Munich Cancer Registry

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ICD-10 C64: Kidney cancer

Incidence and Mortality

Year of diagnosis	1998-2016
Patients	11,292
Diseases	11,533
Creation date	08/21/2018
Export date	08/09/2018
Population	4.81 m

Munich Cancer Registry
Cancer Registry Bavaria - Upper Bavaria Regional Center
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Marchioninistr. 15
Munich, 81377
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https://www.tumorregister-muenchen.de/en

https://www.tumorregister-muenchen.de/en/facts/base/bC64__E-ICD-10-C64-Kidney-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, August 2018

[#] 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

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	401	41	10.2	11.7	13.1	62.8	95.8
1999	393	32	8.1	11.7	12.8	61.8	93.9
2000	361	35	9.7	13.3	12.6	61.5	95.8
2001	354	45	12.7	13.9	12.5	64.1	95.8
2002	608	89	14.6	15.5	12.4	67.1	96.9 #
2003	621	68	11.0	15.5	12.2	61.0	94.4
2004	624	74	11.9	16.2	11.9	55.8	95.5
2005	655	39	6.0	16.7	11.4	52.5	94.2
2006	638	47	7.4	16.8	11.0	52.0	90.1
2007	746	72	9.7	17.1	10.2	51.5	77.6 #
2008	768	65	8.5	17.6	9.4	46.1	65.8
2009	784	73	9.3	18.2	8.9	45.4	63.8
2010	764	62	8.1	18.6	8.0	38.7	61.1
2011	696	45	6.5	18.7	7.5	39.1	59.8
2012	706	52	7.4	19.0	6.8	36.1	61.0
2013	633	49	7.7	19.3	6.1	30.0	58.9
2014	728	61	8.4	19.6	5.4	28.2	56.9
2015	589	71	12.1	19.9	4.4	26.1	98.5
2016	464	54	11.6	20.1	3.3	18.5	88.4 ##
1998-2016	11533	1074	9.3	20.1	13.1	46.0	78.7

11,533 cases diagnosed 1998-2016 are related to a total of 11,292 patients. Currently, in 3,533 (31.3 %) of these 11,292 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 2,733 / 620 / 180 (24.2 % / 5.5 % / 1.6 %) 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 2014, a subgroup of 728 cases has been diagnosed, of which 19.6 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 5.4 % 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	248	61.8	19	7.7	10.1	14.4	64.5	96.8
1999	241	61.3	19	7.9	11.0	14.2	61.0	94.2
2000	237	65.7	24	10.1	12.4	13.9	61.6	94.5
2001	211	59.6	21	10.0	13.1	13.9	61.6	96.2
2002	364	59.9	46	12.6	14.8	13.7	65.1	97.3 #
2003	389	62.6	37	9.5	15.4	13.4	58.6	93.3
2004	387	62.0	38	9.8	16.0	13.0	57.1	94.8
2005	416	63.5	19	4.6	16.7	12.4	50.7	95.2
2006	406	63.6	18	4.4	17.0	12.0	50.0	90.4
2007	479	64.2	35	7.3	17.6	11.1	51.4	77.2 #
2008	494	64.3	29	5.9	18.3	10.0	44.5	64.0
2009	487	62.1	41	8.4	19.1	9.4	44.1	64.9
2010	488	63.9	22	4.5	19.4	8.4	35.2	59.4
2011	445	63.9	29	6.5	19.5	7.6	38.2	59.1
2012	464	65.7	28	6.0	19.9	6.7	34.3	60.3
2013	409	64.6	21	5.1	20.3	5.6	28.6	57.9
2014	475	65.2	34	7.2	20.5	5.3	26.7	57.7
2015	403	68.4	41	10.2	20.9	4.6	23.8	98.8
2016	312	67.2	25	8.0	21.1	3.6	16.0	87.8 ##
1998-2016	7355	63.8	546	7.4	21.1	14.4	44.3	78.3

7,355 cases diagnosed 1998-2016 are related to a total of 7,183 patients. Currently, in 2,389 (33.3 %) of these 7,183 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 1,810 / 444 / 135 (25.2 % / 6.2 % / 1.9 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:
In 2014, a subgroup of 475 cases has been diagnosed, of which 20.5 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 5.3 % 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 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	153	38.2	22	14.4	14.4	10.7	60.1	94.1	
1999	152	38.7	13	8.6	12.8	10.4	63.2	93.4	
2000	124	34.3	11	8.9	14.9	10.3	61.3	98.4	
2001	143	40.4	24	16.8	15.2	10.2	67.8	95.1	
2002	244	40.1	43	17.6	16.5	10.1	70.1	96.3	#
2003	232	37.4	31	13.4	15.7	10.0	65.1	96.1	
2004	237	38.0	36	15.2	16.5	9.8	53.6	96.6	
2005	239	36.5	20	8.4	16.7	9.5	55.6	92.5	
2006	232	36.4	29	12.5	16.4	9.3	55.6	89.7	
2007	267	35.8	37	13.9	16.2	8.6	51.7	78.3	#
2008	274	35.7	36	13.1	16.4	8.3	48.9	69.0	
2009	297	37.9	32	10.8	16.6	7.9	47.5	62.0	
2010	276	36.1	40	14.5	17.2	7.2	44.9	64.1	
2011	251	36.1	16	6.4	17.2	7.2	40.6	61.0	
2012	242	34.3	24	9.9	17.5	6.9	39.7	62.4	
2013	224	35.4	28	12.5	17.7	6.9	32.6	60.7	
2014	253	34.8	27	10.7	18.0	5.7	30.8	55.3	
2015	186	31.6	30	16.1	18.3	4.0	31.2	97.8	
2016	152	32.8	29	19.1	18.4	2.7	23.7	89.5	##
1998-2016	4178	36.2	528	12.6	18.4	10.7	49.1	79.4	

4,178 cases diagnosed 1998-2016 are related to a total of 4,109 patients. Currently, in 1,144 (27.8 %) of these 4,109 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 923 / 176 / 45 (22.5 % / 4.3 % / 1.1 %) 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 2014, a subgroup of 253 cases has been diagnosed, of which 18.0 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 5.7 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 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 4.81 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	248	153	22.4	13.0	14.4	6.3	20.2	9.0	24.5	11.2
1999	241	152	21.5	12.8	13.3	6.6	19.2	9.2	23.6	11.1
2000	237	124	20.8	10.3	13.3	4.8	18.6	7.0	22.4	8.8
2001	211	143	18.2	11.8	10.9	5.5	15.7	8.1	19.7	10.1
2002	364	244	19.5	12.5	11.5	5.8	16.6	8.4	20.8	10.6
2003	389	232	20.8	11.8	12.4	5.4	17.4	7.7	21.1	9.7
2004	387	237	20.6	12.0	12.2	5.5	17.1	7.9	20.9	9.9
2005	416	239	22.0	12.0	12.6	5.6	18.0	7.9	21.5	10.1
2006	406	232	21.2	11.5	12.2	5.7	17.1	7.8	20.6	9.5
2007	479	267	21.6	11.6	12.2	5.3	17.2	7.3	21.1	9.3
2008	494	274	22.2	11.8	12.4	5.7	17.5	8.0	21.3	9.9
2009	487	297	21.8	12.8	11.9	5.9	17.0	8.3	21.1	10.5
2010	488	276	21.7	11.8	11.6	4.8	16.5	7.1	20.3	9.1
2011	445	251	19.9	10.7	10.7	5.4	15.1	7.1	18.4	8.7
2012	464	242	20.4	10.3	10.8	4.2	15.4	6.2	18.9	8.2
2013	409	224	17.8	9.4	9.5	4.3	13.4	6.0	16.3	7.5
2014	475	253	20.4	10.5	10.8	4.5	15.2	6.6	18.5	8.2
2015	403	186	16.9	7.6	8.2	3.2	12.1	4.6	15.3	5.8
2016	312	152	13.0	6.2	6.4	2.6	9.3	3.7	11.7	4.8
1998-2016	7355	4178	20.0	10.9	11.1	5.0	15.8	7.1	19.3	8.9

