Munich Cancer Registry

- Survival
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ICD-10 C64-C66, C68: Urinary tract cancer

Incidence and Mortality

Year of diagnosis	1998-2014
Patients	11,729
Diseases	12,083
Creation date	04/13/2016
Export date	12/23/2015
Population	4.64 m

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

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

http://www.tumorregister-muenchen.de/en/facts/base/bC6466E-ICD-10-C64-C66-C68-Urinary-tract-cancer-incidence-and-mortality.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.

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 2016

[#] 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).

[##] 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.

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

Code	Description
C64	Malignant neoplasm of kidney, except renal pelvis
C65	Malignant neoplasm of renal pelvis
C66	Malignant neoplasm of ureter
C68.-	Malignant neoplasm of other and unspecified urinary organs

INCIDENCE

Table 1

All patients with invasive cancer by year of diagnosis, proportions of DCO, multiple primaries, deaths, and active follow-up (incl. DCO)

Year of diagnosis	Cases n	DCO cases n	Prop. DCO %	Prop. mult. primaries %	Prop. deaths %	Prop. actively followed %
1998	452	38	8.4	35.4	62.4	97.3
1999	442	33	7.5	33.5	62.9	96.8
2000	412	40	9.7	34.7	60.7	96.8
2001	416	45	10.8	32.5	63.2	97.8
2002	718	103	14.3	37.5	67.1	97.9 #
2003	707	77	10.9	33.7	60.0	96.5
2004	710	82	11.5	37.7	53.7	96.6
2005	775	43	5.5	39.6	49.3	95.7
2006	749	50	6.7	38.1	49.9	91.7
2007	861	78	9.1	35.0	48.3	78.0 #
2008	902	73	8.1	36.7	43.1	66.2
2009	904	73	8.1	38.9	42.8	66.2
2010	907	66	7.3	37.0	38.5	62.8
2011	842	57	6.8	35.7	38.4	64.6
2012	851	63	7.4	36.8	36.2	65.6
2013	758	59	7.8	36.9	28.0	98.5
2014	677	64	9.5	29.5	17.4	98.2 ##
1998-2014	12083	1044	8.6	36.1	46.5	83.8

The increases of incident cases in 2002 and 2007 reflect the expansion to additional registry areas.

Please be aware that data of recent annual patient cohorts may not yet be fully processed. The years under evaluation can be found in the respective headings.

Table 1a

All patients with invasive cancer
by year of diagnosis and gender
(incl. DCO)

Year of diagnosis	All n	Males n	Females n	Prop. males %
1998	452	279	173	61.7
1999	442	271	171	61.3
2000	412	266	146	64.6
2001	416	244	172	58.7
2002	718	433	285	60.3
2003	707	440	267	62.2
2004	710	440	270	62.0
2005	775	494	281	63.7
2006	749	463	286	61.8
2007	861	559	302	64.9
2008	902	573	329	63.5
2009	904	565	339	62.5
2010	907	580	327	63.9
2011	842	536	306	63.7
2012	851	554	297	65.1
2013	758	491	267	64.8
2014	677	430	247	63.5
1998-2014	12083	7618	4465	63.0

Table 2

Incidence measures by year of diagnosis 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)

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	279	173	25.2	14.7	16.0	7.1	22.8	10.2	28.2	12.7
1999	271	171	24.2	14.4	15.0	7.3	21.7	10.2	26.8	12.5
2000	266	146	23.4	12.2	14.7	5.6	20.9	8.3	25.6	10.4
2001	244	172	21.1	14.1	12.6	6.5	18.2	9.6	23.0	12.1
2002	433	285	23.2	14.6	13.4	6.7	19.8	9.6	25.1	12.2
2003	440	267	23.5	13.6	13.8	5.9	19.6	8.6	24.3	11.1
2004	440	270	23.4	13.7	13.7	6.2	19.3	8.9	24.0	11.3
2005	494	281	26.1	14.1	14.7	6.4	21.2	9.2	25.9	11.8
2006	463	286	24.2	14.2	13.6	6.8	19.3	9.5	23.8	11.7
2007	559	302	25.2	13.1	13.9	5.8	20.0	8.1	24.8	10.5
2008	573	329	25.7	14.2	14.1	6.5	20.2	9.2	24.8	11.8
2009	565	339	25.3	14.6	13.7	6.5	19.5	9.2	24.4	11.9
2010	580	327	25.7	14.0	13.3	5.6	19.2	8.4	24.1	10.8
2011	536	306	23.5	13.0	12.4	6.2	17.7	8.3	21.9	10.3
2012	554	297	24.2	12.6	12.6	5.1	18.2	7.5	22.9	10.1
2013	491	267	21.5	11.3	11.2	5.0	16.1	7.1	20.3	9.0
2014	430	247	18.8	10.5	9.7	4.6	14.2	6.7	17.7	8.5
1998-2014	7618	4465	23.8	13.4	13.2	6.0	18.9	8.6	23.5	10.9

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 patients)
(incl. DCO)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	452	66.0	13.6	2.8	99.7	50.0	59.0	66.9	75.5	80.9
1999	442	65.7	13.4	1.1	94.3	49.7	57.8	65.8	75.7	81.8
2000	412	66.2	13.1	0.3	93.5	49.4	58.7	66.9	75.3	81.3
2001	416	67.3	12.2	1.9	96.4	52.3	60.6	67.4	76.7	81.2
2002	718	68.3	13.1	0.1	99.5	50.8	61.3	69.6	77.2	82.7
2003	707	67.8	13.6	0.4	99.6	51.5	60.8	68.7	77.0	83.3
2004	710	67.2	13.6	0.0	94.6	49.4	60.8	68.5	76.6	82.1
2005	775	67.4	12.9	0.7	95.1	51.6	60.3	68.1	76.5	82.1
2006	749	67.3	14.0	0.2	95.5	49.7	60.3	68.8	76.3	83.1
2007	861	68.0	14.2	1.2	99.1	50.1	61.6	69.8	76.9	83.6
2008	902	67.7	13.6	0.2	98.1	51.1	60.5	68.9	77.0	83.2
2009	904	67.9	14.2	0.5	96.9	50.3	60.5	70.2	77.8	83.1
2010	907	68.8	13.2	5.4	100	50.8	60.7	70.8	77.8	83.9
2011	842	68.3	14.6	0.5	96.9	51.3	61.3	70.4	77.5	84.5
2012	851	69.1	13.2	1.4	93.1	52.4	61.3	71.3	78.9	83.4
2013	758	68.6	14.0	0.3	101	50.7	61.1	70.7	78.3	83.6
2014	677	68.7	13.0	1.2	98.9	52.4	60.5	70.4	77.3	84.7
1998-2014	12083	67.8	13.6	0.0	101	51.0	60.6	69.4	77.1	83.1

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	279	64.5	13.5	5.0	91.9	48.7	57.9	65.7	73.6	79.4
1999	271	64.5	12.8	2.3	89.5	49.5	57.4	65.5	73.0	80.2
2000	266	64.5	13.3	0.3	93.5	47.9	56.6	65.5	73.1	79.9
2001	244	65.8	11.1	1.9	89.9	51.8	59.3	65.2	74.7	80.0
2002	433	66.7	12.8	0.1	96.2	48.9	59.1	68.5	75.6	81.3
2003	440	65.6	13.5	0.4	99.6	48.5	59.9	65.9	74.5	80.7
2004	440	65.5	13.6	0.0	93.6	49.0	58.8	67.3	74.7	80.1
2005	494	66.0	11.7	0.7	93.3	51.5	59.3	66.6	73.7	79.7
2006	463	65.9	12.9	0.8	95.4	49.5	59.9	67.3	74.3	80.2
2007	559	66.4	13.0	2.6	93.1	49.6	59.3	68.1	74.9	80.5
2008	573	66.4	13.0	0.2	98.1	49.7	58.9	68.1	74.6	81.9
2009	565	66.6	13.8	0.5	96.1	49.6	59.0	69.0	75.8	82.0
2010	580	67.0	12.8	5.4	93.5	48.4	59.2	69.4	76.0	81.6
2011	536	67.7	12.8	1.5	96.9	51.3	60.7	69.3	75.9	82.8
2012	554	67.4	13.7	1.4	93.1	50.1	59.3	69.8	77.1	83.1
2013	491	67.5	13.3	0.9	94.1	49.9	59.8	69.5	76.9	82.5
2014	430	67.8	13.2	1.2	97.0	51.9	60.0	70.1	76.9	82.5
1998-2014	7618	66.4	13.1	0.0	99.6	49.7	59.2	67.9	75.3	81.4

