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

C82-C85: NHL

Year of diagnosis	1998-2012
Patients	8,181
Diseases	8,213
Creation date	03/20/2014
Export date	02/12/2014
Population	4.5 m



http://www.tumorregister-muenchen.de/en/facts/base/base_C8285E.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.



INCIDENCE

Table 1

Patient cohorts by year of diagnosis including DCO cases and multiple primaries, and with proportion of deaths and active follow-up

				Prop.		Prop.
		DCO	Prop.	mult.	Prop.	actively
Year of	Cases	cases	DCO	primaries	deaths	followed
diagnosis	n	'n	%	%	%	%
1998	335	38	11.3	21.2	72.2	99.1
1999	349	54	15.5	18.9	71.1	98.6
2000	300	41	13.7	25.0	69.3	99.0
2001	351	41	11.7	24.5	64.4	98.6
2002	575	100	17.4	23.5	65.6	97.7 #
2003	577	69	12.0	24.3	56.7	98.4 #
2004	606	59	9.7	24.1	54.3	96.7 #
2005	557	57	10.2	24.2	51.2	96.2 #
2006	626	47	7.5	24.0	50.3	95.0 #
2007	705	67	9.5	25.0	51.9	86.5 # ##
2008	668	47	7.0	23.5	46.4	69.0
2009	728	43	5.9	24.6	39.1	68.4
2010	692	50	7.2	23.4	38.2	71.4
2011	668	61	9.1	22.3	39.1	74.9
2012	476	42	8.8	29.6	30.0	97.1 ###
1998-2012	8213	816	9.9	24.0	51.0	87.6

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

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

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

Table 1a

Patient cohorts by year of diagnosis and gender including DCO cases

Year of	All	Males	Females	Prop. males	
diagnosis	n	n	n	8	
1998	335	175	160	52.2	
1999	349	178	171	51.0	
2000	300	/ 157	143	52.3	
2001	351	169	182	48.1	
2002	575	298	277	51.8	
2003	577	281	296	48.7	
2004	606	312	294	51.5	
2005	557	284	273	51.0	
2006	626	354	272	56.5	
2007	705	366	339	51.9	
2008	668	366	302	54.8	
2009	728	393	335	54.0	
2010	692	369	323	53.3	
2011	668	368	300	55.1	
2012	476	249	227	52.3	
1998-2012	8213	4319	3894	52.6	

Table 2

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

			Males	Fem.	Males	Fem.	Males	Fem.	Males	Fem.
Year of	Males	Females	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.
diagnosis	n	n	raw	raw	WS	WS	ES	ES	BRD-S	BRD-S
1998	175	160	15.8	13.6	10.4	6.9	14.5	9.7	18.7	11.9
1999	178	171	15.9	14.4	10.3	7.2	14.3	10.1	18.4	12.5
2000	157	143	13.8	11.9	8.8	5.8	12.3	8.5	15.9	10.6
2001	169	182	14.6	15.0	9.2	7.4	13.0	10.5	16.2	12.8
2002	298	277	16.0	14.1	9.6	6.5	13.6	9.4	17.0	11.8
2003	281	296	15.0	15.0	9.2	7.7	12.8	10.7	15.9	12.9
2004	312	294	16.6	14.9	10.2	7.1	14.2	9.9	16.9	12.4
2005	284	273	15.0	13.7	9.1	6.6	12.5	9.3	15.6	11.4
2006	354	272	18.5	13.5	10.5	6.5	14.9	9.1	18.7	11.3
2007	366	339	16.5	14.7	9.2	6.9	13.3	9.8	16.8	12.2
2008	366	302	16.4	13.0	9.0	5.9	12.6	8.4	16.1	10.5
2009	393	335	17.6	14.4	9.9	6.7	13.7	9.3	16.9	11.7
2010	369	323	16.4	13.8	8.9	6.5	12.6	9.0	15.7	11.3
2011	368	300	16.1	12.7	8.8	5.7	12.2	8.0	15.2	9.9
2012	249	227	10.9	9.6	5.4	4.2	8.0	6.0	10.4	7.5
1998-2012	4319	3894	15.7	13.6	9.1	6.4	12.8	9.1	16.0	11.2



The computation of the incidence measures includes all primaries, irrespective of first or subsequent malignancy.

Table 3 $\label{eq:Age_distribution_parameters} \mbox{ Age distribution parameters by year of diagnosis (All)} \mbox{ (incl. DCO)}$

Year of	Cases		Std.					Median		
diagnosis	n	Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	335	64.8	16.9	5.9	100	41.9	55.2	67.3	77.5	83.8
1999	349	64.8	17.1	2.8	93.9	41.5	56.3	66.1	78.0	84.4
2000	300	65.3	15.8	11,0	91.6	43.8	57.2	67.7	76.9	82.5
2001	351	64.4	16.3	4.9	98.7	40.7	55.1	66.0	76.9	84.0
2002	575	66.7	15.5	1.2	95.5	44.6	58.7	68.8	78.3	84.7
2003	577	64.9	15.8	/1.7	96.3	42.5	56.1	66.9	76.5	82.8
2004	606	65.9	15.0	8.0	97.8	47.8	57.2	66.7	77.1	83.3
2005	557	65.7	15.9	3.4	98.4	44.5	57.8	68.0	77.2	84.0
2006	626	66.4	15.4	1.9	98.5	44.0	59.4	68.6	77.1	83.3
2007	705	67.1	15.7	4.0	101	45.8	57.6	69.6	78.4	84.7
2008	668	67.6	15.5	2.3	96.2	45.7	60.2	70.1	78.1	84.6
2009	728	66.6	15.4	4.3	95.2	45.6	59.2	68.8	77.6	84.4
2010	692	67.4	15.8	0.1	96.7	45.0	60.1	70.4	78.6	85.1
2011	668	67.0	16.1	7.8	99.2	44.0	58.5	70.9	77.8	84.6
2012	476	69.1	14.1	11.5	97.7	50.2	60.9	71.7	79.4	85.2
1998-2012	8213	66.4	15.7	0.1	101	45.0	58.1	69.0	77.8	84.1

