Munich Cancer Registry

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

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

Cancer statistics: Baseline statistics

C60-C68: Urologic cancer

Year of diagnosis	1998-2011
Patients	53178
Diseases	55189
Creation date	04/02/2013
Export date	01/03/2013
Population	4.5 m

http://www.tumorregister-muenchen.de/en/facts/base/base_C6068E.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, April 2013

[#] Base data has been collected since 1998. An increase in new diseases is apparent, which is an effect of two extensions in the MCR catchment area (from a base population of 2.51 million to 3.96 in 2002, and to 4.52 million in 2007). Death certificates from 2011 are incorporated into these analyses.

[##] Due to the high frequency and good prognosis of non-malignant skin cancer (C44), no systematic ascertainment is performed for this diagnosis. C44 is not designated as a primary, but rather as a secondary tumor.

[###] DCO (death certificate only) identifies a cancer case that first becomes available to the MCR through the death certificate. A high proportion of DCO cases (≥5%) in particular cancer types indicate insufficient participation of specific cancer specializations.

INCIDENCE

Table 1

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

Year of diagnosis	Cases # n	DCO cases n	Prop. DCO %	Prop. mult. primaries %	Prop. deaths %	Prop. actively followed %
1998	2456	205	8.3	26.7	59.6	98.0
1999	2356	158	6.7	26.2	57.0	98.2
2000	2513	204	8.1	24.6	52.6	98.0
2001	2605	175	6.7	25.4	48.1	97.4
2002	4872	475	9.7	26.0	49.4	97.3
2003	4751	369	7.8	25.1	44.4	96.8
2004	4711	367	7.8	25.3	40.1	96.5
2005	4638	296	6.4	24.0	36.7	95.0
2006	4567	281	6.2	24.1	35.6	90.5
2007	5201	362	7.0	22.7	32.0	74.7 ##
2008	4759	321	6.7	23.3	30.3	57.1
2009	4475	301	6.7	25.3	29.5	63.8
2010	4009	309	7.7	23.5	24.7	90.3
2011	3276	277	8.5	21.6	18.5	70.5 ###
1998-2011	55189	4100	7.4	24.4	38.3	86.1

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	2456	2189	267	89.1
1999	2356	2120	236	90.0
2000	2513	2276	237	90.6
2001	2605	2330	275	89.4
2002	4872	4415	457	90.6
2003	4751	4330	421	91.1
2004	4711	4280	431	90.9
2005	4638	4196	442	90.5
2006	4567	4112	455	90.0
2007	5201	4719	482	90.7
2008	4759	4269	490	89.7
2009	4475	3983	492	89.0
2010	4009	3559	450	88.8
2011	3276	2929	347	89.4
1998-2011	55189	49707	5482	90.1

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	2189	267	197.6	22.7	120.9	10.2	180.2	15.0	238.6	19.2
1999	2120	236	189.4	19.9	113.8	9.5	168.6	13.7	218.3	17.1
2000	2276	237	199.8	19.7	118.9	8.3	176.5	12.5	231.2	16.4
2001	2330	275	201.0	22.6	118.5	9.6	175.6	14.5	227.1	18.8
2002	4415	457	237.0	23.3	132.8	9.9	198.6	14.6	258.1	19.0
2003	4330	421	231.0	21.4	129.2	8.8	190.5	13.1	244.4	17.1
2004	4280	431	227.5	21.8	125.2	8.9	183.0	13.4	234.1	17.5
2005	4196	442	221.5	22.2	119.4	9.3	174.9	13.6	223.1	17.8
2006	4112	455	214.7	22.6	114.1	10.0	167.1	14.3	213.8	18.2
2007	4719	482	213.0	20.9	114.5	8.6	165.9	12.6	209.0	16.5
2008	4269	490	191.8	21.1	99.0	9.0	145.2	13.1	185.3	16.9
2009	3983	492	178.5	21.2	92.7	8.5	134.4	12.5	169.4	16.5
2010	3559	450	157.9	19.2	81.8	7.0	118.3	10.8	148.6	14.2
2011	2929	347	130.0	14.8	66.5	6.7	96.5	9.3	122.0	11.5
1998-2011	49707	5482	197.8	20.8	107.3	8.7	157.0	12.8	200.3	16.6

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	2456	68.2	13.4	1.3	99.8	53.2	61.5	69.4	77.3	84.2
1999	2356	67.7	12.8	1.1	99.5	54.3	60.7	68.8	76.1	83.6
2000	2513	68.3	12.8	0.3	99.7	55.0	61.8	69.2	76.6	83.4
2001	2605	68.1	12.6	1.9	100	54.2	61.7	68.9	76.5	82.5
2002	4872	69.2	12.4	2.4	102	55.9	62.7	69.8	77.2	83.8
2003	4751	68.7	12.4	0.4	103	55.3	62.8	69.0	76.4	83.0
2004	4711	68.5	12.6	0.0	100	55.3	62.6	68.8	76.6	83.0
2005	4638	68.6	12.3	0.7	101	55.0	62.8	68.9	76.5	83.0
2006	4567	68.9	12.4	0.2	101	55.4	63.5	69.3	76.5	83.5
2007	5201	68.4	12.9	0.1	101	54.1	63.2	69.2	76.3	83.3
2008	4759	69.2	12.2	0.6	101	54.9	63.9	70.0	76.7	83.4
2009	4475	68.8	12.7	0.5	105	53.5	62.9	69.9	76.6	83.4
2010	4009	69.0	13.0	5.4	102	53.4	62.8	70.4	77.2	84.4
2011	3276	69.1	13.3	0.5	109	52.9	63.5	70.5	76.8	84.3
1998-2011	55189	68.7	12.7	0.0	109	54.5	62.7	69.5	76.6	83.5

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	2189	67.9	13.4	1.3	99.8	52.6	61.4	69.2	77.0	83.9
1999	2120	67.5	12.8	2.3	99.5	54.5	60.7	68.5	75.5	83.2
2000	2276	67.9	12.8	0.3	99.7	54.3	61.5	68.9	76.2	82.7
2001	2330	67.7	12.4	1.9	100	54.2	61.6	68.4	75.8	81.5
2002	4415	68.9	12.3	19.1	102	55.6	62.6	69.4	76.6	83.1
2003	4330	68.2	12.2	0.4	101	55.2	62.6	68.6	75.7	82.4
2004	4280	68.0	12.4	0.0	100	55.2	62.4	68.4	76.0	82.1
2005	4196	68.2	12.0	0.7	101	55.1	62.7	68.7	75.7	82.3
2006	4112	68.6	12.1	0.8	101	55.7	63.4	69.0	76.1	82.7
2007	4719	68.1	12.6	0.1	101	53.9	62.9	68.9	75.6	82.3
2008	4269	68.9	12.0	1.8	101	54.8	63.7	69.8	76.0	82.8
2009	3983	68.3	12.5	0.5	105	53.3	62.6	69.6	75.8	82.7
2010	3559	68.3	12.9	5.4	102	52.7	62.4	69.9	76.1	83.1
2011	2929	68.9	12.8	1.5	109	52.9	63.4	70.3	76.3	83.6
1998-2011	49707	68.3	12.5	0.0	109	54.5	62.5	69.1	76.0	82.7