Table 3b

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	Median 10%	25%	50%	75%	90%
1998	173	68.4	13.4	2.8	99.7	56.2	61.3	70.3	76.8	83.4
1999	171	67.6	14.1	1.1	94.3	51.8	58.7	68.8	77.8	84.9
2000	146	69.3	12.2	37.2	91.4	54.5	60.8	70.9	78.2	85.7
2001	172	69.4	13.3	30.6	96.4	53.1	61.7	70.9	78.9	85.1
2002	285	70.6	13.2	2.4	99.5	54.7	63.7	72.4	79.9	85.0
2003	267	71.5	12.9	2.5	96.5	56.3	64.5	72.5	80.9	85.8
2004	270	70.0	13.2	18.5	94.6	53.9	63.6	71.9	79.4	84.7
2005	281	69.8	14.6	4.2	95.1	52.9	63.1	72.6	80.2	83.9
2006	286	69.4	15.4	0.2	95.5	52.1	62.3	71.9	79.1	85.9
2007	302	70.9	15.9	1.2	99.1	53.0	66.2	73.1	80.5	85.8
2008	329	70.0	14.3	0.6	96.1	52.9	63.6	71.4	79.8	84.9
2009	339	70.1	14.7	1.7	96.9	51.3	65.1	72.6	79.9	84.6
2010	327	72.2	13.1	5.4	100	54.7	65.9	73.3	81.0	87.9
2011	306	69.4	17.2	0.5	96.5	50.8	64.3	72.9	79.7	85.8
2012	297	72.3	11.7	9.7	92.8	56.8	67.2	74.1	80.6	84.3
2013	267	70.5	15.0	0.3	101	52.5	64.1	73.3	79.7	85.0
2014	247	70.3	12.5	25.7	98.9	53.1	62.3	72.9	79.2	85.8
1998-2014	4465	70.3	14.1	0.2	101	53.5	63.6	72.4	79.7	85.4

Table 4

Age distribution by 5-year age group and gender for period 2007-2014 (incl. DCO)

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	41	0.6	0.6	19	0.4	0.4	22	0.9	0.9
5-9	15	0.2	0.8	8	0.2	0.6	7	0.3	1.2
10-14	3	0.0	0.9	2	0.0	0.7	1	0.0	1.2
15-19	2	0.0	0.9	1	0.0	0.7	1	0.0	1.3
20-24	7	0.1	1.0	3	0.1	0.8	4	0.2	1.4
25-29	13	0.2	1.2	8	0.2	1.0	5	0.2	1.7
30-34	33	0.5	1.7	20	0.5	1.4	13	0.5	2.2
35-39	87	1.3	3.0	63	1.5	2.9	24	1.0	3.2
40-44	146	2.2	5.2	101	2.4	5.2	45	1.9	5.1
45-49	251	3.7	8.9	207	4.8	10.1	44	1.8	6.9
50-54	397	5.9	14.8	297	6.9	17.0	100	4.1	11.0
55-59	540	8.1	22.9	390	9.1	26.1	150	6.2	17.2
60-64	683	10.2	33.1	482	11.2	37.3	201	8.3	25.6
65-69	1056	15.8	48.9	688	16.0	53.4	368	15.2	40.8
70-74	1172	17.5	66.3	802	18.7	72.1	370	15.3	56.1
75-79	1017	15.2	81.5	564	13.2	85.2	453	18.8	74.9
80-84	743	11.1	92.6	411	9.6	94.8	332	13.8	88.6
85+	496	7.4	100.0	222	5.2	100.0	274	11.4	100.0
All ages	6702	100.0		4288	100.0		2414	100.0	

Included in the statistics are 51.5% multiple primaries in males and 40.2% in females.

Table 5

Age-specific incidence, DCO rate and proportion of all cancers for period 2007-2014

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males DCO rate n=268 %	Females DCO rate n=260 %	Males Prop.all cancers n=91183 %	Females Prop.all cancers n=89596 %
0- 4	17	22	1.9	2.7			9.6	15.9
5- 9	8	7	0.9	0.8			8.3	9.0
10-14	2	1	0.2	0.1			2.0	1.1
15-19	1	1	0.1	0.1			0.5	0.6
20-24	3	4	0.3	0.4			0.8	1.3
25-29	8	5	0.7	0.4			1.4	0.8
30-34	20	13	1.6	1.0			2.6	1.1
35-39	63	24	4.8	1.9			5.5	1.2
40-44	99	45	6.1	2.9	1.0		5.4	1.2
45-49	202	44	12.8	2.9	0.5	2.3	6.3	0.8
50-54	288	100	22.2	7.8	2.4		5.9	1.5
55-59	377	148	35.5	13.2	2.4	2.7	5.1	2.0
60-64	471	199	47.9	18.8	1.7	1.0	4.4	2.2
65-69	673	362	70.0	34.7	3.3	2.5	4.3	3.2
70-74	784	364	86.2	34.8	4.0	5.2	4.6	3.1
75-79	558	444	101.3	62.2	8.4	7.9	4.5	4.4
80-84	401	325	114.8	58.0	15.5	17.5	4.7	3.7
85+	221	271	95.5	46.9	36.2	49.1	3.6	2.6
All ages	4196	2379			6.4	10.9	4.6	2.7
Incidence								
Raw			23.2	12.7				
WS			12.3	5.6				
ES			17.7	8.0				
BRD-S			22.1	10.2				

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).