Table 3a

Age distribution parameters by year of diagnosis (MALES)

(incl. DCO)

Year of	Cases		Std.					Median		
diagnosis	n	Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	175	62.5	17.2	6.6	91.4	38.0	52.9	65.2	76.3	81.7
1999	178	62.4	17.3	2.8	93.8	38.4	55.7	63.8	75.1	82.8
2000	157	63.3	16.5	11.0	90.0	38.0	56.5	65.3	75.3	81.3
2001	169	62.2	15.9	4.9	90.3	38.5	54.4	64.0	74.0	79.8
2002	298	64.5	15.2	1.2	95.5	43.8	57.1	65.5	74.5	81.9
2003	281	63.2	16.2	1.7	94.3	39.9	55.2	66.1	74.9	81.4
2004	312	63.4	14.6	9.1	97.8	46.2	54.5	64.5	73.6	81.6
2005	284	63.4	16.2	3.4	90.9	42.8	54.8	65.2	75.5	81.2
2006	354	65.2	15.8	1.9	98.5	42.8	58.5	67.8	76.9	80.9
2007	366	65.6	15.8	10.6	94.8	43.5	54.9	68.7	77.4	83.4
2008	366	66.0	15.6	2.3	93.1	44.2	58.3	69.1	76.2	82.3
2009	393	64.3	15.7	9.4	94.8	42.7	53.7	67.6	75.5	81.9
2010	369	66.6	16.1	0.1	92.2	45.0	57.2	69.8	78.2	85.3
2011	368	65.2	16.0	7.8	94.6	43.3	56.4	68.9	76.7	82.5
2012	249	68.2	14.2	11.5	96.0	50.2	58.9	71.2	78.7	84.0
1998-2012	4319	64.7	15.9	0.1	98.5	43.1	55.7	67.3	76.2	82.3

Table 3b

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

Year of	Cases		Std.					Median		
diagnosis	n	Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	160	67.4	16.2	5.9	100	46.1	58.5	69.2	79.0	85.7
1999	171	67.3	16.7	4.2	93.9	45.0	56.9	72.0	79.5	87.3
2000	143	67.4	14.8	22,0	91.6	48.7	57.4	71.1	78.9	84.4
2001	182	66.5	16.3	27.1	98.7	41.4	57.6	69.2	79.4	86.4
2002	277	69.0	15.5	6.6	94.6	46.3	60.0	72.4	80.2	87.2
2003	296	66.6	15.3	10.9	96.3	47.0	57.4	67.7	78.4	84.3
2004	294	68.7	15.0	8.0	94.2	49.7	61.9	70.2	79.7	84.2
2005	273	68.1	15.1	10.7	98.4	48.8	61.2	69.4	78.9	85.3
2006	272	68.0	14.8	19.9	95.8	47,5	61.1	70.0	77.8	84.9
2007	339	68.8	15.4	4.0	101	48.6	60.7	71.3	80.0	85.7
2008	302	69.4	15.2	5.4	96.2	48.7	62.7	70.8	80.3	86.0
2009	335	69.2	14.7	4.3	95.2	50.4	62.1	70.6	80.1	85.8
2010	323	68.4	15.5	10.6	96.7	44.5	62.1	71.2	79.3	84.8
2011	300	69.1	16.0	14.1	99.2	47.2	61.5	72.4	79.8	87.5
2012	227	70.1	14.0	17.1	97.7	51.4	61.4	72.0	80.7	86.9
1998-2012	3894	68.4	15.3	4.0	101	48.1	60.2	70.8	79.5	85.7

Age at									
diagnosis	Cases			Males			Females		
Years	n	%	Cum.%	n	96	Cum.%	n	%	Cum.%
0-4	15	0.2	0.2	12	0.3	0.3	3	0.1	0.1
5-9	21	0.3	0.4	14	0.3	0.6	7	0.2	0.3
10-14	20	0.2	0.7	12	0.3	0.9	8	0.2	0.5
15-19	32	0.4	1.1	22	0.5	1.4	10	0.3	0.7
20-24	61	0.7	1.8	40	0.9	2.3	21	0.5	1.3
25-29	86	1.0	2.9	45	1.0	3.4	41	1.1	2.3
30-34	131	1.6	4.5	79	1.8	5.2	52	1.3	3.6
35-39	182	2.2	6.7	106	2.5	7.6	76	2.0	5.6
40-44	273	3.3	10.0	172	4.0	11.6	101	2.6	8.2
45-49	366	4.5	14.5	233	5.4	17.0	133	3.4	11.6
50-54	510	6.2	20.7	290	6.7	23.7	220	5.6	17.3
55-59	646	7.9	28.5	357	8.3	32.0	289	7.4	24.7
60-64	893	10.9	39.4	486	11.3	43.3	407	10.5	35.1
65-69	1113	13.6	53.0	608	14.1	57.3	505	13.0	48.1
70-74	1183	14.4	67.4	627	14.5	71.8	556	14.3	62.4
75-79	1114	/13.6	80.9	579	13.4	85.3	535	13.7	76.1
80-84	878	10.7	91.6	385	8.9	94.2	493	12.7	88.8
85+	689	8.4	100.0	252	5.8	100.0	437	11.2	100.0
All ages	8213	100.0		4319	100.0		3894	100.0	

Included in the statistics are 32.7% multiple primaries in males and 27.8% in females.