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	267	70.5	13.6	2.8	99.7	55.0	62.5	72.3	79.2	86.2
1999	236	69.2	13.5	1.1	94.3	52.6	60.2	71.3	78.6	85.5
2000	237	72.3	11.9	37.2	94.5	58.7	63.4	73.9	80.9	87.4
2001	275	72.0	13.4	30.6	96.4	54.2	64.1	73.7	81.2	88.2
2002	457	72.6	12.8	2.4	99.5	57.6	65.2	73.9	81.9	87.7
2003	421	73.1	13.0	2.5	103	56.8	65.6	74.9	82.2	87.9
2004	431	72.8	13.1	18.5	99.0	56.5	64.9	74.6	82.2	87.9
2005	442	72.1	14.6	4.2	98.8	54.0	64.2	74.8	81.8	88.3
2006	455	71.4	15.0	0.2	96.7	52.8	64.6	74.0	81.9	87.5
2007	482	72.2	14.7	1.2	99.1	55.6	67.0	74.5	82.2	87.1
2008	490	71.8	13.7	0.6	97.0	55.7	64.6	73.6	81.9	86.8
2009	492	72.5	13.7	2.5	103	55.6	66.3	74.3	82.2	87.2
2010	450	74.6	13.1	5.4	100	56.2	68.3	75.8	84.6	89.6
2011	347	70.8	16.7	0.5	97.6	52.7	64.3	73.3	81.7	88.3
1998-2011	5482	72.2	13.9	0.2	103	55.4	64.8	74.1	81.9	87.6

Table 4

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

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	69	0.1	0.1	40	0.1	0.1	29	0.5	0.5
5-9	18	0.0	0.2	10	0.0	0.1	8	0.1	0.7
10-14	7	0.0	0.2	5	0.0	0.1	2	0.0	0.7
15-19	66	0.1	0.3	63	0.1	0.2	3	0.1	0.8
20-24	217	0.4	0.7	210	0.4	0.7	7	0.1	0.9
25-29	372	0.7	1.4	364	0.7	1.4	8	0.1	1.0
30-34	522	0.9	2.3	497	1.0	2.4	25	0.5	1.5
35-39	725	1.3	3.6	671	1.3	3.7	54	1.0	2.5
40-44	716	1.3	4.9	649	1.3	5.0	67	1.2	3.7
45-49	1080	2.0	6.9	954	1.9	7.0	126	2.3	6.0
50-54	1976	3.6	10.5	1778	3.6	10.5	198	3.6	9.6
55-59	4353	7.9	18.3	3999	8.0	18.6	354	6.5	16.1
60-64	7804	14.1	32.5	7289	14.7	33.3	515	9.4	25.5
65-69	10800	19.6	52.0	10099	20.3	53.6	701	12.8	38.3
70-74	9934	18.0	70.0	9124	18.4	71.9	810	14.8	53.0
75-79	7398	13.4	83.5	6500	13.1	85.0	898	16.4	69.4
80-84	4838	8.8	92.2	4048	8.1	93.1	790	14.4	83.8
85+	4294	7.8	100.0	3407	6.9	100.0	887	16.2	100.0
All ages	55189	100.0		49707	100.0		5482	100.0	

Included in the statistics are 25.8% multiple primaries in males and 33.4% in females.

Table 5

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

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males DCO rate n=3351 %	Females DCO rate n=667 %	Males Prop.all cancers n=132509 %	Females Prop.all cancers n=129521 %
0- 4	39	28	3.1	2.3			13.8	13.5
5- 9	10	7	0.8	0.6			6.5	6.7
10-14	5	2	0.4	0.2			3.8	1.3
15-19	63	3	4.8	0.2			21.6	1.3
20-24	208	7	14.0	0.5			41.0	1.6
25-29	361	8	21.4	0.5			44.8	0.9
30-34	493	25	25.3	1.3	0.2		37.8	1.4
35-39	666	52	30.5	2.5	0.2		33.7	1.6
40-44	640	67	28.7	3.2	0.8		23.2	1.3
45-49	944	124	48.6	6.5	0.6	0.8	21.1	1.7
50-54	1741	196	104.3	11.4	0.6	0.5	23.9	2.1
55-59	3928	351	251.8	21.4	0.6	2.3	31.5	3.0
60-64	7161	510	470.5	31.8	1.1	1.0	38.1	3.4
65-69	9894	688	726.0	46.2	1.7	4.1	42.3	4.2
70-74	8905	795	863.4	64.4	2.7	5.4	41.1	5.3
75-79	6352	884	940.0	88.9	7.8	8.1	37.7	6.0
80-84	3929	778	967.3	97.8	18.9	17.9	35.7	5.8
85+	3338	881	1203.4	118.6	46.9	42.0	40.3	6.1
All ages	48677	5406			6.9	12.3	36.7	4.2
Incidence								
Raw			193.7	20.5				
WS			105.1	8.6				
ES			153.8	12.7				
BRD-S			196.1	16.4				

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

Table 6a

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

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C03-C06	Oral cavity	19	20.9	0.9	0.5	1.4		-0.1	5.3
C07-C08	Salivary gland	15	6.2	2.4	1.4	4.0	#	0.6	20.0
C09-C10	Oropharynx	30	25.8	1.2	0.8	1.7		0.3	
C12-C13	Hypopharynx	18	14.5	1.2	0.7	2.0		0.2	5.6
C15	Oesophagus	76	47.3	1.6	1.3	2.0	#	1.9	11.8
C16	Stomach	187	125.9	1.5	1.3	1.7	#	4.0	9.1
C17	Small intestine	34	12.4	2.7	1.9	3.8	#	1.4	2.9
C18	Colon	486	296.6	1.6	1.5	1.8	#	12.4	4.5
C19-C20	Rectum	254	161.6	1.6	1.4	1.8	#	6.1	4.3
C22	Liver	97	78.1	1.2	1.0	1.5	#	1.2	16.5
C23-C24	Bile	36	27.7	1.3	0.9	1.8		0.5	19.4
C25	Pancreas	204	100.9	2.0	1.8	2.3	#	6.8	25.5
C32	Larynx	40	28.1	1.4	1.0	1.9	#	0.8	5.0
C33-C34	Lung	564	342.1	1.6	1.5	1.8	#	14.6	10.1
C38,C45	Mesothelioma	27	18.8	1.4	0.9	2.1		0.5	7.4
C40-C41	Bone	9	1.9	4.8	2.2	9.1	#	0.5	
C43	Malign. melanoma	222	102.7	2.2	1.9	2.5	#	7.8	1.8
C46,C49	Soft tissue	22	14.6	1.5	0.9	2.3		0.5	
C48	Peritoneal	10	1.9	5.2	2.5	9.6	#	0.5	10.0
C50	Breast	9	7.1	1.3	0.6	2.4		0.1	
C60	Penis	13	6.2	2.1	1.1	3.6	#	0.4	
C61	Prostate	638	860.3	0.7	0.7	0.8	#	-14.6	5.8
C62	Testis	54	6.1	8.8	6.6	11.5	#	3.1	1.9
C64	Kidney	311	98.2	3.2	2.8	3.5	#	14.0	6.4
C65	Renal pelvis	59	11.6	5.1	3.9	6.6	#	3.1	
C66	Ureter	43	6.4	6.7	4.8	9.0	#	2.4	
C67	Bladder	347	127.5	2.7	2.4	3.0	#	14.4	5.2
C68	Urethra	17	1.1	15.4	9.0	24.7	#	1.0	
C69	Eye melanoma	10	3.2	3.2	1.5	5.8	#	0.4	
C70-C72	CNS cancer	66	36.8	1.8	1.4	2.3	#	1.9	4.5
C73	Thyroid	35	16.4	2.1	1.5	3.0	#	1.2	
C76-C79	CUP	87	48.8	1.8	1.4	2.2	#	2.5	5.7
C81	Hodgkin lymphoma	9	5.0	1.8	0.8	3.4		0.3	
C82-C85	NHL	200	111.7	1.8	1.6	2.1	#	5.8	5.5
C90	Mult. myeloma	75	36.7	2.0	1.6	2.6	#	2.5	12.0
C91-C96	Leukaemia	93	45.1	2.1	1.7	2.5	#	3.1	34.4
Other primaries		47	32.1	1.5	1.1	1.9	#	1.0	23.4
Not observed		0	1.2	0.0	0.0	3.2		-0.1	
All mult. primaries		4463	2889.7	1.5	1.5	1.6	#	103.2	7.9

Patients	34734
Mean age at second malignancy (years)	72.6
Person-years	152487
Mean observation time (years)	4.4
Median observation time (years)	3.8

The occurrence of second malignancy is statistically significant.

