Munich Cancer Registry

- Survival
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- Homepage

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

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

Cancer statistics: Baseline statistics

C90: Plasmacytoma

Year of diagnosis	1998-2011
Patients	2937
Diseases	2939
Creation date	04/02/2013
Export date	01/03/2013
Population	4.5 m

http://www.tumorregister-muenchen.de/en/facts/base/base_C90__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, 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.

Some remarks regarding this cancer type

The results for plasmacytomas should be interpreted with caution. As with other primarily non-surgically or non-radiologically treated cancer diseases, the MCR hardly manages to obtain even the simplest information on this cancer. The proportion of DCO cases indicates a situation that is far away from a satisfying cooperation. In the group of institutions that potentially participate in reporting are a few hospitals that refuse any contribution to MCR.

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	123	30	24.4	17.9	88.6	98.4
1999	128	27	21.1	22.7	91.4	99.2
2000	132	39	29.5	13.6	94.7	99.2
2001	112	33	29.5	25.9	90.2	99.1
2002	234	76	32.5	21.4	83.8	98.7
2003	230	58	25.2	21.7	83.9	97.4
2004	233	65	27.9	24.5	81.1	98.7
2005	226	46	20.4	26.5	77.9	97.3
2006	230	41	17.8	22.6	72.2	98.7
2007	295	66	22.4	21.0	74.2	91.2 ##
2008	295	58	19.7	20.0	63.7	78.0
2009	262	41	15.6	20.2	57.6	85.5
2010	233	49	21.0	24.5	49.4	90.1
2011	206	57	27.7	20.4	41.7	77.2 ###
1998-2011	2939	686	23.3	21.8	72.5	92.3

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 diagnosis	All n	Males n	Females n	Prop. males %
1998	123	72	51	58.5
1999	128	65	63	50.8
2000	132	78	54	59.1
2001	112	54	58	48.2
2002	234	123	111	52.6
2003	230	138	92	60.0
2004	233	119	114	51.1
2005	226	118	108	52.2
2006	230	116	114	50.4
2007	295	163	132	55.3
2008	295	164	131	55.6
2009	262	133	129	50.8
2010	233	136	97	58.4
2011	206	111	95	53.9
1998-2011	2939	1590	1349	54.1

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	72	51	6.5	4.3	4.0	2.0	5.9	2.9	7.2	3.6
1999	65	63	5.8	5.3	3.6	2.2	5.3	3.3	7.0	4.4
2000	78	54	6.8	4.5	3.8	1.9	6.1	2.9	8.5	3.8
2001	54	58	4.7	4.8	2.7	2.2	4.2	3.2	5.7	4.2
2002	123	111	6.6	5.7	3.7	2.3	5.6	3.5	7.3	4.6
2003	138	92	7.4	4.7	4.0	2.0	6.0	3.0	7.8	3.9
2004	119	114	6.3	5.8	3.5	2.3	5.3	3.4	6.7	4.6
2005	118	108	6.2	5.4	3.1	2.1	4.8	3.2	6.5	4.5
2006	116	114	6.1	5.7	3.2	2.2	4.7	3.4	6.1	4.4
2007	163	132	7.4	5.7	3.7	2.2	5.6	3.3	7.6	4.4
2008	164	131	7.4	5.6	3.6	2.2	5.5	3.4	7.1	4.6
2009	133	129	6.0	5.5	2.8	2.1	4.2	3.2	5.6	4.2
2010	136	97	6.0	4.1	2.9	1.6	4.4	2.4	5.8	3.1
2011	111	95	4.9	4.1	2.3	1.6	3.5	2.5	4.6	3.2
1998-2011	1590	1349	6.3	5.1	3.3	2.1	5.0	3.1	6.6	4.1

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	123	67.3	13.0	26.1	94.0	52.7	58.7	67.8	75.7	84.9
1999	128	69.4	13.0	23.9	92.8	53.2	60.1	70.9	78.7	85.6
2000	132	71.7	11.7	38.2	94.4	55.7	64.6	72.6	79.6	85.8
2001	112	68.8	11.1	36.1	93.7	50.9	61.3	70.1	77.1	81.2
2002	234	70.9	12.1	32.7	93.5	55.9	62.7	71.8	79.9	86.3
2003	230	69.6	11.2	31.4	99.0	55.6	62.2	69.3	78.2	83.7
2004	233	70.7	11.7	37.1	93.4	55.9	63.4	70.8	79.4	84.5
2005	226	71.9	11.1	38.9	102	56.6	65.2	73.2	79.9	84.7
2006	230	71.2	11.8	27.5	94.9	55.9	65.1	71.5	79.7	85.4
2007	295	71.8	10.8	30.9	93.2	59.2	65.3	72.7	80.4	85.3
2008	295	71.6	11.7	33.8	97.9	56.4	65.9	72.1	79.7	85.5
2009	262	71.8	11.2	34.7	94.6	57.2	65.7	72.0	80.0	85.6
2010	233	71.4	12.0	40.5	97.2	54.0	64.5	72.4	80.0	86.5
2011	206	71.3	12.6	33.3	97.4	52.5	65.3	73.0	79.8	86.5
1998-2011	2939	70.9	11.7	23.9	102	55.4	63.8	71.8	79.5	85.3

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	72	64.9	13.4	26.1	92.3	49.5	56.0	65.0	73.7	83.9
1999	65	66.5	13.5	23.9	91.7	48.5	58.5	68.2	76.8	83.7
2000	78	70.9	11.5	38.2	92.3	55.6	61.6	71.6	79.5	86.5
2001	54	67.3	10.7	44.4	85.3	49.1	59.2	69.6	76.0	78.5
2002	123	69.1	12.0	32.7	93.5	54.4	62.1	69.7	78.0	83.6
2003	138	68.4	10.2	36.7	99.0	55.2	61.8	68.0	75.8	81.6
2004	119	68.7	12.3	37.1	93.4	50.2	60.7	69.8	76.4	84.0
2005	118	70.8	11.0	38.9	102	56.6	65.2	71.1	78.0	84.5
2006	116	69.4	12.1	27.5	94.8	53.7	64.0	69.7	76.8	84.4
2007	163	70.4	11.3	30.9	93.2	58.0	63.6	71.3	79.4	82.9
2008	164	70.4	12.1	33.8	97.9	52.3	65.3	70.6	79.0	85.4
2009	133	70.0	10.8	34.7	89.4	54.9	65.2	71.1	77.7	83.8
2010	136	70.3	11.8	41.8	93.0	51.9	63.9	71.5	78.7	84.9
2011	111	70.4	12.5	33.3	97.4	50.5	66.1	72.6	78.1	84.5
1998-2011	1590	69.4	11.8	23.9	102	53.1	62.7	70.4	77.7	83.8

