Munich Cancer Registry



- ▶ Survival
- ▶ Selection Matrix
- ▶ Homepage

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

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

Cancer statistics: Baseline statistics

C23-C24: Gallbladder cancer

Year of diagnosis	1998-2011
Patients	2778
Diseases	2781
Creation date	04/02/2013
Export date	01/03/2013
Population	4.5 m



http://www.tumorregister-muenchen.de/en/facts/base/base_C2324E.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.

ICD-10 codes used for specifying cancer site

ICD-10	Description
C23	Malignant neoplasm of gallbladder
C24	Malignant neoplasm of other and unspecified parts of biliary tract
C24.0	Extrahepatic bile duct
C24.1	Ampulla of Vater
C24.8	Overlapping lesion of biliary tract
C24.9	Biliary tract, unspecified

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	%	96	90	%
1998	106	24	22.6	7.5	91.5	100.0
1999	113	17	15.0	19.5	95.6	100.0
2000	114	27	23.7	/11.4 /	95.6	100.0
2001	125	40	32.0	11.2	89.6	97.6
2002	237	80	33.8	17.3	94.5	100.0
2003	229	72	31.4	12.2	93.0	100.0
2004	231	60	26.0	13.4	86.6	96.5
2005	212	58	27.4	17.5	86.8	97.6
2006	249	54	21.7	18.9	88.4	97.6
2007	256	47	18.4	20.7	89.8	96.1 ##
2008	259	60	23.2	20.5	85.7	91.5
2009	252	40	15.9	16.3	77.8	88.1
2010	217	43	19.8	20.3	73.3	96.8
2011	181	36	19.9	21.5	68.0	86.7 ###
1998-2011	2781	658	23.7	16.9	86.2	95.9

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

^{##} Since 2007 the percentage of actively followed patients sharply declined compared to the previous years. This is a consequence of ambiguous data protection rules that currently forbid cancer registries in Bavaria to obtain the essential life status informations from competent registration offices.

^{###} Please be aware that data of recent annual patient cohorts may not yet be fully processed. Therefore, the presented figures and tables are potentially related to different time periods as pointed out in the respective headlines or legends.

Table 1a

Patient cohorts by year of diagnosis and gender including DCO cases

Year of	All	Males	Females	Prop. males	
diagnosis	n	n	n	%	
1998	106	37	69	34.9	
1999	113	45	68	39.8	
2000	114	53	61	46.5	
2001	125	48	77	38.4	
2002	237	103	134	43.5	
2003	229	91	138	39.7	
2004	231	82	149	35.5	
2005	212	91	121	42.9	
2006	249	96	153	38.6	
2007	256	103	153	40.2	
2008	259	123	136	47.5	
2009	252	125	127	49.6	
2010	217	91	126	41.9	
2011	181	86	95	47.5	
1998-2011	2781	1174	1607	42.2	

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)

			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	37	69	3.3	5.9	1.9	2.5	3.1	3.7	4.5	4.7
1999	45	68	4.0	5.7	2.3	2.3	3.6	3.5	4.6	4.8
2000	53	61	4.7	5.1	2.7	1.6	4.1	2.7	5.6	4.1
2001	48	77	4.1/	6.3	2.3	2.6	3.7	4.0	5.2	5.3
2002	103	134	5.5	6.8	3.1	2.3	4.7	3.8	6.0	5.4
2003	91	138	4.9	7.0	2.6	2.5	4.0	3.9	5.4	5.5
2004	82	149	4.4	7.5	2.4	2.7	3.6	4.3	4.7	5.8
2005	91	121	4.8	6.1	2.5	2.3	3.8	3.5	4.9	4.7
2006	96	153	5.0	7.6	2.6	2.5	3.9	4.1	5.1	5.6
2007	103	153	4.6	6.6	2.5	2.4	3.7	3.8	4.6	5.1
2008	123	136	5.5	5.9	2.6	2.1	4.1	3.2	5.6	4.2
2009	125	127	5.6	5.5	2.7	2.0	4.1	3.0	5.5	4.0
2010	91	126	4.0	5.4	1.9	1.9	2.9	3.0	3.9	4.0
2011	86	95	3.8	4.1	1.8	1.4	2.7	2.1	3.8	2.9
1998-2011	1174	1607	4.7	6.1	2.4	2.2	3.7	3.4	4.9	4.7



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	Cases		Std.					Median		
diagnosis	n	Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	106	73.2	12.7	28.5	99.5	55.5	64.8	74.7	82.6	88.8
1999	113	72.2	12.3	35.3	96.5	56.5	66.8	73.2	79.5	87.0
2000	114	74.9	11.0	44,5	94.0	60.0	66.8	76.2	82.2	88.7
2001	125	72.8	11,9	40.2	99.1	56.5	65.3	74.6	80.5	87.8
2002	237	73.7	11.6	34.1	94.5	57.8	65.9	74.6	82.1	88.1
2003	229	74.3	10.3	37.2	96.8	60.0	66.8	75.0	81.9	87.3
2004	231	73.8	11.8	34.0	100	57.4	67.2	74.2	82.8	88.0
2005	212	72.7	11.6	44.5	98.0	57.5	63.9	72.1	81.8	86.8
2006	249	74.4	12.0	36.7	99.2	57.9	67.4	74.8	83.6	89.2
2007	256	71.9	12.0	35.2	97.1	55.8	64.6	72.5	80.3	87.0
2008	259	73.8	11.9	32.9	99.3	58.5	67.4	74.5	83.3	87.4
2009	252	73.0	11.9	26.5	97.7	56.0	66.9	73.6	81.6	87.7
2010	217	73.3	11.0	45.3	93.8	58.2	66.5	74.3	82.1	87.3
2011	181	74.2	11.2	36.1	100	59.8	66.6	75.1	83.0	87.9
1998-2011	2781	73.5	11.6	26.5	100	58.0	66.2	74.2	82.1	87.7

