Munich Cancer Registry

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

Cancer statistics: Baseline statistics

C64: Kidney cancer

Year of diagnosis	1998-2011
Patients	7862
Diseases	8010
Creation date	04/02/2013
Export date	01/03/2013
Population	4.5 m

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 4.5 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, April 2013

[#] 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 2011 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.

INCIDENCE

Table 1

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

Year of diagnosis	Cases # n	DCO cases n	Prop. DCO %	Prop. mult. primaries %	Prop. deaths %	Prop. actively followed %
1998	394	36	9.1	28.7	54.3	97.5
1999	390	29	7.4	28.2	57.2	97.2
2000	360	35	9.7	29.2	52.8	96.9
2001	352	43	12.2	27.6	52.8	97.4
2002	604	89	14.7	32.5	57.3	97.8
2003	612	66	10.8	28.4	53.3	96.6
2004	619	73	11.8	31.8	44.9	96.6
2005	650	40	6.2	31.8	38.6	95.7
2006	631	47	7.4	28.8	40.1	92.1
2007	736	73	9.9	26.5	38.6	75.3 ##
2008	741	64	8.6	29.3	33.2	58.0
2009	738	74	10.0	31.6	33.1	60.7
2010	664	61	9.2	26.1	26.7	95.3
2011	519	45	8.7	22.4	23.5	80.5 ###
1998-2011	8010	775	9.7	28.9	41.7	86.4

\#   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 diagnosis	All n	Males n	Females n	Prop. males %
1998	394	244	150	61.9
1999	390	239	151	61.3
2000	360	237	123	65.8
2001	352	211	141	59.9
2002	604	361	243	59.8
2003	612	382	230	62.4
2004	619	385	234	62.2
2005	650	414	236	63.7
2006	631	403	228	63.9
2007	736	471	265	64.0
2008	741	477	264	64.4
2009	738	454	284	61.5
2010	664	421	243	63.4
2011	519	331	188	63.8
1998-2011	8010	5030	2980	62.8

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 4.52 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	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	237	123	20.8	10.2	13.3	4.8	18.6	7.0	22.4	8.8
2001	211	141	18.2	11.6	11.0	5.4	15.8	8.0	19.6	9.9
2002	361	243	19.4	12.4	11.3	5.8	16.5	8.3	20.6	10.5
2003	382	230	20.4	11.7	12.2	5.3	17.1	7.7	20.8	9.6
2004	385	234	20.5	11.8	12.2	5.5	17.0	7.9	20.7	9.8
2005	414	236	21.9	11.9	12.6	5.5	17.9	7.8	21.4	10.0
2006	403	228	21.0	11.3	12.2	5.6	16.9	7.7	20.5	9.3
2007	471	265	21.3	11.5	12.0	5.2	16.9	7.3	20.8	9.2
2008	477	264	21.4	11.4	11.8	5.5	16.9	7.7	20.5	9.6
2009	454	284	20.3	12.2	11.1	5.6	15.8	7.9	19.6	10.0
2010	421	243	18.7	10.4	10.0	4.2	14.2	6.2	17.6	7.9
2011	331	188	14.7	8.0	8.1	4.2	11.3	5.4	13.8	6.6
1998-2011	5030	2980	20.0	11.3	11.5	5.3	16.3	7.5	19.9	9.4

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

Table 3

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 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	360	65.5	13.2	0.3	93.5	48.9	57.9	66.2	75.0	80.8
2001	352	66.5	12.4	1.9	96.4	51.8	59.0	66.3	75.6	80.6
2002	604	67.7	12.9	2.4	96.2	50.1	60.7	68.9	76.8	82.3
2003	612	66.9	13.6	0.4	96.2	50.8	60.3	67.8	75.8	82.7
2004	619	66.5	13.8	0.0	94.1	49.0	60.3	67.6	75.8	81.8
2005	650	66.6	12.9	0.7	95.1	51.2	59.7	67.7	75.4	81.3
2006	631	66.2	14.4	0.2	95.5	48.4	59.6	67.8	75.4	81.7
2007	736	67.1	14.6	1.2	99.1	48.3	60.5	69.0	76.4	82.7
2008	741	67.0	13.3	0.6	98.1	50.3	59.4	68.1	76.2	82.7
2009	738	67.5	14.3	0.5	96.9	50.3	59.4	69.7	77.3	83.0
2010	664	67.9	13.9	5.4	100	48.1	59.7	70.1	77.2	83.7
2011	519	67.0	15.5	0.5	96.9	49.5	60.7	69.3	76.6	83.0
1998-2011	8010	66.8	13.8	0.0	100	49.6	59.6	68.2	76.1	82.3

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	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	237	63.7	13.3	0.3	93.5	47.6	56.2	65.0	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	361	66.1	12.6	32.7	96.2	47.3	58.6	67.6	74.7	80.4
2003	382	64.7	13.4	0.4	96.2	48.1	59.2	65.3	73.1	78.6
2004	385	64.8	13.9	0.0	93.6	48.6	58.0	66.3	73.6	79.8
2005	414	65.1	11.5	0.7	92.4	51.2	58.7	65.8	73.1	78.1
2006	403	64.9	13.0	0.8	95.4	48.4	59.1	66.5	73.4	78.5
2007	471	65.5	13.2	2.6	93.1	48.3	58.6	67.5	74.1	80.1
2008	477	65.9	12.6	1.8	98.1	49.3	58.4	67.4	74.4	81.2
2009	454	66.1	13.9	0.5	96.1	49.6	58.6	68.6	75.6	81.8
2010	421	65.4	13.2	5.4	93.5	47.0	56.1	68.3	75.1	80.8
2011	331	66.5	13.5	1.5	96.9	49.9	59.9	68.1	75.4	82.6
1998-2011	5030	65.2	13.0	0.0	98.1	48.9	58.3	66.6	73.9	80.0

