Munich Cancer Registry



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

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

Cancer statistics: Baseline statistics

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

V	4000 0040
Year of diagnosis	1998-2013
Patients	16,402
Diseases	16,660
Creation date	05/19/2015
Export date	12/30/2014
Population	4.64 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 4.64 million inhabitants, account for the frequency of cancer diseases^{##} and the achieved long term results. Additionally, the long term survival evaluated by the Munich Cancer Registry (MCR) is compared with the results of the population-based registry in the USA (SEER), which is useful for checking the consistency of the data on an international level.

In comparing several tables, inconsistent figures may be detected. This is based on the fact that different patient cohorts are included in the base calculation, for example when proportions of multiple tumors or DCO-cases**** are concerned. In other cases the individual tumor diagnosis is the basis for calculation, for example with incidence.

The foot notes describe the currentness of the data. The baseline statistics and survival data are updated annually. This yearly analysis comprises the Annual Report of the MCR. The time-delayed acquisition of data and the occasionally high DCO-rates indicate optimizing reserves, among others, because of current financial and legal conditions that hinder the analyses.

Clinics and physicians have access to essentially more detailed data, with which they can check, compare and in the best case optimize their own data and results.

We would be pleased to receive corrections, critique and useful suggestions. Just send an e-mail to tumor@ibe.med.uni-muenchen.de.

Munich Cancer Registry, May 2015

- [#] Base data has been collected since 1998. An increase in new diseases is apparent, which is an effect of two extensions in the MCR catchment area (from a base population of 2.51 million to 3.96 in 2002, and to 4.52 million in 2007). Death certificates from 2014 are incorporated into these analyses.
- Due to the high frequency and good prognosis of non-malignant skin cancer (C44), no systematic ascertainment is performed for this diagnosis. C44 is not designated as a primary, but rather as a secondary tumor.
- DCO (death certificate only) identifies a cancer case that first becomes available to the MCR through the death certificate. A high proportion of DCO cases (≥5%) in particular cancer types indicate insufficient participation of specific cancer specializations.

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

Code	Description
C67	Malignant neoplasm of bladder
C67.0	Trigone of bladder
C67.1	Dome of bladder
C67.2	Lateral wall of bladder
C67.3	Anterior wall of bladder
C67.4	Posterior wall of bladder
C67.5	Bladder neck
C67.6	Ureteric orifice
C67.7	Urachus
C67.8	Overlapping lesion of bladder
C67.9	Bladder, unspecified
D09.0	Carcinoma in situ: Bladder
D41.4	Neoplasm of uncertain or unknown behaviour of urinary organs: Bladder

INCIDENCE

Table 1

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

				Prop.		Prop.
		DCO	Prop.	mult.	Prop.	actively
Year of	Cases	cases	DCO	primaries	deaths	followed
diagnosis	n	n	%	8	%	%
1998	600	21	3.5	31.2	71.7	98.3
1999	574	20	3.5	36.9	66.0	99.1
2000	578	29	5.0	38.1	67.1	98.6
2001	569	21	3.7	39.5	62.6	98.9
2002	1065	78	7.3	38.6	65.3	98.3 #
2003	1057	73	6.9	37.6	60.9	96.7
2004	1143	65	5.7	39.3	58.4	97.3
2005	1/110	54	4.9	39.6	52.1	96.1
2006	1140	48	4.2	38.2	52.5	94.2
2007	1290	45	3.5	39.1	46.7	85.1 # ##
2008	1263	60	4.8	39.4	44.7	68.6
2009	1276	53	4.2	41.1	44.0	68.2
2010	1292	58	4.5	40.2	39.7	65.9
2011	1318	48	3.6	39.2	35.1	65.6
2012	1296	49	3.8	38.5	27.5	67.4
2013	1089	57	5.2	37.1	19.4	97.0 ###
1998-2013	16660	779	4.7	38.7	48.1	84.6

[#] 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	8
1998	600	432	168	72.0
1999	574	425	149	74.0
2000	578	413	165	71.5
2001	569	397	172	69.8
2002	1065	769	296	72.2
2003	1057	786	271	74.4
2004	1143	819	324	71.7
2005	1110	813	297	73.2
2006	1140	852	288	74.7
2007	1290	959	331	74.3
2008	1263	935	328	74.0
2009	1276	945	331	74.1
2010	1292	953	339	73.8
2011	1318	981	337	74.4
2012	1296	977	319	75.4
2013	1089	821	268	75.4
1998-2013	16660	12277	4383	73.7

Table 2

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

			Males	Fem.	Males	Fem.	Males	Fem.	Males	Fem.
Year of	Males	Females	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.
diagnosis	n	n	raw	raw	WS	WS	ES	ES	BRD-S	BRD-S
1998	432	168	39.0	14.3	23.4	6.0	35.8	9.0	48.3	11.9
1999	425	149	38.0	12.6	22.3	5.2	34.1	8.1	46.1	10.6
2000	413	165	36.3	13.7	20.6	5.2	32.2	8.2	44.5	11.2
2001	397	172	34.3	14.1	19.7	5.9	30.4	9.0	40.6	12.0
2002	769	296	41.3	15.1	22.2	6.0	34.7	9.2	47.3	12.1
2003	786	271	41.9	13.8	22.5	5.6	34.6	8.4	46.3	11.0
2004	819	324	43.5	16.4	22.7	6.3	35.1	9.7	47.4	12.9
2005	813	297	42.9	14.9	21.8	6.0	33.7	8.9	46.2	11.5
2006	852	288	44.5	14.3	22.6	5.6	34.7	8.4	46.6	11.3
2007	959	331	43.3	14.3	21.6	5.7	33.1	8.6	44.2	11.4
2008	935	328	42.0	14.1	20.2	5.7	31.4	8.5	42.1	10.9
2009	945	331	42.3	14.2	20.4	5.3	31.3	8.2	42.0	10.9
2010	953	339	42.3	14.5	19.8	5.2	30.5	8.0	40.9	10.6
2011	981	337	42.9	14.3	19.6	5.8	30.2	8.6	40.5	10.9
2012	977	319	42.8	13.5	19.3	5.1	30.0	7.8	40.7	10.2
2013	821	268	35.9	11.4	16.3	4.4	25.3	6.5	34.2	8.3
1998-2013	12277	4383	41.3	14.1	20.6	5.5	31.8	8.4	42.9	11.0