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	51	70.7	11.5	37.6	94.0	57.6	62.1	70.7	78.6	85.8
1999	63	72.4	11.9	49.2	92.8	56.1	62.1	74.6	80.1	87.9
2000	54	72.8	12.1	40.6	94.4	55.7	66.9	76.0	80.1	85.8
2001	58	70.1	11.3	36.1	93.7	57.3	63.3	70.7	79.1	83.2
2002	111	73.0	11.9	38.9	93.2	56.3	63.7	74.3	82.6	87.8
2003	92	71.6	12.5	31.4	94.2	55.8	63.7	72.6	80.6	85.6
2004	114	72.8	10.7	38.8	92.1	58.0	66.4	73.7	81.6	84.5
2005	108	73.0	11.1	42.1	96.8	55.9	65.9	75.2	81.9	84.9
2006	114	73.1	11.3	40.7	94.9	59.7	66.2	74.4	81.9	85.7
2007	132	73.6	9.9	44.4	92.3	61.6	67.0	73.2	82.0	86.5
2008	131	73.0	10.9	37.5	94.3	58.8	66.4	74.3	81.2	85.5
2009	129	73.6	11.4	36.3	94.6	60.0	67.6	73.1	83.4	87.1
2010	97	73.1	12.3	40.5	97.2	55.9	66.5	73.1	82.6	87.6
2011	95	72.4	12.8	41.9	92.8	54.5	63.1	74.8	82.7	87.9
1998-2011	1349	72.7	11.4	31.4	97.2	56.9	65.7	73.7	81.5	86.3

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.%
20-24	1	0.0	0.0	1	0.1	0.1			0.0
25-29	2	0.1	0.1	2	0.1	0.2			0.0
30-34	7	0.2	0.3	6	0.4	0.6	1	0.1	0.1
35-39	20	0.7	1.0	13	0.8	1.4	7	0.5	0.6
40-44	43	1.5	2.5	28	1.8	3.1	15	1.1	1.7
45-49	102	3.5	6.0	75	4.7	7.9	27	2.0	3.7
50-54	103	3.5	9.5	59	3.7	11.6	44	3.3	7.0
55-59	214	7.3	16.7	120	7.5	19.1	94	7.0	13.9
60-64	314	10.7	27.4	187	11.8	30.9	127	9.4	23.4
65-69	491	16.7	44.1	283	17.8	48.7	208	15.4	38.8
70-74	477	16.2	60.4	280	17.6	66.3	197	14.6	53.4
75-79	482	16.4	76.8	250	15.7	82.0	232	17.2	70.6
80-84	368	12.5	89.3	156	9.8	91.8	212	15.7	86.3
85+	315	10.7	100.0	130	8.2	100.0	185	13.7	100.0
All ages	2939	100.0		1590	100.0		1349	100.0	

Included in the statistics are 29.1% multiple primaries in males and 22.3% 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=336 %	Females DCO rate n=349 %	Males Prop.all cancers n=132509 %	Females Prop.all cancers n=129521 %
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		0.1	0.0			0.2	
25-29	2		0.1	0.0			0.2	
30-34	6	1	0.3	0.1			0.5	0.1
35-39	13	7	0.6	0.3	7.7	14.3	0.7	0.2
40-44	28	15	1.3	0.7			1.0	0.3
45-49	75	27	3.9	1.4	5.3		1.7	0.4
50-54	59	44	3.5	2.6		6.8	0.8	0.5
55-59	120	94	7.7	5.7	5.0	2.1	1.0	0.8
60-64	187	127	12.3	7.9	9.1	7.9	1.0	0.9
65-69	283	208	20.8	14.0	12.7	14.4	1.2	1.3
70-74	280	197	27.1	16.0	18.2	18.8	1.3	1.3
75-79	250	232	37.0	23.3	27.6	23.7	1.5	1.6
80-84	156	212	38.4	26.7	44.9	39.2	1.4	1.6
85+	130	184	46.9	24.8	63.1	69.6	1.6	1.3
All ages	1590	1348			21.1	25.9	1.2	1.0
Incidence								
Raw			6.3	5.1				
WS			3.3	2.1				
ES			5.0	3.1				
BRD-S			6.6	4.1				

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 %
C15	Oesophagus	2	0.9	2.3	0.3	8.4		3.9	
C16	Stomach	6	2.0	3.0	1.1	6.5	#	13.7	
C18	Colon	7	4.8	1.5	0.6	3.0		7.6	
C19-C20	Rectum	6	2.8	2.1	0.8	4.6		10.9	
C22	Liver	2	1.3	1.5	0.2	5.4		2.3	50.0
C25	Pancreas	2	1.7	1.2	0.1	4.3		1.2	50.0
C33-C34	Lung	10	5.9	1.7	0.8	3.1		14.1	10.0
C40-C41	Bone	3	0.0	86.2	17.8	252.0	#	10.2	
C43	Malign. melanoma	4	1.8	2.2	0.6	5.6		7.5	
C61	Prostate	28	14.4	1.9	1.3	2.8	#	46.5	3.6
C64	Kidney	4	1.7	2.3	0.6	6.0		7.8	
C67	Bladder	3	2.0	1.5	0.3	4.4		3.5	
C70-C72	CNS cancer	2	0.7	3.1	0.4	11.0		4.6	
C73	Thyroid	2	0.3	6.2	0.7	22.2		5.7	
C76-C79	CUP	3	0.8	3.7	0.8	10.9		7.5	
C82-C85	NHL	13	1.9	7.0	3.7	12.0	#	38.2	7.7
C91-C96	Leukaemia	5	0.7	7.1	2.3	16.5	#	14.7	
Other primaries		6	2.6	2.3	0.9	5.1		11.7	16.7
Not observed		0	2.6	0.0	0.0	1.4		-8.8	
All mult. primaries		108	48.8	2.2	1.8	2.7	#	203.0	5.6

Patients	974
Mean age at second malignancy (years)	71.1
Person-years	2916
Mean observation time (years)	3.0
Median observation time (years)	2.1

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 1998-2011
FEMALES

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C16	Stomach	3	1.0	3.1	0.6	9.1		9.0	
C18	Colon	3	2.7	1.1	0.2	3.2		1.3	
C33-C34	Lung	2	1.9	1.1	0.1	3.8		0.5	
C43	Malign. melanoma	3	0.9	3.4	0.7	9.9		9.4	
C50	Breast	9	8.1	1.1	0.5	2.1		4.0	11.1
C56	Ovary	3	1.1	2.6	0.5	7.7		8.2	33.3
C76-C79	CUP	2	0.4	4.5	0.5	16.2		6.9	
C82-C85	NHL	8	1.0	7.9	3.4	15.5	#	30.9	25.0
C91-C96	Leukaemia	3	0.4	7.4	1.5	21.7	#	11.5	
Other primaries		14	5.1	2.8	1.5	4.6	#	39.5	14.3
Not observed		0	4.1	0.0	0.0	0.9	#	-18.2	
All mult. primaries		50	26.7	1.9	1.4	2.5	#	103.0	12.0

Patients	794
Mean age at second malignancy (years)	72.8
Person-years	2261
Mean observation time (years)	2.8
Median observation time (years)	1.9

The occurrence of second malignancy is statistically significant.

