# **Munich Cancer Registry**



- Survival
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- Homepage

Munich Cancer Registry at Munich Cancer Center Marchioninistr. 15 Munich, 81377 Germany

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

## **Cancer statistics: Baseline statistics**

C65: Renal pelvis cancer

Year of diagnosis	1998-2012
Patients	876
Diseases	885
Creation date	03/20/2014
Export date	02/12/2014
Population	4.5 m



### http://www.tumorregister-muenchen.de/en/facts/base/base\_C65\_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<sup>#</sup>, with a total of 4.5 million inhabitants, account for the frequency of cancer diseases<sup>##</sup> 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<sup>###</sup> 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, March 2014

- <sup>#</sup> 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 2013 are incorporated into these analyses.
- <sup>##</sup> 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

		DCO	Prop.	Prop. mult.	Prop.	Prop. actively
Year of	Cases	cases	DCO	primaries	deaths	followed
diagnosis	n	n	00	90	00	8
1998	33	/ 1 /	3.0	57.6	84.8	97.0
1999	35			62.9	80.0	100.0
2000	33	1	3.0	66.7	78.8	100.0
2001	34			47.1	73.5	100.0
2002	65	2	3.1	53.8	78.5	100.0 #
2003	55	3	5.5	60.0	76.4	98.2 #
2004	52	4	7.7	57.7	75.0	96.2 #
2005	70			68.6	70.0	100.0 #
2006	68	1	1.5	58.8	63.2	92.6 #
2007	72			55.6	76.4	94.4 # ##
2008	76	1	1.3	59.2	61.8	88.2
2009	71			62.0	64.8	84.5
2010	78	1	1.3	62.8	61.5	91.0
2011	82	3	3.7	65.9	45.1	85.4
2012	61	1	1.6	67.2	37.7	91.8 ###
1998-2012	885	18	2.0	60.8	66.3	93.6

# 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	%	
1998	33	20	13	60.6	
1999	35	22	13	62.9	
2000	33	19	14	57.6	
2001	34	18	16	52.9	
2002	65	41	24	63.1	
2003	55	37	18	67.3	
2004	52	31	21	59.6	
2005	70	43	27	61.4	
2006	68	32	36	47.1	
2007	72	50	22	69.4	
2008	76	45	31	59.2	
2009	71	44	27	62.0	
2010	78	48	30	61.5	
2011	82	49	33	59.8	
2012	61	32	29	52.5	
1998-2012	885	531	354	60.0	

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)

			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	20	13	1.8	1.1	1.0	0.5	1.7	0.8	2.4	1.0
1999	22	13	2.0	1.1	1.3	0.5	1.8	0.8	2.2	1.0
2000	19	14	1.7	1.2	0.9	0.6	1.5	0.8	2.1	1.0
2001	18	16	1.6	1.3	0.9	0.6	1.3	0.9	1.7	1.1
2002	41	24	2.2	1.2	1.2	0.5	1.8	0.7	2.6	1.0
2003	37	18	2.0	0.9	1.0	0.3	1.6	0.5	2.2	0.7
2004	31	21	1.6	1.1	0.9	0.4	1.3	0.6	1.8	0.8
2005	43	27	2.3	1.4	1.2	0.5	1.8	0.8	2.3	1.1
2006	32	36	1.7	1.8	0.7	0.8	1.3	1.1	1.9	1.5
2007	50	22	2.3	1.0	1.1	0.3	1.7	0.5	2.3	0.7
2008	45	31	2.0	1.3	0.9	0.5	1.4	0.7	2.0	1.1
2009	44	27	2.0	1.2	1.0	0.4	1.4	0.6	1.8	0.9
2010	48	30	2.1	1.3	0.9	0.5	1.5	0.7	2.0	1.0
2011	49	33	2.1	1.4	0.9	0.6	1.4	0.8	2.0	1.0
2012	32	29	1.4	1.2	0.7	0.5	1.0	0.7	1.3	1.0
1998-2012	531	354	1.9	1.2	1.0	0.5	1.5	0.7	2.0	1.0

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

Year of	Cases		Std.					Median		
diagnosis	n	Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	33	73.5	10.9	46.8	90.1	56.7	70.3	74.8	81.4	86.7
1999	35	66.8	11.6	41.5	88.2	49.1	61.4	69.4	74.7	78.2
2000	33	70.6	10.6	37.3	88.4	58.2	65.5	71.6	77.2	82.5
2001	34	70.4	9.8	51.1	86.8	61.0	63.7	69.8	79.2	84.6
2002	65	71.9	11.7	46.0	96.4	56.3	62.6	72.9	81.0	83.8
2003	55	72.7	12.0	38.4	97.3	60.2	65.6	74.2	81.3	84.7
2004	52	72.3	10.1	50.6	87.9	57.6	64.7	74.8	80.1	83.5
2005	70	70.8	12.0	37.7	92.1	55.3	64.4	71.4	80.2	84.7
2006	68	73.6	10.0	52.1	91.8	59.6	66.6	74.5	81.2	85.9
2007	72	72.0	11.0	40.5	90.5	59.0	66.1	73.8	79.2	85.2
2008	76	72.9	11.1	20.5	91.1	60.3	67.7	73.6	81.5	84.4
2009	71	71.4	11.1	41.3	95.9	57.0	65.4	72.8	78.9	84.8
2010	78	73.5	9.1	51.6	92.9	60.2	68.1	73.8	80.2	84.7
2011	82	73.3	10.4	42.2	96.9	62.0	67.5	72.3	80.7	87.4
2012	61	71.8	10.6	41.4	90.9	57.1	63.6	73.2	79.9	83.4
1998-2012	885	72.1	10.8	20.5	97.3	57.6	66.1	73.1	80.2	84.7

