Munich Cancer Registry

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

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

Cancer statistics: Baseline statistics

C16: Stomach cancer

Year of diagnosis	1998-2012
Patients	10,781
Diseases	10,790
Creation date	03/20/2014
Export date	02/12/2014
Population	4.5 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 4.5 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, March 2014

[#] 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 2013 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
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	reater 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

Year of diagnosis	Cases n	DCO cases n	Prop. DCO %	Prop. mult. primaries %	Prop. deaths %	Prop. actively followed %	
1998	562	63	11.2	17.3	85.6	98.8	
1999	508	58	11.4	18.1	86.4	98.4	
2000	482	58	12.0	21.4	85.9	98.3	
2001	516	63	12.2	17.8	83.1	97.9	
2002	874	166	19.0	18.5	87.0	98.9	#
2003	761	102	13.4	20.8	84.1	99.2	#
2004	836	89	10.6	21.4	80.5	98.1	#
2005	767	92	12.0	23.2	78.4	97.0	#
2006	761	47	6.2	22.3	73.3	95.8	#
2007	875	79	9.0	23.5	75.5	89.0	# ##
2008	868	61	7.0	22.7	71.7	82.9	
2009	850	65	7.6	21.8	68.6	82.6	
2010	761	54	7.1	24.6	64.1	81.2	
2011	780	45	5.8	21.9	56.5	82.1	
2012	589	47	8.0	25.6	44.8	97.6	###
1998-2012	10790	1089	10.1	21.6	74.6	92.5	

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

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

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

Table 1a

Patient cohorts by year of diagnosis and gender
including DCO cases

Year of diagnosis	All n	Males n	Females n	Prop. males %
1998	562	293	269	52.1
1999	508	263	245	51.8
2000	482	263	219	54.6
2001	516	263	253	51.0
2002	874	455	419	52.1
2003	761	405	356	53.2
2004	836	468	368	56.0
2005	767	410	357	53.5
2006	761	428	333	56.2
2007	875	493	382	56.3
2008	868	488	380	56.2
2009	850	492	358	57.9
2010	761	456	305	59.9
2011	780	455	325	58.3
2012	589	340	249	57.7
1998-2012	10790	5972	4818	55.3

Table 2

Incidence measures by year of diagnosis and gender including DCO cases
(with respect to registry area expansion from 2.51 to 3.96 m as of 2002,
and from 3.96 to 4.52 m as of 2007, respectively)

Year of diagnosis	Males n	Females n	Males Inc. raw	Fem. Inc. raw	Males Inc. WS	Fem. Inc. WS	Males Inc. ES	Fem. Inc. ES	Males Inc. BRD-S	Fem. Inc. BRD-S
1998	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	419	24.4	21.4	13.2	8.1	20.7	12.5	28.3	16.8
2003	405	356	21.6	18.1	11.5	6.5	18.1	10.3	24.5	14.0
2004	468	368	24.9	18.6	13.1	7.8	20.2	11.8	27.3	15.2
2005	410	357	21.6	17.9	10.9	6.7	17.1	10.4	23.5	13.9
2006	428	333	22.3	16.6	11.3	6.3	17.4	9.6	23.4	12.8
2007	493	382	22.3	16.5	11.1	5.8	17.1	9.1	23.2	12.3
2008	488	380	21.9	16.4	11.0	6.1	16.5	9.4	21.9	12.6
2009	492	358	22.0	15.4	10.6	5.8	16.3	8.8	21.6	11.6
2010	456	305	20.2	13.0	10.0	4.7	15.1	7.3	19.4	9.8
2011	455	325	19.9	13.8	9.3	5.2	14.2	7.9	18.9	10.2
2012	340	249	14.9	10.6	7.3	4.2	11.0	6.2	14.1	8.0
1998-2012	5972	4818	21.8	16.8	11.1	6.3	17.1	9.7	22.8	12.9

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)
(incl. DCO)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 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	874	72.9	12.8	19.3	102	55.5	65.0	74.7	81.9	88.6
2003	761	73.0	12.6	17.9	98.5	56.2	64.7	74.9	82.5	87.5
2004	836	70.9	12.6	28.0	98.8	52.9	62.6	72.5	80.8	85.5
2005	767	72.8	12.9	22.1	99.3	55.4	65.1	74.7	82.2	86.9
2006	761	72.0	13.1	21.9	99.1	55.3	63.2	73.7	81.8	86.8
2007	875	72.7	12.8	27.8	101	54.7	65.4	74.6	82.3	87.4
2008	868	71.8	12.9	24.2	101	53.7	64.1	73.1	81.3	86.3
2009	850	72.0	12.9	31.1	102	53.6	64.6	73.5	81.4	87.2
2010	761	71.7	12.7	24.4	103	54.8	63.5	72.5	81.7	87.2
2011	780	72.2	13.1	18.9	98.3	53.6	64.7	73.7	81.7	88.2
2012	589	71.0	13.3	29.4	99.4	53.0	62.8	72.3	81.3	87.2
1998-2012	10790	72.1	13.0	14.5	103	54.2	64.1	73.8	81.8	87.5

Table 3a

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	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	468	70.2	11.9	33.1	97.4	53.5	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	428	70.2	12.2	29.5	99.1	54.9	62.1	71.5	79.1	84.3
2007	493	70.7	12.2	35.3	99.0	53.1	63.4	71.8	80.1	85.2
2008	488	69.9	11.9	24.2	99.5	53.9	63.5	71.2	78.4	83.8
2009	492	70.8	11.7	31.1	102	54.1	63.7	72.1	78.9	85.1
2010	456	70.0	11.8	24.4	96.4	54.8	61.0	69.9	79.7	84.2
2011	455	71.2	12.8	18.9	94.7	52.9	64.1	72.7	81.1	86.1
2012	340	69.9	12.7	29.4	99.4	53.3	61.4	70.7	79.5	85.0
1998-2012	5972	70.4	12.3	14.5	102	53.8	62.8	71.8	79.3	85.2

Table 3b

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	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	419	74.7	13.5	19.3	102	55.3	67.2	77.3	84.6	89.7
2003	356	75.7	12.3	30.3	98.5	59.7	68.5	77.9	83.9	89.6
2004	368	71.7	13.5	28.0	98.8	51.9	62.9	74.3	82.5	87.5
2005	357	74.6	13.1	22.1	99.3	56.6	65.7	77.4	83.8	90.8
2006	333	74.3	13.8	21.9	98.3	56.1	64.7	77.4	84.7	88.5
2007	382	75.4	13.2	27.8	101	57.1	68.3	78.1	85.4	88.7
2008	380	74.2	13.8	35.1	101	53.4	65.9	77.1	84.5	88.6
2009	358	73.6	14.2	32.6	101	51.6	66.2	77.0	84.6	88.4
2010	305	74.4	13.6	26.6	103	54.8	67.1	77.5	84.1	89.1
2011	325	73.5	13.5	28.6	98.3	53.9	66.9	74.8	82.8	89.8
2012	249	72.6	14.0	29.6	99.3	51.9	64.3	73.9	83.5	88.4
1998-2012	4818	74.3	13.5	18.8	103	54.7	66.2	76.8	84.2	89.2