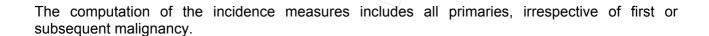


Table 3

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

Year of	Cases		Std.					Median		
diagnosis	n	Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
uragnosis	11	Mean	uev.	М1111.	Max.	10%	23%	30%	156	20%
			/_	/_		\	\.			
1998	600	70.3	13,1	22.9	98.1	52.3	62.1	71.9	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	578	71.6	11.0	34.0	99.7	57.4	63.3	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	1065	71.8	11.4	28.3	99.5	57.6	64.2	72.9	79.9	86.1
2003	1057	71.1	12.0	25.4	103	56.2	63.9	71.8	79.6	85.8
2004	1143	71.4	11.9	23.3	99.0	56.0	63.5	72.7	79.9	85.8
2005	1110	71.7	11.9	18.4	101	57.1	63.7	73.1	80.2	85.4
2006	1140	71.8	11.7	3.0	101	57.2	64.4	72.1	80.2	85.6
2007	1290	71.3	11.9	1.3	101	55.1	65.1	72.1	80.0	85.5
2008	1263	72.0	11.6	6.6	100	56.5	65.5	72.6	80.4	86.3
2009	1276	71.9	11.6	28.5	103	56.8	64.8	73.0	80.3	86.1
2010	1292	72.3	11.7	22.4	100	56.1	65.9	73.2	80.9	86.4
2011	1318	72.4	11.6	1.5	97.8	57.2	65.8	73.0	80.6	86.6
2012	1296	72.6	11.2	32.6	103	56.8	66.1	73.4	80.5	86.2
2013	1089	72.6	11.6	18.3	99.0	56.5	65.8	73.2	81.5	86.5
1998-2013	16660	71.7	11.7	1.3	103	56.3	64.5	72.6	80.2	86.0

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	432	69.2	12.5	26.3	95.6	52.3	61.5	70.1	78.1	84.6
1999	425	69.2	11.6	18.9	94.1	55.0	61.7	70.0	77.9	84.3
2000	413	70.2	10.8	39.3	99.7	55.3	62.7	71.5	77.8	84.1
2001	397	69.6	10.9	28.4	95.1	55.1	62.0	69.9	77.7	83.6
2002	769	71.0	10.9	28.3	97.6	56.9	63.5	71.9	78.8	84.9
2003	786	70.4	11.4	25.4	101	56.4	63.5	70.9	78.2	84.3
2004	819	70.4	11.6	23.3	98.8	55.4	62.8	71.0	78.7	84.3
2005	813	71.0	11.1	18.4	101	57.6	63.8	72.5	78.7	83.9
2006	852	71.1	11.3	3.0	101	56.9	64.0	71.3	79.0	84.8
2007	959	70.8	11.6	1.3	101	55.0	65.0	71.7	79.2	84.6
2008	935	71.7	11.3	29.6	100	56.4	65.4	72.4	79.8	85.4
2009	945	71.2	11.5	28.5	97.4	56.4	64.3	72.4	79.5	84.9
2010	953	71.4	11.3	25.6	99.1	55.7	64.8	72.4	79.9	84.9
2011	981	72.4	11.2	1.5	95.4	57.2	66.5	73.1	80.1	86.1
2012	977	72.3	10.9	32.6	103	56.8	66.1	73.1	79.8	85.2
2013	821	72.3	11.3	18.3	98.6	56.8	65.7	73.1	80.6	85.5
1998-2013	12277	71.1	11.3	1.3	103	56.2	64.2	72.0	79.2	84.9

Table 3b

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

Year of	Cases		Std.					Median		
diagnosis	n	Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	168	72.9	14,1	22.9	98.1	51.1	66.0	76.6	83.6	87.6
1999	149	72.3	11.8	42.1	96.7	55.9	63.8	73.9	80.0	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	271	72.9	13.4	25.4	103	55,3	65.5	75.0	82.5	89.1
2004	324	74.1	12.1	33.3	99.0	57.4	65.8	76.1	82.9	89.1
2005	297	73.4	13.7	28.0	98.8	56.5	63.7	75.3	83.9	90.1
2006	288	73.8	12.6	4.3	97.4	58.3	66.6	75.1	82.8	87.9
2007	331	72.9	12.6	22.2	98.4	55.9	65.6	74.0	82.2	86.8
2008	328	72.9	12.4	6.6	97.0	56.5	65.7	73.3	82.5	87.3
2009	331	73.9	12.0	36.0	103	58.0	66.5	75.0	83.1	88.4
2010	339	75.1	12.3	22.4	100	57.5	68.1	76.4	84.6	89.7
2011	337	72.4	12.5	12.3	97.8	57.6	63.7	72.2	82.0	88.5
2012	319/	73.6	12.1	37.0	97.7	57.2	66.1	74.9	82.5	88.5
2013	268	73.5	12.7	33.4	99.0	55.5	66.0	73.6	83.5	88.6
1998-2013	4383	73.5	12.5	4.3	103	56.8	65.8	74.8	82.9	88.5

Table 4

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

Age at									
diagnosis	Cases			Males			Females		
Years	n	%	Cum.%	n	%	Cum.%	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	3	0.0	0.1	3	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	0.1	0.3	20	0.2	0.2	4	0.1	0.3
30-34	35	0.2	0.5	25	0.2	0.4	10	0.2	0.5
35-39	76	0.5	0.9	54	0.4	0.9	22	0.5	1.0
40 - 44	197	1.2	2.1	145	1.2	2.1	52	1.2	2.2
45-49	379	2.3	4.4	283	2.3	4.4	96	2.2	4.4
50-54	661	4.0	8.3	500	4.1	8.4	161	3.7	8.1
55-59	1181	7.1	15.4	893	7.3	15.7	288	6.6	14.6
60-64	1815	10.9	26.3	1434	11.7	27.4	381	8.7	23.3
65-69	2423	14.5	40.9	1893	15.4	42.8	530	12.1	35.4
70-74	2846	17.1	58.0	2177	17.7	60.6	669	15.3	50.7
75-79	2756	16.5	74.5	2086	17.0	77.5	670	15.3	66.0
80-84	2235	13.4	87.9	1560	12.7	90.3	675	15.4	81.4
85+	2014	12.1	100.0	1197	9.7	100.0	817	18.6	100.0
All ages	16660	100.0		12277	100.0		4383	100.0	

Included in the statistics are 52.8% multiple primaries in males and 39.5% in females.