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

#### 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	20	76.4	9.7	56.1	90.1	60.7	72.8	76.7	84.9	88.2
1999	22	63.8	12.4	41.5	78.2	41.9	53.8	69.1	74.0	76.3
2000	19	73.2	8.7	56.3	88.4	61.2	67.2	73.0	80.9	85.5
2001	18	71.2	9.3	51.7	86.8	61.0	64.0	70.7	78.3	86.5
2002	41	70.8	10.2	46.0	88.2	58.4	62.6	72.7	79.0	82.5
2003	37	71.1	12.9	38.4	97.3	50.7	64.1	73.8	81.1	83.4
2004	31	70.1	10.0	50.6	83.8	54.7	60.6	73.1	78.9	81.2
2005	43	69.5	12.0	37.7	92.1	54.6	63.3	69.1	79.1	84.2
2006	32	74.8	9.7	53.4	87.6	56.5	70.1	77.8	82.9	85.0
2007	50	70.6	10.3	42.8	89.3	56.5	65.8	72.0	78.3	81.5
2008	45	71.2	9.3	49.3	90.0	58.0	66.2	71.4	75.9	83.5
2009	44	68.9	10.4	44.8	87.9	55.9	63.4	70.4	75.6	80.8
2010	48	73.4	8.8	51.6	92.9	60.4	68.4	72.6	78.9	84.2
2011	49	73.6	9.8	48.1	96.9	60.5	68.5	73.1	80.8	85.4
2012	32	70.5	11.7	41.4	89.2	53.2	62.7	72.5	78.6	85.3
1998-2012	531	71.3	10.6	37.7	97.3	56.3	65.0	72.3	78.9	83.8

### Table 3b

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	13	68.9	11.5	46.8	86.0	53.6	59.3	72.2	74.8	82.5
1999	13	71.9	8.2	61.4	88.2	63.6	67.0	69.4	78.2	84.0
2000	14	67.2	12.3	37.3	82.5	50.1	60.6	70.9	75.9	79.0
2001	16	69.5	10.6	51.1	84.9	53.1	62.2	69.1	80.4	84.6
2002	24	73.8	13.9	47.0	96.4	51.0	62.8	78.5	83.0	92.7
2003	18	76.1	9.3	60.9	93.1	61.7	68.9	77.5	82.6	87.8
2004	21	75.7	9.6	57.6	87.9	60.1	71.2	79.0	81.4	86.5
2005	27	73.0	11.8	43.7	91.7	56.2	66.4	74.9	80.9	85.1
2006	36	72.5	10.2	52.1	91.8	60.1	65.1	73.3	77.8	87.9
2007	22	75.3	12.1	40.5	90.5	60.7	69.3	77.7	83.8	87.3
2008	31	75.4	13.0	20.5	91.1	64.1	69.4	78.9	83.4	85.9
2009	27	75.5	11.2	41.3	95.9	63.1	70.1	76.9	82.3	86.6
2010	30	73.7	9.7	54.7	88.8	56.8	66.2	76.0	81.0	84.7
2011	33	72.8	11.3	42.2	90.9	63.4	67.4	71.9	80.0	88.0
2012	29	73.2	9.3	53.0	90.9	59.7	68.0	75.6	80.1	83.4
1998-2012	354	73.3	11.1	20.5	96.4	59.6	67.0	74.8	81.1	85.9

Age at diagnosis	Cases			Males			Females		
Years	n	00	Cum.%	n	olo	Cum.%	n	00	Cum.%
20-24	1	0.1	0.1			0.0	1	0.3	0.3
25-29	0	0.0	0.1			0.0			0.3
30-34	0	0.0	0.1			0.0			0.3
35-39	4	0.5	0.6	3	0.6	0.6	1	0.3	0.6
40 - 44	10	1.1	1.7	6	1.1	1.7	4	1.1	1.7
45-49	16	1.8	3.5	11	2.1	3.8	5	1.4	3.1
50-54	36	4.1	7.6	26	4.9	8.7	10	2.8	5.9
55-59	47	5.3	12.9	30	5.6	14.3	17	4.8	10.7
60-64	93	10.5	23.4	57	10.7	25.0	36	10.2	20.9
65-69	129	14.6	38.0	77	14.5	39.5	52	14.7	35.6
70-74	176	19.9	57.9	122	23.0	62.5	54	15.3	50.8
75-79	147	16.6	74.5	82	15.4	78.0	65	18.4	69.2
80-84	143	16.2	90.6	79	14.9	92.8	64	18.1	87.3
85+	83	9.4	100.0	38	7.2	100.0	45	12.7	100.0
All ages	885	100.0		531	100.0		354	100.0	

Age distribution by 5-year age group and gender for period 1998-2012 (incl. DCO)

Included in the statistics are 103.8% multiple primaries in males and 80.8% in females.

