Munich Cancer Registry



- ▶ Survival
- ▶ Selection Matrix
- ▶ Homepage
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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

C16: Stomach cancer

Year of diagnosis	1998-2013
Patients	11,624
Diseases	11,640
Creation date	05/19/2015
Export date	12/30/2014
Population	4.64 m



http://www.tumorregister-muenchen.de/en/facts/base/base_C16__E.pdf

Global Statements about the statistics on the Internet – Baseline Statistics (grey button ——), Survival (red button ——)

In these analyses, the clinics and physicians of Upper Bavaria and the city and county of Landshut[#], with a total of 4.64 million inhabitants, account for the frequency of cancer diseases^{##} and the achieved long term results. Additionally, the long term survival evaluated by the Munich Cancer Registry (MCR) is compared with the results of the population-based registry in the USA (SEER), which is useful for checking the consistency of the data on an international level.

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

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

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

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

Munich Cancer Registry, May 2015

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

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

Code	Description
C16	Malignant neoplasm of stomach
C16.0	Cardia
C16.1	Fundus of stomach
C16.2	Body of stomach
C16.3	Pyloric antrum
C16.4	Pylorus
C16.5	Lesser curvature of stomach, unspecified
C16.6	Greater curvature of stomach, unspecified
C16.8	Overlapping lesion of stomach
C16.9	Stomach, 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	%	8	%	%
1998	562	63	11.2	17.6	86.5	98.9
1999	508	58	11.4	18.1	87.6	98.2
2000	482	58	12.0	21.6	86.9	98.3
2001	516	63	12.2	17.8	83.7	97.9
2002	875	166	19.0	18.6	87.5	98.9 #
2003	763	102	13.4	20.7	85.2	99.2
2004	839	89	10.6	21.6	80.9	98.3
2005	769	92	12.0	23.8	79.5	97.0
2006	764	47	6.2	22.9	75.0	96.1
2007	878	79	9.0	23.6	76.8	89.7 # ##
2008	872	61	7.0	23.2	73.3	83.0
2009	858	65	7.6	22.7	71.4	83.6
2010	783	54	6.9	24.9	66.9	81.5
2011	847	45	5.3	22.7	61.4	78.5
2012	794	48	6.0	23.6	53.0	77.2
2013	530	48	9.1	24.3	34.5	98.1 ###
1998-2013	11640	1138	9.8	21.9	74.2	91.3

[#] 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	૪
1998	562	293	269	52.1
1999	508	263	245	51.8
2000	482	263	219	54.6
2001	516	263	253	51.0
2002	875	455	420	52.0
2003	763	405	358	53.1
2004	839	470	369	56.0
2005	769	410	359	53.3
2006	764	429	335	56.2
2007	878	496	382	56.5
2008	872	491	381	56.3
2009	858	498	360	58.0
2010	783	471	312	60.2
2011	847	509	338	60.1
2012	794	460	334	57.9
2013	530	311	219	58.7
1998-2013	11640	6487	5153	55.7

Table 2

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

			Males	Fem.	Males	Fem.	Males	Fem.	Males	Fem.
Year of	Males	Females	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.
diagnosis	n	n	raw	raw	WS	WS	ES	ES	BRD-S	BRD-S
1998	293	269	26.4	22.9	15.7	8.8	24.5	13.8	33.5	18.9
1999	263	245	23.5	20.6	13.6	7/. 7	21.4	11.9	29.3	16.6
2000	263	219	23.1	18.2	13.4	6.7	20.8	10.6	27.9	14.8
2001	263	253	22.7	20.8	13.1	8.5	20.1	12.9	26.7	17.0
2002	455	420	24.4	21.5	13.2	8.2	20.7	12.6	28.3	16.9
2003	405	358	21.6	18.2	11.5	6.6	18.1	10.3	24.5	14.1
2004	470	369	25.0	18.7	13.1	7.9	20.3	11.8	27.5	15.2
2005	410	359	21.6	18.0	10.9	6.8	17.1	10.4	23.5	14.0
2006	429	335	22.4	16.7	11.3	6.3	17.4	9.7	23.4	12.8
2007	496	382	22.4	16.5	11.1	5.8	17.2	9.1	23.3	12.3
2008	491	381	22.1	16.4	11.0	6.2	16.6	9.5	22.0	12.6
2009	498	360	22.3	15.5	10.7	5.8	16.5	8.8	21.9	11.7
2010	471	312	20.9	13.3	10.4	4.9	15.6	7.5	20.1	10.0
2011	509	338	22.3	14.3	10.5	5.4	16.0	8.2	21.1	10.7
2012	460	334	20.1	14.2	10.0	5.6	14.9	8.2	19.0	10.6
2013	311	219	13.6	9.3	6.7	3.7	9.9	5.6	12.9	7.2
1998-2013	6487	5153	21.8	16.6	11.1	6.2	17.0	9.6	22.6	12.7

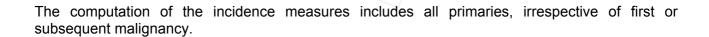


Table 3

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

Year of	Cases		Std.					Median		
		Maan		N/	M	1 0 0.	250		7 .	0.0%
diagnosis	n	Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	562	72.2	13,3	25.0	98.1	52.1	64.3	74.5	82.5	87.4
1999	508	73.0	13.3	18.8	99.9	55.6	64.3	74.8	83.1	88.4
2000	482	72.4	13.2	28.8	98.7	54.0	64.1	74.9	81.2	88.4
2001	516	71.1	13.8	14.5	96.8	53.5	62.5	72.9	81.2	88.3
2002	875	72.9	12.8	19.3	102	55.5	65.0	74.7	81.9	88.6
2003	763	73.0	12.6	17.9	98.5	56.2	64.7	74.9	82.5	87.5
2004	839	70.9	12.6	28.0	98.8	52.9	62.7	72.5	80.8	85.5
2005	769	72.8	12.9	22.1	99.3	55.4	65.1	74.7	82.2	86.9
2006	764	72.0	13.1	21.9	99.1	55.3	63.2	73.7	81.8	86.8
2007	878	72.7	12.8	27.8	101	54.6	65.4	74.6	82.3	87.4
2008	872	71.8	12.9	24.2	101	53.8	64.1	73.1	81.2	86.3
2009	858	71.9	12.9	31.1	102	53.5	64.5	73.6	81.4	87.2
2010	783	71.7	12.7	24.4	103	54.8	63.2	72.5	81.7	87.2
2011	847	71.9	12.9	18.9	98.3	53.7	64.5	73.4	81.3	87.7
2012	794	71.0	13.0	29.4	99.4	53.0	62.8	72.0	81.1	86.8
2013	530	70.3	13.0	20.9	99.5	52.5	62.6	72.7	79.1	85.8
1998-2013	11640	72.0	13.0	14.5	103	54.0	64.0	73.6	81.6	87.3

