Munich Cancer Registry



- ▶ Survival
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Munich Cancer Registry at Munich Cancer Center Marchioninistr. 15 Munich, 81377 Germany

http://www.tumorregister-muenchen.de/en

Cancer statistics: Baseline statistics

C64: Kidney cancer

Year of diagnosis	1998-2013
Patients	9,341
Diseases	9,539
Creation date	05/19/2015
Export date	12/30/2014
Population	4.64 m



http://www.tumorregister-muenchen.de/en/facts/base/base_C64__E.pdf

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 4.64 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. The time-delayed acquisition of data and the occasionally high DCO-rates indicate optimizing reserves, among others, because of current financial and legal conditions that hinder the analyses.

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, May 2015

- 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 2.51 million to 3.96 in 2002, and to 4.52 million in 2007). Death certificates from 2014 are incorporated into these analyses.
- 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. A high proportion of DCO cases (≥5%) in particular cancer types indicate insufficient participation of specific cancer specializations.

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

Code	Description
C64	Malignant neoplasm of kidney, except renal pelvis

INCIDENCE

Table 1

Patient cohorts by year of diagnosis including DCO cases and multiple primaries, and with proportion of deaths and active follow-up

				Prop.		Prop.
		DCO	Prop.	mult.	Prop.	actively
Year of	Cases	cases	DCO	primaries	deaths	followed
diagnosis	n	n	%	8	%	%
1998	394	36	9.1	29.9	58.4	97.7
1999	390	29	7.4	29.2	59.2	97.2
2000	361	35	9.7	31.0	58.2	96.7
2001	352	43	12.2	28.7	57.4	97.7
2002	606	89	14.7	33.5	62.2	97.9 #
2003	616	67	10.9	30.0	56.3	96.6
2004	624	74	11.9	34.0	49.5	97.1
2005	652	39	6.0	34.4	42.9	95.9
2006	638	47	7.4	32.8	43.7	92.9
2007	741	72	9.7	30.6	43.0	79.4 # ##
2008	756	64	8.5	31.5	38.1	60.6
2009	770	72	9.4	34.5	36.6	60.4
2010	746	62	8.3	29.8	31.0	55.9
2011	676	46	6.8	27.1	32.1	58.3
2012	680	52	7.6	28.1	26.3	55.9
2013	537	49	9.1	25.7	18.2	98.1 ###
1998-2013	9539	876	9.2	30.9	42.8	80.7

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

^{##} Since 2007 the percentage of actively followed patients sharply declined compared to the previous years. This is a consequence of ambiguous data protection rules that currently forbid cancer registries in Bavaria to obtain the essential life status informations from competent registration offices.

^{###} Please be aware that data of recent annual patient cohorts may not yet be fully processed. Therefore, the presented figures and tables are potentially related to different time periods as pointed out in the respective headlines or legends.

Table 1a

Patient cohorts by year of diagnosis and gender including DCO cases

Year of	All	Males	Females	Prop. males
diagnosis	n	'n	n	%
1000	204	0.4.4	1.50	61.0
1998	394	244	150	61.9
1999	390	239	151	61.3
2000	361	238	123	65.9
2001	352	211	141	59.9
2002	606	362	244	59.7
2003	616	384	232	62.3
2004	624	387	237	62.0
2005	652	416	236	63.8
2006	638	406	232	63.6
2007	741	475	266	64.1
2008	756	488	268	64.6
2009	770	478	292	62.1
2010	746	476	270	63.8
2011	676	431	245	63.8
2012	680	449	231	66.0
2013	537	341	196	63.5
1998-2013	9539	6025	3514	63.2

Table 2

Incidence measures by year of diagnosis and gender including DCO cases (with respect to registry area expansion from 2.51 to 3.96 m as of 2002, and from 3.96 to 4.64 m as of 2007, respectively)

			Males	Fem.	Males	Fem.	Males	Fem.	Males	Fem.
Year of	Males	Females	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.
diagnosis	n	n	raw	raw	WS	WS	ES	ES	BRD-S	BRD-S
1998	244	150	22.0	12.8	14.2	6.2	19.9	8.8	23.9	11.0
1999	239	151	21.4	12.7	13.2	6.6	19.0	9.2	23.4	11.1
2000	238	123	20.9	10.2	13.3	4.8	18.7	7.0	22.5	8.8
2001	211	141	18.2	11.6	11.0	5.4	15.8	8.0	19.6	9.9
2002	362	244	19.4	12.5	11.3	5.8	16.5	8.4	20.7	10.6
2003	384	232	20.5	11.8	12.3	5.4	17.2	7.7	20.9	9.7
2004	387	237	20.6	12.0	12.2	5.5	17.1	7.9	20.9	9.9
2005	416	236	22.0	11.9	12.6	5.5	18.0	7.8	21.5	10.0
2006	406	232	21.2	11.5	12.2	5.7	17.0	7.8	20.6	9.5
2007	475	266	21.4	11.5	12.1	5.3	17.1	7.3	21.0	9.3
2008	488	268	21.9	11.5	12.2	5.5	17.3	7.8	21.0	9.7
2009	478	292	21.4	12.6	11.7	5.7	16.6	8.1	20.6	10.3
2010	476	270	21.1	11.5	11.4	4.6	16.1	6.9	19.8	8.8
2011	431	245	18.9	10.4	10.2	5.1	14.4	6.8	17.5	8.4
2012	449	231	19.7	9.8	10.5	4.1	15.0	6.0	18.4	7.9
2013	341	196	14.9	8.3	8.0	3.9	11.4	5.5	14.0	6.7
1998-2013	6025	3514	20.3	11.3	11.5	5.2	16.3	7.4	19.9	9.3

