Munich Cancer Registry

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

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

Cancer statistics: Baseline statistics

C81-C96: Systemic neoplasms

Year of diagnosis	1998-2011
Patients	18653
Diseases	18876
Creation date	04/02/2013
Export date	01/03/2013
Population	4.5 m

BERLIN

GERMANY

BAVARIA

MUNICH

http://www.tumorregister-muenchen.de/en/facts/base/base_C8196E.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
C81	Hodgkin lymphoma
C82	Follicular lymphoma
C83	Non-follicular lymphoma
C84	Mature T/NK-cell lymphomas
C85	Other and unspecified types of non-Hodgkin lymphoma
C86	Other specified types of T/NK-cell Lymphoma
C88	Other B-cell lymphoma[malignant immunoproliferative diseases]
C90	Multiple myeloma and malignant plasma cell neoplasms
C91	Lymphoid leukaemia
C92	Myeloid leukaemia
C93	Monocytic leukaemia
C94	Other leukaemias of specified cell type
C95	Leukaemia of unspecified cell type
C96	Other and unspecified malignant neoplasms of lymphoid, haematopoietic and related tissue

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	846	159	18.8	18.3	72.1	98.0
1999	844	167	19.8	19.9	71.9	98.3
2000	821	179	21.8	20.5	70.2	98.2
2001	880	207	23.5	22.0	68.8	97.7
2002	1465	377	25.7	22.9	68.5	96.9
2003	1482	328	22.1	21.3	63.3	97.3
2004	1561	323	20.7	23.4	59.9	96.4
2005	1482	286	19.3	25.0	58.8	95.2
2006	1537	265	17.2	26.0	57.9	95.6
2007	1728	300	17.4	23.2	55.4	86.8 ##
2008	1675	274	16.4	23.5	51.0	75.3
2009	1663	250	15.0	23.6	47.4	80.3
2010	1595	258	16.2	23.9	44.1	91.7
2011	1297	261	20.1	24.1	37.1	78.3 ###
1998-2011	18876	3634	19.3	23.1	57.3	90.8

\#   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	846	463	383	54.7
1999	844	442	402	52.4
2000	821	447	374	54.4
2001	880	445	435	50.6
2002	1465	782	683	53.4
2003	1482	792	690	53.4
2004	1561	818	743	52.4
2005	1482	803	679	54.2
2006	1537	884	653	57.5
2007	1728	941	787	54.5
2008	1675	925	750	55.2
2009	1663	888	775	53.4
2010	1595	872	723	54.7
2011	1297	687	610	53.0
1998-2011	18876	10189	8687	54.0

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	463	383	41.8	32.6	28.8	18.7	38.7	24.2	47.6	28.9
1999	442	402	39.5	33.9	26.7	19.2	36.2	24.7	45.3	30.0
2000	447	374	39.2	31.1	26.5	17.6	36.0	23.0	45.2	27.8
2001	445	435	38.4	35.8	25.5	18.7	34.6	25.3	42.7	30.8
2002	782	683	42.0	34.9	26.7	17.0	36.4	23.4	45.1	29.1
2003	792	690	42.3	35.0	26.5	19.4	36.3	25.2	45.2	30.2
2004	818	743	43.5	37.6	27.8	19.8	37.2	26.0	45.3	31.7
2005	803	679	42.4	34.1	26.9	18.1	35.6	23.6	44.7	29.0
2006	884	653	46.2	32.5	28.1	16.3	38.1	21.6	47.2	26.9
2007	941	787	42.5	34.1	25.3	17.4	34.5	23.1	43.6	28.3
2008	925	750	41.6	32.3	24.8	16.0	32.9	21.4	41.0	26.6
2009	888	775	39.8	33.3	22.5	16.0	30.9	21.7	38.4	26.7
2010	872	723	38.7	30.9	22.2	15.8	30.1	20.7	37.7	25.2
2011	687	610	30.5	26.1	18.2	13.4	23.9	17.4	29.3	20.9
1998-2011	10189	8687	40.5	33.0	25.1	17.1	33.8	22.6	42.0	27.7

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 diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	846	62.4	19.6	0.9	100	33.4	53.3	65.0	76.9	84.9
1999	844	63.2	19.5	0.3	104	35.3	54.9	66.0	77.3	84.3
2000	821	63.3	19.1	0.4	97.6	35.6	54.6	67.1	77.1	84.5
2001	880	63.9	18.1	1.4	98.7	38.0	56.1	66.5	76.9	84.3
2002	1465	65.5	18.0	1.0	99.3	40.0	57.8	68.6	78.6	85.1
2003	1482	64.2	18.6	0.3	99.0	37.9	55.4	67.3	77.8	83.8
2004	1561	64.5	18.7	0.4	98.6	38.1	56.4	67.5	78.0	84.1
2005	1482	64.5	19.6	0.6	102	36.5	56.5	68.8	78.3	84.2
2006	1537	65.8	18.6	0.6	98.5	39.9	58.9	69.6	78.4	84.8
2007	1728	65.6	18.4	0.1	101	39.9	57.3	69.7	78.9	84.7
2008	1675	66.0	18.8	0.4	98.1	40.1	59.2	69.9	78.8	85.0
2009	1663	66.6	17.4	1.3	100	42.7	58.8	69.8	79.0	85.7
2010	1595	66.2	19.0	0.1	101	39.5	58.0	70.6	79.4	86.2
2011	1297	65.4	20.1	0.3	101	38.1	55.3	70.7	79.3	85.9
1998-2011	18876	65.1	18.8	0.1	104	38.7	56.7	69.0	78.3	84.9