Table 5

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

			TOT F	period i	990-2012			
							Males	Females
			Males	Females	Malag	Females		Prop.all
Age at				Age-		DCO rate	_	cancers
diagnosis	Malag	Females	spec.		n=406	n=410		n=142297
Years	n	n	incid.		%	%	%	%
iears	11	11	incia.	incia.	•	•	•	•
0- 4	12	3	0.9	0.2	8.3		3.9	1.3
5- 9	14	7	1.0	0.5	0.5		8.5	6.2
10-14	12	8	0.8	0.6			8.2	4.9
15-19	22	10	1.5	0.7	4.5		6.9	3.7
20-24	40	21	2.5	1.3	1.3	4.8	7.2	4.3
25-29	45	41	2.4			1.0	5.1	4.0
30-34	79	52	3.7	2.5	5.1		5.6	2.8
35-39	106	76	4.5	3.4	0.9	3.9	5.0	2.2
40-44	172	101	7.1	4.4	1.7	3.0	5.7	1.7
45-49	233	133	10.8	6.3	3.4	2.3	4.7	1.7
50-54	290	220	15.7	11.6	4.1	3.6	3.6	2.2
55-59	356	289	20.9	16.2	3.9	3.5	2.6	2.3
60-64	486	406	29.5	23.3	5.8	3.0	2.4	2.5
65-69	608	505	41.4	31.5	6.1	4.4	2.4	2.8
70-74	625	555	53.9	40.2	10.4	9.7	2.5	3.3
75-79	579	535	76.8	48.9	13.1	11.6	3.1	3.3
80-84	385	491	84.8	56.9	19.2	18.3	3.1	3.3
85+	251	437	80.9	53.4	32.7	32.5	2.7	2.7
			00.5	33.1	3217	32.3		
All ages	4315	3890			9.4	10.5	2.9	2.7
3								
Incidence								
Raw			15.7	13.6				
WS			9.1	6.4				
ES			12.8	9.1				
BRD-S			16.0	11.2				

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).

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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

	Observed	Expected		LCL	UCL		DCO
Diagnosis	'n	n	SIR	95%	95%	EAR	%
C03-C06 Oral cavity	6	1.3	4.5	1.6	9.7 #	4.4	
C07-C08 Salivary gland	2	0.3	5.8		21.0	1.6	
C09-C10 Oropharynx	3	1.7	1.8	0.4	5.3	1.3	
C15 Oesophagus	4	2.7	1.5	0.4	3.8	1.2	
C16 Stomach	12	6.5	1.9	1.0	3.2	5.3	8.3
C18 Colon	22	15.2	$\frac{1.4}{1.4}$	0.9	2.2	6.5	4.5
C19-C20 Rectum	15	8.6	1.8	1.0	2.9	6.1	6.7
C21 Anus/canal	4	0.3	12.5		32.0 #	3.5	• • •
C22 Liver	6	4.2	1.4	0.5	3.1	1.7	33.3
C25 Pancreas	8	5.4	1.5	0.6	2.9	2.5	
C32 Larynx	4	1.6	2.5	0.7	6.4	2.3	
C33-C34 Lung	39	18.1	2.2	1.5	2.9 #	20.0	7.7
C38,C45 Mesothelioma	3	1.0	3.0	0.6	8.9	1.9	
C43 Malign. melanoma	26	6.0	4.3	2.8	6.3 #	19.1	
C46,C49 Soft tissue	4	0.8	4.8	1.3	12.4 #	3.0	
C61 Prostate	68	45.0	1.5	_1.2	1.9 #	21.9	2.9
C64 Kidney	21	5.4	3.9/	2.4	6.0 #	14.9	
C66 Ureter	2	0.3	5.9	0.7	21.2	1.6	
C67 Bladder	14	6.7	2.1	1.1	3.5 #	6.9	
C68 Urethra	2	0.1	24.3	2.9	87.7 #	1.8	
C70-C72 CNS cancer	3	2.1	1.4	0.3	4.2	0.9	33.3
C73 Thyroid	2	1.1	1.9	0.2	6.8	0.9	
C76-C79 CUP	7	2.6	2.7	1.1	5.5 #	4.2	
C81 Hodgkin lymphoma	6	0.3	17.4	6.4	38.0 #	5.4	16.7
C82-C85 NHL	12	6.1	2.0	1.0	3.4 #	5.6	8.3
C90 Mult. myeloma	7	1.9	3.6	1.5	7.5 #	4.8	
C91-C96 Leukaemia	17	2.5	6.9	4.0	11.0 #	13.9	11.8
Other primaries	8	1.8	4.4	1.9	8.7 #	5.9	12.5
Not observed	0	5.2	0.0	0.0	0.7 #	-5.0	
2.00 02202 100	ŭ	٥.۵	0.0	0.0	₩ 7 Т	3.0	
All mult. primaries	327	154.9	2.1	1.9	2.4 #	164.2	4.9

Patients	2846
Mean age at second malignancy (years)	69.4
Person-years	10484
Mean observation time (years)	3.7
Median observation time (years)	2.6

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

		Observed 1	Expected		LCL	UCL		DCO
Diagnos	is	n/	n	SIR	95%	95%	EAR	%
C16	Stomach	8 /	4.3	1.8	0.8	3.6	3.5	12.5
C17	Small intestine	2 /	0.5	3.8	0.5	13.7	1.4	
C18	Colon	/ 15 /	11.9	1.3	0.7	2.1	3.0	6.7
C19-C20	Rectum	/ 8/	5.2	1.5	0.7	3.1	2.7	12.5
C21	Anus/canal	2	0.6	3.3	0.4	11.9	1.3	
C22	Liver	5	1.3	3.8	1.2	8.9 ‡	3.5	20.0
C23-C24	Bile	4	1.7	2.3	0.6	5.9	2.2	
C25	Pancreas	7	5.1	1.4	0.6	2.8	1.8	14.3
C33-C34	Lung	27	8.1	3.3	2.2	4.9 ‡	18.1	7.4
C43	Malign. melanoma	11	4.1	2.7	1.4	4.9 ‡	6.6	
C46,C49	Soft tissue	3	0.6	4.7	1.0	13.6	2.3	
C50	Breast	66	34.8	1.9	1.5	2.4 #	29.9	3.0
C51	Vulva	3	1.1	2.6	0.5	7.7	1.8	
C53	Cervix uteri	5	1.6	3.2	1.0	7.4 #	3.3	20.0
C54	Corpus uteri	11	6.4	1.7	0.9	3.1	4.4	
C56	Ovary	9	4.9	1.8	0.8	3.5	4.0	11.1
C64	Kidney	6	2.9	2.1	0.8	4.5	3.0	
C67	Bladder	2	2.2	0.9	0.1	3.3	-0.2	
C69	Eye lymphoma	3	0.0	69.5	14.3	203.2 ‡	2.8	
C73	Thyroid	7	2.1	3.4	1.3	6.9 ‡	4.7	14.3
C76-C79	CUP	2	2.1	1.0	0.1	3.5	-0.1	
C82-C85	NHL	12	4.5	2.7	1.4	4.7 ‡	7.2	
C90	Mult. myeloma	3	1.5	2.1	0.4	6.0	1.5	
C91-C96	Leukaemia	14	1.9	7.6	4.1	12.7 ‡	11.6	21.4
Other p	rimaries	9	4.3	2.1	1.0	4.0	4.5	22.2
Not obs	erved	0	3.0	0.0	0.0	1.2	-2.9	
All mul	t. primaries	244	116.6	2.1	1.8	2.4 ‡	: 121.9	7.0

Patients	2592
Mean age at second malignancy (years)	73.1
Person-years	10447
Mean observation time (years)	4.0
Median observation time (years)	3.1

The occurrence of second malignancy is statistically significant.