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	37	71.9	10.5	51.0	88.9	55.5	62.2	74.7	79.2	83.6
1999	45	68.1	13.0	35.3	89.8	54.1	59.2	68.7	77.5	86.0
2000	53	71.6	12.1	44.5	94.0	56.4	62.3	72.5	80.5	86.0
2001	48	71.9	11.6	42.1	92.8	56.5	63.0	73.4	79.6	88.0
2002	103	70.3	10.3	44.7	93.5	58.1	62.9	70.0	77.7	85.2
2003	91	72.1	9.7	52.5	95.2	58.9	63.9	72.0	79.7	84.8
2004	82	69.9	11.4	34.0	91.5	54.2	63.9	71.1	76.7	83.7
2005	91	70.0	11.1	47.0	98.0	57.0	63.0	69.4	78.9	86.0
2006	96	69.8	12.0	36.7	94.5	53.8	62.3	69.3	79.0	84.2
2007	103	67.9	11.3	35.2	93.1	53.7	61.4	66.6	77.3	82.6
2008	123	72.3	10.4	37.0	93.1	59.2	65.7	72.6	80.6	84.6
2009	125	71.5	11.3	43.3	97.7	53.4	64.9	72.2	80.0	84.6
2010	91	71.2	10.1	45.3	93.7	58.0	64.2	72.9	77.6	84.2
2011	86	71.5	10.7	38.9	89.8	56.4	65.0	73.2	79.4	84.3
1998-2011	1174	70.7	11.0	34.0	98.0	56.5	63.5	71.2	79.0	84.8

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	69	73.9	13.7	28.5	99.5	54.5	65.8	75.2	84.5	90.1
1999	68	75.0	11.1	43.7	96.5	61.6	69.2	75.7	81.9	90.1
2000	61	77.9	9.1	51,1	92.4	66.4	74.0	78.3	82.5	89.7
2001	77	73.3	12,2	40.2	99.1	54.9	65.7	75.7	81.6	87.8
2002	134	76.4	11.8	34.1	94.5	57.8	71.9	79.2	83.6	89.7
2003	138	75.7	10.5	37.2	96.8	61.8	68.1	77.2	83.0	88.1
2004	149	75.9	11.5	44.2	100	60.1	68.8	76.8	84.0	90.3
2005	121	74.7	11.7	44.5	98.0	59.4	65.3	76.5	82.8	89.3
2006	153	77.2	/11.1	43.2	99.2	64.8	71.2	78.5	85.7	91.2
2007	153	74.6	11.7	39.2	97.1	57.9	68.0	75.6	83.0	89.2
2008	136	75.0	13.0	32.9	99.3	57.1	68.4	77.8	84.9	88.1
2009	127	74.5	12.4	26.5	96.6	58.9	67.8	75.1	84.0	88.2
2010	126	74.8	11.5	45.3	93.8	59.1	67.6	75.6	83.9	88.9
2011	95	76.7	11.2	36.1	100	62.4	69.9	76.5	86.2	89.4
1998-2011	1607	75.4	11.7	26.5	100	59.7	68.7	76.9	83.9	89.2

Table 4

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

Age at									
diagnosis	Cases			Males			Females		
Years	n	왕	Cum.%	n	00	Cum.%	n	용	Cum.%
25-29	2	0.1	0.1			0.0	2	0.1	0.1
30-34	5	0.2	0.3	/ 1	0.1	0.1	4	0.2	0.4
35-39	12	0.4	0.7	7	0.6	0.7	5	0.3	0.7
40-44	20	0.7	1.4	9	0.8	1.4	11	0.7	1.4
45-49	58	2.1	3.5	26	2.2	3.7	32	2.0	3.4
50-54	101	3.6	7.1	54	4.6	8.3	47	2.9	6.3
55-59	158	5.7	12.8	94	8.0	16.3	64	4.0	10.3
60-64	261	9.4	22.2	153	13.0	29.3/	108	6.7	17.0
65-69	394	14.2	36.4	203	17.3	46.6	191	11.9	28.9
70-74	444	16.0	52.3	197	16.8	63.4	247	15.4	44.2
75-79	438	15.7	68.1	180	15.3	78.7	258	16.1	60.3
80-84	429	15.4	83.5	138	11.8	90.5	291	18.1	78.4
85+	459	16.5	100.0	112	9.5	100.0	347	21.6	100.0
All ages	2781	100.0		1174	100.0		1607	100.0	

Included in the statistics are 21.9% multiple primaries in males and 18.1% in females.