Observed second primaries with count 1 to 8 are pooled in category "Other primaries".

Table 6b

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

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C03-C06	Oral cavity	2	0.9	2.2	0.3	7.9		0.8	
C15	Oesophagus	2	0.8	2.4	0.3	8.5		0.9	
C16	Stomach	13	6.8	1.9	1.0	3.3	#	4.8	7.7
C17	Small intestine	2	0.7	3.0	0.4	10.7		1.0	
C18	Colon	33	18.4	1.8	1.2	2.5	#	11.2	6.1
C19-C20	Rectum	18	7.7	2.3	1.4	3.7	#	7.9	5.6
C22	Liver	2	1.9	1.0	0.1	3.7		0.0	50.0
C23-C24	Bile	10	2.7	3.7	1.8	6.8	#	5.6	30.0
C25	Pancreas	21	7.7	2.7	1.7	4.2	#	10.3	28.6
C26	GI cancer	2	0.4	5.7	0.7	20.5		1.3	
C33-C34	Lung	43	11.1	3.9	2.8	5.2	#	24.6	11.6
C43	Malign. melanoma	4	5.2	0.8	0.2	2.0		-0.9	25.0
C46,C49	Soft tissue	2	0.9	2.2	0.3	7.9		0.8	
C48	Peritoneal	2	0.5	4.1	0.5	14.9		1.2	
C50	Breast	89	46.3	1.9	1.5	2.4	#	32.9	9.0
C53	Cervix uteri	12	2.0	6.0	3.1	10.6	#	7.7	8.3
C54	Corpus uteri	16	9.0	1.8	1.0	2.9	#	5.4	
C56	Ovary	8	7.0	1.1	0.5	2.2		0.7	12.5
C64	Kidney	55	4.3	12.8	9.7	16.7	#	39.1	14.5
C65	Renal pelvis	17	0.5	33.2	19.3	53.2	#	12.7	
C66	Ureter	14	0.2	58.5	32.0	98.2	#	10.6	
C67	Bladder	35	3.3	10.5	7.3	14.6	#	24.4	2.9
C68	Urethra	2	0.1	35.8	4.3	129.3	#	1.5	
C70-C72	CNS cancer	2	2.4	0.8	0.1	3.1		-0.3	100.0
C73	Thyroid	14	2.5	5.7	3.1	9.6	#	8.9	
C76-C79	CUP	6	3.1	1.9	0.7	4.2		2.2	16.7
C82-C85	NHL	13	6.5	2.0	1.1	3.4	#	5.0	15.4
C91-C96	Leukaemia	8	2.7	3.0	1.3	5.9	#	4.1	25.0
Other primaries		9	7.6	1.2	0.5	2.3		1.1	
Not observed		0	1.8	0.0	0.0	2.1		-1.4	
All mult. primaries		456	164.9	2.8	2.5	3.0	#	224.3	10.1

Patients	3727
Mean age at second malignancy (years)	73.0
Person-years	12978
Mean observation time (years)	3.5
Median observation time (years)	2.4

The occurrence of second malignancy is statistically significant.

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

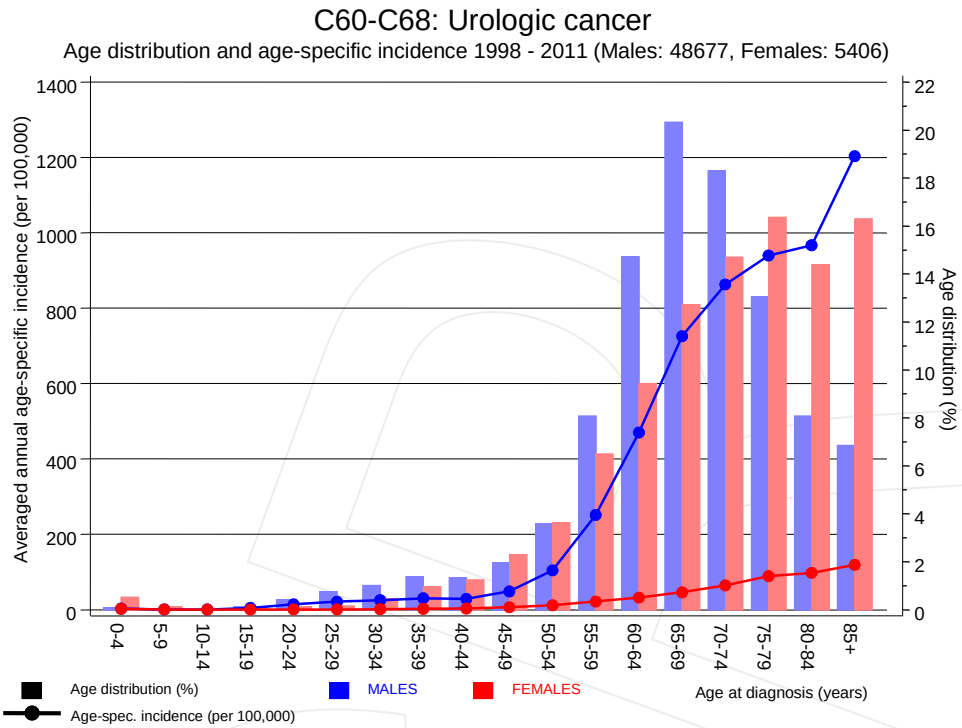


Figure 7. Age distribution and age-specific incidence

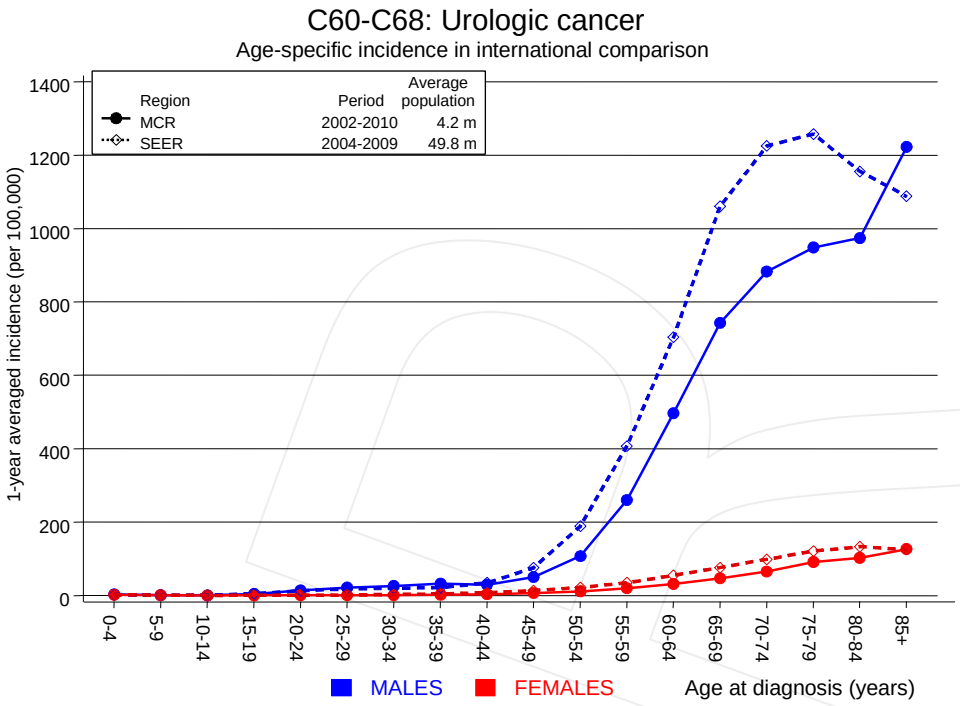


Figure 7a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

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.