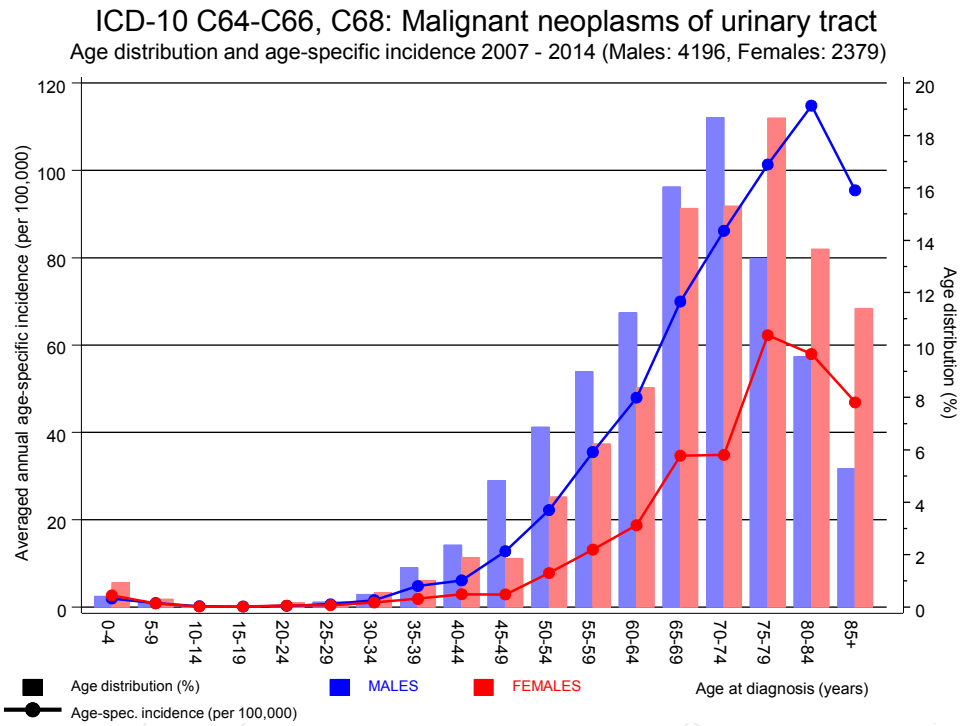


Figure 6. Age distribution and age-specific incidence

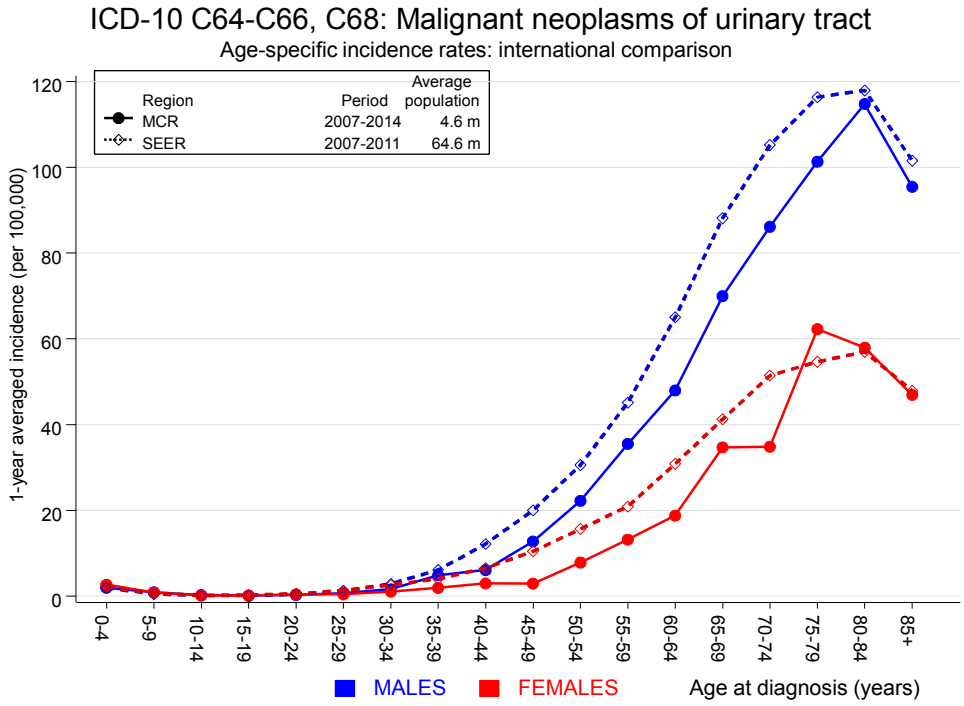


Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

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

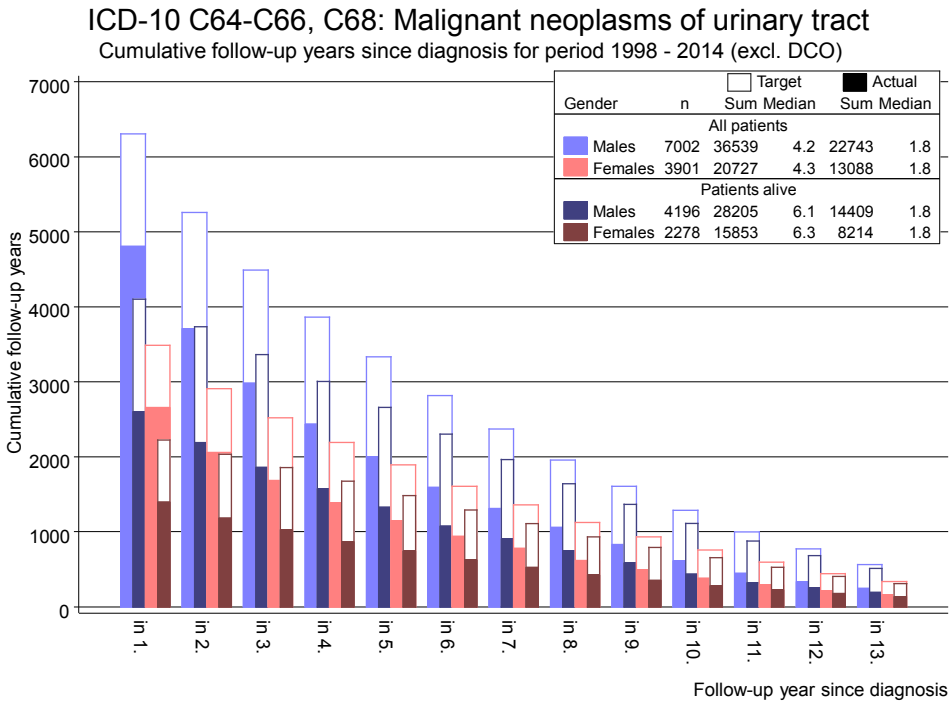


Figure 7. Cumulative follow-up years depending on time since diagnosis

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

Table 8a

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of second primaries for period 1998-2014
MALES

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C03-C06	Oral cavity	5	3.1	1.6	0.5	3.8		0.9	
C09-C10	Oropharynx	13	3.8	3.4	1.8	5.9	#	4.1	
C12-C13	Hypopharynx	5	2.1	2.4	0.8	5.5		1.3	
C15	Oesophagus	16	6.7	2.4	1.4	3.9	#	4.2	18.8
C16	Stomach	26	15.5	1.7	1.1	2.5	#	4.7	15.4
C17	Small intestine	9	1.9	4.7	2.2	9.0	#	3.2	
C18	Colon	91	37.4	2.4	2.0	3.0	#	24.2	6.6
C19-C20	Rectum	35	20.7	1.7	1.2	2.4	#	6.5	
C21	Anus/canal	2	0.8	2.5	0.3	9.2		0.5	50.0
C22	Liver	28	10.4	2.7	1.8	3.9	#	7.9	14.3
C23-C24	Bile	6	3.7	1.6	0.6	3.5		1.0	16.7
C25	Pancreas	33	13.8	2.4	1.7	3.4	#	8.7	24.2
C32	Larynx	10	3.8	2.6	1.3	4.8	#	2.8	
C33-C34	Lung	133	44.8	3.0	2.5	3.5	#	39.8	12.0
C38,C45	Mesothelioma	2	2.5	0.8	0.1	2.8		-0.2	50.0
C40-C41	Bone	2	0.3	6.8	0.8	24.7		0.8	
C43	Malign. melanoma	49	15.7	3.1	2.3	4.1	#	15.0	2.0
C46,C49	Soft tissue	11	2.0	5.5	2.7	9.8	#	4.1	
C48	Peritoneal	3	0.3	10.9	2.3	32.0	#	1.2	33.3
C60	Penis	3	0.9	3.5	0.7	10.2		1.0	
C61	Prostate	368	112.3	3.3	3.0	3.6	#	115.3	4.9
C62	Testis	6	0.9	6.6	2.4	14.4	#	2.3	
C64	Kidney	164	13.3	12.4	10.5	14.4	#	67.9	4.9
C65	Renal pelvis	34	1.6	21.1	14.6	29.5	#	14.6	
C66	Ureter	35	0.9	38.4	26.7	53.4	#	15.4	
C67	Bladder	160	17.1	9.4	8.0	11.0	#	64.4	7.5
C68	Urethra	9	0.3	31.5	14.4	59.7	#	3.9	
C68	Urinary org.	3	0.2	14.3	2.9	41.7	#	1.3	66.7
C70-C72	CNS cancer	10	4.9	2.0	1.0	3.7		2.3	10.0
C73	Thyroid	11	2.4	4.6	2.3	8.3	#	3.9	9.1
C76-C79	CUP	7	6.4	1.1	0.4	2.3		0.3	14.3
C81	Hodgkin lymphoma	2	0.8	2.5	0.3	9.0		0.5	
C82-C85	NHL	53	15.2	3.5	2.6	4.6	#	17.0	5.7
C90	Mult. myeloma	11	4.9	2.3	1.1	4.1	#	2.8	9.1
C91-C96	Leukaemia	14	6.3	2.2	1.2	3.8	#	3.5	14.3
Other primaries		7	4.1	1.7	0.7	3.6		1.3	14.3
Not observed		0	1.7	0.0	0.0	2.1		-0.8	
All mult. primaries		1376	383.3	3.6	3.4	3.8	#	447.5	7.0

Patients	6890
Median age at second malignancy (years)	71.5
Person-years	22184
Mean observation time (years)	3.2
Median observation time (years)	1.7

The occurrence of second malignancy is statistically significant.