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	401	65.3	13.8	2.8	99.7	49.4	58.7	65.9	75.1	80.3
1999	393	65.3	13.5	1.1	94.3	49.7	57.6	65.5	75.3	81.8
2000	361	65.5	13.3	0.3	93.5	48.8	57.9	66.2	75.1	80.8
2001	354	66.5	12.4	1.9	96.4	51.8	59.0	66.4	75.6	80.6
2002	608	67.6	13.2	0.1	96.2	50.0	60.6	68.9	76.8	82.3
2003	621	66.9	13.6	0.4	96.2	50.8	60.3	67.8	75.8	82.6
2004	624	66.6	13.8	0.0	94.1	49.0	60.3	67.7	76.1	81.8
2005	655	66.7	12.9	0.7	95.1	51.3	59.7	67.7	75.5	81.4
2006	638	66.3	14.3	0.2	95.5	48.4	59.6	67.9	75.5	81.7
2007	746	67.1	14.5	1.2	99.1	48.3	60.5	69.0	76.3	82.7
2008	768	66.8	13.8	0.2	98.1	49.7	59.2	68.2	76.2	82.8
2009	784	67.4	14.5	0.5	96.9	50.2	59.7	69.7	77.2	82.7
2010	764	67.9	13.5	5.4	100	48.5	59.4	70.0	77.0	83.5
2011	696	67.2	15.1	0.5	96.9	49.9	60.4	69.6	76.6	83.0
2012	706	68.0	13.5	1.4	93.1	50.7	60.3	70.2	77.5	83.1
2013	633	67.3	14.3	0.3	97.3	49.9	59.3	69.7	77.0	82.4
2014	728	67.8	13.4	1.2	97.0	52.0	60.1	69.7	76.6	83.7
2015	589	69.7	12.4	0.7	98.9	52.2	61.0	71.6	78.1	84.6
2016	464	69.1	12.8	12.6	94.8	52.2	60.8	71.0	78.2	83.6
1998-2016	11533	67.2	13.7	0.0	100	50.1	59.8	68.8	76.6	82.6

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	248	63.4	13.5	5.0	91.9	46.7	56.4	64.5	72.7	78.5
1999	241	64.4	12.9	2.3	88.4	50.1	57.5	65.0	72.2	80.3
2000	237	63.6	13.4	0.3	93.5	47.6	56.2	65.0	72.0	78.5
2001	211	65.1	11.1	1.9	89.9	51.8	58.7	64.4	73.0	79.1
2002	364	65.9	13.0	0.1	96.2	47.2	58.6	67.6	74.6	80.4
2003	389	64.7	13.3	0.4	96.2	48.0	59.2	65.3	73.1	78.7
2004	387	64.8	13.9	0.0	93.6	48.6	58.0	66.3	73.6	79.9
2005	416	65.1	11.5	0.7	92.4	51.2	58.8	65.8	73.0	78.1
2006	406	65.0	13.0	0.8	95.4	48.4	59.1	66.6	73.5	78.5
2007	479	65.5	13.2	2.6	93.1	48.3	58.6	67.5	74.1	80.4
2008	494	65.7	13.3	0.2	98.1	49.1	57.9	67.5	74.4	81.2
2009	487	66.2	14.1	0.5	96.1	49.6	58.6	68.8	75.7	81.8
2010	488	65.5	12.9	5.4	93.5	47.2	56.4	68.2	74.7	80.8
2011	445	66.5	13.1	1.5	96.9	50.0	59.9	68.5	75.0	82.4
2012	464	66.2	13.9	1.4	93.1	48.4	57.4	69.0	75.7	82.4
2013	409	66.1	13.4	0.9	94.1	49.2	58.4	67.3	75.4	81.7
2014	475	66.6	13.4	1.2	97.0	51.5	58.7	68.0	75.7	81.6
2015	403	69.1	11.7	28.1	98.9	52.7	60.5	70.9	77.1	83.6
2016	312	68.3	12.3	20.8	94.8	52.2	59.5	69.9	77.4	82.6
1998-2016	7355	65.8	13.1	0.0	98.9	49.3	58.6	67.2	74.8	80.7

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	153	68.2	13.7	2.8	99.7	56.2	61.3	70.0	77.5	84.0
1999	152	66.6	14.3	1.1	94.3	49.4	57.9	66.6	77.6	83.9
2000	124	69.2	12.3	37.2	91.4	54.5	60.7	70.9	78.0	86.4
2001	143	68.7	13.9	30.6	96.4	51.2	60.6	70.4	78.8	85.1
2002	244	70.0	13.1	2.4	93.6	54.7	63.7	72.3	78.9	83.8
2003	232	70.6	13.2	2.5	95.2	54.3	63.9	72.0	80.2	85.3
2004	237	69.4	13.4	18.5	94.1	52.5	63.5	70.6	78.5	84.7
2005	239	69.3	14.8	4.2	95.1	51.8	62.4	72.4	79.8	83.8
2006	232	68.5	16.2	0.2	95.5	49.6	61.1	71.7	79.2	85.7
2007	267	70.1	16.3	1.2	99.1	49.3	66.0	72.3	79.8	85.8
2008	274	68.8	14.5	0.6	96.1	51.8	61.6	69.5	78.9	84.2
2009	297	69.3	15.0	1.7	96.9	50.7	63.2	71.4	79.7	84.5
2010	276	72.1	13.5	5.4	100	54.3	65.2	72.9	81.1	88.0
2011	251	68.4	18.1	0.5	96.5	49.1	63.4	72.7	79.3	85.1
2012	242	71.4	11.9	9.7	92.4	56.4	66.0	72.9	80.0	83.8
2013	224	69.4	15.6	0.3	97.3	51.4	61.8	72.2	79.1	84.5
2014	253	70.2	13.2	2.5	94.3	53.1	62.4	72.9	79.4	85.8
2015	186	70.9	13.8	0.7	98.0	50.0	62.3	73.9	79.4	86.6
2016	152	70.9	13.7	12.6	93.6	52.3	64.4	73.1	80.3	85.7
1998-2016	4178	69.7	14.5	0.2	100	52.1	62.8	72.0	79.3	85.1

Table 4

Age distribution by 5-year age group and sex for period 2007-2016
(incl. DCO)

Age at diagnosis Years	Cases n	%	Males Cum.%	n	%	Females Cum.%	n	%	Cum.%
0-4	45	0.7	0.7	21	0.5	0.5	24	1.0	1.0
5-9	15	0.2	0.9	8	0.2	0.7	7	0.3	1.3
10-14	4	0.1	0.9	2	0.0	0.7	2	0.1	1.4
15-19	2	0.0	1.0	1	0.0	0.7	1	0.0	1.4
20-24	7	0.1	1.1	4	0.1	0.8	3	0.1	1.5
25-29	15	0.2	1.3	10	0.2	1.0	5	0.2	1.7
30-34	33	0.5	1.8	20	0.4	1.5	13	0.5	2.3
35-39	95	1.4	3.1	67	1.5	3.0	28	1.2	3.4
40-44	159	2.3	5.5	110	2.5	5.5	49	2.0	5.5
45-49	283	4.1	9.6	223	5.0	10.5	60	2.5	7.9
50-54	459	6.7	16.2	347	7.8	18.2	112	4.6	12.6
55-59	594	8.6	24.9	444	10.0	28.2	150	6.2	18.7
60-64	725	10.5	35.4	516	11.6	39.8	209	8.6	27.4
65-69	1066	15.5	50.9	697	15.6	55.4	369	15.2	42.6
70-74	1149	16.7	67.6	780	17.5	72.9	369	15.2	57.8
75-79	1067	15.5	83.1	621	13.9	86.9	446	18.4	76.3
80-84	681	9.9	93.0	373	8.4	95.2	308	12.7	89.0
85+	479	7.0	100.0	212	4.8	100.0	267	11.0	100.0
All ages	6878	100.0		4456	100.0		2422	100.0	

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 2007-2016

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males DCO rate n=304 %	Females DCO rate n=298 %	Males Prop.all cancers n=113978 %	Females Prop.all cancers n=112253 %
0- 4	19	24	1.7	2.3			9.7	16.1
5- 9	8	7	0.7	0.7			7.7	8.3
10-14	2	2	0.2	0.2		50.0	1.7	2.0
15-19	1	1	0.1	0.1			0.4	0.5
20-24	4	3	0.3	0.2			0.9	0.8
25-29	10	5	0.6	0.3			1.5	0.6
30-34	20	13	1.3	0.8			2.1	0.9
35-39	67	28	4.1	1.8			4.8	1.1
40-44	107	49	5.7	2.7	0.9		4.9	1.1
45-49	218	60	11.0	3.1	0.5	1.7	5.5	0.9
50-54	340	112	19.7	6.5	2.1		5.5	1.3
55-59	433	149	30.6	10.1	1.6	2.7	4.7	1.6
60-64	509	207	41.6	15.6	1.8	0.5	3.9	1.8
65-69	684	366	57.7	28.2	3.8	2.5	3.7	2.6
70-74	776	366	70.1	28.9	4.5	5.2	3.7	2.5
75-79	618	441	77.6	44.0	8.4	9.5	3.7	3.3
80-84	370	306	80.4	43.2	19.7	22.9	3.4	2.8
85+	212	266	69.2	36.2	43.9	56.8	2.7	2.1
All ages	4398	2405			6.9	12.4	3.9	2.1
Incidence								
Raw			19.2	10.2				
WS			10.2	4.5				
ES			14.6	6.4				
BRD-S			17.9	8.0				

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).

