Munich Cancer Registry

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

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

Cancer statistics: Baseline statistics

C67, D09.0, D41.4: Bladder cancer

Year of diagnosis	1998-2012
Patients	15,052
Diseases	15,273
Creation date	03/20/2014
Export date	02/12/2014
Population	4.5 m

http://www.tumorregister-muenchen.de/en/facts/base/base_C67D_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 4.5 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, March 2014

[#] 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.

[##] 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 used for specifying cancer site

ICD-10	Description
C67	Malignant neoplasm of bladder
D09.0	Carcinoma in situ: Bladder
D41.4	Neoplasm of uncertain or unknown behaviour of urinary organs

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	601	21	3.5	30.8	69.6	98.3
1999	574	20	3.5	36.1	64.5	99.1
2000	577	29	5.0	37.6	64.8	98.4
2001	569	21	3.7	39.4	59.9	98.8
2002	1062	78	7.3	38.3	63.5	98.5 #
2003	1053	73	6.9	36.7	58.7	96.4 #
2004	1141	65	5.7	38.7	56.6	97.5 #
2005	1107	54	4.9	38.7	50.5	96.2 #
2006	1129	48	4.3	37.2	51.4	93.8 #
2007	1280	45	3.5	38.4	44.3	84.1 # ##
2008	1239	60	4.8	38.6	42.2	67.3
2009	1252	54	4.3	39.9	41.7	67.6
2010	1271	58	4.6	39.0	36.3	63.7
2011	1277	48	3.8	38.2	30.1	66.1
2012	1141	51	4.5	38.2	21.8	96.6 ###
1998-2012	15273	725	4.7	38.0	47.7	85.8

\#   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	601	432	169	71.9
1999	574	426	148	74.2
2000	577	412	165	71.4
2001	569	397	172	69.8
2002	1062	766	296	72.1
2003	1053	783	270	74.4
2004	1141	817	324	71.6
2005	1107	811	296	73.3
2006	1129	847	282	75.0
2007	1280	953	327	74.5
2008	1239	918	321	74.1
2009	1252	923	329	73.7
2010	1271	939	332	73.9
2011	1277	952	325	74.5
2012	1141	851	290	74.6
1998-2012	15273	11227	4046	73.5

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	432	169	39.0	14.4	23.4	6.0	35.8	9.1	48.3	12.0
1999	426	148	38.1	12.5	22.4	5.2	34.2	8.0	46.2	10.6
2000	412	165	36.2	13.7	20.6	5.2	32.1	8.2	44.4	11.2
2001	397	172	34.3	14.1	19.7	5.9	30.4	9.0	40.6	12.0
2002	766	296	41.1	15.1	22.1	6.0	34.5	9.2	47.1	12.1
2003	783	270	41.8	13.7	22.5	5.6	34.5	8.4	46.1	10.9
2004	817	324	43.4	16.4	22.7	6.3	35.0	9.7	47.3	12.9
2005	811	296	42.8	14.9	21.7	5.9	33.7	8.9	46.0	11.5
2006	847	282	44.2	14.0	22.5	5.4	34.5	8.2	46.3	11.0
2007	953	327	43.0	14.2	21.5	5.6	32.9	8.5	44.0	11.2
2008	918	321	41.2	13.8	19.9	5.5	30.8	8.3	41.3	10.6
2009	923	329	41.4	14.1	19.9	5.3	30.5	8.2	41.0	10.9
2010	939	332	41.7	14.2	19.5	5.0	30.0	7.8	40.3	10.4
2011	952	325	41.7	13.8	19.0	5.6	29.3	8.2	39.4	10.5
2012	851	290	37.2	12.3	16.6	4.6	26.0	7.0	35.5	9.2
1998-2012	11227	4046	40.9	14.1	20.6	5.5	31.8	8.4	42.9	11.0

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	601	70.2	13.1	22.9	98.1	52.3	62.1	71.8	79.4	86.0
1999	574	70.0	11.7	18.9	96.7	55.1	61.9	70.9	78.6	84.6
2000	577	71.6	10.9	34.0	99.7	57.4	63.4	72.6	79.6	85.8
2001	569	70.7	11.5	28.4	95.8	55.1	62.4	71.7	79.1	85.4
2002	1062	71.8	11.4	28.3	99.5	57.8	64.2	72.9	80.0	86.1
2003	1053	71.0	12.0	25.4	103	56.2	63.9	71.7	79.5	85.7
2004	1141	71.4	11.9	23.3	99.0	56.0	63.5	72.7	79.9	85.8
2005	1107	71.7	11.9	18.4	101	57.1	63.7	73.1	80.2	85.4
2006	1129	71.8	11.6	3.0	101	57.2	64.5	72.2	80.2	85.7
2007	1280	71.4	11.9	1.3	101	55.1	65.1	72.1	80.0	85.6
2008	1239	72.0	11.6	6.6	100	56.5	65.5	72.6	80.4	86.3
2009	1252	72.0	11.7	28.5	103	56.7	64.8	73.1	80.3	86.2
2010	1271	72.4	11.7	22.4	100	56.1	65.9	73.2	81.0	86.4
2011	1277	72.4	11.6	1.5	97.8	57.2	65.9	73.0	80.7	86.8
2012	1141	72.8	11.1	32.6	97.8	57.2	66.2	73.8	80.7	86.2
1998-2012	15273	71.7	11.7	1.3	103	56.3	64.4	72.6	80.1	86.0