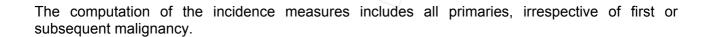


Table 3

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

Year of	Cases		Std.					Median		
diagnosis	n	Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	394	65.1	13,7	2.8	99.7	49.4	58.7	65.8	74.6	79.5
1999	390	65.2	13.5	1.1	94.3	49.6	57.6	65.4	74.9	81.8
2000	361	65.5	13.2	0.3	93.5	48.8	57.9	66.2	74.9	80.8
2001	352	66.5	12.4	1.9	96.4	51.8	59.0	66.3	75.6	80.6
2002	606	67.7	12.9	2.4	96.2	50.1	60.7	68.9	76.8	82.3
2003	616	66.9	13.6	0.4	96.2	50.6	60.3	67.8	75.8	82.7
2004	624	66.6	13.8	0.0	94.1	49.0	60.3	67.7	76.1	81.8
2005	652	66.6	12.9	0.7	95.1	51.3	59.7	67.7	75.4	81.3
2006	638	66.3	14.3	0.2	95.5	48.4	59.8	67.9	75.4	81.7
2007	741	67.2	14.6	1.2	99.1	48.3	60.6	69.1	76.4	82.7
2008	756	67.0	13.5	0.6	98.1	50.1	59.5	68.2	76.2	82.8
2009	770	67.4	14.2	0.5	96.9	50.2	59.6	69.7	77.1	82.8
2010	746	67.9	13.6	5.4	100	48.5	59.6	70.0	77.1	83.7
2011	676	67.4	15.1	0.5	96.9	49.9	60.7	69.7	76.8	83.7
2012	680	67.9	13.5	1.4	93.1	50.5	60.4	69.9	77.4	82.9
2013	537	67.1	14.5	0.3	97.3	49.4	58.8	69.4	77.0	82.6
1998-2013	9539	66.9	13.8	0.0	100	49.7	59.7	68.5	76.3	82.4

Table 3a

Age distribution parameters by year of diagnosis (MALES)

(incl. DCO)

Year of	Cases		Std.					Median		
diagnosis	n	Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	244	63.2	13.4	5.0	91.9	46.7	56.4	64.3	72.1	78.1
1999	239	64.3	12.8	2.3	88.4	49.7	57.5	64.5	72.2	80.3
2000	238	63.6	13.4	0.3	93.5	47.6	56.2	64.9	72.0	78.5
2001	211	64.9	11.1	1.9	89.9	51.8	58.6	64.3	72.9	78.7
2002	362	66.1	12.6	32.7	96.2	47.3	58.6	67.6	74.7	80.4
2003	384	64.6	13.4	0.4	96.2	48.0	59.2	65.3	73.1	78.6
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	73.4	78.5
2007	475	65.6	13.2	2.6	93.1	48.3	58.6	67.6	74.2	80.4
2008	488	65.9	13.0	1.8	98.1	49.3	58.2	67.5	74.4	81.5
2009	478	66.1	13.8	0.5	96.1	49.6	58.6	68.6	75.6	81.8
2010	476	65.5	12.9	5.4	93.5	47.2	56.5	68.2	74.7	80.8
2011	431	66.6	13.2	1.5	96.9	50.0	59.7	68.5	75.2	82.5
2012	449	66.2	13.9	1.4	93.1	48.1	57.5	69.0	75.7	82.4
2013	341	66.2	13.3	2.0	94.1	49.0	58.4	67.3	75.2	81.8
1998-2013	6025	65.4	13.1	0.0	98.1	48.9	58.3	66.8	74.2	80.4

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Table 3b

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

Year of	Cases		Std.					Median		
diagnosis	n	Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	150	68.1	13,7	2.8	99.7	55.6	61.3	69.8	76.8	83.7
1999	151	66.6	14.4	1.1	94.3	49.4	57.7	67.1	77.6	83.9
2000	123	69.1	12.2	37.2	91.4	54.5	60.6	70.5	77.9	85.7
2001	141	68.8	13.8	30.6	96.4	52.1	61.3	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	236	69.2	14.8	4.2	95.1	51.8	62.4	72.4	79.7	83.7
2006	232	68.6	16.2	0.2	95.5	49.6	61.1	71.7	79.2	85.7
2007	266	70.1	16.3	1.2	99.1	49.3	66.0	72.3	79.8	85.8
2008	268	69.0	14.1	0.6	96.1	52.0	61.8	69.6	78.9	84.2
2009	292	69.5	14.6	2.5	96.9	50.7	63.3	71.4	79.7	84.5
2010	270	72.2	13.6	5.4	100	54.3	65.9	73.0	81.1	88.1
2011	245	68.8	17.8	0.5	96.5	49.1	64.1	73.3	79.4	85.3
2012	231	71.2	12.1	9.7	92.4	56.2	65.5	72.9	80.0	83.5
2013	196	68.7	16.3	0.3	97.3	50.7	60.8	71.7	79.1	85.0
1998-2013	3514	69.5	14.6	0.2	100	52.1	62.7	71.8	79.1	85.0

Table 4

Age distribution by 5-year age group and gender for period 1998-2013 (incl. DCO)

Age at									
diagnosis	Cases			Males			Females		
Years	n	%	Cum.%	n	્રે	Cum.%	n	%	Cum.%
0-4	67	0.7	0.7	35	0.6	0.6	32	0.9	0.9
5-9	19	0.2	0.9	10	0.2	0.7	9	0.3	1.2
10-14	4	0.0	0.9	3	0.0	0.8	1	0.0	1.2
15-19	3	0.0	1.0/			0.8	3	0.1	1.3
20-24	10	0.1	1.1	4	0.1	0.9	6	0.2	1.5
25-29	16	0.2	1.2	10	0.2	1.0	6	0.2	1.6
30-34	56	0.6	1.8	32	0.5	1.6	24	0.7	2.3
35-39	168	1.8	3.6	114	1.9	3.5	54	1.5	3.8
40 - 44	228	2.4	6.0	169	2.8	6.3	59	1.7	5.5
45-49	411	4.3	10.3	318	5.3	11.5	93	2.6	8.2
50-54	578	6.1	16.4	429	7.1	18.7	149	4.2	12.4
55-59	896	9.4	25.7	638	10.6	29.2	258	7.3	19.7
60-64	1232	12.9	38.7	857	14.2	43.5	375	10.7	30.4
65-69	1575	16.5	55.2	1059	17.6	61.0	516	14.7	45.1
70-74	1518	15.9	71.1	978	16.2	77.3	540	15.4	60.5
75-79	1331	14.0	85.0	723	12.0	89.3	608	17.3	77.8
80-84	846	8.9	93.9	419	7.0	96.2	427	12.2	89.9
85+	581	6.1	100.0	227	3.8	100.0	354	10.1	100.0
All ages	9539	100.0		6025	100.0		3514	100.0	

Included in the statistics are 40.6% multiple primaries in males and 31.3% in females.