Table 5

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

							Males	Females
			Malag	Females	Molog	Females		Prop.all
700 0+						DCO rate	_	cancers
Age at	Malag	Ecmolog	~	Age-	n=447	n=331		n=153136
diagnosis Years		n	incid.	spec.	%	11=331 %	%	%
iears	n	11	incia.	incia.	6	0	6	6
0- 4	3	1	0.2	0.1			0.9	0.4
0- 4 5- 9	3	1	0.2	0.1			0.9	0.4
10-14		1	0.0					0.6
15-14	3	/	0.0	0.0			0.8	0.0
20-24	4	5	0.2					0 0
20-24 25-29	20	5 4		0.3			0.7 2.1	0.9 0.4
25-29 30-34		10	1.0					
	25	22	1.1	0.5			1.7	0.5
35-39	54		2.2	0.9	0 7		2.4	0.6
40-44	145	52	5.5	2.1	0.7		4.5	0.8
45-49	283	96	12.0	4.2	0.4	0 6	5.3	7 1.1
50-54	500	161	24.8	7.8	0.2	0.6	5.8	1.5
55-59	891	287	48.6	14.9	0.4	0.7	6.2	2.1
60-64	1433	381	80.8	20.3	1.0	1.3	6.6	2.2
65-69	1887	527	119.5	30.5	1.6	1.7	6.9	2.8
70-74	2169	669	169.3	44.1	1.8	1.3	8.1	3.6
75-79	2081	667	251.8	56.2	3.4	3.3	10.1	3.8
80-84	1556	674	311.0	72.3	6.4	9.8	1/1.4	4.3
85+	1194	817	350.1	91.4	15.6	26.6	12.0	4.8
All ages	12248	4375			3.6	7.6	7.7	2.9
Incidence								
Raw			41.2	14.1				
WS			20.6	5.5				
ES			31.8	8.3				
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 1998-2013 MALES

		Observed	Expected		LCL	UCL		DC
Diagnos	is	n	n	SIR	95%	95%	EAR	
C00	Lip	3	0.9	3.4	0.7	9.9	0.6	
	Oral cavity	16	4.8	3.3	1.9	5.4	# 3.3	6.
C07-C08	Salivary gland	/ 3	1.6	1.9	0.4	5.6	0.4	
C09-C10	Oropharynx	6	5.6	1.1	0.4	2.3	0.1	
C12-C13	Hypopharynx	7	3.1	2.3	0.9	4.7	1.1	
C15	0esophagus	24	11.1	2.2	1.4	3.2	# 3.8	12.
C16	Stomach	47	31.2	1.5	1.1	2.0	# 4.6	2.
C17	Small intestine	9	3.2	2.8	1.3	5.3	# 1.7	
C18	Colon	117	72.5	1.6	1.3	1.9	# 13.1	6.
C19-C20	Rectum	51	36.9	1.4	1.0	1.8	# 4.1	5.
221	Anus/canal	5	1.3	3.8	1.2	8.8	# 1.1	
222	Liver	35	18.5	1.9	1.3	2.6	# 4.8	11.
C23-C24	Bile	13	7.0	1.9	1.0	3.2	1.8	30.
225	Pancreas	50	25.5	2.0	1.5	2.6	# 7.2	20.
226	GI cancer	2	1.0	1.9	0.2	6.9	0.3	50.
232	Larynx	14	6.2	2.3	1.2	3.8	# 2.3	
233-C34	-	257	79.4	3.2	2.9	3.7	# 52.2	12.
38,C45	Mesothelioma	6	4.5	1.3	0.5	2.9	0.5	16.
243	Malign. melanoma	47	25.4	1.9	1.4	2.5	# 6.4	
246,C49	Soft tissue	4	3.7	1.1	0.3	2.8	0.1	
248	Peritoneal	2	0.5	4.4	0.5	15.8	0.5	50.
250	Breast	4	1.8	2.3	0.6	5.8	0.7	
260	Penis	3	1.6	1.9	0.4	5.5/	0.4	
261	Prostate	945	203.7	4.6	4.3	4.9	# 217.8	5.
262	Testis	3	1.1	2.7	0.5	7.8	0.6	
264	Kidney	85	22.8	3.7	3.0	4.6	# 18.3	21.
265	Renal pelvis	78	3.0	26.1	20.7		# 22.0	
266	Ureter	50	1.7	29.9	22.2		# 14.2	
267	Bladder	152	34.0	4.5	3.8	5.2		
268	Urethra	36	0.4	81.8		113.2		
	CNS cancer	11	8.5	1.3	0.6	2.3	0.7	18.
273	Thyroid	6	3.6	1.7	0.6	3.6	0.7	
276-C79	-	25	12.4	2.0	1.3	3.0		8.
281	Hodgkin lymphoma	2	1.2	1.7	0.2	6.1	0.2	0.
C82-C85		54	28.2	1.9	1.4	2.5		7.
290	Mult. myeloma	15	9.2	1.6	0.9	2.7	1.7	13.
	Leukaemia	27	12.0	2.2	1.5	3.3		37.
other n	rimaries	5	3.1	1.6	0.5	3.7	0.5	20.
Not obse		0	3.6	0.0	0.0	1.0	-1.1	۷0.

Patients		8106
Median age at second	<pre>malignancy (years)</pre>	73.8
Person-years		34041
Mean observation time	e (years)	4.2
Median observation ti	ime (vears)	3.2