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	293	70.0	13.4	25.0	94.1	50.0	59.3	72.3	79.2	86.9
1999	263	70.6	12.7	29.8	97.4	53.9	63.0	71.5	79.4	86.5
2000	263	70.0	12.8	28.8	97.2	53.5	62.4	71.3	78.3	86.7
2001	263	68.4	13.3	14.5	96.8	52.9	60.0	70.2	78.4	84.6
2002	455	71.2	11.9	32.8	95.8	55.5	63.7	72.7	79.3	85.8
2003	405	70.6	12.4	17.9	97.8	53.5	62.8	72.3	79.8	85.7
2004	470	70.2	11.9	33.1	97.4	53.7	62.5	71.3	78.9	84.5
2005	410	71.3	12.5	29.8	96.5	54.4	64.4	73.1	80.5	85.4
2006	429	70.2	12.2	29.5	99.1	54.9	62.2	71.5	79.1	84.3
2007	496	70.6	12.2	35.3	99.0	52.7	63.3	71.8	80.1	85.2
2008	491	69.9	11.8	24.2	99.5	54.0	63.4	71.2	78.4	83.7
2009	498	70.8	11.7	31.1	102	54.1	63.6	72.2	78.9	85.1
2010	471	69.9	11.8	24.4	96.4	54.8	60.9	69.8	79.7	84.2
2011	509	70.9	12.5	18.9	94.7	53.2	63.7	72.6	80.0	85.8
2012	460	69.8	12.3	29.4	99.4	53.3	61.4	70.5	78.5	84.8
2013	311	69.5	12.3	20.9	95.8	53.2	62.6	71.9	77.7	83.7
1998-2013	6487	70.3	12.3	14.5	102	53.6	62.7	71.8	79.1	85.1

Table 3b

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

E	Q		Q + -1					M = -1		
Year of	Cases		Std.	/				Median		
diagnosis	n	Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	269	74.7	12,7	30.9	98.1	55.0	68.6	76.6	84.2	88.0
1999	245	75.6	13.4	18.8	99.9	59.4	68.5	78.4	85.2	89.8
2000	219	75.3	13.2	33.1	98.7	54.8	68.4	78.5	84.4	89.9
2001	253	73.9	13.9	26.4	96.7	54.4	65.4	75.7	84.0	90.6
2002	420	74.7	13.5	19.3	102	55.4	67.3	77.3	84.5	89.7
2003	358	75.7	12.3	30.3	98.5	59.7	68.5	77.8	83.9	89.6
2004	369	71.7	13.5	28.0	98.8	51.9	63.2	74.3	82.5	87.5
2005	359	74.6	13.1	22.1	99.3	56.6	65.7	77.4	83.8	90.8
2006	335	74.3	13.8	21.9	98.3	56.1	64.7	76.7	84.7	88.5
2007	382	75.4	13.2	27.8	101	57.1	68.3	78.1	85.4	88.7
2008	381	74.2	13.8	35.1	101	53.6	66.0	77.1	84.4	88.5
2009	360	73.6	14.2	32.6	101	51.4	66.1	77.0	84.6	88.4
2010	312	74.4	13.5	26.6	103	54.8	67.1	77.4	84.0	88.8
2011	338	73.4	13.3	28.6	98.3	53.9	66.7	74.6	82.4	89.7
2012	334	72.6	13.8	29.6	99.3	52.1	64.4	73.6	83.5	88.2
2013	219	71.6	13.9	32.3	99.5	50.8	62.3	73.7	81.2	88.5
1998-2013	5153	74.1	13.5	18.8	103	54.5	66.2	76.6	84.1	89.1

Table 4

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

Age at									
diagnosis	Cases			Males			Females		
Years	n	%	Cum.%	n	ે	Cum.%	n	%	Cum.%
10-14	1	0.0	0.0	/ 1	0.0	0.0			0.0
15-19	4	0.0	0.0	2	0.0	0.0	2	0.0	0.0
20-24	6	0.1	0.1	3	0.0	0.1	3	0.1	0.1
25-29	23	0.2	0.3	10	0.2	0.2	13	0.3	0.3
30-34	48	0.4	0.7	19	0.3	0.5	29	0.6	0.9
35-39	109	0.9	1.6	64	1.0	1.5	45	0.9	1.8
40 - 44	190	1.6	3.3	110	1.7	3.2	80	1.6	3.3
45-49	364	3.1	6.4	216	3.3	6.6	148	2.9	6.2
50-54	551	4.7	11.1	327	5.0	11.6	224	4.3	10.6
55-59	783	6.7	17.9	522	8.0	19.6	261	5.1	15.6
60-64	1081	9.3	27.1	706	10.9	30.5	375	7.3	22.9
65-69	1405	12.1	39.2	925	14.3	44.8	480	9.3	32.2
70-74	1734	14.9	54.1	1064	16.4	61.2	670	13.0	45.2
75-79	1872	16.1	70.2	1047	16.1	77.3	825	16.0	61.2
80-84	1679	14.4	84.6	807	12.4	89.8	872	16.9	78.1
85+	1790	15.4	100.0	664	10.2	100.0	1126	21.9	100.0
All ages	11640	100.0		6487	100.0		5153	100.0	

Included in the statistics are 28.8% multiple primaries in males and 23.7% in females.