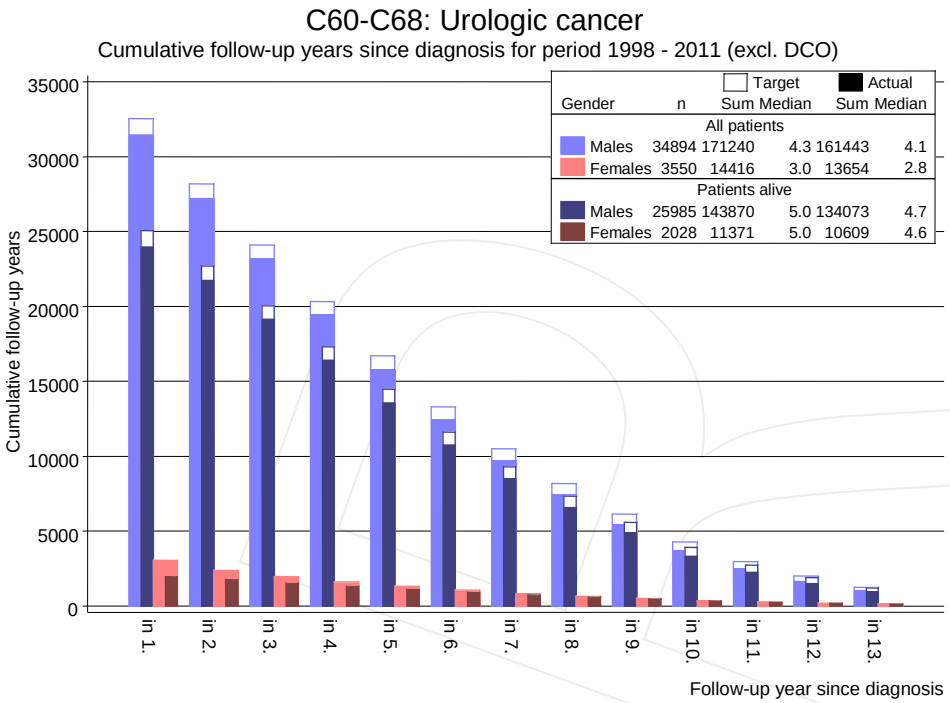
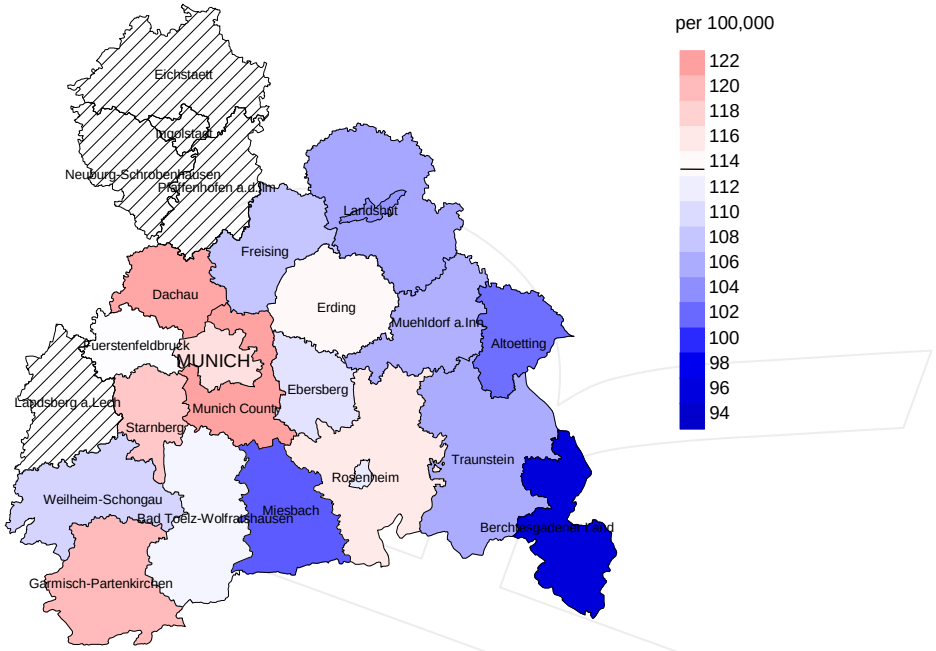


Figure 8. Cumulative follow-up years depending on time since diagnosis

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

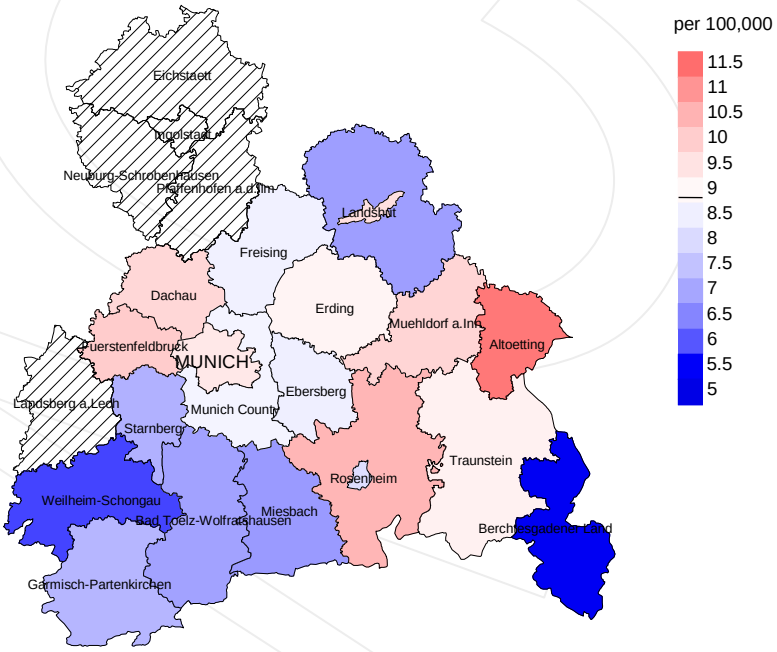
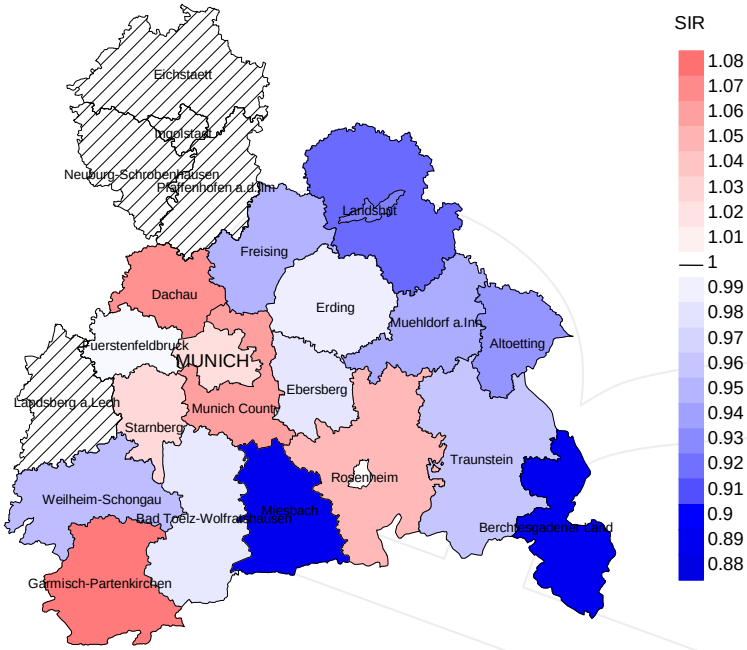


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 113.6/100,000 WS N=24,207, females 8.9/100,000 WS N=2,548). 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 68 women were identified with newly diagnosed urologic cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 8.5/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 5.7 and 13.2/100,000.