Observed second primaries with count 1 are pooled in category “Other primaries”

Table 8b

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of second primaries for period 1998–2014
FEMALES

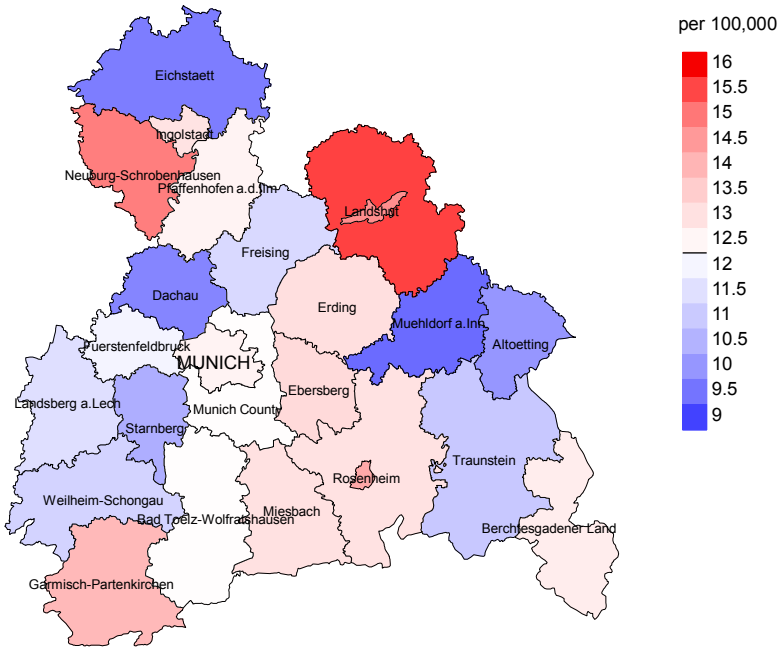
Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C15	Oesophagus	2	0.9	2.2	0.3	7.9		0.8	
C16	Stomach	13	6.0	2.2	1.1	3.7	#	5.4	
C17	Small intestine	2	0.7	2.7	0.3	9.9		1.0	
C18	Colon	34	16.8	2.0	1.4	2.8	#	13.4	2.9
C19–C20	Rectum	11	7.0	1.6	0.8	2.8		3.1	9.1
C22	Liver	6	1.9	3.1	1.1	6.8	#	3.2	16.7
C23–C24	Bile	10	2.5	4.1	1.9	7.5	#	5.9	20.0
C25	Pancreas	18	7.5	2.4	1.4	3.8	#	8.2	27.8
C33–C34	Lung	40	11.2	3.6	2.5	4.8	#	22.5	12.5
C43	Malign. melanoma	11	5.5	2.0	1.0	3.6	#	4.3	9.1
C46,C49	Soft tissue	2	0.9	2.2	0.3	8.0		0.9	
C50	Breast	99	45.5	2.2	1.8	2.7	#	41.8	8.1
C51	Vulva	3	1.7	1.8	0.4	5.2		1.0	33.3
C53	Cervix uteri	5	1.9	2.7	0.9	6.2		2.4	
C54	Corpus uteri	16	8.8	1.8	1.0	2.9	#	5.6	6.3
C56	Ovary	8	6.6	1.2	0.5	2.4		1.1	12.5
C64	Kidney	72	4.2	17.3	13.6	21.8	#	53.0	11.1
C65	Renal pelvis	13	0.5	24.5	13.0	41.9	#	9.7	
C66	Ureter	18	0.3	65.1	38.6	103.0	#	13.8	
C67	Bladder	80	3.2	25.1	19.9	31.2	#	60.0	11.3
C68	Urinary org.	3	0.1	49.0	10.1	143.1	#	2.3	66.7
C70–C72	CNS cancer	4	2.2	1.8	0.5	4.7		1.4	25.0
C73	Thyroid	19	2.3	8.1	4.9	12.7	#	13.0	5.3
C76–C79	CUP	8	3.0	2.7	1.1	5.2	#	3.9	12.5
C82–C85	NHL	21	6.4	3.3	2.0	5.0	#	11.4	9.5
C90	Mult. myeloma	4	2.1	1.9	0.5	4.9		1.5	
C91–C96	Leukaemia	8	2.7	3.0	1.3	5.9	#	4.2	12.5
Other primaries		7	3.1	2.2	0.9	4.6		3.0	14.3
Not observed		0	3.7	0.0	0.0	1.0	#	-2.9	
All mult. primaries		537	159.2	3.4	3.1	3.7	#	295.1	9.9

Patients	3909
Median age at second malignancy (years)	74.3
Person-years	12802
Mean observation time (years)	3.3
Median observation time (years)	1.6

The occurrence of second malignancy is statistically significant.

Observed second primaries with count 1 are pooled in category “Other primaries”

Average incidence (world standard population) 2007 - 2014: Males



Average incidence (world standard population) 2007 - 2014: Females

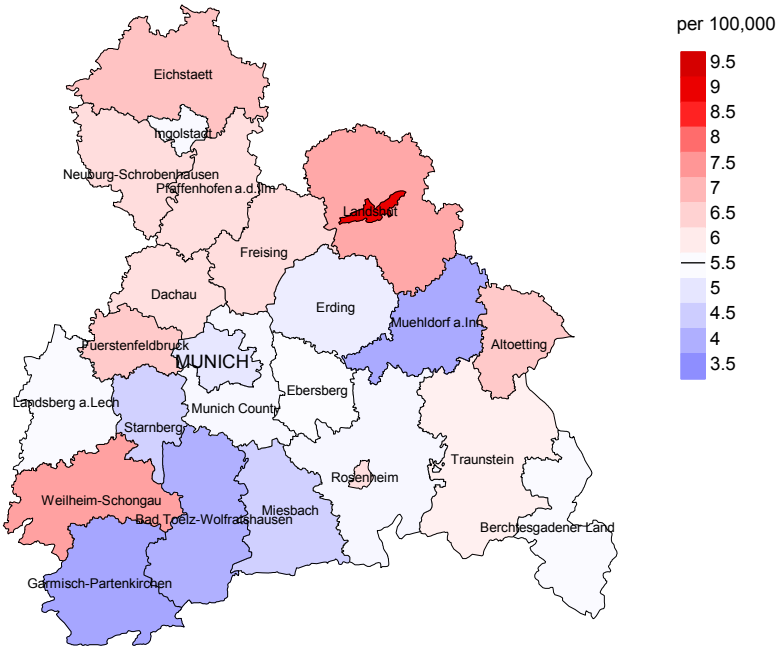
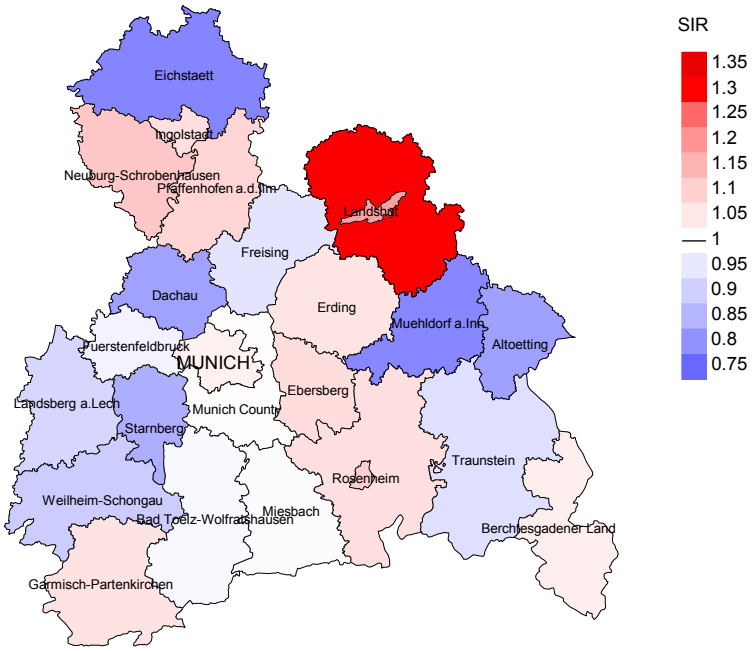


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2014. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 12.3/100,000 WS N=4,196, females 5.6/100,000 WS N=2,379).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 65,347 female residents (averaged) in the period from 2007 to 2014 a total of 72 women were identified with newly diagnosed urinary tract cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 5.5/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 3.8 and 7.7/100,000.