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

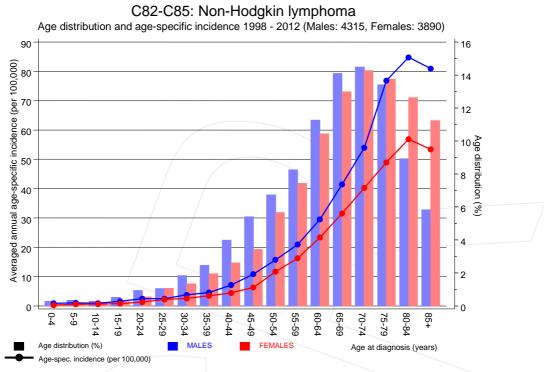


Figure 7. Age distribution and age-specific incidence



C82-C85: Non-Hodgkin lymphoma

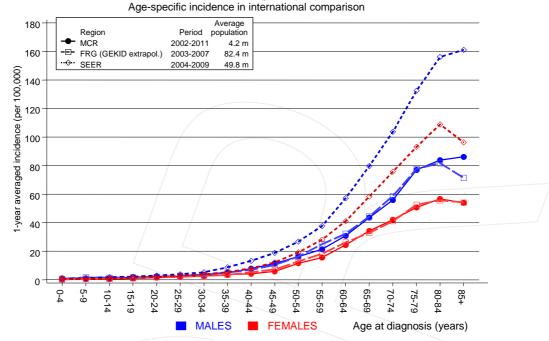


Figure 7a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).



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.

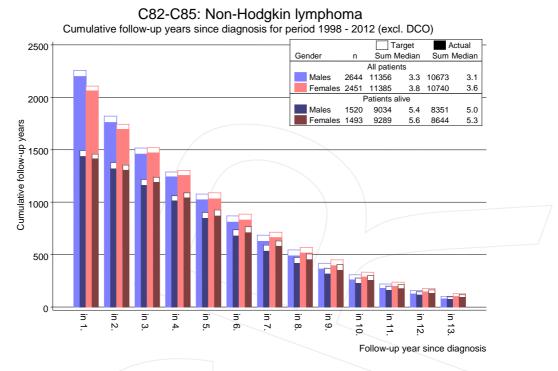
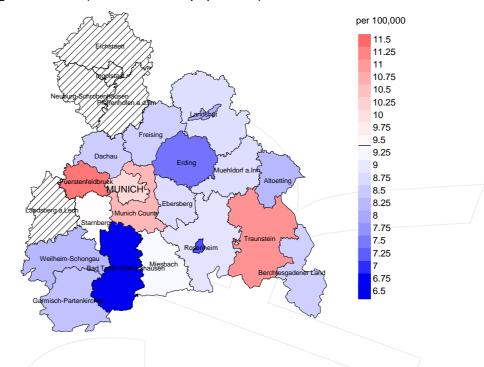


Figure 8. Cumulative follow-up years depending on time since diagnosis

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

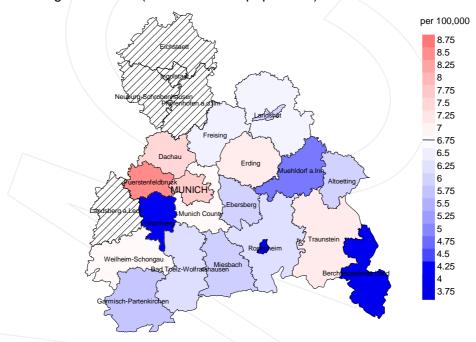
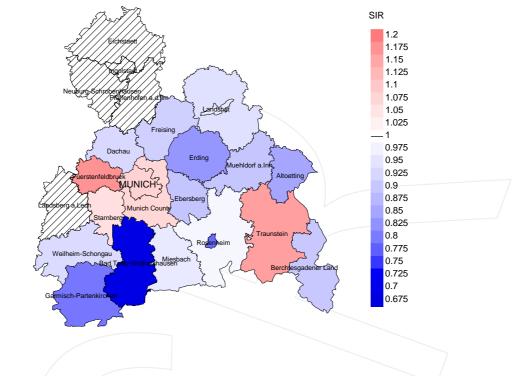


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 9.4/100,000 WS N=1,867, females 6.8/100,000 WS N=1,710). 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 42 women were identified with newly diagnosed NHL. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 6.0/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 3.5 and 10.6/100,000.

Standardized incidence ratio (SIR) 2003 - 2008: Males



Standardized incidence ratio (SIR) 2003 - 2008: Females

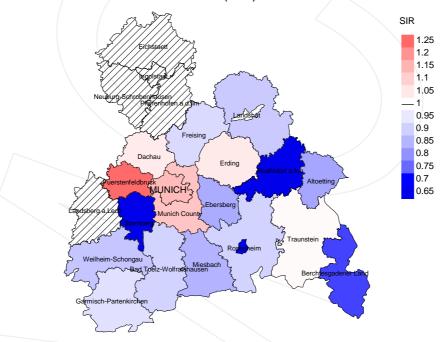


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=1,867, females N=1,710). 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 42 women were identified with newly diagnosed NHL. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.83. Though, the value of this parameter may vary with an underlying probability of 99% between 0.54 and 1.23, and is therefore not statistically striking.