Table 5

Age-specific incidence, DCO rate and proportion of all cancers for period 1998-2013

							N/ - 7	
			24-7		M-1	7	Males	Females
				Females		Females	_	Prop.all
Age at	_	_	~	Age-		DCO rate		cancers
diagnosis				spec.	n=439	n=435		n=153136
Years	n	n	incid.	incid.	%	%	%	%
0- 4	33	31	2.2	2.2			10.2	12.7
5- 9	10	8	0.7	0.6			5.7	6.4
10-14	3	1	0.2	0.1			1.8	0.6
15-19		3	0.0	0.2				1.0
20-24	4	6	0.2	0.3			0.7	1.1
25-29	10	6	0.5	0.3			1.0	0.5
30-34	32	24	1.4	1.1	3.1		2.1	1.2
35-39	114	52	4.6	2.2			5.1	1.4
40 - 44	166	59	6.3	2.4	0.6		5.2	0.9
45-49	312	92	13.2	4.0		1.1	5.8	1.1
50-54	418	149	20.7	7.2	1.7		4.8	1.3
55-59	624	256	34.0	13.3	2.4	_2.3	4.3	1.9
60-64	844	369	47.6	19.7	3.2	0.3	3.9	2.1
65-69	1036	508	65.6	29.4	5.1	3.3	3.8	2.7
70-74	969	536	75.6	35.3	5.1	7.8	3.6	2.9
75-79	720	602	87.1	50.7	11.5	9.6	3.5	3.4
80-84	415	424	82.9	45.5	22.7	23.6	3.0	2.7
85+	227	353	66.6	39.5	48.0	59.5	2.3	2.1
All ages	5937	3479			7.4	12.5	3.8	2.3
Incidence								
Raw			20.0	11.2				
WS			11.3	5.2				
ES			16.1	7.3				
BRD-S			19.7	9.2				

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

Table 6a

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of second primaries for period 1998-2013

		MALES					
	Observed	Expected		LCL	UCL		DCO
Diagnosis	n /	n	SIR	95%	95%	EAR	%
C03-C06 Oral cavity	4	2.4	1.7	0.5	4.3	0.9	
C09-C10 Oropharynx	10	2.9	3.4	1.6	6.3 #	4.2	
C12-C13 Hypopharynx	2	1.7	1.2	0.1	4.3	0.2	
C15 Oesophagus	9	5.0	1.8	0.8	3.4	2.4	11.1
C16 Stomach	19	11.5	1.6	1.0	2.6	4.4	15.8
C17 Small intestine	5	1.4	3.6	1.2	8.5 #	2.1	
C18 Colon	59	27.8	2.1	1.6	2.7 #	18.4	8.5
C19-C20 Rectum	20	15.7	1.3	0.8	2.0	2.5	
C22 Liver	20	7.8	2.6	1.6	4.0 #	7.2	15.0
C23-C24 Bile	5	2.7	1.8	0.6	4.3	1.4	20.0
C25 Pancreas	14	10.0	1.4	0.8	2.4	2.4	28.6
C32 Larynx	8	2.9	2.7	1.2	5.4 #	3.0	
C33-C34 Lung	83	33.4	2.5	2.0	3.1 #	29.3	9.6
C38,C45 Mesothelioma	2	1.9	1.1/	0.1	3.8	0.1	50.0
C43 Malign. melanoma	35	11.1	3.1	2.2	4.4 #	14.1	2.9
C46,C49 Soft tissue	7	1.5	4.8	1.9	9.9 #	3.3	
C48 Peritoneal	2	0.2	10.2	1.2	36.8 #	1.1	
C61 Prostate	220	84.6	2.6	2.3	3.0 #	79.9	2.7
C62 Testis	5	0.7	6.8		15.9 #	2.5	
C64 Kidney	106	10.0	10.6		12.8 #	56.7	0.9
C65 Renal pelvis	9	1.2	7.8		14.8 #	4.6	
C66 Ureter	6	0.6	9.3		20.3 #	3.2	
C67 Bladder	37	12.3	3.0	2.1	4.1 #	14.6	
C70-C72 CNS cancer	5	3.7	1.3	0.4	3.1	0.8	
C73 Thyroid	7	1.8	3.8	1.5	7.9 #	3.1	
C76-C79 CUP	7	4.7	1.5	0.6	3.1	1.4	14.3
C82-C85 NHL	36	11.2	3.2	2.3	4.5 #	14.7	5.6
C90 Mult. myeloma	7	3.6	2.0	0.8	4.0	2.0	
C91-C96 Leukaemia	8	4.5	1.8	0.8	3.5	2.1	25.0
Other primaries	10	4.7	2.1	1.0	3.9 #	3.1	20.0
Not observed	0	1.9	0.0	0.0	1.9	-1.1	

Patients	3819
Median age at second malignancy (years)	70.6
Person-years	16939
Mean observation time (years)	4.4
Median observation time (years)	3.4

All mult. primaries

The occurrence of second malignancy is statistically significant.

Observed second primaries with count 1 are pooled in category "Other primaries".

767

285.4

2.7 2.5 2.9 # 284.3 5.3

Table 6b

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of second primaries for period 1998-2013