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	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	243	70.0	13.1	2.4	93.6	54.7	63.6	72.2	78.9	83.8
2003	230	70.6	13.3	2.5	95.2	54.2	63.8	72.0	80.1	85.5
2004	234	69.2	13.4	18.5	94.1	52.5	63.4	70.3	77.7	84.5
2005	236	69.2	14.8	4.2	95.1	51.8	62.5	72.4	79.7	83.7
2006	228	68.6	16.3	0.2	95.5	49.0	61.1	71.7	79.4	85.7
2007	265	70.1	16.3	1.2	99.1	49.3	66.0	72.4	79.8	85.8
2008	264	68.9	14.2	0.6	96.1	52.0	61.6	69.6	78.9	84.0
2009	284	69.7	14.7	2.5	96.9	51.3	63.4	71.4	79.8	84.6
2010	243	72.2	13.9	5.4	100	53.8	65.9	73.0	81.4	88.5
2011	188	68.0	18.6	0.5	96.5	47.2	63.4	72.3	79.3	85.1
1998-2011	2980	69.4	14.7	0.2	100	51.8	62.5	71.5	79.0	85.1

Table 4

Age distribution by 5-year age group and gender for period 1998-2011
(incl. DCO)

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	59	0.7	0.7	31	0.6	0.6	28	0.9	0.9
5-9	16	0.2	0.9	9	0.2	0.8	7	0.2	1.2
10-14	3	0.0	1.0	2	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	9	0.1	1.1	3	0.1	0.9	6	0.2	1.5
25-29	14	0.2	1.3	8	0.2	1.1	6	0.2	1.7
30-34	43	0.5	1.8	23	0.5	1.5	20	0.7	2.4
35-39	140	1.7	3.6	96	1.9	3.4	44	1.5	3.9
40-44	197	2.5	6.0	146	2.9	6.3	51	1.7	5.6
45-49	350	4.4	10.4	264	5.2	11.6	86	2.9	8.5
50-54	473	5.9	16.3	350	7.0	18.5	123	4.1	12.6
55-59	766	9.6	25.9	546	10.9	29.4	220	7.4	20.0
60-64	1078	13.5	39.3	741	14.7	44.1	337	11.3	31.3
65-69	1348	16.8	56.2	910	18.1	62.2	438	14.7	46.0
70-74	1241	15.5	71.7	791	15.7	77.9	450	15.1	61.1
75-79	1106	13.8	85.5	604	12.0	89.9	502	16.8	77.9
80-84	677	8.5	93.9	328	6.5	96.5	349	11.7	89.6
85+	487	6.1	100.0	178	3.5	100.0	309	10.4	100.0
All ages	8010	100.0		5030	100.0		2980	100.0	

Included in the statistics are 37.0% multiple primaries in males and 29.1% in females.

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 1998-2011

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males DCO rate n=388 %	Females DCO rate n=385 %	Males Prop.all cancers n=132509 %	Females Prop.all cancers n=129521 %
0- 4	30	27	2.4	2.3			10.6	13.0
5- 9	9	6	0.7	0.5			5.8	5.8
10-14	2	1	0.2	0.1			1.5	0.7
15-19		3	0.0	0.2				1.3
20-24	3	6	0.2	0.4			0.6	1.4
25-29	8	6	0.5	0.3			1.0	0.7
30-34	23	20	1.2	1.1	4.3		1.8	1.2
35-39	96	42	4.4	2.0			4.9	1.3
40-44	144	51	6.5	2.4	0.7		5.2	1.0
45-49	258	85	13.3	4.4		1.2	5.8	1.2
50-54	342	123	20.5	7.2	1.5		4.7	1.3
55-59	534	218	34.2	13.3	2.4	2.3	4.3	1.9
60-64	730	332	48.0	20.7	3.7	0.6	3.9	2.2
65-69	891	430	65.4	28.9	5.7	4.2	3.8	2.6
70-74	784	446	76.0	36.1	5.6	8.1	3.6	3.0
75-79	601	498	88.9	50.1	13.1	10.2	3.6	3.4
80-84	326	348	80.3	43.8	23.6	24.1	3.0	2.6
85+	178	308	64.2	41.5	50.6	61.0	2.2	2.1
All ages	4959	2950			7.8	13.1	3.7	2.3
Incidence								
Raw			19.7	11.2				
WS			11.3	5.2				
ES			16.1	7.4				
BRD-S			19.7	9.3				