Table 5

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

Age at diagnosis Years 0- 4 5- 9	Males n	Females n	Age-spec.incid.	0.0 0.0		Females DCO rate n=441 %		Females Prop.all cancers n=129521
10-14			0.0	0.0				
15-19			0.0	0.0				
20-24		•	0.0	0.0				
25-29	1	2	0.0	0.1			0 1	0.2
30-34	1	4	0.1	0.2		40.0	0.1	0.2
35-39	7	5 11	0.3	0.2		40.0	0.4	0.2
40-44	9	11	0.4	0.5		9.1	0.3	0.2
45-49	26	32	1.3	1.7	11 1	9.4	0.6	0.4
50-54	54	47	3.2	2.7	11.1	6.4	0.7	0.5
55-59	94	64	6.0	3.9	5.3	12.5	0.8	0.5
60-64	153	108	10.1	6.7	7.2	8.3	0.8	0.7
65-69	203	191	14.9		12.3	8.4	0.9	1.2
70-74	197	246	19.1	19.9	16.2	13.8	0.9	1.6
75-79	180	258	26.6	25.9		26.7	1.1	1.8
80-84	138	291	34.0	36.6	32.6	37.8	1.3	2.2
85+	111	347	40.0	46.7	50.5	53.6	1.3	2.4
All ages	1173	1606			18.4	27.5	0.9	1.2
Incidence								
1 1 1 C C C C C C C C C C C C C C C C C								
			4.7	6.1				
Raw			4.7	6.1				
Raw WS			2.4	2.2				
Raw WS ES			2.4	2.2 3.4				
Raw WS			2.4	2.2				
Raw WS ES			2.4	2.2 3.4				
Raw WS ES			2.4	2.2 3.4				
Raw WS ES			2.4	2.2 3.4				
Raw WS ES			2.4	2.2 3.4				
Raw WS ES			2.4	2.2 3.4				
Raw WS ES			2.4	2.2 3.4				
Raw WS ES			2.4	2.2 3.4				
Raw WS ES			2.4	2.2 3.4				
Raw WS ES			2.4	2.2 3.4				
Raw WS ES			2.4	2.2 3.4				
Raw WS ES			2.4	2.2 3.4				
Raw WS ES			2.4	2.2 3.4				
Raw WS ES			2.4	2.2 3.4				
Raw WS ES			2.4	2.2 3.4				
Raw WS ES			2.4	2.2 3.4				

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

	Observed E	xpected		LCL UCL		DCO
Diagnosis	'n	n	SIR	95% 95%	EAR	%
C15 Oesophagus	2	0.3	5.7	0.7 20.7	14.3	
C16 Stomach	3	0.9	3.4	0.7 9.8	18.3	33.3
C18 Colon	6 /	2.1	2.9	1.1 6.2	# 33.9	16.7
C22 Liver	3 /	0.6	5.4	1.1 15.7	# 21.2	
C25 Pancreas	4	0.7	5.6	1.5 14.3	# 28.5	25.0
C33-C34 Lung	/ 3	2.4	1.2	0.3 3.6	4.9	
C43 Malign. melanoma	1 2	0.7	2.7	0.3 9.7	10.9	
C61 Prostate	9	6.1	/ 1.5 /	0.7 2.8	24.8	22.2
C67 Bladder	2	0.9	2.3	0.3 8.2	9.7	
C82-C85 NHL	2	0.8	2.5	0.3 9.2	10.5	50.0
Other primaries	4	1.0	3.9	1.1 9.9	# 25.8	50.0
Not observed	0	4.1	0.0	0.0 0.9	# -35.2	
All mult. primaries	40	20.7	1.9	1.4 2.6	# 167.6	20.0

Patients	751
Mean age at second malignancy (years)	68.8
Person-years	1152
Mean observation time (years)	1.5
Median observation time (years)	0.8

The occurrence of second malignancy is statistically significant.

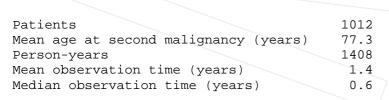
Observed second primaries with count 1 are pooled in category "Other primaries".

Table 6b

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

FEMALES

	Observed	Expected		LCL	UCL		DCO
Diagnosis	n	n	SIR	95%	95%	EAR	%
C16 Stomach	2 /	0.8	2.5	0.3	9.0	8.5	100.0
C18 Colon	8	2.1	3.7	1.6	7.4 #	41.7	50.0
C19-C20 Rectum	3 /	0.9	3.4	0.7	9.8	15.0	33.3
C22 Liver	2	0.2	8.8	1.1	31.7 #	12.6	
C25 Pancreas	6	0.9	6.8	2.5	14.7 #	36.3	16.7
C33-C34 Lung	4	1.3	3.2	0.9	8.2	19.5	
C56 Ovary	8	0.8	9.9	4.3	19.6 #	51.1	25.0
C64 Kidney	2	0.5	4.1	0.5	14.7	10.7	
C82-C85 NHL	4	0.7	5.4	1.5	13.8 #	23.1	50.0
Other primaries	8	7.1	1.1	0.5	2.2	6.5	12.5
Not observed	0	3.4	0.0	0.0	1.1	-24.1	
All mult. primaries	47	18.7	2.5	1.8	3.3 #	200.9	27.7



The occurrence of second malignancy is statistically significant.