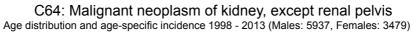
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	Observed	Expected		LCL	UCL		DCO
Diagnosis	/ n /	n	SIR	95%	95%	EAR	%
C15 Oesophagus	2	0.7	3.0	0.4	10.9	1.4	
C16 Stomach	10	4.6	2.2	1.0	4.0 #	5.5	
C18 Colon	24	12.7	1.9	1.2	2.8 #	11.5	4.2
C19-C20 Rectum	9	5.4	1.7	0.8	3.2	3.7	11.1
C22 Liver	3	1.4	2.1	0.4	6.1	1.6	33.3
C23-C24 Bile	9	1.9	4.8	2.2	9.1 #	7.3	22.2
C25 Pancreas	10	5.5	1.8	0.9	3.3	4.6	30.0
C33-C34 Lung	25	8.3	3.0	1.9	4.4 #	17.0	8.0
C43 Malign. melanoma	ı 4	4.0	1.0	0.3	2.5	-0.0	
C46,C49 Soft tissue	2	0.7	2.9	0.4	10.6	1.3	
C50 Breast	61	34.6	1.8	1.4	2.3 #	27.0	6.6
C53 Cervix uteri	3	1.4	2.1	0.4	6.0	1.6	
C54 Corpus uteri	11	6.7	1.6	0.8	2.9	4.4	9.1
C56 Ovary	3	5.0	0.6	0.1	1.7	-2.1	
C64 Kidney	44	3.2	13.9	10.1	18.7 #	41.6	2.3
C65 Renal pelvis	3	0.4	7.8	1.6	22.7 #	2.7	
C66 Ureter	2	0.2	9.9	1.2	35.8 #	1.8	50.0
C67 Bladder	11	2.4	4.7	2.3	8.3 \#	8.8	
C73 Thyroid	15	1.9	8.1	4.5	13.4 #	13.4	
C76-C79 CUP	5	2.2	2.3	0.7	5.3	2.8	20.0
C82-C85 NHL	14	4.8	2.9	1.6	4.9 #	9.4	7.1
C90 Mult. myeloma	2	1.6	1.3	0.2	4.6	0.4	
C91-C96 Leukaemia	5	2.0	2.5	0.8	5.9	3.1	20.0
Other primaries	6	5.0	1.2	0.4	2.6	1.1	16.7
Not observed	0	3.7	0.0	0.0	1.0	-3.7	
All mult. primaries	283	120.2	2.4	2.1	2.6 #	166.0	7.4

Patients	2153
Median age at second malignancy (years)	72.7
Person-years	9806
Mean observation time (years)	4.6
Median observation time (years)	3.5

The occurrence of second malignancy is statistically significant.

Observed second primaries with count 1 are pooled in category "Other primaries".



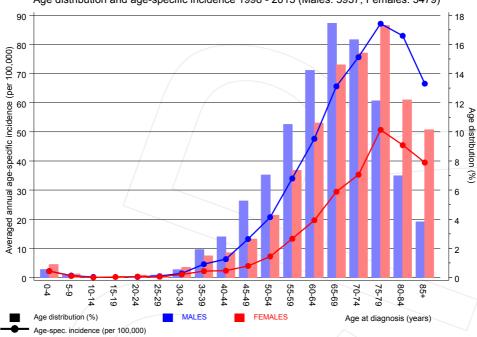


Figure 7. Age distribution and age-specific incidence



C64: Malignant neoplasm of kidney, except renal pelvis Age-specific incidence in international comparison

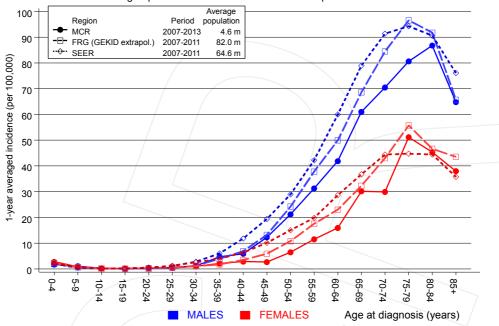


Figure 7a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).



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.

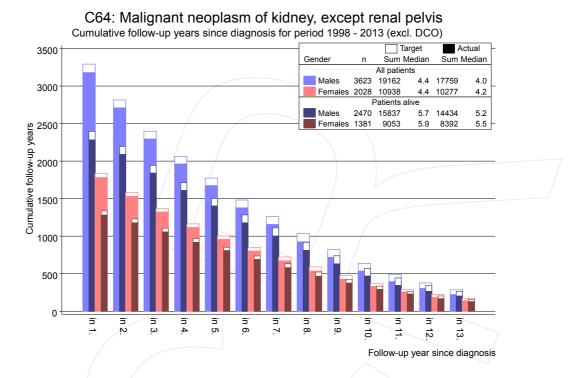
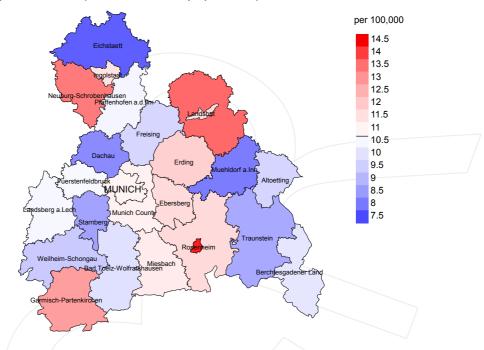


Figure 8. Cumulative follow-up years depending on time since diagnosis

The increase of the lost to follow-up rate can be interpreted as a consequence of a declining number of survivors over time.



Average incidence (world standard population) 2007 - 2013: Males



Average incidence (world standard population) 2007 - 2013: Females

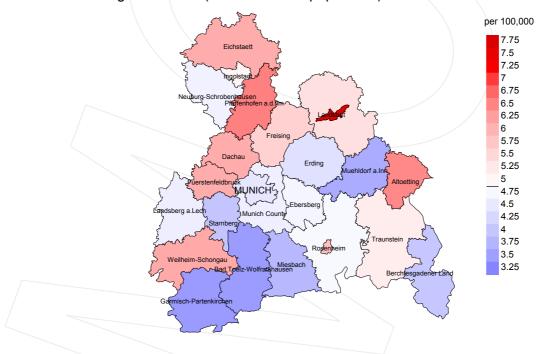
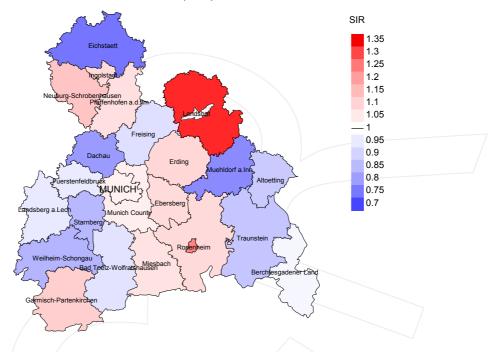


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 10.7/100,000 WS N=3,091, females 4.9/100,000 WS N=1,754).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,928 female residents (averaged) in the period from 2007 to 2013 a total of 51 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 3.0 and 7.0/100,000.