Standardized incidence ratio (SIR) 2003 - 2008: Males



Standardized incidence ratio (SIR) 2003 - 2008: Females

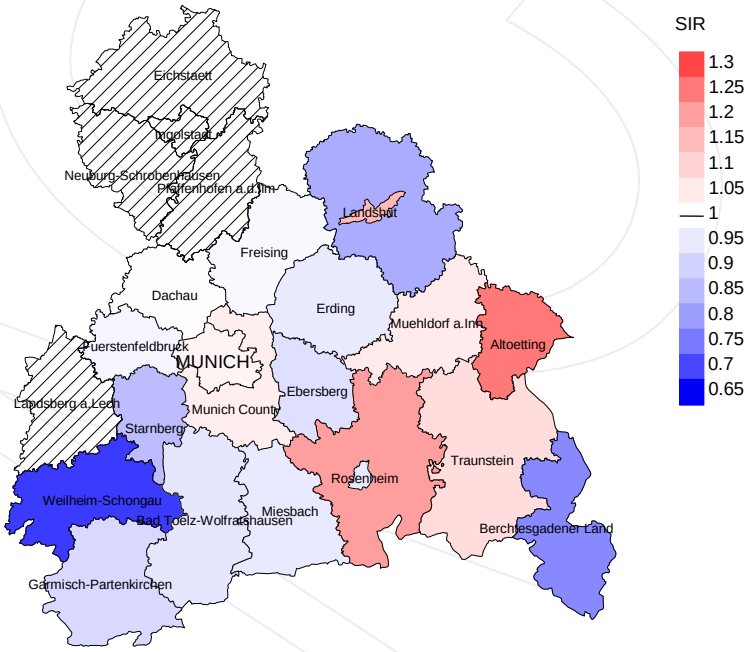


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=24,207, females N=2,548). 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 68 women were identified with newly diagnosed urologic cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.93. Though, the value of this parameter may vary with an underlying probability of 99% between 0.66 and 1.26, 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	2456	98.0	8.3	1463	59.6	95.4
1999	2356	98.2	6.7	1344	57.0	95.6
2000	2513	98.0	8.1	1323	52.6	95.8
2001	2605	97.4	6.7	1253	48.1	96.4
2002	4872	97.3	9.7	2407	49.4	97.3
2003	4751	96.8	7.8	2111	44.4	98.1
2004	4711	96.5	7.8	1889	40.1	98.4
2005	4638	95.0	6.4	1704	36.7	97.5
2006	4567	90.5	6.2	1628	35.6	98.7
2007	5201	74.7	7.0	1666	32.0	98.4
2008	4759	57.1	6.7	1440	30.3	99.4
2009	4475	63.8	6.7	1318	29.5	98.6
2010	4009	90.3	7.7	989	24.7	98.1
2011	3276	70.5	8.5	607	18.5	96.7
1998-2011	55189	86.1	7.4	21142	38.3	97.6

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	2456	1110	93.7	334	13.6
1999	2356	1046	94.2	283	12.0
2000	2513	1057	95.1	289	11.5
2001	2605	1114	93.8	279	10.7
2002	4872	1653	95.9	670	13.8
2003	4751	1795	97.1	570	12.0
2004	4711	1779	96.9	528	11.2
2005	4638	1900	96.5	461	9.9
2006	4567	1996	97.0	471	10.3
2007	5201	2261	97.4	579	11.1
2008	4759	2380	98.9	540	11.3
2009	4475	2467	98.6	561	12.5
2010	4009	2615	98.5	554	13.8
2011	3276	2483	99.0	443	13.5
1998-2011	55189	25656	97.1	6562	11.9

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	1110	59.5	40.5	80.8
1999	1046	63.6	36.4	79.4
2000	1057	62.7	37.3	80.1
2001	1114	60.3	39.7	79.3
2002	1653	65.0	35.0	81.1
2003	1795	66.4	33.6	79.3
2004	1779	63.7	36.3	78.3
2005	1900	65.3	34.7	77.0
2006	1996	65.0	35.0	77.4
2007	2261	66.7	33.3	77.2
2008	2380	63.7	36.3	74.3
2009	2467	62.5	37.5	74.4
2010	2615	62.9	37.1	74.6
2011	2483	61.4	38.6	72.9
1998-2011	25656	63.7	36.3	76.9

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	946	77.7	75.9	80.2	77.3
1999	892	77.3	75.2	80.7	76.9
2000	898	77.9	76.2	80.6	77.6
2001	952	77.7	75.7	80.6	77.3
2002	1397	77.6	76.0	80.4	77.0
2003	1534	77.4	75.6	80.9	76.6
2004	1498	77.9	75.8	81.2	77.1
2005	1631	77.9	75.8	81.4	76.7
2006	1701	77.6	76.0	80.5	77.0
2007	1941	77.8	76.3	80.6	77.0
2008	2079	78.2	76.2	81.6	77.0
2009	2136	78.2	75.9	81.8	77.1
2010	2239	78.5	76.7	81.5	77.6
2011	2186	78.9	76.9	81.9	77.7
1998-2011	22030	78.0	76.1	81.1	77.1

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	164	79.9	78.3	82.7	79.8
1999	154	77.6	76.4	81.2	77.5
2000	159	77.3	76.6	79.3	77.5
2001	162	80.0	78.0	84.4	79.1
2002	256	77.9	76.5	81.7	77.5
2003	261	78.1	77.2	80.1	77.6
2004	281	79.9	78.4	83.3	79.5
2005	269	79.0	77.5	83.4	78.1
2006	295	79.2	77.6	82.9	78.3
2007	320	79.4	78.1	82.6	79.1
2008	301	78.8	76.9	83.6	77.8
2009	331	78.6	76.6	83.8	77.4
2010	376	80.3	78.3	84.5	79.5
2011	297	80.2	76.4	86.7	78.0
1998-2011	3626	79.1	77.4	83.2	78.3

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	557	50.3	0.26	28.0	0.23	47.1	0.27	70.1	0.30
1999	551	49.2	0.26	27.0	0.24	45.3	0.27	66.9	0.31
2000	546	47.9	0.24	25.7	0.22	43.8	0.25	65.0	0.29
2001	561	48.4	0.24	25.9	0.22	43.8	0.25	64.0	0.29
2002	891	47.8	0.21	24.1	0.19	40.6	0.21	58.9	0.23
2003	1005	53.6	0.24	26.4	0.21	44.1	0.24	64.7	0.27
2004	939	49.9	0.22	23.7	0.19	39.7	0.22	58.8	0.26
2005	1041	55.0	0.25	25.1	0.21	42.2	0.25	63.4	0.29
2006	1095	57.2	0.27	26.0	0.23	43.5	0.27	63.5	0.30
2007	1285	58.0	0.28	25.7	0.23	43.3	0.27	63.4	0.31
2008	1299	58.4	0.31	24.8	0.26	41.6	0.29	61.8	0.34
2009	1305	58.5	0.34	24.7	0.27	40.8	0.31	59.2	0.36
2010	1394	61.9	0.40	25.0	0.31	41.9	0.36	61.5	0.42
2011	1338	59.4	0.47	24.0	0.37	40.4	0.43	59.0	0.50
1998-2011	13807	54.9	0.28	25.1	0.24	42.2	0.27	62.0	0.32