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

C23-C24: Malignant neoplasm of gallbladder and other parts of biliary tract Age distribution and age-specific incidence 1998 - 2011 (Males: 1173, Females: 1606)

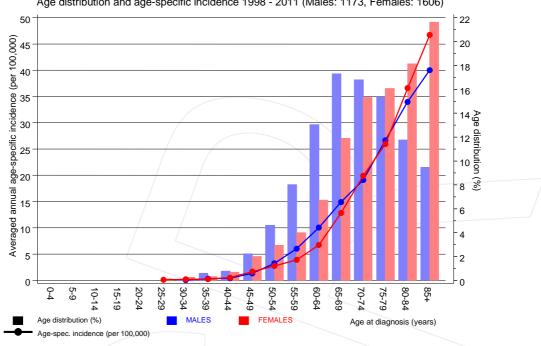


Figure 7. Age distribution and age-specific incidence



C23-C24: Malignant neoplasm of gallbladder and other parts of biliary tract

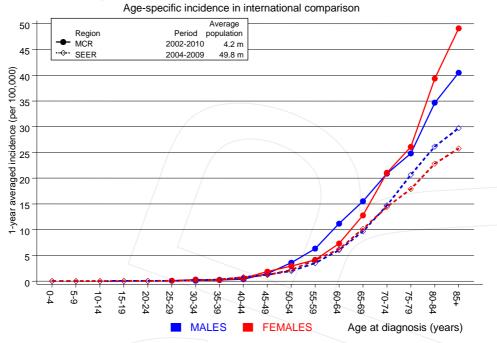


Figure 7a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).



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.



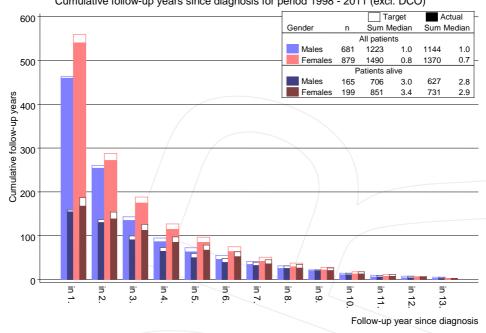
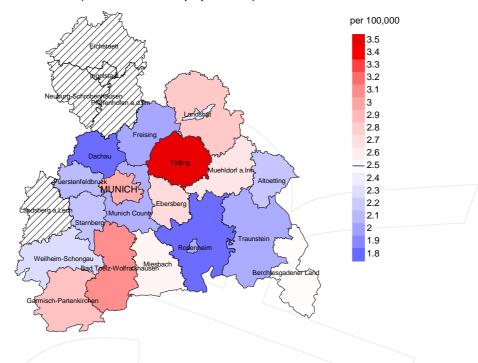


Figure 8. Cumulative follow-up years depending on time since diagnosis

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

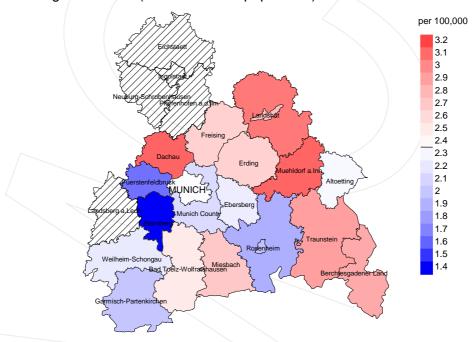
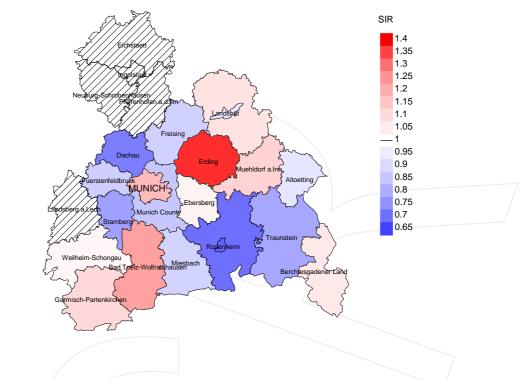


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 2.5/100,000 WS N=554, females 2.4/100,000 WS N=799). 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 18 women were identified with newly diagnosed gallbladder cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 2.2/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 1.0 and 4.3/100,000.

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=554, females N=799). 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 18 women were identified with newly diagnosed gallbladder cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.80. Though, the value of this parameter may vary with an underlying probability of 99% between 0.40 and 1.42, and is therefore not statistically striking.

MORTALITY

Table 10a

Patient cohorts of incident cancers by year of diagnosis, follow-up status, proportion of DCO, deaths among the annual cohorts, and proportion of available death certificates (with respect to registry area expansion from 2.51 to 3.96 m as of 2002, and from 3.96 to 4.52 m as of 2007, respectively)

		Prop.				Prop. deaths
	Incident	actively	Prop.		Prop.	with death
Year of	cases	followed	DCO	Deaths	deaths	certific.
diagnosis	n	%	%	/ n /	%	%
1998	106	100.0	22.6	97	91.5	93.8
1999	113	100.0	15.0	108	95.6	96.3
2000	114	100.0	23.7	109	95.6	97.2
2001	125	97.6	32.0	112	89.6	96.4
2002	237	100.0	33.8	224	94.5	97.8
2003	229	100.0	31.4	213	93.0	98.6
2004	231	96.5	26.0	200	86.6	98.0
2005	212	97.6	27.4	184	86.8	98.9
2006	249	97.6	21.7	220	88.4	98.6
2007	256	96.1	18.4	230	89.8	98.7
2008	259	91.5	23.2	222	85.7	99.5
2009	252	88.1	15.9	196	77.8	98.0
2010	217	96.8	19.8	159	73.3	99.4
2011	181	86.7	19.9	123	68.0	97.6
1998-2011	2781	95.9	23.7	2397	86.2	98.1

base_C2324E.pdf

Table 10b

Annual cohorts of incident cancers and deaths, proportion of death certificates and cases deceased the same year of cancer diagnosis (incl. DCO)