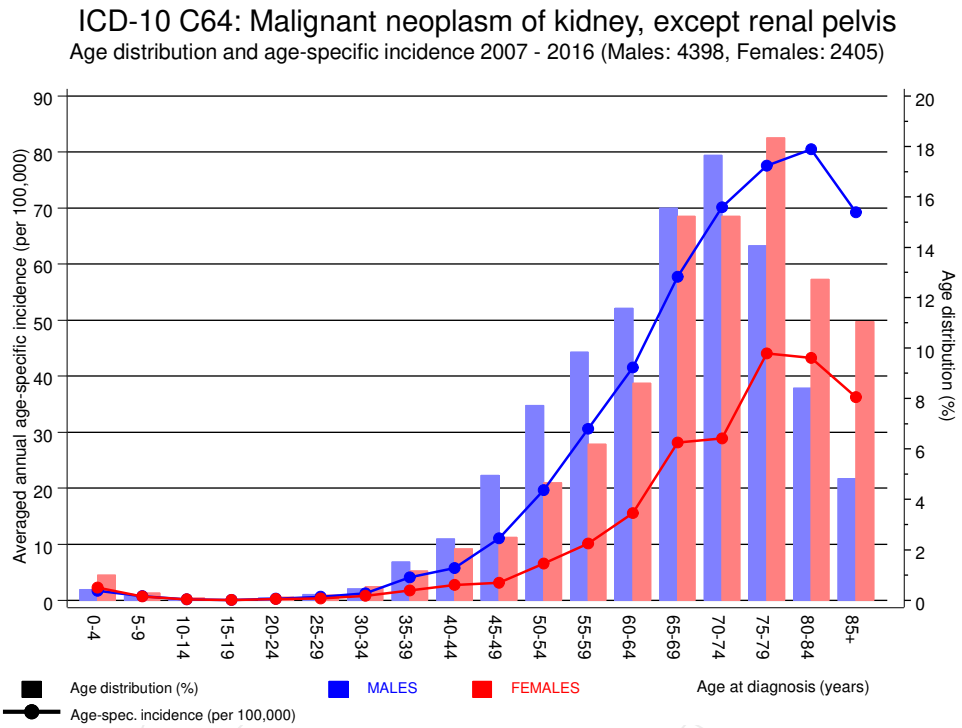


Figure 6. Age distribution (males: mean=66.6 yrs, median=68.5 yrs; females: mean=70.1 yrs, median=72.4 yrs) and age-specific incidence.

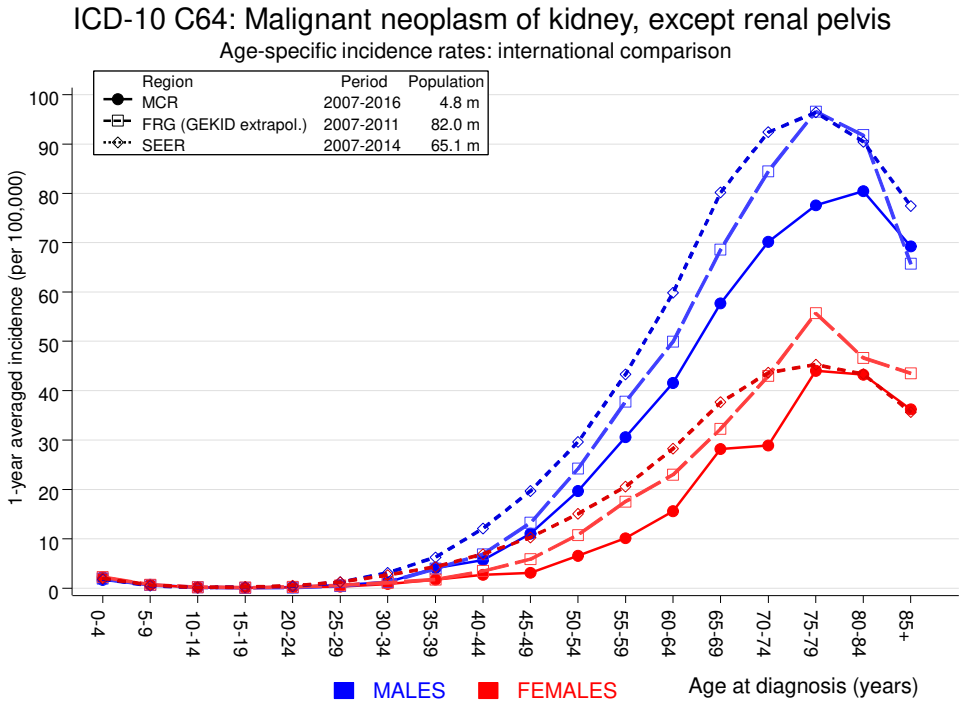


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

Extrapolated age-specific patient population of Germany, data status middle of 2010. Association of Population-based Cancer Registries in Germany (GEKID e.V.). Berlin, 2014. http://www.gekid.de. Last access: 02/11/2015
Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 18 Regs Research Data, released April 2014, based on the November 2013 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 1998–2016

MALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C03–C06	Oral cavity	9	3.3	2.7	1.3	5.2	#	2.4	
C09–C10	Oropharynx	15	4.1	3.7	2.1	6.1	#	4.6	
C12–C13	Hypopharynx	6	2.2	2.7	1.0	5.8		1.6	
C15	Oesophagus	15	7.4	2.0	1.1	3.3	#	3.2	13.3
C16	Stomach	24	16.0	1.5	1.0	2.2		3.4	16.7
C17	Small intestine	8	2.1	3.7	1.6	7.3	#	2.5	
C18	Colon	91	38.6	2.4	1.9	2.9	#	22.2	6.6
C19–C20	Rectum	40	21.4	1.9	1.3	2.5	#	7.9	
C21	Anus/canal	2	0.9	2.3	0.3	8.3		0.5	50.0
C22	Liver	35	11.4	3.1	2.1	4.3	#	10.0	11.4
C23–C24	Bile	8	3.9	2.0	0.9	4.0		1.7	12.5
C25	Pancreas	37	14.8	2.5	1.8	3.4	#	9.4	18.9
C32	Larynx	11	4.1	2.7	1.3	4.8	#	2.9	9.1
C33–C34	Lung	133	47.3	2.8	2.4	3.3	#	36.4	9.8
C38,C45	Mesothelioma	6	2.7	2.2	0.8	4.8		1.4	16.7
C40–C41	Bone	3	0.3	9.3	1.9	27.2	#	1.1	
C43	Malign. melanoma	49	17.1	2.9	2.1	3.8	#	13.6	4.1
C46,C49	Soft tissue	11	2.2	5.0	2.5	9.0	#	3.7	
C48	Peritoneal	4	0.3	13.3	3.6	34.0	#	1.6	25.0
C50	Breast	2	1.0	1.9	0.2	7.0		0.4	
C61	Prostate	337	115.8	2.9	2.6	3.2	#	93.9	3.3
C62	Testis	6	1.0	6.2	2.3	13.5	#	2.1	
C64	Kidney	170	14.0	12.1	10.4	14.1	#	66.2	1.2
C65	Renal pelvis	12	1.7	7.0	3.6	12.1	#	4.4	
C66	Ureter	10	1.0	10.3	5.0	19.0	#	3.8	
C67	Bladder	52	17.9	2.9	2.2	3.8	#	14.5	7.7
C68	Urinary org.	2	0.2	8.1	1.0	29.4		0.7	
C70–C72	CNS cancer	12	5.2	2.3	1.2	4.1	#	2.9	
C73	Thyroid	15	2.6	5.9	3.3	9.7	#	5.3	13.3
C76–C79	CUP	8	6.7	1.2	0.5	2.4		0.6	12.5
C81	Hodgkin lymphoma	2	0.9	2.2	0.3	8.1		0.5	
C82–C85	NHL	59	16.3	3.6	2.8	4.7	#	18.1	5.1
C90	Mult. myeloma	11	5.2	2.1	1.1	3.8	#	2.5	9.1
C91–C96	Leukaemia	14	6.5	2.1	1.2	3.6	#	3.2	14.3
Others, specified		10	5.3	1.9	0.9	3.4		2.0	20.0
Not observed		0	0.8	0.0	0.0	4.5		-0.3	
All further malignancies		1229	402.2	3.1	2.9	3.2	#	351.0	5.8