Males Females Males Females Males Females Prop.all Prop.all Age at DCO rate DCO rate cancers cancers Age- Agediagnosis Males Females n=10 n=8 n=146755 n=142297 spec. spec. Years incid. incid. % n n % % % 0- 4 0.0 0.0 5-9 0.0 0.0 10 - 140.0 0.0 15-19 0.0 0.0 20-24 1 0.0 0.1 0.2 25-29 0.0 0.0 30-34 0.0 0.0 35-39 3 0.1 0.0 0.1 0.0 1 40 - 445 4 0.2 0.2 0.2 0.1 45-49 5 0.5 0.2 9.1 0.2 0.1 11 50-54 26 0.5 0.3 0.1 10 1.4 55-59 29 1.7 0.1 17 1.0 5.9 0.2 60-64 57 2.1 0.2 36 3.5 0.3 65-69 77 0.3 50 5.2 3.1 2.0 0.3 70-74 54 3.9 0.5 0.3 121 10.4 0.8 75-79 10.8 5.9 3.7 0.4 0.4 81 65 1.5 17.4 7.4 1.3 80-84 79 64 0.4 6.3 0.6 12.3 5.5 0.3 85+ 38 45 10.5 2.2 0.4 2.3 352 1.9 0.4 0.2 All ages 527 Incidence Raw 1.9 1.2 0.9 WS 0.5 0.7 ES 1.5 2.0 BRD-S 1.0

## Age-specific incidence, DCO rate and proportion of all cancers for period 1998-2012

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 1998-2012 MALES

	LCL	UCL		DCO			
Diagnosis	n	n	SIR	95%	95%	EAR	00
C16 Stomach	2	1.0	2.0	0.2	7.2	9.5	
C18 Colon	2	2.3	0.9	0.1	3.1	-3.1	
C19-C20 Rectum	2	1.2	1.7	0.2	6.1	7.9	
C22 Liver	2	0.6	3.4	0.4	12.3	13.5	50.0
C25 Pancreas	4	0.8	5.0	1.4	12.8 #	30.7	
C33-C34 Lung	6	2.5	2.4	0.9	5.2	33.4	50.0
C43 Malign. m	elanoma 4	0.8	5.1	1.4	13.1 #	30.9	
C61 Prostate	20	б.4	3.1	1.9	4.8 #	130.3	5.0
C64 Kidney	8	0.7	11.2	4.8	22.0 #	69.9	
C65 Renal pel	vis 4	0.1	41.4	11.3	106.1 #	37.5	
C66 Ureter	17	0.1	324.0	188.7	518.7 #	162.7	
C67 Bladder	31	1.1	28.9	19.6	41.0 #	287.2	16.1
C68 Urethra	3	0.0	251.1	51.8	733.9 #	28.7	
Other primaries	7	1.2	5.7	2.3	11.8 #	55.5	14.3
Not observed	0	3.2	0.0	0.0	1.2	-30.5	
All mult. primarie	es 112	22.0	5.1	4.2	6.1 #	864.0	9.8

Patients	399
Mean age at second malignancy (years)	71.7
Person-years	1042
Mean observation time (years)	2.6
Median observation time (years)	1.6

# 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 1998-2012 FEMALES

	Observed	Expected		LCL	UCL		DCO
Diagnosis	n	n	SIR	95%	95%	EAR	00
C25 Pancreas	2	0.5	4.2	0.5	15.3	20.6	50.0
C33-C34 Lung	4	0.7	6.1	1.7	15.6 #	45.0	
C50 Breast	9	2.7	3.3	1.5	6.3 #	84.4	22.2
C64 Kidney	4	0.3	15.9	4.3	40.6 #	50.5	25.0
C65 Renal pelvis	3	0.0	91.1	18.8	266.2 #	40.0	
C66 Ureter	1/1 /	0.0	698.5	348.7	1250 #	148.0	
C67 Bladder	22	0.2	105.4	66.1	159.6 #	293.6	4.5
Other primaries	4	1.4	2.9	0.8	7.5	35.4	
Not observed	0	4.1	0.0	0.0	0.9 #	-55.2	
All mult. primaries	59	9.8	6.0	4.6	7.7 #	662.2	8.5

Patients	259
Mean age at second malignancy (years)	75.6
Person-years	742
Mean observation time (years)	2.9
Median observation time (years)	1.6

# The occurrence of second malignancy is statistically significant.

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

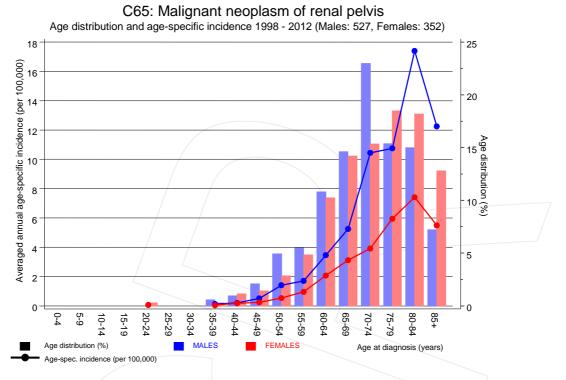
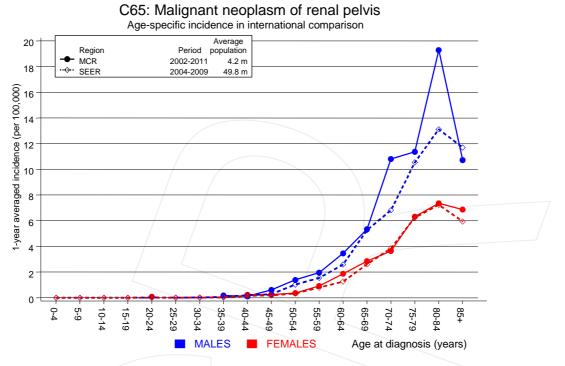