Table 5

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

							Males	Females
			Males	Females	Males	Females	Prop.all	Prop.all
Age at			Age-	Age-	DCO rate	DCO rate	cancers	cancers
diagnosis	Males	Females	spec.	spec.	n=484	n=653	n=158258	n=153136
Years	n	n	incid.	incid.	%	%	%	%
0- 4			0.0	0.0				
5- 9			0.0	0.0				
10-14	1		0.1	0.0			0.6	
15-19	2	2	0.1	0.1			0.6	0.7
20-24	3	3	0.2	0.2	33.3		0.5	0.6
25-29	10	13	0.5	0.6			1.0	1.2
30-34	19	29	0.8	1.3	5.3	3.4	1.3	1.4
35-39	64	45	2.6	1.9	3.1	4.4	2.8	1.2
40-44	110	80	4.2	3.2	0.9	1.3	3.4	1.3
45-49	216	148	9.1	6.4	1.9	2.0	4.0	1.7
50-54	327	224	16.2	10.9	4.0	5.4	3.8	2.0
55-59	522	261	28.5	13.6	2.5	3.4	3.6	1.9
60-64	705	373	39.8	19.9	4.3	3.5	3.2	2.2
65-69	923	480	58.5	27.8	4.4	4.6	3.4	2.5
70-74	1064	668	83.1	44.0	4.3	5.8	4.0	3.6
75-79	1046	825	126.6	69.5	6.8	9.0	5.1	4.7
80-84	806	872	161.1	93.5	13.5	14.2	5.9	5.5
85+	664	1126	194.7	126.0	22.9	31.3	6.7	6.6
All ages	6482	5149			7.5	12.7	4.1	3.4
Incidence								
Raw			21.8	16.6				
WS			11.1	6.2				
ES			17.0	9.6				
BRD-S			22.6	12.7				

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

Table 6a

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of second primaries for period 1998-2013

	Observed	Expected		LCL	UCL		DCO
Diagnosis	n /	n	SIR	95%	95%	EAR	%
ann ann a		1 8	2 0	1 0	F 0	2 2	
C09-C10 Oropharynx	5	1.7	3.0	1.0	7.0	3.3	/
C15 Oesophagus	12	3.1	3.8	2.0	6.7 #	8.8	8.3
C16 Stomach	/ 3	8.7	0.3	0.1	1.0	-5.7	
C17 Small intestine	8	0.9	9.1	3.9	17.9 #	7.1	
C18 Colon	64	20.1	3.2	2.5	4.1 #	43.5	10.9
C19-C20 Rectum	24	10.4	2.3	1.5	3.4 #	13.5	
C21 Anus/canal	2	0.4	5.5	0.7	20.0	1.6	50.0
C22 Liver	17	5.1	3.3	1.9	5.3 #	11.8	29.4
C23-C24 Bile	6	1.9	3.1	1.1	6.8 #	4.0	33.3
C25 Pancreas	32	6.9	4.6	3.2	6.5 #	24.9	18.8
C32 Larynx	3	1.8	1.7	0.3	4.9	1.2	33.3
C33-C34 Lung	54	22.2	2.4	1.8	3.2 #	31.5	18.5
C38,C45 Mesothelioma	5	1.2	4.1	_1.3	9.6 #	3.8	
C43 Malign. melanoma	. 10	7.0	1.4	0.7	2.6	3.0	
C61 Prostate	74	57.4	1.3	1.0	1.6 #	16.4	23.0
C62 Testis	2	0.4	5.1	0.6	18.4	1.6	
C64 Kidney	20	6.4	3.1	1.9	4.8 #	13.5	10.0
C65 Renal pelvis	2	0.8	2.4	0.3	8.8	1.2	
C67 Bladder	17	9.3	1.8	1.1	2.9 #	7.7	5.9
C70-C72 CNS cancer	5	2.4	2.1	0.7	4.9	2.6	60.0
C73 Thyroid	2	1.1	1.9	0.2	6.7	0.9	
C76-C79 CUP	6	3.4	1.8	0.6	3.8	2.6	
C81 Hodgkin lymphoma		0.3	5.8	0.7	21.0	1.6	50.0
C82-C85 NHL	18	7.8	2.3	1.4	3.7 #	10.2	5.6
C90 Mult. myeloma	2	2.5	0.8	0.1	2.9	-0.5	3.0
C91-C96 Leukaemia	5	3.3	1.5	0.5	3.5	1.7	60.0
est est leasaemia		3.3	1.5	0.5	3.3	±• /	00.0
Other primaries	9	2.3	3.9	1.8	7.4 #	6.6	22.2
Not observed	0	5.6	0.0	0.0	0.7 #	-5.5	
All mult. primaries	409	194.5	2.1	1.9	2.3 #	212.7	15.4
F		== = . 3			11		

Patients	4313
Median age at second malignancy (years)	75.4
Person-years	10085
Mean observation time (years)	2.3
Median observation time (years)	1.1

The occurrence of second malignancy is statistically significant.

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

Table 6b

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of second primaries for period 1998-2013

