6	67.0	69.4	78.2	84.0
2000	14	67.2	12.3	37.3	82.5	50.1	60.6	70.9	75.9	79.0
2001	16	69.5	10.6	51.1	84.9	53.1	62.2	69.1	80.4	84.6
2002	24	73.8	13.9	47.0	96.4	51.0	62.8	78.5	83.0	92.7
2003	18	76.1	9.3	60.9	93.1	61.7	68.9	77.5	82.6	87.8
2004	22	75.1	9.7	57.6	87.9	60.1	66.2	77.9	81.4	86.5
2005	27	73.0	11.8	43.7	91.7	56.2	66.4	74.9	80.9	85.1
2006	36	72.5	10.2	52.1	91.8	60.1	65.1	73.3	77.8	87.9
2007	23	75.0	11.9	40.5	90.5	60.7	67.4	77.0	83.8	87.3
2008	31	75.4	13.0	20.5	91.1	64.1	69.4	78.9	83.4	85.9
2009	27	75.5	11.2	41.3	95.9	63.1	70.1	76.9	82.3	86.6
2010	34	73.3	10.1	54.7	89.9	57.6	66.2	75.3	81.0	84.8
2011	32	72.2	11.0	42.2	90.9	63.4	67.4	71.8	77.7	87.8
2012	39	74.7	8.8	53.0	90.9	61.4	68.9	77.0	81.0	84.8
2013	26	77.3	8.2	61.5	91.2	68.2	70.4	75.8	84.1	90.0
2014	35	72.2	9.6	48.7	88.1	57.2	67.0	74.4	78.2	81.3
2015	34	77.8	10.8	52.2	95.6	66.2	73.5	78.5	86.8	90.0
2016	21	74.9	10.1	53.0	91.0	64.6	67.4	78.5	82.0	86.5
2017	26	76.4	7.3	54.4	93.7	68.5	73.6	77.2	79.1	82.0
2018	27	77.0	8.3	58.4	88.0	60.5	72.5	79.1	83.6	84.7
2019	17	75.1	10.8	49.9	93.4	58.6	69.6	78.4	80.5	87.4
2020	18	72.7	9.0	55.0	91.5	62.2	66.6	73.3	79.2	84.4
1998–2020	573	74.1	10.5	20.5	96.4	60.3	68.1	75.6	81.2	86.5

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									
5-9									
10-14									
15-19									
20-24	1	0.1	0.1			0.0	1	0.3	0.3
25-29	0	0.0	0.1			0.0			0.3
30-34	0	0.0	0.1			0.0			0.3
35-39	1	0.1	0.2	1	0.2	0.2			0.3
40-44	6	0.6	0.8	3	0.5	0.6	3	0.8	1.0
45-49	11	1.1	1.8	8	1.2	1.9	3	0.8	1.8
50-54	31	3.0	4.8	21	3.3	5.1	10	2.6	4.4
55-59	49	4.7	9.6	34	5.3	10.4	15	3.8	8.2
60-64	82	7.9	17.5	58	9.0	19.4	24	6.2	14.4
65-69	141	13.6	31.1	85	13.2	32.6	56	14.4	28.7
70-74	211	20.4	51.5	155	24.1	56.7	56	14.4	43.1
75-79	227	22.0	73.5	129	20.0	76.7	98	25.1	68.2
80-84	173	16.7	90.2	104	16.1	92.9	69	17.7	85.9
85+	101	9.8	100.0	46	7.1	100.0	55	14.1	100.0
All ages	1034	100.0		644	100.0		390	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=8 %	Females DCO rate n=7 %	Males Prop.all cancers n=153686 %	Females Prop.all cancers n=155051 %
0- 4								
5- 9								
10-14								
15-19								
20-24		1		0.1				0.2
25-29								
30-34								
35-39	1		0.0				0.1	
40-44	3	3	0.1	0.1			0.1	0.0
45-49	8	3	0.3	0.1			0.2	0.0
50-54	21	10	0.8	0.4			0.2	0.1
55-59	33	15	1.6	0.7			0.3	0.1
60-64	58	24	3.3	1.3			0.3	0.2
65-69	85	54	5.2	3.0		1.9	0.4	0.3
70-74	153	56	10.2	3.3	1.3	1.8	0.6	0.3
75-79	129	98	10.7	6.5	3.1	1.0	0.5	0.5
80-84	104	69	14.4	6.5		1.4	0.7	0.4
85+	46	55	9.9	5.3	4.3	5.5	0.4	0.3
All ages	641	388			1.2	1.8	0.4	0.3
Incidence								
Raw			2.0	1.2				
WS			0.9	0.4				
ES			1.3	0.6				
BRD-S			1.8	0.9				

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).

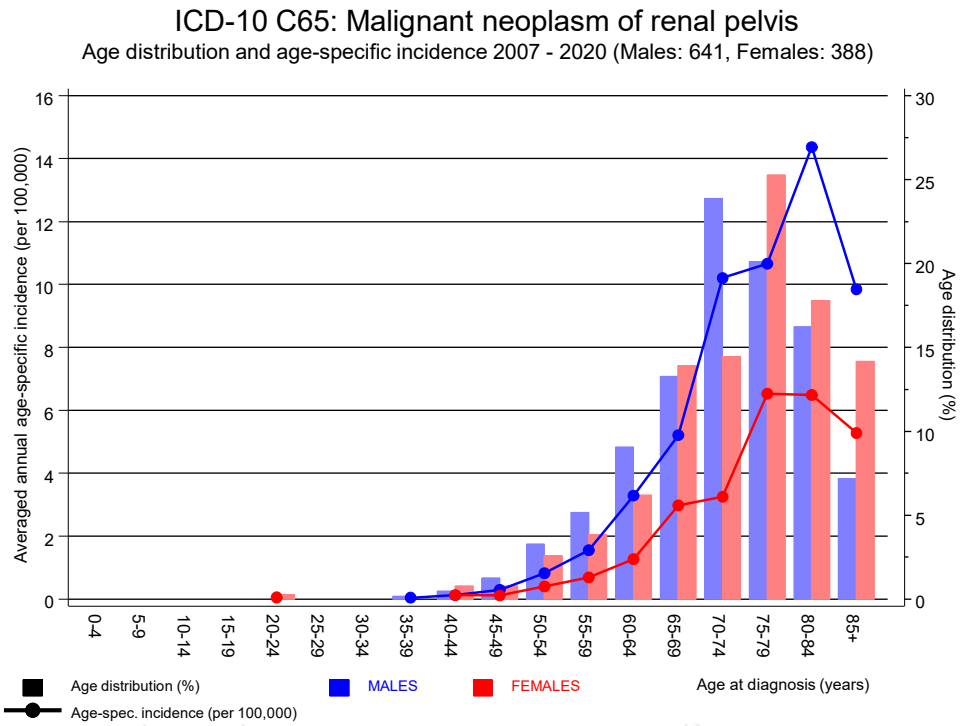


Figure 6. Age distribution (males: mean=72.8 yrs, median=73.8 yrs; females: mean=75.0 yrs, median=76.5 yrs) and age-specific incidence.