Figure 7. Age distribution and age-specific incidence

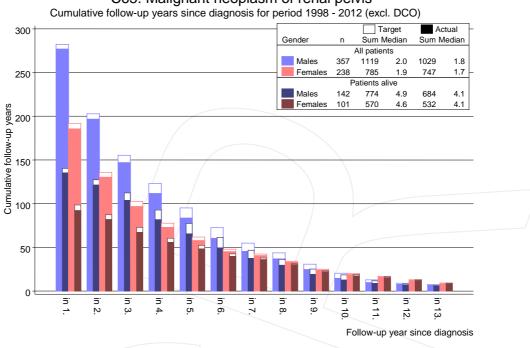




**Figure 7a.** Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).



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.

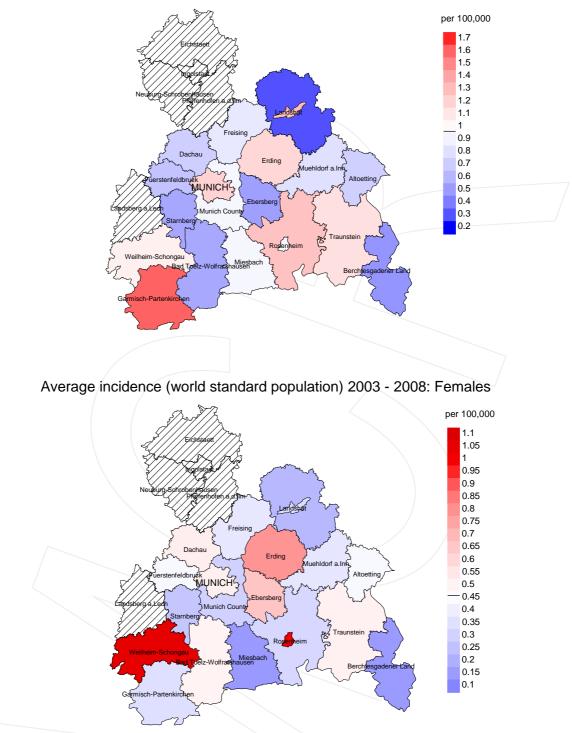


C65: Malignant neoplasm of renal pelvis

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.

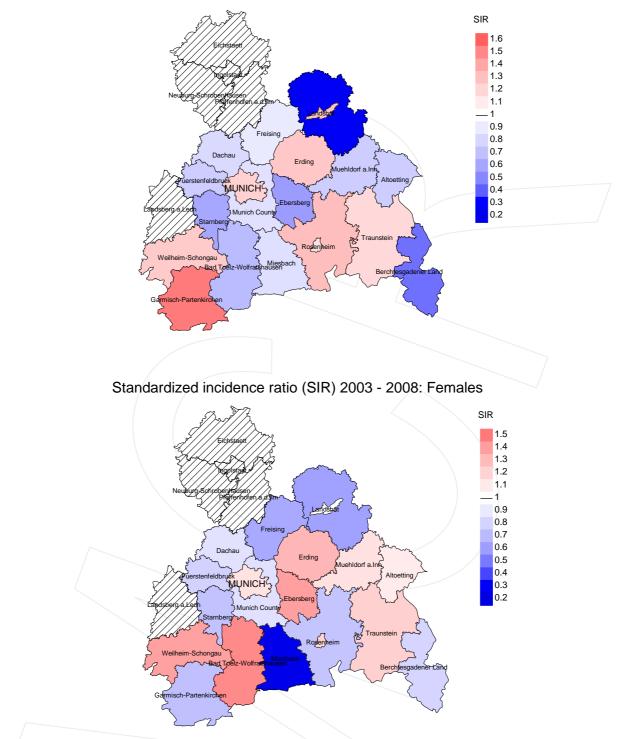




Average incidence (world standard population) 2003 - 2008: Males

**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 1.0/100,000 WS N=224, females 0.5/100,000 WS N=151). 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 6 women were identified with newly diagnosed renal pelvis cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 0.7/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.2 and 1.9/100,000.



Standardized incidence ratio (SIR) 2003 - 2008: Males

**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=224, females N=151). 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 6 women were identified with newly diagnosed renal pelvis cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.40. Though, the value of this parameter may vary with an underlying probability of 99% between 0.36 and 3.64, 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)

		Prop.				Prop. deaths
	Incident	actively	Prop.		Prop.	with death
Year of	cases	followed	DCO	Deaths	deaths	certific.
diagnosis	n	8	olo	n	90	90
1998	33	97.0	3.0	28	84.8	96.4
1999	35	100.0		28	80.0	96.4
2000	33	100.0	3.0	26	78.8	96.2
2001	34	100.0		25	73.5	96.0
2002	65	100.0	3.1	51	78.5	98.0
2003	55	98.2	5.5	42	76.4	97.6
2004	52	96.2	7.7	39	75.0	97.4
2005	70	100.0		49	70.0	95.9
2006	68	92.6	1.5	43	63.2	100.0
2007	72	94.4		55	76.4	96.4
2008	76	88.2	1.3	47	61.8	100.0
2009	71	84.5		46	64.8	97.8
2010	78	91.0	1.3	48	61.5	100.0
2011	82	85.4	3.7	37	45.1	100.0
2012	61	91.8	1.6	23	37.7	87.0
1998-2012	885	93.6	2.0	587	66.3	97.4