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	463	60.8	19.5	0.9	95.8	33.9	50.2	63.2	75.1	83.8
1999	442	61.3	18.9	0.3	93.8	33.3	54.1	63.8	74.8	82.8
2000	447	62.5	18.8	0.4	97.6	35.9	54.1	66.0	75.4	83.0
2001	445	61.3	17.6	1.4	96.4	37.6	53.5	63.9	74.0	79.9
2002	782	63.0	18.0	1.0	98.3	37.0	55.1	66.4	75.1	81.9
2003	792	63.2	17.9	1.6	99.0	37.4	55.4	66.6	76.0	82.3
2004	818	62.5	18.5	0.4	97.8	36.6	54.1	65.3	75.0	82.8
2005	803	63.1	19.8	0.7	102	35.5	54.9	67.3	77.2	83.0
2006	884	64.3	18.4	1.0	98.5	39.6	56.8	68.2	76.8	82.2
2007	941	64.1	18.4	0.1	97.8	38.1	54.3	68.7	77.5	82.8
2008	925	64.4	19.2	0.4	98.1	37.6	57.9	69.0	76.8	83.2
2009	888	64.9	17.0	2.2	97.0	42.1	56.1	69.0	76.6	83.3
2010	872	65.5	18.7	0.1	101	39.7	55.9	70.3	78.2	85.2
2011	687	63.9	19.7	2.5	101	36.3	54.0	69.6	77.5	84.0
1998-2011	10189	63.5	18.6	0.1	102	37.5	54.9	67.6	76.5	83.0

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	383	64.3	19.7	1.3	100	33.4	55.2	67.8	78.7	85.8
1999	402	65.3	19.9	1.5	104	39.1	56.1	70.3	79.0	87.2
2000	374	64.3	19.4	2.1	95.1	35.1	54.6	69.1	78.2	85.4
2001	435	66.6	18.2	2.8	98.7	40.6	58.1	70.4	79.7	86.8
2002	683	68.3	17.6	2.9	99.3	43.0	59.9	71.8	80.9	87.9
2003	690	65.3	19.4	0.3	98.9	38.5	55.4	68.5	80.1	85.7
2004	743	66.7	18.6	0.7	98.6	41.1	59.7	69.9	80.2	85.2
2005	679	66.3	19.2	0.6	98.4	38.8	58.5	70.1	79.8	85.3
2006	653	68.0	18.6	0.6	95.8	41.0	61.5	72.3	80.7	86.1
2007	787	67.5	18.3	1.0	101	43.8	60.2	71.1	80.5	86.0
2008	750	68.0	18.2	1.4	97.4	42.4	60.6	71.0	81.0	86.5
2009	775	68.5	17.7	1.3	100	43.3	60.7	71.4	81.7	87.2
2010	723	67.1	19.3	0.8	98.7	39.3	58.9	71.2	80.9	87.0
2011	610	67.0	20.3	0.3	99.2	40.5	56.6	72.0	81.7	88.4
1998-2011	8687	66.9	18.9	0.3	104	40.4	58.8	70.8	80.3	86.5

Table 4

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

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	214	1.1	1.1	126	1.2	1.2	88	1.0	1.0
5-9	137	0.7	1.9	91	0.9	2.1	46	0.5	1.5
10-14	119	0.6	2.5	64	0.6	2.8	55	0.6	2.2
15-19	198	1.0	3.5	112	1.1	3.9	86	1.0	3.2
20-24	255	1.4	4.9	132	1.3	5.2	123	1.4	4.6
25-29	275	1.5	6.3	141	1.4	6.5	134	1.5	6.1
30-34	352	1.9	8.2	218	2.1	8.7	134	1.5	7.7
35-39	469	2.5	10.7	285	2.8	11.5	184	2.1	9.8
40-44	613	3.2	13.9	371	3.6	15.1	242	2.8	12.6
45-49	740	3.9	17.9	460	4.5	19.6	280	3.2	15.8
50-54	954	5.1	22.9	561	5.5	25.1	393	4.5	20.3
55-59	1353	7.2	30.1	768	7.5	32.7	585	6.7	27.1
60-64	1833	9.7	39.8	1050	10.3	43.0	783	9.0	36.1
65-69	2469	13.1	52.9	1416	13.9	56.9	1053	12.1	48.2
70-74	2510	13.3	66.2	1435	14.1	71.0	1075	12.4	60.6
75-79	2500	13.2	79.4	1322	13.0	83.9	1178	13.6	74.1
80-84	2029	10.7	90.2	917	9.0	92.9	1112	12.8	86.9
85+	1856	9.8	100.0	720	7.1	100.0	1136	13.1	100.0
All ages	18876	100.0		10189	100.0		8687	100.0	

Included in the statistics are 30.0% multiple primaries in males and 24.9% in females.

Table 5

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

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males DCO rate n=1790 %	Females DCO rate n=1820 %	Males Prop.all cancers n=132509 %	Females Prop.all cancers n=129521 %
0- 4	126	88	10.0	7.3	0.8	1.1	44.5	42.3
5- 9	91	46	7.1	3.8	1.1	2.2	59.1	44.2
10-14	64	55	4.9	4.5			48.1	36.2
15-19	112	86	8.6	6.9	3.6		38.5	35.8
20-24	131	123	8.8	8.2	1.5	4.9	25.8	28.1
25-29	140	134	8.3	7.8	0.7	0.7	17.4	14.6
30-34	217	133	11.1	7.0	4.1		16.6	7.7
35-39	285	184	13.1	8.9	3.2	4.9	14.4	5.6
40-44	371	241	16.6	11.4	3.5	3.3	13.4	4.5
45-49	458	279	23.6	14.6	5.0	5.7	10.2	3.9
50-54	560	392	33.5	22.9	5.9	7.4	7.7	4.2
55-59	767	585	49.2	35.7	6.9	7.2	6.1	5.0
60-64	1044	781	68.6	48.7	9.9	8.2	5.5	5.3
65-69	1407	1050	103.2	70.5	13.1	12.8	6.0	6.5
70-74	1427	1070	138.4	86.7	18.5	16.7	6.6	7.1
75-79	1311	1172	194.0	117.9	25.6	23.3	7.8	8.0
80-84	912	1102	224.5	138.6	38.7	37.9	8.3	8.2
85+	716	1131	258.1	152.3	56.1	56.5	8.7	7.8
All ages	10139	8652			17.7	21.0	7.7	6.7
Incidence								
Raw			40.3	32.9				
WS			25.0	17.1				
ES			33.7	22.6				
BRD-S			41.7	27.6				