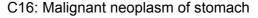
FEMALES

	Observed	Expected		LCL	UCL		DCO
Diagnosis	/ n /	n	SIR	95%	95%	EAR	%
C09-C10 Oropharynx	2	0.3	5.8	0.7	20.8	2.0	
C16 Stomach	4	4.9	0.8	0.2	2.1	-1.1	50.0
C17 Small intestine	/ 4	0.5	8.7	2.4	22.4 #	4.3	
C18 Colon	42	12.9	3.3	2.3	4.4 #	35.5	4.8
C19-C20 Rectum	14	5.2	2.7	1.5	4.5 #	10.7	21.4
C22 Liver	4	1.4	2.9	0.8	7.5	3.2	50.0
C23-C24 Bile	2	1.9	1.1	0.1	3.8	0.1	50.0
C25 Pancreas	18	5.4	3.4	2.0	5.3 #	15.4	44.4
C33-C34 Lung	21	7.2	2.9	1.8	4.5 #	16.9	9.5
C43 Malign. melanoma	4	3.4	1.2	0.3	3.0	0.7	
C48 Peritoneal	2	0.3	5.8	0.7	21.0	2.0	100.0
C50 Breast	61	29.6	2.1	1.6	2.6 #	38.3	19.7
C51 Vulva	2	1.2	1.7	0.2	6.0	1.0	
C53 Cervix uteri	2	1.3	1.5/	0.2	5.5	0.8	50.0
C54 Corpus uteri	4	5.7	0.7	0.2	1.8	-2.0	
C56 Ovary	11	4.5	2.4	1.2	4.3 #	7.9	36.4
C64 Kidney	11	2.8	3.9	2.0	7.0 #	10.0	18.2
C67 Bladder	3	2.5	1.2	0.2	3.5	0.6	33.3
C73 Thyroid	3	1.5	2.1	0.4	6.0	1.9	
C82-C85 NHL	14	4.4	3.2	1.7	5.3 #	11.7	7.1
C90 Mult. myeloma	3	1.5	2.0	0.4	6.0	1.9	33.3
C91-C96 Leukaemia	5	1.9	2.6	0.9	6.1	3.8	40.0
Other primaries	4	4.6	0.9	0.2	2.2	-0.7	50.0
Not observed	0	5.3	0.0	0.0	0.7 #	-6.5	
All mult. primaries	240	110.3	2.2	1.9	2.5 #	158.2	20.0

Patients	3446
Median age at second malignancy (years)	77.5
Person-years	8199
Mean observation time (years)	2.4
Median observation time (years)	1.0

The occurrence of second malignancy is statistically significant.

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



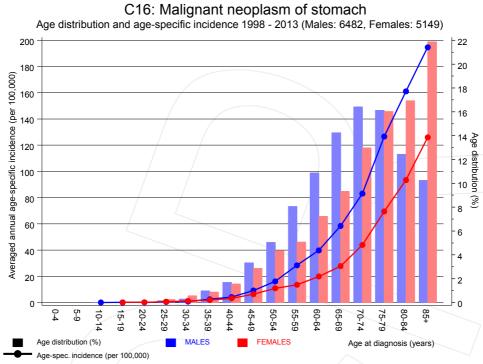


Figure 7. Age distribution and age-specific incidence



C16: Malignant neoplasm of stomach Age-specific incidence in international comparison

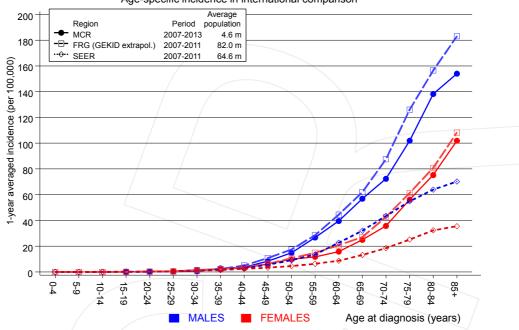


Figure 7a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).



Reference:

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

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

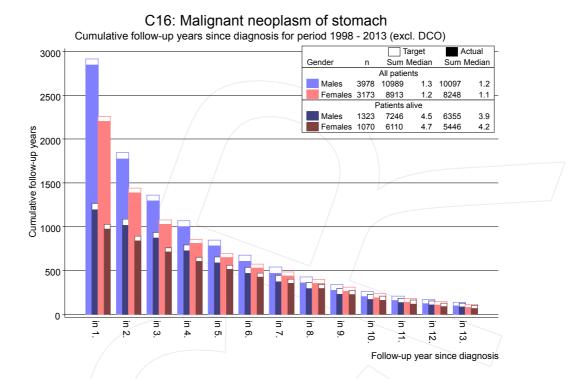
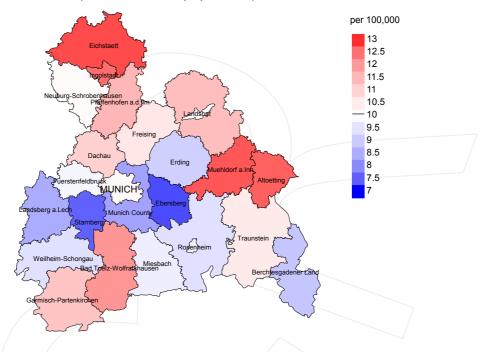


Figure 8. Cumulative follow-up years depending on time since diagnosis

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



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



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

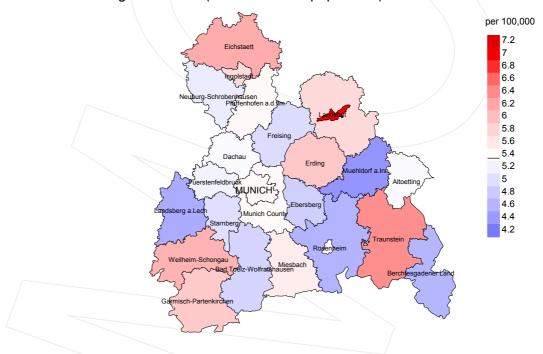
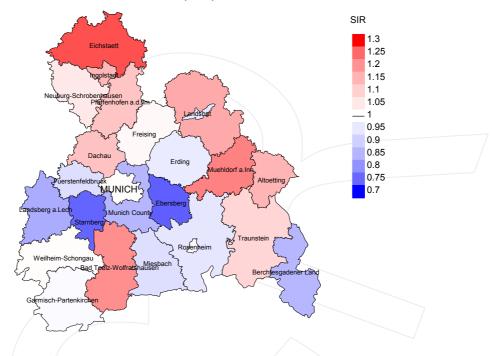


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 10.1/100,000 WS N=3,233, females 5.3/100,000 WS N=2,323).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,928 female residents (averaged) in the period from 2007 to 2013 a total of 59 women were identified with newly diagnosed stomach cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 4.8/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 3.2 and 7.2/100,000.