Table 4

Age distribution by 5-year age group and gender for period 1998-2012 (incl. DCO)

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females 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	0.1	2	0.0	0.0
20-24	5	0.0	0.1	2	0.0	0.1	3	0.1	0.1
25-29	22	0.2	0.3	9	0.2	0.2	13	0.3	0.4
30-34	46	0.4	0.7	19	0.3	0.6	27	0.6	0.9
35-39	102	0.9	1.7	60	1.0	1.6	42	0.9	1.8
40-44	176	1.6	3.3	102	1.7	3.3	74	1.5	3.3
45-49	327	3.0	6.3	196	3.3	6.5	131	2.7	6.1
50-54	497	4.6	10.9	292	4.9	11.4	205	4.3	10.3
55-59	728	6.7	17.7	484	8.1	19.5	244	5.1	15.4
60-64	997	9.2	26.9	646	10.8	30.4	351	7.3	22.7
65-69	1294	12.0	38.9	850	14.2	44.6	444	9.2	31.9
70-74	1571	14.6	53.5	964	16.1	60.7	607	12.6	44.5
75-79	1736	16.1	69.6	963	16.1	76.9	773	16.0	60.5
80-84	1586	14.7	84.3	754	12.6	89.5	832	17.3	77.8
85+	1698	15.7	100.0	628	10.5	100.0	1070	22.2	100.0
All ages	10790	100.0		5972	100.0		4818	100.0	

Included in the statistics are 28.2% multiple primaries in males and 23.2% in females.

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 1998-2012

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males DCO rate n=461 %	Females DCO rate n=627 %	Males Prop.all cancers n=146755 %	Females Prop.all cancers n=142297 %
0- 4			0.0	0.0				
5- 9			0.0	0.0				
10-14	1		0.1	0.0			0.7	
15-19	2	2	0.1	0.1			0.6	0.7
20-24	2	3	0.1	0.2	50.0		0.4	0.6
25-29	9	13	0.5	0.7			1.0	1.3
30-34	19	27	0.9	1.3	5.3	3.7	1.3	1.4
35-39	60	42	2.6	1.9	3.3	4.8	2.8	1.2
40-44	102	74	4.2	3.2	1.0	1.4	3.4	1.3
45-49	196	131	9.1	6.2	2.0	2.3	4.0	1.6
50-54	292	205	15.8	10.9	4.5	5.9	3.6	2.0
55-59	484	244	28.5	13.7	2.7	3.3	3.6	1.9
60-64	646	350	39.2	20.1	4.3	3.7	3.2	2.2
65-69	849	444	57.9	27.7	4.5	4.7	3.3	2.5
70-74	964	606	83.2	43.9	4.5	6.3	3.9	3.6
75-79	962	773	127.7	70.7	7.0	9.1	5.1	4.8
80-84	753	832	165.8	96.3	13.8	14.3	6.0	5.6
85+	628	1070	202.5	130.6	23.2	31.7	6.8	6.7
All ages	5969	4816			7.7	13.0	4.1	3.4
Incidence								
Raw			21.7	16.8				
WS			11.1	6.3				
ES			17.1	9.7				
BRD-S			22.8	12.9				

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 1998-2012
MALES

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C09-C10	Oropharynx	5	1.5	3.2	1.1	7.6	#	3.7	
C15	Oesophagus	11	2.9	3.9	1.9	6.9	#	8.8	9.1
C16	Stomach	2	8.2	0.2	0.0	0.9	#	-6.7	
C17	Small intestine	8	0.8	10.2	4.4	20.1	#	7.8	
C18	Colon	59	18.7	3.2	2.4	4.1	#	43.5	10.2
C19-C20	Rectum	22	9.7	2.3	1.4	3.4	#	13.3	
C21	Anus/canal	2	0.3	6.1	0.7	22.2		1.8	50.0
C22	Liver	17	4.7	3.6	2.1	5.8	#	13.2	29.4
C23-C24	Bile	6	1.8	3.4	1.2	7.4	#	4.6	33.3
C25	Pancreas	32	6.3	5.1	3.5	7.2	#	27.7	18.8
C32	Larynx	3	1.6	1.8	0.4	5.3		1.5	33.3
C33-C34	Lung	52	20.6	2.5	1.9	3.3	#	33.9	19.2
C38,C45	Mesothelioma	5	1.1	4.5	1.5	10.6	#	4.2	
C43	Malign. melanoma	9	6.3	1.4	0.7	2.7		3.0	
C61	Prostate	69	53.0	1.3	1.0	1.6	#	17.3	24.6
C62	Testis	2	0.4	5.4	0.7	19.4		1.8	
C64	Kidney	18	5.9	3.1	1.8	4.8	#	13.1	11.1
C65	Renal pelvis	2	0.7	2.7	0.3	9.7		1.4	
C67	Bladder	14	8.5	1.6	0.9	2.8		5.9	7.1
C70-C72	CNS cancer	5	2.2	2.3	0.7	5.3		3.0	60.0
C73	Thyroid	2	1.0	2.0	0.2	7.3		1.1	
C76-C79	CUP	6	3.2	1.9	0.7	4.1		3.0	
C81	Hodgkin lymphoma	2	0.3	6.5	0.8	23.3		1.8	50.0
C82-C85	NHL	18	7.1	2.5	1.5	4.0	#	11.8	5.6
C90	Mult. myeloma	2	2.3	0.9	0.1	3.1		-0.3	
C91-C96	Leukaemia	5	3.0	1.7	0.5	3.9		2.2	60.0
Other primaries		9	2.1	4.3	2.0	8.1	#	7.4	22.2
Not observed		0	5.1	0.0	0.0	0.7	#	-5.5	
All mult. primaries		387	179.1	2.2	2.0	2.4	#	224.2	16.0

Patients	4122
Mean age at second malignancy (years)	74.0
Person-years	9271
Mean observation time (years)	2.2
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 1998-2012
FEMALES

Diagnosis	Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C09-C10 Oropharynx	2	0.3	6.2	0.7	22.2		2.2	
C16 Stomach	4	4.7	0.9	0.2	2.2		-0.9	50.0
C17 Small intestine	4	0.4	9.6	2.6	24.6	#	4.7	
C18 Colon	41	12.2	3.4	2.4	4.6	#	38.0	4.9
C19-C20 Rectum	11	4.9	2.2	1.1	4.0	#	8.0	27.3
C22 Liver	4	1.3	3.2	0.9	8.1		3.6	50.0
C23-C24 Bile	2	1.8	1.1	0.1	4.0		0.3	50.0
C25 Pancreas	17	5.0	3.4	2.0	5.5	#	15.9	47.1
C33-C34 Lung	19	6.6	2.9	1.7	4.5	#	16.3	10.5
C43 Malign. melanoma	2	3.1	0.6	0.1	2.3		-1.5	
C48 Peritoneal	2	0.3	6.8	0.8	24.7		2.3	100.0
C50 Breast	57	27.4	2.1	1.6	2.7	#	39.0	21.1
C51 Vulva	2	1.1	1.8	0.2	6.5		1.2	
C53 Cervix uteri	2	1.2	1.6	0.2	5.8		1.0	50.0
C54 Corpus uteri	4	5.3	0.8	0.2	2.0		-1.6	
C56 Ovary	11	4.3	2.6	1.3	4.6	#	8.9	36.4
C64 Kidney	11	2.6	4.2	2.1	7.6	#	11.1	18.2
C67 Bladder	3	2.3	1.3	0.3	3.8		0.9	33.3
C73 Thyroid	2	1.4	1.5	0.2	5.3		0.8	
C82-C85 NHL	14	4.1	3.4	1.9	5.7	#	13.0	7.1
C91-C96 Leukaemia	5	1.8	2.9	0.9	6.7		4.3	40.0
Other primaries	5	5.7	0.9	0.3	2.1		-0.9	40.0
Not observed	0	5.0	0.0	0.0	0.7	#	-6.5	
All mult. primaries	224	102.7	2.2	1.9	2.5	#	160.0	21.0