Patients	6504
Median age at next malignancy (years)	70.8
Person-years	23551
Mean observation time (years)	3.6
Median observation time (years)	1.9

The occurrence of further malignancy listed is statistically significant.

Observed further malignancies with count 1 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 1998–2016
FEMALES

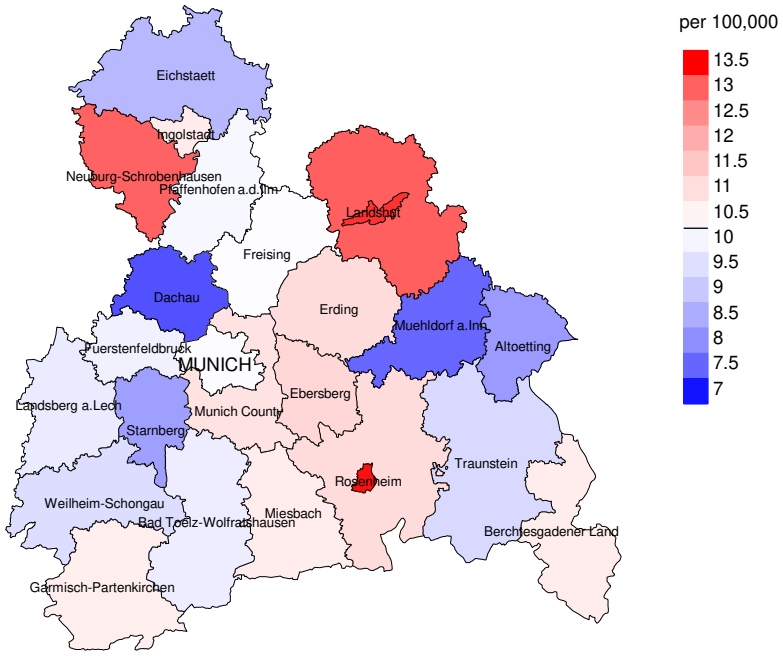
Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C15	Oesophagus	3	1.0	3.0	0.6	8.7		1.5	
C16	Stomach	16	6.2	2.6	1.5	4.2	#	7.4	
C17	Small intestine	2	0.8	2.5	0.3	9.0		0.9	
C18	Colon	36	17.2	2.1	1.5	2.9	#	14.1	2.8
C19–C20	Rectum	13	7.1	1.8	1.0	3.1		4.4	7.7
C22	Liver	6	2.1	2.9	1.1	6.3	#	2.9	16.7
C23–C24	Bile	13	2.5	5.1	2.7	8.8	#	7.9	15.4
C25	Pancreas	20	8.0	2.5	1.5	3.9	#	9.0	35.0
C33–C34	Lung	38	12.0	3.2	2.2	4.3	#	19.5	15.8
C43	Malign. melanoma	14	5.8	2.4	1.3	4.0	#	6.1	
C46,C49	Soft tissue	3	1.0	3.1	0.6	9.1		1.5	
C50	Breast	102	47.1	2.2	1.8	2.6	#	41.2	3.9
C51	Vulva	4	1.8	2.3	0.6	5.8		1.7	25.0
C53	Cervix uteri	4	1.9	2.1	0.6	5.4		1.6	
C54	Corpus uteri	18	9.1	2.0	1.2	3.1	#	6.7	5.6
C56	Ovary	11	6.8	1.6	0.8	2.9		3.2	9.1
C64	Kidney	68	4.3	16.0	12.4	20.3	#	47.9	1.5
C65	Renal pelvis	4	0.6	7.2	2.0	18.5	#	2.6	
C66	Ureter	5	0.3	17.7	5.7	41.3	#	3.5	20.0
C67	Bladder	16	3.3	4.8	2.7	7.8	#	9.5	6.3
C70–C72	CNS cancer	6	2.3	2.7	1.0	5.8		2.8	33.3
C73	Thyroid	23	2.4	9.6	6.1	14.4	#	15.5	4.3
C76–C79	CUP	8	3.2	2.5	1.1	5.0	#	3.6	12.5
C82–C85	NHL	22	6.7	3.3	2.1	5.0	#	11.5	9.1
C90	Mult. myeloma	4	2.2	1.8	0.5	4.7		1.4	
C91–C96	Leukaemia	9	2.8	3.2	1.5	6.1	#	4.7	11.1
Others, specified		5	2.6	1.9	0.6	4.5		1.8	20.0
Not observed		0	4.6	0.0	0.0	0.8	#	-3.4	
All further malignancies		473	165.5	2.9	2.6	3.1	#	231.1	7.6

Patients	3557
Median age at next malignancy (years)	73.2
Person-years	13308
Mean observation time (years)	3.7
Median observation time (years)	2.0

The occurrence of further malignancy listed is statistically significant.

Observed further malignancies with count 1 are pooled in category “Others, specified”.

Average incidence (world standard population) 2007 - 2016: Males



Average incidence (world standard population) 2007 - 2016: Females

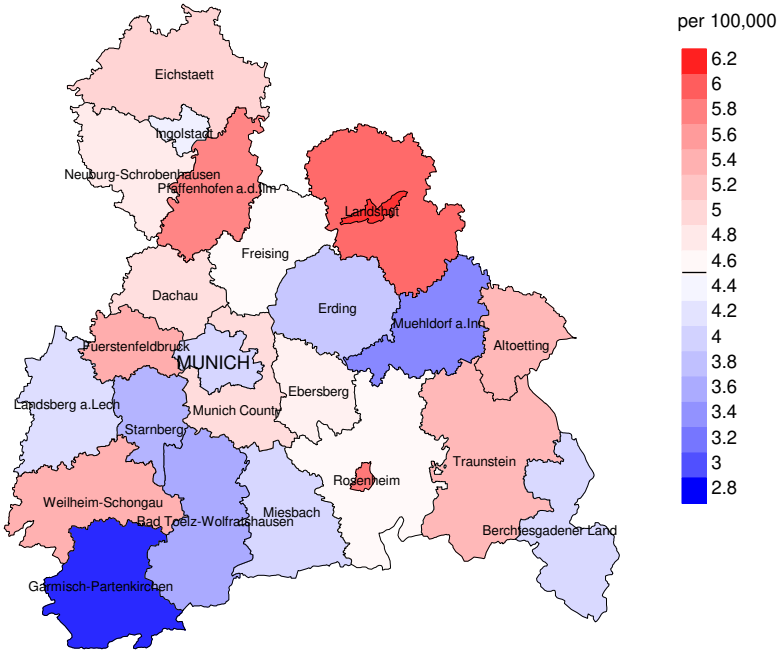
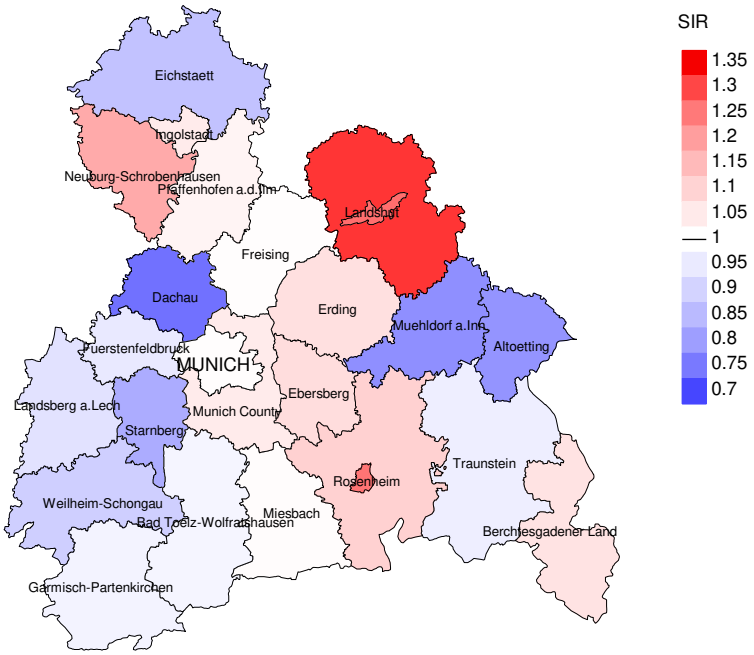