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

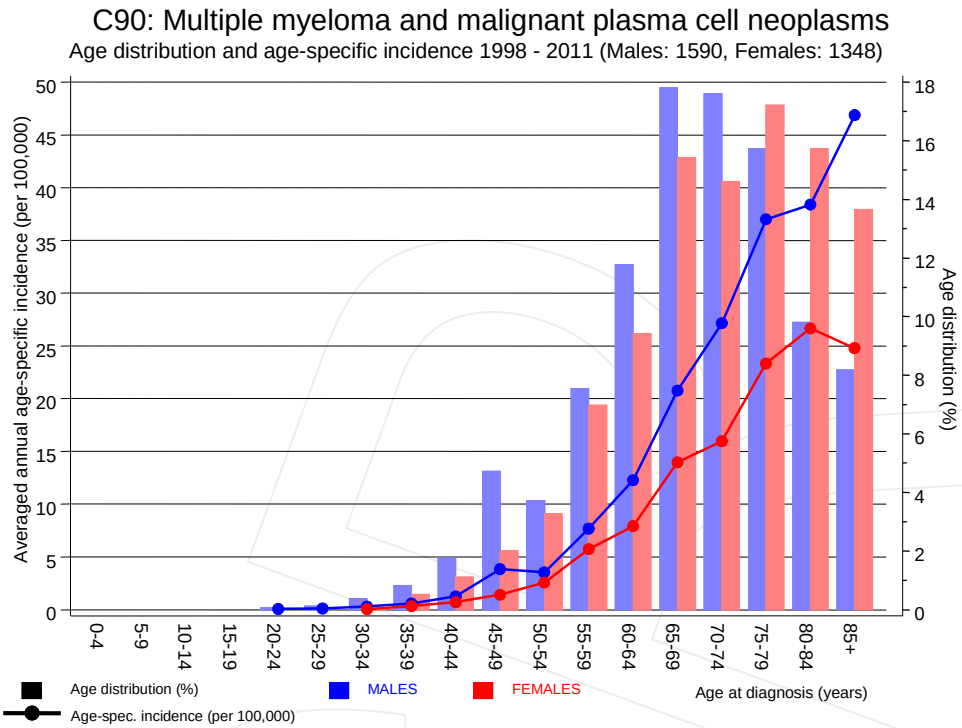


Figure 7. Age distribution and age-specific incidence

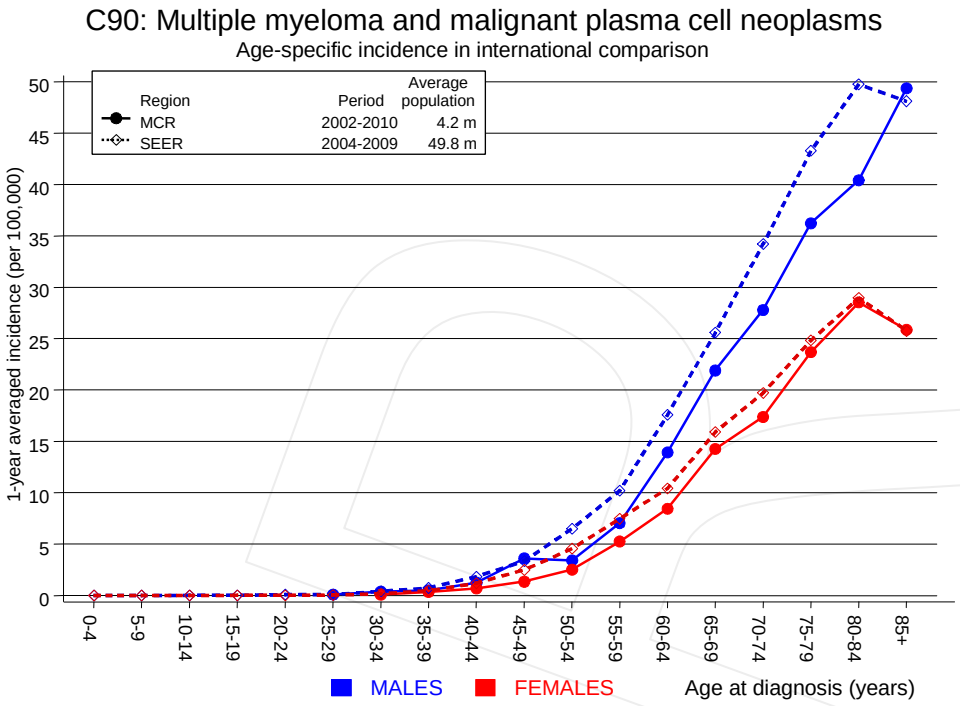


Figure 7a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 18 Regs Research Data, released April 2012, based on the November 2011 submission. http://www.seer.cancer.gov.