Patients	3317
Mean age at second malignancy (years)	75.9
Person-years	7583
Mean observation time (years)	2.3
Median observation time (years)	1.0

The occurrence of second malignancy is statistically significant.

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

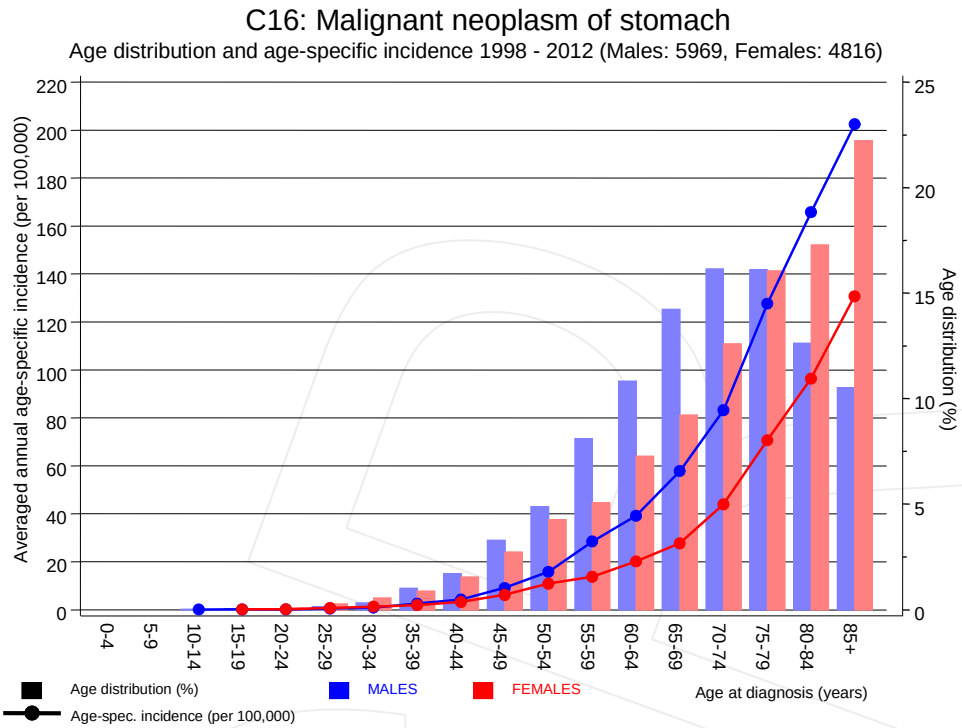


Figure 7. Age distribution and age-specific incidence

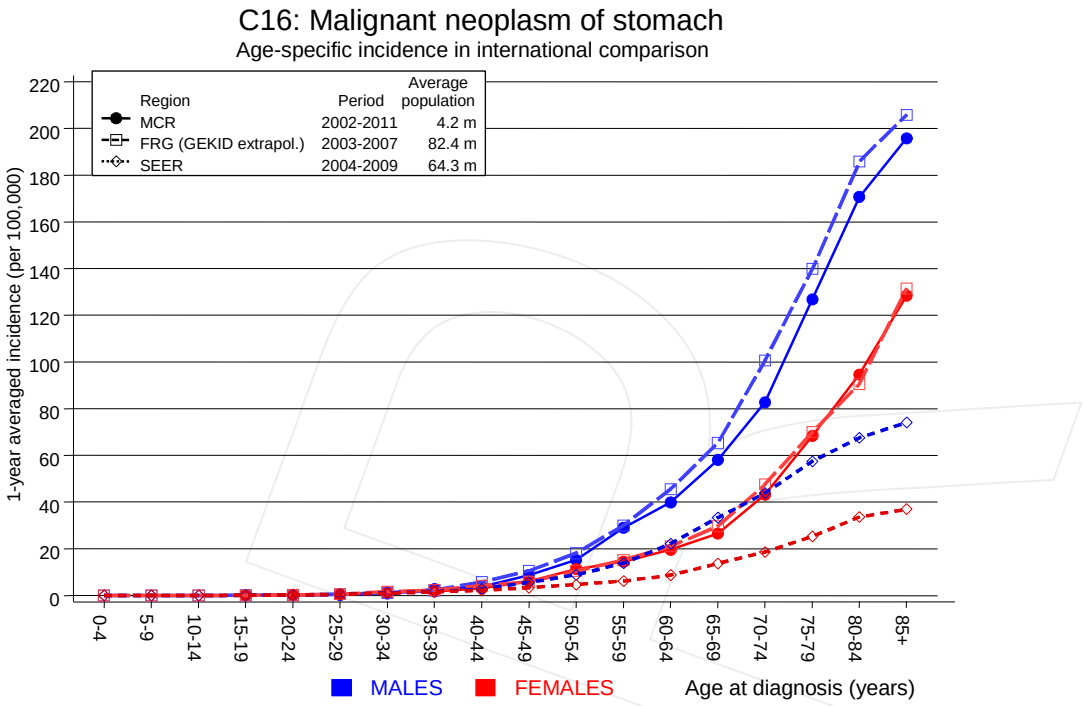


Figure 7a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).

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, 2011. http://www.gekid.de. Last access: 05/12/2011

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.