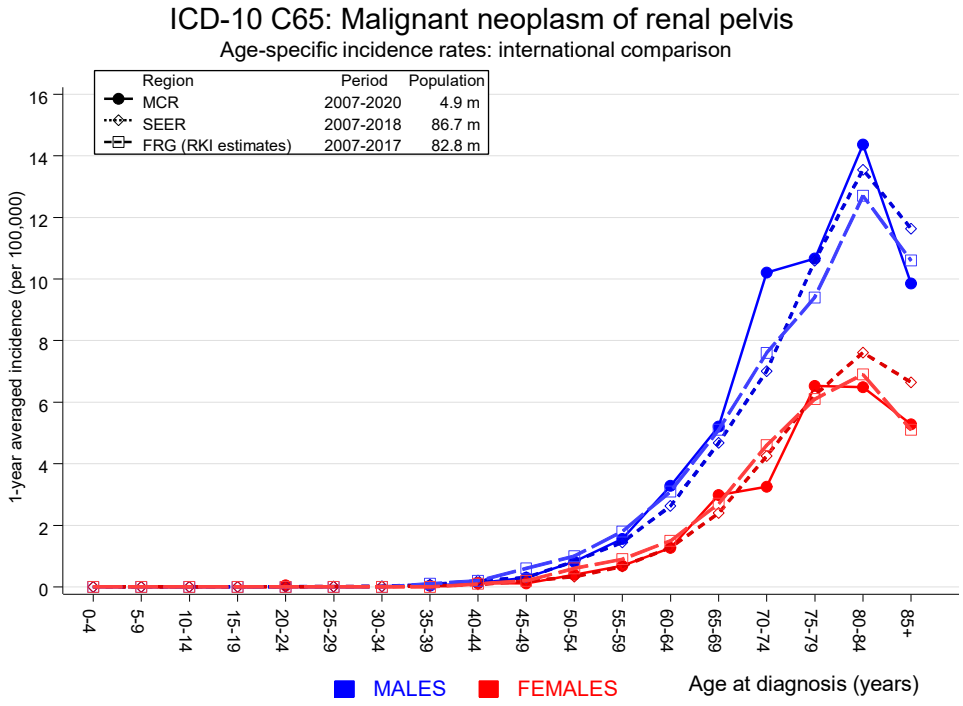


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, RKI estimates) and SEER (Surveillance, Epidemiology, and End Results, USA).

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 %
C15	Oesophagus	1	0.9	1.2	0.0	6.5		0.6	
C16	Stomach	3	2.0	1.5	0.3	4.4		4.2	
C17	Small intestine	3	0.3	10.8	2.2	31.7	#	11.3	
C18	Colon	8	4.8	1.7	0.7	3.3		13.2	12.5
C19–C20	Rectum	2	2.4	0.8	0.1	3.0		−1.6	
C22	Liver	3	1.3	2.2	0.5	6.5		6.9	33.3
C23–C24	Bile	1	0.5	1.9	0.0	10.6		2.0	
C25	Pancreas	6	1.9	3.1	1.1	6.8	#	16.9	
C33–C34	Lung	19	5.4	3.5	2.1	5.5	#	56.6	26.3
C38,C45	Mesothelioma	1	0.3	3.0	0.1	16.8		2.8	
C43	Malign. melanoma	7	2.1	3.4	1.4	7.0	#	20.5	
C46,C49	Soft tissue	1	0.3	3.6	0.1	20.0		3.0	
C60	Penis	3	0.1	24.4	5.0	71.2	#	11.9	
C61	Prostate	53	13.1	4.0	3.0	5.3	#	165.8	5.7
C64	Kidney	16	1.5	10.5	6.0	17.0	#	60.1	6.3
C65	Renal pelvis	9	0.2	39.4	18.0	74.8	#	36.4	
C66	Ureter	46	0.1	338.2	247.6	451.1	#	190.5	
C67	Bladder	100	2.5	40.6	33.1	49.4	#	405.1	20.0
C68	Urethra	8	0.0	169.8	73.3	334.6	#	33.0	
C68	Urinary org.	6	0.0	149.9	55.0	326.3	#	24.8	83.3
C76–C79	CUP	2	0.8	2.4	0.3	8.7		4.8	
C82–C85	NHL	1	2.0	0.5	0.0	2.7		−4.3	
C90	Mult. myeloma	1	0.6	1.6	0.0	8.7		1.5	100.0
C91–C96	Leukaemia	1	0.8	1.3	0.0	7.2		1.0	
Not observed		0	3.2	0.0	0.0	1.2		−13.1	
All further malignancies		301	47.3	6.4	5.7	7.1	#	1054	12.3

Patients	876
Median age at next malignancy (years)	74.3
Person-years	2408
Mean observation time (years)	2.7
Median observation time (years)	1.3

The occurrence of further specified malignancy is statistically significant.