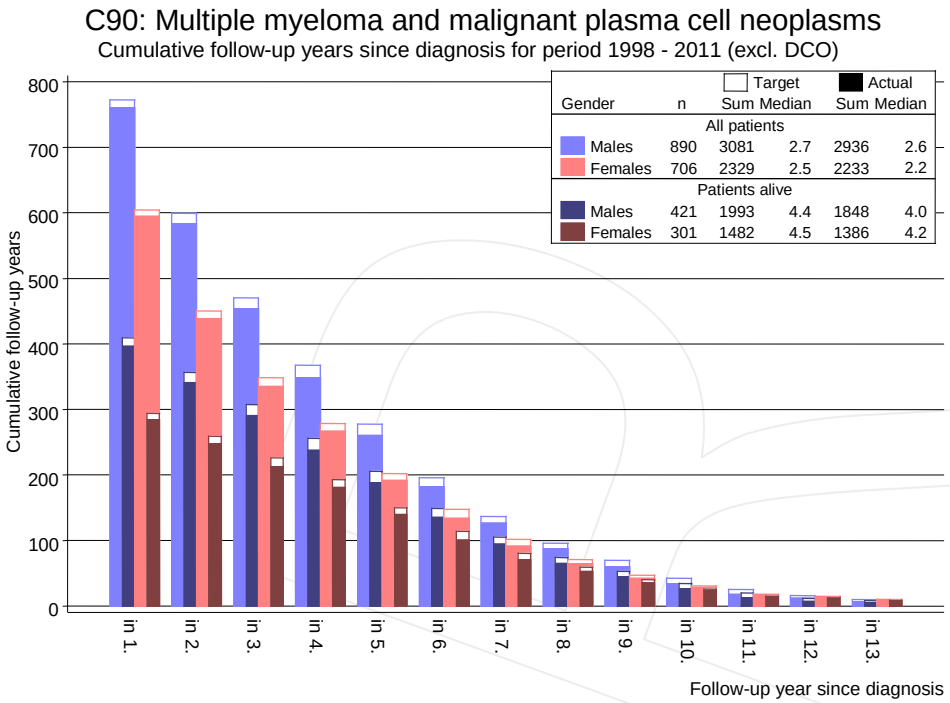
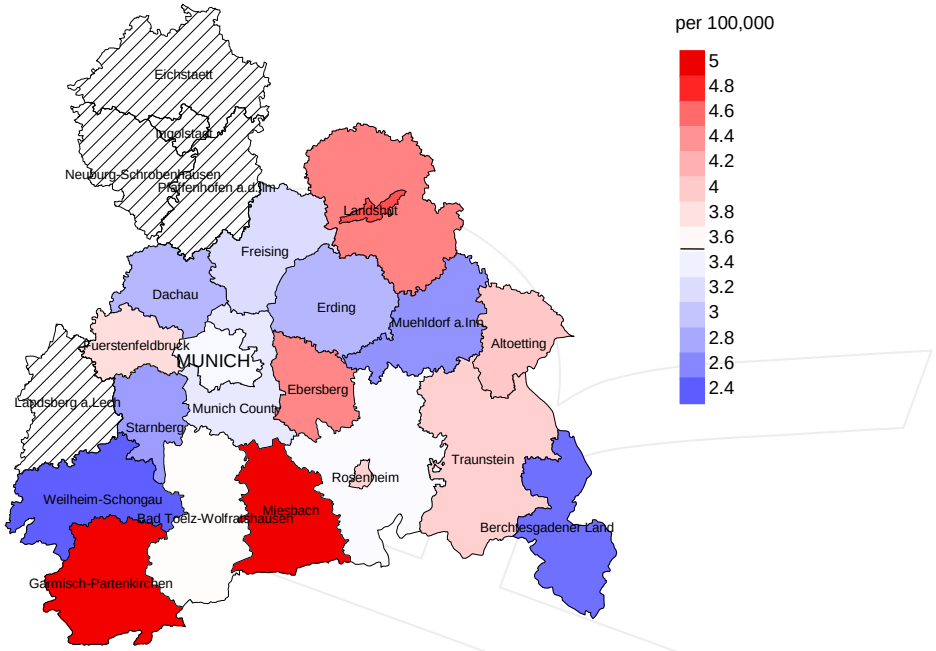


Figure 8. Cumulative follow-up years depending on time since diagnosis

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

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



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

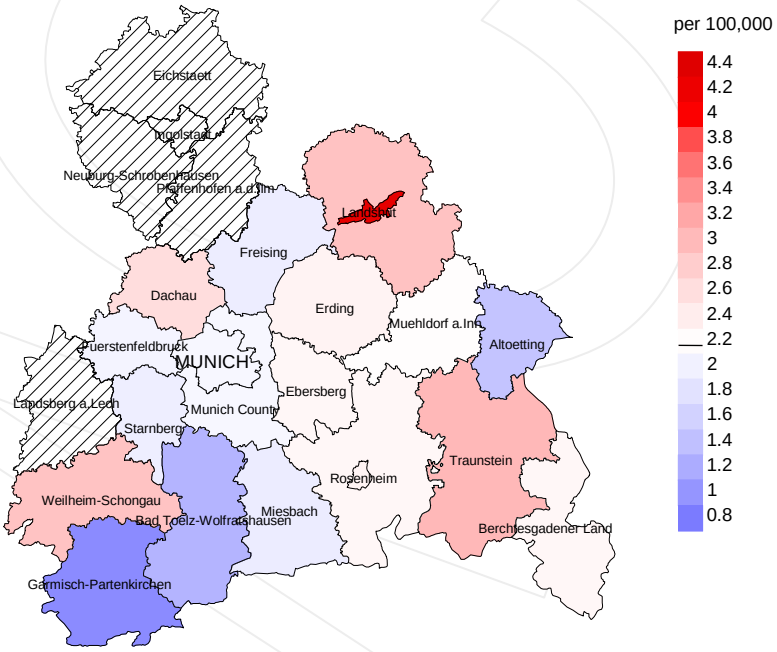
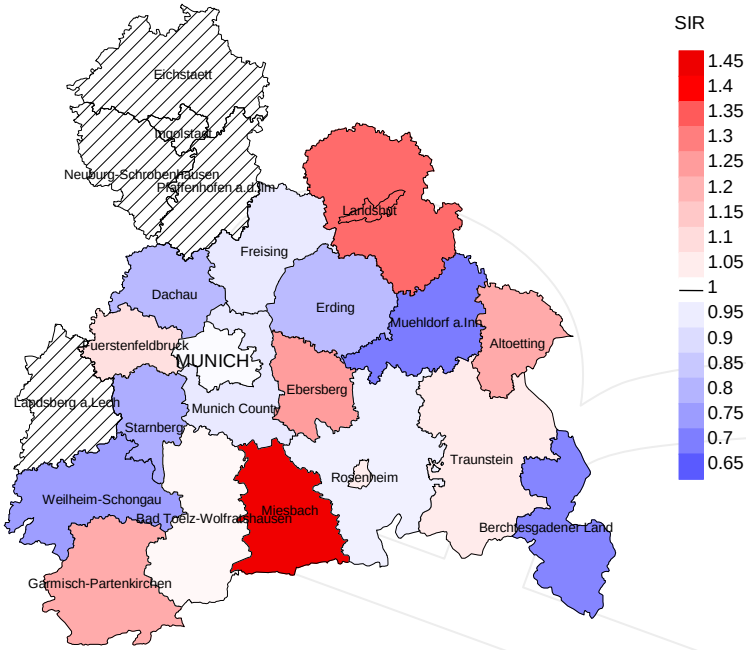


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 3.5/100,000 WS N=787, females 2.2/100,000 WS N=662). 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 22 women were identified with newly diagnosed plasmacytoma. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 2.3/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 1.1 and 4.2/100,000.