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 1998-2011
MALES

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C03-C06	Oral cavity	2	1.9	1.0	0.1	3.7		0.0	
C09-C10	Oropharynx	6	2.5	2.4	0.9	5.3		2.5	
C15	Oesophagus	6	4.0	1.5	0.6	3.3		1.4	16.7
C16	Stomach	14	9.5	1.5	0.8	2.5		3.2	21.4
C17	Small intestine	5	1.0	4.9	1.6	11.4	#	2.9	
C18	Colon	51	22.8	2.2	1.7	2.9	#	20.2	9.8
C19-C20	Rectum	18	13.1	1.4	0.8	2.2		3.5	
C22	Liver	17	6.3	2.7	1.6	4.4	#	7.7	17.6
C23-C24	Bile	3	2.1	1.4	0.3	4.1		0.6	33.3
C25	Pancreas	10	7.9	1.3	0.6	2.3		1.5	30.0
C32	Larynx	5	2.4	2.0	0.7	4.8		1.8	
C33-C34	Lung	63	27.6	2.3	1.8	2.9	#	25.4	11.1
C38,C45	Mesothelioma	2	1.5	1.3	0.2	4.8		0.4	50.0
C43	Malign. melanoma	28	8.6	3.3	2.2	4.7	#	13.9	3.6
C46,C49	Soft tissue	3	1.2	2.6	0.5	7.5		1.3	
C48	Peritoneal	2	0.2	13.0	1.6	46.8	#	1.3	
C61	Prostate	178	67.4	2.6	2.3	3.1	#	79.3	2.2
C62	Testis	5	0.6	8.0	2.6	18.6	#	3.1	
C64	Kidney	84	8.1	10.4	8.3	12.9	#	54.4	1.2
C65	Renal pelvis	8	0.9	9.0	3.9	17.8	#	5.1	
C66	Ureter	3	0.5	6.1	1.3	17.9	#	1.8	
C67	Bladder	31	9.5	3.3	2.2	4.6	#	15.4	
C70-C72	CNS cancer	5	3.1	1.6	0.5	3.8		1.4	
C73	Thyroid	7	1.5	4.7	1.9	9.6	#	3.9	
C76-C79	CUP	4	3.8	1.1	0.3	2.7		0.2	25.0
C82-C85	NHL	30	8.8	3.4	2.3	4.9	#	15.2	6.7
C90	Mult. myeloma	6	2.8	2.1	0.8	4.6		2.3	
C91-C96	Leukaemia	8	3.4	2.3	1.0	4.6	#	3.3	25.0
Other primaries		11	5.0	2.2	1.1	3.9	#	4.3	18.2
Not observed		0	1.4	0.0	0.0	2.6		-1.0	
All mult. primaries		615	229.3	2.7	2.5	2.9	#	276.5	6.0

Patients	3496
Mean age at second malignancy (years)	69.5
Person-years	13948
Mean observation time (years)	4.0
Median observation time (years)	3.1

The occurrence of second malignancy is statistically significant.

Observed second primaries with count 1 are pooled in category "Other primaries".
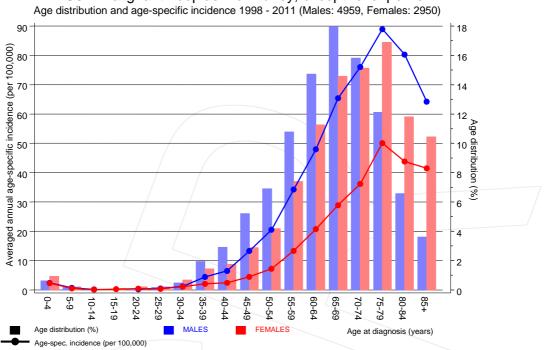
Table 6b

Standardized incidence ratio (SIR, with 95% confidence limits),
excess absolute risk (EAR) and DCO rate of second primaries
for period 1998-2011
FEMALES

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C16	Stomach	8	3.8	2.1	0.9	4.1		5.2	
C18	Colon	19	10.5	1.8	1.1	2.8	#	10.5	5.3
C19-C20	Rectum	9	4.5	2.0	0.9	3.8		5.5	11.1
C22	Liver	2	1.1	1.8	0.2	6.4		1.1	50.0
C23-C24	Bile	7	1.5	4.6	1.8	9.5	#	6.7	28.6
C25	Pancreas	9	4.4	2.1	0.9	3.9		5.7	22.2
C33-C34	Lung	21	6.7	3.1	1.9	4.8	#	17.6	9.5
C43	Malign. melanoma	3	3.1	1.0	0.2	2.8		-0.2	
C46,C49	Soft tissue	2	0.5	3.7	0.4	13.3		1.8	
C50	Breast	53	28.4	1.9	1.4	2.4	#	30.3	7.5
C53	Cervix uteri	3	1.2	2.5	0.5	7.2		2.2	
C54	Corpus uteri	10	5.5	1.8	0.9	3.3		5.6	
C56	Ovary	2	4.2	0.5	0.1	1.7		-2.7	
C64	Kidney	38	2.6	14.8	10.5	20.4	#	43.6	2.6
C65	Renal pelvis	2	0.3	6.7	0.8	24.3		2.1	
C67	Bladder	8	1.8	4.3	1.9	8.5	#	7.6	
C73	Thyroid	13	1.6	8.2	4.4	14.1	#	14.1	
C76-C79	CUP	4	1.7	2.3	0.6	5.9		2.8	25.0
C82-C85	NHL	9	3.8	2.4	1.1	4.5	#	6.4	11.1
C91-C96	Leukaemia	3	1.5	1.9	0.4	5.7		1.8	33.3
Other primaries		7	4.2	1.7	0.7	3.4		3.5	14.3
Not observed		0	4.8	0.0	0.0	0.8	#	-5.9	
All mult. primaries		232	97.9	2.4	2.1	2.7	#	165.1	7.8

Patients	1992
Mean age at second malignancy (years)	71.0
Person-years	8123
Mean observation time (years)	4.1
Median observation time (years)	3.2

The occurrence of second malignancy is statistically significant.