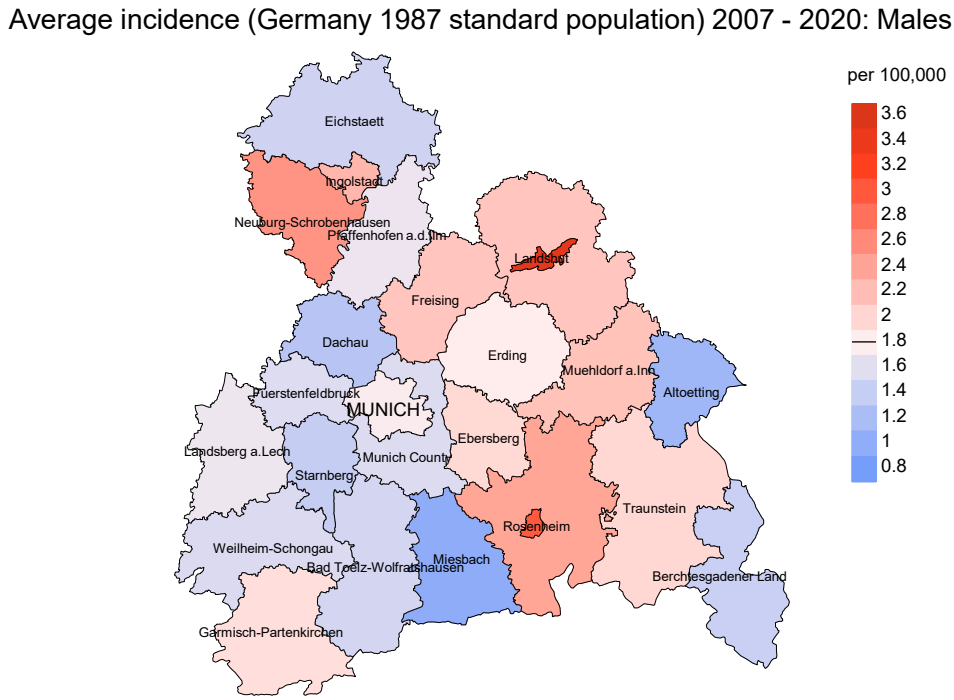
Table 7b

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 %
C17	Small intestine	1	0.1	9.3	0.2	51.7		5.7	
C18	Colon	2	2.2	0.9	0.1	3.2		−1.5	
C19–C20	Rectum	1	0.9	1.2	0.0	6.5		0.9	
C25	Pancreas	4	1.1	3.7	1.0	9.5	#	18.5	25.0
C33–C34	Lung	15	1.5	9.9	5.5	16.3	#	85.5	20.0
C46,C49	Soft tissue	2	0.1	16.5	2.0	59.7	#	11.9	
C50	Breast	17	5.9	2.9	1.7	4.6	#	70.5	23.5
C53	Cervix uteri	1	0.2	4.6	0.1	25.4		5.0	
C55,C57	Fem. genitals un	1	0.1	17.6	0.4	98.3		6.0	100.0
C56	Ovary	1	0.8	1.2	0.0	6.8		1.2	
C64	Kidney	8	0.5	15.9	6.9	31.3	#	47.6	37.5
C65	Renal pelvis	5	0.1	67.5	21.9	157.6	#	31.3	
C66	Ureter	23	0.0	584.2	370.3	876.5	#	145.7	
C67	Bladder	64	0.5	136.4	105.0	174.2	#	403.2	17.2
C68	Urethra	2	0.0	380.3	46.1	1374	#	12.7	
C68	Urinary org.	2	0.0	189.9	23.0	685.9	#	12.6	100.0
C70–C72	CNS cancer	1	0.3	3.9	0.1	21.5		4.7	
C73	Thyroid	1	0.2	4.0	0.1	22.3		4.8	
C76–C79	CUP	1	0.4	2.3	0.1	13.0		3.6	
C82–C85	NHL	2	0.8	2.4	0.3	8.5		7.3	
Not observed		0	5.1	0.0	0.0	0.7	#	−32.2	
All further malignancies		154	20.9	7.4	6.3	8.6	#	844.7	16.2

Patients	559
Median age at next malignancy (years)	76.5
Person-years	1576
Mean observation time (years)	2.8
Median observation time (years)	1.2

The occurrence of further specified malignancy is statistically significant.



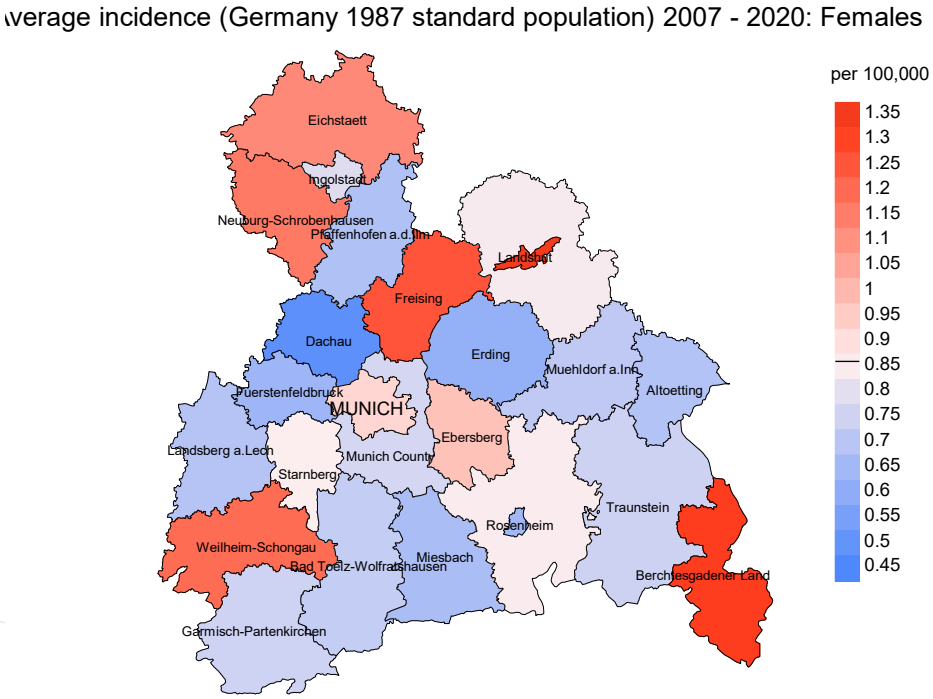
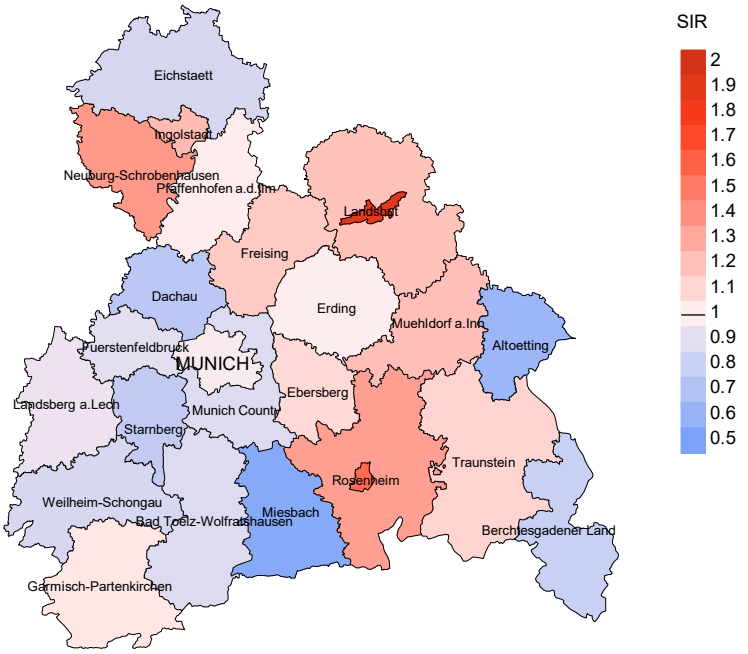


Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 1.8/100,000 WS N=641, females 0.9/100,000 WS N=388).