MORTALITY

Table 10a

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

		Prop.				Prop. deaths
	Incident	actively	Prop.		Prop.	with death
Year of	cases	followed	DCO	Deaths	deaths	certific.
diagnosis	n	%	%	/ n /	%	%
1998	335	99.1	11.3	242	72.2	93.4
1999	349	98.6	15.5	248	71.1	95.6
2000	300	99.0	13.7	208	69.3	98.6
2001	351	98.6	11.7	226	64.4	96.0
2002	575	97.7	17.4	377	65.6	95.8
2003	577	98.4	12.0	327	56.7	98.2
2004	606	96.7	9.7	329	54.3	98.2
2005	557	96.2	10.2	285	51.2	99.3
2006	626	95.0	7.5	315	50.3	97.8
2007	705	86.5	9.5	366	51.9	97.8
2008	668	69.0	7.0	310	46.4	99.0
2009	728	68.4	5.9	285	39.1	97.9
2010	692	71.4	7.2	264	38.2	98.5
2011	668	74.9	9.1	261	39.1	97.7
2012	476	97.1	8.8	143	30.0	97.9
1998-2012	8213	87.6	9.9	4186	51.0	97.5

Table 10b

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

			Prop. deaths		Prop.
Year of	Incident		with death	Deaths in	deaths in
diagnosis/	cases	Deaths	certific.	same year	same year
death	n	n	%	n	% / Call
1998	335	192	95.8	74	22.1
1999	349	225	92.9	87	24.9
2000	300	189	96.3	65	21.7
2001	351	212	96.7	/ 71	20.2
2002	575	319	97.2	151	26.3
2003	577	323	97.5	132	22.9
2004	606	337	97.3	127	21.0
2005	557	321	97.5	116	20.8
2006	626	363	98.3	121	19.3
2007	705	416	96.9	164	23.3
2008	668	381	98.2	135	20.2
2009	728	422	98.3	151	20.7
2010	692	404	98.3	138	19.9
2011	668	415	98.8	136	20.4
2012	476	431	99.3	118	24.8
1998-2012	8213	4950	97.6	1786	21.7

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)

				Prop. cancer	
		Prop.	Prop.	recorded	
		cancer-	not cancer-	on death	
Year of	Deaths	related	related	certificate	
death	n	%	90	%	
1998	192	67.7	32.3	92.4	
1999	225	73.8	26.2	92.8	
2000	189	83.1	16.9	92.9	
2001	212	81.1	18.9	93.7	
2002	319	81.8	18.2	91.9	
2003	323	80.8	19.2	92.4	
2004	337	86.1	13.9	93.6	
2005	321	80.1	19.9	92.3	
2006	363	79.9	20.1	89.9	
2007	416	82.2	17.8	91.1	
2008	381	79.5	20.5	88.8	
2009	422	78.7	21.3	87.0	
2010	404	75.7	24.3	83.6	
2011	415	76.6	23.4	84.9	
2012	431	77.5	22.5	85.0	
1998-2012	4950	79.2	20.8	89.5	

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

					Age at
		Age at	Age at	Age at	death
		death	death	death	(according
		(all	(cancer-	(not cancer-	to death
Year of	Deaths	causes)	related)	related)	certificate)
death	n	Years	Years	Years	Years
1998	94	71.1	68.6	75.6	71.0
1999	125	68.3	65.5	76.5	68.4
2000	99	67.6	66.6	72.5	67.3
2001	98	67.4	66.2	73.4	67.3
2002	165	70.7	70.1	73.7	70.3
2003	164	71.1	69.6	78.5	70.4
2004	172	72.1	71.4	75.7	72.1
2005	173	73.0	73.3	71.3	72.9
2006	193	72.0	71.3	74.6	72.0
2007	224	70.3	69.8	72.6	69.3
2008	204	72.7	72.0	75.8	72.1
2009	233	73.7	72.0	79.1	72.4
2010	226	72.6	71.7	75.8	71.7
2011	223	73.6	71.9	78.5	72.6
2012	228	73.2	72.6	74.8	72.8
1998-2012	2621	71.7	70.7	75.6	71.2

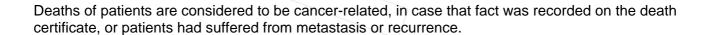


Table 11b Means of age at death according to the grouping in Table 10 FEMALES

					Age at
		Age at	Age at	Age at	death
		death	death	death	(according
		(all	(cancer-	(not cancer-	to death
Year of	Deaths	causes)	related)	related)	certificate)
death	n	Years	Years	Years	Years
1998	98	75.5	72.6	82.6	75.8
1999	100	76.8	74.4	83.1	77.4
2000	90	74.9	73.7	80.6	73.7
2001	114	74.7	73.1	80.7	74.4
2002	154	75.2	74.4	78.4	75.5
2003	159	74.5	72.6	81.1	73.5
2004	165	74.3	74.3	74.4	74.2
2005	148	77.3	74.7	85.6	76.3
2006	170	75.9	75.0	80.0	74.8
2007	192	76.3	75.6	79.8	75.5
2008	177	77.2	75.7	82.3	76.8
2009	189	78.8	77.6	83.7	77.9
2010	178	77.3	75.2	82.9	76.2
2011	192	77.3	76.3	81.5	76.8
2012	203	78.5	77.7	82.2	77.8
1998-2012	2329	76.5	75.1	81.5	75.9



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 12a $\begin{tabular}{ll} Mortality measures (cancer-related death) and mortality-incidence-index \\ by year of death \\ \hline MALES \\ \end{tabular}$