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

C64: Malignant neoplasm of kidney, except renal pelvis
Age distribution and age-specific incidence 1998 - 2011 (Males: 4959, Females: 2950)

Figure 7. Age distribution and age-specific incidence

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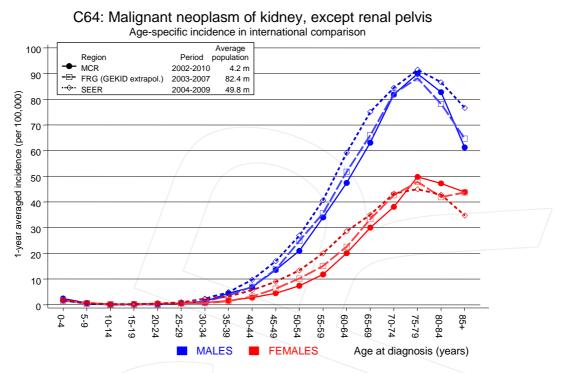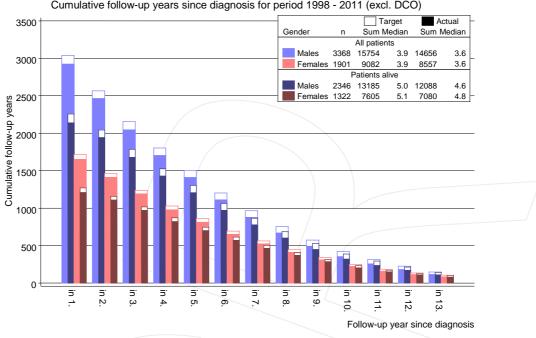Age-specific incidence in international comparison

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, 2011. http://www.gekid.de. Last access: 05/12/2011

Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 18 Regs Research Data, released April 2012, based on the November 2011 submission. http://www.seer.cancer.gov.
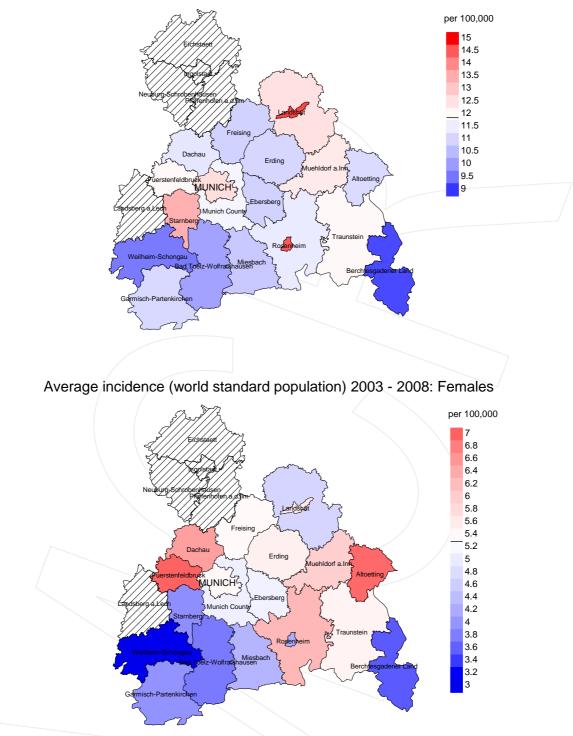
C64: Malignant neoplasm of kidney, except renal pelvis

Cumulative follow-up years since diagnosis for period 1998 - 2011 (excl. DCO)

Gender	n	Target Sum	Median	Actual Sum	Median
All patients					
Males	3368	15754	3.9	14656	3.6
Females	1901	9082	3.9	8557	3.6
Patients alive					
Males	2346	13185	5.0	12088	4.6
Females	1322	7605	5.1	7080	4.8

Cumulative follow-up years

Follow-up year since diagnosis

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) 2003 - 2008: Males
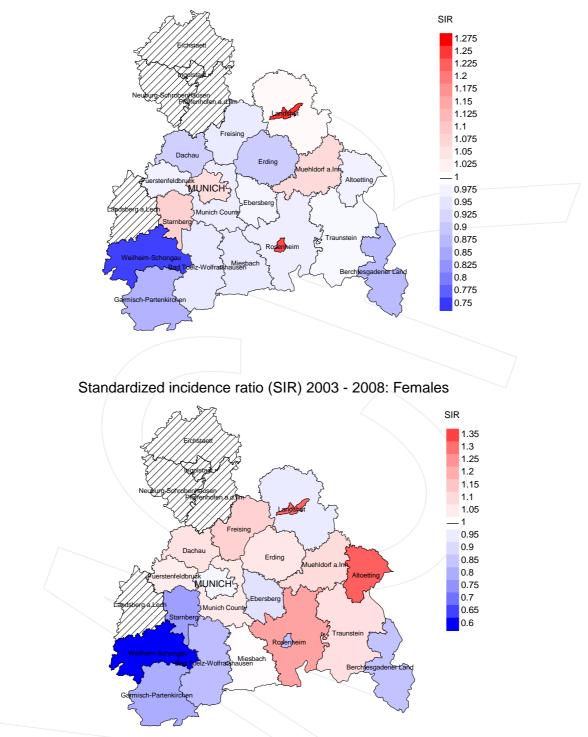
Average incidence (world standard population) 2003 - 2008: Females

Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2003 to 2008. 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 11.9/100,000 WS N=2,376, females 5.3/100,000 WS N=1,366). Since cancer data are not available in some counties until 2007, the local incidence rates were not calculated, and the map tiles show as shaded.

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 63,131 female residents (averaged) in the period from 2003 to 2008 a total of 37 women were identified with newly diagnosed kidney cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 5.1/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 2.8 and 9.4/100,000.

Standardized incidence ratio (SIR) 2003 - 2008: Males

Standardized incidence ratio (SIR) 2003 - 2008: Females

Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2003 to 2008. 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=2,376, females N=1,366). Since cancer data are not available in some counties until 2007, the local SIR values were not calculated, and the map tiles show as shaded.