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 12 women were identified with newly diagnosed renal pelvis cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 1.0/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.4 and 2.0/100,000.

Standardized incidence ratio (SIR) 2007 - 2020: Males



Standardized incidence ratio (SIR) 2007 - 2020: Females

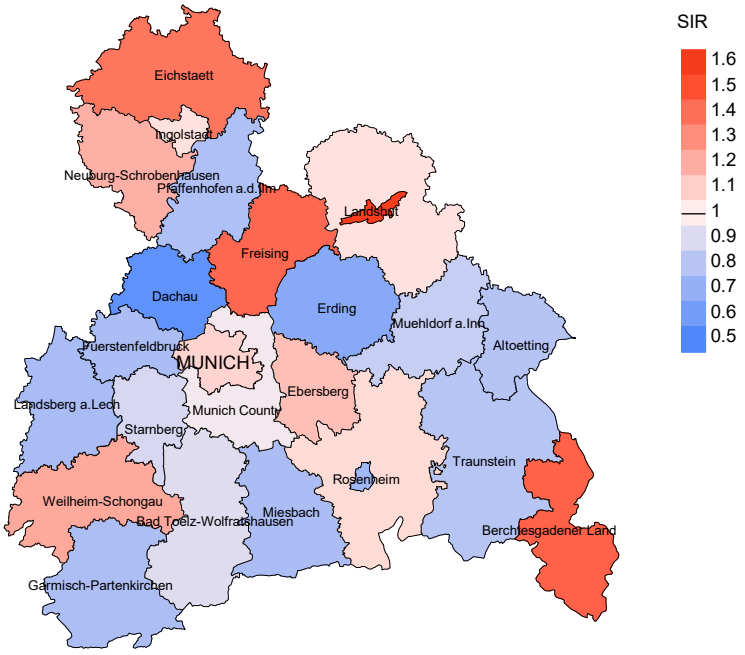


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=641, females N=388).

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 12 women were identified with newly diagnosed renal pelvis cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.15. Though, the value of this parameter may vary with an underlying probability of 99% between 0.47 and 2.31, 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	33	97.0	3.0	29	87.9	96.6
1999	36	100.0		32	88.9	93.8
2000	33	100.0	3.0	28	84.8	92.9
2001	34	100.0		29	85.3	93.1
2002	65	100.0	3.1	56	86.2	98.2
2003	55	94.5	7.3	45	81.8	95.6
2004	53	98.1	7.5	44	83.0	95.5
2005	70	100.0		62	88.6	91.9
2006	69	92.8	1.4	53	76.8	96.2
2007	72	97.2		63	87.5	95.2
2008	77	97.4	1.3	62	80.5	98.4
2009	72	98.6		57	79.2	94.7
2010	84	100.0	1.2	73	86.9	97.3
2011	83	100.0	4.8	59	71.1	96.6
2012	88	100.0	1.1	69	78.4	95.7
2013	90	96.7	2.2	66	73.3	97.0
2014	84	98.8	1.2	63	75.0	93.7
2015	85	96.5	2.4	64	75.3	90.6
2016	71	100.0	2.8	53	74.6	83.0
2017	71	100.0	1.4	43	60.6	79.1
2018	58	98.3		31	53.4	58.1
2019	53	100.0		15	28.3	86.7
2020	46	100.0		20	43.5	100.0
1998-2020	1482	98.4	1.9	1116	75.3	93.0

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	33	15	93.3	4	12.1
1999	36	20	100.0	8	22.2
2000	33	29	93.1	7	21.2
2001	34	25	100.0	10	29.4
2002	65	35	100.0	11	16.9
2003	55	48	93.8	16	29.1
2004	53	38	94.7	14	26.4
2005	70	47	97.9	15	21.4
2006	69	45	100.0	9	13.0
2007	72	63	95.2	19	26.4
2008	77	43	100.0	12	15.6
2009	72	56	100.0	16	22.2
2010	84	60	100.0	17	20.2
2011	83	80	97.5	18	21.7
2012	88	54	98.1	18	20.5
2013	90	72	100.0	16	17.8
2014	84	77	100.0	18	21.4
2015	85	73	98.6	18	21.2
2016	71	76	100.0	19	26.8
2017	71	84	91.7	15	21.1
2018	58	49	65.3	12	20.7
2019	53	51	35.3	6	11.3
2020	46	56	92.9	12	26.1
1998–2020	1482	1196	93.6	310	20.9

Table 9c

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

Year of death	Deaths n	Prop. cancer-related %	Prop. non-cancer-related %	Prop. cancer recorded on death certificate %
1998	15	66.7	33.3	64.3
1999	20	85.0	15.0	80.0
2000	29	65.5	34.5	88.9
2001	25	68.0	32.0	84.0
2002	35	80.0	20.0	80.0
2003	48	75.0	25.0	86.7
2004	38	78.9	21.1	86.1
2005	47	85.1	14.9	87.0
2006	45	80.0	20.0	84.4
2007	63	77.8	22.2	86.7
2008	43	86.0	14.0	90.7
2009	56	78.6	21.4	78.6
2010	60	75.0	25.0	83.3
2011	80	86.3	13.8	93.6
2012	54	68.5	31.5	75.5
2013	72	72.2	27.8	81.9
2014	77	85.7	14.3	93.5
2015	73	71.2	28.8	81.9
2016	76	76.3	23.7	84.2
2017	84	64.3	35.7	76.6
2018	49	65.3	34.7	90.6
2019	51	41.2	58.8	83.3
2020	56	46.4	53.6	73.1
1998-2020	1196	73.2	26.8	83.9