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	432	69.2	12.5	26.3	95.6	52.3	61.5	70.1	78.1	84.6
1999	426	69.2	11.6	18.9	94.1	55.0	61.6	69.9	77.9	84.3
2000	412	70.3	10.7	40.8	99.7	55.3	62.7	71.6	77.9	84.1
2001	397	69.6	10.9	28.4	95.1	55.1	62.0	69.9	77.7	83.6
2002	766	71.0	10.9	28.3	97.6	57.8	63.5	72.0	78.8	84.9
2003	783	70.4	11.4	25.4	101	56.4	63.5	70.8	78.1	84.3
2004	817	70.4	11.7	23.3	98.8	55.4	62.8	71.0	78.7	84.3
2005	811	71.1	11.1	18.4	101	57.6	63.8	72.5	78.8	83.9
2006	847	71.1	11.3	3.0	101	56.9	64.0	71.4	79.0	84.8
2007	953	70.8	11.5	1.3	101	55.0	65.0	71.7	79.2	84.6
2008	918	71.6	11.2	29.6	100	56.4	65.3	72.3	79.6	85.4
2009	923	71.3	11.5	28.5	97.4	56.3	64.3	72.5	79.5	85.1
2010	939	71.4	11.3	25.6	99.1	55.7	64.9	72.5	79.9	85.0
2011	952	72.4	11.3	1.5	95.4	57.0	66.4	73.1	80.4	86.2
2012	851	72.4	10.7	32.6	97.8	56.9	66.3	73.4	79.9	84.9
1998-2012	11227	71.0	11.3	1.3	101	56.2	64.0	72.0	79.1	84.8

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	169	72.9	14.2	22.9	98.1	51.1	65.9	76.4	83.5	87.6
1999	148	72.4	11.7	42.1	96.7	55.9	64.0	74.4	80.1	86.0
2000	165	75.0	10.9	34.0	94.5	60.0	68.4	76.0	82.5	88.7
2001	172	73.3	12.3	30.9	95.8	55.8	66.2	74.9	82.5	88.6
2002	296	73.9	12.2	36.1	99.5	57.6	65.4	76.0	82.6	88.9
2003	270	72.9	13.4	25.4	103	54.9	65.5	75.0	82.3	89.2
2004	324	74.1	12.1	33.3	99.0	57.4	65.8	76.1	82.9	89.1
2005	296	73.4	13.7	28.0	98.8	56.5	63.7	75.2	83.9	90.1
2006	282	74.0	12.4	4.3	97.4	58.4	66.6	75.3	82.8	87.9
2007	327	72.8	12.7	22.2	98.4	55.6	65.6	74.0	82.6	86.9
2008	321	73.0	12.4	6.6	97.0	56.7	65.8	73.3	82.6	87.3
2009	329	73.9	12.0	36.0	103	57.5	66.5	75.0	83.1	88.5
2010	332	75.2	12.4	22.4	100	57.5	68.4	76.7	84.7	89.7
2011	325	72.5	12.5	12.3	97.8	57.7	63.7	72.4	82.5	88.7
2012	290	73.7	12.2	37.0	97.7	57.5	66.0	74.9	82.7	89.0
1998-2012	4046	73.6	12.5	4.3	103	56.9	65.8	75.0	82.9	88.6

Table 4

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

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	4	0.0	0.0	3	0.0	0.0	1	0.0	0.0
5-9	1	0.0	0.0			0.0	1	0.0	0.0
10-14	1	0.0	0.0			0.0	1	0.0	0.1
15-19	2	0.0	0.1	2	0.0	0.0			0.1
20-24	9	0.1	0.1	4	0.0	0.1	5	0.1	0.2
25-29	24	0.2	0.3	20	0.2	0.3	4	0.1	0.3
30-34	31	0.2	0.5	22	0.2	0.5	9	0.2	0.5
35-39	67	0.4	0.9	48	0.4	0.9	19	0.5	1.0
40-44	177	1.2	2.1	129	1.1	2.0	48	1.2	2.2
45-49	351	2.3	4.4	263	2.3	4.4	88	2.2	4.3
50-54	609	4.0	8.4	463	4.1	8.5	146	3.6	8.0
55-59	1091	7.1	15.5	822	7.3	15.8	269	6.6	14.6
60-64	1692	11.1	26.6	1341	11.9	27.8	351	8.7	23.3
65-69	2221	14.5	41.1	1736	15.5	43.2	485	12.0	35.3
70-74	2581	16.9	58.0	1975	17.6	60.8	606	15.0	50.2
75-79	2553	16.7	74.7	1921	17.1	77.9	632	15.6	65.9
80-84	2024	13.3	88.0	1396	12.4	90.4	628	15.5	81.4
85+	1835	12.0	100.0	1082	9.6	100.0	753	18.6	100.0
All ages	15273	100.0		11227	100.0		4046	100.0	

Included in the statistics are 51.5% multiple primaries in males and 38.4% in females.