Standardized incidence ratio (SIR) 2007 - 2013: Males



Standardized incidence ratio (SIR) 2007 - 2013: Females

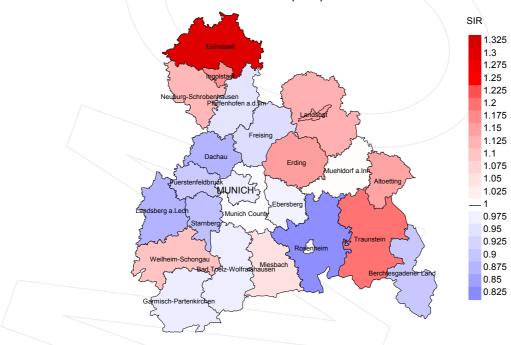


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=3,233, females N=2,323).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,642 female residents (averaged) in the period from 2007 to 2013 a total of 59 women were identified with newly diagnosed stomach cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.98. Though, the value of this parameter may vary with an underlying probability of 99% between 0.68 and 1.36, and is therefore not statistically striking.

MORTALITY

Table 10a

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

Year of	Incident	Prop. actively followed	Prop.	Dootha	Prop.	Prop. deaths with death certific.
	cases		DCO	Deaths	deaths	
diagnosis	n	%	%	n	%	%
1000	5.60	00.0	11 0	106	06.5	02.0
1998	562	98.9	11.2	486	86.5	93.2
1999	508	98.2	11.4	445	87.6	92.8
2000	482	98.3	12.0	419	86.9	97.6
2001	516	97.9	12.2	432	83.7	92.6
2002	875	98.9	19.0	766	87.5	97.8
2003	763	99.2	13.4	650	85.2	98.2
2004	839	98.3	10.6	679	80.9	97.3
2005	769	97.0	12.0	611	79.5	98.7
2006	764	96.1	6.2	573	75.0	97.4
2007	878	89.7	9.0	674	76.8	99.3
2008	872	83.0	7.0	639	73.3	98.6
2009	858	83.6	7.6	613	71.4	98.9
2010	783	81.5	6.9	524	66.9	97.9
2011	847	78.5	5.3	520	61.4	96.2
2012	794	77.2	6.0	421	53.0	95.7
2013	530	98.1	9.1	183	34.5	90.7
1998-2013	11640	91.3	9.8	8635	74.2	96.9

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.		D
_			deaths		Prop.
Year of	Incident		with death	Deaths in	deaths in /
diagnosis/	cases	Deaths	certific.	same year	same year
death	n	n	90	n	96
1998	562	452	92.9	220	39.1
1999	508	426	91.3	198	39.0
2000	482	409	95.8	167	34.6
2001	516	429	94.2	191	37.0
2002	875	611	98.0	350	40.0
2003	763	628	96.5	291	38.1
2004	839	631	97.8	265	31.6
2005	769	641	97.2	266	34.6
2006	764	615	96.7	219	28.7
2007	878	692	98.4	298	33.9
2008	872	712	98.3	279	32.0
2009	858	707	99.0	267	31.1
2010	783	664	98.5	227	29.0
2011	847	644	98.4	231	27.3
2012	794	692	99.1	238	30.0
2013	530	541	98.0	144	27.2
1998-2013	11640	9494	97.2	3851	33.1

Table 10c

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

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

				Prop.
				cancer
		Prop.	Prop.	recorded
		cancer-	non-cancer-	on death
Year of	Deaths	related	related	certificate
death	n/	%	%	%
1998	452	70.6	29.4	92.9
1999	426	81.2	18.8	93.8
2000	409	82.9	17.1	93.4
2001	429	80.0	20.0	94.3
2002	611	83.0	17.0	92.5
2003	628	83.0	17.0	91.6
2004	631	82.6	17.4	91.6
2005	641	81.3	18.7	91.5
2006	615	82.8	17.2	92.4
2007	692	81.1	18.9	90.3
2008	712	82.3	17.7	89.7
2009	707	81.3	18.7	90.1
2010	664	79.7	20.3	89.6
2011	644	79.0	21.0	88.5
2012	692	80.3	19.7	88.3
2013	541	77.6	22.4	84.7
1998-2013	9494	80.7	19.3	90.7

 $$\operatorname{\textsc{Table 11a}}$$ Medians of age at death according to the grouping in Table 10 $$\operatorname{\textsc{MALES}}$$

Year of death	Deaths n	Age at death (all causes)	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	219	75.4	72.7	79.6	75.4
1999	223	74.5	73.4	80.2	74.6
2000	206	74.3	72.0	79.0	73.0
2001	214	73.9	72.4	79.3	73.8
2002	320	75.1	73.8	81.6	74.6
2003	340	75.3	73.8	79.9	74.8
2004	345	76.0	74.1	82.9	74.8
2005	343	75.7	74.3	79.5	75.4
2006	342	76.8	75.4	82.5	76.2
2007	382	75.4	73.2	81.2	75.1
2008	374	76.0	74.5	81.9	75.2
2009	411	74.5	73.3	79.9	73.8
2010	391	74.5	73.1	81.8	73.8
2011	393	75.5	73.6	83.1	74.8
2012	397	75.2	73.6	82.5	73.9
2013	317	75.4	74.3	82.9	74.8
1998-2013	5217	75.2	73.6	81.4	74.6

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

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

		Age at death (all	Age at death (cancer-	Age at death (non-cancer-	Age at death (according to death
Year of	Deaths	causes)	related)	related)	certificate)
death	n	Years	Years	Years	Years
1998	233	79.7	77.2	83.0	80.0
1999	203	80.1	78.3	85.2	80.2
2000	203	80.3	79.1	85.5	79.7
2001	215	79.5	78.2	85.7	79.5
2002	291	81.2	79.4	86.3	80.4
2003	288	79.1	77.7	86.5	78.7
2004	286	79.8	78.3	84.5	79.2
2005	298	79.7	78.3	84.4	78.9
2006	273	80.8	79.4	85.5	80.3
2007	310	81.7	80.9	85.9	81.3
2008	338	81.1	78.3	87.3	79.5
2009	296	81.5	80.4	85.0	80.8
2010	273	81.9	79.8	86.8	81.2
2011	251	81.4	79.4	87.7	80.3
2012	295	78.6	75.5	86.6	77.1
2013	224	82.7	78.8	87.1	79.5
1998-2013	4277	80.7	78.8	85.7	79.8