Year of	Deaths	Mort.			MI-Index				MI-Index
death	n	raw	raw	WS	WS	ES	ES	BRD-S	BRD-S
1998	61	5.5	0.35	3.4	0.32	5.1	0.35	7.1	0.38
1999	93	8.3	0.52	5.1	0.49	7.4	0.52	9.5	0.52
2000	82	7.2	0.52	4.4	0.50	6.4	0.52	8.5	0.54
2001	82	7.1	0.49	4.3	0.47	6.3	0.49	8.1	0.50
2002	138	7.4	0.46	4.1	0.43	6.3	0.47	8.6	0.51
2003	137	7.3	0.49	4.0	0.43	6.0	0.47	8.1	0.51
2004	147	7.8	0.47	4.0	0.40	6.3	0.45	8.8	0.52
2005	144	7.6	0.51	3.6	0.40	5.9	0.47	8.4	0.54
2006	151	7.9	0.43	3.9	0.37	6.1	0.41	8.2	0.44
2007	183	8.3	0.50	4.3	0.46	6.5	0.49	8.7	0.52
2008	167	7.5	0.46	3.6	0.40	5.6	0.44	7.7	0.48
2009	179	8.0	0.46	3.7	0.37	5.8	0.42	8.1	0.48
2010	178	7.9	0.48	3.6	0.41	5.6	0.44	7.8	0.49
2011	166	7.3	0.45	3.3	0.38	5.1	0.42	6.9	0.46
2012	169	7.4	0.68	3.3	0.61	5.1	0.64	7.2	0.69
1998-2012	2077	7.6	0.48	3.8	0.42	5.9	0.46	8.0	0.50

Table 12b

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

FEMALES

Year of	Deaths	Mort.	MI-Index	Mort.	MI-Index	Mort.	MI-Index	Mort.	MI-Index
death	n	raw	raw	WS	WS	ES	ES	BRD-S	BRD-S
1998	69	5.9	0.43	2.5	0.36	3.7	0.38	4.9	0.41
1999	73	6.2	0.43	2.4	0.33	3.8	0.37	5.4	0.43
2000	75	6.2	0.52	2.4	0.41	3.8	0.45	5.0	0.47
2001	90	7.4	0.49	3.0	0.41	4.6	0.44	6.2	0.49
2002	123	6.3	0.45	2.3	0.36	3.6	0.38	5.0	0.42
2003	124	6.3	0.42	2.5	0.33	3.8	0.35	5.0	0.39
2004	143	7.2	0.49	2.7	0.39	4.2	0.42	5.9	0.47
2005	113	5.7	0.41	2.1	0.32	3.2	0.35	4.4	0.38
2006	139	6.9	0.51	2.5	0.39	3.9	0.43	5.3	0.47
2007	159	6.9	0.47	2.4	0.35	3.8	0.39	5.1	0.42
2008	136	5.9	0.45	2.0	0.33	3.1	0.37	4.3	0.41
2009	153	6.6	0.46	2.0	0.30	3.3	0.35	4.7	0.40
2010	130	5.6	0.40	1.9	0.30	3.0	0.33	4.1	0.37
2011	152	6.4	0.51	2.1	0.37	3.3	0.42	4.6	0.47
2012	165	7.0	0.73	2.2	0.53	3.5	0.58	4.9	0.65
1998-2012	1844	6.4	0.47	2.3	0.36	3.6	0.39	4.9	0.44

Table 13

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

Age at								
death	Cases		Males			Females		
Years	n	% Cum.%	n	%	Cum.%	n	%	Cum.%
0-4	1	0.0 0.0	1	0.0	0.0			0.0
5-9	6	0.2 0.2	/ 5	0.2	0.3	1	0.1	0.1
10-14	3	0.1 0.3	2	0.1	0.4	1	0.1	0.1
15-19	5	0.1 0.4	4	0.2	0.6	1	0.1	0.2
20-24	10	0.3 0.6	6	0.3	0.9	4	0.2	0.4
25-29	10	0.3 0.9	4	0.2	1.1	6	0.3	0.7
30-34	20	0.5 / 1.4	14	0.7	1.7	6	0.3	1.0
35-39	31	0.8 2.2	23	1.1	2.8/	8	0.4	1.5
40-44	56	1.4 3.6	40	1.9	4.7	16	0.9	2.3
45-49	87	2.2 5.8	57	2.7	7.5	30	1.6	3.9
50-54	131	3.3 9.1	78	3.7	11.2	53	2.8	6.8
55-59	226	5.7 14.8	138	6.6	17.8	88	4.7	11.5
60-64	322	8.2 23.0	203	9.7	27.5	119	6.4	17.9
65-69	475	12.0 35.0	279	13.3	40.9	196	10.5	28.4
70-74	606	15.3 50.4	343	16.4	57.3	263	14.1	42.6
75-79	672	17.0 67.4	365	17.5	74.7	307	16.5	59.1
80-84	678	17.2 84.5	306	14.6	89.4	372	20.0	79.1
85+	611	15.5 100.0	222	10.6	100.0	389	20.9	100.0
All ages	3950	100.0	2090	100.0		1860	100.0	

Included in the statistics are 32.7% multiple primaries in males and 27.8% in females.

Table 14

Age-specific mortality (cancer-related) and proportion of all cancers for period 1998-2012 (incl. multiple primaries)

			Males		Females		Males	Females
Age at			Age-		Age-		_	Prop.all
death		Females	_ /		spec.		cancers	cancers
Years	n	n	mortal.	MI-index	mortal.	MI-index	%	%
	_		/					
0 - 4	1	-	0.1	0.08	0.0	\	3.2	
5- 9	5	1	0.4		0.1		14.3	2.6
10-14	2	1	0.1		0.1	0.13	6.1	3.6
15-19	4	1	0.3		0.1	0.10	9.5	2.9
20-24	6	4	0.4		0.2		7.2	8.5
25-29	4	6	0.2		0.3	0.15	4.2	5.5
30-34	14	6	0.7		0.3		8.0	2.8
35-39	23	8	1.0	0.22	0.4		6.0	1.6
40-44	40	16	1.7		0.7	0.16	4.9	1.5
45-49	57	30	2.6	0.24	1.4		3.4	1.6
50-54	78	53	4.2		2.8	0.24	2.5	1.8
55-59	138	88	8.1		4.9		2.5	2.0
60-64	203	119	12.3		6.8		2.4	2.0
65-69	279	196	19.0		12.2		2.5	2.5
70-74	343	263	29.6	0.55	19.1		2.8	2.9
75-79	365	307	48.4		28.1		3.0	3.1
80-84	306	372	67.4		43.1		3.1	3.6
85+	222	389	71.6	0.88	47.5	0.89	2.8	3.1
All ages	2090	1860					2.8	2.8
Mortality								
Raw			7.6	0.48	6.5			
WS			3.9	0.42	2.3	0.36		
ES			5.9	0.46	3.6	0.40		
BRD-S			8.1	0.51	5.0	0.44		
PYLL-70								
per 100,000			40.9		22.9			
ES			37.1		20.2			
AYLL-70			11.9		10.6			