Standardized incidence ratio (SIR) 2003 - 2008: Males



Standardized incidence ratio (SIR) 2003 - 2008: Females

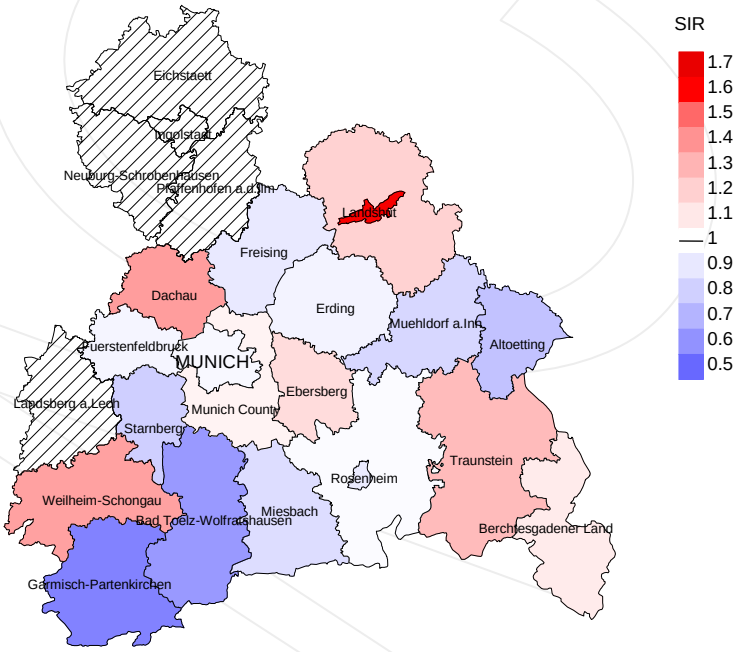


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=787, females N=662). 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 22 women were identified with newly diagnosed plasmacytoma. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.15. Though, the value of this parameter may vary with an underlying probability of 99% between 0.62 and 1.95, 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	123	98.4	24.4	109	88.6	93.6
1999	128	99.2	21.1	117	91.4	94.0
2000	132	99.2	29.5	125	94.7	95.2
2001	112	99.1	29.5	101	90.2	96.0
2002	234	98.7	32.5	196	83.8	98.0
2003	230	97.4	25.2	193	83.9	97.9
2004	233	98.7	27.9	189	81.1	98.4
2005	226	97.3	20.4	176	77.9	98.3
2006	230	98.7	17.8	166	72.2	98.8
2007	295	91.2	22.4	219	74.2	99.1
2008	295	78.0	19.7	188	63.7	98.9
2009	262	85.5	15.6	151	57.6	98.7
2010	233	90.1	21.0	115	49.4	99.1
2011	206	77.2	27.7	86	41.7	100.0
1998-2011	2939	92.3	23.3	2131	72.5	97.8

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	123	84	92.9	35	28.5
1999	128	97	95.9	41	32.0
2000	132	110	91.8	45	34.1
2001	112	101	95.0	36	32.1
2002	234	143	95.8	87	37.2
2003	230	162	99.4	79	34.3
2004	233	193	98.4	91	39.1
2005	226	148	98.0	66	29.2
2006	230	154	97.4	67	29.1
2007	295	183	98.9	90	30.5
2008	295	213	97.7	84	28.5
2009	262	213	97.7	70	26.7
2010	233	222	99.1	74	31.8
2011	206	209	98.6	70	34.0
1998-2011	2939	2232	97.4	935	31.8

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	84	53.6	46.4	94.9
1999	97	75.3	24.7	96.8
2000	110	65.5	34.5	97.0
2001	101	60.4	39.6	99.0
2002	143	81.1	18.9	97.1
2003	162	80.9	19.1	96.9
2004	193	83.4	16.6	96.8
2005	148	83.1	16.9	95.2
2006	154	84.4	15.6	96.7
2007	183	85.8	14.2	95.6
2008	213	85.0	15.0	92.3
2009	213	82.6	17.4	96.6
2010	222	82.9	17.1	90.5
2011	209	84.2	15.8	92.7
1998-2011	2232	80.0	20.0	95.2

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	35	70.1	65.7	77.4	71.5
1999	50	71.6	70.3	75.9	71.8
2000	62	72.0	70.4	74.6	72.8
2001	46	74.1	73.7	74.9	74.5
2002	73	70.7	70.9	70.0	71.0
2003	83	72.2	71.6	74.7	72.1
2004	103	72.4	71.4	76.6	72.8
2005	76	73.6	73.2	75.8	73.5
2006	80	72.2	71.6	75.1	71.9
2007	94	73.4	72.8	78.0	73.4
2008	122	73.2	72.1	81.4	72.9
2009	113	73.4	72.8	75.9	73.7
2010	117	73.8	73.6	74.8	73.3
2011	113	74.1	73.2	80.9	74.0
1998-2011	1167	72.8	72.1	75.9	72.9

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	49	75.8	71.7	79.4	75.7
1999	47	78.2	77.0	81.5	78.2
2000	48	76.4	75.7	78.1	76.2
2001	55	74.7	72.2	78.0	74.0
2002	70	75.6	74.5	81.9	75.8
2003	79	75.0	73.7	80.2	74.9
2004	90	74.6	73.8	79.5	74.6
2005	72	75.4	73.4	85.7	74.8
2006	74	75.4	75.4	75.3	75.5
2007	89	76.9	76.3	79.5	76.8
2008	91	75.2	74.0	80.3	74.7
2009	100	74.7	73.4	81.3	74.7
2010	105	75.8	75.4	78.3	75.5
2011	96	75.5	73.4	83.3	74.7
1998-2011	1065	75.6	74.4	80.1	75.3

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	22	2.0	0.31	1.2	0.30	1.7	0.30	2.0	0.28
1999	38	3.4	0.58	2.1	0.57	3.1	0.59	4.3	0.62
2000	39	3.4	0.50	1.9	0.49	3.0	0.50	4.5	0.53
2001	30	2.6	0.56	1.4	0.49	2.2	0.54	3.4	0.61
2002	57	3.1	0.46	1.7	0.45	2.6	0.46	3.5	0.48
2003	68	3.6	0.49	1.9	0.47	2.9	0.49	4.0	0.52
2004	84	4.5	0.71	2.3	0.66	3.6	0.68	4.8	0.72
2005	63	3.3	0.53	1.6	0.53	2.6	0.55	3.6	0.56
2006	67	3.5	0.58	1.7	0.53	2.6	0.55	3.6	0.59
2007	84	3.8	0.52	1.8	0.49	2.9	0.51	4.0	0.53
2008	107	4.8	0.65	2.3	0.65	3.6	0.66	4.8	0.67
2009	93	4.2	0.70	1.9	0.68	3.0	0.70	4.0	0.71
2010	94	4.2	0.69	1.8	0.61	2.8	0.64	3.9	0.68
2011	100	4.4	0.90	1.9	0.85	3.1	0.88	4.3	0.93
1998-2011	946	3.8	0.59	1.9	0.56	2.9	0.58	4.0	0.61