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	105	8.9	0.40	2.9	0.29	4.9	0.33	7.1	0.37
1999	114	9.6	0.49	3.4	0.36	5.5	0.40	7.7	0.46
2000	117	9.7	0.49	3.4	0.41	5.5	0.44	7.8	0.48
2001	111	9.1	0.41	3.0	0.32	5.0	0.35	7.3	0.39
2002	184	9.4	0.41	3.3	0.34	5.2	0.36	7.3	0.39
2003	187	9.5	0.45	3.2	0.37	5.1	0.40	7.2	0.43
2004	198	10.0	0.47	3.2	0.36	5.1	0.39	7.3	0.43
2005	202	10.2	0.47	3.3	0.37	5.3	0.40	7.4	0.43
2006	204	10.2	0.46	3.3	0.34	5.3	0.38	7.5	0.42
2007	225	9.7	0.47	3.0	0.35	5.0	0.40	7.3	0.44
2008	218	9.4	0.46	3.1	0.35	4.9	0.38	6.8	0.42
2009	240	10.3	0.49	3.4	0.40	5.4	0.44	7.6	0.46
2010	253	10.8	0.57	3.2	0.47	5.3	0.50	7.7	0.55
2011	187	8.0	0.55	2.6	0.39	4.2	0.46	5.9	0.52
1998-2011	2545	9.7	0.47	3.1	0.36	5.1	0.40	7.2	0.44

Table 13

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

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	1	0.0	0.0	1	0.0	0.0			0.0
5-9	6	0.0	0.0	3	0.0	0.0	3	0.1	0.1
10-14	0	0.0	0.0			0.0			0.1
15-19	1	0.0	0.0	1	0.0	0.0			0.1
20-24	12	0.1	0.1	11	0.1	0.1	1	0.0	0.2
25-29	9	0.1	0.2	7	0.0	0.2	2	0.1	0.2
30-34	9	0.1	0.2	8	0.1	0.2	1	0.0	0.3
35-39	32	0.2	0.4	28	0.2	0.4	4	0.2	0.4
40-44	56	0.3	0.7	46	0.3	0.7	10	0.4	0.8
45-49	128	0.7	1.4	104	0.7	1.4	24	0.9	1.7
50-54	267	1.5	3.0	212	1.4	2.8	55	2.1	3.8
55-59	593	3.4	6.3	503	3.4	6.2	90	3.4	7.2
60-64	1136	6.5	12.8	988	6.6	12.8	148	5.6	12.8
65-69	2074	11.8	24.6	1816	12.2	25.0	258	9.7	22.5
70-74	2863	16.3	40.9	2505	16.8	41.8	358	13.5	36.0
75-79	3442	19.6	60.5	2972	19.9	61.7	470	17.7	53.8
80-84	3419	19.5	80.0	2864	19.2	80.9	555	21.0	74.7
85+	3518	20.0	100.0	2849	19.1	100.0	669	25.3	100.0
All ages	17566	100.0		14918	100.0		2648	100.0	

Included in the statistics are 25.8% multiple primaries in males and 33.4% in females.

Table 14

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

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4	1		0.1	0.03	0.0		3.4	
5- 9	3	3	0.2	0.30	0.2	0.38	9.7	8.3
10-14			0.0		0.0			
15-19	1		0.1	0.02	0.0		2.6	
20-24	11	1	0.7	0.05	0.1	0.14	13.8	2.3
25-29	7	2	0.4	0.02	0.1	0.25	8.0	2.0
30-34	8	1	0.4	0.02	0.1	0.04	4.8	0.5
35-39	28	4	1.3	0.04	0.2	0.07	7.7	0.9
40-44	46	10	2.1	0.07	0.5	0.15	6.1	1.0
45-49	104	24	5.4	0.11	1.3	0.19	6.8	1.4
50-54	212	55	12.7	0.12	3.2	0.28	7.5	2.1
55-59	503	90	32.2	0.13	5.5	0.25	9.8	2.2
60-64	988	148	64.9	0.14	9.2	0.29	12.8	2.7
65-69	1816	258	133.2	0.18	17.3	0.37	17.5	3.7
70-74	2505	358	242.9	0.27	29.0	0.44	22.6	4.5
75-79	2972	470	439.8	0.46	47.3	0.52	27.2	5.2
80-84	2864	555	705.1	0.71	69.8	0.70	32.7	5.8
85+	2849	669	1027.1	0.84	90.1	0.75	40.0	5.9
All ages	14918	2648					22.2	4.3
Mortality								
Raw			59.4	0.30	10.1	0.48		
WS			27.1	0.25	3.3	0.38		
ES			45.5	0.29	5.3	0.41		
BRD-S			67.0	0.33	7.5	0.45		
PYLL-70								
per 100,000			122.6		22.8			
ES			106.7		19.7			
AYLL-70			7.5		8.6			

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

Table 15a

Multiple primaries in deaths in period 1998-2011
MALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C09-C10	Oropharynx	60	0.9	32	53.3	3	5.0	25	41.7
C15	Oesophagus	119	1.8	22	18.5	9	7.6	88	73.9
C16	Stomach	318	4.7	75	23.6	28	8.8	215	67.6
C18	Colon	684	10.2	262	38.3	65	9.5	357	52.2
C19-C20	Rectum	382	5.7	146	38.2	43	11.3	193	50.5
C22	Liver	163	2.4	16	9.8	13	8.0	134	82.2
C23-C24	Bile	72	1.1	9	12.5	5	6.9	58	80.6
C25	Pancreas	307	4.6	18	5.9	21	6.8	268	87.3
C32	Larynx	85	1.3	49	57.6	6	7.1	30	35.3
C33-C34	Lung	980	14.6	131	13.4	72	7.3	777	79.3
C43	Malign. melanoma	258	3.8	134	51.9	9	3.5	115	44.6
C44	Skin others	292	4.4	96	32.9	18	6.2	178	61.0
C61	Prostate	606	9.0			105	17.3	501	82.7
C64	Kidney	235	3.5			48	20.4	187	79.6
C65	Renal pelvis	125	1.9			18	14.4	107	85.6
C66	Ureter	75	1.1			16	21.3	59	78.7
C67	Bladder	614	9.2			170	27.7	444	72.3
C70-C72	CNS cancer	144	2.1	22	15.3	8	5.6	114	79.2
C76-C79	CUP	156	2.3	29	18.6	19	12.2	108	69.2
C82-C85	NHL	266	4.0	82	30.8	42	15.8	142	53.4
C90	Mult. myeloma	112	1.7	22	19.6	11	9.8	79	70.5
C91-C96	Leukaemia	197	2.9	18	9.1	16	8.1	163	82.7
Other primaries		454	6.8	130	28.6	42	9.3	282	62.1
All mult. primaries		6704	100.0	1293	19.3	787	11.7	4624	69.0

Multiple primaries with number of cases n<60 are pooled in category "Other primaries".