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

Table 6a

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

Diagnosis	Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C03-C06 Oral cavity	6	2.8	2.2	0.8	4.7		1.4	
C07-C08 Salivary gland	7	0.7	10.4	4.2	21.4	#	2.8	
C09-C10 Oropharynx	6	3.4	1.7	0.6	3.8		1.1	
C12-C13 Hypopharynx	2	1.9	1.0	0.1	3.7		0.0	
C15 Oesophagus	10	5.4	1.8	0.9	3.4		2.0	
C16 Stomach	30	13.0	2.3	1.6	3.3	#	7.5	3.3
C18 Colon	50	30.5	1.6	1.2	2.2	#	8.6	4.0
C19-C20 Rectum	36	17.6	2.0	1.4	2.8	#	8.1	2.8
C21 Anus/canal	4	0.6	6.5	1.8	16.7	#	1.5	
C22 Liver	14	8.4	1.7	0.9	2.8		2.5	28.6
C25 Pancreas	16	10.6	1.5	0.9	2.4		2.4	12.5
C32 Larynx	5	3.3	1.5	0.5	3.5		0.7	
C33-C34 Lung	85	36.8	2.3	1.8	2.9	#	21.1	3.5
C38,C45 Mesothelioma	6	2.0	3.0	1.1	6.6	#	1.8	16.7
C40-C41 Bone	3	0.2	12.1	2.5	35.3	#	1.2	
C43 Malign. melanoma	48	11.9	4.0	3.0	5.4	#	15.8	
C46,C49 Soft tissue	9	1.7	5.4	2.5	10.3	#	3.2	
C50 Breast	3	0.8	4.0	0.8	11.6		1.0	
C60 Penis	3	0.7	4.5	0.9	13.2		1.0	
C61 Prostate	162	89.0	1.8	1.6	2.1	#	32.0	4.9
C64 Kidney	31	10.9	2.9	1.9	4.1	#	8.8	
C65 Renal pelvis	2	1.2	1.7	0.2	6.1		0.4	
C67 Bladder	27	12.8	2.1	1.4	3.1	#	6.2	7.4
C68 Urethra	2	0.1	16.6	2.0	59.8	#	0.8	
C70-C72 CNS cancer	9	4.3	2.1	1.0	4.0		2.1	11.1
C73 Thyroid	7	2.2	3.2	1.3	6.6	#	2.1	
C76-C79 CUP	17	5.2	3.3	1.9	5.3	#	5.2	
C81 Hodgkin lymphoma	8	0.7	11.4	4.9	22.5	#	3.2	12.5
C82-C85 NHL	49	12.0	4.1	3.0	5.4	#	16.2	10.2
C90 Mult. myeloma	8	3.8	2.1	0.9	4.1		1.8	12.5
C91-C96 Leukaemia	43	4.7	9.1	6.6	12.3	#	16.8	25.6
Other primaries	9	7.7	1.2	0.5	2.2		0.6	11.1
Not observed	0	2.2	0.0	0.0	1.6		-1.0	
All mult. primaries	717	309.0	2.3	2.2	2.5	#	179.0	6.1

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Patients                                6557
Mean age at second malignancy (years)   69.5
Person-years                            22795
Mean observation time (years)            3.5
Median observation time (years)          2.6
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The occurrence of second malignancy is statistically significant.

Observed second primaries with count 1 are pooled in category "Other primaries".
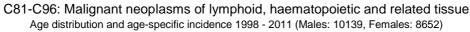
Table 6b

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

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C00	Lip	3	0.1	25.0	5.2	73.0	#	1.5	
C09-C10	Oropharynx	3	0.8	3.8	0.8	11.2		1.2	
C16	Stomach	17	7.0	2.4	1.4	3.9	#	5.2	5.9
C17	Small intestine	2	0.8	2.4	0.3	8.8		0.6	
C18	Colon	27	19.3	1.4	0.9	2.0		4.0	11.1
C19-C20	Rectum	10	8.5	1.2	0.6	2.2		0.8	10.0
C21	Anus/canal	4	1.0	4.0	1.1	10.4	#	1.6	
C22	Liver	6	2.1	2.9	1.0	6.2	#	2.0	33.3
C23-C24	Bile	5	2.8	1.8	0.6	4.2		1.2	
C25	Pancreas	13	8.1	1.6	0.9	2.7		2.6	15.4
C33-C34	Lung	42	13.1	3.2	2.3	4.3	#	15.1	4.8
C38,C45	Mesothelioma	2	0.4	5.7	0.7	20.6		0.9	
C43	Malign. melanoma	16	6.6	2.4	1.4	4.0	#	4.9	
C46,C49	Soft tissue	4	1.1	3.7	1.0	9.5	#	1.5	
C50	Breast	100	57.6	1.7	1.4	2.1	#	22.1	3.0
C51	Vulva	2	1.8	1.1	0.1	4.0		0.1	
C53	Cervix uteri	5	2.7	1.9	0.6	4.3		1.2	60.0
C54	Corpus uteri	18	10.6	1.7	1.0	2.7	#	3.9	
C56	Ovary	13	8.1	1.6	0.9	2.7		2.6	7.7
C64	Kidney	4	4.8	0.8	0.2	2.1		-0.4	
C67	Bladder	2	3.4	0.6	0.1	2.1		-0.7	
C69	Eye lymphoma	2	0.1	29.8	3.6	107.6	#	1.0	
C70-C72	CNS cancer	2	2.8	0.7	0.1	2.6		-0.4	50.0
C73	Thyroid	11	3.6	3.0	1.5	5.4	#	3.8	9.1
C76-C79	CUP	5	3.2	1.5	0.5	3.6		0.9	
C82-C85	NHL	37	7.2	5.1	3.6	7.1	#	15.6	13.5
C90	Mult. myeloma	3	2.3	1.3	0.3	3.7		0.3	33.3
C91-C96	Leukaemia	23	2.9	7.8	5.0	11.8	#	10.5	17.4
Other primaries		12	6.3	1.9	1.0	3.3		3.0	16.7
Not observed		0	1.6	0.0	0.0	2.3		-0.8	
All mult. primaries		393	190.6	2.1	1.9	2.3	#	105.7	8.1