Standardized incidence ratio (SIR) 2007 - 2014: Males



Standardized incidence ratio (SIR) 2007 - 2014: Females

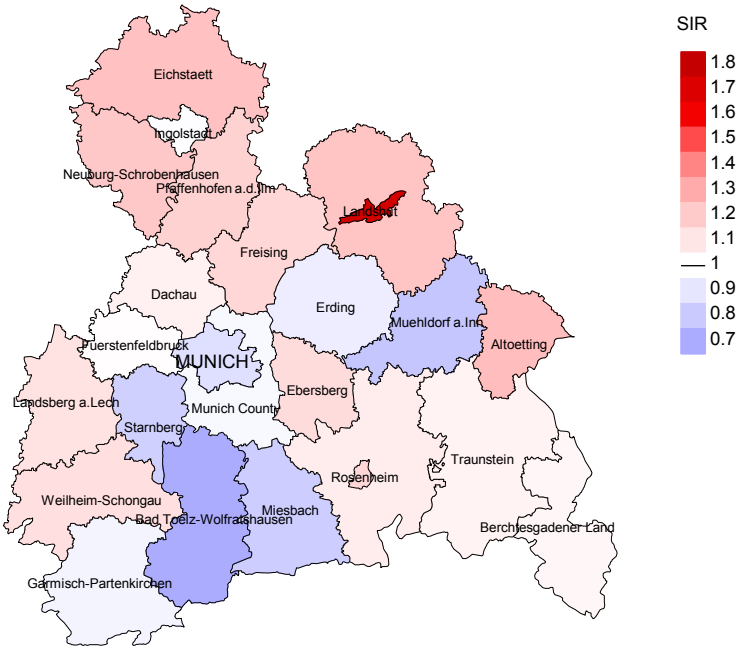


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2014. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=4,196, females N=2,379).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,924 female residents (averaged) in the period from 2007 to 2014 a total of 72 women were identified with newly diagnosed urinary tract cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.14. Though, the value of this parameter may vary with an underlying probability of 99% between 0.82 and 1.53, 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 diagnosis	Incident cases n	Prop. actively followed %	Prop. DCO %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	452	97.3	8.4	282	62.4	94.3
1999	442	96.8	7.5	278	62.9	94.2
2000	412	96.8	9.7	250	60.7	96.4
2001	416	97.8	10.8	263	63.2	98.5
2002	718	97.9	14.3	482	67.1	96.7
2003	707	96.5	10.9	424	60.0	98.3
2004	710	96.6	11.5	381	53.7	97.1
2005	775	95.7	5.5	382	49.3	97.6
2006	749	91.7	6.7	374	49.9	98.4
2007	861	78.0	9.1	416	48.3	98.3
2008	902	66.2	8.1	389	43.1	99.5
2009	904	66.2	8.1	387	42.8	99.0
2010	907	62.8	7.3	349	38.5	99.1
2011	842	64.6	6.8	323	38.4	98.5
2012	851	65.6	7.4	308	36.2	97.4
2013	758	98.5	7.8	212	28.0	98.6
2014	677	98.2	9.5	118	17.4	94.1
1998-2014	12083	83.8	8.6	5618	46.5	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 4.64 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	452	251	93.6	66	14.6
1999	442	251	96.0	76	17.2
2000	412	258	95.3	66	16.0
2001	416	257	95.7	72	17.3
2002	718	376	97.3	149	20.8
2003	707	411	96.4	141	19.9
2004	710	400	96.5	129	18.2
2005	775	376	95.7	102	13.2
2006	749	417	97.6	105	14.0
2007	861	465	97.6	140	16.3
2008	902	494	99.2	135	15.0
2009	904	510	99.2	153	16.9
2010	907	542	98.5	141	15.5
2011	842	545	98.2	140	16.6
2012	851	566	98.4	150	17.6
2013	758	566	98.9	131	17.3
2014	677	511	99.2	104	15.4
1998–2014	12083	7196	97.6	2000	16.6

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)

Year of death	Deaths n	Prop. cancer-related %	Prop. non-cancer-related %	Prop. cancer recorded on death certificate %
1998	251	64.9	35.1	79.6
1999	251	74.5	25.5	85.1
2000	258	72.1	27.9	83.7
2001	257	72.8	27.2	85.8
2002	376	71.3	28.7	85.8
2003	411	74.2	25.8	86.4
2004	400	70.0	30.0	82.1
2005	376	74.2	25.8	83.3
2006	417	71.0	29.0	78.4
2007	465	72.7	27.3	81.3
2008	494	71.5	28.5	81.6
2009	510	73.1	26.9	80.8
2010	542	68.3	31.7	77.9
2011	545	68.3	31.7	81.3
2012	566	62.4	37.6	72.2
2013	566	65.0	35.0	76.1
2014	511	65.2	34.8	74.2
1998-2014	7196	69.6	30.4	80.2

Table 11a

Medians 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 (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	162	71.4	69.5	76.6	70.5
1999	157	73.7	72.4	83.2	73.0
2000	161	73.0	69.3	78.9	72.4
2001	168	70.4	69.5	75.6	70.0
2002	217	74.2	73.6	74.6	74.8
2003	250	74.6	72.9	79.1	73.9
2004	231	74.3	73.2	77.3	73.6
2005	222	73.6	71.8	80.3	72.4
2006	260	73.9	72.4	77.4	73.0
2007	289	74.4	72.5	79.8	73.4
2008	312	74.9	73.4	78.7	74.5
2009	323	74.3	72.8	79.3	72.8
2010	327	75.5	74.2	78.6	74.6
2011	353	76.1	73.7	82.2	74.9
2012	330	77.3	75.1	80.7	75.7
2013	350	77.4	74.9	81.6	76.2
2014	321	77.7	75.3	82.4	76.5
1998-2014	4433	75.0	73.2	79.5	74.1

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

Medians 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 (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	89	80.8	77.7	82.3	80.9
1999	94	77.3	76.7	80.5	78.7
2000	97	76.5	76.1	77.8	77.0
2001	89	78.9	75.9	84.2	77.8
2002	159	78.5	75.6	82.5	76.9
2003	161	78.8	77.6	80.5	78.4
2004	169	81.1	80.0	83.1	80.7
2005	154	78.2	75.2	83.1	76.1
2006	157	78.9	78.2	81.6	77.8
2007	176	79.9	78.7	82.3	79.9
2008	182	80.2	78.1	85.1	78.4
2009	187	80.8	77.4	85.7	78.2
2010	215	81.1	78.7	85.6	79.5
2011	192	81.9	79.2	87.3	80.5
2012	236	80.1	77.3	84.1	77.6
2013	216	80.5	77.3	84.8	78.8
2014	190	81.8	79.5	85.8	80.3
1998-2014	2763	80.0	77.9	83.9	78.8

By 2010, life expectancy at birth was 77.5 years for boys and 82.6 years for girls.

