Munich Cancer Registry

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ICD-10 C92: Myeloid leukaemia

Incidence and Mortality

Year of diagnosis	1998-2014
Patients	3,638
Diseases	3,652
Creation date	04/13/2016
Export date	12/23/2015
Population	4.64 m

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

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

http://www.tumorregister-muenchen.de/en/facts/base/bC92__E-ICD-10-C92-Myeloid-leukaemia-incidence-and-mortality.pdf

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

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

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

The foot notes describe the currentness of the data. The baseline statistics and survival data are updated annually. This yearly analysis comprises the Annual Report of the MCR.

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 2016

[#] 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).

[##] 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.

Some remarks regarding this cancer type

The results for leukemias 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.

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

Code	Description
C92.-	Myeloid leukaemia
C92.0	Acute myeloblastic leukaemia [AML]
C92.1	Chronic myeloid leukaemia [CML], BCR/ABL-positive
C92.2	Atypical chronic myeloid leukaemia, BCR/ABL-negative
C92.3	Myeloid sarcoma
C92.4	Acute promyelocytic leukaemia [PML]
C92.5	Acute myelomonocytic leukaemia
C92.6	Acute myeloid leukaemia with 11q23-abnormality
C92.7	Other myeloid leukaemia
C92.8	Acute myeloid leukaemia wiht multilineage dysplasia
C92.9	Myeloid leukaemia, unspecified

INCIDENCE

Table 1

All patients by year of diagnosis,
proportions of DCO, multiple primaries, deaths, and active follow-up
(incl. DCO)

Year of diagnosis	Cases n	DCO cases n	Prop. DCO %	Prop. mult. primaries %	Prop. deaths %	Prop. actively followed %
1998	92	26	28.3	13.0	88.0	98.9
1999	113	33	29.2	15.9	80.5	99.1
2000	129	39	30.2	12.4	75.2	98.4
2001	135	58	43.0	21.5	83.0	98.5
2002	180	62	34.4	18.3	77.2	93.9 #
2003	239	85	35.6	20.5	79.5	97.5
2004	228	87	38.2	25.0	78.9	96.9
2005	217	73	33.6	28.6	78.3	96.3
2006	246	95	38.6	32.9	85.0	95.5
2007	238	72	30.3	29.8	76.5	88.7 #
2008	250	77	30.8	32.4	74.8	85.2
2009	254	56	22.0	33.1	73.2	83.9
2010	319	65	20.4	34.8	71.8	82.8
2011	248	51	20.6	35.1	72.6	85.9
2012	309	68	22.0	37.5	70.2	86.7
2013	264	79	29.9	39.4	68.6	99.6
2014	191	78	40.8	45.5	67.0	96.9 ##
1998-2014	3652	1104	30.2	30.1	75.5	92.0

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

Please be aware that data of recent annual patient cohorts may not yet be fully processed. The years under evaluation can be found in the respective headings.

Table 1a

All patients
by year of diagnosis and gender
(incl. DCO)

Year of diagnosis	All n	Males n	Females n	Prop. males %
1998	92	44	48	47.8
1999	113	63	50	55.8
2000	129	66	63	51.2
2001	135	69	66	51.1
2002	180	91	89	50.6
2003	239	120	119	50.2
2004	228	111	117	48.7
2005	217	105	112	48.4
2006	246	141	105	57.3
2007	238	133	105	55.9
2008	250	132	118	52.8
2009	254	128	126	50.4
2010	319	163	156	51.1
2011	248	131	117	52.8
2012	309	154	155	49.8
2013	264	157	107	59.5
2014	191	103	88	53.9
1998-2014	3652	1911	1741	52.3