			Prop.		
			deaths		Prop.
Year of	Incident		with death	Deaths in	deaths in
diagnosis/	cases	Deaths	certific.	same year	same year
death	n	/ n /	%	n	8
1998	106	94	93.6	57	53.8
1999	113	104	94.2	54	47.8
2000	114	121	95.9	62	54.4
2001	125	114	97.4	55	44.0
2002	237	191	99.0	146	61.6
2003	229	148	96.6	115	50.2
2004	231	155	98.7	108	46.8
2005	212	165	97.6	96	45.3
2006	249	201	98.0	125	50.2
2007	256	191	98.4	102	39.8
2008	259	202	98.0	123	47.5
2009	252	208	98.6	100	39.7
2010	217	208	100.0	94	43.3
2011	181	178	99.4	77	42.5
1998-2011	2781	2280	97.9	1314	47.2

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)

				Prop.	
				cancer	
		Prop.	Prop.	recorded	
		cancer-	not cancer-	on death	
Year of	Deaths	related	related	certificate	
death	n /	%	8	%	
1998	94	87.2	12.8	95.5	
1999	104	80.8	19.2	94.9	
2000	121	91.7	8.3	98.3	
2001	114	91.2	8.8	96.4	
2002	191	90.6	9.4	93.7	
2003	148	89.2	10.8	95.8	
2004	155	90.3	9.7	96.1	
2005	165	91.5	8.5	95.7	
2006	201	87.6	12.4	91.9	
2007	191	93.2	6.8	95.7	
2008	202	94.6	5.4	96.5	
2009	208	88.9	11.1	93.2	
2010	208	90.9	9.1	94.7	
2011	178	91.0	9.0	94.9	
1998-2011	2280	90.3	9.7	95.0	

Table 11a $\begin{tabular}{ll} \begin{tabular}{ll} \begin{tabula$

					Age at
		Age at	Age at	Age at	death
		death	death	death	(according
		(all	(cancer-	(not cancer-	to death
Year of	Deaths	causes)	related)	related)	certificate)
death	n	Years	Years	Years	Years
1998	36	73.5	73.2	74.7	73.7
1999	36	72.3	71.1	75.5	70.8
2000	42	73.9	74.1	72.2	74.0
2001	52	71.7	71.2	74.9	71.8
2002	81	71.6	71.0	76.2	71.3
2003	61	73.7	73.4	75.9	74.2
2004	59	71.8	71.5	74.3	71.7
2005	84	70.0	69.8	71.9	69.9
2006	78	73.3	72.8	76.4	73.3
2007	68	69.4	69.3	71.2	70.0
2008	77	72.0	71.9	73.5	71.8
2009	103	71.1	71.1	71.2	71.5
2010	90	73.1	72.6	79.7	72.9
2011	90	72.2	71.9	75.7	71.9
1998-2011	957	72.0	71.7	74.7	71.9

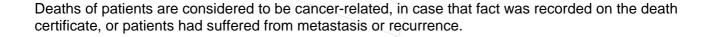


Table 11b Means of age at death according to the grouping in Table 10 FEMALES

					Age at
		Age at	Age at	Age at	death
		death	death	death	(according
		(all	(cancer-	(not cancer-	to death
Year of	Deaths	causes)	related)	related)	certificate)
death	n	Years	Years	Years	Years
1998	58	74.8	73.9	82.5	74.6
1999	68	76.7	76.3	79.3	76.8
2000	79	76.7	76.2	81.6	76.6
2001	62	77.7	77.1	89.1	77.8
2002	110	76.0	75.7	79.5	76.0
2003	87	75.7	75.2	80.2	75.9
2004	96	77.2	76.9	79.5	77.1
2005	81	75.8	75.0	84.3	75.5
2006	123	78.0	76.8	86.1	76.9
2007	123	76.5	76.0	84.4	76.1
2008	125	75.9	75.4	85.2	76.0
2009	105	78.5	77.5	86.2	77.7
2010	118	76.5	75.8	82.6	76.1
2011	88	76.2	75.7	79.9	76.0
1998-2011	1323	76.6	76.0	82.7	76.4



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 $\begin{tabular}{ll} Mortality measures (cancer-related death) and mortality-incidence-index \\ by year of death \\ \hline MALES \\ \end{tabular}$

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	30	2.7	0.81	1.5	0.82	2.5	0.82	3.9	0.86
1999	26	2.3	0.58	1.3	0.57	2.1	0.58	2.7	0.59
2000	39	3.4	0.75	1.9	0.72	3.1	0.77	4.3	0.79
2001	45	3.9	0.94	2.2	0.95	3.5	0.93	4.6	0.88
2002	71	3.8	0.69	2.1	0.67	3.2	0.69	4.3	0.71
2003	54	2.9	0.59	1.5	0.58	2.4	0.59	3.3	0.61
2004	54	2.9	0.66	1.5	0.64	2.4	0.65	3.2	0.67
2005	77	4.1	0.85	2.2	0.85	3.3	0.85	4.2	0.85
2006	68	3.6	0.71	1.8	0.68	2.7	0.70	3.7	0.72
2007	63	2.8	0.61	1.5	0.57	2,1	0.58	2.7	0.59
2008	72	3.2	0.59	1.6	0.60	2.5	0.60	3.4	0.60
2009	92	4.1	0.74	2.0	0.76	3.1	0.75	4.1	0.74
2010	83	3.7	0.91	1.7	0.89	2.7	0.91	3.5	0.89
2011	84	3.7	0.98	1.7	0.94	2.7	0.97	3.7	0.97
1998-2011	858	3.4	0.73	1.7	0.72	2.7	0.73	3.6	0.74