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 1998-2013

ΕI			

	Observed	Expected		LCL	UCL		DCO
Diagnosis	/ n /	n	SIR	95%	95%	EAR	%
C15 Oesophagus	/ 2/	0.9	2.3	0.3	8.3	1.0	
C16 Stomach	10	6.8	1.5	0.7	2.7	2.7	20.0
C17 Small intestine	4	0.7	5.8	1.6	14.7	# 2.8	
C18 Colon	24	18.3	1.3	0.8	2.0	4.8	4.2
C19-C20 Rectum	17	7.4	2.3	1.3	3.7	# 8.1	5.9
C21 Anus/canal	2	0.8	2.5	0.3	8.9	1.0	
C22 Liver	4	2.0	2.0	0.5	5.1	1.7	25.0
C23-C24 Bile	5	2.7	1.8	0.6	4.3	1.9	60.0
C25 Pancreas	19	7.9	2.4	1.5	3.8	# 9.4	26.3
C26 GI cancer	2	0.4	5.1	0.6	18.4	1.4	50.0
C33-C34 Lung	47	10.7	4.4	3.2	5.9	# 30.8	10.6
C43 Malign. melanoma	. 4	5.1	0.8	0.2	2.0	-0.9	25.0
C50 Breast	70	43.3	1.6	1.3	2.0	# 22.6	5.7
C51 Vulva	2	1.8	1.1	0.1	4.1	0.2	
C53 Cervix uteri	9	1.8	4.9	2.2	9.3	# 6.1	22.2
C54 Corpus uteri	13	8.3	1.6	0.8	2.7	4.0	15.4
C55,C57 Fem. genitals un	. 3	0.5	5.7	1.2	16.7	# 2.1	33.3
C56 Ovary	11	6.5	1.7	0.8	3.0	3.8	18.2
C64 Kidney	23	4.1	5.6	3.6	8.4		26.1
C65 Renal pelvis	33	0.5	62.8	43.2		# 27.6	
C66 Ureter	25	0.3	94.1	60.9		# 21.0	
C67 Bladder	39	3.6	10.9	7.8		# 30.1	
C68 Urethra	2	0.0	40.1		144.8	# 1.7	
C70-C72 CNS cancer	5	2.1	2.3	0.8	5.5	2.4	40.0
C73 Thyroid	2	2.1	0.9	0.1	3.4	-0.1	
C76-C79 CUP	4	3.3	1.2	0.3	3.1	0.6	
C82-C85 NHL	12	6.4	1.9	1.0	3.3	4.7	33.3
C90 Mult. myeloma	5	2.1	2.4	0.8	5.5	2.4	
C91-C96 Leukaemia	7	2.8	2.5	1.0	5.2		28.6
0 0 0							
Other primaries	8	3.3	2.4	1.0	4.7	# 4.0	12.5
Not observed	0	3.0	0.0	0.0	1.2	-2.5	
All mult. primaries	413	159.7	2.6	2.3	2.8	# 215.0	11.1
			,	0			

Patients	2935
Median age at second malignancy (years)	76.9
Person-years	11781
Mean observation time (years)	4.0
Median observation time (years)	2.8

The occurrence of second malignancy is statistically significant.

Observed second primaries 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 - 2013 (Males: 12248, Females: 4375)

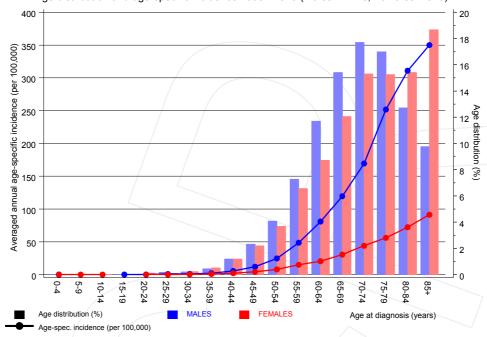


Figure 7. Age distribution and age-specific incidence



C67, D09.0, D41.4: Malignant neoplasm of bladder (incl. non-invasive) Age-specific incidence in international comparison

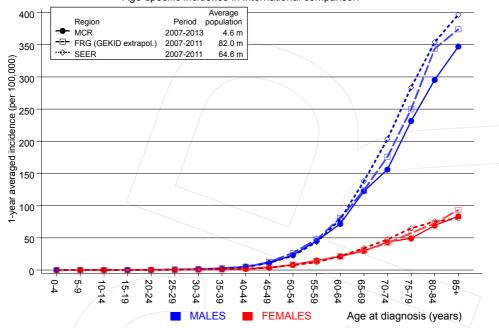


Figure 7a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).



Reference:

Extrapolated age-specific patient population of Germany, data status middle of 2010. Association of Population-based Cancer Registries in Germany (GEKID e.V.). Berlin, 2014. http://www.gekid.de. Last access: 02/11/2015

Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 18 Regs Research Data, released April 2014, based on the November 2013 submission. http://www.seer.cancer.gov.

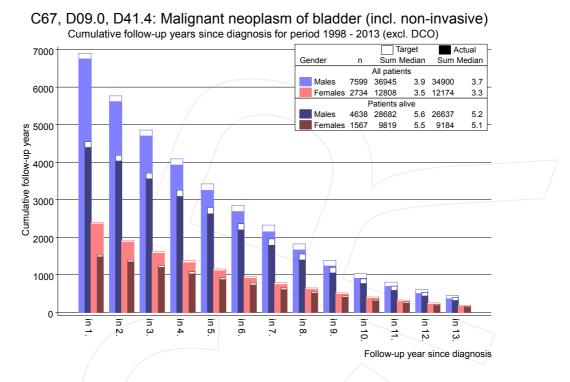
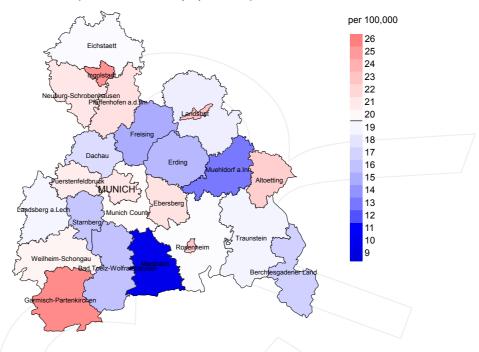


Figure 8. Cumulative follow-up years depending on time since diagnosis

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



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



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

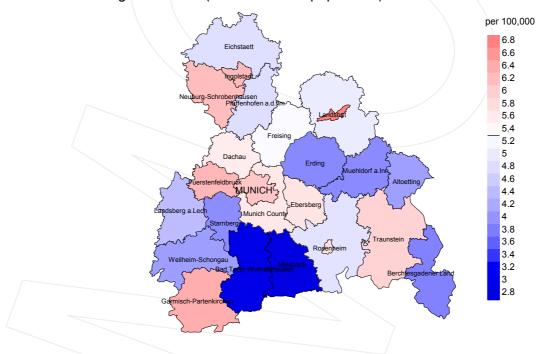
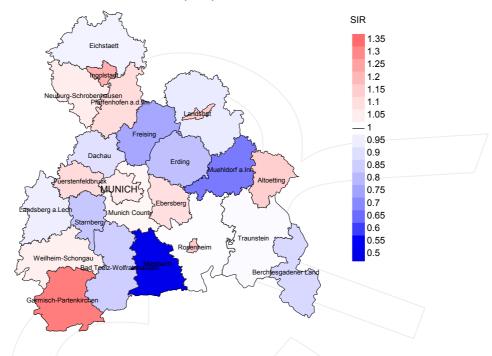


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 19.6/100,000 WS N=6,546, females 5.3/100,000 WS N=2,247).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,928 female residents (averaged) in the period from 2007 to 2013 a total of 60 women were identified with newly diagnosed bladder cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 5.7/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 3.7 and 8.7/100,000.