#### 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)

			Prop.		
			deaths		Prop.
Year of	Incident		with death	Deaths in	deaths in
diagnosis/	cases	Deaths	certific.	same year	same year
death	n	n	00	n	ફ
1998	33	15	93.3	4	12.1
1999	35	20	100.0	8	22.9
2000	33	29	93.1	7	21.2
2001	34	25	100.0	10	29.4
2002	65	35	100.0	11	16.9
2003	55	48	93.8	16	29.1
2004	52	38	94.7	14	26.9
2005	70	47	97.9	15	21.4
2006	68	45	100.0	9	13.2
2007	72	63	95.2	19	26.4
2008	76	44	100.0	12	15.8
2009	71	56	100.0	16	22.5
2010	78	60	100.0	17	21.8
2011	82	78	97.4	19	23.2
2012	61	48	100.0	12	19.7
1998-2012	885	651	97.8	189	21.4

#### Table 10c

Annual cohorts of deaths, proportion of cancer-related and not cancerrelated 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)

		Prop. cancer-	Prop. not cancer-	Prop. cancer recorded on death	
Year of	Deaths	related	related	certificate	
death	n	00	90	9	
1998	15	66.7	33.3	64.3	
1999	20	85.0	15.0	80.0	
2000	29	65.5	34.5	88.9	
2001	25	68.0	32.0	84.0	
2002	35	80.0	20.0	80.0	
2003	48	75.0	25.0	86.7	
2004	38	76.3	23.7	86.1	
2005	47	85.1	14.9	87.0	
2006	45	80.0	20.0	84.4	
2007	63	77.8	22.2	86.7	
2008	44	86.4	13.6	90.9	
2009	56	76.8	23.2	78.6	
2010	60	75.0	25.0	83.3	
2011	78	85.9	14.1	93.4	
2012	48	68.8	31.3	77.1	
1998-2012	651	77.9	22.1	84.8	

Munich Cancer Registry

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	10	75.6	75.6	75.7	75.8
1999	8	79.9	79.1	85.8	79.1
2000	21	73.0	67.9	83.2	72.4
2001	14	73.9	71.1	80.6	72.3
2002	18	72.9	73.9	65.4	73.4
2003	32	78.1	77.3	80.9	77.4
2004	20	75.8	75.9	75.0	75.9
2005	27	72.2	71.3	77.5	71.3
2006	26	73.7	71.7	82.1	73.0
2007	42	73.6	72.8	76.7	73.3
2008	25	75.5	74.8	83.7	74.5
2009	34	73.6	71.6	81.2	71.0
2010	34	75.8	74.0	83.0	74.5
2011	53	76.4	75.2	84.2	75.9
2012	26	78.7	75.2	85.3	76.5
1998-2012	390	75.2	73.8	80.8	74.3

#### Table 11a

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

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.

Year of	Deaths	Age at death (all causes)	Age at death (cancer- related)	Age at death (not cancer- related)	Age at death (according to death certificate)
death	n	Years	Years	Years	Years
1998	5	77.4	71.9	85.7	71.9
1999	12	74.2	74.3	73.9	73.9
2000	8	78.3	73.9	85.5	76.6
2001	11	77.3	72.6	85.5	76.0
2002	17	76.8	74.4	82.4	74.4
2003	16	75.4	74.1	78.2	75.3
2004	18	79.4	78.8	80.8	77.9
2005	20	75.6	73.6	86.9	73.6
2006	19	74.9	72.0	85.7	71.3
2007	21	78.4	76.7	83.8	78.0
2008	19	77.5	74.8	87.3	76.9
2009	22	77.1	73.7	86.4	74.9
2010	26	80.2	78.5	84.1	78.2
2011	25	77.9	75.8	89.0	76.7
2012	22	75.8	75.2	77.6	74.6
1998-2012	261	77.2	75.0	83.4	75.7

#### Table 11b

## Means of age at death according to the grouping in Table 10 $$\operatorname{FEMALES}$

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		MI-Index	Mort.	MI-Index
death	n	raw	raw	WS	WS	ES	ES	BRD-S	BRD-S
1998	7	0.6	0.37	0.3	0.35	0.6	0.36	0.7	0.32
1999	7	0.6	0.33	0.3	0.27	0.6	0.34	0.9	0.43
2000	14	1.2	0.74	0.7	0.75	1.1	0.75	1.6	0.75
2001	10	0.9	0.56	0.5	0.57	0.8	0.58	1.0	0.55
2002	16	0.9	0.39	0.4	0.37	0.7	0.39	1.1	0.41
2003	25	1.3	0.68	0.6	0.63	1.1	0.69	1.6	0.73
2004	17	0.9	0.55	0.4	0.46	0.7	0.50	1.1	0.60
2005	23	1.2	0.53	0.6	0.49	0.9	0.52	1.3	0.54
2006	21	1.1	0.66	0.5	0.72	0.8	0.67	1.1	0.61
2007	33	1.5	0.66	0.7	0.65	1.2	0.67	1.6	0.67
2008	23	1.0	0.51	0.4	0.46	0.7	0.51	1.1	0.57
2009	27	1.2	0.64	0.5	0.59	0.8	0.61	1.1	0.64
2010	27	1.2	0.56	0.5	0.55	0.8	0.56	1.2	0.58
2011	46	2.0	0.94	0.8	0.89	1.3	0.92	1.9	0.94
2012	17	0.7	0.53	0.3	0.43	0.5	0.47	0.7	0.51
1998-2012	313	1.1	0.59	0.5	0.56	0.9	0.59	1.2	0.61