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

Table 15b

Multiple primaries in deaths in period 1998-2011
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C16	Stomach	35	3.0	10	28.6	8	22.9	17	48.6
C18	Colon	94	8.2	41	43.6	11	11.7	42	44.7
C19-C20	Rectum	35	3.0	16	45.7	4	11.4	15	42.9
C22	Liver	12	1.0	2	16.7	4	33.3	6	50.0
C23-C24	Bile	15	1.3			3	20.0	12	80.0
C25	Pancreas	44	3.8	2	4.5	6	13.6	36	81.8
C33-C34	Lung	93	8.1	11	11.8	11	11.8	71	76.3
C43	Malign. melanoma	21	1.8	12	57.1	1	4.8	8	38.1
C44	Skin others	20	1.7	7	35.0	1	5.0	12	60.0
C50	Breast	229	19.9	138	60.3	17	7.4	74	32.3
C53	Cervix uteri	66	5.7	51	77.3	6	9.1	9	13.6
C54	Corpus uteri	49	4.3	35	71.4	8	16.3	6	12.2
C56	Ovary	32	2.8	14	43.8	6	18.8	12	37.5
C64	Kidney	47	4.1			12	25.5	35	74.5
C65	Renal pelvis	32	2.8			7	21.9	25	78.1
C66	Ureter	23	2.0			10	43.5	13	56.5
C67	Bladder	99	8.6			9	9.1	90	90.9
C68	Urinary org.	10	0.9	4	40.0	1	10.0	5	50.0
C70-C72	CNS cancer	18	1.6	4	22.2	3	16.7	11	61.1
C73	Thyroid	23	2.0	12	52.2	1	4.3	10	43.5
C76-C79	CUP	24	2.1	4	16.7	1	4.2	19	79.2
C82-C85	NHL	28	2.4	10	35.7	6	21.4	12	42.9
C91-C96	Leukaemia	26	2.3	2	7.7	4	15.4	20	76.9
Other primaries		75	6.5	29	38.7	11	14.7	35	46.7
All mult. primaries		1150	100.0	404	35.1	151	13.1	595	51.7

Multiple primaries with number of cases n<10 are pooled in category "Other primaries".

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

Table 16

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

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4			0.0		0.0			
5- 9	2	1	0.2	0.20	0.1	0.17	6.9	3.0
10-14			0.0		0.0			
15-19	1		0.1	0.02	0.0		2.9	
20-24	11	1	0.7	0.05	0.1	0.14	14.7	2.6
25-29	6	2	0.4	0.02	0.1	0.25	7.4	2.1
30-34	8	1	0.4	0.02	0.1	0.04	4.9	0.6
35-39	27	4	1.2	0.04	0.2	0.09	7.9	1.0
40-44	39	7	1.7	0.07	0.3	0.13	5.6	0.8
45-49	93	19	4.8	0.11	1.0	0.17	6.7	1.3
50-54	164	43	9.8	0.10	2.5	0.26	6.6	1.9
55-59	406	73	26.0	0.11	4.5	0.26	9.1	2.1
60-64	808	101	53.1	0.13	6.3	0.25	12.4	2.2
65-69	1425	210	104.6	0.16	14.1	0.39	16.9	3.7
70-74	1901	251	184.3	0.25	20.3	0.41	21.6	3.9
75-79	2341	354	346.4	0.45	35.6	0.51	27.9	4.9
80-84	2210	430	544.1	0.72	54.1	0.74	33.2	5.6
85+	2267	530	817.3	0.85	71.4	0.75	41.2	5.7
All ages	11709	2027					21.6	4.1
Mortality								
Raw			46.6	0.28	7.7	0.47		
WS			21.4	0.23	2.5	0.36		
ES			35.8	0.27	4.0	0.40		
BRD-S			52.6	0.31	5.7	0.44		
PYLL-70								
per 100,000			100.5		17.4			
ES			87.3		14.9			
AYLL-70			7.6		8.5			

* See corresponding tables with multiple primaries.

Table 17

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

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4			0.0		0.0			
5- 9	2	1	0.2	0.20	0.1	0.17	7.1	3.1
10-14			0.0		0.0			
15-19	1		0.1	0.02	0.0		2.9	
20-24	10	1	0.7	0.05	0.1	0.14	14.3	2.8
25-29	5	2	0.3	0.02	0.1	0.25	6.7	2.2
30-34	8		0.4	0.02	0.0		5.0	
35-39	24	2	1.1	0.04	0.1	0.05	7.4	0.5
40-44	33	5	1.5	0.06	0.2	0.10	5.0	0.6
45-49	82	16	4.2	0.10	0.8	0.16	6.3	1.2
50-54	131	40	7.8	0.09	2.3	0.26	5.8	2.0
55-59	330	61	21.2	0.10	3.7	0.24	8.1	2.0
60-64	615	81	40.4	0.11	5.1	0.24	10.7	2.0
65-69	1048	175	76.9	0.14	11.8	0.36	14.4	3.6
70-74	1329	190	128.9	0.20	15.4	0.35	17.9	3.5
75-79	1581	279	234.0	0.35	28.1	0.44	23.2	4.6
80-84	1556	344	383.1	0.57	43.3	0.64	29.1	5.3
85+	1728	446	623.0	0.69	60.1	0.66	38.5	5.6
All ages	8483	1643					18.4	3.8
Mortality								
Raw			33.8	0.22	6.2	0.42		
WS			15.6	0.19	2.0	0.32		
ES			26.1	0.22	3.3	0.36		
BRD-S			37.9	0.25	4.6	0.39		
PYLL-70								
per 100,000			80.7		14.5			
ES			70.4		12.5			
AYLL-70			8.0		8.5			

* See corresponding tables with multiple primaries.

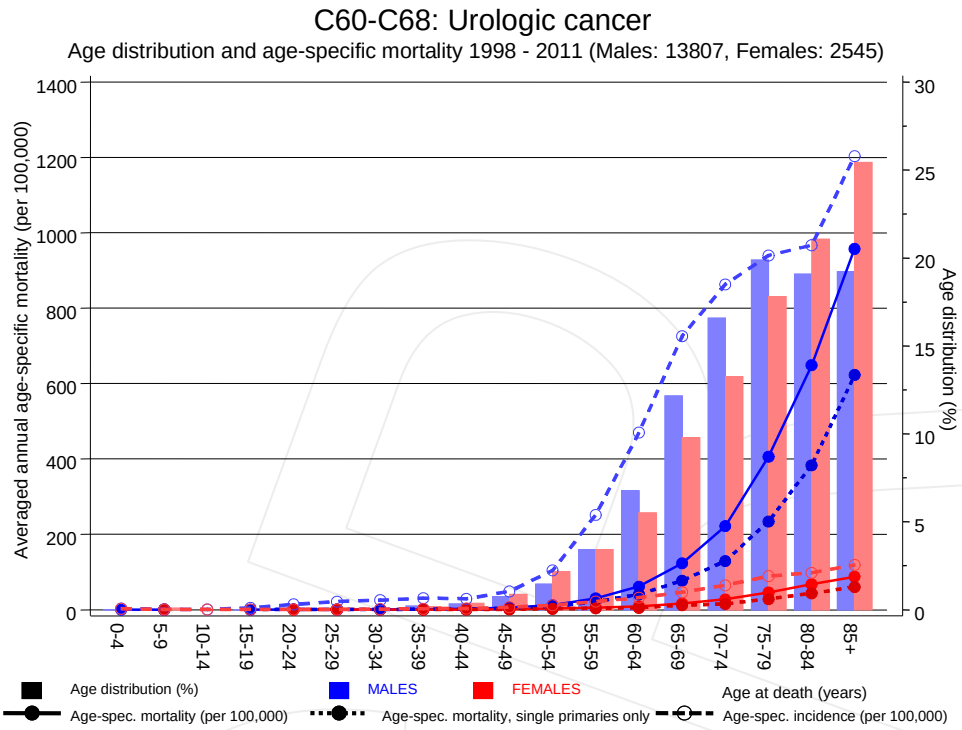
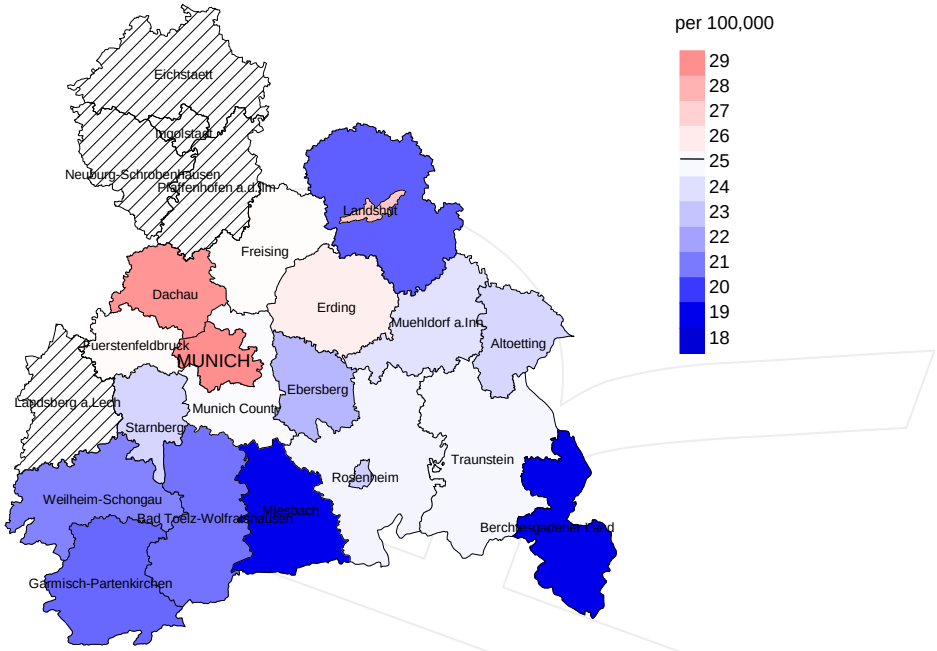