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	114	10.3	0.41	6.0	0.38	9.3	0.41	12.4	0.44
1999	118	10.5	0.44	6.0	0.40	9.5	0.44	13.3	0.50
2000	116	10.2	0.44	5.8	0.40	9.1	0.44	12.5	0.50
2001	125	10.8	0.52	6.1	0.50	9.4	0.52	12.3	0.54
2002	159	8.5	0.37	4.5	0.34	7.3	0.37	10.2	0.41
2003	191	10.2	0.44	5.4	0.40	8.4	0.44	11.7	0.49
2004	167	8.9	0.38	4.5	0.33	7.1	0.37	9.9	0.41
2005	162	8.6	0.34	4.3	0.30	6.7	0.33	9.1	0.36
2006	191	10.0	0.42	5.0	0.37	7.6	0.40	10.3	0.44
2007	220	9.9	0.40	4.9	0.36	7.6	0.39	10.4	0.43
2008	220	9.9	0.39	4.6	0.33	7.2	0.37	10.2	0.42
2009	240	10.8	0.44	5.0	0.37	7.7	0.41	10.6	0.45
2010	223	9.9	0.39	4.4	0.34	6.9	0.37	9.8	0.42
2011	250	10.9	0.48	4.9	0.40	7.6	0.44	10.3	0.48
2012	210	9.2	0.39	3.8	0.31	6.2	0.35	8.6	0.39
2013	239	10.5	0.49	4.5	0.41	7.2	0.45	10.1	0.50
2014	204	8.9	0.48	3.8	0.39	6.1	0.44	8.6	0.49
1998-2014	3149	9.8	0.42	4.7	0.37	7.5	0.40	10.3	0.45

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	49	4.2	0.29	1.5	0.21	2.3	0.23	3.2	0.26
1999	69	5.8	0.41	2.2	0.30	3.5	0.35	4.8	0.39
2000	70	5.8	0.48	2.2	0.39	3.4	0.42	4.8	0.46
2001	62	5.1	0.37	1.9	0.30	3.0	0.32	4.2	0.36
2002	109	5.6	0.38	2.1	0.31	3.3	0.34	4.5	0.37
2003	114	5.8	0.43	2.1	0.35	3.2	0.38	4.5	0.41
2004	113	5.7	0.43	1.8	0.31	2.9	0.34	4.3	0.38
2005	118	5.9	0.43	2.2	0.37	3.4	0.38	4.5	0.39
2006	105	5.2	0.37	1.8	0.27	2.8	0.30	3.9	0.34
2007	119	5.2	0.40	1.6	0.27	2.6	0.33	4.0	0.38
2008	133	5.7	0.41	1.9	0.30	3.0	0.33	4.2	0.37
2009	134	5.8	0.40	2.0	0.31	3.1	0.34	4.3	0.36
2010	147	6.3	0.45	2.0	0.36	3.2	0.39	4.7	0.44
2011	122	5.2	0.41	1.7	0.27	2.7	0.33	3.7	0.37
2012	143	6.1	0.49	2.0	0.40	3.2	0.43	4.6	0.46
2013	129	5.5	0.49	1.7	0.35	2.8	0.39	3.9	0.44
2014	129	5.5	0.53	1.7	0.37	2.7	0.41	4.0	0.48
1998-2014	1865	5.6	0.42	1.9	0.32	3.0	0.35	4.2	0.39

Table 13

Age distribution of age at death (cancer-related) for period 2007-2014
(**incl. multiple primaries**)

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
5-9	2	0.1	0.1	2	0.1	0.1			0.0
10-14	0	0.0	0.1			0.1			0.0
15-19	0	0.0	0.1			0.1			0.0
20-24	2	0.1	0.1	1	0.1	0.2	1	0.1	0.1
25-29	2	0.1	0.2	1	0.1	0.2	1	0.1	0.2
30-34	2	0.1	0.3	2	0.1	0.3			0.2
35-39	5	0.2	0.4	2	0.1	0.4	3	0.3	0.5
40-44	16	0.5	1.0	8	0.4	0.8	8	0.7	1.2
45-49	36	1.2	2.2	27	1.4	2.3	9	0.8	2.0
50-54	93	3.1	5.3	71	3.7	6.0	22	2.0	4.0
55-59	141	4.7	9.9	107	5.6	11.6	34	3.1	7.1
60-64	232	7.7	17.6	171	9.0	20.6	61	5.5	12.6
65-69	352	11.7	29.3	230	12.1	32.6	122	11.1	23.7
70-74	553	18.4	47.7	394	20.7	53.3	159	14.4	38.1
75-79	564	18.7	66.5	353	18.5	71.8	211	19.1	57.3
80-84	557	18.5	85.0	309	16.2	88.0	248	22.5	79.8
85+	452	15.0	100.0	229	12.0	100.0	223	20.2	100.0
All ages	3009	100.0		1907	100.0		1102	100.0	

Included in the statistics are 51.5% multiple primaries in males and 40.2% in females.

Table 14

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2014
(**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	2		0.2	0.25	0.0		9.5	
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24	1	1	0.1	0.33	0.1	0.25	2.1	3.6
25-29	1	1	0.1	0.13	0.1	0.20	1.6	1.6
30-34	2		0.2	0.10	0.0		2.3	
35-39	2	3	0.2	0.03	0.2	0.13	1.1	1.2
40-44	8	8	0.5	0.08	0.5	0.18	1.7	1.3
45-49	27	9	1.7	0.13	0.6	0.20	2.6	0.7
50-54	71	22	5.5	0.24	1.7	0.22	3.8	1.2
55-59	107	34	10.1	0.27	3.0	0.23	3.5	1.3
60-64	171	61	17.4	0.35	5.8	0.30	3.6	1.7
65-69	230	122	23.9	0.33	11.7	0.33	3.2	2.3
70-74	394	159	43.3	0.49	15.2	0.43	4.3	2.4
75-79	353	211	64.1	0.63	29.6	0.47	4.1	3.4
80-84	309	248	88.5	0.75	44.2	0.75	4.2	3.8
85+	229	223	98.9	1.03	38.6	0.81	3.8	2.6
All ages	1907	1102					3.8	2.5
Mortality								
Raw			10.6	0.44	5.9	0.46		
WS			4.7	0.38	1.9	0.34		
ES			7.5	0.41	3.0	0.38		
BRD-S			10.4	0.46	4.4	0.42		
PYLL-70								
per 100,000			35.1		13.8			
ES			31.3		11.5			
AYLL-70			9.0		8.4			

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

Table 15a

Multiple primaries in deaths in period 1998–2014
MALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C09–C10	Oropharynx	24	1.1	13	54.2	2	8.3	9	37.5
C15	Oesophagus	23	1.1	5	21.7	1	4.3	17	73.9
C16	Stomach	55	2.6	19	34.5	4	7.3	32	58.2
C18	Colon	155	7.3	67	43.2	26	16.8	62	40.0
C19–C20	Rectum	68	3.2	24	35.3	16	23.5	28	41.2
C22	Liver	40	1.9	6	15.0	8	20.0	26	65.0
C25	Pancreas	45	2.1	2	4.4	6	13.3	37	82.2
C33–C34	Lung	210	9.8	41	19.5	27	12.9	142	67.6
C43	Malign. melanoma	53	2.5	30	56.6	4	7.5	19	35.8
C44	Skin others	67	3.1	30	44.8	3	4.5	34	50.7
C61	Prostate	386	18.1	163	42.2	61	15.8	162	42.0
C64	Kidney	112	5.2			33	29.5	79	70.5
C65	Renal pelvis	43	2.0			13	30.2	30	69.8
C66	Ureter	57	2.7			30	52.6	27	47.4
C67	Bladder	436	20.4	220	50.5	64	14.7	152	34.9
C70–C72	CNS cancer	40	1.9	13	32.5	5	12.5	22	55.0
C76–C79	CUP	28	1.3	14	50.0	4	14.3	10	35.7
C82–C85	NHL	62	2.9	17	27.4	10	16.1	35	56.5
C90	Mult. myeloma	34	1.6	9	26.5	6	17.6	19	55.9
C91–C96	Leukaemia	33	1.5	8	24.2	2	6.1	23	69.7
Other primaries		165	7.7	63	38.2	18	10.9	84	50.9
All mult. primaries		2136	100.0	744	34.8	343	16.1	1049	49.1