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

Table 15a $\begin{tabular}{ll} Multiple primaries in deaths in period 1998-2012 \\ \hline MALES \end{tabular}$

					Syn- chron	Syn- chron		
	Total	Total	Pre	Pre	±30d	±30d	Post	Post
Diagnosis	n /	융↓	n	←%	n	← %	n	-%
C09-C10 Oropharynx	8	1.0	5	62.5			3	37.5
C16 Stomach	35	4.2	12	34.3	8	22.9	15	42.9
C18 Colon	61	7.3	31	50.8	11	18.0	19	31.1
C19-C20 Rectum	34	4.1	15	44.1	5	14.7	14	41.2
C22 Liver	12	1.4	2	16.7	2	16.7	8	66.7
C25 Pancreas	/ 16 /	1.9			3	18.8	13	81.3
C32 Larynx	9 -	1.1	6	66.7	1	11.1	2	22.2
C33-C34 Lung	80	9.6	14	17.5	/ 11	13.8	55	68.8
C43 Malign. melanoma	31	3.7	12	38.7	3	9.7	16	51.6
C44 Skin others	92	11.1	20	21.7	8	8.7	64	69.6
C46,C49 Soft tissue	9	1.1	7	77.8	1	11.1	1	11.1
C61 Prostate	135	16.3	81	60.0	23	17.0	31	23.0
C64 Kidney	28	3.4	21	75.0	3	10.7	4	14.3
C67 Bladder	41	4.9	18	43.9	5	12.2	18	43.9
C70-C72 CNS cancer	17	2.0	7	41.2	4	23.5	6	35.3
C76-C79 CUP	19	2.3	3	15.8	_ 2	10.5	14	73.7
C81 Hodgkin lymphoma	21	2.5	13	61.9	1	4.8	7	33.3
C82-C85 NHL	33	4.0			1	3.0	32	97.0
C90 Mult. myeloma	28	3.4	12	42.9	11	39.3	5	17.9
C91-C96 Leukaemia	48	5.8	15	31.3	7	14.6	26	54.2
Other primaries	73	8.8	28	38.4	10	13.7	35	47.9
_ \								
All mult. primaries	830	100.0	322	38.8	120	14.5	388	46.7

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 15b

Multiple primaries in deaths in period 1998-2012
FEMALES

					Syn- chron	Syn- chron		
	Total	Total	Pre	Pre	±30d	±30d	Post	Post
Diagnosis	n /	%↓	n	← %	n	~%	n	← %
C16 Stomach	29	4.4	9	31.0	3	10.3	17	58.6
C18 Colon	46	7.0	19	41.3	6	13.0	21	45.7
C19-C20 Rectum	16	2.4	9	56.3	2	12.5	5	31.3
C21 Anus/canal	9	1.4	4	44.4			5	55.6
C22 Liver	6	0.9			1	16.7	5	83.3
C23-C24 Bile	10 /	1.5	1	10.0	1	10.0	8	80.0
C25 Pancreas	/ 11 -	1.7			2	18.2	9	81.8
C33-C34 Lung	40	6.1	4	10.0	3	7.5	33	82.5
C43 Malign. melanoma	17	2.6	9	52.9	1	5.9	7	41.2
C44 Skin others	52	7.9	20	38.5	3	5.8	29	55.8
C46,C49 Soft tissue	7	1.1			3	42.9	4	57.1
C50 Breast	159	24.1	100	62.9	15	9.4	44	27.7
C53 Cervix uteri	14	2.1	10	71.4	_ 1	7.1	3	21.4
C54 Corpus uteri	18	2.7	15	83.3	1	5.6	2	11.1
C56 Ovary	21	3.2	6	28.6	3	14.3	12	57.1
C64 Kidney	15	2.3	7	46.7	_ 3	20.0	5	33.3
C67 Bladder	14	2.1	7	50.0			7	50.0
C70-C72 CNS cancer	17	2.6	6	35.3	2	11.8	9	52.9
C73 Thyroid	8	1.2	6	75.0			2	25.0
C76-C79 CUP	10	1.5	4	40.0			6	60.0
C81 Hodgkin lymphoma	12	1.8	10	83.3			2	16.7
C82-C85 NHL	29	4.4			1 \	3.4	28	96.6
C90 Mult. myeloma	27	4.1	11	40.7	9	33.3	7	25.9
C91-C96 Leukaemia	36	5.5	4	11.1	3	8.3	29	80.6
Other primaries	37	5.6	20	54.1	2	5.4	15	40.5
All mult. primaries	660	100.0	281	42.6	65	9.8	314	47.6

Multiple primaries with number of cases n<6 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	Males	Females	Males Age- spec.		Females Age- spec.		Males Prop.all cancers	Females Prop.all cancers
Years	n	n		MI-index		MT-index		%
20025				/		\	v	v
0- 4			0.0		0.0			
5- 9	5	1	0.4	0.36	0.1	0.14	15.2	2.8/
10-14	2	1	0.1	0.17	0.1	0.13	6.1	3.8
15-19	4	1	0.3	0.19	0.1	0.11	10.3	3.2
20-24	5	4 /	0.3	0.13	0.2	0.20	6.4	9.3
25-29	4	6	0.2	0.09	0.3	0.16	4.4	5.8
30-34	14	5	0.7	0.18	0.2	0.10	8.1	2.7
35-39	20	7	0.9	0.20	0.3	0.09	5.6	1.6
40-44	34	16	1.4	0.21	0.7	0.17	4.5	1.7
45-49	52	30	2.4	0.24	1.4	0.25	3.4	1.8
50-54	69	48	3.7	0.26	2.5	0.23	2.6	2.0
55-59	129	81	7.6	0.40	4.5	0.31	2.7	2.2
60-64	175	105	10.6	0.43	6.0	0.32	2.5	2.1
65-69	239	153	16.3	0.47	9.5	0.36	2.6	2.5
70-74	269	215	23.2	0.55	15.6		2.7	3.0
75-79	285	262	37.8	0.68	24.0	0.60	3.1	3.3
80-84	220	299	48.4	0.81	34.6	0.77	3.0	3.6
85+	160	315	51.6	0.86	38.5	0.87	2.6	3.1
All ages	1686	1549					2.8	2.8
Mortality								
Raw			6.1		5.4			
WS			3.2		2.0			
ES			4.8		3.1			
BRD-S			6.5	0.50	4.2	0.44		
PYLL-70								
per 100,000			36.6		21.1			
ES 100,000			33.2		18.6			
AYLL-70			12.0		11.3			
711111 / 0			12.0		11.5			