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	10	75.6	76.3	74.9	81.0
1999	8	81.0	77.1	85.8	77.1
2000	21	76.5	73.1	85.6	76.1
2001	14	74.5	71.9	79.7	73.8
2002	18	74.1	76.1	65.4	76.1
2003	32	77.5	76.3	82.5	76.7
2004	20	78.4	77.2	82.3	77.2
2005	27	71.8	68.8	75.7	68.8
2006	26	74.2	73.0	79.1	74.0
2007	42	76.0	74.7	78.8	76.0
2008	24	77.7	76.5	83.7	76.0
2009	34	73.6	71.7	80.2	71.7
2010	34	78.5	77.5	85.5	77.6
2011	53	75.0	74.4	89.3	74.4
2012	30	78.4	75.0	87.0	77.4
2013	43	76.1	75.5	81.6	75.5
2014	48	76.0	75.1	84.4	75.5
2015	51	78.7	78.5	81.0	78.1
2016	44	77.0	75.8	81.9	75.8
2017	51	79.1	77.0	85.4	78.2
2018	30	75.5	71.8	78.1	73.0
2019	31	80.0	79.1	80.4	78.3
2020	41	78.9	76.0	84.4	77.0
1998–2020	732	77.0	75.3	81.6	76.0

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	5	82.7	72.1	85.7	72.1
1999	12	75.6	76.3	73.9	75.2
2000	8	77.0	74.5	88.9	75.4
2001	11	77.6	70.2	87.9	74.9
2002	17	79.8	79.6	80.5	79.6
2003	16	76.5	77.4	75.6	77.4
2004	18	80.0	78.9	83.9	79.5
2005	20	74.7	71.6	88.0	71.6
2006	19	77.3	75.3	85.0	74.2
2007	21	78.4	76.9	85.6	77.5
2008	19	80.0	76.5	87.5	79.5
2009	22	78.9	76.8	92.3	77.4
2010	26	79.8	79.3	85.1	78.9
2011	27	82.2	78.8	90.1	80.6
2012	24	76.5	75.8	77.9	75.7
2013	29	81.1	77.2	83.5	80.1
2014	29	78.5	77.8	88.7	78.5
2015	22	80.3	78.2	87.5	79.5
2016	32	81.6	79.9	87.2	79.6
2017	33	80.1	79.8	88.2	79.9
2018	19	81.2	80.7	81.2	81.5
2019	20	80.5	78.7	85.4	80.7
2020	15	84.8	84.8	86.8	84.1
1998–2020	464	79.7	77.9	85.8	78.8

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

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

Table 11a

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

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	7	0.6	0.37	0.3	0.35	0.6	0.36	0.7	0.32
1999	7	0.6	0.32	0.3	0.26	0.6	0.32	0.9	0.42
2000	14	1.2	0.74	0.7	0.75	1.1	0.75	1.6	0.75
2001	10	0.9	0.56	0.5	0.57	0.8	0.58	1.0	0.55
2002	16	0.9	0.39	0.4	0.37	0.7	0.39	1.1	0.41
2003	25	1.3	0.68	0.6	0.63	1.1	0.69	1.6	0.73
2004	17	0.9	0.55	0.4	0.46	0.7	0.50	1.1	0.60
2005	23	1.2	0.53	0.6	0.49	0.9	0.52	1.3	0.54
2006	21	1.1	0.64	0.5	0.70	0.8	0.65	1.1	0.59
2007	33	1.5	0.67	0.7	0.66	1.2	0.69	1.6	0.69
2008	22	1.0	0.48	0.4	0.41	0.7	0.46	1.1	0.54
2009	27	1.2	0.63	0.5	0.58	0.8	0.60	1.1	0.63
2010	27	1.2	0.54	0.5	0.52	0.8	0.54	1.2	0.56
2011	46	2.1	0.90	0.8	0.86	1.4	0.89	1.9	0.91
2012	20	0.9	0.41	0.3	0.35	0.6	0.38	0.8	0.39
2013	30	1.3	0.48	0.6	0.49	0.9	0.50	1.2	0.48
2014	42	1.8	0.86	0.7	0.84	1.2	0.84	1.6	0.88
2015	39	1.6	0.76	0.5	0.60	0.9	0.67	1.5	0.76
2016	35	1.5	0.70	0.6	0.72	0.9	0.72	1.3	0.68
2017	31	1.3	0.69	0.4	0.56	0.7	0.60	1.1	0.68
2018	22	0.9	0.71	0.4	0.72	0.6	0.73	0.8	0.70
2019	10	0.4	0.28	0.1	0.22	0.2	0.24	0.4	0.27
2020	19	0.8	0.68	0.3	0.74	0.5	0.73	0.7	0.70
1998-2020	543	1.2	0.60	0.5	0.56	0.8	0.59	1.2	0.61

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	3	0.3	0.23	0.1	0.22	0.2	0.21	0.2	0.24
1999	10	0.8	0.77	0.3	0.55	0.5	0.65	0.7	0.77
2000	5	0.4	0.36	0.2	0.32	0.3	0.34	0.4	0.37
2001	7	0.6	0.44	0.3	0.42	0.4	0.42	0.5	0.42
2002	12	0.6	0.50	0.2	0.44	0.4	0.48	0.5	0.53
2003	11	0.6	0.61	0.2	0.63	0.3	0.62	0.4	0.67
2004	13	0.7	0.59	0.2	0.56	0.3	0.56	0.5	0.58
2005	17	0.9	0.63	0.3	0.66	0.5	0.65	0.7	0.62
2006	15	0.7	0.42	0.3	0.37	0.5	0.40	0.6	0.44
2007	16	0.7	0.70	0.2	0.66	0.4	0.70	0.6	0.78
2008	15	0.6	0.48	0.2	0.51	0.4	0.49	0.5	0.47
2009	17	0.7	0.63	0.2	0.65	0.4	0.62	0.5	0.61
2010	18	0.8	0.55	0.2	0.41	0.4	0.45	0.6	0.52
2011	23	1.0	0.74	0.3	0.63	0.5	0.67	0.7	0.70
2012	17	0.7	0.44	0.3	0.43	0.4	0.42	0.5	0.39
2013	22	0.9	0.85	0.3	0.75	0.4	0.78	0.7	0.85
2014	24	1.0	0.69	0.3	0.58	0.5	0.60	0.7	0.63
2015	13	0.5	0.38	0.2	0.43	0.3	0.42	0.4	0.45
2016	23	0.9	1.10	0.3	0.86	0.4	0.94	0.6	0.96
2017	23	0.9	0.88	0.2	0.81	0.4	0.82	0.6	0.84
2018	10	0.4	0.37	0.1	0.35	0.2	0.36	0.3	0.35
2019	11	0.4	0.65	0.1	0.63	0.2	0.65	0.3	0.63
2020	7	0.3	0.39	0.1	0.20	0.1	0.24	0.2	0.30
1998-2020	332	0.7	0.58	0.2	0.52	0.4	0.54	0.5	0.56