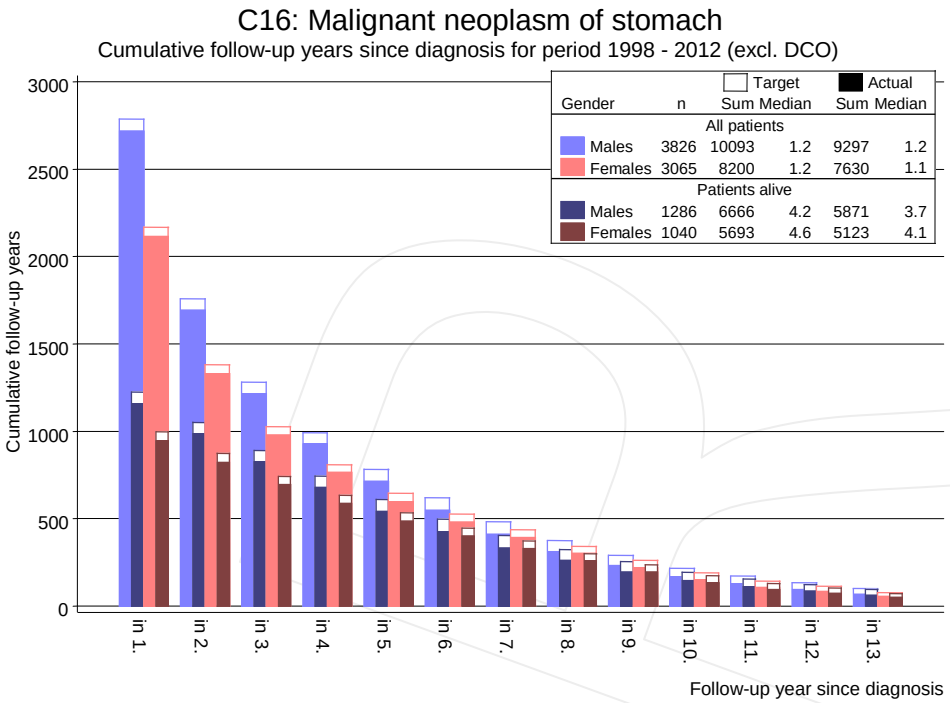
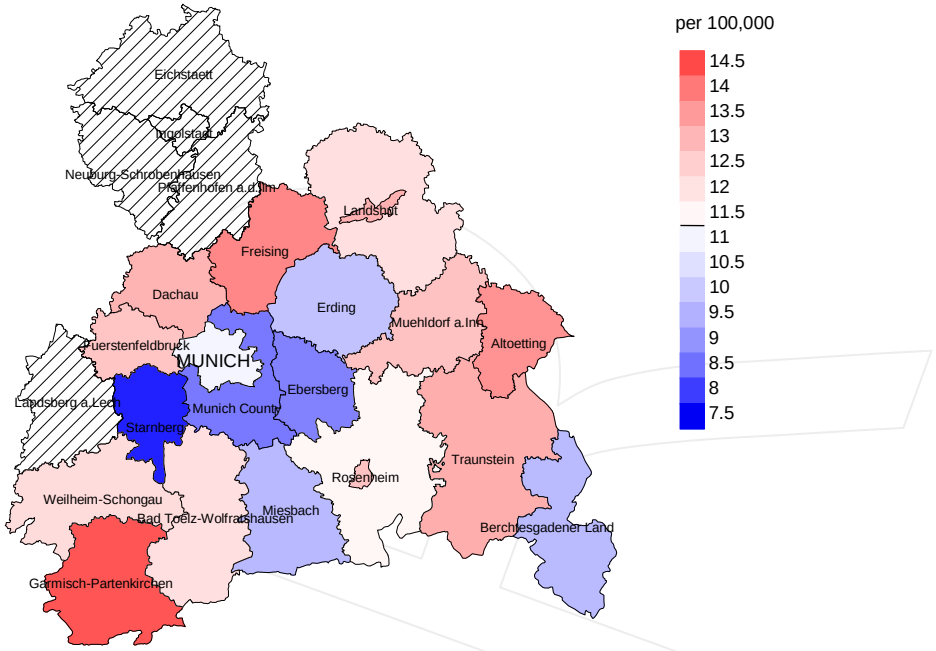


Figure 8. Cumulative follow-up years depending on time since diagnosis

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

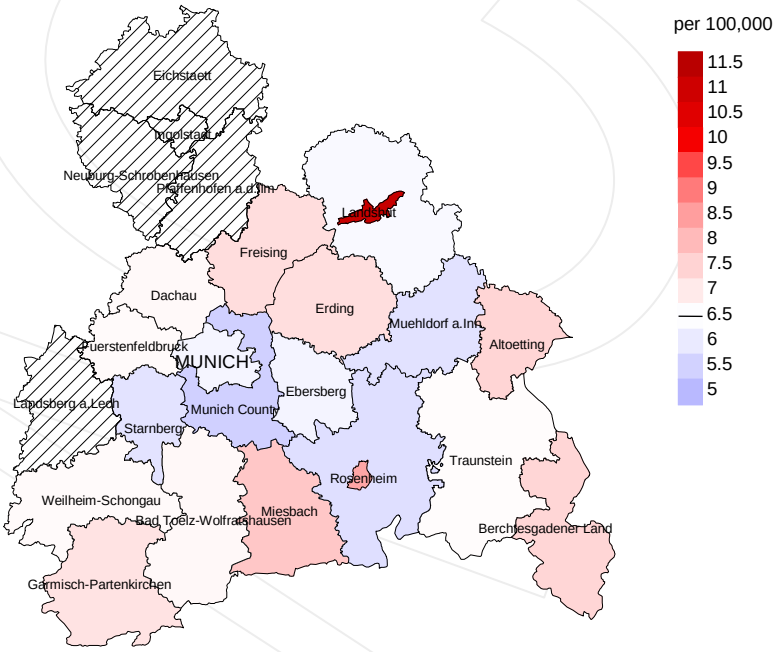
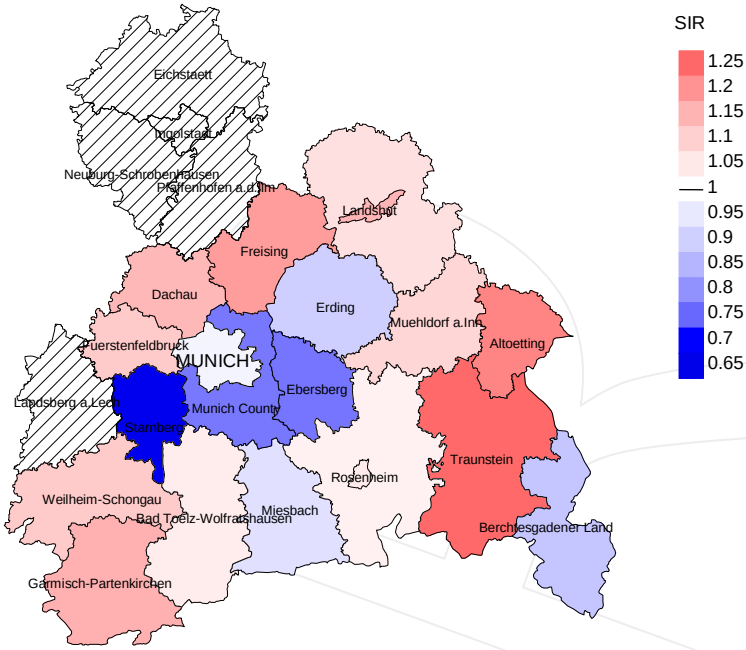


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 11.3/100,000 WS N=2,544, females 6.5/100,000 WS N=2,070). 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 61 women were identified with newly diagnosed stomach cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 6.3/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 4.2 and 9.2/100,000.