Patients	5428
Mean age at second malignancy (years)	70.8
Person-years	19141
Mean observation time (years)	3.5
Median observation time (years)	2.5

The occurrence of second malignancy is statistically significant.

Observed second malignancy with count 1 are pooled in category "Other primaries".
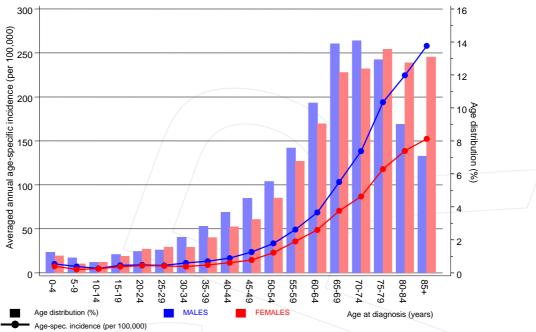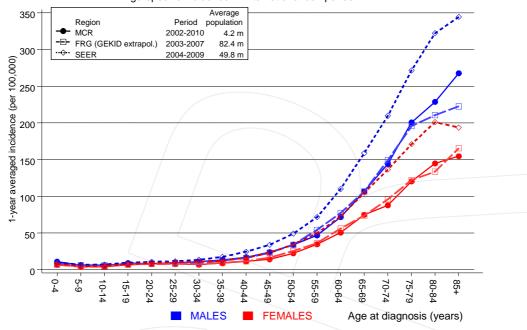
C81-C96: Malignant neoplasms of lymphoid, haematopoietic and related tissue

Age distribution and age-specific incidence 1998 - 2011 (Males: 10139, Females: 8652)

Figure 7. Age distribution and age-specific incidence

C81-C96: Malignant neoplasms of lymphoid, haematopoietic and related tissue
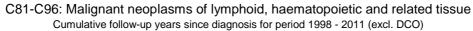
Age-specific incidence in international comparison

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, 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.

C81-C96: Malignant neoplasms of lymphoid, haematopoietic and related tissue
Cumulative follow-up years since diagnosis for period 1998 - 2011 (excl. DCO)

Gender	n	Target Sum	Target Median	Actual Sum	Actual Median
All patients					
Males	6029	24787	3.3	23211	3.1
Females	4981	20828	3.3	19495	3.1
Patients alive					
Males	3575	19728	5.0	18152	4.6
Females	2962	16862	5.2	15530	4.7
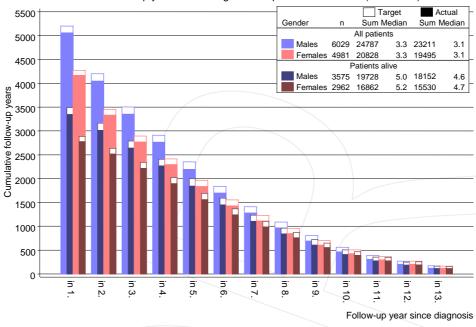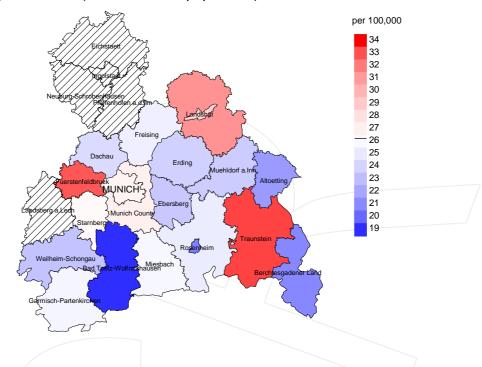
Figure 8. Cumulative follow-up years depending on time since diagnosis
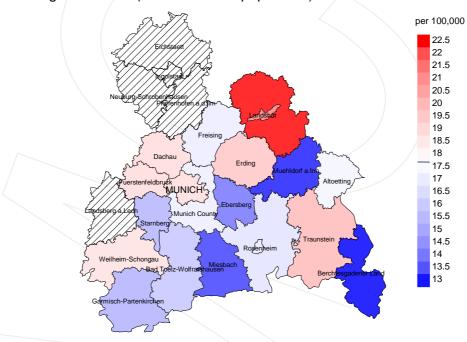
The increase of the lost to follow-up rate can be interpreted as a consequence of a declining number of survivors over time.

Average incidence (world standard population) 2003 - 2008: Males
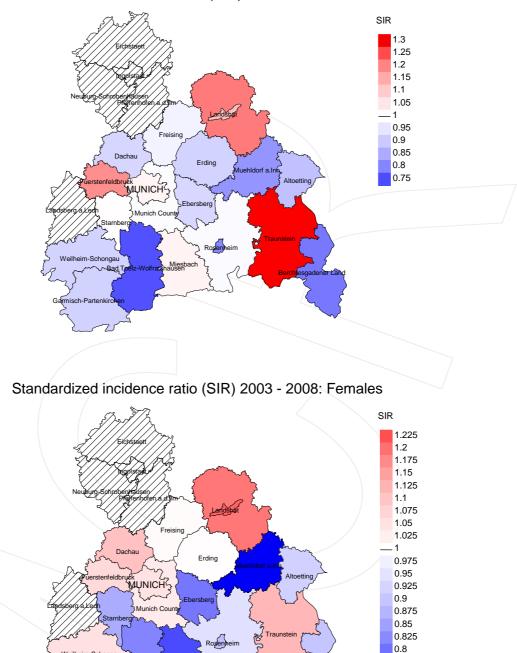
Average incidence (world standard population) 2003 - 2008: Females

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 26.2/100,000 WS N=4,888, females 17.7/100,000 WS N=4,113). 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 97 women were identified with newly diagnosed systemic neoplasms. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 14.4/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 10.1 and 20.6/100,000.