Table 5

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

Age at diagnosis Years	Males n	Females n	Males Age- spec. incid.	Females Age- spec. incid.	Males DCO rate n=414 %	Females DCO rate n=310 %	Males Prop.all cancers n=146755 %	Females Prop.all cancers n=142297 %
0- 4	3	1	0.2	0.1			1.0	0.4
5- 9		1	0.0	0.1				0.9
10-14		1	0.0	0.1				0.6
15-19	2		0.1	0.0			0.6	
20-24	4	5	0.2	0.3			0.7	1.0
25-29	20	4	1.1	0.2			2.3	0.4
30-34	22	9	1.0	0.4			1.6	0.5
35-39	48	19	2.1	0.9			2.3	0.5
40-44	129	48	5.3	2.1	0.8		4.3	0.8
45-49	263	88	12.2	4.2	0.4		5.3	1.1
50-54	463	146	25.0	7.7	0.2	0.7	5.8	1.4
55-59	820	268	48.3	15.0	0.4	0.7	6.1	2.1
60-64	1340	351	81.3	20.2	1.0	1.1	6.5	2.2
65-69	1733	483	118.1	30.1	1.6	1.9	6.7	2.7
70-74	1967	606	169.8	43.9	1.8	1.5	8.0	3.6
75-79	1917	629	254.4	57.5	3.7	3.3	10.1	3.9
80-84	1392	627	306.5	72.6	6.5	10.0	11.1	4.2
85+	1079	753	347.9	91.9	15.8	26.7	11.7	4.7
All ages	11202	4039			3.7	7.7	7.6	2.8
Incidence								
Raw			40.8	14.1				
WS			20.6	5.5				
ES			31.7	8.4				
BRD-S			42.8	11.0				

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

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

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C00	Lip	2	0.7	2.7	0.3	9.6		0.4	
C03-C06	Oral cavity	13	4.4	3.0	1.6	5.1	#	2.8	7.7
C07-C08	Salivary gland	3	1.4	2.1	0.4	6.1		0.5	
C09-C10	Oropharynx	6	5.2	1.2	0.4	2.5		0.3	
C12-C13	Hypopharynx	7	2.9	2.4	1.0	5.0		1.3	
C15	Oesophagus	22	10.1	2.2	1.4	3.3	#	3.8	13.6
C16	Stomach	44	29.1	1.5	1.1	2.0	#	4.8	2.3
C17	Small intestine	8	2.9	2.8	1.2	5.5	#	1.7	
C18	Colon	106	66.7	1.6	1.3	1.9	#	12.6	7.5
C19-C20	Rectum	49	34.2	1.4	1.1	1.9	#	4.8	6.1
C21	Anus/canal	3	1.2	2.5	0.5	7.4		0.6	
C22	Liver	31	17.0	1.8	1.2	2.6	#	4.5	9.7
C23-C24	Bile	11	6.3	1.7	0.9	3.1		1.5	36.4
C25	Pancreas	44	23.1	1.9	1.4	2.6	#	6.7	20.5
C26	GI cancer	2	0.9	2.1	0.3	7.7		0.3	50.0
C32	Larynx	13	5.7	2.3	1.2	3.9	#	2.3	
C33-C34	Lung	225	73.1	3.1	2.7	3.5	#	48.8	11.6
C38,C45	Mesothelioma	6	4.1	1.5	0.5	3.2		0.6	16.7
C43	Malign. melanoma	44	22.5	2.0	1.4	2.6	#	6.9	
C46,C49	Soft tissue	4	3.3	1.2	0.3	3.1		0.2	
C48	Peritoneal	2	0.4	4.8	0.6	17.2		0.5	50.0
C50	Breast	2	1.6	1.3	0.2	4.6		0.1	
C60	Penis	2	1.5	1.4	0.2	4.9		0.2	
C61	Prostate	898	186.9	4.8	4.5	5.1	#	228.5	5.9
C62	Testis	3	1.1	2.8	0.6	8.3		0.6	
C64	Kidney	78	20.8	3.8	3.0	4.7	#	18.4	20.5
C65	Renal pelvis	68	2.7	25.5	19.8	32.3	#	21.0	
C66	Ureter	43	1.5	28.8	20.9	38.8	#	13.3	
C67	Bladder	135	30.9	4.4	3.7	5.2	#	33.5	
C68	Urethra	27	0.3	80.8	53.3	117.6	#	8.6	
C70-C72	CNS cancer	10	7.9	1.3	0.6	2.3		0.7	10.0
C73	Thyroid	5	3.3	1.5	0.5	3.5		0.5	
C76-C79	CUP	23	11.5	2.0	1.3	3.0	#	3.7	8.7
C81	Hodgkin lymphoma	2	1.1	1.9	0.2	6.8		0.3	
C82-C85	NHL	46	25.5	1.8	1.3	2.4	#	6.6	8.7
C90	Mult. myeloma	12	8.3	1.4	0.7	2.5		1.2	16.7
C91-C96	Leukaemia	23	10.9	2.1	1.3	3.2	#	3.9	39.1
	Other primaries	5	2.8	1.8	0.6	4.1		0.7	20.0
	Not observed	0	3.3	0.0	0.0	1.1		-1.1	
	All mult. primaries	2027	636.6	3.2	3.0	3.3	#	446.8	7.4

Patients	7733
Mean age at second malignancy (years)	73.3
Person-years	31116
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 1998-2012
FEMALES