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									
15-19									
20-24	1	0.2	0.2			0.0	1	0.4	0.4
25-29	0	0.0	0.2			0.0			0.4
30-34	0	0.0	0.2			0.0			0.4
35-39	0	0.0	0.2			0.0			0.4
40-44	2	0.3	0.5			0.0	2	0.8	1.3
45-49	5	0.8	1.2	4	1.0	1.0	1	0.4	1.7
50-54	19	3.0	4.2	14	3.5	4.5	5	2.1	3.8
55-59	23	3.6	7.8	16	4.0	8.4	7	2.9	6.7
60-64	39	6.1	13.9	29	7.2	15.6	10	4.2	10.9
65-69	56	8.7	22.6	36	8.9	24.6	20	8.4	19.2
70-74	133	20.7	43.3	92	22.8	47.4	41	17.2	36.4
75-79	142	22.1	65.4	91	22.6	70.0	51	21.3	57.7
80-84	123	19.2	84.6	71	17.6	87.6	52	21.8	79.5
85+	99	15.4	100.0	50	12.4	100.0	49	20.5	100.0
All ages	642	100.0		403	100.0		239	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								
15-19								
20-24		1			0.1	1.00		2.3
25-29								
30-34								
35-39								
40-44		2			0.1	0.67		0.2
45-49	4	1	0.1	0.50	0.0	0.33	0.3	0.1
50-54	14	5	0.5	0.67	0.2	0.50	0.5	0.2
55-59	16	7	0.8	0.48	0.3	0.47	0.4	0.2
60-64	29	10	1.6	0.50	0.5	0.42	0.5	0.2
65-69	36	20	2.2	0.42	1.1	0.37	0.4	0.3
70-74	92	41	6.1	0.60	2.4	0.73	0.8	0.5
75-79	91	51	7.5	0.71	3.4	0.52	0.7	0.5
80-84	71	52	9.8	0.68	4.9	0.75	0.7	0.6
85+	50	49	10.7	1.09	4.7	0.89	0.5	0.4
All ages	403	239					0.6	0.4
Mortality								
Raw			1.2	0.63	0.7	0.62		
WS			0.5	0.59	0.2	0.55		
ES			0.8	0.61	0.4	0.57		
BRD-S			1.1	0.63	0.5	0.59		
PYLL-70								
per 100,000			2.9		1.5			
ES			2.5		1.3			
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	2	0.4	1	50.0			1	50.0
C09–C10 Oropharynx	5	1.1	4	80.0			1	20.0
C12–C13 Hypopharynx	1	0.2	1	100.0				
C15 Oesophagus	3	0.7	2	66.7			1	33.3
C16 Stomach	5	1.1	3	60.0			2	40.0
C17 Small intestine	1	0.2	1	100.0				
C18 Colon	27	5.9	19	70.4	1	3.7	7	25.9
C19–C20 Rectum	11	2.4	9	81.8	1	9.1	1	9.1
C21 Anus/canal	1	0.2	1	100.0				
C22 Liver	1	0.2					1	100.0
C23–C24 Bile	1	0.2					1	100.0
C25 Pancreas	9	2.0	1	11.1	2	22.2	6	66.7
C32 Larynx	3	0.7	2	66.7			1	33.3
C33–C34 Lung	32	7.0	11	34.4			21	65.6
C43 Malign. melanoma	9	2.0	8	88.9			1	11.1
C44 Skin others	12	2.6	6	50.0			6	50.0
C46,C49 Soft tissue	1	0.2					1	100.0
C60 Penis	1	0.2					1	100.0
C61 Prostate	75	16.4	48	64.0	11	14.7	16	21.3
C62 Testis	1	0.2	1	100.0				
C64 Kidney	24	5.3	7	29.2	13	54.2	4	16.7
C65 Renal pelvis	10	2.2			1	10.0	9	90.0
C66 Ureter	44	9.6	9	20.5	30	68.2	5	11.4
C67 Bladder	144	31.5	81	56.3	12	8.3	51	35.4
C68 Urethra	7	1.5	3	42.9	1	14.3	3	42.9
C68 Urinary org.	8	1.8	2	25.0	2	25.0	4	50.0
C69 Eye lymphoma	1	0.2	1	100.0				
C70–C72 CNS cancer	2	0.4	2	100.0				
C73 Thyroid	1	0.2	1	100.0				
C76–C79 CUP	6	1.3	4	66.7	1	16.7	1	16.7
C82–C85 NHL	6	1.3	4	66.7	1	16.7	1	16.7
C90 Mult. myeloma	2	0.4	1	50.0			1	50.0
C91–C96 Leukaemia	1	0.2					1	100.0
All further malignancies	457	100.0	233	51.0	76	16.6	148	32.4

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	1	0.5	1	100.0				
C15 Oesophagus	1	0.5					1	100.0
C16 Stomach	2	0.9	2	100.0				
C17 Small intestine	4	1.9	2	50.0			2	50.0
C18 Colon	8	3.7	6	75.0	2	25.0		
C19–C20 Rectum	4	1.9	3	75.0			1	25.0
C25 Pancreas	4	1.9			1	25.0	3	75.0
C33–C34 Lung	17	7.9	5	29.4	2	11.8	10	58.8
C44 Skin others	5	2.3	3	60.0	2	40.0		
C46,C49 Soft tissue	2	0.9					2	100.0
C50 Breast	37	17.2	27	73.0			10	27.0
C51 Vulva	2	0.9	2	100.0				
C53 Cervix uteri	7	3.3	6	85.7			1	14.3
C54 Corpus uteri	5	2.3	4	80.0			1	20.0
C55,C57 Fem. genitals un	3	1.4	2	66.7			1	33.3
C56 Ovary	4	1.9	3	75.0			1	25.0
C64 Kidney	7	3.3	2	28.6	2	28.6	3	42.9
C65 Renal pelvis	4	1.9					4	100.0
C66 Ureter	19	8.8	2	10.5	12	63.2	5	26.3
C67 Bladder	65	30.2	21	32.3	11	16.9	33	50.8
C68 Urethra	1	0.5					1	100.0
C68 Urinary org.	3	1.4	1	33.3			2	66.7
C70–C72 CNS cancer	1	0.5					1	100.0
C73 Thyroid	1	0.5	1	100.0				
C76–C79 CUP	2	0.9	1	50.0			1	50.0
C82–C85 NHL	3	1.4	2	66.7			1	33.3
C90 Mult. myeloma	2	0.9	1	50.0			1	50.0
C91–C96 Leukaemia	1	0.5	1	100.0				
All further malignancies	215	100.0	98	45.6	32	14.9	85	39.5