Figure 8a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 10.2/100,000 WS N=4,398, females 4.5/100,000 WS N=2,405).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 76 women were identified with newly diagnosed kidney cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 4.7/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 3.3 and 6.6/100,000.

Standardized incidence ratio (SIR) 2007 - 2016: Males



Standardized incidence ratio (SIR) 2007 - 2016: Females

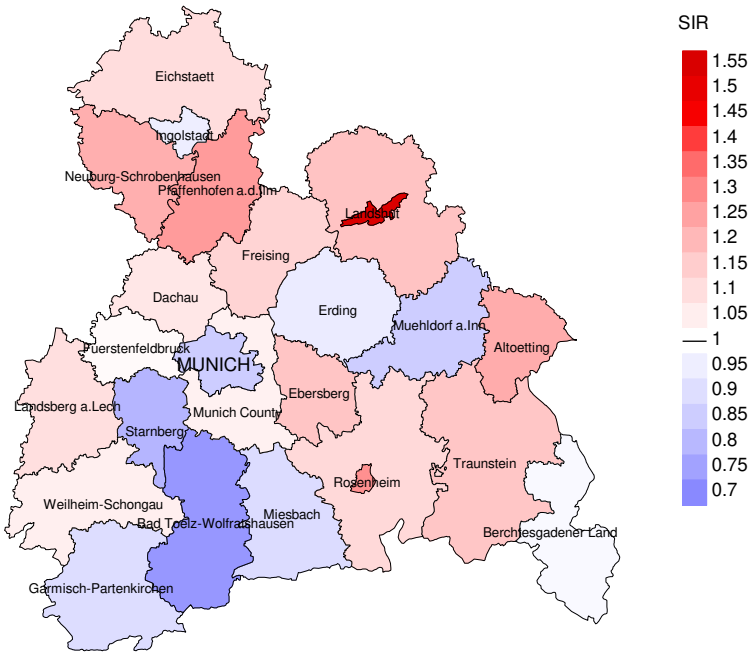


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=4,398, females N=2,405).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 76 women were identified with newly diagnosed kidney cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.17. Though, the value of this parameter may vary with an underlying probability of 99% between 0.85 and 1.56, 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 4.81 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	401	95.8	10.2	252	62.8	94.4
1999	393	93.9	8.1	243	61.8	95.1
2000	361	95.8	9.7	222	61.5	96.4
2001	354	95.8	12.7	227	64.1	98.2
2002	608	96.9	14.6	408	67.1	96.6
2003	621	94.4	11.0	379	61.0	98.2
2004	624	95.5	11.9	348	55.8	98.0
2005	655	94.2	6.0	344	52.5	98.5
2006	638	90.1	7.4	332	52.0	98.2
2007	746	77.6	9.7	384	51.5	99.0
2008	768	65.8	8.5	354	46.1	98.9
2009	784	63.8	9.3	356	45.4	98.3
2010	764	61.1	8.1	296	38.7	98.0
2011	696	59.8	6.5	272	39.1	97.4
2012	706	61.0	7.4	255	36.1	97.3
2013	633	58.9	7.7	190	30.0	98.4
2014	728	56.9	8.4	205	28.2	95.6
2015	589	98.5	12.1	154	26.1	98.1
2016	464	88.4	11.6	86	18.5	95.3
1998-2016	11533	78.7	9.3	5307	46.0	97.6

Table 9b

Annual cohorts of incident cancers and deaths, proportion of death certificates and cases deceased within the same year of being diagnosed with cancer (incl. DCO)
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.81 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	401	213	93.9	63	15.7
1999	393	212	95.3	66	16.8
2000	361	207	95.2	54	15.0
2001	354	219	95.0	59	16.7
2002	608	322	96.9	125	20.6
2003	621	328	97.0	114	18.4
2004	624	342	96.8	110	17.6
2005	655	309	95.1	75	11.5
2006	638	345	97.7	91	14.3
2007	746	379	98.2	114	15.3
2008	768	408	99.0	108	14.1
2009	784	427	99.1	130	16.6
2010	764	455	98.5	119	15.6
2011	696	415	98.3	104	14.9
2012	706	478	98.1	119	16.9
2013	633	449	99.1	91	14.4
2014	728	435	98.4	105	14.4
2015	589	532	98.5	114	19.4
2016	464	450	99.1	82	17.7
1998-2016	11533	6925	97.7	1843	16.0

Table 9c

Annual cohorts of deaths, proportion of cancer-related and non-cancer-related deaths, and cancer recorded on death certificates (incl. DCO)
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.81 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. non-cancer-related %	Prop. cancer recorded on death certificate %
1998	213	65.3	34.7	79.5
1999	212	71.7	28.3	84.7
2000	207	71.5	28.5	81.7
2001	219	73.1	26.9	85.6
2002	322	70.2	29.8	85.6
2003	328	73.8	26.2	86.2
2004	342	69.0	31.0	81.9
2005	309	72.2	27.8	82.3
2006	345	69.9	30.1	77.2
2007	379	71.8	28.2	79.6
2008	408	69.6	30.4	80.9
2009	427	72.4	27.6	80.6
2010	455	67.3	32.7	76.6
2011	415	64.6	35.4	78.7
2012	478	60.7	39.3	71.2
2013	449	62.1	37.9	73.7
2014	435	60.0	40.0	69.4
2015	532	60.9	39.1	71.8
2016	450	55.3	44.7	70.0
1998-2016	6925	66.6	33.4	77.7

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	142	71.1	69.4	76.8	70.1
1999	138	73.5	71.4	81.4	72.4
2000	124	72.4	68.7	79.5	71.5
2001	147	69.7	67.7	74.9	69.4
2002	188	73.8	73.2	74.6	73.8
2003	196	73.7	71.3	77.8	73.0
2004	203	73.7	72.4	77.2	73.6
2005	186	73.6	71.8	80.3	72.2
2006	220	73.1	71.3	77.0	72.3
2007	230	74.2	72.4	79.8	73.1
2008	265	74.5	72.7	78.1	73.9
2009	269	74.7	72.9	79.3	73.2
2010	276	75.4	74.0	78.6	74.4
2011	269	75.8	73.1	82.2	74.4
2012	276	77.0	74.9	80.7	75.5
2013	274	77.3	74.3	81.3	75.6
2014	277	77.3	74.3	81.9	75.4
2015	336	76.9	75.0	83.4	75.6
2016	284	78.3	76.3	80.6	77.7
1998-2016	4300	75.2	73.1	79.7	74.1