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=4,888, females N=4,113). 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 97 women were identified with newly diagnosed systemic neoplasms. 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 0.61 and 1.04, 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	846	98.0	18.8	610	72.1	95.2
1999	844	98.3	19.8	607	71.9	95.7
2000	821	98.2	21.8	576	70.2	97.2
2001	880	97.7	23.5	605	68.8	96.7
2002	1465	96.9	25.7	1004	68.5	97.4
2003	1482	97.3	22.1	938	63.3	98.4
2004	1561	96.4	20.7	935	59.9	98.3
2005	1482	95.2	19.3	872	58.8	99.2
2006	1537	95.6	17.2	890	57.9	98.2
2007	1728	86.8	17.4	958	55.4	98.7
2008	1675	75.3	16.4	854	51.0	98.7
2009	1663	80.3	15.0	789	47.4	98.2
2010	1595	91.7	16.2	703	44.1	98.6
2011	1297	78.3	20.1	481	37.1	98.8
1998-2011	18876	90.8	19.3	10822	57.3	97.9

Table 10b

Annual cohorts of incident cancers and deaths, proportion of death certificates
and cases deceased the same year of cancer diagnosis
(incl. DCO)
(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	846	519	95.8	228	27.0
1999	844	552	94.9	230	27.3
2000	821	537	95.7	232	28.3
2001	880	596	96.5	250	28.4
2002	1465	828	97.5	473	32.3
2003	1482	839	98.2	451	30.4
2004	1561	887	98.1	447	28.6
2005	1482	894	98.4	420	28.3
2006	1537	922	98.4	438	28.5
2007	1728	1020	97.6	484	28.0
2008	1675	1023	98.3	451	26.9
2009	1663	1056	98.1	463	27.8
2010	1595	1099	98.3	473	29.7
2011	1297	1023	98.6	379	29.2
1998-2011	18876	11795	97.7	5419	28.7

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)

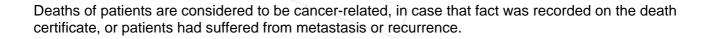| Year of death	Deaths n	Prop. cancer-related %	Prop. not cancer-related %	Prop. cancer recorded on death certificate %
1998	519	64.0	36.0	94.2
1999	552	72.6	27.4	94.3
2000	537	75.0	25.0	95.7
2001	596	72.8	27.2	94.8
2002	828	81.0	19.0	94.9
2003	839	80.8	19.2	94.7
2004	887	85.2	14.8	94.6
2005	894	82.8	17.2	95.1
2006	922	82.8	17.2	93.2
2007	1020	82.5	17.5	92.8
2008	1023	80.8	19.2	90.2
2009	1056	82.0	18.0	91.4
2010	1099	79.7	20.3	89.5
2011	1023	79.8	20.2	88.8
1998-2011	11795	79.7	20.3	92.8

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	260	68.0	65.3	73.4	68.6
1999	307	68.5	65.8	75.6	68.5
2000	299	68.5	66.8	73.6	68.7
2001	280	69.7	68.9	72.1	69.7
2002	428	70.3	70.2	70.9	70.4
2003	447	70.6	69.7	75.1	70.4
2004	466	71.6	70.8	76.0	71.9
2005	480	72.4	71.8	75.4	72.3
2006	512	71.7	70.8	75.7	71.4
2007	543	70.5	69.9	73.8	70.1
2008	563	72.1	71.5	75.1	71.8
2009	572	73.1	72.0	77.6	72.7
2010	605	73.1	72.4	76.0	72.8
2011	564	72.9	72.0	76.9	72.7
1998-2011	6326	71.3	70.4	75.0	71.2

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	259	72.3	68.8	77.7	72.7
1999	245	75.0	72.9	80.6	75.0
2000	238	74.0	71.6	81.5	73.3
2001	316	74.6	72.3	79.8	74.3
2002	400	74.6	72.9	81.3	74.6
2003	392	74.2	72.6	80.2	73.9
2004	421	74.2	73.6	78.2	74.2
2005	414	75.0	73.3	83.5	74.6
2006	410	75.1	74.2	79.3	74.4
2007	477	75.1	74.2	78.9	74.9
2008	460	75.3	73.6	81.2	74.7
2009	484	75.9	74.8	81.1	75.4
2010	494	76.2	75.2	80.4	75.6
2011	459	75.3	73.8	80.8	74.8
1998-2011	5469	74.9	73.5	80.3	74.6

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	173	15.6	0.38	10.3	0.36	14.5	0.38	18.6	0.39
1999	223	19.9	0.51	12.7	0.47	18.2	0.50	23.3	0.52
2000	224	19.7	0.50	12.1	0.46	17.8	0.50	23.9	0.53
2001	213	18.4	0.48	10.8	0.42	16.3	0.47	22.1	0.52
2002	351	18.8	0.45	10.4	0.39	16.1	0.44	21.9	0.49
2003	370	19.7	0.47	10.9	0.41	16.4	0.45	22.0	0.49
2004	395	21.0	0.48	10.9	0.39	17.0	0.46	23.5	0.52
2005	398	21.0	0.50	10.5	0.39	16.5	0.47	23.1	0.52
2006	419	21.9	0.48	10.9	0.39	16.8	0.44	22.9	0.49
2007	454	20.5	0.48	10.6	0.42	15.8	0.46	21.6	0.50
2008	467	21.0	0.51	10.2	0.41	15.6	0.48	21.2	0.52
2009	463	20.7	0.52	9.6	0.43	14.9	0.49	20.7	0.54
2010	481	21.3	0.55	9.6	0.43	14.9	0.50	20.8	0.55
2011	454	20.1	0.67	9.3	0.51	14.2	0.60	19.8	0.68
1998-2011	5085	20.2	0.50	10.5	0.42	15.9	0.47	21.8	0.52