Standardized incidence ratio (SIR) 2003 - 2008: Males



Standardized incidence ratio (SIR) 2003 - 2008: Females

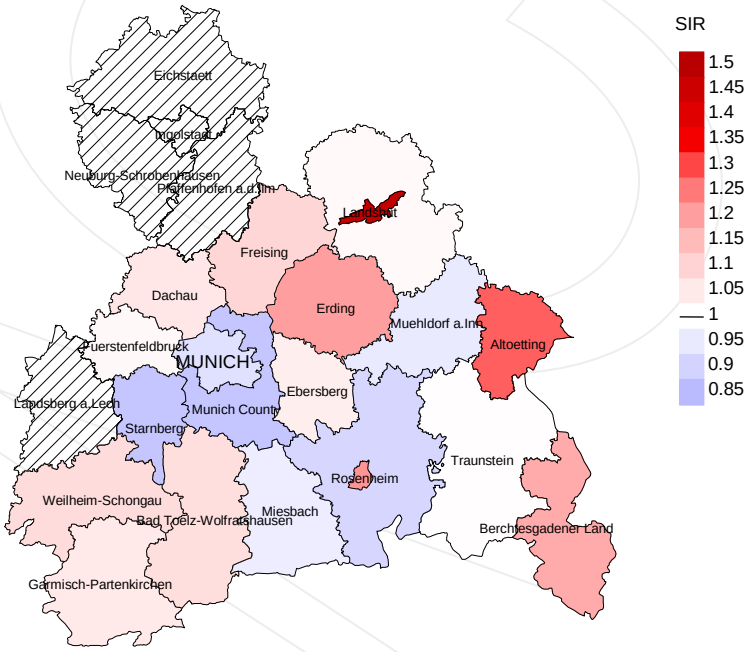


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=2,544, females N=2,070). 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 61 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 1.04. Though, the value of this parameter may vary with an underlying probability of 99% between 0.73 and 1.43, and is therefore not statistically striking.

MORTALITY

Table 10a

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

Year of diagnosis	Incident cases n	Prop. actively followed %	Prop. DCO %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	562	98.8	11.2	481	85.6	93.3
1999	508	98.4	11.4	439	86.4	93.4
2000	482	98.3	12.0	414	85.9	97.8
2001	516	97.9	12.2	429	83.1	92.5
2002	874	98.9	19.0	760	87.0	97.8
2003	761	99.2	13.4	640	84.1	98.6
2004	836	98.1	10.6	673	80.5	97.5
2005	767	97.0	12.0	601	78.4	98.8
2006	761	95.8	6.2	558	73.3	98.2
2007	875	89.0	9.0	661	75.5	99.1
2008	868	82.9	7.0	622	71.7	98.4
2009	850	82.6	7.6	583	68.6	99.0
2010	761	81.2	7.1	488	64.1	99.2
2011	780	82.1	5.8	441	56.5	98.2
2012	589	97.6	8.0	264	44.8	94.3
1998-2012	10790	92.5	10.1	8054	74.6	97.4

Table 10b

Annual cohorts of incident cancers and deaths, proportion of death certificates and cases deceased the same year of cancer diagnosis
(incl. DCO)
(with respect to registry area expansion from 2.51 to 3.96 m as of 2002, and from 3.96 to 4.52 m as of 2007, respectively)

Year of diagnosis/ death	Incident cases n	Deaths n	Prop. deaths with death certific. %	Deaths in same year n	Prop. deaths in same year %
1998	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	874	611	98.0	350	40.0
2003	761	628	96.5	291	38.2
2004	836	631	97.8	265	31.7
2005	767	640	97.2	265	34.6
2006	761	615	96.7	219	28.8
2007	875	692	98.4	298	34.1
2008	868	712	98.3	279	32.1
2009	850	705	99.0	266	31.3
2010	761	659	98.8	224	29.4
2011	780	629	98.7	221	28.3
2012	589	623	99.8	191	32.4
1998-2012	10790	8861	97.2	3645	33.8

Table 10c

Annual cohorts of deaths, proportion of cancer-related and not cancer-related deaths, and cancer recorded on death certificates (incl. DCO)
(with respect to registry area expansion from 2.51 to 3.96 m as of 2002, and from 3.96 to 4.52 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. not cancer-related %	Prop. cancer recorded on death certificate %
1998	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	640	81.3	18.8	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	705	81.3	18.7	90.1
2010	659	79.7	20.3	89.6
2011	629	78.9	21.1	88.2
2012	623	79.3	20.7	87.6
1998-2012	8861	80.8	19.2	91.0

Table 11a

Means of age at death according to the grouping in Table 10
MALES

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (not cancer-related) Years	Age at death (according to death certificate) Years
1998	219	73.3	71.0	79.0	73.3
1999	223	72.8	71.6	78.8	73.0
2000	206	72.6	71.3	77.7	71.7
2001	214	72.0	70.6	77.4	71.8
2002	320	73.2	72.2	77.9	73.0
2003	340	73.4	72.3	78.6	72.7
2004	345	74.5	73.0	82.1	73.7
2005	343	73.7	72.7	79.0	73.4
2006	342	74.6	72.8	81.7	74.1
2007	382	74.1	72.7	79.8	73.7
2008	374	74.1	72.9	80.6	73.5
2009	410	73.4	72.1	79.3	72.5
2010	386	73.3	71.5	80.5	72.6
2011	381	74.8	72.8	81.9	74.1
2012	355	74.7	72.8	81.7	73.5
1998-2012	4840	73.7	72.3	80.0	73.2

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

Table 11b

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

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (not cancer-related) Years	Age at death (according to death certificate) Years
1998	233	77.4	75.8	81.4	77.8
1999	203	76.6	74.7	84.0	77.1
2000	203	78.7	77.7	84.3	78.7
2001	215	77.9	76.5	83.7	77.8
2002	291	78.0	76.7	85.5	77.5
2003	288	77.1	75.6	84.2	76.5
2004	286	77.2	75.6	83.9	76.4
2005	297	76.9	75.4	81.8	76.1
2006	273	77.6	76.7	83.4	77.5
2007	310	77.9	76.3	84.9	77.0
2008	338	78.3	76.3	86.3	77.2
2009	295	78.5	76.9	85.2	77.7
2010	273	78.8	76.7	86.0	77.9
2011	248	78.0	76.1	85.7	76.9
2012	268	76.8	74.6	86.0	75.6
1998-2012	4021	77.7	76.1	84.4	77.1

By 2010, life expectancy for a newborn male in Germany is 77.5 years compared with 82.6 years for his female counterpart.