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	23	2.0	0.45	0.9	0.45	1.3	0.45	1.7	0.46
1999	35	2.9	0.56	1.1	0.49	1.7	0.51	2.4	0.54
2000	33	2.7	0.61	1.0	0.55	1.6	0.56	2.2	0.59
2001	31	2.5	0.53	1.1	0.49	1.7	0.52	2.3	0.54
2002	59	3.0	0.53	1.2	0.52	1.8	0.51	2.4	0.52
2003	63	3.2	0.68	1.3	0.65	1.9	0.66	2.6	0.68
2004	77	3.9	0.68	1.5	0.66	2.3	0.67	3.2	0.68
2005	60	3.0	0.56	1.2	0.54	1.8	0.55	2.4	0.54
2006	63	3.1	0.55	1.1	0.49	1.7	0.52	2.5	0.56
2007	73	3.2	0.56	1.1	0.48	1.7	0.52	2.4	0.55
2008	74	3.2	0.56	1.2	0.53	1.8	0.53	2.5	0.55
2009	83	3.6	0.64	1.4	0.65	2.1	0.65	2.7	0.65
2010	90	3.8	0.93	1.3	0.82	2.1	0.84	2.8	0.91
2011	76	3.2	0.80	1.2	0.76	1.9	0.77	2.6	0.80
1998-2011	840	3.2	0.62	1.2	0.58	1.8	0.59	2.5	0.61

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.%
25-29	1	0.1	0.1	1	0.1	0.1			0.0
30-34	1	0.1	0.1	1	0.1	0.2			0.0
35-39	6	0.3	0.4	5	0.5	0.7	1	0.1	0.1
40-44	14	0.8	1.2	10	1.1	1.8	4	0.5	0.6
45-49	22	1.2	2.5	17	1.8	3.6	5	0.6	1.2
50-54	42	2.4	4.8	25	2.6	6.2	17	2.0	3.2
55-59	82	4.6	9.4	43	4.5	10.8	39	4.6	7.9
60-64	176	9.8	19.3	108	11.4	22.2	68	8.1	16.0
65-69	289	16.2	35.4	159	16.8	39.0	130	15.5	31.4
70-74	352	19.7	55.1	186	19.6	58.6	166	19.8	51.2
75-79	321	18.0	73.1	172	18.2	76.8	149	17.7	68.9
80-84	273	15.3	88.4	124	13.1	89.9	149	17.7	86.7
85+	208	11.6	100.0	96	10.1	100.0	112	13.3	100.0
All ages	1787	100.0		947	100.0		840	100.0	

Included in the statistics are 29.1% multiple primaries in males and 22.3% 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			0.0		0.0			
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24			0.0		0.0			
25-29	1		0.1	0.50	0.0		1.1	
30-34	1		0.1	0.17	0.0		0.6	
35-39	5	1	0.2	0.38	0.0	0.14	1.4	0.2
40-44	10	4	0.4	0.36	0.2	0.27	1.3	0.4
45-49	17	5	0.9	0.23	0.3	0.19	1.1	0.3
50-54	25	17	1.5	0.42	1.0	0.39	0.9	0.6
55-59	43	39	2.8	0.36	2.4	0.41	0.8	1.0
60-64	108	68	7.1	0.58	4.2	0.54	1.4	1.2
65-69	159	130	11.7	0.56	8.7	0.63	1.5	1.8
70-74	186	166	18.0	0.66	13.4	0.84	1.7	2.1
75-79	172	149	25.5	0.69	15.0	0.64	1.6	1.7
80-84	124	149	30.5	0.79	18.7	0.70	1.4	1.6
85+	96	112	34.6	0.74	15.1	0.61	1.3	1.0
All ages	947	840					1.4	1.4
Mortality								
Raw			3.8	0.60	3.2	0.62		
WS			1.9	0.56	1.2	0.58		
ES			2.9	0.58	1.8	0.59		
BRD-S			4.0	0.61	2.5	0.61		
PYLL-70								
per 100,000			13.6		8.3			
ES			11.6		6.8			
AYLL-70			8.4		7.1			

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 ←%
C15	Oesophagus	2	0.7	1	50.0			1	50.0
C16	Stomach	9	3.1	5	55.6	2	22.2	2	22.2
C18	Colon	13	4.5	5	38.5	3	23.1	5	38.5
C19-C20	Rectum	17	5.9	9	52.9	3	17.6	5	29.4
C22	Liver	6	2.1	1	16.7	1	16.7	4	66.7
C25	Pancreas	4	1.4			1	25.0	3	75.0
C32	Larynx	3	1.0	2	66.7			1	33.3
C33-C34	Lung	13	4.5	3	23.1	2	15.4	8	61.5
C40-C41	Bone	5	1.7			1	20.0	4	80.0
C43	Malign. melanoma	15	5.2	12	80.0	1	6.7	2	13.3
C44	Skin others	23	8.0	13	56.5			10	43.5
C46,C49	Soft tissue	3	1.0	1	33.3			2	66.7
C61	Prostate	68	23.8	48	70.6	5	7.4	15	22.1
C62	Testis	3	1.0	2	66.7	1	33.3		
C64	Kidney	19	6.6	9	47.4	4	21.1	6	31.6
C66	Ureter	2	0.7	2	100.0				
C67	Bladder	11	3.8	5	45.5			6	54.5
C70-C72	CNS cancer	7	2.4	2	28.6	2	28.6	3	42.9
C76-C79	CUP	4	1.4					4	100.0
C82-C85	NHL	23	8.0	4	17.4	7	30.4	12	52.2
C90	Mult. myeloma	14	4.9			3	21.4	11	78.6
C91-C96	Leukaemia	11	3.8	2	18.2	1	9.1	8	72.7
Other primaries		11	3.8	4	36.4			7	63.6
All mult. primaries		286	100.0	130	45.5	37	12.9	119	41.6

Multiple primaries with number of cases n<2 are pooled in category "Other primaries".

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

Table 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 ←%
C03-C06 Oral cavity	2	1.0	1	50.0			1	50.0
C16 Stomach	4	2.0			1	25.0	3	75.0
C18 Colon	15	7.5	10	66.7			5	33.3
C19-C20 Rectum	12	6.0	9	75.0	1	8.3	2	16.7
C25 Pancreas	4	2.0			1	25.0	3	75.0
C33-C34 Lung	6	3.0	3	50.0	1	16.7	2	33.3
C43 Malign. melanoma	9	4.5	6	66.7			3	33.3
C44 Skin others	9	4.5	3	33.3	1	11.1	5	55.6
C50 Breast	62	30.8	50	80.6	4	6.5	8	12.9
C51 Vulva	2	1.0	2	100.0				
C53 Cervix uteri	3	1.5	3	100.0				
C54 Corpus uteri	5	2.5	4	80.0			1	20.0
C56 Ovary	6	3.0	3	50.0	1	16.7	2	33.3
C64 Kidney	4	2.0	4	100.0				
C67 Bladder	4	2.0	1	25.0	1	25.0	2	50.0
C70-C72 CNS cancer	6	3.0	5	83.3			1	16.7
C76-C79 CUP	3	1.5	1	33.3			2	66.7
C82-C85 NHL	15	7.5	4	26.7	4	26.7	7	46.7
C90 Mult. myeloma	11	5.5					11	100.0
C91-C96 Leukaemia	10	5.0	3	30.0	3	30.0	4	40.0
Other primaries	9	4.5	4	44.4			5	55.6
All mult. primaries	201	100.0	116	57.7	18	9.0	67	33.3

Multiple primaries with number of cases n<2 are pooled in category "Other primaries".