#### 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	3	0.3	0.23	0.1	0.22	0.2	0.21	0.2	0.24
1999	10	0.8	0.77	0.3	0.55	0.5	0.65	0.7	0.77
2000	5	0.4	0.36	0.2	0.32	0.3	0.34	0.4	0.37
2001	7	0.6	0.44	0.3	0.42	0.4	0.42	0.5	0.42
2002	12	0.6	0.50	0.2	0.44	0.4	0.48	0.5	0.53
2003	11	0.6	0.61	0.2	0.63	0.3	0.62	0.4	0.67
2004	12	0.6	0.57	0.2	0.52	0.3	0.53	0.5	0.56
2005	17	0.9	0.63	0.3	0.66	0.5	0.65	0.7	0.62
2006	15	0.7	0.42	0.3	0.37	0.5	0.40	0.6	0.44
2007	16	0.7	0.73	0.2	0.71	0.4	0.74	0.6	0.81
2008	15	0.6	0.48	0.2	0.51	0.4	0.49	0.5	0.47
2009	16	0.7	0.59	0.2	0.63	0.4	0.60	0.5	0.59
2010	18	0.8	0.62	0.2	0.49	0.4	0.53	0.6	0.59
2011	21	0.9	0.66	0.3	0.56	0.5	0.60	0.6	0.64
2012	16	0.7	0.55	0.2	0.50	0.4	0.50	0.5	0.48
1998-2012	194	0.7	0.55	0.2	0.50	0.4	0.52	0.5	0.55

Age at										
death	Cases			Males			Females			
Years	n	00	Cum.%	n	00	Cum.%	n	00	Cum.%	
20-24	1	0.2	0.2			0.0	1	0.5	0.5	
25-29	0	0.0	0.2			0.0			0.5	
30-34	0	0.0	0.2			0.0			0.5	
35-39	0	0.0	0.2			0.0			0.5	
40 - 44	б	1.2	1.4	3	0.9	0.9	3	1.5	2.0	
45-49	4	0.8	2.1	2	0.6	1.6	2	1.0	3.0	
50-54	10	1.9	4.1	8	2.5	4.1	2	1.0	4.1	
55-59	32	6.2	10.3	22	7.0	11.1	10	5.1	9.1	
60-64	35	6.8	17.2	21	6.6	17.7	14	7.1	16.2	
65-69	56	10.9	28.1	40	12.7	30.4	16	8.1	24.4	
70-74	108	21.1	49.1	73	23.1	53.5	35	17.8	42.1	
75-79	101	19.7	68.8	55	17.4	70.9	46	23.4	65.5	
80-84	98	19.1	87.9	58	18.4	89.2	40	20.3	85.8	
85+	62	12.1	100.0	34	10.8	100.0	28	14.2	100.0	
All ages	513	100.0		316	100.0		197	100.0		

## Age distribution of age at death (cancer-related) for period 1998-2012 (incl. multiple primaries)

Included in the statistics are 103.8% multiple primaries in males and 80.8% in females.

		( •	-	ltiple pr				
		( -		LOIPIO PI				
			Males		Females		Males	Females
Age at			Age-		Age-		-	Prop.all
death	Males	Females	spec.		spec.		cancers	cancers
Years	n	n	mortal.	MI-index	mortal.	MI-index	0/0	00
0 1			0.0		0.0			
0-4 5-9			0.0		0.0			
			0.0		0.0			
10-14			0.0		0.0			
15-19		- /	0.0		0.0	1 0 0		0.1
20-24		1	0.0		0.1	1.00		2.1
25-29			0.0		0.0			
30-34			0.0		0.0			
35-39	2	2	0.0	0 50	0.0	0 85	<b>a</b> 4	0 0
40-44	3	3	0.1		0.1	0.75	0.4	0.3
45-49	2	2	0.1	0.18	0.1		0.1	0.1
50-54	8	2	0.4		0.1	0.20	0.3	0.1
55-59	22	10	1.3		0.6		0.4	0.2
60-64	21	14	1.3		0.8	0.39	0.3	0.2
65-69	40	16	2.7		1.0	0.31	0.4	0.2
70-74	73	35	6.3		2.5		0.6	0.4
75-79	55	46	7.3		4.2		0.5	0.5
80-84	58	40	12.8		4.6		0.6	0.4
85+	34	28	11.0	0.89	3.4	0.62	0.4	0.2
All ages	316	197					0.4	0.3
Mortality			1 0	0 60	0 7			
Raw			1.2		0.7			
WS			0.5		0.2			
ES			0.9		0.4			
BRD-S			1.2	0.61	0.5	0.55		
PYLL-70								
			3.2		2.0			
per 100,000 ES			3.2		2.0			
			2.8					
AYLL-70			0.3		10.0			

Age-specific mortality (cancer-related) and proportion of all cancers for period 1998-2012