Multiple primaries with number of cases 1 to 19 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 1998–2014
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C16	Stomach	28	2.8	7	25.0	8	28.6	13	46.4
C18	Colon	62	6.2	21	33.9	12	19.4	29	46.8
C19–C20	Rectum	29	2.9	10	34.5	5	17.2	14	48.3
C23–C24	Bile	13	1.3			4	30.8	9	69.2
C25	Pancreas	40	4.0	2	5.0	5	12.5	33	82.5
C33–C34	Lung	75	7.5	11	14.7	11	14.7	53	70.7
C43	Malign. melanoma	25	2.5	13	52.0	2	8.0	10	40.0
C44	Skin others	28	2.8	17	60.7	2	7.1	9	32.1
C50	Breast	174	17.5	94	54.0	14	8.0	66	37.9
C53	Cervix uteri	28	2.8	20	71.4	1	3.6	7	25.0
C54	Corpus uteri	33	3.3	20	60.6	4	12.1	9	27.3
C56	Ovary	36	3.6	14	38.9	8	22.2	14	38.9
C64	Kidney	48	4.8			13	27.1	35	72.9
C65	Renal pelvis	20	2.0			6	30.0	14	70.0
C66	Ureter	25	2.5			15	60.0	10	40.0
C67	Bladder	161	16.2	51	31.7	28	17.4	82	50.9
C70–C72	CNS cancer	25	2.5	4	16.0	5	20.0	16	64.0
C73	Thyroid	23	2.3	10	43.5	1	4.3	12	52.2
C76–C79	CUP	16	1.6	3	18.8	2	12.5	11	68.8
C82–C85	NHL	28	2.8	9	32.1	7	25.0	12	42.9
C91–C96	Leukaemia	17	1.7	2	11.8	4	23.5	11	64.7
Other primaries		62	6.2	20	32.3	12	19.4	30	48.4
All mult. primaries		996	100.0	328	32.9	169	17.0	499	50.1

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 2007-2014
(**First 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		0.2	0.25	0.0		10.0	
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24	1	1	0.1	0.33	0.1	0.25	2.3	3.8
25-29	1	1	0.1	0.13	0.1	0.20	1.8	1.7
30-34	2		0.2	0.11	0.0		2.3	
35-39	2	3	0.2	0.04	0.2	0.13	1.2	1.3
40-44	7	7	0.4	0.08	0.5	0.18	1.7	1.3
45-49	26	7	1.6	0.14	0.5	0.18	2.8	0.7
50-54	44	17	3.4	0.18	1.3	0.21	2.8	1.1
55-59	78	22	7.3	0.27	2.0	0.19	3.0	1.0
60-64	132	36	13.4	0.35	3.4	0.24	3.4	1.3
65-69	168	101	17.5	0.36	9.7	0.35	3.0	2.5
70-74	265	105	29.1	0.51	10.0	0.40	3.8	2.1
75-79	230	163	41.8	0.67	22.9	0.49	3.7	3.4
80-84	183	174	52.4	0.82	31.0	0.79	3.4	3.5
85+	139	177	60.0	1.10	30.6	0.86	3.2	2.6
All ages	1280	814					3.3	2.4
Mortality								
Raw			7.1	0.43	4.3	0.45		
WS			3.3	0.36	1.4	0.31		
ES			5.1	0.39	2.2	0.36		
BRD-S			6.9	0.45	3.2	0.41		
PYLL-70								
per 100,000			26.8		10.3			
ES			23.9		8.6			
AYLL-70			9.3		8.4			

* See corresponding tables with multiple primaries.

Table 17

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2014
(**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		0.2	0.25	0.0		10.0	
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24	1	1	0.1	0.33	0.1	0.25	2.6	4.2
25-29	1	1	0.1	0.13	0.1	0.20	2.0	1.8
30-34	2		0.2	0.11	0.0		2.4	
35-39	2	1	0.2	0.04	0.1	0.04	1.3	0.5
40-44	7	5	0.4	0.08	0.3	0.13	1.8	1.0
45-49	22	5	1.4	0.12	0.3	0.14	2.6	0.5
50-54	37	15	2.9	0.17	1.2	0.19	2.6	1.1
55-59	61	17	5.7	0.23	1.5	0.15	2.6	0.9
60-64	111	25	11.3	0.33	2.4	0.19	3.3	1.0
65-69	131	86	13.6	0.33	8.2	0.33	2.8	2.5
70-74	185	72	20.3	0.43	6.9	0.31	3.3	1.7
75-79	143	118	26.0	0.49	16.5	0.39	3.0	3.0
80-84	110	132	31.5	0.56	23.5	0.68	2.7	3.2
85+	85	126	36.7	0.71	21.8	0.65	2.5	2.2
All ages	900	604					2.9	2.1
Mortality								
Raw			5.0	0.34	3.2	0.36		
WS			2.4	0.29	1.0	0.26		
ES			3.6	0.32	1.7	0.29		
BRD-S			4.8	0.35	2.4	0.34		
PYLL-70								
per 100,000			22.5		7.9			
ES			20.2		6.6			
AYLL-70			9.6		8.0			

* See corresponding tables with multiple primaries.

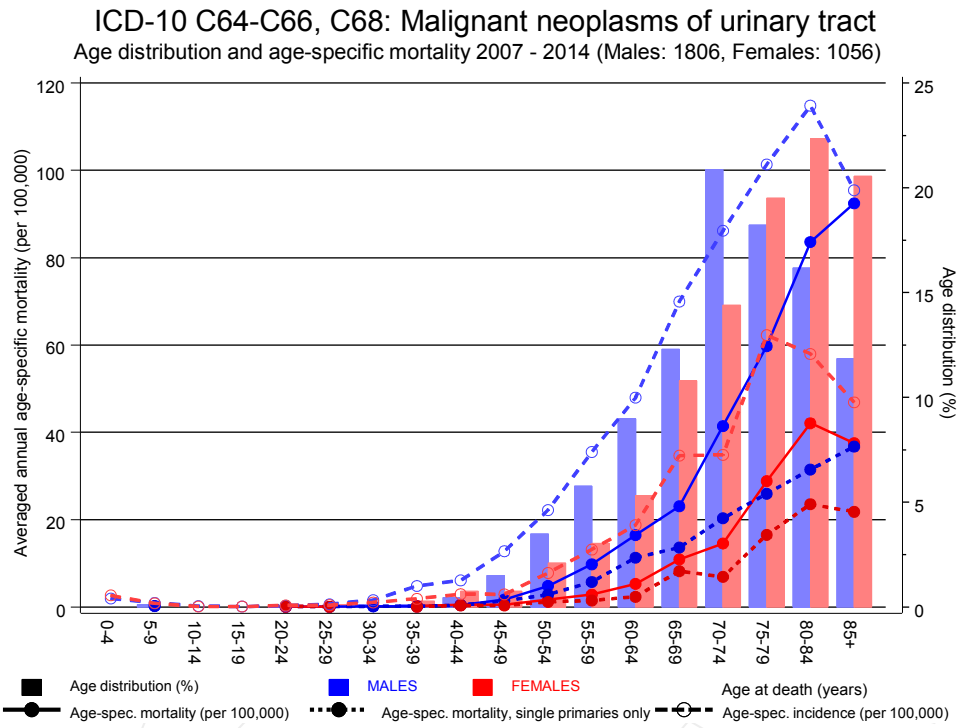
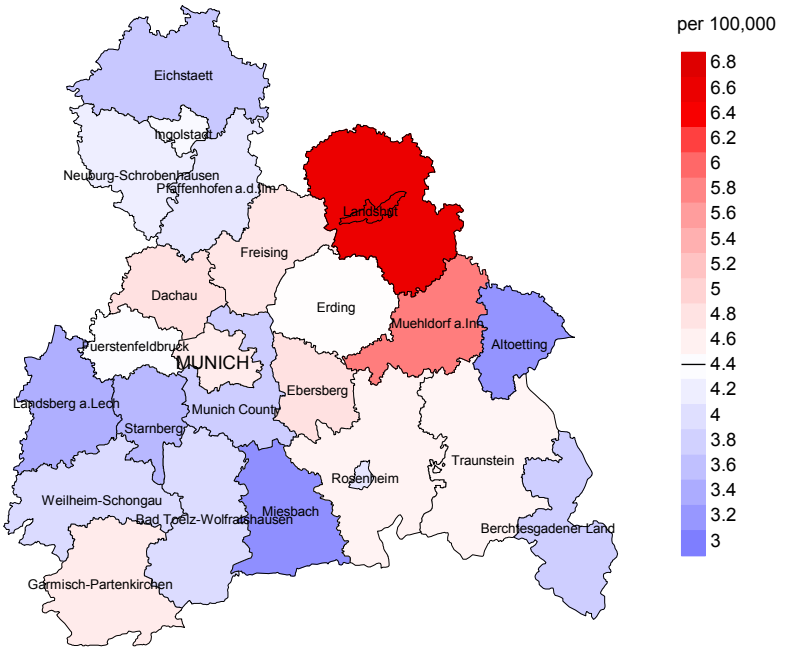