Standardized incidence ratio (SIR) 2007 - 2013: Males



Standardized incidence ratio (SIR) 2007 - 2013: Females

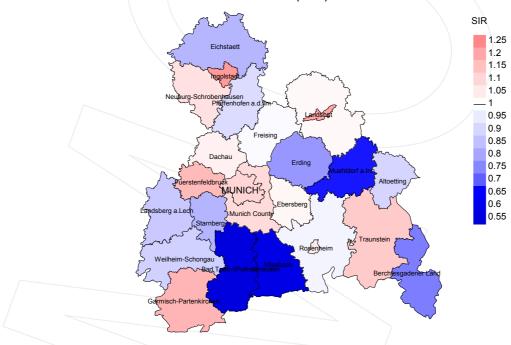


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=6,546, females N=2,247).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,642 female residents (averaged) in the period from 2007 to 2013 a total of 60 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 1.02. Though, the value of this parameter may vary with an underlying probability of 99% between 0.71 and 1.41, and is therefore not statistically striking.

MORTALITY

Table 10a

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

Year of	Incident cases	Prop. actively followed	Prop. DCO	Deaths	Prop. deaths	Prop. deaths with death certific.
diagnosis	n	%	%	n	%	%
1998 1999	600 574	98.3	3.5	430 379	71.7	93.0 96.3
2000 2001	578 569	98.6 98.9	5.0 3.7	388 356	67.1 62.6	95.1 95.5
2002	1065	98.3	7.3	695	65.3	96.1
2003	1057	96.7	6.9	644	60.9	97.4
2004	1143	97.3	5.7	667	58.4	98.2
2005	1110	96.1	4.9	578	52.1	97.9
2006	1140	94.2	4.2	599	52.5	98.3
2007	1290	85.1	3.5	602	46.7	97.7
2008	1263	68.6	4.8	564	44.7	98.4
2009	1276	68.2	4.2	561	44.0	97.7
2010	1292	65.9	4.5	513	39.7	97.7
2011	1318	65.6	3.6	463	35.1	95.9
2012	1296	67.4	3.8	357	27.5	95.5
2013	1089	97.0	5.2	211	19.4	90.0
1998-2013	16660	84.6	4.7	8007	48.1	96.7

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 4.64 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	8	n	%
1998	600	351	91.2	74	12.3
1999	574	324	93.5	74	12.9
2000	578	336	94.0	68	11.8
2001	569	346	94.2	59	10.4
2002	1065	511	96.1	159	14.9
2003	1057	607	97.0	156	14.8
2004	1143	627	96.7	150	13.1
2005	1110	641	97.7	134	12.1
2006	1140	653	97.1	143	12.5
2007	1290	761	97.6	146	11.3
2008	1263	733	98.6	156	12.4
2009	1276	805	98.6	190	14.9
2010	1292	848	98.5	163	12.6
2011	1318	856	98.4	170	12.9
2012	1296	929	98.7	179	13.8
2013	1089	859	98.7	140	12.9
1998-2013	16660	10187	97.3	2161	13.0

Table 10c

Annual cohorts of deaths, proportion of cancer-related and non-cancer-related deaths, and cancer recorded on death certificates (incl. DCO)

(with respect to registry area expansion from 2.51 to 3.96 m as of 2002, and from 3.96 to 4.64 m as of 2007, respectively)

				Prop.
				cancer
		Prop.	Prop.	recorded
		cancer-	non-cancer-	on death
Year of	Deaths	related	related	certificate
death	n	%	8	%
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	761	63.5	36.5	75.9
2008	733	62.8	37.2	73.3
2009	805	61.5	38.5	75.2
2010	848	58.4	41.6	72.1
2011	856	57.2	42.8	74.1
2012	929	58.4	41.6	73.0
2013	859	56.7	43.3	70.0
1998-2013	10187	60.0	40.0	74.4

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

		Age at death (all	Age at death (cancer-	Age at death (non-cancer-	Age at death (according to death
Year of	Deaths	causes)	related)	related)	certificate)
death	n	Years	Years	Years	Years
1998	243	80.0	80.7	79.7	81.0
1999	219	78.4	77.9	79.3	78.1
2000	243	79.1	76.8	81.0	78.0
2001	237	80.0	77.9	81.6	78.9
2002	376	78.4	76.8	81.6	77.5
2003	453	77.9	75.7	81.1	77.2
2004	438	79.8	78.4	82.1	79.1
2005	452	79.5	78.1	81.6	78.6
2006	452	78.1	76.5	80.6	76.9
2007	541	79.7	78.5	80.8	79.1
2008	541	79.7	78.2	81.7	78.5
2009	593	80.2	77.9	81.9	79.3
2010	614	81.4	78.8	84.1	79.9
2011	622	80.3	78.6	82.5	79.6
2012	705	80.7	79.0	83.2	79.4
2013	652	81.1	78.1	84.2	79.4
1998-2013	7381	79.8	78.0	82.1	78.8

Deaths of patients are considered to be cancer-related, in case that fact was recorded on the death certificate, or patients had suffered from metastasis or recurrence.

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

Year of death	Deaths n	Age at death (all causes)	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate)
1998	108	83.1	82.0	86.2	82.6
1999	105	80.9	79.4	81.7	80.1
2000	93	83.8	81.5	86.0	82.3
2001	109	84.0	81.1	85.6	83.7
2002	135	83.1	81.5	87.0	82.4
2003	154	83.2	81.3	86.0	81.8
2004	189	83.9	80.9	87.2	82.5
2005	189	83.0	82.0	84.3	82.8
2006	201	82.5	81.2	85.9	81.9
2007	220	82.4	81.0	87.1	81.3
2008	192	83.3	80.5	86.1	81.6
2009	212	82.7	79.5	84.3	80.7
2010	234	84.1	82.3	87.0	82.8
2011	234	83.1	79.8	87.7	81.2
2012	224	84.1	79.8	88.9	82.6
2013	207	83.0	79.5	85.8	80.1
1998-2013	2806	83.1	80.8	86.3	81.9

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 $\label{lem:mortality} \mbox{Mortality measures (cancer-related death) and mortality-incidence-index}$ by year of death MALES