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

#### Table 15a

## Multiple primaries in deaths in period 1998-2012 MALES

					Syn-	Syn-		
					chron	chron		
	Total	Total	Pre	Pre	±30d	±30d	Post	Post
Diagnosis	n	80↓	n	<del>6</del> ⊅	n	é→	n	60
C16 Stomach	3	0.9	2	66.7			1	33.3
C18 Colon	17	5.1	11	64.7	1	5.9	5	29.4
C19-C20 Rectum	6	1.8	5	83.3			1	16.7
C25 Pancreas	7	2.1	1	14.3	1	14.3	5	71.4
C32 Larynx	3	0.9	2	66.7			1	33.3
C33-C34 Lung	19	5.7	9	47.4			10	52.6
C43 Malign. melanoma	3	0.9	2	66.7			1	33.3
C44 Skin others	4	1.2	2	50.0			2	50.0
C61 Prostate	46	13.8	29	63.0	8	17.4	9	19.6
C64 Kidney	18	5.4	5	27.8	9	50.0	4	22.2
C65 Renal pelvis	7	2.1					7	100.0
C66 Ureter	29	8.7	7	24.1	18	62.1	4	13.8
C67 Bladder	135	40.4	77	57.0	19	14.1	39	28.9
C68 Urethra	3	0.9					3	100.0
C68 Urinary org.	6	1.8	2	33.3	2	33.3	2	33.3
C70-C72 CNS cancer	4	1.2	3	75.0			1	25.0
C76-C79 CUP	3	0.9	2	66.7			1	33.3
C82-C85 NHL	4	1.2	3	75.0			1	25.0
C90 Mult. myeloma	5	1.5	1	20.0			4	80.0
Other primaries	12	3.6	6	50.0			6	50.0
-								
All mult. primaries	334	100.0	169	50.6	58	17.4	107	32.0

Multiple primaries with number of cases n<3 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 1998-2012 FEMALES

Total Total Pre Pre ±30d ±30d Pos	: Post
Diagnosis n %↓ n ←% n ←% n	\$
C03-C06 Oral cavity 1 0.7 1 100.0	
C15 Oesophagus /1 /0.7 1	100.0
C17 Small intestine 2 1.3 1 50.0 1	50.0
C18 Colon 4 2.7 2 50.0 2 50.0	
C19-C20 Rectum 3 2.0 3 100.0	
C25 Pancreas 3 2.0 3	100.0
C33-C34 Lung 6 4.0 3 50.0 3	50.0
C44 Skin others 2 1.3 2 100.0	
C50 Breast 19 12.7 14 73.7 5	26.3
C53 Cervix uteri 6 4.0 5 83.3 1	16.7
C54 Corpus uteri 1 0.7 1 100.0	
C55,C57 Fem. genitals un 2 1.3 1 50.0 1	50.0
C56 Ovary 2 1.3 2 100.0	
C64 Kidney 6 4.0 2 33.3 1 16.7 3	50.0
C65 Renal pelvis 4 2.7 4	100.0
C66 Ureter 20 13.3 7 35.0 9 45.0 4	20.0
C67 Bladder 60 40.0 20 33.3 11 18.3 29	48.3
C68 Urinary org. 1 0.7 1 100.0	
C73 Thyroid 1 0.7 1 100.0	
C76-C79 CUP 1 0.7 1 100.0	
C82-C85 NHL 2 1.3 1 50.0 1	50.0
C90 Mult. myeloma 1 0.7 1 100.0	
C91-C96 Leukaemia 2 1.3 1 50.0 1	50.0
All mult. primaries 150 100.0 68 45.3 25 16.7 57	38.0

Multiple primaries with number of cases n<1 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.

#### Age-specific mortality (cancer-related) and proportion of all cancers for period 1998-2012 (Singular primaries only \*)

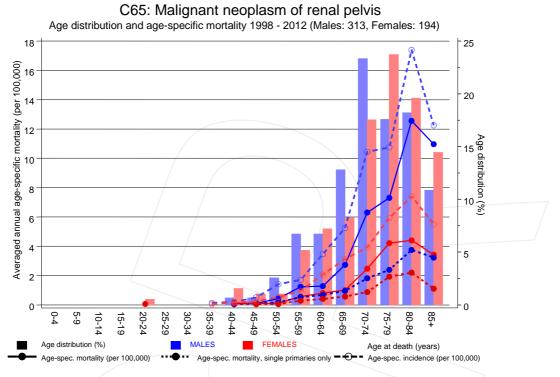
Age at death Years	Males n	Females n	- /	MI-index	Females Age- spec. mortal.	MI-index	cancers	Females Prop.all cancers %
0- 4			0.0		0.0			
0-4 5-9			0.0		0.0			
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24		1	0.0		0.0	1.00		2.3
25-29		± /	0.0		0.0	1.00		2.5
30-34			0.0		0.0			
35-39			0.0		0.0			
40-44	2	2	0.1	0.50	0.1	1.00	0.3	0.2
45-49	2	2	0.1	0.22	0.1	0.67	0.1	0.1
50-54	4	1	0.2		0.1	0.14	0.1	0.0
55-59	10	6	0.6	0.53	0.3	0.50	0.2	0.2
60-64	14	9	0.8	0.38	0.5	0.35	0.2	0.2
65-69	22	11	1.5	0.65	0.7	0.33	0.2	0.2
70-74	29	20	2.5	0.50	1.5	0.67	0.3	0.3
75-79	28	28	3.7		2.6	0.65	0.3	0.4
80-84	30	25	6.6		2.9	0.64	0.4	0.3
85+	16	19	5.2	0.84	2.3	0.66	0.3	0.2
							$\langle \rangle$	
All ages	157	124					0.3	0.2
Mortality			0.0	0 57	0.4			
Raw			0.6		0.4	0.55		
WS ES			0.3		0.2	0.49 0.51		
BRD-S			0.4		0.2			
BRD-5			0.0	0.00	0.5	0.54		
PYLL-70								
per 100,000			1.8		1.4			
ES			1.6		1.2			
AYLL-70			8.4		10.5			