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 63,131 female residents (averaged) in the period from 2003 to 2008 a total of 37 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 0.92. Though, the value of this parameter may vary with an underlying probability of 99% between 0.58 and 1.39, 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 4.52 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	394	97.5	9.1	214	54.3	93.5
1999	390	97.2	7.4	223	57.2	94.6
2000	360	96.9	9.7	190	52.8	95.8
2001	352	97.4	12.2	186	52.8	98.9
2002	604	97.8	14.7	346	57.3	96.5
2003	612	96.6	10.8	326	53.3	98.2
2004	619	96.6	11.8	278	44.9	97.8
2005	650	95.7	6.2	251	38.6	98.0
2006	631	92.1	7.4	253	40.1	98.0
2007	736	75.3	9.9	284	38.6	98.6
2008	741	58.0	8.6	246	33.2	99.6
2009	738	60.7	10.0	244	33.1	98.8
2010	664	95.3	9.2	177	26.7	99.4
2011	519	80.5	8.7	122	23.5	95.9
1998-2011	8010	86.4	9.7	3340	41.7	97.5
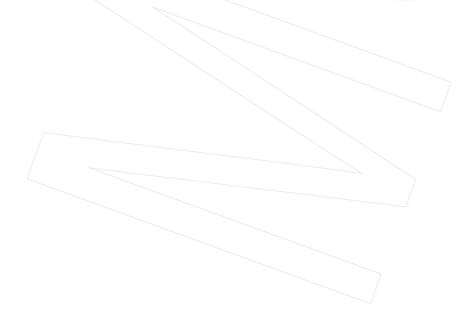
Table 10b

Annual cohorts of incident cancers and deaths, proportion of death certificates
and cases deceased the same year of cancer diagnosis
(incl. DCO)
(with respect to registry area expansion from 2.51 to 3.96 m as of 2002,
and from 3.96 to 4.52 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	394	212	93.9	58	14.7
1999	390	212	95.3	63	16.2
2000	360	207	95.2	54	15.0
2001	352	219	95.0	57	16.2
2002	604	322	96.9	125	20.7
2003	612	327	96.9	114	18.6
2004	619	342	96.5	110	17.8
2005	650	310	95.2	76	11.7
2006	631	344	97.7	90	14.3
2007	736	380	98.2	114	15.5
2008	741	407	99.3	108	14.6
2009	738	425	99.1	129	17.5
2010	664	454	98.2	118	17.8
2011	519	386	98.7	90	17.3
1998-2011	8010	4547	97.2	1306	16.3

Table 10c

Annual cohorts of deaths, proportion of cancer-related and not 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 4.52 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. not cancer-related %	Prop. cancer recorded on death certificate %
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	310	72.3	27.7	82.4
2006	344	70.1	29.9	77.4
2007	380	71.8	28.2	79.6
2008	407	69.8	30.2	80.9
2009	425	72.2	27.8	80.5
2010	454	66.5	33.5	76.7
2011	386	62.4	37.6	77.4
1998-2011	4547	69.8	30.2	81.0

Table 11a

Means of age at death according to the grouping in Table 10
MALES

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (not cancer-related) Years	Age at death (according to death certificate) Years
1998	142	71.5	69.7	75.6	70.5
1999	138	72.7	70.5	78.2	71.4
2000	124	72.1	69.8	77.9	71.3
2001	147	70.4	69.1	74.3	69.6
2002	188	73.3	72.6	75.0	73.1
2003	195	72.9	71.3	78.0	72.3
2004	203	73.0	71.6	76.2	72.6
2005	186	72.9	71.4	76.5	72.3
2006	219	71.8	70.8	74.9	71.3
2007	231	73.9	72.1	79.6	72.9
2008	264	74.1	72.5	77.7	73.4
2009	267	73.6	71.9	78.1	72.4
2010	274	74.1	72.6	77.0	73.0
2011	252	74.5	71.4	80.3	73.1
1998-2011	2830	73.1	71.4	77.3	72.3

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

Means of age at death according to the grouping in Table 10
FEMALES

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (not cancer-related) Years	Age at death (according to death certificate) Years
1998	70	79.5	77.3	82.2	79.5
1999	74	76.5	74.0	82.9	76.1
2000	83	75.8	75.1	77.5	76.1
2001	72	78.0	75.9	83.2	76.6
2002	134	76.6	74.8	80.3	75.9
2003	132	76.4	75.2	79.1	76.0
2004	139	78.8	77.2	82.1	78.6
2005	124	76.9	74.6	83.7	75.2
2006	125	78.1	77.3	79.4	77.4
2007	149	79.2	77.9	81.5	79.0
2008	143	78.0	76.3	82.0	76.9
2009	158	78.6	75.8	85.1	76.9
2010	180	79.3	76.8	84.4	78.1
2011	134	80.2	76.1	85.8	78.0
1998-2011	1717	78.1	76.1	82.3	77.2

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 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	0.41	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	0.39	8.7	0.43
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	177	8.0	0.38	3.9	0.34	6.1	0.37	8.3	0.41
2008	183	8.2	0.39	3.9	0.33	6.1	0.36	8.4	0.41
2009	196	8.8	0.44	4.1	0.37	6.3	0.40	8.7	0.45
2010	181	8.0	0.44	3.6	0.37	5.6	0.40	7.9	0.46
2011	163	7.2	0.50	3.4	0.42	5.2	0.46	7.0	0.51
1998-2011	2017	8.0	0.41	4.0	0.36	6.3	0.39	8.5	0.43