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	71	80.8	77.7	82.4	81.1
1999	74	77.8	76.5	84.4	78.3
2000	83	76.5	76.5	76.9	77.8
2001	72	79.0	77.8	82.3	78.0
2002	134	78.1	75.7	82.5	76.9
2003	132	78.3	77.3	80.4	77.9
2004	139	81.1	79.9	83.1	80.8
2005	123	78.7	75.3	82.6	76.2
2006	125	79.4	78.7	80.5	78.6
2007	149	80.1	79.0	82.2	80.1
2008	143	80.4	78.1	83.8	78.1
2009	158	81.1	77.5	85.7	78.8
2010	179	81.3	79.1	85.7	80.3
2011	146	81.7	78.7	87.4	79.8
2012	202	80.4	77.6	84.1	78.3
2013	175	80.6	77.5	85.0	78.8
2014	158	82.3	80.0	85.9	80.3
2015	196	81.5	78.7	86.1	79.7
2016	166	82.8	77.8	86.1	80.5
1998-2016	2625	80.5	78.1	84.2	79.1

By 2010, life expectancy at birth was 77.5 years for boys and 82.6 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	99	8.9	0.40	5.2	0.37	8.1	0.40	10.9	0.44
1999	99	8.8	0.41	5.1	0.39	8.0	0.42	10.9	0.46
2000	89	7.8	0.38	4.5	0.34	6.9	0.38	9.5	0.43
2001	109	9.4	0.52	5.4	0.49	8.2	0.52	10.6	0.54
2002	136	7.3	0.38	3.9	0.34	6.3	0.38	8.7	0.42
2003	148	7.9	0.39	4.3	0.35	6.5	0.38	8.9	0.43
2004	144	7.7	0.38	4.0	0.33	6.2	0.37	8.4	0.41
2005	132	7.0	0.33	3.5	0.29	5.4	0.31	7.3	0.35
2006	162	8.5	0.41	4.3	0.36	6.4	0.39	8.6	0.43
2007	176	7.9	0.38	3.9	0.33	6.1	0.36	8.3	0.40
2008	183	8.2	0.37	3.9	0.32	6.1	0.35	8.4	0.40
2009	199	8.9	0.41	4.1	0.35	6.4	0.38	8.9	0.43
2010	185	8.2	0.39	3.7	0.32	5.8	0.36	8.1	0.41
2011	182	8.1	0.41	3.7	0.35	5.7	0.38	7.7	0.42
2012	169	7.4	0.37	3.1	0.29	5.0	0.33	6.9	0.37
2013	180	7.8	0.44	3.3	0.35	5.2	0.39	7.3	0.45
2014	159	6.8	0.34	2.9	0.27	4.6	0.30	6.2	0.34
2015	215	9.0	0.54	3.8	0.47	6.0	0.49	8.2	0.54
2016	172	7.2	0.56	2.9	0.46	4.6	0.50	6.4	0.55
1998-2016	2938	8.0	0.40	3.8	0.35	5.9	0.38	8.1	0.42

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	40	3.4	0.26	1.1	0.18	1.9	0.21	2.6	0.24
1999	53	4.5	0.35	1.7	0.26	2.7	0.30	3.7	0.34
2000	59	4.9	0.48	1.8	0.38	2.9	0.41	4.1	0.46
2001	51	4.2	0.36	1.5	0.28	2.5	0.31	3.5	0.35
2002	90	4.6	0.37	1.7	0.30	2.7	0.32	3.6	0.35
2003	94	4.8	0.41	1.7	0.32	2.7	0.36	3.8	0.39
2004	92	4.7	0.40	1.5	0.29	2.4	0.32	3.5	0.36
2005	92	4.6	0.39	1.7	0.33	2.6	0.34	3.5	0.36
2006	79	3.9	0.34	1.3	0.23	2.0	0.26	2.9	0.31
2007	97	4.2	0.36	1.3	0.24	2.1	0.29	3.2	0.34
2008	101	4.4	0.37	1.4	0.25	2.3	0.28	3.2	0.33
2009	111	4.8	0.38	1.7	0.28	2.6	0.31	3.5	0.34
2010	121	5.2	0.44	1.6	0.34	2.6	0.37	3.9	0.43
2011	86	3.7	0.35	1.2	0.23	1.9	0.28	2.7	0.31
2012	121	5.1	0.51	1.6	0.39	2.6	0.42	3.9	0.48
2013	99	4.2	0.45	1.3	0.31	2.1	0.35	3.0	0.40
2014	103	4.3	0.41	1.3	0.29	2.1	0.32	3.0	0.37
2015	109	4.5	0.59	1.2	0.39	2.1	0.45	3.1	0.53
2016	77	3.1	0.51	1.0	0.39	1.6	0.42	2.2	0.47
1998-2016	1675	4.4	0.40	1.4	0.29	2.3	0.33	3.3	0.37

Table 12

Age distribution of age at death (cancer-related) for period 2007-2016
(**incl. multiple malignancies**)

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4									
5-9	2	0.1	0.1	2	0.1	0.1			0.0
10-14	1	0.0	0.1			0.1	1	0.1	0.1
15-19	1	0.0	0.1	1	0.1	0.2			0.1
20-24	1	0.0	0.2	1	0.1	0.2			0.1
25-29	3	0.1	0.3	2	0.1	0.3	1	0.1	0.2
30-34	2	0.1	0.4	2	0.1	0.4			0.2
35-39	6	0.2	0.6	3	0.2	0.6	3	0.3	0.5
40-44	14	0.5	1.1	8	0.4	1.0	6	0.6	1.1
45-49	37	1.3	2.4	28	1.5	2.6	9	0.9	2.0
50-54	83	2.9	5.3	62	3.4	6.0	21	2.0	4.0
55-59	126	4.4	9.7	100	5.5	11.5	26	2.5	6.5
60-64	220	7.7	17.4	169	9.3	20.8	51	5.0	11.5
65-69	352	12.4	29.8	234	12.9	33.6	118	11.5	23.0
70-74	502	17.6	47.5	367	20.2	53.8	135	13.2	36.2
75-79	566	19.9	67.3	354	19.5	73.2	212	20.7	56.9
80-84	511	18.0	85.3	280	15.4	88.6	231	22.5	79.4
85+	418	14.7	100.0	207	11.4	100.0	211	20.6	100.0
All ages	2845	100.0		1820	100.0		1025	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2016
(**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	2		0.2	0.25			8.3	
10-14		1			0.1	0.50		4.2
15-19	1		0.1	1.00			2.3	
20-24	1		0.1	0.25			1.8	
25-29	2	1	0.1	0.20	0.1	0.20	2.7	1.4
30-34	2		0.1	0.10			1.9	
35-39	3	3	0.2	0.04	0.2	0.11	1.5	1.1
40-44	8	6	0.4	0.07	0.3	0.12	1.6	0.9
45-49	28	9	1.4	0.13	0.5	0.15	2.4	0.7
50-54	62	21	3.6	0.18	1.2	0.19	3.0	1.1
55-59	100	26	7.1	0.23	1.8	0.17	3.0	0.9
60-64	169	51	13.8	0.33	3.8	0.25	3.4	1.4
65-69	234	118	19.7	0.34	9.1	0.32	3.2	2.2
70-74	367	135	33.2	0.47	10.7	0.37	3.9	2.0
75-79	354	212	44.4	0.57	21.2	0.48	3.9	3.0
80-84	280	231	60.9	0.76	32.6	0.75	3.7	3.4
85+	207	211	67.6	0.98	28.7	0.79	3.2	2.3
All ages	1820	1025					3.5	2.2
Mortality								
Raw			8.0	0.41	4.3	0.43		
WS			3.5	0.34	1.4	0.30		
ES			5.5	0.38	2.2	0.34		
BRD-S			7.6	0.42	3.1	0.39		
PYLL-70								
per 100,000			27.4		9.7			
ES			24.0		8.1			
AYLL-70			9.0		8.2			