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

Table 16

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

Age at 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			0.0		0.0			
25-29	1		0.1	0.50	0.0		1.2	
30-34	1		0.1	0.20	0.0		0.6	
35-39	4	1	0.2	0.33	0.0	0.14	1.2	0.2
40-44	9	4	0.4	0.33	0.2	0.27	1.3	0.5
45-49	15	4	0.8	0.22	0.2	0.17	1.1	0.3
50-54	24	16	1.4	0.44	0.9	0.42	1.0	0.7
55-59	41	34	2.6	0.38	2.1	0.40	0.9	1.0
60-64	99	61	6.5	0.61	3.8	0.55	1.5	1.3
65-69	136	109	10.0	0.57	7.3	0.66	1.6	1.9
70-74	161	141	15.6	0.71	11.4	0.83	1.8	2.2
75-79	137	126	20.3	0.74	12.7	0.64	1.6	1.7
80-84	91	121	22.4	0.81	15.2	0.68	1.4	1.6
85+	75	94	27.0	0.74	12.7	0.61	1.4	1.0
All ages	794	711					1.5	1.4
Mortality								
Raw			3.2	0.61	2.7	0.62		
WS			1.6	0.57	1.0	0.58		
ES			2.5	0.59	1.6	0.60		
BRD-S			3.3	0.62	2.1	0.61		
PYLL-70								
per 100,000			12.4		7.4			
ES			10.6		6.1			
AYLL-70			8.5		7.3			

* See corresponding tables with multiple primaries.

Table 17

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

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			0.0		0.0			
25-29	1		0.1	0.50	0.0		1.3	
30-34	1		0.1	0.20	0.0		0.6	
35-39	4	1	0.2	0.33	0.0	0.14	1.2	0.3
40-44	8	4	0.4	0.30	0.2	0.29	1.2	0.5
45-49	15	4	0.8	0.23	0.2	0.19	1.1	0.3
50-54	23	14	1.4	0.47	0.8	0.38	1.0	0.7
55-59	38	34	2.4	0.39	2.1	0.44	0.9	1.1
60-64	87	55	5.7	0.57	3.4	0.54	1.5	1.4
65-69	120	101	8.8	0.56	6.8	0.64	1.6	2.1
70-74	148	133	14.3	0.70	10.8	0.82	2.0	2.4
75-79	124	114	18.4	0.72	11.5	0.62	1.8	1.9
80-84	78	114	19.2	0.75	14.3	0.66	1.5	1.8
85+	67	89	24.2	0.70	12.0	0.59	1.5	1.1
All ages	714	663					1.5	1.5
Mortality								
Raw			2.8	0.59	2.5	0.61		
WS			1.4	0.56	1.0	0.57		
ES			2.2	0.58	1.5	0.59		
BRD-S			3.0	0.60	2.0	0.60		
PYLL-70								
per 100,000			11.4		7.0			
ES			9.9		5.7			
AYLL-70			8.7		7.4			

* See corresponding tables with multiple primaries.

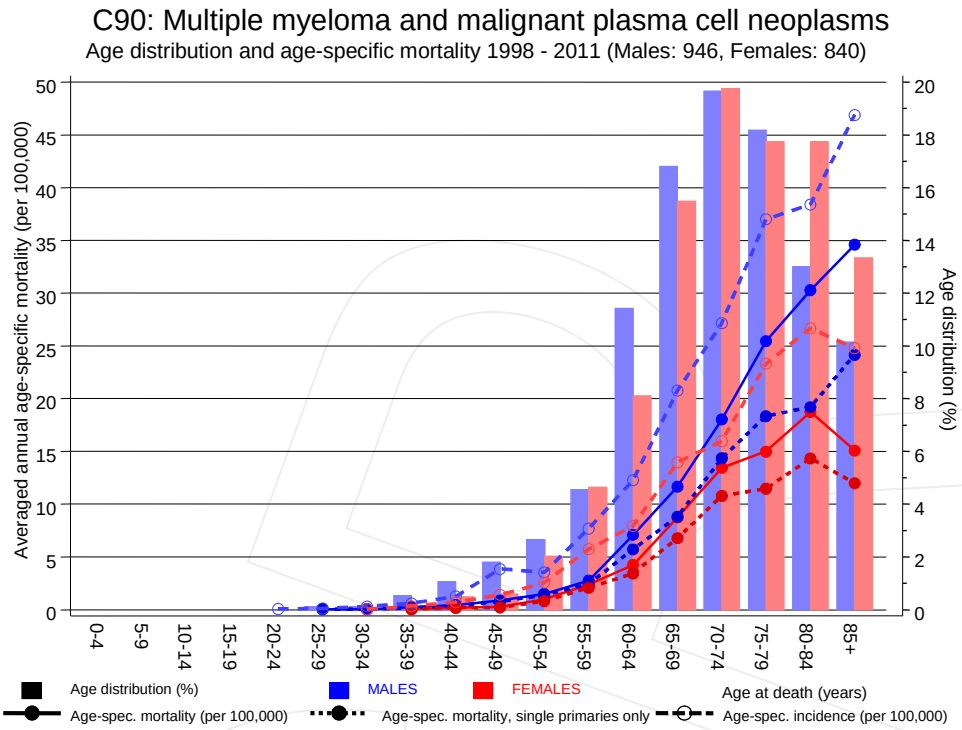
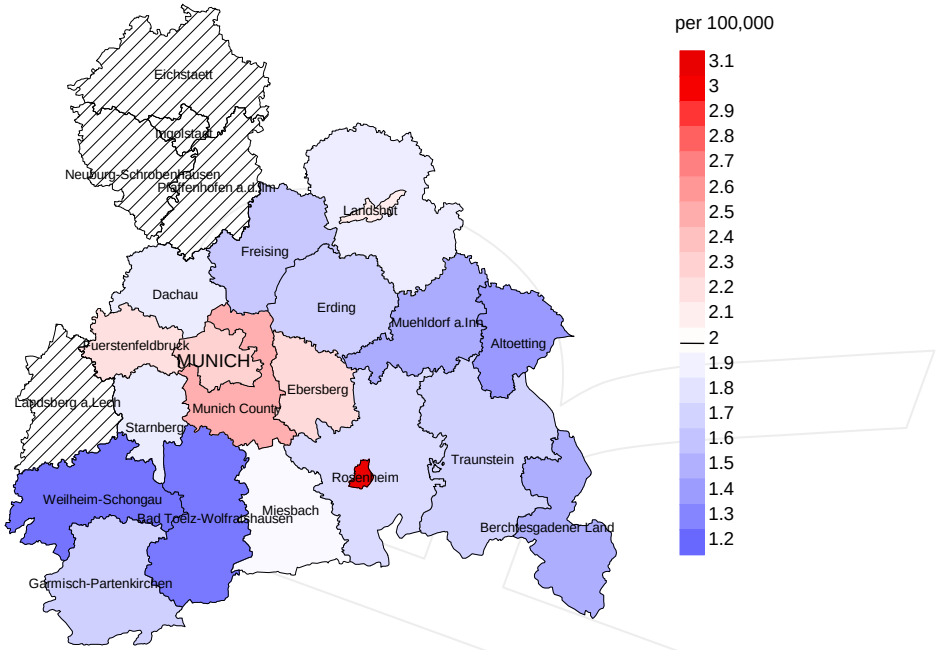