Table 2

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

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	44	48	4.0	4.1	2.7	2.5	3.7	3.1	4.8	3.5
1999	63	50	5.6	4.2	3.6	2.3	5.0	3.1	6.0	3.8
2000	66	63	5.8	5.2	4.5	3.1	5.5	4.0	6.4	4.6
2001	69	66	6.0	5.4	3.7	2.6	5.1	3.8	6.5	4.7
2002	91	89	4.9	4.5	3.3	2.3	4.3	3.2	5.4	3.8
2003	120	119	6.4	6.0	3.7	3.2	5.4	4.3	7.0	5.1
2004	111	117	5.9	5.9	3.5	3.3	4.9	4.3	6.1	5.1
2005	105	112	5.5	5.6	3.3	3.1	4.5	3.9	5.7	4.8
2006	141	105	7.4	5.2	4.1	2.3	5.9	3.2	7.6	4.2
2007	133	105	6.0	4.5	3.8	2.3	4.9	3.1	6.0	3.8
2008	132	118	5.9	5.1	3.7	2.3	4.7	3.3	5.9	4.2
2009	128	126	5.7	5.4	3.4	2.7	4.5	3.7	5.5	4.4
2010	163	156	7.2	6.7	4.1	3.2	5.6	4.3	7.2	5.3
2011	131	117	5.7	5.0	3.4	2.7	4.5	3.4	5.4	4.0
2012	154	155	6.7	6.6	3.5	3.5	5.0	4.6	6.5	5.4
2013	157	107	6.9	4.5	3.4	2.1	4.9	2.8	6.6	3.6
2014	103	88	4.5	3.7	2.0	1.5	3.1	2.2	4.4	2.9
1998-2014	1911	1741	6.0	5.2	3.5	2.6	4.8	3.5	6.1	4.3

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 patients)
(incl. DCO)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	92	61.7	21.8	0.9	94.1	32.4	47.5	67.6	78.1	86.3
1999	113	64.1	17.5	1.5	92.0	39.5	55.0	68.8	75.7	85.0
2000	129	59.1	20.9	0.4	97.6	32.2	46.4	63.1	73.8	81.5
2001	135	64.2	16.2	9.8	96.4	38.2	56.5	66.2	76.5	81.6
2002	180	63.3	18.3	2.0	96.1	37.6	52.9	67.5	77.4	83.1
2003	239	65.0	17.6	1.0	98.9	40.6	53.5	67.2	79.6	84.2
2004	228	65.0	18.0	0.4	93.3	40.4	56.7	67.4	78.2	84.6
2005	217	64.1	19.2	0.6	92.9	38.6	55.6	69.3	78.3	83.5
2006	246	67.9	17.4	1.0	95.1	40.9	62.5	72.3	79.5	84.8
2007	238	63.7	19.1	3.0	94.5	37.4	51.6	68.4	77.0	83.7
2008	250	66.0	19.1	0.6	98.1	39.8	57.9	71.1	78.8	84.2
2009	254	65.0	18.3	4.2	100	38.7	53.1	69.4	77.6	86.3
2010	319	67.5	17.4	1.3	94.2	46.5	59.3	70.9	78.8	86.4
2011	248	64.6	18.9	0.3	98.4	41.3	54.4	69.7	77.3	84.5
2012	309	66.2	18.3	0.0	98.7	41.8	57.0	71.1	79.3	84.5
2013	264	69.3	16.9	0.5	92.7	48.8	63.6	73.4	79.9	85.0
2014	191	72.6	14.9	0.5	95.9	52.2	68.2	75.5	82.0	86.4
1998-2014	3652	65.7	18.3	0.0	100	40.2	56.5	70.1	78.6	84.7

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	44	62.4	22.2	0.9	94.1	32.4	48.6	69.6	77.1	86.5
1999	63	62.6	17.5	1.5	91.5	38.9	54.9	64.6	74.7	81.5
2000	66	56.5	22.4	0.4	97.6	22.7	43.0	61.8	72.4	79.7
2001	69	60.7	16.9	9.8	96.4	37.7	51.2	63.0	75.1	80.1
2002	91	60.1	19.6	2.0	94.9	32.3	47.5	63.9	75.0	80.5
2003	120	65.2	16.9	10.1	93.6	39.9	54.2	67.6	78.1	84.4
2004	111	65.4	17.2	0.4	90.1	41.8	60.0	67.3	78.2	84.6
2005	105	62.8	18.9	2.7	91.3	36.4	52.1	69.3	77.1	81.1
2006	141	66.5	16.7	1.0	93.6	41.9	60.7	70.7	76.5	82.2
2007	133	61.3	19.7	3.0	94.5	32.6	48.2	67.6	75.0	82.2
2008	132	63.4	20.9	0.6	98.1	35.0	53.1	69.2	77.3	83.0
2009	128	63.6	18.2	4.2	92.2	37.6	52.6	69.3	75.7	82.7
2010	163	66.6	17.0	2.9	93.4	47.8	60.3	70.3	77.5	83.3
2011	131	64.5	17.9	6.4	98.4	42.8	54.5	67.9	76.0	83.4
2012	154	66.9	17.1	9.9	94.0	43.0	57.7	70.6	80.0	84.5
2013	157	69.2	16.2	0.5	92.7	48.9	65.6	72.7	78.5	84.3
2014	103	73.5	14.9	0.5	95.9	56.8	69.6	76.2	83.3	86.4
1998-2014	1911	64.8	18.3	0.4	98.4	38.9	55.9	69.5	77.5	83.5