Table 14a

Further malignancies in deaths in period 1998–2016
MALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03–C06	Oral cavity	13	0.8	7	53.8	2	15.4	4	30.8
C09–C10	Oropharynx	27	1.7	11	40.7	2	7.4	14	51.9
C15	Oesophagus	28	1.7	9	32.1	1	3.6	18	64.3
C16	Stomach	58	3.6	20	34.5	7	12.1	31	53.4
C18	Colon	141	8.8	47	33.3	30	21.3	64	45.4
C19–C20	Rectum	68	4.2	16	23.5	19	27.9	33	48.5
C22	Liver	46	2.9	5	10.9	9	19.6	32	69.6
C23–C24	Bile	14	0.9	2	14.3	1	7.1	11	78.6
C25	Pancreas	54	3.4	1	1.9	9	16.7	44	81.5
C32	Larynx	19	1.2	12	63.2	1	5.3	6	31.6
C33–C34	Lung	202	12.6	33	16.3	26	12.9	143	70.8
C43	Malign. melanoma	47	2.9	26	55.3	4	8.5	17	36.2
C44	Skin others	62	3.9	24	38.7	4	6.5	34	54.8
C46,C49	Soft tissue	11	0.7	4	36.4	2	18.2	5	45.5
C61	Prostate	342	21.3	127	37.1	46	13.5	169	49.4
C64	Kidney	111	6.9			36	32.4	75	67.6
C65	Renal pelvis	20	1.2	4	20.0	10	50.0	6	30.0
C66	Ureter	17	1.1	6	35.3	4	23.5	7	41.2
C67	Bladder	97	6.0	36	37.1	14	14.4	47	48.5
C70–C72	CNS cancer	17	1.1	4	23.5	2	11.8	11	64.7
C73	Thyroid	17	1.1	6	35.3			11	64.7
C76–C79	CUP	26	1.6	12	46.2	2	7.7	12	46.2
C82–C85	NHL	56	3.5	12	21.4	9	16.1	35	62.5
C90	Mult. myeloma	22	1.4	9	40.9	3	13.6	10	45.5
C91–C96	Leukaemia	21	1.3	1	4.8	1	4.8	19	90.5
Others, specified		69	4.3	27	39.1	7	10.1	35	50.7
All further malignancies		1605	100.0	461	28.7	251	15.6	893	55.6

Further malignancies with number of cases 1 to 9 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 1998–2016
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C16	Stomach	25	3.4	6	24.0	8	32.0	11	44.0
C18	Colon	49	6.7	14	28.6	8	16.3	27	55.1
C19–C20	Rectum	24	3.3	6	25.0	5	20.8	13	54.2
C22	Liver	10	1.4	2	20.0	4	40.0	4	40.0
C23–C24	Bile	16	2.2	1	6.3	4	25.0	11	68.8
C25	Pancreas	44	6.1	3	6.8	5	11.4	36	81.8
C33–C34	Lung	70	9.6	8	11.4	9	12.9	53	75.7
C43	Malign. melanoma	19	2.6	10	52.6	2	10.5	7	36.8
C44	Skin others	21	2.9	13	61.9			8	38.1
C50	Breast	164	22.6	82	50.0	18	11.0	64	39.0
C53	Cervix uteri	16	2.2	9	56.3	1	6.3	6	37.5
C54	Corpus uteri	27	3.7	14	51.9	4	14.8	9	33.3
C56	Ovary	25	3.4	8	32.0	4	16.0	13	52.0
C64	Kidney	47	6.5			14	29.8	33	70.2
C67	Bladder	31	4.3	7	22.6	9	29.0	15	48.4
C70–C72	CNS cancer	9	1.2			2	22.2	7	77.8
C73	Thyroid	26	3.6	11	42.3	2	7.7	13	50.0
C76–C79	CUP	17	2.3	2	11.8	1	5.9	14	82.4
C82–C85	NHL	32	4.4	13	40.6	6	18.8	13	40.6
Others, specified		54	7.4	18	33.3	14	25.9	22	40.7
All further malignancies		726	100.0	227	31.3	120	16.5	379	52.2

Further malignancies with number of cases 1 to 7 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 2007-2016
(**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	2		0.2	0.25			8.7	
10-14								
15-19	1		0.1	1.00			2.4	
20-24	1		0.1	0.25			2.0	
25-29	2	1	0.1	0.22	0.1	0.20	3.0	1.5
30-34	2		0.1	0.11			2.0	
35-39	3	3	0.2	0.05	0.2	0.11	1.6	1.2
40-44	7	5	0.4	0.07	0.3	0.12	1.5	0.8
45-49	26	7	1.3	0.13	0.4	0.13	2.5	0.6
50-54	48	18	2.8	0.16	1.1	0.19	2.7	1.1
55-59	82	22	5.8	0.23	1.5	0.18	2.8	0.9
60-64	142	37	11.6	0.34	2.8	0.22	3.4	1.2
65-69	176	92	14.9	0.36	7.1	0.31	3.0	2.2
70-74	274	99	24.8	0.50	7.8	0.35	3.8	1.9
75-79	248	160	31.1	0.61	16.0	0.48	3.7	2.9
80-84	193	180	42.0	0.83	25.4	0.85	3.5	3.4
85+	143	177	46.7	1.09	24.1	0.86	3.0	2.4
All ages	1350	801					3.3	2.2
Mortality								
Raw			5.9	0.41	3.4	0.42		
WS			2.7	0.34	1.1	0.28		
ES			4.1	0.37	1.7	0.33		
BRD-S			5.6	0.42	2.4	0.38		
PYLL-70								
per 100,000			22.9		7.7			
ES			20.3		6.3			
AYLL-70			9.4		8.3			

* See corresponding tables with multiple malignancies.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2016
(**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	2		0.2	0.25			8.7	
10-14								
15-19	1		0.1	1.00			2.4	
20-24	1		0.1	0.25			2.0	
25-29	2	1	0.1	0.22	0.1	0.20	3.0	1.5
30-34	2		0.1	0.12			2.0	
35-39	3	1	0.2	0.05	0.1	0.04	1.6	0.4
40-44	7	3	0.4	0.07	0.2	0.08	1.5	0.5
45-49	22	7	1.1	0.11	0.4	0.14	2.1	0.6
50-54	42	15	2.4	0.16	0.9	0.16	2.4	0.9
55-59	68	19	4.8	0.22	1.3	0.17	2.3	0.8
60-64	122	28	10.0	0.34	2.1	0.19	3.0	0.9
65-69	138	82	11.6	0.32	6.3	0.31	2.4	2.0
70-74	200	73	18.1	0.43	5.8	0.30	2.9	1.4
75-79	166	118	20.8	0.45	11.8	0.38	2.6	2.2
80-84	120	137	26.1	0.57	19.4	0.70	2.3	2.7
85+	83	135	27.1	0.66	18.4	0.69	1.9	1.9
All ages	979	619					2.5	1.7
Mortality								
Raw			4.3	0.33	2.6	0.36		
WS			2.0	0.28	0.8	0.24		
ES			3.1	0.31	1.3	0.28		
BRD-S			4.0	0.34	1.9	0.32		
PYLL-70								
per 100,000			19.9		6.2			
ES			17.7		5.0			
AYLL-70			9.8		7.9			

* See corresponding tables with multiple malignancies.