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	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	155	14.0	0.53	8.1	0.52	12.8	0.52	17.5	0.52
1999	185	16.5	0.71	9.5	0.70	15.1	0.71	20.6	0.71
2000	166	14.6	0.63	8.3	0.62	13.1	0.63	17.9	0.65
2001	170	14.7	0.65	8.3	0.64	13.2	0.66	18.1	0.68
2002	261	14.0	0.57	7.5	0.57	12.0	0.58	16.5	0.58
2003	283	15.1	0.70	7.9	0.68	12.6	0.70	17.6	0.72
2004	291	15.5	0.62	7.7	0.59	12.5	0.62	17.6	0.64
2005	290	15.3	0.71	7.5	0.69	11.9	0.70	16.9	0.72
2006	274	14.3	0.64	6.9	0.61	11.1	0.64	15.6	0.67
2007	308	13.9	0.62	6.7	0.60	10.6	0.62	14.7	0.63
2008	316	14.2	0.64	6.6	0.60	10.6	0.64	14.7	0.67
2009	337	15.1	0.68	7.1	0.67	11.1	0.67	14.9	0.68
2010	316	14.0	0.67	6.6	0.63	10.0	0.64	13.5	0.67
2011	307	13.4	0.60	6.2	0.59	9.7	0.61	12.9	0.61
2012	317	13.9	0.69	6.3	0.63	9.7	0.65	13.2	0.69
2013	261	11.4	0.84	5.3	0.81	8.2	0.83	11.1	0.87
1998-2013	4237	14.2	0.65	7.0	0.63	11.0	0.65	15.1	0.67

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	164	13.9	0.61	5.2	0.58	8.1	0.59	11.1	0.59
1999	161	13.6	0.66	5.3	0.68	8.1	0.68	11.0	0.67
2000	173	14.4	0.79	4.9	0.73	7.9	0.74	11.0	0.74
2001	173	14.2	0.68	5.1	0.61	8.2	0.63	11.1	0.65
2002	246	12.6	0.59	4.4	0.54	6.9	0.55	9.5	0.56
2003	238	12.1	0.66	4.5	0.68	7.0	0.68	9.5	0.68
2004	230	11.6	0.62	4.1	0.53	6.5	0.55	8.9	0.58
2005	231	11.6	0.64	4.3	0.63	6.6	0.64	8.9	0.64
2006	235	11.7	0.70	3.9	0.63	6.2	0.64	8.7	0.68
2007	253	11.0	0.66	3.8	0.65	5.9	0.65	7.8	0.63
2008	270	11.6	0.71	3.9	0.64	6.2	0.66	8.6	0.68
2009	238	10.2	0.66	3.3	0.57	5.3	0.60	7.4	0.63
2010	213	9.1	0.68	3.0	0.61	4.7	0.63	6.4	0.64
2011	202	8.6	0.60	2.9	0.54	4.5	0.55	6.1	0.57
2012	239	10.1	0.72	3.7	0.67	5.6	0.69	7.5	0.71
2013	159	6.7	0.73	2.2	0.57	3.5	0.62	4.7	0.65
1998-2013	3425	11.0	0.67	3.8	0.61	6.0	0.63	8.1	0.64

Table 13

Age distribution of age at death (cancer-related) for period 1998-2013

(incl. multiple primaries)

Age at								
death	Cases		Males			Females		
Years	n	% Cum. %	n n	%	Cum.%	n	%	Cum.%
20-24	4	0.1 0.1	. / 2	0.0	0.0	2	0.1	0.1
25-29	11	0.1 0.2	4	0.1	0.1	7	0.2	0.3
30-34	20	0.3 / 0.5	6	0.1	0.3	14	0.4	0.7
35-39	48	0.6 / 1.1	. 28	0.7	0.9	20	0.6	1.3
40-44	91	1.2 / 2.3	51	1.2	2.1/	40	1.2	2.4
45-49	184	2.4 4.7	109	2.6	4.7	75	2.2	4.6
50-54	286	3.7 8.4	178	4.2	8.9	108	3.1	7.8
55-59	443	5.8 14.2	292	6.9	15.8	151	4.4	12.2
60-64	659	8.6 22.8	433	10.2	26.0	226	6.6	18.7
65-69	834	10.9 33.6	549	12.9	38.9	285	8.3	27.1
70-74	1079	14.1 47.7	670	15.8	54.7	409	11.9	39.0
75-79	1222	15.9 63.6	699	16.5	71.2	523	15.2	54.2
80-84	1267	16.5 80.1	649	15.3	86.5	618	18.0	72.2
85+	1525	19.9 100.0	573	13.5	100.0	952	27.8	100.0
All ages	7673	100.0	4243	100.0		3430	100.0	

Included in the statistics are 28.8% multiple primaries in males and 23.7% in females.

Table 14

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

			Males		Females		Males	Females
Age at			Age-		Age-		Prop.all	Prop.all
death	Males	Females	spec.		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	2	2	0.1	0.67	0.1	0.67	2.2	3.9
25-29	4	7	0.2	0.40	0.3	0.54	3.7	6.1
30-34	6	14	0.3	0.32	0.6	0.48	3.2	6.2
35-39	28	20	1.1	0.44	0.8	0.44	7.0	3.9
40-44	51	40	1.9	0.46	1.6	0.50	6.0	3.5
45-49	109	75	4.6	0.50	3.2	0.51	6.0	3.7
50-54	178	108	8.8	0.54	5.3	0.48	5.4	3.5
55-59	292	151	15.9	0.56	7.9	0.58	4.9	3.2
60-64	433	226	24.4	0.61	12.0	0.60	4.9	3.5
65-69	549	285	34.8	0.59	16.5	0.59	4.6	3.4
70-74	670	409	52.3	0.63	26.9	0.61	4.9	4.1
75-79	699	523	84.6	0.67	44.0	0.63	5.3	4.9
80-84	649	618	129.7	0.80	66.2	0.71	6.0	5.5
85+	573	952	168.0	0.86	106.5	0.85	6.4	7.0
All ages	4243	3430					5.3	4.7
Mortality								
Raw			14.3	0.65	11.0	0.67		
WS			7.0	0.63	3.8	0.61		
ES			11.0	0.65	6.0	0.63		
BRD-S			15.1	0.67	8.2	0.64		
DVI I 70								
PYLL-70			60.1		20 5			
per 100,000			62.1		39.7			
ES			54.4		34.1			
AYLL-70			10.1		11.4			