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	159	13.5	0.42	6.9	0.37	9.3	0.38	11.6	0.40
1999	178	15.0	0.44	6.2	0.33	9.4	0.38	12.8	0.43
2000	180	15.0	0.48	6.4	0.36	9.5	0.41	12.4	0.45
2001	221	18.2	0.51	7.6	0.41	11.4	0.45	15.5	0.51
2002	321	16.4	0.47	6.7	0.39	9.9	0.42	13.3	0.46
2003	308	15.6	0.45	6.4	0.33	9.5	0.38	12.7	0.42
2004	362	18.3	0.49	7.2	0.36	10.9	0.42	14.8	0.47
2005	343	17.2	0.51	6.8	0.37	10.1	0.43	13.4	0.46
2006	344	17.1	0.53	6.5	0.40	9.8	0.46	13.5	0.51
2007	387	16.8	0.50	6.4	0.37	9.6	0.42	12.9	0.46
2008	362	15.6	0.48	5.9	0.37	8.9	0.41	11.9	0.45
2009	403	17.3	0.52	6.3	0.39	9.6	0.44	13.0	0.49
2010	397	17.0	0.55	5.9	0.37	9.0	0.44	12.5	0.50
2011	363	15.5	0.60	5.7	0.43	8.7	0.51	11.7	0.57
1998-2011	4328	16.4	0.50	6.4	0.38	9.6	0.43	13.0	0.47

Table 13

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

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	11	0.1	0.1	5	0.1	0.1	6	0.1	0.1
5-9	18	0.2	0.3	12	0.2	0.3	6	0.1	0.3
10-14	23	0.2	0.5	13	0.2	0.6	10	0.2	0.5
15-19	27	0.3	0.8	14	0.3	0.8	13	0.3	0.8
20-24	41	0.4	1.2	25	0.5	1.3	16	0.4	1.2
25-29	44	0.5	1.7	28	0.5	1.9	16	0.4	1.5
30-34	60	0.6	2.3	38	0.7	2.6	22	0.5	2.0
35-39	110	1.1	3.5	65	1.2	3.8	45	1.0	3.0
40-44	147	1.5	5.0	98	1.9	5.7	49	1.1	4.2
45-49	216	2.2	7.3	129	2.5	8.2	87	2.0	6.1
50-54	287	3.0	10.2	174	3.3	11.5	113	2.6	8.7
55-59	538	5.6	15.8	311	6.0	17.5	227	5.2	13.9
60-64	796	8.3	24.1	488	9.4	26.9	308	7.0	20.9
65-69	1262	13.1	37.2	760	14.6	41.5	502	11.4	32.3
70-74	1523	15.8	53.1	876	16.8	58.3	647	14.7	47.0
75-79	1665	17.3	70.4	924	17.7	76.0	741	16.8	63.8
80-84	1521	15.8	86.2	708	13.6	89.6	813	18.5	82.3
85+	1322	13.8	100.0	543	10.4	100.0	779	17.7	100.0
All ages	9611	100.0		5211	100.0		4400	100.0	

Included in the statistics are 30.0% multiple primaries in males and 24.9% in females.

Table 14

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

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4	5	6	0.4	0.04	0.5	0.07	17.2	27.3
5- 9	12	6	0.9	0.13	0.5	0.13	38.7	16.7
10-14	13	10	1.0	0.20	0.8	0.18	44.8	41.7
15-19	14	13	1.1	0.13	1.0	0.15	36.8	44.8
20-24	25	16	1.7	0.19	1.1	0.13	31.3	37.2
25-29	28	16	1.7	0.20	0.9	0.12	32.2	15.7
30-34	38	22	2.0	0.17	1.2	0.16	22.6	10.8
35-39	65	45	3.0	0.23	2.2	0.24	17.9	9.8
40-44	98	49	4.4	0.26	2.3	0.20	12.9	4.9
45-49	129	87	6.6	0.28	4.5	0.31	8.4	5.0
50-54	174	113	10.4	0.31	6.6	0.29	6.1	4.3
55-59	311	227	19.9	0.40	13.9	0.39	6.0	5.6
60-64	488	308	32.1	0.46	19.2	0.39	6.3	5.5
65-69	760	502	55.8	0.54	33.7	0.48	7.3	7.1
70-74	876	647	84.9	0.61	52.4	0.60	7.9	8.1
75-79	924	741	136.7	0.70	74.5	0.63	8.5	8.3
80-84	708	813	174.3	0.77	102.3	0.73	8.1	8.5
85+	543	779	195.8	0.75	104.9	0.69	7.6	6.8
All ages	5211	4400					7.8	7.2
Mortality								
Raw			20.7	0.51	16.7	0.51		
WS			10.7	0.43	6.5	0.38		
ES			16.3	0.48	9.8	0.43		
BRD-S			22.3	0.53	13.2	0.48		
PYLL-70								
per 100,000			116.8		77.4			
ES			108.5		72.0			
AYLL-70			12.3		12.3			