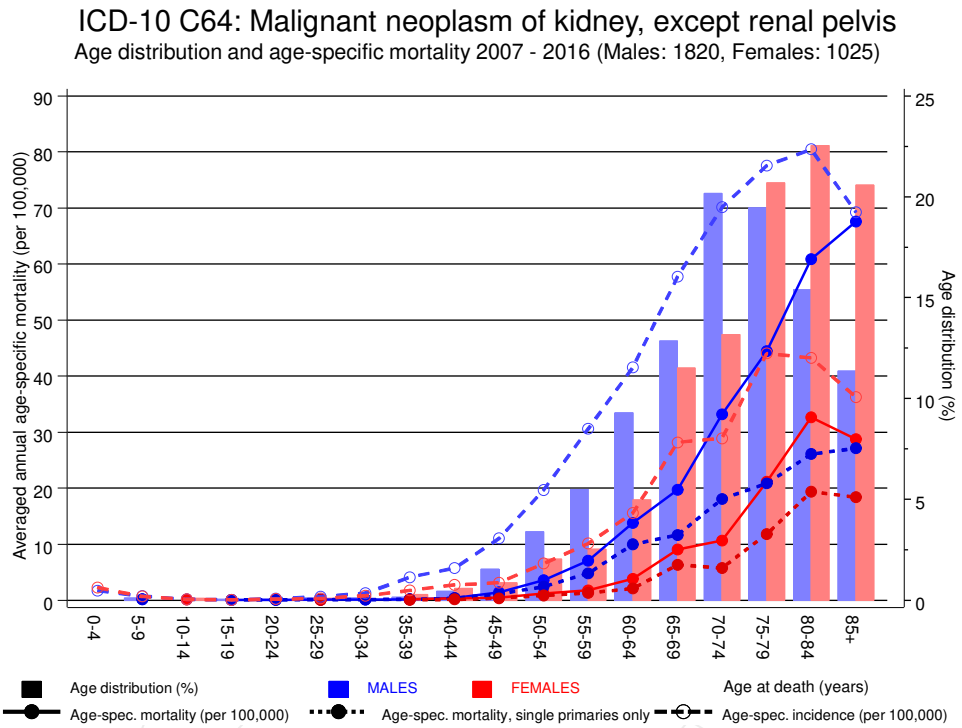
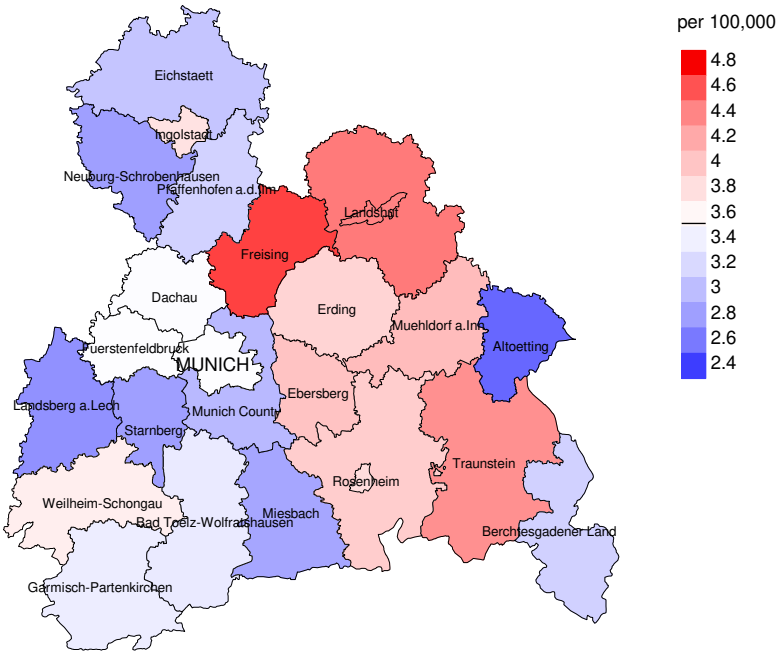


Figure 17. Distribution of age at death (bars; males: mean=67.4 yrs, median=68.4 yrs; females: mean=70.8 yrs, median=72.4 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

Average mortality (world standard population) 2007 - 2016: Males



Average mortality (world standard population) 2007 - 2016: Females

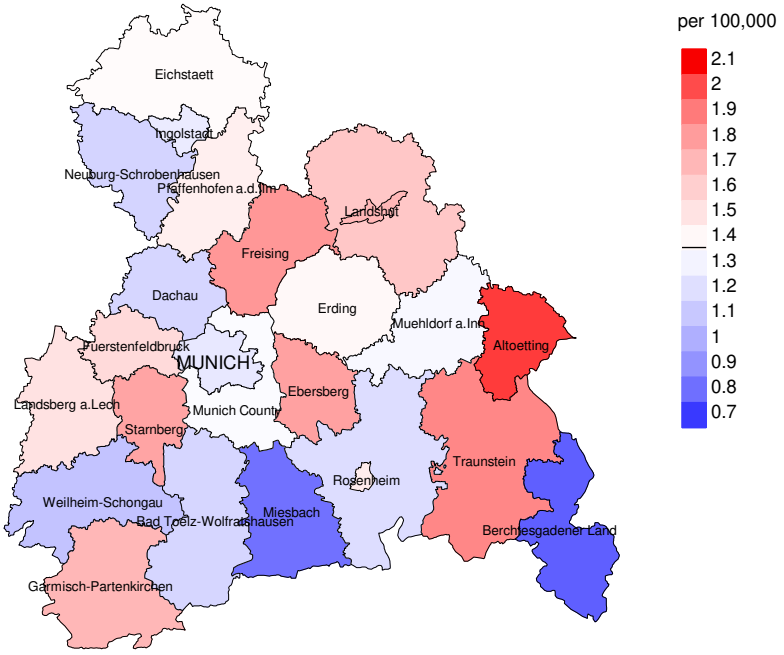
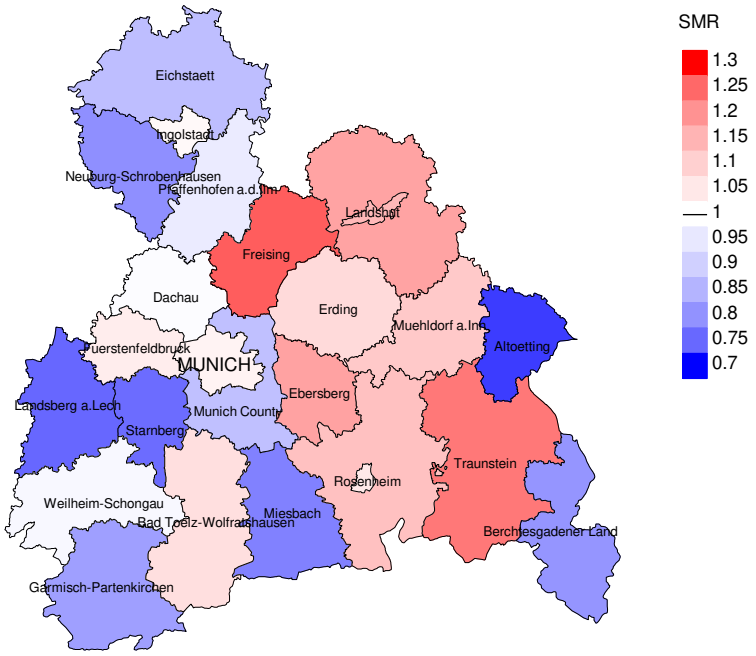


Figure 18a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2016. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 3.5/100,000 WS N=1,820, females 1.4/100,000 WS N=1,025).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 42 women died from kidney cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 1.8/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 1.1 and 3.0/100,000.

Standardized mortality ratio (SMR) 2007 - 2016: Males



Standardized mortality ratio (SMR) 2007 - 2016: Females

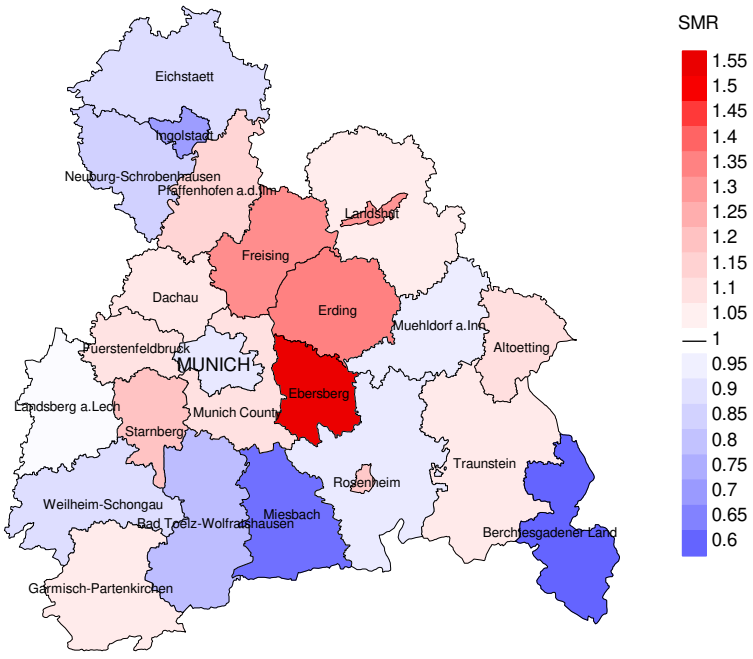


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=1,820, females N=1,025).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 42 women died from kidney cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.55. Though, the value of this parameter may vary with an underlying probability of 99% between 1.00 and 2.28, 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 index from mortality and incidence (Mortality-Incidence ratio, **MI-index**) is a statistic 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 MI- index. 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 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 between mortality and incidence
FRG	Federal Republic of Germany

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