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

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



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

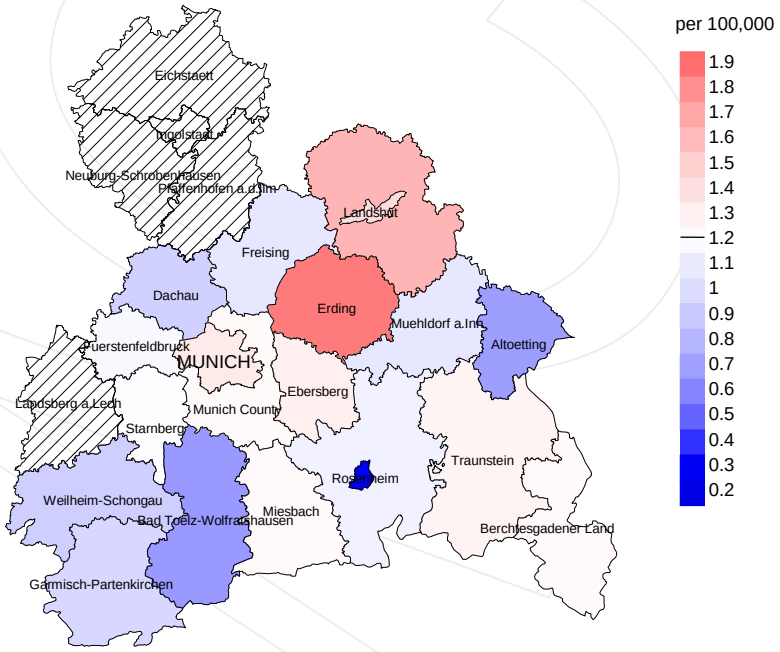
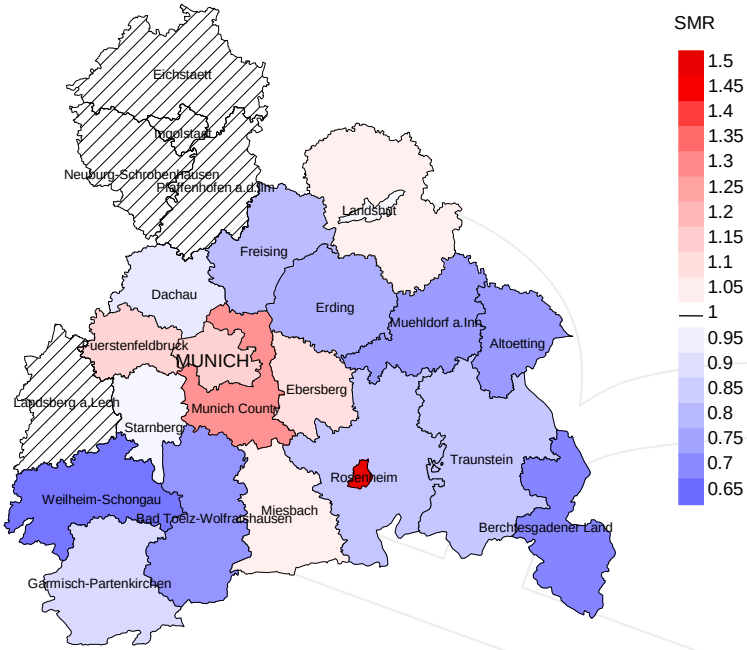


Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2003 to 2008. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 2.0/100,000 WS N=465, females 1.2/100,000 WS N=400). 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 12 women died from plasmacytoma. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 1.3/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.5 and 2.9/100,000.

Standardized mortality ratio (SMR) 2003 - 2008: Males



Standardized mortality ratio (SMR) 2003 - 2008: Females

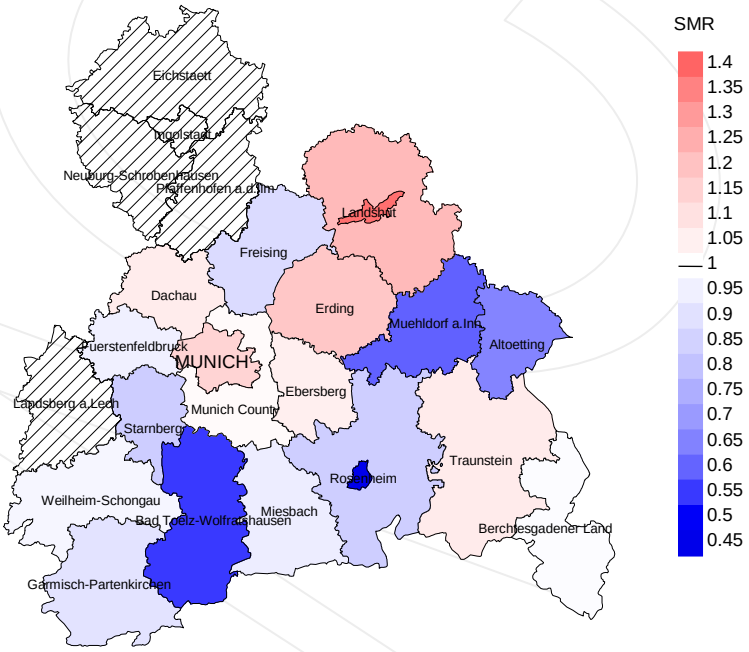


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=465, females N=400). 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 12 women died from plasmacytoma. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.05. Though, the value of this parameter may vary with an underlying probability of 99% between 0.43 and 2.11, 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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