Standardized incidence ratio (SIR) 2007 - 2013: Males



Standardized incidence ratio (SIR) 2007 - 2013: Females

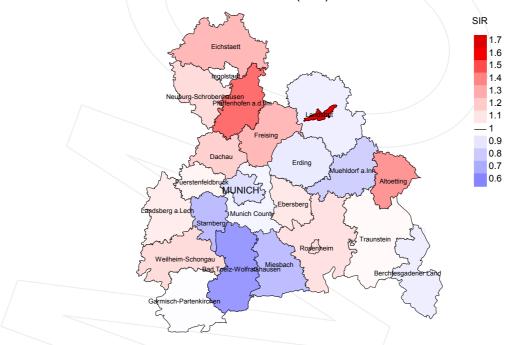


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=3,091, females N=1,754).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,642 female residents (averaged) in the period from 2007 to 2013 a total of 51 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 1.09. Though, the value of this parameter may vary with an underlying probability of 99% between 0.74 and 1.55, and is therefore not statistically striking.

MORTALITY

Table 10a

Patient cohorts of incident cancers by year of diagnosis, follow-up status, proportion of DCO, deaths among the annual cohorts, and proportion of available death certificates (with respect to registry area expansion from 2.51 to 3.96 m as of 2002, and from 3.96 to 4.64 m as of 2007, respectively)

Year of	Incident cases	Prop. actively followed	Prop. DCO	Deaths	Prop. deaths	Prop. deaths with death certific.
diagnosis	n	%	%	n	%	%
1998	394	97.7	9.1	230	58.4	92.6
1999	390	97.2	7.4	231	59.2	94.4
2000	361	96.7	9.7	210	58.2	94.8
2001	352	97.7	12.2	202	57.4	98.5
2002	606	97.9	14.7	377	62.2	96.0
2003	616	96.6	10.9	347	56.3	98.0
2004	624	97.1	11.9	309	49.5	96.1
2005	652	95.9	6.0	280	42.9	97.5
2006	638	92.9	7.4	279	43.7	97.8
2007	741	79.4	9.7	319	43.0	98.1
2008	756	60.6	8.5	288	38.1	99.3
2009	770	60.4	9.4	282	36.6	98.2
2010	746	55.9	8.3	231	31.0	98.7
2011	676	58.3	6.8	217	32.1	97.7
2012	680	55.9	7.6	179	26.3	94.4
2013	537	98.1	9.1	98	18.2	99.0
1998-2013	9539	80.7	9.2	4079	42.8	97.0

Table 10b

Annual cohorts of incident cancers and deaths, proportion of death certificates and cases deceased the same year of cancer diagnosis (incl. DCO)

			Prop. deaths		Prop.
Year of	Incident		with death	Deaths in	deaths in
diagnosis/	cases	Deaths	certific.	same year	same year
death	n	'n	%	n	%
1998	394	212	93.9	58	14.7
1999	390	212	95.3	63	16.2
2000	361	207	95.2	54	15.0
2001	352	219	95.0	57	16.2
2002	606	322	96.9	125	20.6
2003	616	327	96.9	114	18.5
2004	624	342	96.5	110	17.6
2005	652	309	95.1	75	11.5
2006	638	345	97.7	91	14.3
2007	741	379	98.2	114	15.4
2008	756	407	99.3	108	14.3
2009	770	426	99.1	129	16.8
2010	746	455	98.5	119	16.0
2011	676	413	98.3	106	15.7
2012	680	477	98.3	117	17.2
2013	537	433	99.1	83	15.5
1998-2013	9539	5485	97.5	1523	16.0

Table 10c

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 2.51 to 3.96 m as of 2002, and from 3.96 to 4.64 m as of 2007, respectively)

				Prop.
				cancer
		Prop.	Prop.	recorded
		cancer-	non-cancer-	on death
Year of	Deaths	related	related	certificate
death	n/	%	%	%
1998	212	65.1	34.9	79.9
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	327	73.4	26.6	86.1
2004	342	69.0	31.0	81.8
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	407	69.8	30.2	80.9
2009	426	72.1	27.9	80.6
2010	455	66.4	33.6	76.6
2011	413	63.7	36.3	78.8
2012	477	60.4	39.6	71.2
2013	433	61.9	38.1	73.0
1998-2013	5485	68.3	31.7	79.6

Table 11a $\begin{tabular}{ll} Medians of age at death according to the grouping in Table 10 \\ MALES \end{tabular}$

Year of death	Deaths n	Age at death (all causes)	Age at death (cancer-related)	Age at death (non-cancer-related) Years	Age at death (according to death certificate)
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	195	73.8	71.3	77.8	73.1
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	264	74.6	72.7	78.2	73.9
2009	268	74.6	72.7	79.9	72.9
2010	276	75.4	74.2	78.0	74.4
2011	268	75.8	72.7	80.7	74.6
2012	275	77.0	74.9	80.7	75.5
2013	264	77.4	74.3	81.7	75.5
1998-2013	3388	74.4	72.6	79.0	73.4

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 11b $\begin{tabular}{ll} \begin{tabular}{ll} \begin{tabula$

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)
1998	70	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	76.9	80.3	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	145	81.6	78.7	87.5	79.8
2012	202	80.4	77.6	84.1	78.3
2013	169	80.6	76.7	85.0	78.7
1998-2013	2097	80.0	77.7	83.4	78.8

By 2010, life expectancy for a newborn male in Germany is 77.5 years compared with 82.6 years for his female counterpart.

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 12a

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

MALES

Year of	Deaths	Mort.	MI-Index	Mort.	MI-Index	Mort.	MI-Index	Mort.	MI-Index
death	n	raw	raw	WS	WS	ES	ES	BRD-S	BRD-S
1998	99	8.9	0.41	5.2	0.37	8.1	0.41	10.9	0.45
1999	99	8.8	0.42	5.1	0.39	8.0	0.42	10.9	0.47
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	0.35	6.3	0.38	8.7	0.42
2003	147	7.8	0.39	4.1	0.34	6.4	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	0.37	8.3	0.40
2008	183	8.2	0.38	3.9	0.33	6.1	0.36	8.4	0.40
2009	197	8.8	0.42	4.1	0.36	6.3	0.39	8.8	0.43
2010	181	8.0	0.39	3.6	0.32	5.6	0.36	7.9	0.41
2011	177	7.7	0.42	3.6	0.36	5.5	0.39	7.4	0.42
2012	167	7.3	0.38	3.0	0.30	4.9	0.34	6.9	0.38
2013	175	7.7	0.52	3.3	0.42	5.2	0.46	7.3	0.53
1998-2013	2373	8.0	0.40	3.9	0.35	6.1	0.38	8.3	0.42