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	52	4.4	0.75	1.8	0.71	2.7	0.74	3.6	0.75
1999	58	4.9	0.85	1.8	0.77	2.8	0.79	3.9	0.82
2000	72	6.0	1.18	2.1	1.33	3.4	1.25	4.8	1.16
2001	59	4.9	0.77	1.7	0.63	2.8	0.69	4.0	0.75
2002	102	5.2	0.76	1.9	0.80	2.9	0.77	4.1	0.76
2003	78	4.0	0.57	1.5	0.59	2.3	0.59	3.2	0.58
2004	86	4.4	0.58	1.5	0.55	2.4	0.57	3.4	0.58
2005	74	3.7	0.61	1.3	0.56	2.0	0.57	2.9	0.62
2006	108	5.4	0.71	1.8	0.72	2.9	0.71	4.0	0.71
2007	115	5.0	0.75	1.7	0.70	2.8	0.72	3.8	0.75
2008	119	5.1	0.88	1.8	0.84	2.8	0.86	3.8	0.91
2009	93	4.0	0.73	1.2	0.60	2.0	0.66	2.9	0.73
2010	106	4.5	0.84	1.5	0.80	2.4	0.82	3.3	0.81
2011	78	3.3	0.83	1.2	0.87	1.8	0.84	2.4	0.84
1998-2011	1200	4.6	0.75	1.6	0.72	2.5	0.73	3.5	0.75

Table 13

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

Age at									
death	Cases			Males			Females		
Years	n	%	Cum.%	n	90	Cum.%	n	%	Cum.%
25-29	2	0.1	0.1			0.0	2	0.2	0.2
30-34	2	0.1	0.2	/ 1	0.1	0.1	1	0.1	0.3
35-39	6	0.3	0.5	2	0.2	0.3	4	0.3	0.6
40-44	9	0.4	0.9	6	0.7	1.0	3	0.3	0.8
45-49	35	1.7	2.6	10	1.2	2.2	25	2.1	2.9
50-54	58	2.8	5.4	32	3.7	5.9	26	2.2	5.1
55-59	130	6.3	11.7	75	8.7	14.7	55	4.6	9.7
60-64	169	8.2	20.0	104	12.1	26.7	65	5.4	15.1
65-69	269	13.1	33.0	134	15.6	42.3	135	11.3	26.3
70-74	338	16.4	49.4	162	18.8	61.2	176	14.7	41.0
75-79	354	17.2	66.6	139	16.2	77.3	215	17.9	58.9
80-84	329	16.0	82.6	98	11.4	88.7	231	19.3	78.2
85+	359	17.4	100.0	97	11.3	100.0	262	21.8	100.0
All ages	2060	100.0		860	100.0		1200	100.0	

Included in the statistics are 21.9% multiple primaries in males and 18.1% in females.

Table 14

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

			Males		Females		Males	Females
Age at			Age-		Age-		Prop.all	Prop.all
death	Males	Females	spec.		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			0.0		0.0			
15-19			0.0		0.0			
20-24			0.0		0.0			
25-29		2	0.0		0.1	1.00		2.0
30-34	1	1	0.1		0.1	0.25	0.6	0.5
35-39	2	4	0.1	0.29	0.2	0.80	0.5	0.9
40-44	6	3	0.3	0.67	0.1	0.27	0.8	0.3
45-49	10	25	0.5	0.38	1.3	0.78	0.6	1.4
50-54	32	26	1.9	0.59	1.5	0.55	1.1	1.0
55-59	75	55	4.8	0.80	3.4	0.86	1.5	1.4
60-64	104	65	6.8	0.68	4.1	0.60	1.3	1.2
65-69	134	135	9.8		9.1	0.71	1.3	1.9
70-74	162	176	15.7		14.3	0.71	1.5	2.2
75-79	139	215	20.6	0.77	21.6	0.83	1.3	2.4
80-84	98	231	24.1	0.71	29.1	0.79	1.1	2.4
85+	97	262	35.0	0.87	35.3	0.76	1.4	2.3
All ages	860	1200					1.3	2.0
Mortality								
Raw			3.4		4.6	0.75		
WS			1.7	0.72	1.6	0.72		
ES			2.7	0.73	2.5			
BRD-S			3.6	0.74	3.5	0.75		
PYLL-70								
per 100,000			13.7		12.7			
ES			12.0		10.8			
AYLL-70			8.5		9.1			