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	48	61.2	21.6	1.3	87.5	27.9	44.8	63.8	80.1	86.3
1999	50	66.0	17.6	12.6	92.0	43.0	55.6	70.8	77.1	86.4
2000	63	61.8	19.1	16.5	94.3	35.6	47.6	63.8	76.1	86.2
2001	66	67.8	14.7	26.8	89.5	52.7	59.5	71.2	79.3	84.0
2002	89	66.7	16.4	13.5	96.1	42.8	55.9	69.3	80.1	85.6
2003	119	64.9	18.3	1.0	98.9	41.4	53.4	66.4	80.8	84.2
2004	117	64.7	18.8	0.7	93.3	39.1	56.3	68.1	78.2	84.2
2005	112	65.3	19.4	0.6	92.9	41.6	57.8	69.3	80.1	84.6
2006	105	69.7	18.4	1.8	95.1	38.7	66.3	74.7	81.0	86.6
2007	105	66.8	17.9	3.5	94.3	43.6	57.0	69.8	79.7	86.0
2008	118	68.9	16.4	15.7	94.9	45.9	61.6	72.5	81.0	86.5
2009	126	66.4	18.4	17.8	100	39.1	54.5	69.8	79.8	87.0
2010	156	68.3	17.7	1.3	94.2	46.5	58.3	71.2	82.3	87.8
2011	117	64.7	20.1	0.3	90.0	41.3	54.2	70.9	79.5	85.4
2012	155	65.4	19.5	0.0	98.7	41.4	56.5	71.6	78.9	84.0
2013	107	69.4	17.9	11.1	92.4	46.2	60.8	74.8	82.4	87.5
2014	88	71.4	14.9	9.9	93.2	48.4	66.4	74.7	80.3	86.7
1998-2014	1741	66.7	18.2	0.0	100	41.4	57.0	71.1	80.1	85.9

Table 4

Age distribution by 5-year age group and gender for period 2007-2014
(incl. DCO)

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	20	1.0	1.0	10	0.9	0.9	10	1.0	1.0
5-9	9	0.4	1.4	6	0.5	1.5	3	0.3	1.3
10-14	13	0.6	2.0	8	0.7	2.2	5	0.5	1.9
15-19	20	1.0	3.0	15	1.4	3.5	5	0.5	2.4
20-24	19	0.9	3.9	10	0.9	4.5	9	0.9	3.3
25-29	25	1.2	5.1	16	1.5	5.9	9	0.9	4.2
30-34	28	1.4	6.5	14	1.3	7.2	14	1.4	5.7
35-39	45	2.2	8.6	21	1.9	9.1	24	2.5	8.1
40-44	72	3.5	12.1	41	3.7	12.8	31	3.2	11.3
45-49	98	4.7	16.8	47	4.3	17.1	51	5.2	16.6
50-54	105	5.1	21.9	54	4.9	22.0	51	5.2	21.8
55-59	110	5.3	27.2	50	4.5	26.5	60	6.2	28.0
60-64	150	7.2	34.4	85	7.7	34.2	65	6.7	34.7
65-69	245	11.8	46.3	144	13.1	47.3	101	10.4	45.1
70-74	329	15.9	62.1	188	17.1	64.4	141	14.5	59.6
75-79	312	15.1	77.2	170	15.4	79.8	142	14.6	74.2
80-84	255	12.3	89.5	135	12.3	92.1	120	12.3	86.5
85+	218	10.5	100.0	87	7.9	100.0	131	13.5	100.0
All ages	2073	100.0		1101	100.0		972	100.0	

Included in the statistics are 44.8% multiple primaries in males and 43.2% in females.