Table 12b

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

FEMALES

Year of	Deaths	Mort.	MI-Index	Mort.	MI-Index	Mort.	MI-Index	Mort.	MI-Index
death	n	raw	raw	WS	WS	ES	ES	BRD-S	BRD-S
1998	39	3.3	0.26	1.1	0.18	1.8	0.21	2.5	0.23
1999	53	4.5	0.36	1.7	0.27	2.7	0.30	3.7	0.34
2000	59	4.9	0.48	1.8	0.38	2.9	0.41	4.1	0.47
2001	51	4.2	0.36	1.5	0.28	2.5	0.31	3.5	0.36
2002	90	4.6	0.37	1.7	0.30	2.7	0.32	3.6	0.35
2003	93	4.7	0.41	1.7	0.32	2.7	0.35	3.7	0.39
2004	92	4.7	0.40	1.5	0.29	2.4	0.32	3.5	0.36
2005	92	4.6	0.40	1.7	0.33	2.6	0.35	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	0.37	1.3	0.24	2.1	0.29	3.2	0.34
2008	101	4.4	0.38	1.4	0.26	2.3	0.29	3.2	0.34
2009	111	4.8	0.38	1.7	0.29	2.6	0.32	3.5	0.35
2010	121	5.2	0.45	1.6	0.35	2.6	0.38	3.9	0.44
2011	86	3.6	0.35	1.2	0.24	1.9	0.29	2.7	0.32
2012	121	5.1	0.53	1.6	0.40	2.6	0.44	3.9	0.50
2013	93	3.9	0.48	1.3	0.33	2.0	0.37	2.8	0.43
1998-2013	1378	4.4	0.40	1.5	0.29	2.4	0.33	3.4	0.37

Table 13

Age distribution of age at death (cancer-related) for period 1998-2013

(incl. multiple primaries)

Age at								
death	Cases		Males			Females		
Years	n	% Cum.%	'n	%	Cum.%	n	%	Cum.%
0 - 4	1	0.0 0.0		0.0	0.0			0.0
5-9	5	0.1 0.2	2	0.1	0.1	3	0.2	0.2
10-14	0	0.0 / 0.2			0.1			0.2
15-19	0	0.0 / 0.2			0.1			0.2
20-24	2	0.1 0.2	2	0.1	0.2			0.2
25-29	3	0.1 0.3	1	0.0	0.2	2	0.1	0.4
30-34	3	0.1 0.4	2	0.1	0,3	1	0.1	0.4
35-39	11	0.3 0.6	8	0.3	0.7	3	0.2	0.6
40-44	24	0.6 1.3	16	0.7	1.3	8	0.6	1.2
45-49	53	1.4 2.6	41	1.7	3.0	12	0.9	2.1
50-54	115	3.0 5.6	83	3.4	6.4	32	2.3	4.3
55-59	225	5.8 11.4	178	7.3	13.6	47	3.3	7.7
60-64	366	9.5 20.9	272	11.1	24.7	94	6.7	14.3
65-69	530	13.7 34.6	370	15.1	39.8	160	11.3	25.7
70-74	688	17.8 52.4	475	19.4	59.1	213	15.1	40.8
75-79	693	17.9 70.4	425	17.3	76.4	268	19.0	59.8
80-84	626	16.2 86.6	336	13.7	90.1	290	20.6	80.4
85+	519	13.4 100.0	242	9.9	100.0	277	19.6	100.0
All ages	3864	100.0	2454	100.0		1410	100.0	

Included in the statistics are 40.6% multiple primaries in males and 31.3% in females.

Table 14

Age-specific mortality (cancer-related) and proportion of all cancers for period 1998-2013 (incl. multiple primaries)

			Males		Females		Males	Females
Age at			Age-		Age-		Prop.all	Prop.all
death	Males	Females	spec.		spec.		cancers	cancers
Years	n	n	mortal.	MI-index	mortal.	MI-index	%	%
0 - 4	1		0.1	0.03	0.0		3.0	
5- 9	2	3 /	0.1	0.20	0.2	0.33	5.3	7.5
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24	2		0.1	0.50	0.0		2.2	
25-29	1	2	0.0	0.10	0.1	0.33	0.9	1.7
30-34	2	1	0.1	0.06	0.0	0.04	1.1	0.4
35-39	8	3	0.3	0.07	0.1	0.06	2.0	0.6
40-44	16	8	0.6	0.09	0.3	0.14	1.9	0.7
45-49	41	12	1.7	0.13	0.5	0.13	2.3	0.6
50-54	83	32	4.1	0.19	1.6	0.21	2.5	1.0
55-59	178	47	9.7	0.28	2.4	0.18	3.0	1.0
60-64	272	94	15.3	0.32	5.0	0.25	3.1	1.4
65-69	370	160	23.4	0.35	9.3	0.31	3.1	1.9
70-74	475	213	37.1	0.49	14.0	0.39	3.5	2.2
75-79	425	268	51.4	0.59	22.6	0.44	3.2	2.5
80-84	336	290	67.2	0.80	31.1	0.68	3.1	2.6
85+	242	277	71.0	1.07	31.0	0.78	2.7	2.0
All ages	2454	1410					3.1	1.9
2								
Mortality								
Raw			8.3	0.41	4.5	0.40		
WS			4.1	0.35	1.6			
ES			6.3		2.5	0.33		
BRD-S			8.6	0.43	3.5	0.37		
PYLL-70								
per 100,000			32.4		11.9			
ES			28.8		10.3			
AYLL-70			8.9		8.7			
-								

The rates underestimate the prognosis if other synchronous cancers are prognostic unfavorable.