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

The difference between age at diagnosis (Table 3) and age at urologic 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

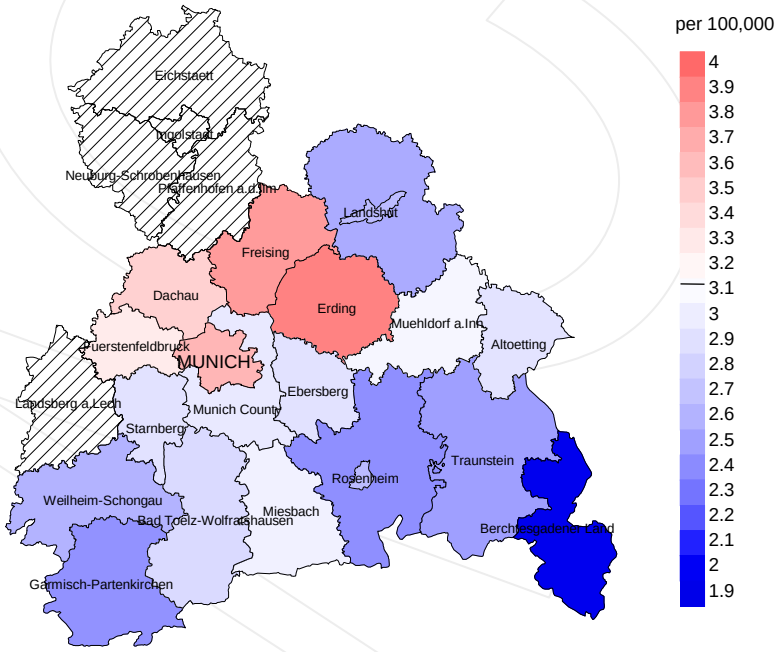
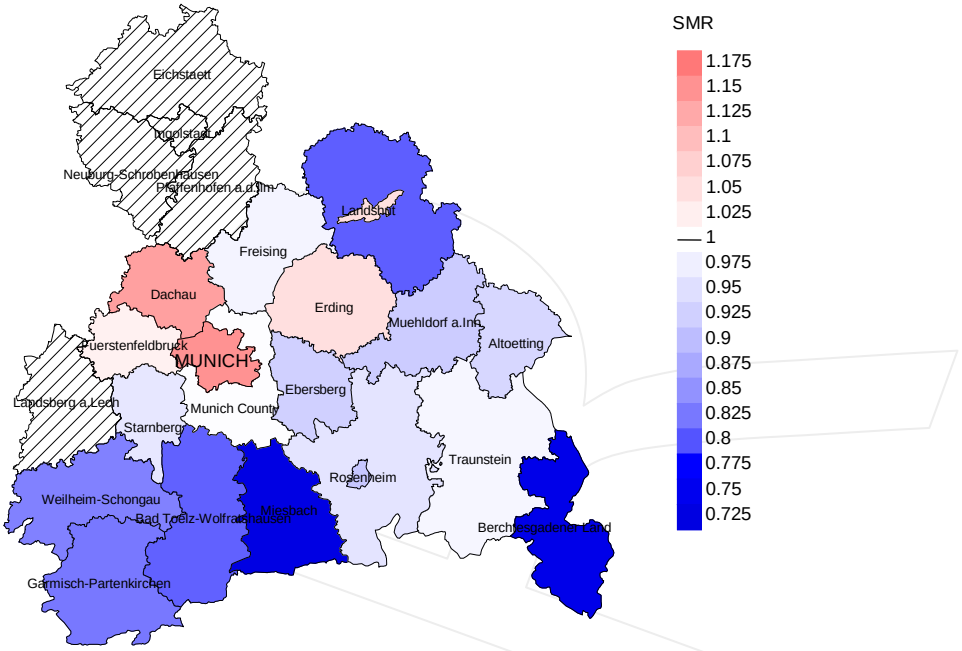


Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2003 to 2008. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 25.2/100,000 WS N=6,394, females 3.1/100,000 WS N=1,175). 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 30 women died from urologic cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 2.9/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 1.6 and 4.9/100,000.

Standardized mortality ratio (SMR) 2003 - 2008: Males



Standardized mortality ratio (SMR) 2003 - 2008: Females

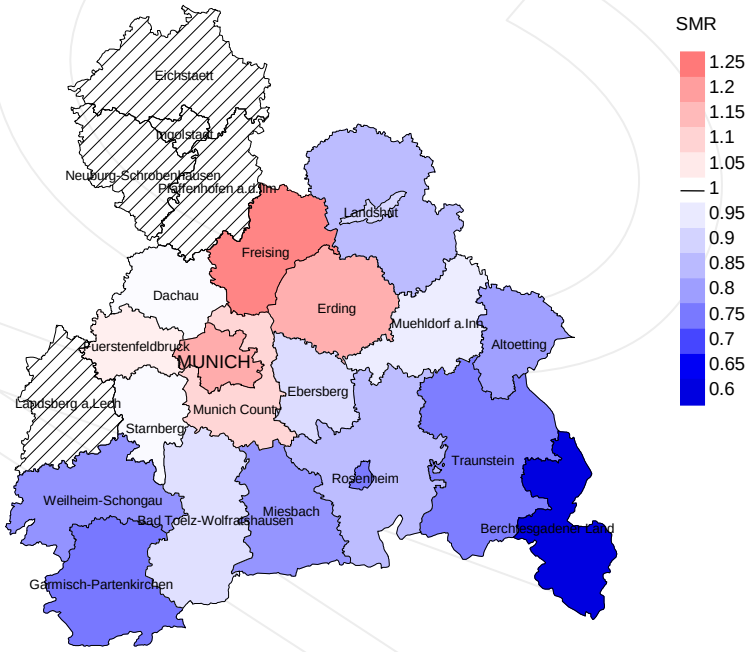


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=6,394, females N=1,175). 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 30 women died from urologic cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.92. Though, the value of this parameter may vary with an underlying probability of 99% between 0.54 and 1.45, 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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