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 2007-2014

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males DCO rate n=297 %	Females DCO rate n=248 %	Males Prop.all cancers n=91183 %	Females Prop.all cancers n=89596 %
0- 4	10	10	1.1	1.2			5.6	7.2
5- 9	6	3	0.7	0.4			6.3	3.8
10-14	8	5	0.9	0.6			8.0	5.6
15-19	15	5	1.6	0.5			6.9	3.0
20-24	10	9	0.9	0.8			2.7	2.9
25-29	16	9	1.3	0.7			2.9	1.4
30-34	14	14	1.1	1.1		7.1	1.8	1.2
35-39	21	24	1.6	1.9	14.3	4.2	1.8	1.2
40-44	41	31	2.5	2.0	7.3	9.7	2.2	0.8
45-49	47	51	3.0	3.4	8.5	15.7	1.5	0.9
50-54	54	51	4.2	4.0	16.7	7.8	1.1	0.8
55-59	50	60	4.7	5.3	24.0	10.0	0.7	0.8
60-64	85	65	8.7	6.1	17.6	10.8	0.8	0.7
65-69	144	101	15.0	9.7	24.3	26.7	0.9	0.9
70-74	186	141	20.4	13.5	29.0	24.1	1.1	1.2
75-79	169	142	30.7	19.9	29.0	33.1	1.4	1.4
80-84	134	120	38.4	21.4	48.5	36.7	1.6	1.4
85+	87	131	37.6	22.7	55.2	50.4	1.4	1.3
All ages	1097	972			27.1	25.5	1.2	1.1
Incidence								
Raw			6.1	5.2				
WS			3.4	2.5				
ES			4.6	3.4				
BRD-S			5.9	4.2				

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).