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

Table 15a

Multiple primaries in deaths in period 1998-2011
MALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03-C06 Oral cavity	19	1.0	7	36.8	3	15.8	9	47.4
C09-C10 Oropharynx	15	0.8	7	46.7	1	6.7	7	46.7
C15 Oesophagus	18	0.9	3	16.7	1	5.6	14	77.8
C16 Stomach	66	3.3	26	39.4	11	16.7	29	43.9
C18 Colon	143	7.2	69	48.3	24	16.8	50	35.0
C19-C20 Rectum	83	4.2	36	43.4	13	15.7	34	41.0
C22 Liver	25	1.3	4	16.0	4	16.0	17	68.0
C25 Pancreas	33	1.7	1	3.0	6	18.2	26	78.8
C32 Larynx	15	0.8	9	60.0	2	13.3	4	26.7
C33-C34 Lung	183	9.3	29	15.8	31	16.9	123	67.2
C38,C45 Mesothelioma	10	0.5			4	40.0	6	60.0
C43 Malign. melanoma	78	4.0	39	50.0	9	11.5	30	38.5
C44 Skin others	262	13.3	55	21.0	14	5.3	193	73.7
C46,C49 Soft tissue	25	1.3	14	56.0	1	4.0	10	40.0
C61 Prostate	358	18.1	223	62.3	46	12.8	89	24.9
C62 Testis	15	0.8	12	80.0	2	13.3	1	6.7
C64 Kidney	73	3.7	45	61.6	10	13.7	18	24.7
C67 Bladder	100	5.1	53	53.0	11	11.0	36	36.0
C70-C72 CNS cancer	41	2.1	10	24.4	10	24.4	21	51.2
C73 Thyroid	10	0.5	8	80.0			2	20.0
C76-C79 CUP	36	1.8	5	13.9	4	11.1	27	75.0
C81 Hodgkin lymphoma	12	0.6					12	100.0
C82-C85 NHL	87	4.4			21	24.1	66	75.9
C90 Mult. myeloma	25	1.3			5	20.0	20	80.0
C91-C96 Leukaemia	160	8.1			46	28.8	114	71.3
Other primaries	82	4.2	30	36.6	9	11.0	43	52.4
All mult. primaries	1974	100.0	685	34.7	288	14.6	1001	50.7

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

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

Table 15b

Multiple primaries in deaths in period 1998-2011
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C16	Stomach	43	3.1	14	32.6	5	11.6	24	55.8
C18	Colon	89	6.4	43	48.3	12	13.5	34	38.2
C19-C20	Rectum	43	3.1	28	65.1	4	9.3	11	25.6
C21	Anus/canal	12	0.9	6	50.0			6	50.0
C23-C24	Bile	12	0.9	3	25.0	1	8.3	8	66.7
C25	Pancreas	26	1.9	1	3.8	6	23.1	19	73.1
C33-C34	Lung	73	5.2	11	15.1	10	13.7	52	71.2
C43	Malign. melanoma	48	3.5	33	68.8	1	2.1	14	29.2
C44	Skin others	122	8.8	37	30.3	8	6.6	77	63.1
C46,C49	Soft tissue	10	0.7	1	10.0	3	30.0	6	60.0
C50	Breast	358	25.7	256	71.5	28	7.8	74	20.7
C51	Vulva	14	1.0	9	64.3			5	35.7
C53	Cervix uteri	32	2.3	22	68.8	3	9.4	7	21.9
C54	Corpus uteri	51	3.7	38	74.5	4	7.8	9	17.6
C56	Ovary	38	2.7	14	36.8	7	18.4	17	44.7
C64	Kidney	25	1.8	13	52.0	5	20.0	7	28.0
C67	Bladder	33	2.4	17	51.5	4	12.1	12	36.4
C70-C72	CNS cancer	33	2.4	16	48.5	3	9.1	14	42.4
C73	Thyroid	23	1.7	18	78.3			5	21.7
C76-C79	CUP	20	1.4	7	35.0	1	5.0	12	60.0
C82-C85	NHL	56	4.0			9	16.1	47	83.9
C90	Mult. myeloma	28	2.0			2	7.1	26	92.9
C91-C96	Leukaemia	128	9.2			42	32.8	86	67.2
Other primaries		74	5.3	27	36.5	5	6.8	42	56.8
All mult. primaries		1391	100.0	614	44.1	163	11.7	614	44.1

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

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

Table 16

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

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4	4	6	0.3	0.03	0.5	0.07	16.7	27.3
5- 9	12	6	0.9	0.13	0.5	0.13	41.4	18.2
10-14	13	10	1.0	0.20	0.8	0.18	44.8	43.5
15-19	14	13	1.1	0.13	1.0	0.15	40.0	48.1
20-24	23	15	1.6	0.18	1.0	0.12	30.7	38.5
25-29	26	15	1.5	0.19	0.9	0.12	32.1	15.6
30-34	38	19	2.0	0.18	1.0	0.15	23.2	10.6
35-39	59	41	2.7	0.22	2.0	0.23	17.3	9.9
40-44	87	43	3.9	0.25	2.0	0.19	12.4	4.9
45-49	115	81	5.9	0.27	4.2	0.33	8.2	5.4
50-54	154	101	9.2	0.30	5.9	0.29	6.2	4.5
55-59	286	194	18.3	0.42	11.8	0.38	6.4	5.6
60-64	413	264	27.1	0.47	16.5	0.41	6.3	5.8
65-69	623	411	45.7	0.54	27.6	0.48	7.4	7.2
70-74	703	529	68.2	0.64	42.9	0.61	8.0	8.2
75-79	694	602	102.7	0.72	60.5	0.64	8.3	8.3
80-84	521	648	128.3	0.81	81.5	0.73	7.8	8.5
85+	400	612	144.2	0.77	82.4	0.66	7.3	6.6
All ages	4185	3610					7.7	7.3
Mortality								
Raw			16.7	0.50	13.7	0.50		
WS			8.8	0.41	5.5	0.37		
ES			13.2	0.47	8.2	0.42		
BRD-S			17.7	0.52	10.9	0.47		
PYLL-70								
per 100,000			105.3		69.3			
ES			98.3		65.2			
AYLL-70			12.8		12.8			

* See corresponding tables with multiple primaries.