## \* See corresponding tables with multiple primaries.

#### Age-specific mortality (cancer-related) and proportion of all cancers for period 1998-2012 (Single primaries only \*)

Age at death		Females	Males Age- spec.	MT	Females Age- spec.	MT indon	cancers	Females Prop.all cancers %
Years	n	n	mortar.	MI-index	mortar.	MI-INdex	6	6
0- 4			0.0		0.0			
5-9			0.0		0.0			
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24		1 /	0.0		0.1	1.00		2.5
25-29			0.0		0.0			
30-34			0.0		0.0			
35-39			0.0		0.0			
40 - 44	1	2	0.0	0.50	0.1	1.00	0.1	0.2
45-49	2	1	0.1	0.25	0.0	0.50	0.1	0.1
50-54	3	1	0.2	0.25	0.1	0.20	0.1	0.0
55-59	9	5	0.5	0.82	0.3	0.45	0.2	0.1
60-64	11	7	0.7		0.4	0.58	0.2	0.2
65-69	14	9	1.0		0.6	0.45	0.2	0.2
70-74	21	12	1.8	0.64	0.9	0.55	0.3	0.2
75-79	18	21	2.4		1.9	0.57	0.2	0.3
80-84	17	19	3.7		2.2	0.70	0.3	0.3
85+	10	9	3.2	0.56	1.1	0.43	0.2	0.1
All ages	106	87					0.2	0.2
Mortality								
Raw			0.4		0.3	0.54		
WS			0.2		0.1			
ES			0.3		0.2			
BRD-S			0.4	0.57	0.2	0.55		
PYLL-70								
per 100,000			1.4		1.1			
ES			1.3		1.0			
AYLL-70			8.9		10.8			

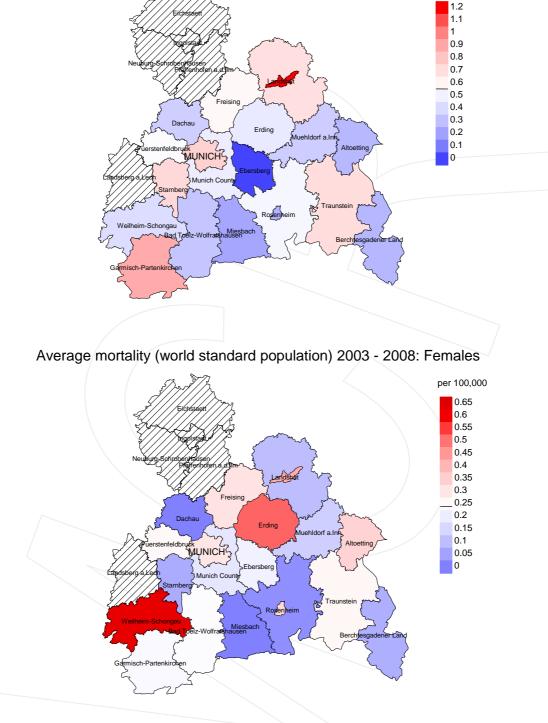
## \* See corresponding tables with multiple primaries.



**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 renal pelvis cancer-related death (see Table 10) should be considered.

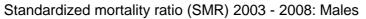
per 100,000

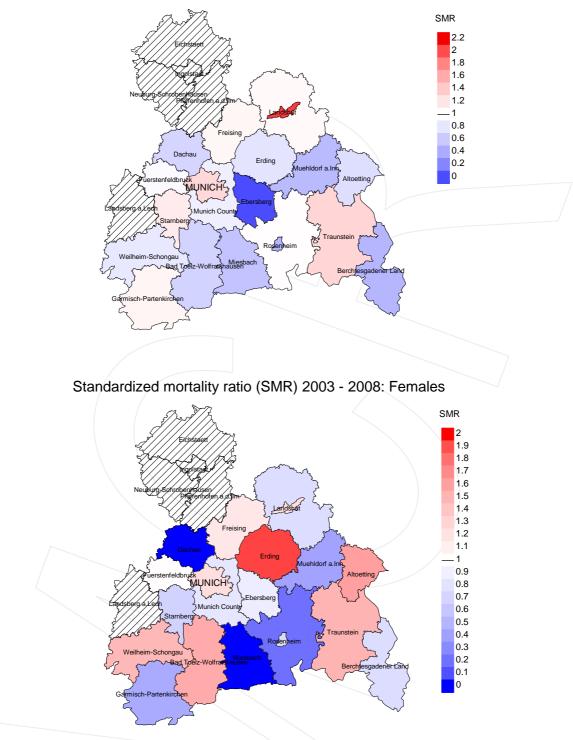


Average mortality (world standard population) 2003 - 2008: Males

**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 0.6/100,000 WS N=137, females 0.2/100,000 WS N=81). 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 2 women died from renal pelvis cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.2/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.0 and 1.1/100,000.





**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=137, females N=81). 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 2 women died from renal pelvis cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.87. Though, the value of this parameter may vary with an underlying probability of 99% between 0.05 and 4.04, 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 BRD-S DCO	Average years of life lost prior to age 70 given a person dies before that age German standard population 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

#### **Recommended Citation**

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