Table 12b

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	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	0.33	3.6	0.35
2003	93	4.7	0.41	1.7	0.32	2.7	0.36	3.7	0.39
2004	92	4.7	0.40	1.5	0.29	2.4	0.32	3.5	0.36
2005	93	4.7	0.40	1.8	0.34	2.7	0.35	3.6	0.37
2006	79	3.9	0.35	1.3	0.24	2.0	0.27	2.9	0.31
2007	97	4.2	0.37	1.3	0.24	2.1	0.30	3.2	0.34
2008	101	4.4	0.39	1.4	0.26	2.3	0.30	3.2	0.34
2009	111	4.8	0.39	1.7	0.30	2.6	0.33	3.5	0.36
2010	121	5.2	0.50	1.6	0.39	2.6	0.42	3.9	0.49
2011	78	3.3	0.42	1.1	0.27	1.8	0.33	2.5	0.38
1998-2011	1157	4.4	0.39	1.5	0.29	2.4	0.32	3.4	0.36

Table 13

Age distribution of age at death (cancer-related) for period 1998-2011
(**incl. multiple primaries**)

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	1	0.0	0.0	1	0.0	0.0			0.0
5-9	5	0.2	0.2	2	0.1	0.1	3	0.3	0.3
10-14	0	0.0	0.2			0.1			0.3
15-19	0	0.0	0.2			0.1			0.3
20-24	2	0.1	0.2	2	0.1	0.2			0.3
25-29	3	0.1	0.3	1	0.0	0.3	2	0.2	0.4
30-34	2	0.1	0.4	1	0.0	0.3	1	0.1	0.5
35-39	9	0.3	0.7	7	0.3	0.7	2	0.2	0.7
40-44	18	0.6	1.2	13	0.6	1.3	5	0.4	1.1
45-49	48	1.5	2.7	37	1.8	3.1	11	0.9	2.0
50-54	97	3.0	5.7	71	3.4	6.5	26	2.2	4.2
55-59	203	6.2	11.9	159	7.6	14.1	44	3.7	8.0
60-64	319	9.8	21.7	238	11.4	25.6	81	6.9	14.8
65-69	478	14.7	36.3	341	16.4	42.0	137	11.6	26.4
70-74	557	17.1	53.4	386	18.6	60.5	171	14.5	40.9
75-79	575	17.6	71.1	357	17.2	77.7	218	18.5	59.4
80-84	517	15.9	86.9	273	13.1	90.8	244	20.7	80.0
85+	427	13.1	100.0	191	9.2	100.0	236	20.0	100.0
All ages	3261	100.0		2080	100.0		1181	100.0	

Included in the statistics are 37.0% multiple primaries in males and 29.1% in females.

Table 14

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2011
(**incl. multiple primaries**)

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	1		0.1	0.03	0.0		3.4	
5- 9	2	3	0.2	0.22	0.2	0.43	6.5	8.3
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24	2		0.1	0.67	0.0		2.5	
25-29	1	2	0.1	0.13	0.1	0.33	1.1	2.0
30-34	1	1	0.1	0.04	0.1	0.05	0.6	0.5
35-39	7	2	0.3	0.07	0.1	0.05	1.9	0.4
40-44	13	5	0.6	0.09	0.2	0.10	1.7	0.5
45-49	37	11	1.9	0.14	0.6	0.13	2.4	0.6
50-54	71	26	4.3	0.20	1.5	0.21	2.5	1.0
55-59	159	44	10.2	0.29	2.7	0.20	3.1	1.1
60-64	238	81	15.6	0.32	5.1	0.24	3.1	1.5
65-69	341	137	25.0	0.37	9.2	0.31	3.3	1.9
70-74	386	171	37.4	0.49	13.9	0.38	3.5	2.1
75-79	357	218	52.8	0.59	21.9	0.43	3.3	2.4
80-84	273	244	67.2	0.83	30.7	0.70	3.1	2.5
85+	191	236	68.9	1.07	31.8	0.76	2.7	2.1
All ages	2080	1181					3.1	1.9

Mortality					
Raw	8.3	0.41	4.5	0.40
WS	4.2	0.36	1.6	0.29
ES	6.5	0.40	2.5	0.33
BRD-S	8.8	0.44	3.4	0.37

PYLL-70		
per 100,000	33.6	12.0
ES	30.0	10.6
AYLL-70	8.8	8.7

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

Table 15a

Multiple primaries in deaths in period 1998-2011
MALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C09-C10 Oropharynx	13	1.2	5	38.5	2	15.4	6	46.2
C15 Oesophagus	15	1.4	3	20.0	1	6.7	11	73.3
C16 Stomach	45	4.2	14	31.1	3	6.7	28	62.2
C18 Colon	88	8.3	33	37.5	15	17.0	40	45.5
C19-C20 Rectum	42	4.0	10	23.8	13	31.0	19	45.2
C22 Liver	29	2.7	4	13.8	7	24.1	18	62.1
C23-C24 Bile	11	1.0	2	18.2	1	9.1	8	72.7
C25 Pancreas	25	2.4	1	4.0	6	24.0	18	72.0
C32 Larynx	10	0.9	7	70.0	1	10.0	2	20.0
C33-C34 Lung	130	12.3	25	19.2	23	17.7	82	63.1
C43 Malign. melanoma	26	2.5	15	57.7	2	7.7	9	34.6
C44 Skin others	24	2.3	8	33.3	2	8.3	14	58.3
C61 Prostate	214	20.2	83	38.8	31	14.5	100	46.7
C64 Kidney	71	6.7			20	28.2	51	71.8
C65 Renal pelvis	21	2.0	4	19.0	8	38.1	9	42.9
C66 Ureter	10	0.9	3	30.0	3	30.0	4	40.0
C67 Bladder	94	8.9	35	37.2	15	16.0	44	46.8
C70-C72 CNS cancer	22	2.1	6	27.3	4	18.2	12	54.5
C73 Thyroid	10	0.9	2	20.0			8	80.0
C76-C79 CUP	15	1.4	9	60.0	2	13.3	4	26.7
C82-C85 NHL	38	3.6	8	21.1	7	18.4	23	60.5
C90 Mult. myeloma	23	2.2	7	30.4	5	21.7	11	47.8
C91-C96 Leukaemia	21	2.0	3	14.3	2	9.5	16	76.2
Other primaries	62	5.9	26	41.9	8	12.9	28	45.2
All mult. primaries	1059	100.0	313	29.6	181	17.1	565	53.4