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C15	Oesophagus	2	0.8	2.6	0.3	9.4		1.2	
C16	Stomach	9	6.3	1.4	0.7	2.7		2.5	22.2
C17	Small intestine	4	0.6	6.5	1.8	16.6	#	3.2	
C18	Colon	21	16.8	1.2	0.8	1.9		3.9	4.8
C19-C20	Rectum	16	6.9	2.3	1.3	3.8	#	8.5	6.3
C21	Anus/canal	2	0.7	2.7	0.3	9.7		1.2	
C22	Liver	3	1.8	1.7	0.3	4.9		1.1	
C23-C24	Bile	5	2.5	2.0	0.7	4.7		2.4	60.0
C25	Pancreas	19	7.1	2.7	1.6	4.2	#	11.1	26.3
C26	GI cancer	2	0.4	5.7	0.7	20.4		1.5	50.0
C33-C34	Lung	43	9.6	4.5	3.2	6.0	#	31.2	11.6
C43	Malign. melanoma	4	4.5	0.9	0.2	2.3		-0.5	25.0
C50	Breast	64	39.3	1.6	1.3	2.1	#	23.1	4.7
C51	Vulva	2	1.6	1.3	0.2	4.6		0.4	
C53	Cervix uteri	9	1.7	5.3	2.4	10.0	#	6.8	22.2
C54	Corpus uteri	13	7.6	1.7	0.9	2.9		5.1	15.4
C56	Ovary	11	6.0	1.8	0.9	3.3		4.7	18.2
C64	Kidney	22	3.7	5.9	3.7	9.0	#	17.1	27.3
C65	Renal pelvis	32	0.5	67.7	46.3	95.6	#	29.5	
C66	Ureter	21	0.2	92.0	57.0	140.7	#	19.4	
C67	Bladder	36	3.2	11.1	7.8	15.4	#	30.7	
C68	Urethra	2	0.0	43.4	5.3	156.8	#	1.8	
C70-C72	CNS cancer	5	2.0	2.5	0.8	5.9		2.8	40.0
C73	Thyroid	2	1.9	1.0	0.1	3.7		0.0	
C76-C79	CUP	3	3.0	1.0	0.2	2.9		-0.0	
C82-C85	NHL	8	5.9	1.4	0.6	2.7		2.0	37.5
C90	Mult. myeloma	4	1.9	2.1	0.6	5.3		1.9	
C91-C96	Leukaemia	7	2.5	2.8	1.1	5.8	#	4.2	28.6
Other primaries		8	3.4	2.3	1.0	4.6	#	4.3	
Not observed		0	2.8	0.0	0.0	1.3		-2.6	
All mult. primaries		379	145.4	2.6	2.4	2.9	#	218.6	10.8

Patients	2783
Mean age at second malignancy (years)	75.1
Person-years	10684
Mean observation time (years)	3.8
Median observation time (years)	2.7

The occurrence of second malignancy is statistically significant.

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

C67, D09.0, D41.4: Malignant neoplasm of bladder (incl. non-invasive)
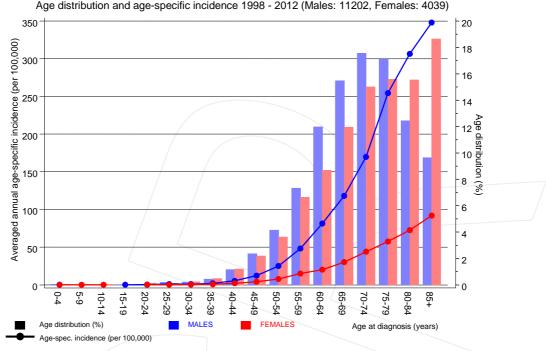Age distribution and age-specific incidence 1998 - 2012 (Males: 11202, Females: 4039)

Figure 7. Age distribution and age-specific incidence

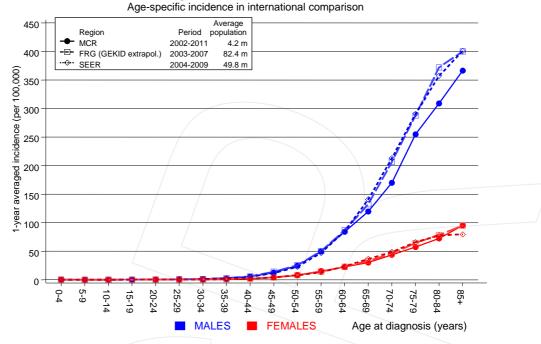C67, D09.0, D41.4: Malignant neoplasm of bladder (incl. non-invasive)

Age-specific incidence in international comparison

Region	Period	Average population
MCR	2002-2011	4.2 m
FRG (GEKID extrapol.)	2003-2007	82.4 m
SEER	2004-2009	49.8 m

MALES   **FEMALES**   Age at diagnosis (years)

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.

C67, D09.0, D41.4: Malignant neoplasm of bladder (incl. non-invasive)
Cumulative follow-up years since diagnosis for period 1998 - 2012 (excl. DCO)

Gender	n	Target Sum	Target Median	Actual Sum	Actual Median
All patients					
Males	7334	33791	3.7	31902	3.5
Females	2630	11612	3.4	11011	3.1
Patients alive					
Males	4535	26378	5.3	24489	4.9
Females	1522	8994	5.1	8392	4.8
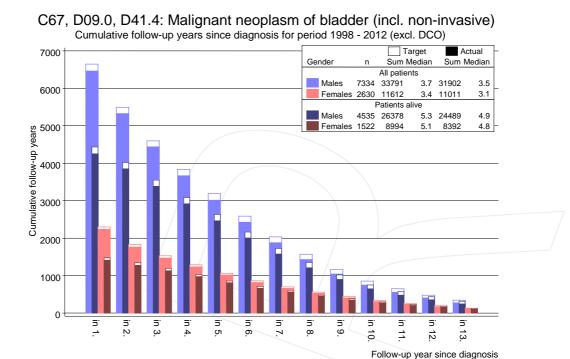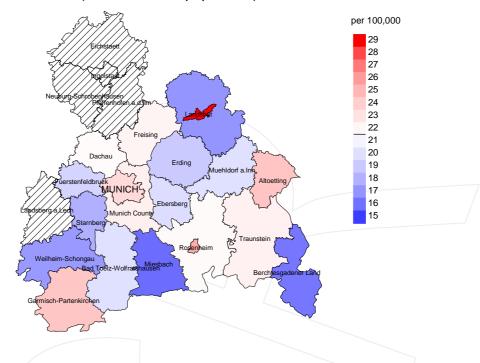
Figure 8. Cumulative follow-up years depending on time since diagnosis