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

Table 12a

Mortality measures (cancer-related death) and mortality-incidence-index
by year of death
MALES

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	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	0.65	6.6	0.60	10.6	0.64	14.7	0.67
2009	336	15.1	0.68	7.1	0.67	11.1	0.68	14.8	0.68
2010	312	13.8	0.69	6.5	0.65	9.9	0.66	13.3	0.69
2011	296	13.0	0.65	6.0	0.64	9.3	0.66	12.4	0.66
2012	277	12.1	0.81	5.4	0.74	8.4	0.77	11.6	0.82
1998-2012	3920	14.3	0.66	7.0	0.63	11.1	0.65	15.3	0.67

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	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	0.67	4.5	0.69	7.0	0.69	9.5	0.68
2004	230	11.6	0.63	4.1	0.53	6.5	0.55	8.9	0.59
2005	230	11.6	0.64	4.3	0.63	6.6	0.64	8.8	0.64
2006	235	11.7	0.71	3.9	0.63	6.2	0.65	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	0.69
2009	237	10.2	0.66	3.3	0.58	5.3	0.61	7.4	0.63
2010	213	9.1	0.70	3.0	0.63	4.7	0.65	6.4	0.66
2011	200	8.5	0.62	2.9	0.56	4.5	0.57	6.0	0.59
2012	217	9.2	0.88	3.4	0.81	5.1	0.83	6.8	0.86
1998-2012	3240	11.3	0.67	3.9	0.62	6.2	0.64	8.4	0.65

Table 13

Age distribution of age at death (cancer-related) for period 1998-2012
(**incl. multiple primaries**)

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
20-24	3	0.0	0.0	1	0.0	0.0	2	0.1	0.1
25-29	9	0.1	0.2	2	0.1	0.1	7	0.2	0.3
30-34	18	0.3	0.4	6	0.2	0.2	12	0.4	0.6
35-39	46	0.6	1.1	26	0.7	0.9	20	0.6	1.3
40-44	83	1.2	2.2	46	1.2	2.1	37	1.1	2.4
45-49	173	2.4	4.6	102	2.6	4.7	71	2.2	4.6
50-54	264	3.7	8.3	161	4.1	8.8	103	3.2	7.8
55-59	408	5.7	14.0	265	6.7	15.5	143	4.4	12.2
60-64	618	8.6	22.6	398	10.1	25.6	220	6.8	19.0
65-69	790	11.0	33.6	521	13.3	38.9	269	8.3	27.3
70-74	1004	14.0	47.6	616	15.7	54.6	388	12.0	39.2
75-79	1147	16.0	63.6	657	16.7	71.3	490	15.1	54.3
80-84	1182	16.5	80.1	590	15.0	86.4	592	18.2	72.6
85+	1425	19.9	100.0	535	13.6	100.0	890	27.4	100.0
All ages	7170	100.0		3926	100.0		3244	100.0	

Included in the statistics are 28.2% multiple primaries in males and 23.2% in females.

Table 14

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2012
(**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			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	2	7	0.1	0.22	0.4	0.54	2.1	6.4
30-34	6	12	0.3	0.32	0.6	0.44	3.4	5.6
35-39	26	20	1.1	0.43	0.9	0.48	6.8	4.0
40-44	46	37	1.9	0.45	1.6	0.50	5.7	3.5
45-49	102	71	4.7	0.52	3.4	0.54	6.0	3.8
50-54	161	103	8.7	0.55	5.5	0.50	5.2	3.6
55-59	265	143	15.6	0.55	8.0	0.59	4.8	3.2
60-64	398	220	24.2	0.62	12.6	0.63	4.8	3.6
65-69	521	269	35.5	0.61	16.8	0.61	4.6	3.5
70-74	616	388	53.2	0.64	28.1	0.64	5.0	4.3
75-79	657	490	87.2	0.68	44.8	0.63	5.4	5.0
80-84	590	592	129.9	0.78	68.5	0.71	6.0	5.7
85+	535	890	172.5	0.85	108.7	0.83	6.7	7.1
All ages	3926	3244					5.3	4.8
Mortality								
Raw			14.3	0.66	11.3	0.67		
WS			7.0	0.63	3.9	0.62		
ES			11.1	0.65	6.2	0.64		
BRD-S			15.3	0.67	8.4	0.65		
PYLL-70								
per 100,000			61.3		40.8			
ES			53.6		35.1			
AYLL-70			9.9		11.3			

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

Table 15a

Multiple primaries in deaths in period 1998-2012
MALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03-C06 Oral cavity	12	1.0	11	91.7			1	8.3
C09-C10 Oropharynx	15	1.2	7	46.7	3	20.0	5	33.3
C15 Oesophagus	24	2.0	4	16.7	13	54.2	7	29.2
C18 Colon	154	12.8	68	44.2	42	27.3	44	28.6
C19-C20 Rectum	64	5.3	35	54.7	11	17.2	18	28.1
C22 Liver	23	1.9	3	13.0	7	30.4	13	56.5
C23-C24 Bile	14	1.2	2	14.3	2	14.3	10	71.4
C25 Pancreas	56	4.7	10	17.9	16	28.6	30	53.6
C32 Larynx	21	1.7	14	66.7	2	9.5	5	23.8
C33-C34 Lung	140	11.6	37	26.4	28	20.0	75	53.6
C43 Malign. melanoma	36	3.0	28	77.8			8	22.2
C44 Skin others	55	4.6	39	70.9	3	5.5	13	23.6
C61 Prostate	255	21.2	171	67.1	22	8.6	62	24.3
C64 Kidney	48	4.0	26	54.2	4	8.3	18	37.5
C67 Bladder	93	7.7	61	65.6	10	10.8	22	23.7
C70-C72 CNS cancer	12	1.0	6	50.0	1	8.3	5	41.7
C76-C79 CUP	14	1.2	9	64.3	2	14.3	3	21.4
C82-C85 NHL	45	3.7	23	51.1	8	17.8	14	31.1
C90 Mult. myeloma	12	1.0	6	50.0	2	16.7	4	33.3
C91-C96 Leukaemia	26	2.2	6	23.1	1	3.8	19	73.1
Other primaries	83	6.9	46	55.4	5	6.0	32	38.6
All mult. primaries	1202	100.0	612	50.9	182	15.1	408	33.9

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

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

Table 15b

Multiple primaries in deaths in period 1998-2012
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C18	Colon	116	13.6	52	44.8	28	24.1	36	31.0
C19-C20	Rectum	33	3.9	15	45.5	3	9.1	15	45.5
C22	Liver	8	0.9	1	12.5	2	25.0	5	62.5
C25	Pancreas	40	4.7	3	7.5	11	27.5	26	65.0
C33-C34	Lung	39	4.6	13	33.3	7	17.9	19	48.7
C43	Malign. melanoma	20	2.3	17	85.0	1	5.0	2	10.0
C44	Skin others	24	2.8	20	83.3			4	16.7
C50	Breast	268	31.5	195	72.8	24	9.0	49	18.3
C53	Cervix uteri	17	2.0	15	88.2	1	5.9	1	5.9
C54	Corpus uteri	42	4.9	36	85.7	3	7.1	3	7.1
C56	Ovary	47	5.5	26	55.3	7	14.9	14	29.8
C64	Kidney	22	2.6	9	40.9	7	31.8	6	27.3
C67	Bladder	22	2.6	13	59.1	2	9.1	7	31.8
C70-C72	CNS cancer	12	1.4	7	58.3	1	8.3	4	33.3
C73	Thyroid	9	1.1	8	88.9			1	11.1
C76-C79	CUP	8	0.9	5	62.5	1	12.5	2	25.0
C82-C85	NHL	33	3.9	19	57.6	5	15.2	9	27.3
C90	Mult. myeloma	8	0.9	4	50.0	2	25.0	2	25.0
C91-C96	Leukaemia	13	1.5	3	23.1	1	7.7	9	69.2
Other primaries		71	8.3	37	52.1	16	22.5	18	25.4
All mult. primaries		852	100.0	498	58.5	122	14.3	232	27.2