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

Table 15a

Multiple primaries in deaths in period 1998-2013

MALES

					Syn- chron	Syn- chron		
	Total	Total	Pre	Pre	±30d	±30d	Post	Post
Diagnosis	n	% ↓	n	← %	n	← %	n	~ %
C03-C06 Oral cavity	12	0.9	11	91.7			1	8.3
C09-C10 Oropharynx	17	1.3	8	47.1	3	17.6	6	35.3
C15 Oesophagus	13/	1.0			3	23.1	10	76.9
C16 Stomach	22	1.7			12	54.5	10	45.5
C18 Colon	173	13.1	80	46.2	45	26.0	48	27.7
C19-C20 Rectum	69	5.2	39	56.5	12	17.4	18	26.1
C22 Liver	25	1.9	3	12.0	8	32.0	14	56.0
C23-C24 Bile	14	1.1	2	14.3	2	14.3	10	71.4
C25 Pancreas	58	4.4	12	20.7	16	27.6	30	51.7
C32 Larynx	25	1.9	18	72.0	2	8.0	5	20.0
C33-C34 Lung	151	11.4	40	26.5	31	20.5	80	53.0
C43 Malign. melanoma	39	3.0	31	79.5			8	20.5
C44 Skin others	66	5.0	46	69.7	4	6.1	16	24.2
C61 Prostate	280	21.2	194	69.3	23	8.2	63	22.5
C64 Kidney	51	3.9	26	51.0	4	7.8	21	41.2
C67 Bladder	109	8.3	70	64.2	11	10.1	28	25.7
C70-C72 CNS cancer	14	1.1	7	50.0	1	7.1	6	42.9
C76-C79 CUP	14	1.1	9	64.3	2	14.3	3	21.4
C82-C85 NHL	46	3.5	24	52.2	8	17.4	14	30.4
C90 Mult. myeloma	14	1.1	8	57.1	2	14.3	4	28.6
C91-C96 Leukaemia	28	2.1	7	25.0	1	3.6	20	71.4
Other primaries	81	6.1	49	60.5	4	4.9	28	34.6
All mult. primaries	1321	100.0	684	51.8	194	14.7	443	33.5

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 15b

Multiple primaries in deaths in period 1998-2013
FEMALES

					Syn- chron	Syn- chron		
	Total	Total	Pre	Pre	±30d	±30d	Post	Post
Diagnosis	n	%↓	n	~%	n	←%	n	~ %
C16 Stomach	12	1.3			4	33.3	8	66.7
C18 Colon	121	13.2	54	44.6	29	24.0	38	31.4
C19-C20 Rectum	38 /	4.1	18	47.4	5	13.2	15	39.5
C25 Pancreas	42	4.6	4	9.5	12	28.6	26	61.9
C33-C34 Lung	43	4.7	13	30.2	9	20.9	21	48.8
C43 Malign. meland	oma 24	2.6	19	79.2	1	4.2	4	16.7
C44 Skin others	29	3.2	21	72.4	1	3.4	7	24.1
C50 Breast	287	31.2	206	71.8	26	9.1	55	19.2
C53 Cervix uteri	17	1.8	15	88.2	1	5.9	1	5.9
C54 Corpus uteri	44	4.8	38	86.4	3	6.8	3	6.8
C56 Ovary	53	5.8	29	54.7	8	15.1	16	30.2
C64 Kidney	23	2.5	9	39.1	7	30.4	/ 7	30.4
C67 Bladder	23	2.5	14	60.9	_ 2	8.7	7	30.4
C70-C72 CNS cancer	14	1.5	8	57.1	1	7.1	5	35.7
C73 Thyroid	10	1.1	8	80.0			2	20.0
C82-C85 NHL	34	3.7	19	55.9	6	17.6	9	26.5
C91-C96 Leukaemia	13	1.4	3	23.1	1	7.7	9	69.2
Other primaries	93	10.1	46	49.5	19	20.4	28	30.1
All mult. primaries	920	100.0	524	57.0	135	14.7	261	28.4

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

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

Table 16

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

(Singular primaries only *)

			Males		Females		Males	Females
Age at			Age-		Age-		Prop.all	Prop.all
death	Males	Females	spec.		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	1	2	0.1	0.50	0.1	0.67	1.2	4.3
25-29	4	7	0.2	0.40	0.3	0.54	4.0	6.4
30-34	6	13	0.3	0.33	0.6	0.46	3.3	6.5
35-39	28	19	1.1	0.44	0.8	0.42	7.5	4.1
40-44	48	38	1.8	0.46	1.5	0.49	6.1	3.8
45-49	102	70	4.3	0.50	3.0	0.51	6.2	4.0
50-54	165	92	8.2	0.55	4.5	0.47	5.7	3.5
55-59	261	124	14.2	0.56	6.4	0.56	5.1	3.1
60-64	370	173	20.9	0.62	9.2	0.56	5.0	3.2
65-69	457	236	29.0	0.60	13.7	0.60	4.7	3.5
70-74	567	342	44.3	0.66	22.5	0.62	5.3	4.4
75-79	545	430	65.9	0.69	36.2	0.64	5.5	5.0
80-84	491	518	98.1	0.82	55.5	0.70	6.1	5.8
85+	443	791	129.9	0.88	88.5	0.85	6.6	7.2
All ages	3488	2855					5.5	4.9
Mortality								
Raw			11.7	0.66	9.2	0.66		
WS			5.8	0.63	3.2	0.60		
ES			9.1	0.65	5.0	0.62		
BRD-S			12.3	0.67	6.8	0.64		
PYLL-70								
per 100,000			56.1		34.6			
ES			49.2		29.7			
AYLL-70			10.4		11.8			

^{*} See corresponding tables with multiple primaries.