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
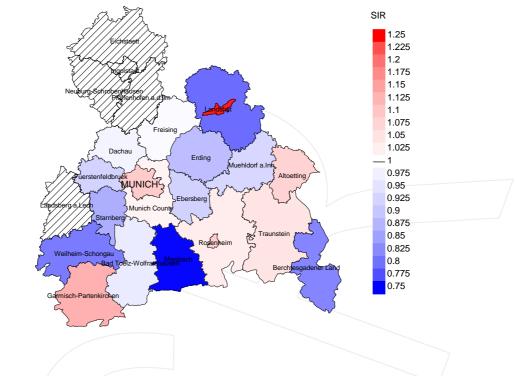
Average incidence (world standard population) 2003 - 2008: Females
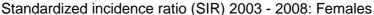
Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 21.6/100,000 WS N=4,880, females 5.6/100,000 WS N=1,722). 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 40 women were identified with newly diagnosed bladder cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 4.6/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 2.8 and 7.2/100,000.

Standardized incidence ratio (SIR) 2003 - 2008: Males

Standardized incidence ratio (SIR) 2003 - 2008: Females
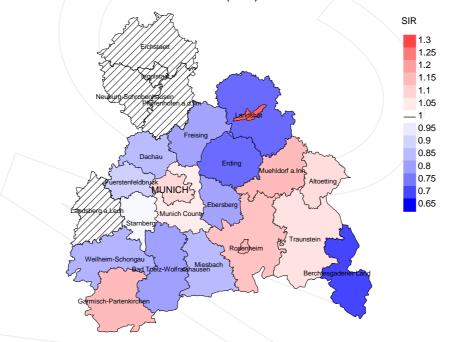
Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=4,880, females N=1,722). 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 40 women were identified with newly diagnosed bladder cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.81. Though, the value of this parameter may vary with an underlying probability of 99% between 0.52 and 1.20, 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	601	98.3	3.5	418	69.6	93.1
1999	574	99.1	3.5	370	64.5	96.5
2000	577	98.4	5.0	374	64.8	95.5
2001	569	98.8	3.7	341	59.9	95.9
2002	1062	98.5	7.3	674	63.5	96.4
2003	1053	96.4	6.9	618	58.7	97.4
2004	1141	97.5	5.7	646	56.6	98.8
2005	1107	96.2	4.9	559	50.5	97.5
2006	1129	93.8	4.3	580	51.4	98.8
2007	1280	84.1	3.5	567	44.3	98.9
2008	1239	67.3	4.8	523	42.2	99.0
2009	1252	67.6	4.3	522	41.7	98.3
2010	1271	63.7	4.6	461	36.3	98.5
2011	1277	66.1	3.8	384	30.1	95.8
2012	1141	96.6	4.5	249	21.8	97.2
1998-2012	15273	85.8	4.7	7286	47.7	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)

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	601	351	91.2	74	12.3
1999	574	324	93.5	74	12.9
2000	577	336	94.0	68	11.8
2001	569	346	94.2	59	10.4
2002	1062	511	96.1	159	15.0
2003	1053	607	97.0	156	14.8
2004	1141	627	96.7	150	13.1
2005	1107	641	97.7	134	12.1
2006	1129	653	97.1	143	12.7
2007	1280	760	97.8	145	11.3
2008	1239	732	98.6	155	12.5
2009	1252	804	98.6	190	15.2
2010	1271	848	98.5	163	12.8
2011	1277	855	98.5	170	13.3
2012	1141	897	99.3	163	14.3
1998-2012	15273	9292	97.3	2003	13.1

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	351	57.0	43.0	77.2
1999	324	54.0	46.0	72.3
2000	336	58.9	41.1	75.0
2001	346	55.8	44.2	73.3
2002	511	62.8	37.2	77.4
2003	607	58.3	41.7	76.1
2004	627	61.9	38.1	77.4
2005	641	63.2	36.8	75.4
2006	653	65.1	34.9	77.0
2007	760	63.6	36.4	75.9
2008	732	62.7	37.3	73.3
2009	804	61.4	38.6	75.2
2010	848	58.4	41.6	72.1
2011	855	57.4	42.6	74.1
2012	897	58.3	41.7	72.3
1998-2012	9292	60.3	39.7	74.8

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	243	78.7	78.0	79.5	78.9
1999	219	78.0	77.0	79.2	77.4
2000	243	77.5	75.7	79.9	77.0
2001	237	78.5	76.9	80.3	77.4
2002	376	78.0	76.1	81.0	77.0
2003	453	77.3	75.4	79.9	76.3
2004	438	78.8	77.4	81.0	77.9
2005	452	78.1	76.5	80.7	77.2
2006	452	77.5	76.1	80.0	76.7
2007	540	78.1	76.8	80.4	77.4
2008	541	78.9	77.2	81.9	77.6
2009	593	78.7	76.8	81.7	77.7
2010	614	79.7	77.3	82.9	78.3
2011	621	79.1	77.4	81.4	78.2
2012	680	79.7	77.8	82.3	78.4
1998-2012	6702	78.6	76.9	81.1	77.6