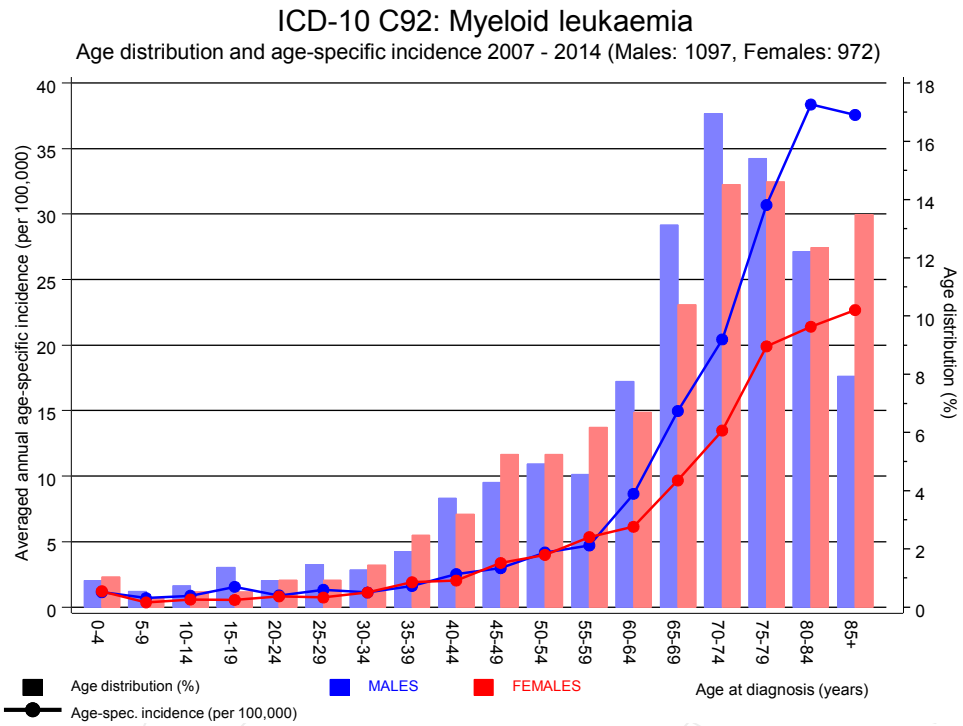


Figure 6. Age distribution and age-specific incidence

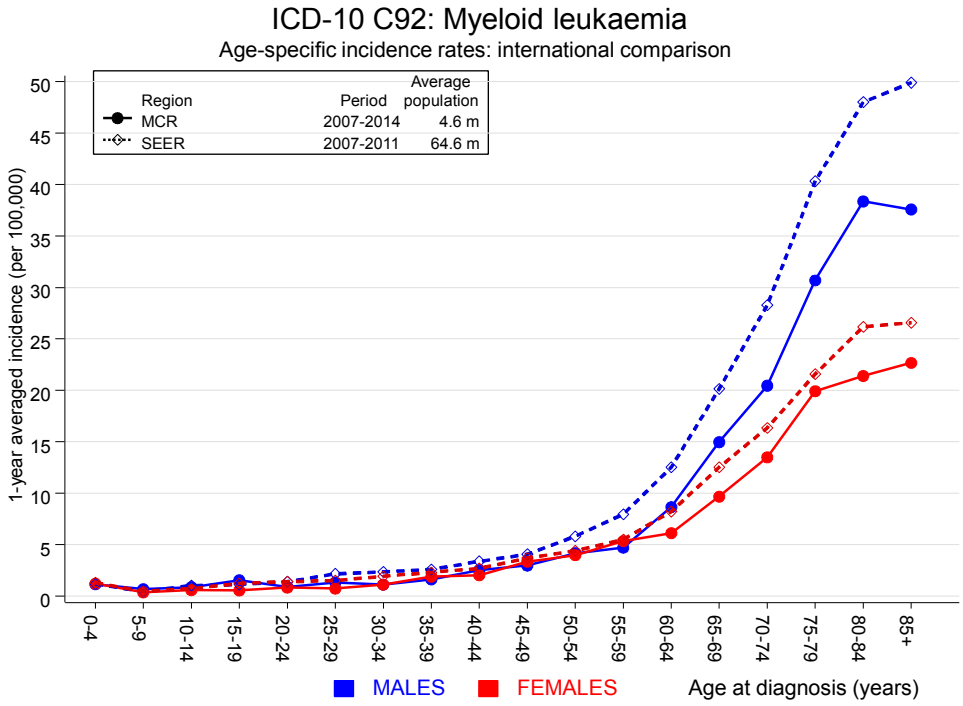


Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

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

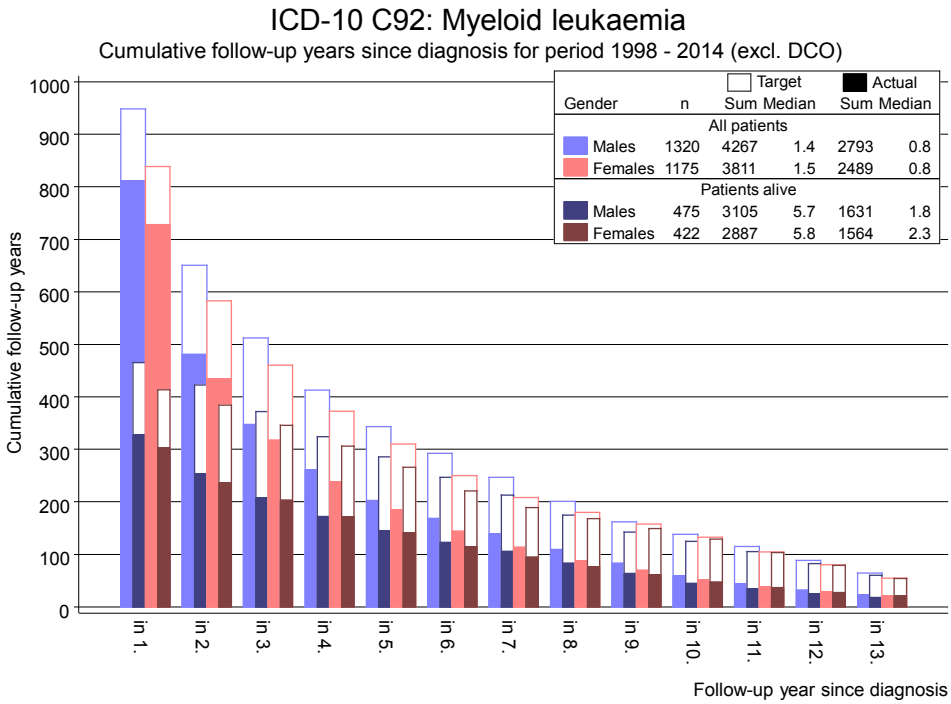


Figure 7. Cumulative follow-up years depending on time since diagnosis

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

Table 8a

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of second primaries for period 1998-2014
MALES