Table 17
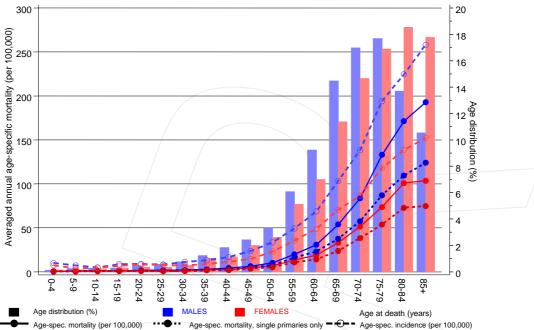
Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2011
(**Single primaries only ***)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4	4	6	0.3	0.03	0.5	0.07	17.4	27.3
5- 9	11	5	0.9	0.12	0.4	0.11	39.3	15.6
10-14	13	9	1.0	0.21	0.7	0.17	44.8	40.9
15-19	14	11	1.1	0.13	0.9	0.13	40.0	47.8
20-24	20	13	1.4	0.16	0.9	0.11	28.6	36.1
25-29	24	12	1.4	0.18	0.7	0.09	32.0	13.3
30-34	36	17	1.8	0.17	0.9	0.14	22.6	10.4
35-39	53	33	2.4	0.21	1.6	0.19	16.3	8.7
40-44	75	37	3.4	0.22	1.7	0.17	11.3	4.6
45-49	97	70	5.0	0.24	3.7	0.31	7.4	5.1
50-54	127	88	7.6	0.28	5.1	0.27	5.6	4.4
55-59	250	176	16.0	0.41	10.7	0.38	6.1	5.7
60-64	349	226	22.9	0.46	14.1	0.38	6.1	5.6
65-69	511	353	37.5	0.51	23.7	0.44	7.0	7.2
70-74	592	472	57.4	0.60	38.2	0.58	8.0	8.7
75-79	588	534	87.0	0.66	53.7	0.61	8.6	8.7
80-84	444	578	109.3	0.74	72.7	0.69	8.3	9.0
85+	344	555	124.0	0.68	74.7	0.62	7.7	6.9
All ages	3552	3195					7.7	7.4
Mortality								
Raw			14.1	0.46	12.1	0.47		
WS			7.5	0.38	4.8	0.34		
ES			11.2	0.43	7.2	0.39		
BRD-S			15.0	0.48	9.6	0.44		
PYLL-70								
per 100,000			92.2		60.1			
ES			86.6		56.7			
AYLL-70			13.2		12.8			

* See corresponding tables with multiple primaries.

C81-C96: Malignant neoplasms of lymphoid, haematopoietic and related tissue
Age distribution and age-specific mortality 1998 - 2011 (Males: 5085, Females: 4328)
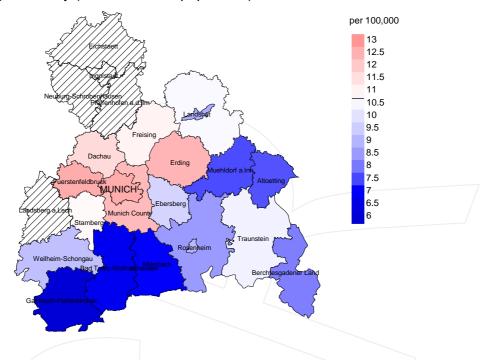
Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).
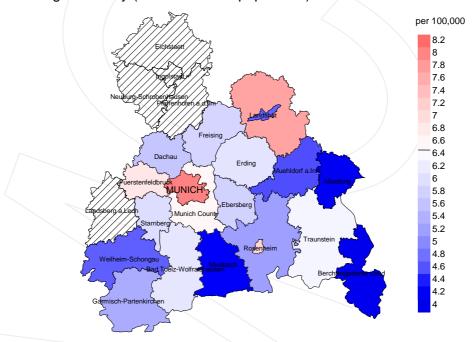
The difference between age at diagnosis (Table 3) and age at systemic neoplasms-related death (see Table 10) should be considered.

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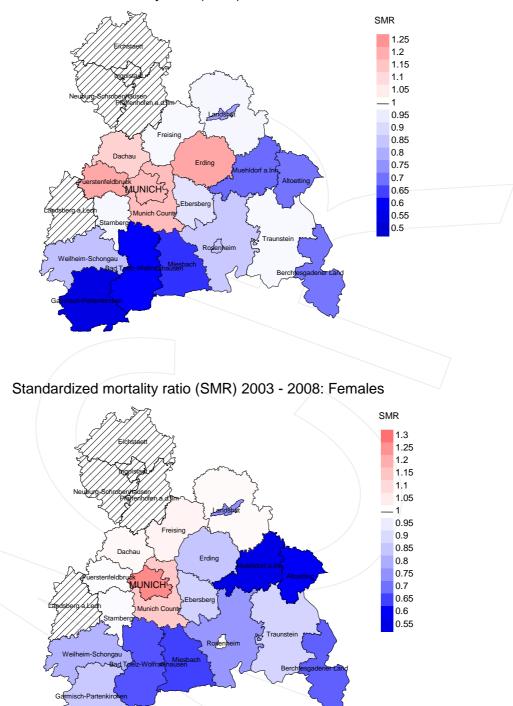
Average mortality (world standard population) 2003 - 2008: Females

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 10.7/100,000 WS N=2,417, females 6.5/100,000 WS N=2,026). 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 51 women died from systemic neoplasms. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 5.8/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 3.8 and 8.6/100,000.

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=2,417, females N=2,026). 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 51 women died from systemic neoplasms. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.88. Though, the value of this parameter may vary with an underlying probability of 99% between 0.60 and 1.26, 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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