Year of	Deaths	Mort.	MI-Index	Mort.	MI-Index	Mort.	MI-Index	Mort.	MI-Index
death	n	raw	raw	WS	WS	ES	ES	BRD-S	BRD-S
1998	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	0.31	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	0.30	15.4	0.33
2003	262	14.0	0.33	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	0.37
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	0.31	10.9	0.35	16.6	0.39
2009	359	16.1	0.38	6.7	0.33	11.3	0.36	16.4	0.39
2010	355	15.8	0.37	6.4	0.32	10.8	0.36	15.8	0.39
2011	358	15.7	0.36	6.2	0.32	10.5	0.35	15.1	0.37
2012	414	18.1	0.43	7.1	0.37	12.1	0.41	17.6	0.44
2013	368	16.1	0.45	6.3	0.39	10.6	0.42	15.4	0.45
1998-2013	4391	14.8	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	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	70	6.0	0.42	1.8	0.30	3.1	0.34	4.7	0.39
1999	60	5.1	0.40	1.6	0.31	2.7	0.33	3.9	0.36
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	0.44	1.9	0.35	3.2	0.38	4.5	0.40
2007	143	6.2	0.43	1.8	0.32	3.0	0.35	4.4	0.39
2008	120	5.2	0.37	1.5	0.27	2.6	0.30	3.7	0.34
2009	136	5.8	0.41	1.8	0.34	2.9	0.36	4.2	0.39
2010	140	6.0	0.41	1.7	0.32	2.8	0.35	4.0	0.37
2011	132	5.6	0.39	1.7	0.30	2.8	0.33	3.9	0.36
2012	129	5.5	0.41	1.7	0.33	2.7	0.35	3.8	0.37
2013	120	5.1	0.45	1.6	0.36	2.5	0.38	3.5	0.42
1998-2013	1722	5.5	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 1998-2013

(incl. multiple primaries)

Age at									
death	Cases			Males			Females		
Years	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
10-14	1	0.0	0.0			0.0	1	0.1	0.1
15-19	0	0.0	0.0			0.0			0.1
20-24	0	0.0	0.0			0.0			0.1
25-29	0	0.0	0.0			0.0			0.1
30-34	0	0.0	0.0			0.0			0.1
35-39	3	0.0	0.1			0.0	3	0.2	0.2
40-44	15	0.2	0.3	8	0.2	0,2	7	0.4	0.6
45-49	45	0.7	1.0	30	0.7	0.8	15	0.9	1.5
50-54	102	1.6	2.6	71	1.6	2.4	31	1.8	3.2
55-59	196	3.1	5.8	151	3.3	5.8	45	2.6	5.8
60-64	357	5.7	11.5	288	6.4	12.1	69	3.9	9.7
65-69	618	9.9	21.3	471	10.4	22.6	147	8.4	18.1
70-74	949	15.1	36.5	728	16.1	38.7	221	12.6	30.6
75-79	1135	18.1	54.6	851	18.9	57.6	284	16.1	46.8
80-84	1284	20.5	75.0	923	20.5	78.1	361	20.5	67.3
85+	1565	25.0	100.0	990	21.9	100.0	575	32.7	100.0
All ages	6270	100.0		4511	100.0		1759	100.0	

Included in the statistics are 52.8% multiple primaries in males and 39.5% in females.

Table 14

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

			Males		Females		Males	Females
Age at			Age-		Age-		Prop.all	Prop.all
death	Males	Females	/ - /		spec.		cancers	cancers
Years	n	n	mortal.	MI-index	mortal.	MI-index	%	%
0- 4			0.0		0.0			
5- 9			0.0		0.0			
10-14		1/	0.0		0.1	1.00		3.2
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	0.14		0.6
40-44	8	7	0.3	0.06	0.3	0.13	0.9	0.6
45-49	30	15	1.3	0.11	0.6	0.16	1.7	0.7
50-54	71	31	3.5	0.14	1.5	0.19	2.2	1.0
55-59	151	45	8.2	0.17	2.3	0.16	2.6	0.9
60-64	288	69	16.2	0.20	3.7	0.18	3.2	1.1
65-69	471	147	29.8	0.25	8.5	0.28	3.9	1.8
70-74	728	221	56.8	0.33	14.6	0.33	5.4	2.2
75-79	851	284	103.0	0.41	23.9	0.42	6.5	2.6
80-84	923	361	184.5	0.59	38.7	0.53	8.5	3.2
85+	990	575	290.3	0.83	64.3	0.70	11.1	4.2
All ages	4511	1759					5.6	2.4
Mortality								
Raw			15.2	0.37	5.7	0.40		
WS			6.7	0.32	1.7	0.31		
ES			11.4	0.36	2.8	0.33		
BRD-S			16.8	0.39	4.0	0.36		
D								
PYLL-70								
per 100,000			27.5		10.1			
ES			23.8		8.6			
AYLL-70			7.2		8.4			

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

Table 15a $\begin{tabular}{ll} Multiple primaries in deaths in period 1998-2013 \\ \hline MALES \end{tabular}$

						Syn- chron	Syn- chron		
		Total	Total	Pre	Pre	±30d	±30d	Post	Post
Diagnos	is	n/	%↓	n	← %	n	~ %	n	← %
C15	Oesophagus	45	1.3	10	22.2	1	2.2	34	75.6
C16	Stomach	107	3.1	31	29.0	12	11.2	64	59.8
C18	Colon	219	6.3	98	44.7	21	9.6	100	45.7
C19-C20	Rectum	120	3.5	62	51.7	8	6.7	50	41.7
C22	Liver	56	1.6	10	17.9	4	7.1	42	75.0
C25	Pancreas	89	2.6	7	7.9	5	5.6	77	86.5
C32	Larynx	31	0.9	20	64.5	1	3.2	10	32.3
C33-C34	Lung	495	14.2	56	11.3	26	5.3	413	83.4
C43	Malign. melanoma	73	2.1	42	57.5	1	1.4	30	41.1
C44	Skin others	118	3.4	42	35.6	5	4.2	71	60.2
C61	Prostate	1066	30.6	344	32.3	275	25.8	447	41.9
C64	Kidney	133	3.8	56	42.1	21	15.8	56	42.1
C65	Renal pelvis	161	4.6	48	29.8	24	14.9	89	55.3
C66	Ureter	136	3.9	50	36.8	24	17.6	62	45.6
C67	Bladder	125	3.6			1	0.8	124	99.2
C68	Urethra	50	1.4	4	8.0	15	30.0	31	62.0
C70-C72	CNS cancer	36	1.0	7	19.4	1	2.8	28	77.8
C76-C79	CUP	39	1.1	7	17.9	5	12.8	27	69.2
C82-C85	NHL	74	2.1	31	41.9	8	10.8	35	47.3
C91-C96	Leukaemia	67	1.9	8	11.9	3	4.5	56	83.6
Other p	rimaries	238	6.8	82	34.5	16	6.7	140	58.8
All mul	t. primaries	3478	100.0	1015	29.2	477	13.7	1986	57.1

Multiple primaries with number of cases 1 to 26 are pooled in category "Other primaries".