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C09-C10	Oropharynx	2	0.4	5.1	0.6	18.6		5.6	
C15	Oesophagus	2	0.6	3.3	0.4	11.8		4.8	
C18	Colon	10	3.1	3.3	1.6	6.0	#	24.0	
C19-C20	Rectum	2	1.8	1.1	0.1	4.0		0.7	
C25	Pancreas	4	1.1	3.5	1.0	9.0		9.9	
C33-C34	Lung	10	3.9	2.6	1.2	4.8	#	21.2	10.0
C43	Malign. melanoma	5	1.5	3.4	1.1	7.9	#	12.2	
C61	Prostate	19	9.5	2.0	1.2	3.1	#	32.7	5.3
C64	Kidney	2	1.2	1.7	0.2	6.1		2.8	
C67	Bladder	2	1.3	1.5	0.2	5.4		2.3	
C70-C72	CNS cancer	2	0.5	4.2	0.5	15.3		5.3	
C81	Hodgkin lymphoma	2	0.1	20.8	2.5	75.1	#	6.6	
C82-C85	NHL	11	1.3	8.4	4.2	15.1	#	33.5	9.1
C90	Mult. myeloma	5	0.4	12.3	4.0	28.7	#	15.9	
C91-C96	Leukaemia	15	0.5	28.2	15.8	46.5	#	50.0	53.3
Other primaries		10	4.5	2.2	1.1	4.0	#	18.9	10.0
Not observed		0	1.3	0.0	0.0	2.8		-4.6	
All mult. primaries		103	33.1	3.1	2.5	3.8	#	241.7	11.7

Patients	1505
Median age at second malignancy (years)	68.8
Person-years	2891
Mean observation time (years)	1.9
Median observation time (years)	0.6

The occurrence of second malignancy is statistically significant.

Observed second primaries with count 1 are pooled in category “Other primaries”

Table 8b

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of second primaries for period 1998–2014
FEMALES

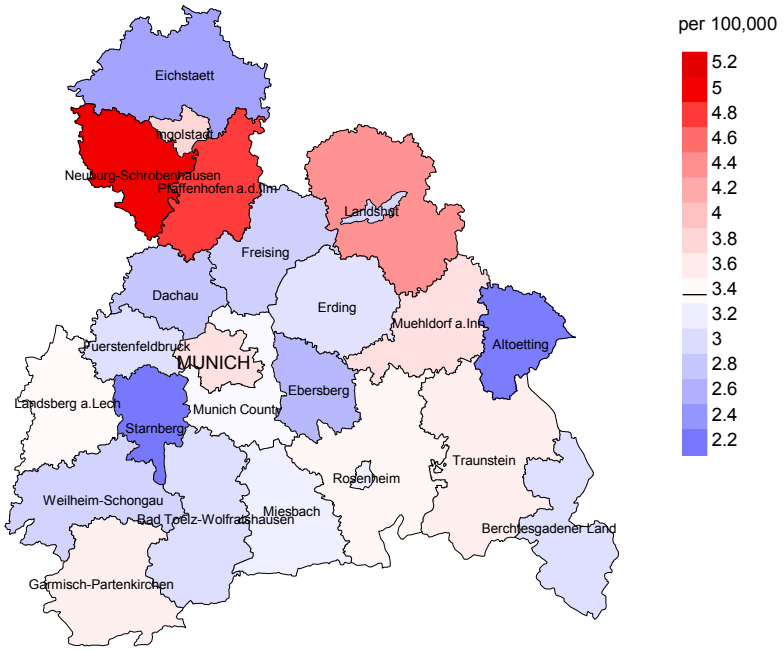
Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C15	Oesophagus	2	0.1	15.7	1.9	56.6	#	7.3	
C18	Colon	3	1.9	1.6	0.3	4.6		4.2	
C25	Pancreas	2	0.9	2.3	0.3	8.4		4.4	50.0
C33–C34	Lung	5	1.6	3.2	1.0	7.4	#	13.3	
C50	Breast	13	7.0	1.9	1.0	3.2		23.4	
C53	Cervix uteri	5	0.4	13.9	4.5	32.4	#	18.0	40.0
C54	Corpus uteri	7	1.2	5.7	2.3	11.8	#	22.4	
C82–C85	NHL	3	0.8	3.8	0.8	11.0		8.6	33.3
C91–C96	Leukaemia	5	0.3	15.0	4.9	34.9	#	18.1	40.0
Other primaries		10	4.2	2.4	1.1	4.4	#	22.5	10.0
Not observed		0	3.4	0.0	0.0	1.1		-13.0	
All mult. primaries		55	21.7	2.5	1.9	3.3	#	129.2	12.7

Patients	1344
Median age at second malignancy (years)	67.9
Person-years	2577
Mean observation time (years)	1.9
Median observation time (years)	0.6

The occurrence of second malignancy is statistically significant.