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

Munich Cancer Registry

Table 15a

Multiple primaries in deaths in period 1998-2011

MALES

	Total	Total	Pre	Pre	Syn- chron ±30d	Syn- chron ±30d	Post	Post
Diagnosis	n /	%↓	n	-%	n	_8 ←%	n	-%
5								
C03-C06 Oral cavity	1	0.5					1	100.0
C12-C13 Hypopharynx	/2	1.0	1	50.0			1	50.0
C15 Oesophagus	/ 2	1.0			1	50.0	1	50.0
C16 Stomach	/ 11	5.7	7	63.6	2	18.2	2	18,2
C17 Small intestine	3	1.6	1	33.3	1	33.3	1	33.3
C18 Colon	/ 16 /	8.3	10	62.5	4	25.0	2	12.5
C19-C20 Rectum	12	6.3	12	100.0				
C22 Liver	3	1.6			2	66.7	1	33.3
C23-C24 Bile	2	1.0					2	100.0
C25 Pancreas	9	4.7			3	33.3	6	66.7
C26 GI cancer	2	1.0			1	50.0	1	50.0
C32 Larynx	5	2.6	4	80.0	1	20.0		
C33-C34 Lung	9	4.7	3	33.3	2	22.2	4	44.4
C38,C45 Mesothelioma	1	0.5					1	100.0
C43 Malign. melanoma	8	4.2	5	62.5			3	37.5
C44 Skin others	8	4.2	3	37.5	_ 1	12.5	4	50.0
C46,C49 Soft tissue	1	0.5	1	100.0				
C48 Peritoneal	1	0.5			1	100.0		
C61 Prostate	48	25.0	37	77.1	4	8.3	7	14.6
C62 Testis	5	2.6	5	100.0				
C64 Kidney	11	5.7	8	72.7	1	9.1	2	18.2
C67 Bladder	15	7.8	12	80.0	2	13.3	1	6.7
C68 Urinary org.	1	0.5			1	100.0		
C69 Eye melanoma	2	1.0	1	50.0			1	50.0
C70-C72 CNS cancer	2	1.0	1	50.0	1/	50.0		
C73 Thyroid	1	0.5	1	100.0				
C76-C79 CUP	4	2.1	2	50.0	2	50.0		
C82-C85 NHL	4	2.1	1	25.0	1	25.0	2	50.0
C90 Mult. myeloma	2	1.0					2	100.0
C91-C96 Leukaemia	1_	0.5			1	100.0		
All mult. primaries	192	100.0	115	59.9	32	16.7	45	23.4

Multiple primaries with number of cases n<1 are pooled in category "Other primaries".

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

Table 15b

Multiple primaries in deaths in period 1998-2011
FEMALES

					Syn- chron	Syn- chron		
	Total	Total	Pre	Pre	±30d	±30d	Post	Post
Diagnosis	n /	%↓	n	%	n	-%	n	-%
	/	• •						
C03-C06 Oral cavity	3	1.4	3	100.0				
C16 Stomach	6	2.8	1	16.7	\ 1	16.7	4	66.7
C17 Small intestine	2	0.9	1	50.0			1	50.0
C18 Colon	24	11.3	14	58.3	1	4.2	9	37.5
C19-C20 Rectum	12	5.6	7	58.3	3	25.0	2	16.7
C22 Liver	_ 2 /	0.9			1	50.0	1	50.0
C25 Pancreas	6	2.8	1	16.7	4	66.7	1	16.7
C33-C34 Lung	8	3.8	3	37.5	/ 1	12.5	4	50.0
C43 Malign. melanoma	10	4.7	9	90.0			1	10.0
C44 Skin others	8	3.8	4	50.0	3	37.5	1	12.5
C50 Breast	50	23.5	47	94.0	2	4.0	1	2.0
C51 Vulva	3	1.4	3	100.0				
C53 Cervix uteri	2	0.9	1	50.0			1	50.0
C54 Corpus uteri	16	7.5	16	100.0				
C56 Ovary	15	7.0	5	33.3	3	20.0	7	46.7
C64 Kidney	10	4.7	7	70.0	_ 3	30.0		
C67 Bladder	9	4.2	9	100.0				
C70-C72 CNS cancer	3	1.4	2	66.7	1	33.3		
C76-C79 CUP	3	1.4	1	33.3	1	33.3	1	33.3
C82-C85 NHL	8	3.8	6	75.0	1	12.5	1	12.5
C91-C96 Leukaemia	2	0.9	1	50.0			1	50.0
Other primaries	_ 11	5.2	5	45.5	5	45.5	1	9.1
All mult. primaries	213	100.0	146	68.5	30	14.1	37	17.4

Multiple primaries with number of cases n<2 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			Males Age-		Females Age-		Males	Females Prop.all
death	Males	Females			spec.		cancers	cancers
Years	n	n		MI-index		MT-index		%
10012				/			· ·	· ·
0- 4			0.0		0.0			
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24			0.0		0.0			
25-29		2	0.0		0.1	1.00		2.1
30-34	1	1	0.1	1.00	0.1	0.25	0.6	0.6
35-39	2	4	0.1	0.40	0.2	0.80	0.6	1.0
40-44	6	3	0.3	0.67	0.1	0.27	0.9	0.3
45-49	10	24	0.5	0.40	1.3	0.77	0.7	1.6
50-54	31	25	1.9	0.63	1.5	0.56	1.2	1.1
55-59	68	48	4.4	0.83	2.9	0.87	1.5	1.4
60-64	84	59	5.5	0.64	3.7	0.60	1.3	1.3
65-69	121	119	8.9	0.68	8.0	0.74	1.4	2.1
70-74	137	151	13.3		12.2	0.73	1.6	2.3
75-79	115	183	17.0	0.78	18.4	0.81	1.4	2.5
80-84	79	189	19.4	0.72	23.8	0.78	1.2	2.5
85+	73	238	26.3	0.82	32.0	0.79	1.3	2.6
All ages	727	1046					1.3	2.1
Mortality								
Raw			2.9		4.0	0.75		
WS			1.5	0.72	1.4	0.73		
ES			2.3		2.2	0.74		
BRD-S			3.0	0.74	3.0	0.75		
PYLL-70								
per 100,000			12.4		11.8			
ES			10.9		10.0			
AYLL-70			8.7		9.3			

^{*} 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 *)