ICD-10 C44 (Other malignant neoplasms of skin) is not systematically recorded by MCR and therefore not considered for evaluation as a particular primary but at least as a multiple malignancy.

Table 15b

Multiple primaries in deaths in period 1998-2013
FEMALES

						Syn-	Syn-		
						chron	chron		
		Total	Total	Pre	Pre	\±30d	±30d	Post	Post
Diagnosis		n	% ↓	n	← %	n	% →	n	←%
	tomach	23	2.4	7	30.4	1	4.3	15	65.2
	olon	75	7.7	35	46.7	2	2.7	38	50.7
C19-C20 Re		29	3.0	15	51.7	2	6.9	12	41.4
C23-C24 B	ile	10	1.0	1	10.0			9	90.0
	ancreas	33	3.4	_ 1	3.0	/ 1	3.0	31	93.9
C33-C34 Li	2	84	8.6	7	8.3	9	10.7	68	81.0
	align. melanoma	15	1.5	12	80.0			3	20.0
	kin others	20	2.0	5	25.0			15	75.0
C50 B1	reast	161	16.5	105	65.2	8	5.0	48	29.8
	ulva	12	1.2	7	58.3	1	8.3	4	33.3
	ervix uteri	58	5.9	46	79.3	6	10.3	6	10.3
	orpus uteri	51	5.2	39	76.5	6	11.8	6	11.8
C56 01	vary	35	3.6	12	34.3	_ 1	2.9	22	62.9
C64 K	idney	42	4.3	17	40.5	8	19.0	17	40.5
C65 R6	enal pelvis	84	8.6	39	46.4	14	16.7	31	36.9
C66 U1	reter	47	4.8	22	46.8	11	23.4	14	29.8
C67 B	ladder	38	3.9					38	100.0
C70-C72 C1	NS cancer	14	1.4	7	50.0			7	50.0
C76-C79 CT	UP \	15	1.5	1	6.7			14	93.3
C82-C85 NF	HL	20	2.0	8	40.0	3	15.0	9	45.0
C91-C96 Le	eukaemia	23	2.4	2	8.7	2	8.7	19	82.6
Other prin	maries	88	9.0	28	31.8	11	12.5	49	55.7
All mult.	primaries	977	100.0	416	42.6	86	8.8	475	48.6

Multiple primaries with number of cases 1 to 9 are pooled in category "Other primaries".

ICD-10 C44 (Other malignant neoplasms of skin) is not systematically recorded by MCR and therefore not considered for evaluation as a particular primary but at least as a multiple malignancy.

Table 16

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

(Singular primaries only *)

			Males		Females		Males	Females
Age at			Age-		Age-		Prop.all	Prop.all
death	Males	Females	/ - /		spec.		cancers	cancers
Years	n	n	mortal.	MI-index	mortal.	MI-index	%	%
0- 4			0.0		0.0			
5- 9			0.0		0.0			
10-14		1/	0.0		0.1	1.00		3.4
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	4	0.3	0.05	0.2	0.09	0.9	0.4
45-49	26	12	1.1	0.10	0.5	0.15	1.6	0.7
50-54	56	23	2.8	0.13	1.1	0.17	1.9	0.9
55-59	117	37	6.4	0.15	1.9	0.16	2.3	0.9
60-64	227	43	12.8	0.20	2.3	0.14	3.0	0.8
65-69	335	103	21.2	0.24	6.0	0.26	3.5	1.5
70-74	476	151	37.2	0.31	9.9	0.30	4.5	1.9
75-79	578	211	69.9	0.41	17.8	0.42	5.8	2.5
80-84	618	261	123.5	0.62	28.0	0.51	7.6	2.9
85+	688	448	201.8	0.85	50.1	0.70	10.2	4.1
All ages	3128	1297					4.9	2.2
Mortality								
Raw			10.5	0.35	4.2	0.38		
WS			4.7	0.30	1.2	0.28		
ES			7.9	0.33	2.0	0.31		
BRD-S			11.6	0.37	2.9	0.34		
PYLL-70								
per 100,000			21.5		7.5			
ES			18.7		6.4			
AYLL-70			7.5		8.8			

^{*} See corresponding tables with multiple primaries.

Table 17

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

(Single primaries only *)

Age at			Males Age-		Females Age-		_	Females Prop.all
death		Females		NGT ' 1	spec.	200	cancers	cancers
Years	n	n	mortal.	MI-index	mortal.	MI-index	%	%
0- 4			/		0 0			
0- 4 5- 9			0.0		0.0			
10-14		1 /	0.0		0.0	1.00		3.7
15-19			0.0		0.0			3.7
20-24			0.0		0.0			
25-29			0.0		0.0			
30-34			0.0		0.0			
35-39		3	0.0		0.0			0.7
40-44	7	2	0.0	0.06	0.1		0.9	0.7
45-49	22	11	0.9	0.00	0.5		1.4	0.7
50-54	44	21	2.2	0.09	1.0		1.7	0.9
55-59	78	31	4.3	0.12	1.6		1.7	0.9
60-64	145	35	8.2	0.12	1.0		2.2	0.8
65-69	189	72	12.0	0.18	4.2		2.3	1.3
70-74	247	105	19.3	0.10	6.9		2.8	1.6
75-79	314	147	38.0	0.21	12.4		3.9	2.0
80-84	352	194	70.4		20.8		5.5	2.6
85+	452	358	132.5	0.63	40.1	0.60	8.4	3.8
031	432	330	132.3	0.03	40.1	0.00	0.4	3.0
All ages	1850	980					3.4	2.0
AII ages	1030	200					3.4	2.0
Mortality								
Raw			6.2	0.26	3.2	0.33		
WS			2.8		0.9			
ES			4.7	0.25	1.5			
BRD-S			6.8	0.27	2.2			
BKD 5			0.0	0.27	2.2	0.25		
PYLL-70								
per 100,000			14.9		6.2			
ES ES			13.0		5.4			
AYLL-70			8.2		9.4			
, 0			٠.٢		7.1			

^{*} See corresponding tables with multiple primaries.