Observed second primaries with count 1 are pooled in category “Other primaries”

Average incidence (world standard population) 2007 - 2014: Males



Average incidence (world standard population) 2007 - 2014: Females

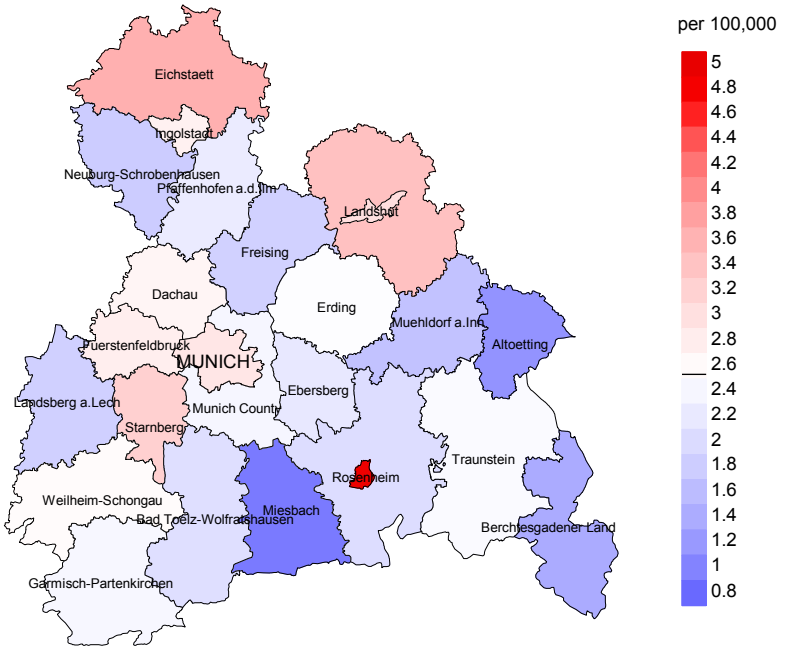
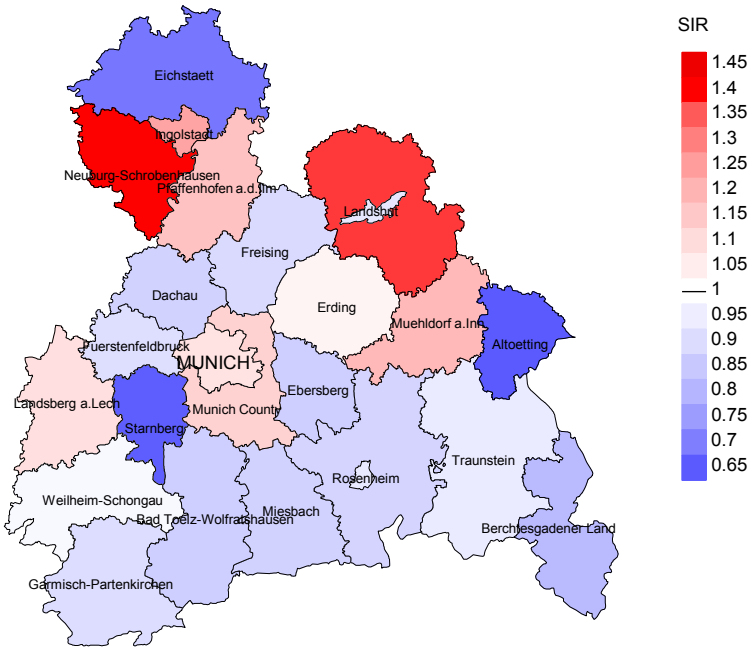


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2014. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 3.4/100,000 WS N=1,097, females 2.5/100,000 WS N=972).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 65,347 female residents (averaged) in the period from 2007 to 2014 a total of 20 women were identified with newly diagnosed myeloid leukaemia. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 2.2/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.9 and 5.3/100,000.