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	108	81.8	80.2	84.7	81.2
1999	105	80.2	78.7	82.2	79.4
2000	93	81.5	79.5	85.1	80.4
2001	109	82.5	81.0	84.6	81.8
2002	135	81.2	79.3	84.9	80.9
2003	154	81.7	80.0	84.3	80.5
2004	189	82.0	80.0	85.3	81.1
2005	189	80.9	79.8	83.1	80.7
2006	201	81.0	78.8	84.9	80.1
2007	220	81.0	79.0	84.8	79.5
2008	191	81.8	79.3	85.8	80.0
2009	211	80.2	77.9	84.3	78.7
2010	234	82.0	79.8	85.4	80.8
2011	234	81.2	77.6	85.8	78.9
2012	217	81.7	77.9	86.8	79.8
1998-2012	2590	81.4	79.1	85.0	80.1

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	130	11.7	0.30	6.3	0.27	11.1	0.31	16.9	0.35
1999	115	10.3	0.27	5.6	0.25	9.6	0.28	14.4	0.31
2000	137	12.0	0.33	6.5	0.32	10.9	0.34	16.4	0.37
2001	130	11.2	0.33	5.9	0.30	10.2	0.34	15.2	0.37
2002	233	12.5	0.30	6.2	0.28	10.6	0.31	15.4	0.33
2003	262	14.0	0.34	6.9	0.31	11.5	0.33	16.6	0.36
2004	271	14.4	0.33	6.7	0.30	11.6	0.33	17.3	0.37
2005	282	14.9	0.35	6.7	0.31	11.4	0.34	17.4	0.38
2006	297	15.5	0.35	7.0	0.31	11.8	0.34	17.4	0.38
2007	340	15.3	0.36	6.8	0.32	11.5	0.35	16.9	0.38
2008	340	15.3	0.37	6.3	0.32	10.9	0.36	16.6	0.40
2009	359	16.1	0.39	6.7	0.34	11.3	0.37	16.4	0.40
2010	355	15.8	0.38	6.4	0.33	10.8	0.36	15.8	0.39
2011	359	15.7	0.38	6.2	0.33	10.5	0.36	15.1	0.38
2012	399	17.5	0.47	6.8	0.41	11.6	0.45	17.0	0.48
1998-2012	4009	14.6	0.36	6.5	0.32	11.1	0.35	16.3	0.38

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	70	6.0	0.41	1.8	0.30	3.1	0.34	4.7	0.39
1999	60	5.1	0.41	1.6	0.31	2.7	0.34	3.9	0.37
2000	61	5.1	0.37	1.5	0.29	2.6	0.32	3.7	0.33
2001	63	5.2	0.37	1.5	0.25	2.5	0.28	3.9	0.33
2002	88	4.5	0.30	1.4	0.23	2.3	0.25	3.3	0.27
2003	92	4.7	0.34	1.4	0.25	2.4	0.28	3.3	0.30
2004	117	5.9	0.36	1.8	0.28	2.9	0.30	4.1	0.32
2005	123	6.2	0.42	1.8	0.30	3.0	0.34	4.4	0.38
2006	128	6.4	0.45	1.9	0.36	3.2	0.39	4.5	0.41
2007	143	6.2	0.44	1.8	0.32	3.0	0.36	4.4	0.39
2008	119	5.1	0.37	1.5	0.27	2.5	0.31	3.6	0.34
2009	135	5.8	0.41	1.8	0.33	2.9	0.36	4.1	0.38
2010	140	6.0	0.42	1.7	0.33	2.8	0.36	4.0	0.38
2011	132	5.6	0.41	1.7	0.31	2.8	0.34	3.9	0.38
2012	124	5.3	0.43	1.6	0.35	2.6	0.37	3.6	0.40
1998-2012	1595	5.6	0.39	1.7	0.30	2.7	0.33	3.9	0.36

Table 13

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

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
35-39	3	0.1	0.1			0.0	3	0.2	0.2
40-44	13	0.2	0.3	7	0.2	0.2	6	0.4	0.6
45-49	43	0.8	1.0	29	0.7	0.9	14	0.9	1.4
50-54	91	1.6	2.6	63	1.5	2.4	28	1.7	3.1
55-59	183	3.2	5.8	141	3.4	5.8	42	2.6	5.7
60-64	331	5.8	11.6	269	6.5	12.4	62	3.8	9.5
65-69	574	10.0	21.6	437	10.6	23.0	137	8.4	18.0
70-74	844	14.7	36.3	645	15.7	38.7	199	12.2	30.2
75-79	1046	18.2	54.6	785	19.1	57.9	261	16.1	46.2
80-84	1179	20.6	75.1	840	20.5	78.3	339	20.8	67.1
85+	1426	24.9	100.0	891	21.7	100.0	535	32.9	100.0
All ages	5733	100.0		4107	100.0		1626	100.0	

Included in the statistics are 51.5% multiple primaries in males and 38.4% in females.

Table 14

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2012
(**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			0.0		0.0			
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24			0.0		0.0			
25-29			0.0		0.0			
30-34			0.0		0.0			
35-39		3	0.0		0.1	0.16		0.6
40-44	7	6	0.3	0.05	0.3	0.13	0.9	0.6
45-49	29	14	1.3	0.11	0.7	0.16	1.7	0.7
50-54	63	28	3.4	0.14	1.5	0.19	2.1	1.0
55-59	141	42	8.3	0.17	2.4	0.16	2.5	0.9
60-64	269	62	16.3	0.20	3.6	0.18	3.2	1.0
65-69	437	137	29.8	0.25	8.5	0.28	3.9	1.8
70-74	645	199	55.7	0.33	14.4	0.33	5.2	2.2
75-79	785	261	104.2	0.41	23.9	0.41	6.5	2.6
80-84	840	339	185.0	0.60	39.3	0.54	8.5	3.2
85+	891	535	287.3	0.82	65.3	0.71	11.1	4.3
All ages	4107	1626					5.6	2.4