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

Average mortality (world standard population) 2007 - 2014: Males



Average mortality (world standard population) 2007 - 2014: Females

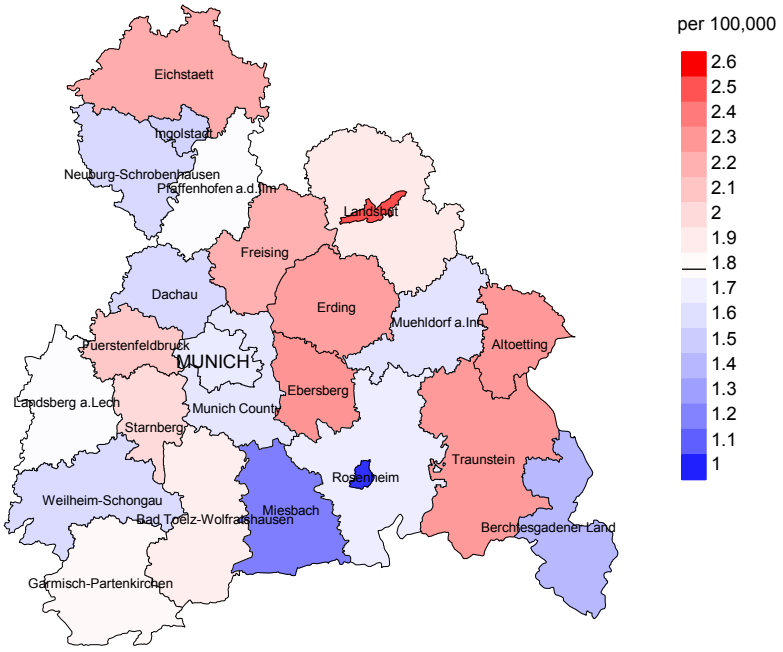
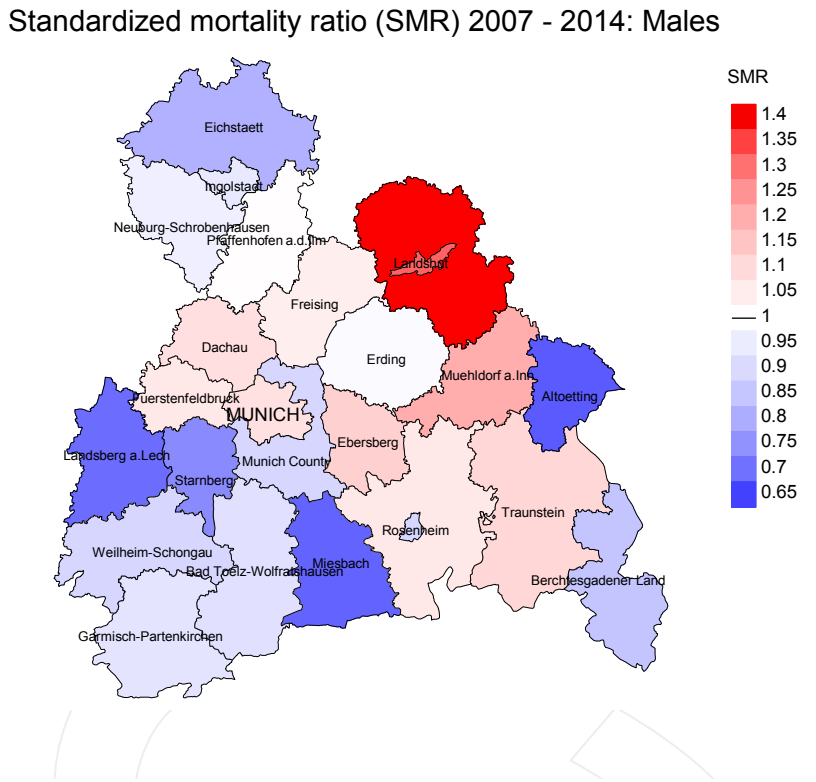


Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2014. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 4.4/100,000 WS N=1,789, females 1.8/100,000 WS N=1,049).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 65,347 female residents (averaged) in the period from 2007 to 2014 a total of 40 women died from urinary tract cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 2.3/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 1.4 and 3.7/100,000.



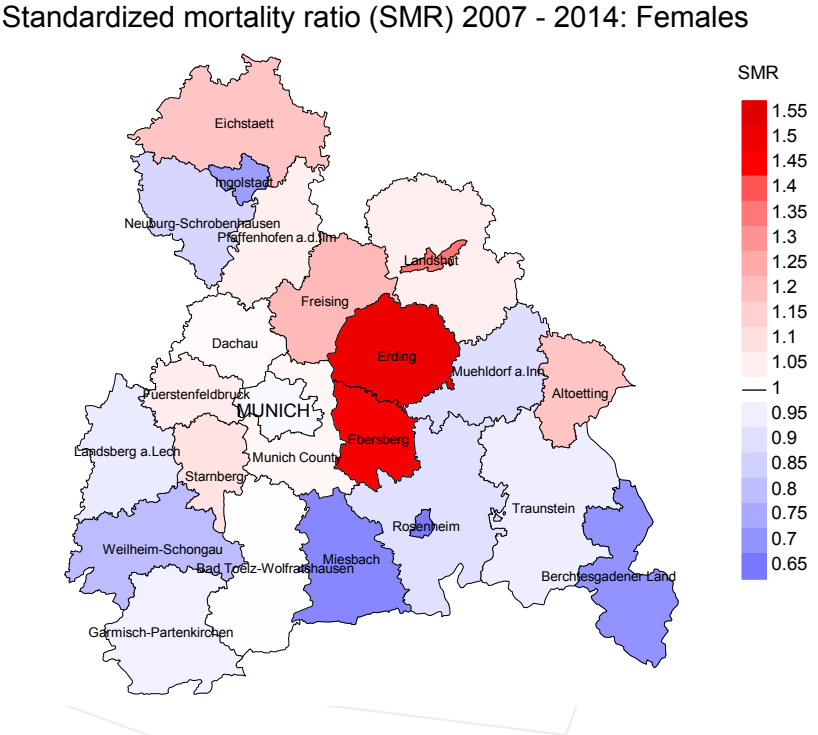


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2014. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=1,789, females N=1,049).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,924 female residents (averaged) in the period from 2007 to 2014 a total of 40 women died from urinary tract cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.48. Though, the value of this parameter may vary with an underlying probability of 99% between 0.94 and 2.19, 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, where applicable. 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

Recommended Citation

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