Table 17

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

			Males		Females		Males	Females
Age at			Mares Age-		Age-			Prop.all
death	Malag	Females	_		spec.		cancers	cancers
Years	mares n	n	spec.	MI-index	- \	MT indox		%
ieals	11	11	mortar.	MI-IIIGEX	mortar.	MI-IIIdex	6	6
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	1	2	0.0	0.50	0.0	0.67	1.3	4.5
25-29	4	7	0.1		0.1	0.67	4.3	6.8
30-34	6	13	0.2	0.44	0.5	0.34	3.4	7.1
35-39	27	18	1.1	0.33	0.8	0.46	7.5	4.2
40-44	48	37	1.1		1.5	0.41	6.4	4.2
		69				0.40		
45-49	101 158	91	4.3 7.8	0.50	3.0		6.6 6.1	4.4 3.9
50-54 55-59	253		13.8	0.56 0.57	4.4 6.1	0.49	5.5	3.9
60-64		118						
	341	165 219	19.2	0.61	8.8	0.56	5.2	3.6
65-69	421		26.7	0.60	12.7	0.59	5.0	3.9
70-74	515	310	40.2	0.65	20.4	0.60	5.8	4.7
75-79	478	398	57.8	0.65	33.5	0.64	6.0	5.5
80-84	421	481	84.1	0.74	51.6	0.69	6.6	6.5
85+	392	729	115.0	0.81	81.6	0.80	7.3	7.7
		0.555						
All ages	3166	2657					5.9	5.3
Mortality			10.6	0.64	0 6	0.51		
Raw			10.6	0.64	8.6			
WS			5.4		3.0	0.59		
ES			8.3	0.63	4.7	0.61		
BRD-S			11.1	0.65	6.3	0.62		
D								
PYLL-70								
per 100,000			53.9		33.5			
ES			47.3		28.8			
AYLL-70			10.6		12.0			

^{*} See corresponding tables with multiple primaries.

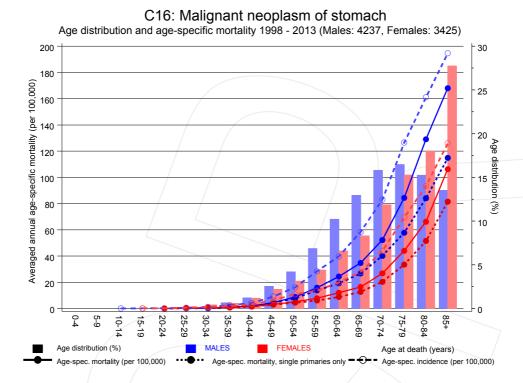
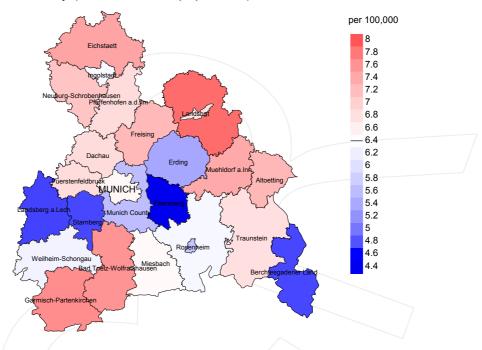


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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



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



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

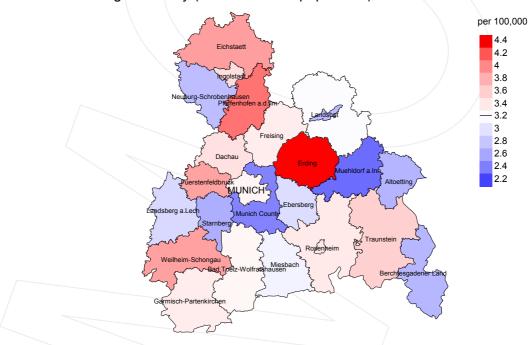
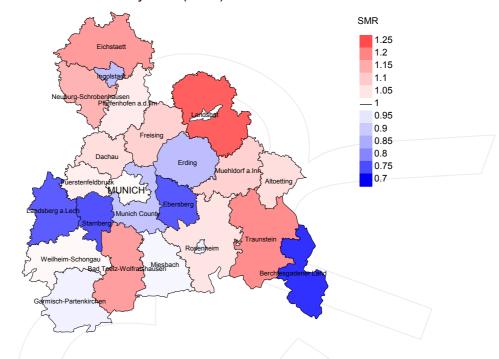


Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2013. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 6.4/100,000 WS N=2,154, females 3.2/100,000 WS N=1,559).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,928 female residents (averaged) in the period from 2007 to 2013 a total of 40 women died from stomach cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 3.0/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 1.8 and 4.8/100,000.

Standardized mortality ratio (SMR) 2007 - 2013: Males



Standardized mortality ratio (SMR) 2007 - 2013: Females

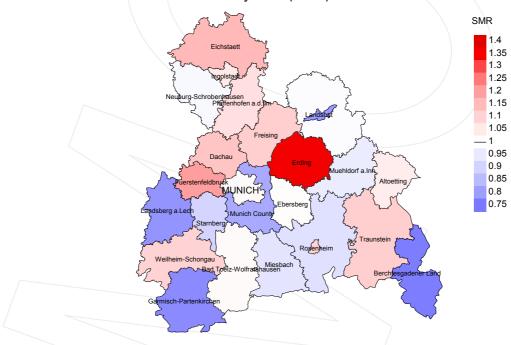


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=2,154, females N=1,559).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,642 female residents (averaged) in the period from 2007 to 2013 a total of 40 women died from stomach cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.00. Though, the value of this parameter may vary with an underlying probability of 99% between 0.64 and 1.49, and is therefore not statistically striking.

Statistical Notes

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

1. All multiple primaries included

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

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

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

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

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

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

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

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

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

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

Shortcuts

FRG Federal Republic of Germany

GEKID Association of Population-based Cancer Registries in Germany

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

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

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

BRD-S German standard population

DCO Death certificate only EAR Excess absolute risk

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

ES European standard population (old)

LCL Lower confidence limit

MI-index Ratio between mortality and incidence

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

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

Recommended Citation

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