Mortality						
Raw			15.0	0.37	5.7	0.40
WS			6.7	0.32	1.7	0.31
ES			11.3	0.36	2.8	0.33
BRD-S			16.7	0.39	4.0	0.36

PYLL-70				
per 100,000		27.5		9.8
ES		23.8		8.2
AYLL-70		7.2		8.2

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

Table 15a

Multiple primaries in deaths in period 1998-2012
MALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C15	Oesophagus	37	1.2	8	21.6	1	2.7	28	75.7
C16	Stomach	94	3.1	27	28.7	10	10.6	57	60.6
C18	Colon	194	6.3	88	45.4	18	9.3	88	45.4
C19-C20	Rectum	112	3.6	58	51.8	8	7.1	46	41.1
C22	Liver	44	1.4	9	20.5	3	6.8	32	72.7
C25	Pancreas	84	2.7	7	8.3	5	6.0	72	85.7
C33-C34	Lung	445	14.5	52	11.7	22	4.9	371	83.4
C43	Malign. melanoma	61	2.0	34	55.7	1	1.6	26	42.6
C44	Skin others	97	3.2	34	35.1	5	5.2	58	59.8
C61	Prostate	962	31.3	303	31.5	251	26.1	408	42.4
C64	Kidney	119	3.9	50	42.0	19	16.0	50	42.0
C65	Renal pelvis	144	4.7	43	29.9	21	14.6	80	55.6
C66	Ureter	117	3.8	46	39.3	21	17.9	50	42.7
C67	Bladder	102	3.3					102	100.0
C68	Urethra	34	1.1	5	14.7	11	32.4	18	52.9
C70-C72	CNS cancer	31	1.0	6	19.4			25	80.6
C76-C79	CUP	37	1.2	7	18.9	5	13.5	25	67.6
C82-C85	NHL	60	2.0	28	46.7	5	8.3	27	45.0
C91-C96	Leukaemia	58	1.9	7	12.1	3	5.2	48	82.8
Other primaries		244	7.9	93	38.1	15	6.1	136	55.7
All mult. primaries		3076	100.0	905	29.4	424	13.8	1747	56.8

Multiple primaries with number of cases n<30 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

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C16	Stomach	21	2.3	7	33.3	1	4.8	13	61.9
C18	Colon	70	7.8	34	48.6	2	2.9	34	48.6
C19-C20	Rectum	27	3.0	14	51.9	2	7.4	11	40.7
C23-C24	Bile	9	1.0					9	100.0
C25	Pancreas	31	3.5	1	3.2	1	3.2	29	93.5
C33-C34	Lung	80	8.9	7	8.8	8	10.0	65	81.3
C43	Malign. melanoma	14	1.6	11	78.6			3	21.4
C44	Skin others	18	2.0	5	27.8			13	72.2
C50	Breast	148	16.5	95	64.2	7	4.7	46	31.1
C51	Vulva	12	1.3	7	58.3	1	8.3	4	33.3
C53	Cervix uteri	54	6.0	43	79.6	5	9.3	6	11.1
C54	Corpus uteri	47	5.2	35	74.5	6	12.8	6	12.8
C56	Ovary	29	3.2	9	31.0	1	3.4	19	65.5
C64	Kidney	39	4.3	15	38.5	8	20.5	16	41.0
C65	Renal pelvis	76	8.5	37	48.7	11	14.5	28	36.8
C66	Ureter	42	4.7	22	52.4	8	19.0	12	28.6
C67	Bladder	32	3.6					32	100.0
C70-C72	CNS cancer	13	1.4	7	53.8			6	46.2
C73	Thyroid	9	1.0	7	77.8			2	22.2
C76-C79	CUP	14	1.6	1	7.1			13	92.9
C82-C85	NHL	19	2.1	7	36.8	3	15.8	9	47.4
C91-C96	Leukaemia	20	2.2	2	10.0	2	10.0	16	80.0
Other primaries		73	8.1	20	27.4	10	13.7	43	58.9
All mult. primaries		897	100.0	386	43.0	76	8.5	435	48.5

Multiple primaries with number of cases n<8 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 1998-2012
(**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			0.0		0.0			
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24			0.0		0.0			
25-29			0.0		0.0			
30-34			0.0		0.0			
35-39		3	0.0		0.1	0.19		0.7
40-44	6	3	0.2	0.05	0.1	0.07	0.8	0.3
45-49	25	11	1.2	0.10	0.5	0.15	1.6	0.7
50-54	50	21	2.7	0.12	1.1	0.17	1.9	0.9
55-59	110	35	6.5	0.16	2.0	0.16	2.3	0.9
60-64	213	39	12.9	0.20	2.2	0.14	3.0	0.8
65-69	308	95	21.0	0.24	5.9	0.25	3.4	1.5
70-74	421	135	36.3	0.30	9.8	0.29	4.3	1.9
75-79	538	194	71.4	0.41	17.7	0.41	5.8	2.5
80-84	573	248	126.2	0.62	28.7	0.52	7.7	3.0
85+	627	419	202.2	0.85	51.2	0.71	10.2	4.1
All ages	2871	1203					4.8	2.2
Mortality								
Raw			10.5	0.35	4.2	0.38		
WS			4.7	0.30	1.2	0.28		
ES			8.0	0.33	2.0	0.31		
BRD-S			11.7	0.37	2.9	0.34		
PYLL-70								
per 100,000			21.6		7.2			
ES			18.7		6.1			
AYLL-70			7.5		8.5			

* See corresponding tables with multiple primaries.