^{*} 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			Males Age-		Females Age-		Males Prop.all	Females Prop.all
death	Males	Females			spec.		cancers	cancers
Years	n	n		MI-index		MI-index		%
0- 4			0.0		0.0			
5- 9	5	1	0.4	0.36	0.1	0.14	15.6	2.9
10-14	2	1	0.1	0.17	0.1	0.13	6.1	4.2
15-19	4	1	0.3	0.20	0.1	0.11	10.3	3.8
20-24	5	4	0.3	0.13	0.2		6.8	10.0
25-29	4	5	0.2	0.10	0.3	0.14	4.8	5.2
30-34	13	4	0.6	0.17	0.2	0.08	7.8	2.4
35-39	19	7	0.8	0.20	0.3	0.10	5.5	1.7
40-44	31	14	1.3		0.6		4.4	1.6
45-49	48	26	2.2		1.2		3.3	1.8
50-54	56	43	3.0		2.3		2.3	2.0
55-59	115	71	6.8		4.0		2.6	2.1
60-64	147	83	8.9		4.8		2.4	1.9
65-69	198	117	13.5		7.3		2.5	2.2
70-74	223	187	19.2		13.6	0.47	2.7	3.1
75-79	232	227	30.8		20.8	0.56	3.1	3.4
80-84	193	256	42.5	0.77	29.6	0.70	3.3	3.7
85+	137	281	44.2	0.77	34.3	0.81	2.8	3.2
All ages	1432	1328					2.8	2.8
Mortality								
Raw			5.2		4.6			
WS			2.7		1.7			
ES			4.1		2.6			
BRD-S			5.5	0.47	3.6	0.40		
PYLL-70								
per 100,000			32.7		18.2			
ES			29.8		16.3			
AYLL-70			12.5		11.9			

^{*} See corresponding tables with multiple primaries.

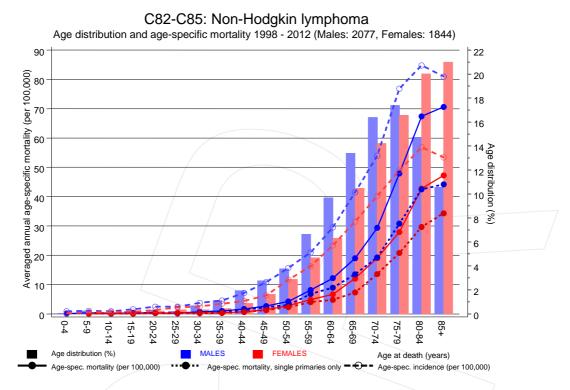
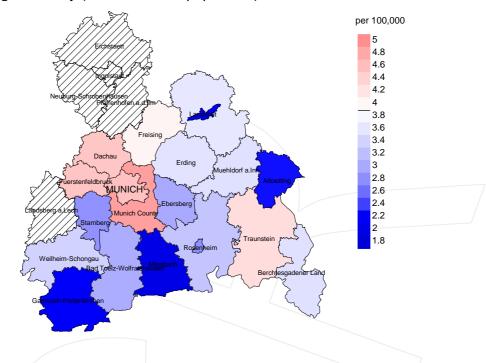


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

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



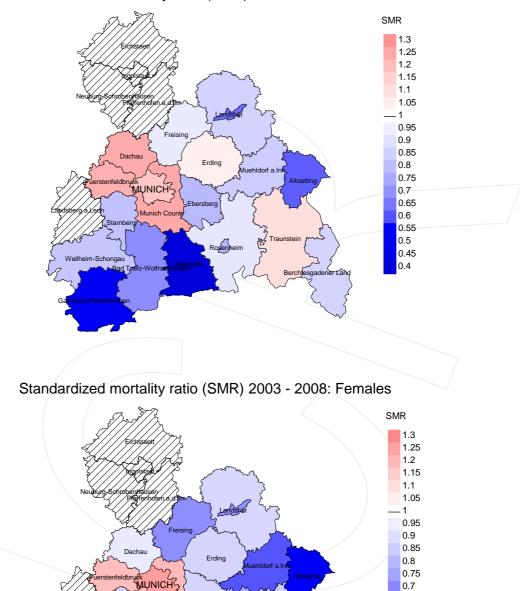
Average mortality (world standard population) 2003 - 2008: Females



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 3.9/100,000 WS N=890, females 2.3/100,000 WS N=769). 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 19 women died from NHL. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 1.9/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.9 and 3.7/100,000.

Standardized mortality ratio (SMR) 2003 - 2008: Males



0.65 0.6 0.55 0.5 0.45

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=890, females N=769). 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 19 women died from NHL. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.87. Though, the value of this parameter may vary with an underlying probability of 99% between 0.44 and 1.54, and is therefore not statistically striking.

Statistical Notes

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

1. All multiple primaries included

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

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

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

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

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

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

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

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

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

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

Shortcuts

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

BRD-S German standard population

DCO Death certificate only EAR Excess absolute risk

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

ES European standard population (old) FRG Federal Republic of Germany

GEKID Association of Population-based Cancer Registries in Germany

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

LCL Lower confidence limit

MI-index Ratio between mortality and incidence

MCR Munich Cancer Registry (Tumorregister München)

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

SEER Surveillance, Epidemiology, and End Results (USA)

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

Recommended Citation

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