Multiple primaries with number of cases n<8 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 1998-2012
(**Singular primaries only** *)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4			0.0		0.0			
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24		2	0.0		0.1	0.67		4.7
25-29	2	7	0.1	0.22	0.4	0.54	2.2	6.8
30-34	6	11	0.3	0.33	0.5	0.42	3.5	5.9
35-39	26	19	1.1	0.43	0.9	0.45	7.2	4.2
40-44	43	35	1.8	0.44	1.5	0.49	5.7	3.7
45-49	96	66	4.5	0.52	3.1	0.55	6.3	4.1
50-54	149	87	8.1	0.55	4.6	0.49	5.5	3.6
55-59	237	117	13.9	0.54	6.6	0.57	4.9	3.1
60-64	342	169	20.8	0.63	9.7	0.59	4.9	3.4
65-69	435	226	29.6	0.63	14.1	0.62	4.8	3.6
70-74	523	323	45.1	0.66	23.4	0.64	5.3	4.5
75-79	514	405	68.2	0.70	37.0	0.64	5.6	5.1
80-84	449	497	98.9	0.80	57.5	0.71	6.0	6.0
85+	421	743	135.7	0.87	90.7	0.84	6.9	7.3
All ages	3243	2707					5.5	5.0
Mortality								
Raw			11.8	0.66	9.4	0.67		
WS			5.9	0.64	3.3	0.62		
ES			9.2	0.66	5.1	0.63		
BRD-S			12.5	0.68	7.0	0.65		
PYLL-70								
per 100,000			55.4		35.4			
ES			48.5		30.5			
AYLL-70			10.3		11.8			

* See corresponding tables with multiple primaries.

Table 17

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2012
(**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			0.0		0.0			
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24		2	0.0		0.1	0.67		5.0
25-29	2	7	0.1	0.25	0.4	0.54	2.4	7.2
30-34	6	11	0.3	0.33	0.5	0.42	3.6	6.5
35-39	25	18	1.1	0.42	0.8	0.44	7.3	4.4
40-44	43	34	1.8	0.45	1.5	0.48	6.0	4.0
45-49	95	65	4.4	0.52	3.1	0.56	6.6	4.5
50-54	143	86	7.7	0.57	4.6	0.51	5.9	4.0
55-59	229	111	13.5	0.55	6.2	0.56	5.2	3.3
60-64	313	161	19.0	0.61	9.3	0.59	5.0	3.7
65-69	400	211	27.3	0.62	13.2	0.61	5.1	4.0
70-74	473	293	40.8	0.65	21.2	0.62	5.8	4.8
75-79	451	375	59.9	0.67	34.3	0.63	6.0	5.6
80-84	384	462	84.6	0.72	53.5	0.69	6.5	6.6
85+	373	689	120.3	0.80	84.1	0.79	7.5	7.9
All ages	2937	2525					5.8	5.4
Mortality								
Raw			10.7	0.64	8.8	0.65		
WS			5.4	0.62	3.1	0.61		
ES			8.4	0.63	4.8	0.62		
BRD-S			11.3	0.65	6.5	0.63		
PYLL-70								
per 100,000			53.1		34.3			
ES			46.6		29.6			
AYLL-70			10.5		11.9			

* See corresponding tables with multiple primaries.

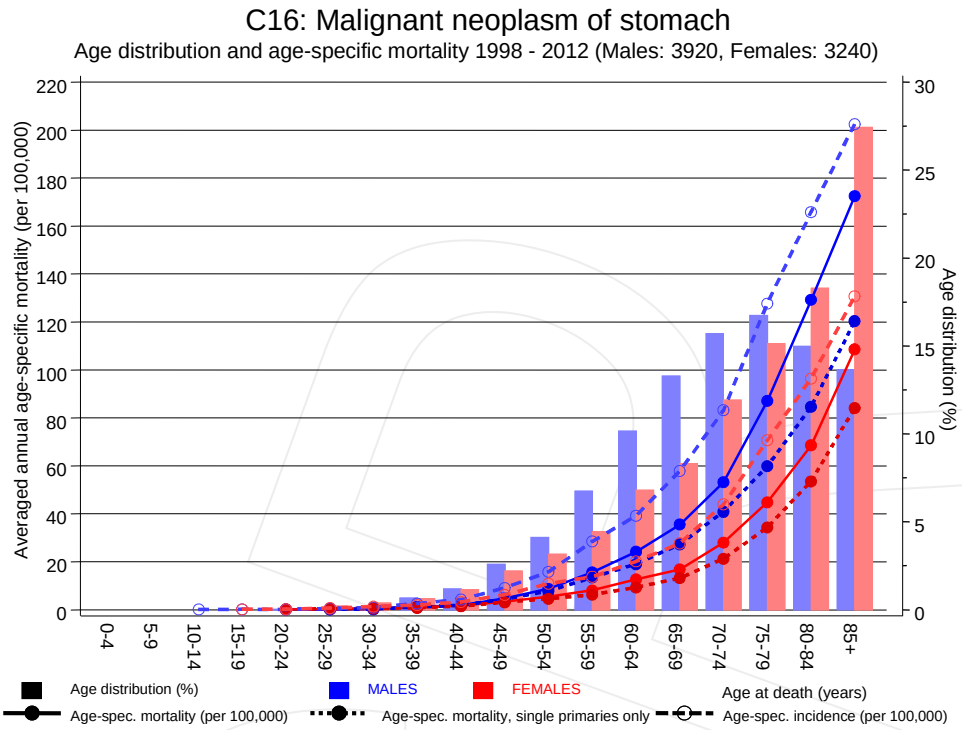
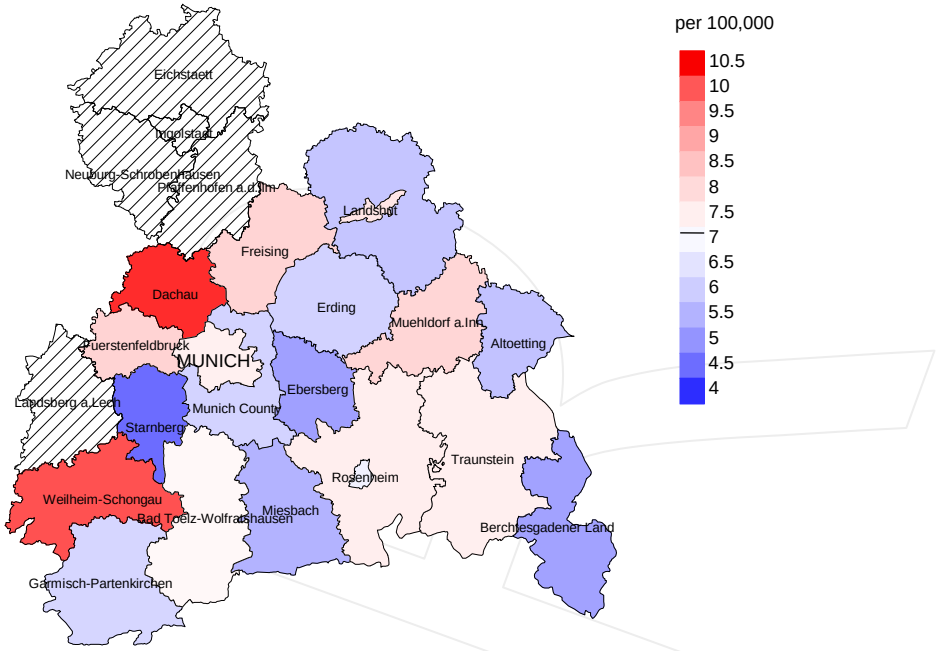