Multiple primaries with number of cases n<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 1998-2011
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C16	Stomach	20	4.1	5	25.0	7	35.0	8	40.0
C18	Colon	37	7.5	11	29.7	6	16.2	20	54.1
C19-C20	Rectum	15	3.0	3	20.0	3	20.0	9	60.0
C22	Liver	9	1.8	2	22.2	3	33.3	4	44.4
C23-C24	Bile	11	2.2			3	27.3	8	72.7
C25	Pancreas	29	5.9	2	6.9	5	17.2	22	75.9
C33-C34	Lung	47	9.5	6	12.8	6	12.8	35	74.5
C43	Malign. melanoma	13	2.6	7	53.8	1	7.7	5	38.5
C44	Skin others	6	1.2	3	50.0			3	50.0
C50	Breast	104	21.1	52	50.0	12	11.5	40	38.5
C53	Cervix uteri	12	2.4	7	58.3	1	8.3	4	33.3
C54	Corpus uteri	16	3.2	8	50.0	4	25.0	4	25.0
C56	Ovary	17	3.4	8	47.1	5	29.4	4	23.5
C64	Kidney	27	5.5			10	37.0	17	63.0
C67	Bladder	30	6.1	9	30.0	6	20.0	15	50.0
C70-C72	CNS cancer	15	3.0	2	13.3	3	20.0	10	66.7
C73	Thyroid	18	3.7	8	44.4	1	5.6	9	50.0
C76-C79	CUP	11	2.2	2	18.2	1	9.1	8	72.7
C82-C85	NHL	14	2.8	4	28.6	4	28.6	6	42.9
C90	Mult. myeloma	4	0.8			1	25.0	3	75.0
C91-C96	Leukaemia	12	2.4	1	8.3	2	16.7	9	75.0
Other primaries		26	5.3	12	46.2	5	19.2	9	34.6
All mult. primaries		493	100.0	152	30.8	89	18.1	252	51.1

Multiple primaries with number of cases n<4 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 1998-2011
(**Singular 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			0.0		0.0			
5- 9	2	1	0.2	0.22	0.1	0.20	6.9	3.0
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24	2		0.1	0.67	0.0		2.7	
25-29	1	2	0.1	0.13	0.1	0.33	1.2	2.1
30-34	1	1	0.1	0.05	0.1	0.06	0.6	0.6
35-39	7	2	0.3	0.08	0.1	0.05	2.1	0.5
40-44	11	4	0.5	0.08	0.2	0.09	1.6	0.5
45-49	35	7	1.8	0.15	0.4	0.09	2.5	0.5
50-54	51	21	3.1	0.17	1.2	0.20	2.1	0.9
55-59	135	37	8.7	0.30	2.3	0.21	3.0	1.1
60-64	197	59	12.9	0.33	3.7	0.22	3.0	1.3
65-69	266	119	19.5	0.39	8.0	0.34	3.2	2.1
70-74	293	127	28.4	0.51	10.3	0.35	3.3	2.0
75-79	264	177	39.1	0.62	17.8	0.43	3.1	2.4
80-84	189	198	46.5	0.87	24.9	0.75	2.8	2.6
85+	139	199	50.1	1.19	26.8	0.79	2.5	2.2
All ages	1593	954					2.9	1.9
Mortality								
Raw			6.3	0.41	3.6	0.40		
WS			3.2	0.35	1.2	0.28		
ES			5.0	0.39	2.0	0.32		
BRD-S			6.7	0.44	2.8	0.36		
PYLL-70								
per 100,000			27.9		9.3			
ES			24.7		7.9			
AYLL-70			9.0		8.3			

* See corresponding tables with multiple primaries.

Table 17

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2011
(**Single primaries only ***)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4			0.0		0.0			
5- 9	2	1	0.2	0.22	0.1	0.20	7.1	3.1
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24	1		0.1	0.33	0.0		1.4	
25-29	1	2	0.1	0.13	0.1	0.33	1.3	2.2
30-34	1		0.1	0.05	0.0		0.6	
35-39	7		0.3	0.08	0.0		2.1	
40-44	9	3	0.4	0.07	0.1	0.07	1.4	0.4
45-49	32	5	1.6	0.15	0.3	0.07	2.4	0.4
50-54	43	20	2.6	0.16	1.2	0.20	1.9	1.0
55-59	119	31	7.6	0.29	1.9	0.19	2.9	1.0
60-64	162	47	10.6	0.30	2.9	0.20	2.8	1.2
65-69	209	99	15.3	0.35	6.7	0.32	2.9	2.0
70-74	220	96	21.3	0.45	7.8	0.29	3.0	1.8
75-79	190	143	28.1	0.52	14.4	0.38	2.8	2.3
80-84	126	156	31.0	0.64	19.6	0.63	2.4	2.4
85+	94	162	33.9	0.82	21.8	0.67	2.1	2.0
All ages	1216	765					2.6	1.8
Mortality								
Raw			4.8	0.35	2.9	0.34		
WS			2.5	0.31	1.0	0.25		
ES			3.8	0.34	1.6	0.28		
BRD-S			5.0	0.37	2.2	0.32		
PYLL-70								
per 100,000			23.9		7.4			
ES			21.2		6.5			
AYLL-70			9.3		8.1			

* See corresponding tables with multiple primaries.