Table 15a

Multiple primaries in deaths in period 1998-2013

MALES

					Syn-	Syn-		
					chron	chron		
	Total	Total	Pre	Pre	±30d	±30d	Post	Post
Diagnosis	n	%↓	n	← %	n	~ %	n	~ %
C09-C10 Oropharynx	16	1.2	7	43.8	2	12.5	7	43.8
C15 Oesophagus	/ 17	1.3	3	17.6	1	5.9	13	76.5
C16 Stomach	49	3.7	17	34.7	4	8.2	28	57.1
C18 Colon	110	8.3	39	35.5	21	19.1	50	45.5
C19-C20 Rectum	51	3.9	13	25.5	15	29.4	23	45.1
C22 Liver	36	2.7	5	13.9	8	22.2	23	63.9
C23-C24 Bile	13	1.0	2	15.4	1	7.7	10	76.9
C25 Pancreas	35	2.6	1	2.9	6	17.1	28	80.0
C32 Larynx	13	1.0	9	69.2	1	7.7	3	23.1
C33-C34 Lung	164	12.4	27	16.5	26	15.9	111	67.7
C43 Malign. melanoma	39	3.0	20	51.3	4	10.3	15	38.5
C44 Skin others	41	3.1	13	31.7	3	7.3	25	61.0
C61 Prostate	254	19.2	95	37.4	_ 36	14.2	123	48.4
C64 Kidney	90	6.8			27	30.0	63	70.0
C65 Renal pelvis	22	1.7	4	18.2	9	40.9	9	40.9
C66 Ureter	18	1.4	5	27.8	5	27.8	8	44.4
C67 Bladder	119	9.0	47	39.5	19	16.0	53	44.5
C70-C72 CNS cancer	28	2.1	8	28.6	5	17.9	15	53.6
C73 Thyroid	11	0.8	3	27.3			8	72.7
C76-C79 CUP	22	1.7	11	50.0	2	9.1	9	40.9
C82-C85 NHL	47	3.6	9	19.1	9	19.1	29	61.7
C90 Mult. myeloma	28	2.1	7	25.0	6	21.4	15	53.6
C91-C96 Leukaemia	26	2.0	4	15.4	2	7.7	20	76.9
Other primaries	72	5.5	30	41.7	10	13.9	32	44.4
All mult. primaries	1321	100.0	379	28.7	222	16.8	720	54.5
-								

Multiple primaries with number of cases 1 to 10 are pooled in category "Other primaries".

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 multiple malignancy.

Table 15b

Multiple primaries in deaths in period 1998-2013

FEMALES

					Syn-	Syn-		
					chron	chron		
	Total	Total	Pre	Pre	±30d	±30d	Post	Post
Diagnosis	n	%↓	n	-%	n	% ←	n	←%
C16 Stomach	23	3.7	6	26.1	7	30.4	10	43.5
C18 Colon	43	7.0	13	30.2	7	16.3	23	53.5
C19-C20 Rectum	/ 21 /	3.4	4	19.0	5	23.8	12	57.1
C22 Liver	9	1.5	2	22.2	3	33.3	4	44.4
C23-C24 Bile	12	1.9			/ 3	25.0	9	75.0
C25 Pancreas	36	5.8	2	5.6	5	13.9	29	80.6
C33-C34 Lung	57	9.3	7	12.3	8	14.0	42	73.7
C43 Malign. melanoma	18	2.9	9	50.0	1	5.6	8	44.4
C44 Skin others	15	2.4	11	73.3			4	26.7
C50 Breast	122	19.8	61	50.0	13	10.7	48	39.3
C53 Cervix uteri	14	2.3	8	57.1	1	7.1	5	35.7
C54 Corpus uteri	24	3.9	12	50.0	4	16.7	8	33.3
C56 Ovary	28	4.5	9	32.1	~ 7	25.0	12	42.9
C64 Kidney	35	5.7			10	28.6	25	71.4
C67 Bladder	36	5.8	10	27.8	9	25.0	17	47.2
C70-C72 CNS cancer	21	3.4	3	14.3	5	23.8	13	61.9
C73 Thyroid	18	2.9	8	44.4	1	5.6	9	50.0
C76-C79 CUP	12	1.9	2	16.7	1	8.3	9	75.0
C82-C85 NHL	20	3.2	6	30.0	5	25.0	9	45.0
C91-C96 Leukaemia	14	2.3	2	14.3	2	14.3	10	71.4
Other primaries	38	6.2	14	36.8	9	23.7	15	39.5
All mult. primaries	616	100.0	189	30.7	106	17.2	321	52.1

Multiple primaries with number of cases 1 to 5 are pooled in category "Other primaries".

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 multiple malignancy.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers for period 1998-2013

(Singular primaries only *)

			Males		Females		Males	Females
Age at			Age-		Age-			Prop.all
death	Males	Females	spec.		spec.		cancers	cancers
Years	n	n		MI-index		MI-index	%	8
0- 4			0.0		0.0			
5- 9	2	1 /	0.1	0.20	0.1	0.14	5.6	2.7
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24	2		0.1	0.50	0.0		2.4	
25-29	1	2	0.0	0.10	0.1	0.33	1.0	1.8
30-34	2	1	0.1	0.07	0.0	0.05	1.1	0.5
35-39	8	3	0.3		0.1		2.1	0.6
40-44	14	6	0.5	0.09	0.2	0.12	1.8	0.6
45-49	39	8	1.7	0.13	0.3	0.09	2.4	0.5
50-54	60	25	3.0	0.17	1.2	0.20	2.1	1.0
55-59	150	40	8.2	0.28	2.1	0.19	2.9	1.0
60-64	225	68	12.7	0.32	3.6	0.23	3.0	1.3
65-69	290	137	18.4	0.37	7.9	0.33	3.0	2.0
70-74	357	158	27.9	0.51	10.4	0.37	3.3	2.0
75-79	314	219	38.0	0.63	18.4	0.45	3.1	2.6
80-84	230	233	46.0	0.85	25.0		2.8	2.6
85+	176	234	51.6	1.20	26.2	0.83	2.6	2.1
All ages	1870	1135					2.9	1.9
Mortality								
Raw			6.3		3.7			
WS			3.1	0.35	1.2			
ES			4.8		2.0			
BRD-S			6.5	0.43	2.8	0.37		
PYLL-70								
			26.9		9.1			
per 100,000 ES			20.9		7.8			
AYLL-70			9.1		8.3			
VITIT- \ 0			٠,١		0.3			

^{*} See corresponding tables with multiple primaries.

base_C64__E.pdf

Table 17

Age-specific mortality (cancer-related) and proportion of all cancers for period 1998-2013

(Single primaries only *)