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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) 2003 - 2008: Males



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

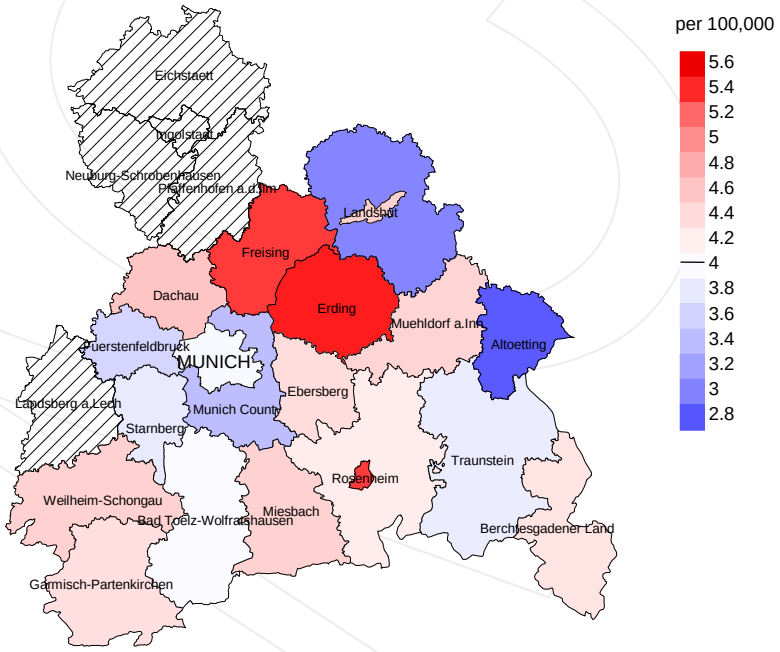
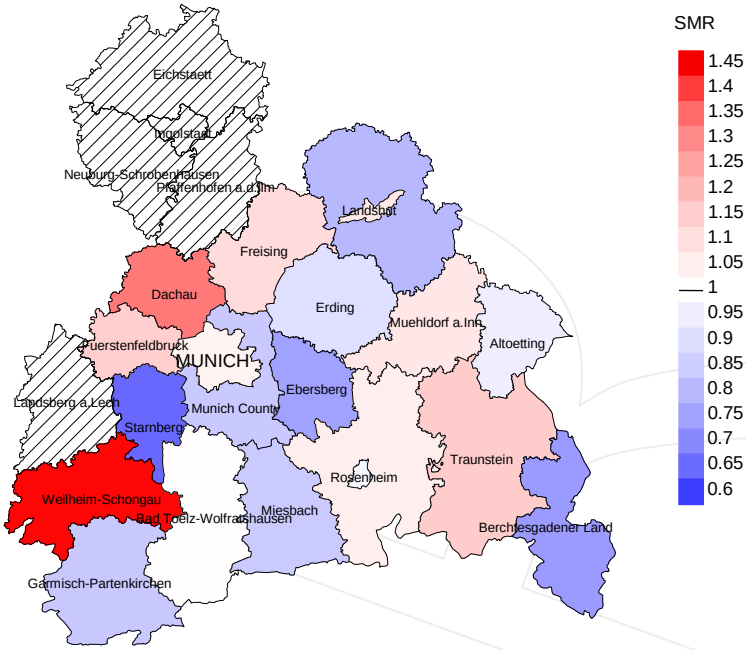


Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2003 to 2008. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 7.1/100,000 WS N=1,679, females 4.0/100,000 WS N=1,383). 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 45 women died from stomach cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 4.4/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 2.7 and 6.8/100,000.

Standardized mortality ratio (SMR) 2003 - 2008: Males



Standardized mortality ratio (SMR) 2003 - 2008: Females

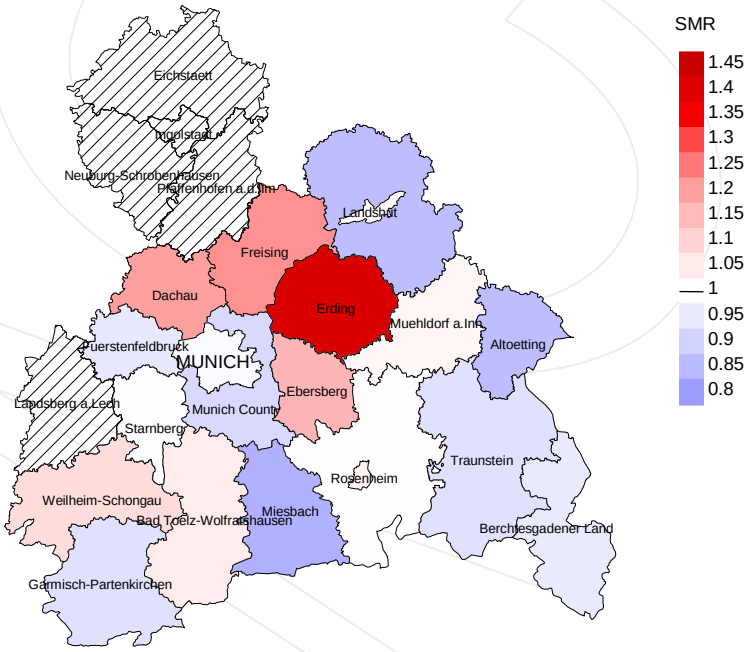


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=1,679, females N=1,383). 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 45 women died from stomach cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.16. Though, the value of this parameter may vary with an underlying probability of 99% between 0.76 and 1.68, and is therefore not statistically striking.

Statistical Notes

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

1. **All multiple primaries included**

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

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

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

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

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

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

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

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

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

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

Shortcuts

AYLL-70	Average years of life lost prior to age 70 given a person dies before that age
BRD-S	German standard population
DCO	Death certificate only
EAR	Excess absolute risk = excess cancer cases (O - E) per 10,000 person-years
ES	European standard population (old)
FRG	Federal Republic of Germany
GEKID	Association of Population-based Cancer Registries in Germany (Gesellschaft der epidemiologischen Krebsregister in Deutschland e.V.)
LCL	Lower confidence limit
MI-index	Ratio between mortality and incidence
MCR	Munich Cancer Registry (Tumorregister München)
PYLL-70	Potential years of life lost prior to age 70 given a person dies before that age
SEER	Surveillance, Epidemiology, and End Results (USA)
SIR	Standardized incidence ratio
SMR	Standardized mortality ratio
UCL	Upper confidence limit
WS	World standard population

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