			Males		Females		Males	Females
Age at			Age-		Age-		Prop.all	Prop.all
death	Males	Females	spec.		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			0.0		0.0			
15-19			0.0		0.0			
20-24			0.0		0.0			
25-29		2	0.0		0.1	1.00		2.2
30-34	1	1	0.1		0.1	0.25	0.6	0.6
35-39	2	4	0.1	0.40	0.2	0.80	0.6	1.0
40-44	6	2	0.3	0.75	0.1	0.18	0.9	0.3
45-49	10	24	0.5	0.43	1.3	0.77	0.8	1.8
50-54	26	24	1.6	0.53	1.4	0.56	1.1	1.2
55-59	65	45	4.2	0.83	2.7	0.83	1.6	1.5
60-64	81	59	5.3	0.64	3.7	0.61	1.4	1.5
65-69	119	117	8.7	0.70	7.9	0.75	1.6	2.4
70-74	130	146	12.6	0.82	11.8	0.73	1.7	2.7
75-79	107	1/73	15.8	0.75	17.4	0.80	1.6	2.8
80-84	76	184	18.7	0.71	23.1	0.77	1.4	2.9
85+	70	233	25.2	0.80	31.4	0.78	1.6	2.9
All ages	693	1014					1.5	2.4
Mortality								
Raw			2.8	0.72	3.9	0.75		
WS			1.4	0.71	1.4	0.72		
ES			2.2	0.72	2.1	0.73		
BRD-S			2.9	0.73	2.9	0.74		
PYLL-70								
per 100,000			11.7		11.4			
ES			10.3		9.7			
AYLL-70			8.6		9.2			

^{*} See corresponding tables with multiple primaries.

MORTALITY

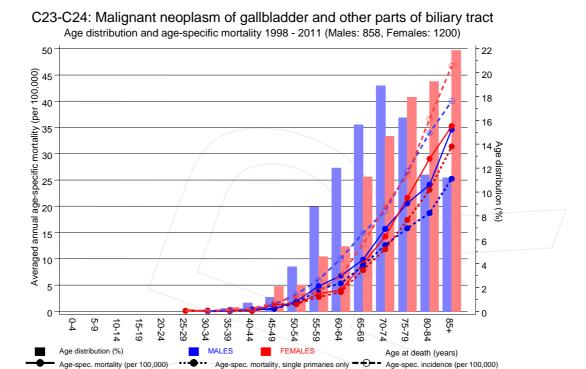


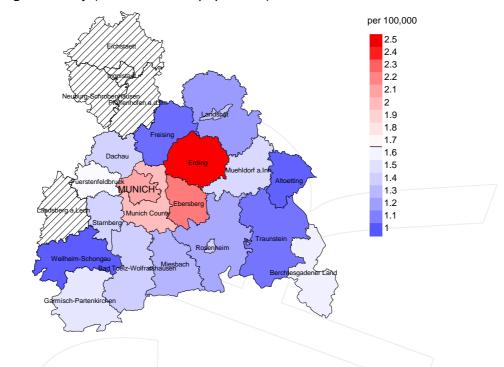
Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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



Age-spec. mortality (per 100,000)

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



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

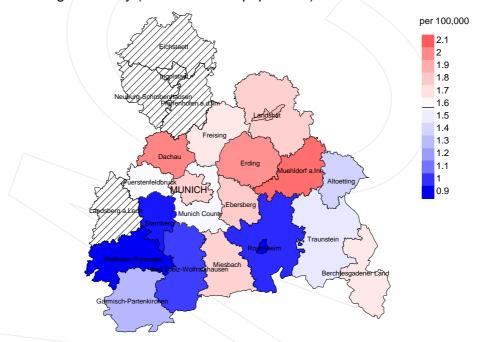


Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2003 to 2008. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 1.7/100,000 WS N=374, females 1.6/100,000 WS N=553). 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 15 women died from gallbladder cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 1.8/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.8 and 3.6/100,000.

Standardized mortality ratio (SMR) 2003 - 2008: Males

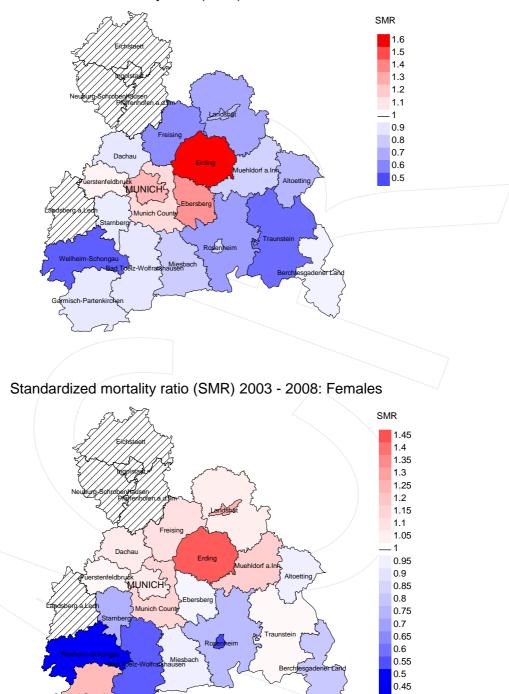


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=374, females N=553). 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 15 women died from gallbladder cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.96. Though, the value of this parameter may vary with an underlying probability of 99% between 0.44 and 1.81, 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

Recommended Citation

Munich Cancer Registry. Baseline statistics C23-C24: Gallbladder cancer [Internet]. 2013 [updated 2013 Apr 2; cited 2013 Jun 1]. Available from: http://www.tumorregister-muenchen.de/en/facts/base/base_C2324E.pdf

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