Table 17
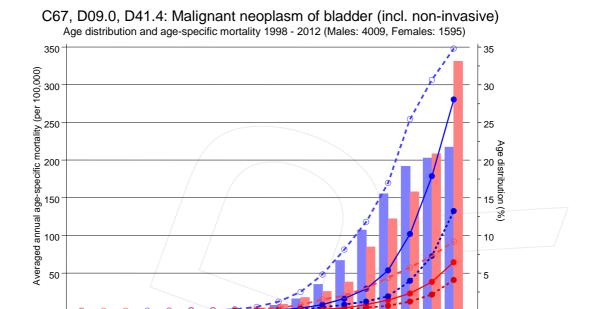
Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2012
(**Single primaries only ***)

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			0.0		0.0			
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24			0.0		0.0			
25-29			0.0		0.0			
30-34			0.0		0.0			
35-39		3	0.0		0.1	0.20		0.7
40-44	6	2	0.2	0.05	0.1	0.05	0.8	0.2
45-49	21	10	1.0	0.09	0.5	0.16	1.5	0.7
50-54	41	19	2.2	0.12	1.0	0.16	1.7	0.9
55-59	74	29	4.4	0.13	1.6	0.15	1.7	0.9
60-64	137	32	8.3	0.16	1.8	0.14	2.2	0.7
65-69	181	67	12.3	0.18	4.2	0.20	2.3	1.3
70-74	223	92	19.2	0.21	6.7	0.23	2.7	1.5
75-79	300	134	39.8	0.30	12.2	0.33	4.0	2.0
80-84	330	187	72.7	0.44	21.7	0.43	5.6	2.7
85+	411	336	132.5	0.64	41.0	0.61	8.3	3.8
All ages	1724	911					3.4	1.9

Mortality					
Raw	6.3	0.26	3.2	0.32
WS	2.9	0.23	0.9	0.24
ES	4.8	0.25	1.5	0.26
BRD-S	7.0	0.28	2.2	0.29

PYLL-70		
per 100,000	15.2	6.0
ES	13.3	5.1
AYLL-70	8.2	9.1

* See corresponding tables with multiple primaries.

C67, D09.0, D41.4: Malignant neoplasm of bladder (incl. non-invasive)
Age distribution and age-specific mortality 1998 - 2012 (Males: 4009, Females: 1595)

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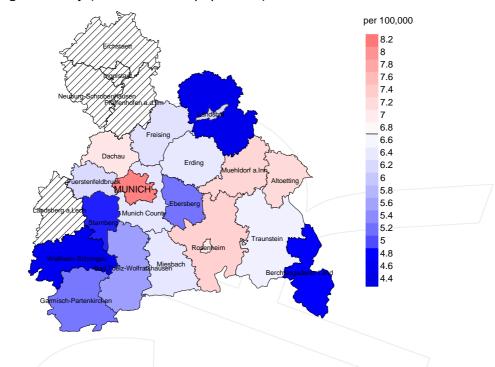
The difference between age at diagnosis (Table 3) and age at bladder cancer-related death (see Table 10) should be considered.

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

Average mortality (world standard population) 2003 - 2008: Females
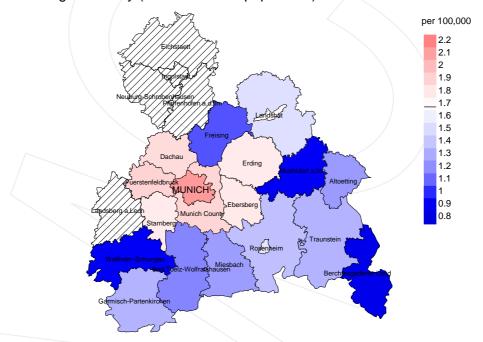
Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2003 to 2008. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 6.7/100,000 WS N=1,717, females 1.7/100,000 WS N=689). 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 18 women died from bladder cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 1.8/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.8 and 3.5/100,000.

Standardized mortality ratio (SMR) 2003 - 2008: Males

Standardized mortality ratio (SMR) 2003 - 2008: Females
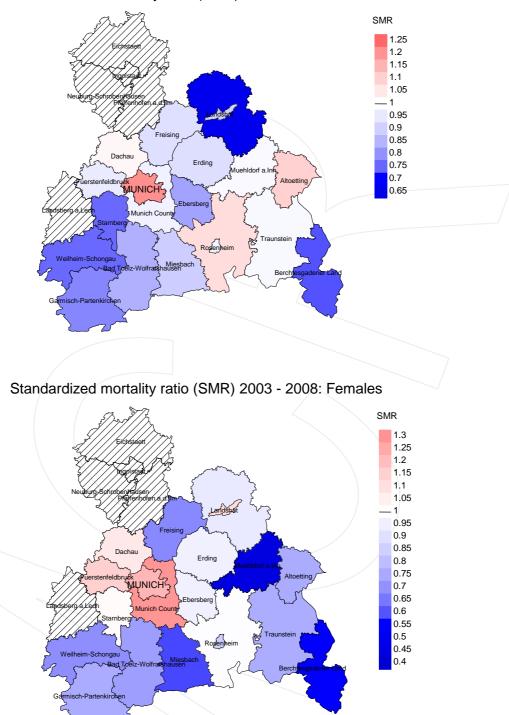
Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=1,717, females N=689). 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 18 women died from bladder cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.95. Though, the value of this parameter may vary with an underlying probability of 99% between 0.47 and 1.70, 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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