C64: Malignant neoplasm of kidney, except renal pelvis
Age distribution and age-specific mortality 1998 - 2011 (Males: 2017, Females: 1157)
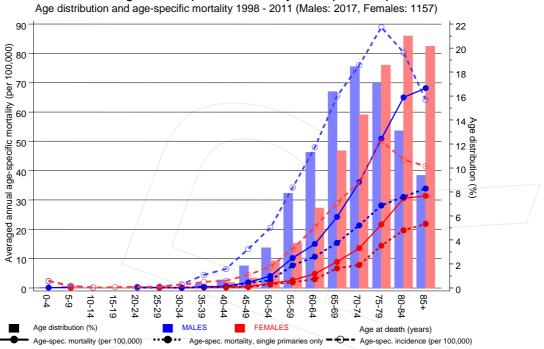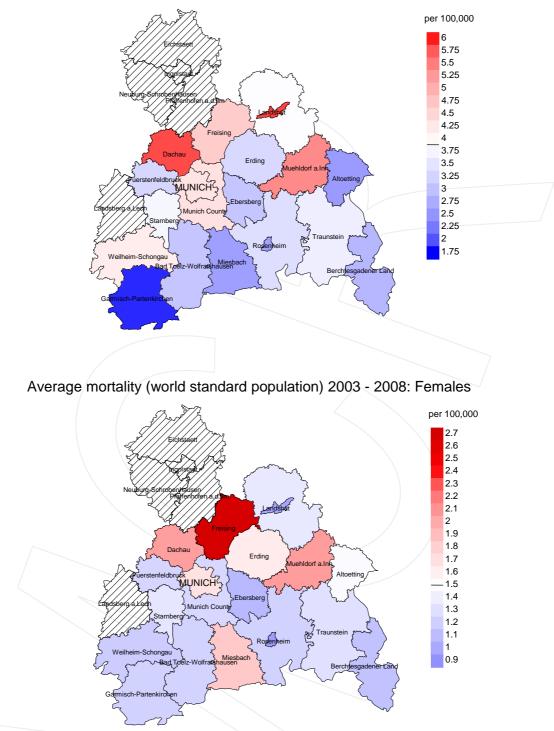
Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).
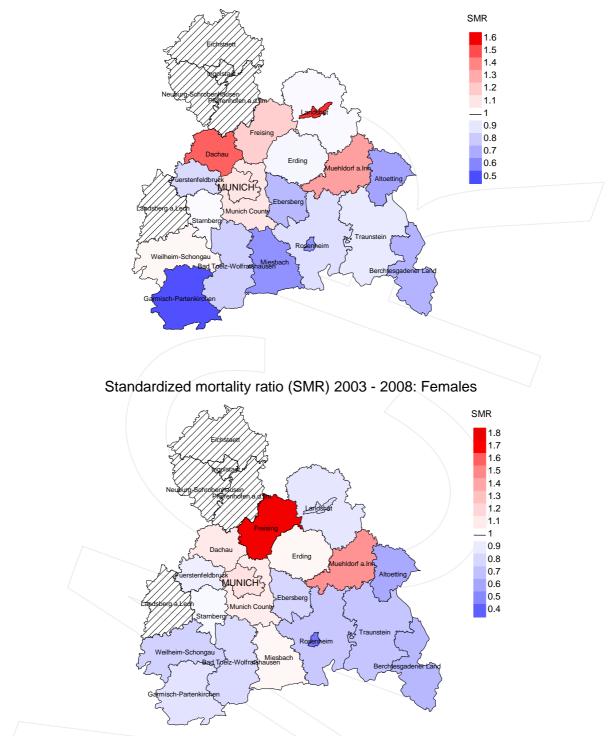
The difference between age at diagnosis (Table 3) and age at kidney cancer-related death (see Table 10) should be considered.

Average mortality (world standard population) 2003 - 2008: Males

Average mortality (world standard population) 2003 - 2008: Females

Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2003 to 2008. 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 3.9/100,000 WS N=897, females 1.5/100,000 WS N=535). Since cancer data are not available in some counties until 2007, the local mortality rates were not calculated, and the map tiles show as shaded.

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 63,131 female residents (averaged) in the period from 2003 to 2008 a total of 12 women died from kidney cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 1.1/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.4 and 2.5/100,000.

Standardized mortality ratio (SMR) 2003 - 2008: Males

Standardized mortality ratio (SMR) 2003 - 2008: Females

Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2003 to 2008. 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=897, females N=535). Since cancer data are not available in some counties until 2007, the local SMR values were not calculated, and the map tiles show as shaded.

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 63,131 female residents (averaged) in the period from 2003 to 2008 a total of 12 women died from kidney cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.80. Though, the value of this parameter may vary with an underlying probability of 99% between 0.33 and 1.61, 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 tumor-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

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)
FRG	Federal Republic of Germany
GEKID	Association of Population-based Cancer Registries in Germany
	(Gesellschaft der epidemiologischen Krebsregister in Deutschland e.V.)
LCL	Lower confidence limit
MI-index	Ratio between mortality and incidence
MCR	Munich Cancer Registry (Tumorregister München)
PYLL-70	Potential years of life lost prior to age 70 given a person dies before that age
SEER	Surveillance, Epidemiology, and End Results (USA)
SIR	Standardized incidence ratio
SMR	Standardized mortality ratio
UCL	Upper confidence limit
WS	World standard population

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