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								
15-19								
20-24		1			0.1	1.00		2.4
25-29								
30-34								
35-39								
40-44		2			0.1	1.00		0.3
45-49	4	1	0.1	0.50	0.0	0.33	0.3	0.1
50-54	8		0.3	0.67			0.3	
55-59	9	3	0.4	0.38	0.1	0.30	0.2	0.1
60-64	20	3	1.1	0.61	0.2	0.23	0.4	0.1
65-69	17	17	1.0	0.50	0.9	0.47	0.2	0.3
70-74	44	26	2.9	0.63	1.5	0.87	0.5	0.4
75-79	43	32	3.6	0.88	2.1	0.54	0.5	0.4
80-84	33	33	4.6	0.87	3.1	0.77	0.4	0.5
85+	19	30	4.1	0.95	2.9	0.91	0.3	0.3
All ages	197	148					0.4	0.3
Mortality								
Raw			0.6	0.68	0.4	0.63		
WS			0.3	0.62	0.1	0.55		
ES			0.4	0.64	0.2	0.57		
BRD-S			0.6	0.68	0.3	0.60		
PYLL-70								
per 100,000			1.9		0.8			
ES			1.6		0.7			
AYLL-70			9.2		8.4			

* 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.	Males MI-index	Females Age-spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19								
20-24		1			0.1	1.00		2.5
25-29								
30-34								
35-39								
40-44		2			0.1	1.00		0.3
45-49	4		0.1	0.50			0.3	
50-54	6		0.2	0.86			0.3	
55-59	7	3	0.3	0.47	0.1	0.43	0.2	0.1
60-64	18	2	1.0	0.78	0.1	0.29	0.3	0.1
65-69	8	12	0.5	0.38	0.7	0.48	0.1	0.2
70-74	32	15	2.1	0.80	0.9	0.79	0.4	0.2
75-79	26	19	2.1	0.76	1.3	0.42	0.3	0.3
80-84	19	26	2.6	0.70	2.4	0.84	0.3	0.4
85+	11	16	2.4	0.73	1.5	0.62	0.2	0.2
All ages	131	96					0.3	0.2
Mortality								
Raw			0.4	0.68	0.3	0.57		
WS			0.2	0.66	0.1	0.54		
ES			0.3	0.67	0.1	0.54		
BRD-S			0.4	0.68	0.2	0.56		
PYLL-70								
per 100,000			1.5		0.7			
ES			1.3		0.6			
AYLL-70			10.2		9.3			

* See corresponding tables with multiple malignancies.

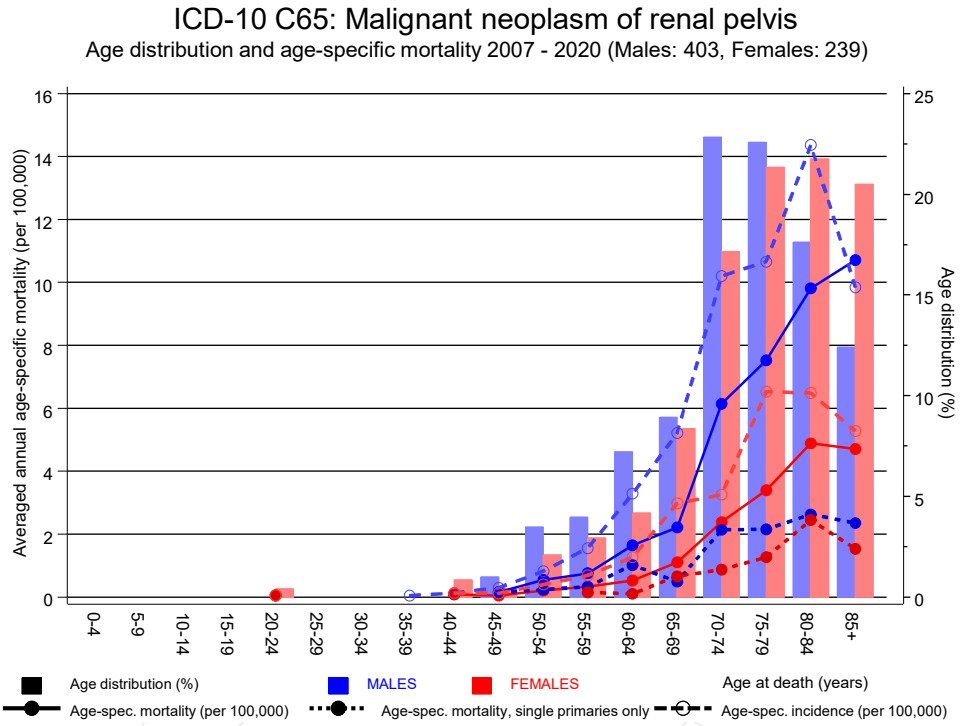


Figure 17. Distribution of age at death (bars; males: mean=72.0 yrs, median=72.9 yrs; females: mean=74.8 yrs, median=76.4 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