Age at			Males Age-		Females Age-		Males	Females Prop.all
death	Maleg	Females			spec.		cancers	cancers
Years	n	n		MI-index	- \	MT-index		%
ICALD			mor car.	111 1110011	morcar.	III IIIGEN		,
0- 4			0.0		0.0			
5- 9	2	1 /	0.1	0.20	0.1	0.14	5.7	2.8
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24	1		0.1	0.25	0.0		1.3	
25-29	1	2	0.0	0.10	0.1	0.33	1.1	1.9
30-34	2		0.1	0.07	0.0		1.1	
35-39	8	1	0.3	0.08	0.0	0.02	2.2	0.2
40-44	12	4	0.5	0.09	0.2	0.09	1.6	0.4
45-49	35	6	1.5	0.13	0.3	0.08	2.3	0.4
50-54	50	22	2.5	0.15	1.1	0.18	1.9	0.9
55-59	130	34	7.1		1.8		2.8	1.0
60-64	185	51	10.4		2.7		2.8	1.1
65-69	229	115	14.5		6.7		2.7	2.0
70-74	260	118	20.3		7.8		2.9	1.8
75-79	217	177	26.3		14.9		2.7	2.5
80-84	147	182	29.4		19.5		2.3	2.4
85+	115	189	33.7	0.80	21.1	0.70	2.1	2.0
All ages	1394	902					2.6	1.8
Mortality				0.05				
Raw			4.7	0.35	2.9			
WS			2.4		1.0	0.25		
ES			3.6		1.6			
BRD-S			4.8	0.36	2.2	0.32		
PYLL-70								
per 100,000			22.9		7.2			
ES ES			20.2		6.2			
AYLL-70			9.4		8.1			
7.1.1.1.1.7.0			\ \ \.		J			

^{*} See corresponding tables with multiple primaries.

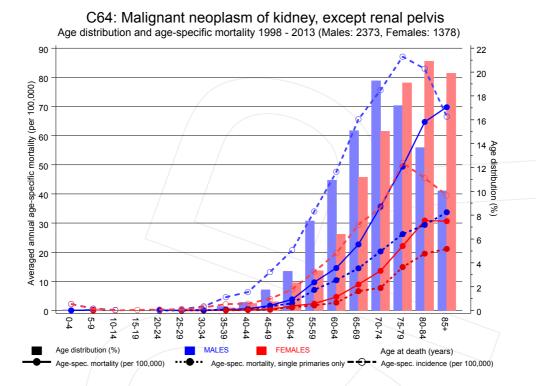
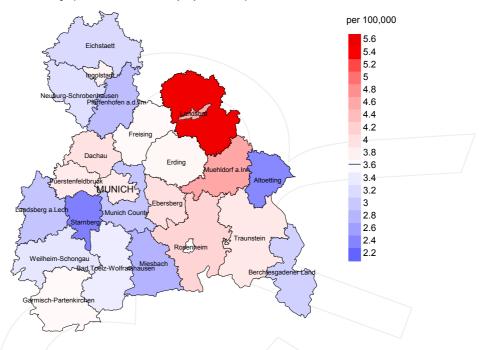


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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 - 2013: Males



Average mortality (world standard population) 2007 - 2013: Females

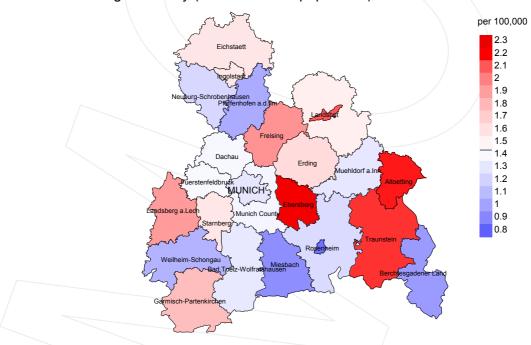
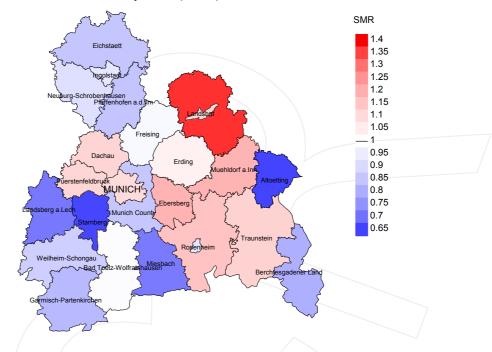


Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2013. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 3.6/100,000 WS N=1,247, females 1.4/100,000 WS N=728).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,928 female residents (averaged) in the period from 2007 to 2013 a total of 31 women died from kidney cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 2.2/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 1.2 and 3.8/100,000.

Standardized mortality ratio (SMR) 2007 - 2013: Males



Standardized mortality ratio (SMR) 2007 - 2013: Females

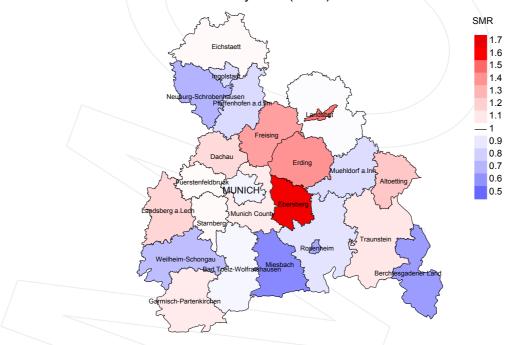


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=1,247, females N=728).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,642 female residents (averaged) in the period from 2007 to 2013 a total of 31 women died from kidney cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.65. Though, the value of this parameter may vary with an underlying probability of 99% between 0.99 and 2.59, 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. 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

FRG Federal Republic of Germany

GEKID Association of Population-based Cancer Registries in Germany

(Gesellschaft der epidemiologischen Krebsregister in Deutschland e.V.)

MCR Munich Cancer Registry (Tumorregister München)
SEER Surveillance, Epidemiology, and End Results (USA)

AYLL-70 Average years of life lost prior to age 70 given a person dies before that age

BRD-S German standard population

DCO Death certificate only EAR Excess absolute risk

= excess cancer cases (O - E) per 10,000 person-years

ES European standard population (old)

LCL Lower confidence limit

MI-index Ratio between mortality and incidence

PYLL-70 Potential years of life lost prior to age 70 given a person dies before that age

SIR Standardized incidence ratio SMR Standardized mortality ratio UCL Upper confidence limit WS World standard population

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