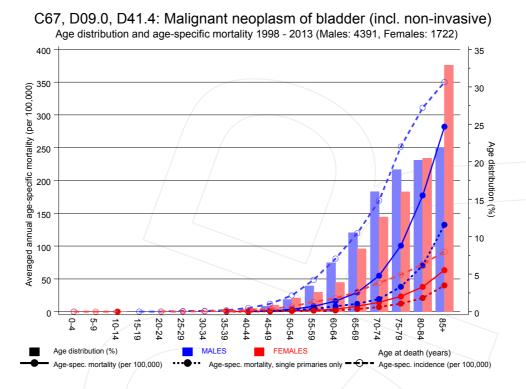
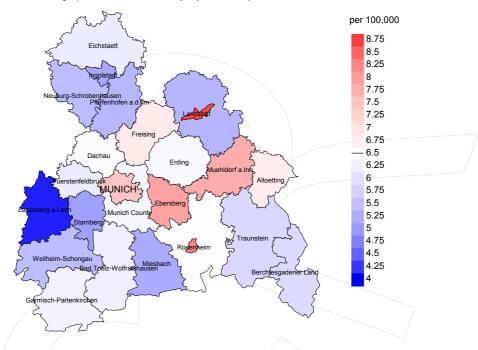


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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



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



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

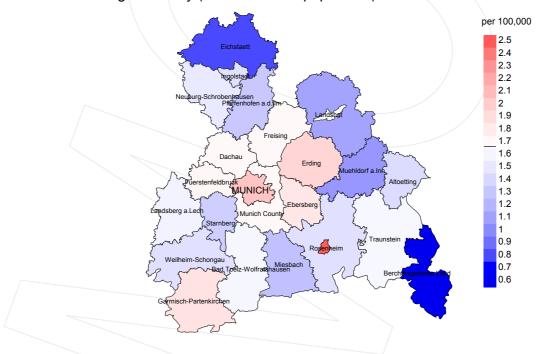
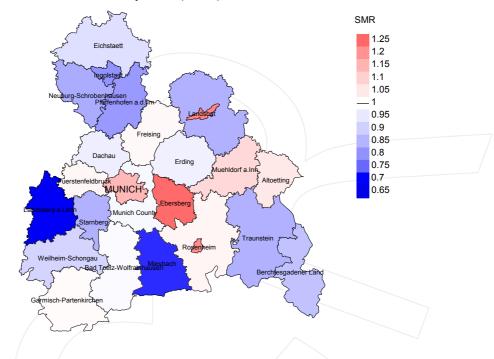


Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2013. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 6.5/100,000 WS N=2,487, females 1.7/100,000 WS N=905).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,928 female residents (averaged) in the period from 2007 to 2013 a total of 24 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 4.1/100,000.

Standardized mortality ratio (SMR) 2007 - 2013: Males



Standardized mortality ratio (SMR) 2007 - 2013: Females

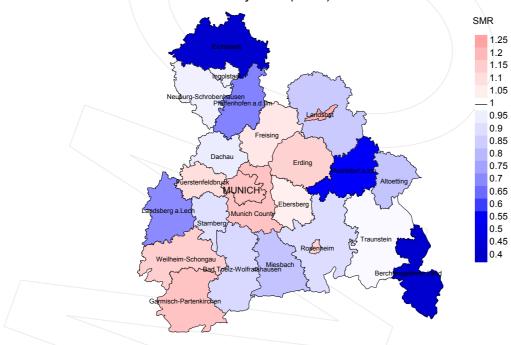


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=2,487, females N=905).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,642 female residents (averaged) in the period from 2007 to 2013 a total of 24 women died from bladder cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.05. Though, the value of this parameter may vary with an underlying probability of 99% between 0.58 and 1.73, and is therefore not statistically striking.

Statistical Notes

In all tables and figures the respective reference values should be carefully considered. The incidence rates include diagnoses (with multiple primary), and death certificate only (DCO) cases. For mortality statistics patients, diagnoses and progressive course of disease are presented. In the calculations, all courses of disease are considered whereby progressions occurred and/or death certificate identified progressive cancers were ascertained. Additionally there are three groups of disease course to consider:

1. All multiple primaries included

The mortality statistic describes the tumor-specific death, independent of any malignancy. The patient perspective, induced secondary malignancies, and the problem of multiple malignancies from the same primary tumor all have reasons for their inclusion.

2. First singular primary (no information about other prior or synchronous malignancy)

The mortality statistic describes the cancer-related death for patients who have no therapeutic restrictions due to a previous or synchronous cancer. These statistics are comparable to studies that have exclusion criteria based on a second malignancy.

3. Single primary (no information about other prior, syn- or metachronous malignancy)

The mortality statistic describes the tumor-specific death that occurs without any impact through secondary primaries, earlier, synchronous, later or induced. Precisely the difference between disease group 1 and 2 highlight the magnitude of the problem of secondary malignancies.

For this reason differences appear concerning official mono-causal mortality statistics. To judge the maximum deviation, 2 further tables are presented. In the first table the distribution of secondary malignancies before, at or after the described cancer are shown, that could be an alternative cause of death. In the second table, the age-specific mortality rates for all courses of disease, without designation of secondary malignancies are shown.

A previously minimally acknowledged statistic is the **age at death**, which allows for a good assessment of the quality of classification of the apparent tumor-specific death. For assumed tumor-independent deaths, the age of death should be estimated from the age of diagnosis and the normal life expectancy, whereas tumor-dependent deaths can be estimated from the age of diagnosis plus the average tumor-specific life expectancy. The comparison of different tumors demonstrates this association, if the causes of cancer and the competing cause of death are independent of each other (e.g. breast and colon versus head/neck and lung).

The index from mortality and incidence (Mortality-Incidence ratio, **MI-index**) is a statistic that allows for the evaluation of the quality of data. For diseases with poor prognoses, comparable values are obtained from all age groups, because to a large extent, the numerator and denominator contain the same cases. For tumors with a good prognosis, increasing and decreasing incidence and age-specific differences in prognosis can more strongly alter the MI- index. Additionally, attention should be paid to the confidence intervals where fewer cases are reported.

The complexity of problems identified here emphasizes the importance of relative survival data for the appropriate analysis of long term results.

As a measurement of the burden of disease, the number of potential life years loss due to premature deaths in a cohort can be calculated (**PYLL**, potential years of life lost, standardized per 100,000 persons or per European standard) as well as the average loss of life years per individual (**AYLL**, average years of life lost). Depending upon the analytic aim (health economy, prevention, health care research) different methods exist for the generation of these measurements. In the results presented here, the age for a premature death is considered to be before 70 years, according to the guidelines of the OECD and the WHO (as seen in the abbreviation PYLL-70 or AYLL-70).

Shortcuts

FRG Federal Republic of Germany

GEKID Association of Population-based Cancer Registries in Germany

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

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

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

BRD-S German standard population

DCO Death certificate only EAR Excess absolute risk

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

ES European standard population (old)

LCL Lower confidence limit

MI-index Ratio between mortality and incidence

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

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

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