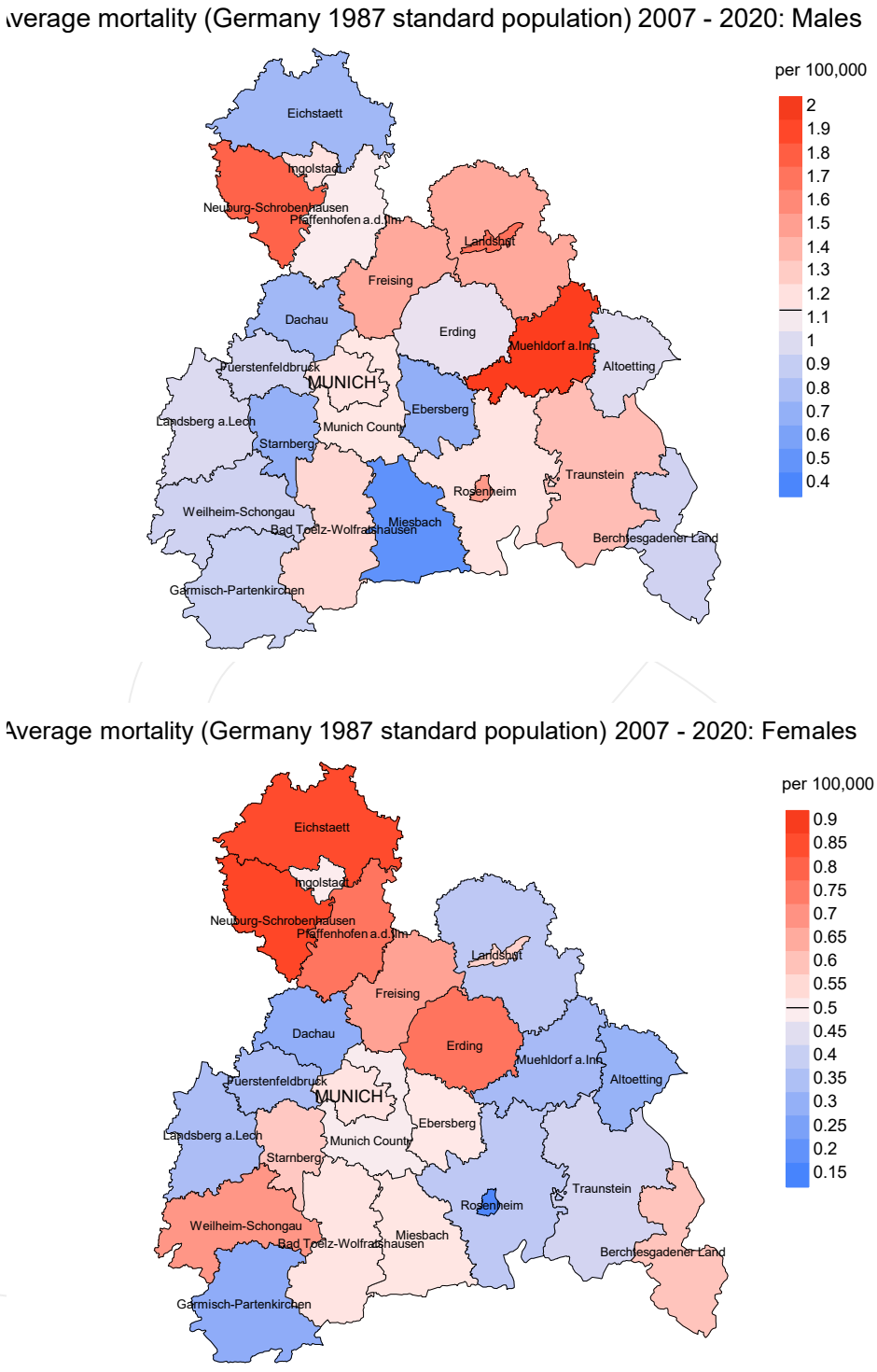
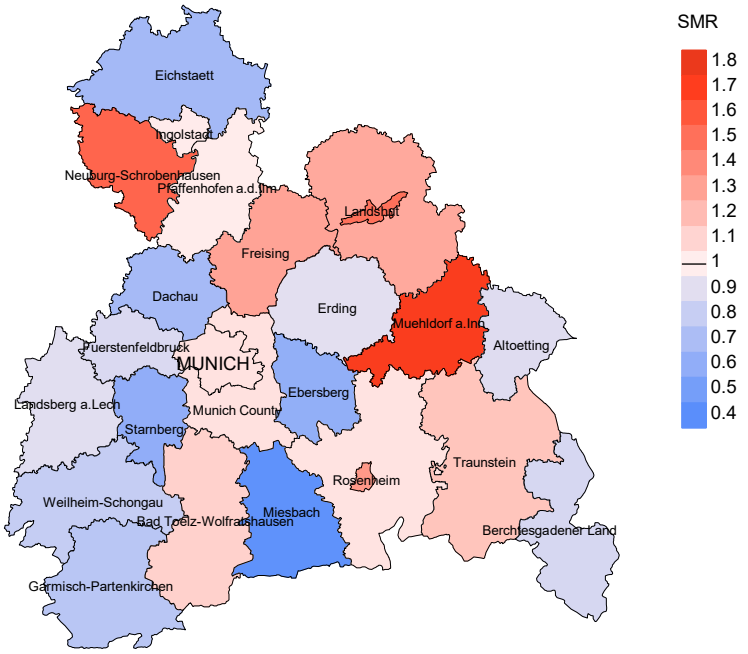


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2020. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 1.1/100,000 WS N=403, females 0.5/100,000 WS N=239).

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 7 women died from renal pelvis cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.5/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.1 and 1.4/100,000.

Standardized mortality ratio (SMR) 2007 - 2020: Males



Standardized mortality ratio (SMR) 2007 - 2020: Females

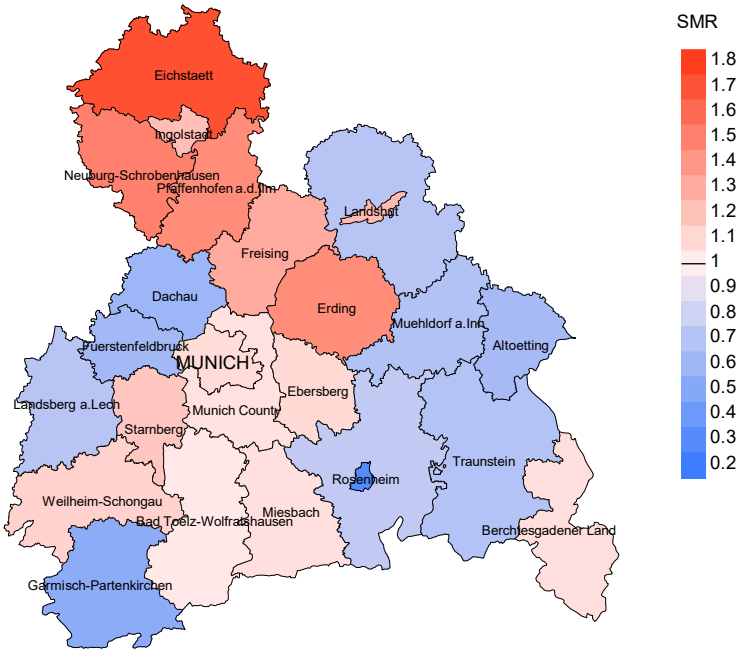


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=403, females N=239).

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 7 women died from renal pelvis cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.10. Though, the value of this parameter may vary with an underlying probability of 99% between 0.32 and 2.68, 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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