Standardized incidence ratio (SIR) 2007 - 2014: Males



Standardized incidence ratio (SIR) 2007 - 2014: Females

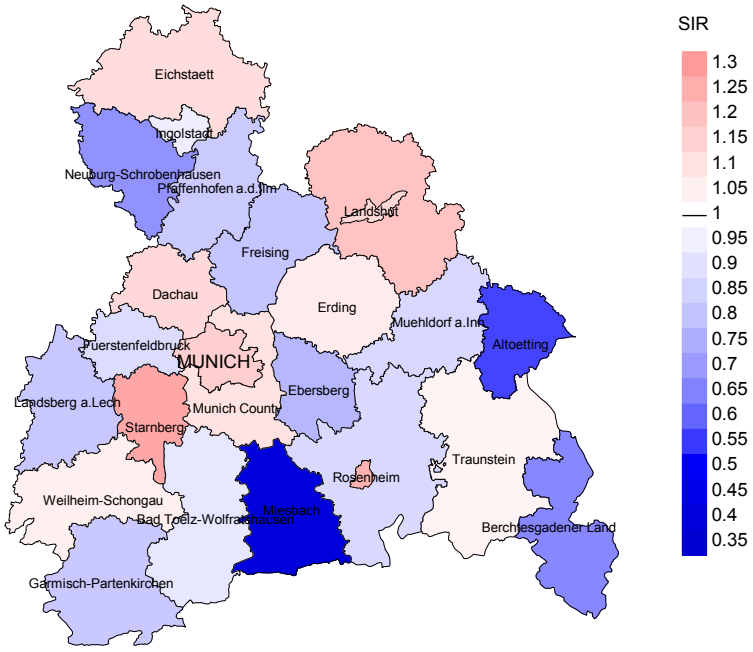


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2014. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=1,097, females N=972).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,924 female residents (averaged) in the period from 2007 to 2014 a total of 20 women were identified with newly diagnosed myeloid leukaemia. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.77. Though, the value of this parameter may vary with an underlying probability of 99% between 0.40 and 1.34, and is therefore not statistically striking.

MORTALITY

Table 10a

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

Year of diagnosis	Incident cases n	Prop. actively followed %	Prop. DCO %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	92	98.9	28.3	81	88.0	97.5
1999	113	99.1	29.2	91	80.5	96.7
2000	129	98.4	30.2	97	75.2	96.9
2001	135	98.5	43.0	112	83.0	99.1
2002	180	93.9	34.4	139	77.2	97.8
2003	239	97.5	35.6	190	79.5	99.5
2004	228	96.9	38.2	180	78.9	98.9
2005	217	96.3	33.6	170	78.3	99.4
2006	246	95.5	38.6	209	85.0	98.6
2007	238	88.7	30.3	182	76.5	97.8
2008	250	85.2	30.8	187	74.8	99.5
2009	254	83.9	22.0	186	73.2	99.5
2010	319	82.8	20.4	229	71.8	98.3
2011	248	85.9	20.6	180	72.6	97.8
2012	309	86.7	22.0	217	70.2	98.2
2013	264	99.6	29.9	181	68.6	97.8
2014	191	96.9	40.8	128	67.0	96.9
1998-2014	3652	92.0	30.2	2759	75.5	98.4

Table 10b

Annual cohorts of incident cancers and deaths, proportion of death certificates and cases deceased the same year of cancer diagnosis
(incl. DCO)
(with respect to registry area expansion from 2.51 to 3.96 m as of 2002, and from 3.96 to 4.64 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	92	92	98.9	46	50.0
1999	113	86	97.7	42	37.2
2000	129	94	96.8	53	41.1
2001	135	118	97.5	63	46.7
2002	180	122	98.4	79	43.9
2003	239	145	98.6	109	45.6
2004	228	140	98.6	100	43.9
2005	217	180	99.4	107	49.3
2006	246	168	98.8	140	56.9
2007	238	169	98.8	108	45.4
2008	250	167	97.6	117	46.8
2009	254	163	97.5	111	43.7
2010	319	201	98.0	139	43.6
2011	248	202	97.5	108	43.5
2012	309	207	98.6	130	42.1
2013	264	230	98.3	140	53.0
2014	191	191	98.4	120	62.8
1998-2014	3652	2675	98.2	1712	46.9

Table 10c

Annual cohorts of deaths, proportion of cancer-related and non-cancer-related deaths, and cancer recorded on death certificates (incl. DCO)
(with respect to registry area expansion from 2.51 to 3.96 m as of 2002, and from 3.96 to 4.64 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. non-cancer-related %	Prop. cancer recorded on death certificate %
1998	92	73.9	26.1	95.6
1999	86	80.2	19.8	97.6
2000	94	88.3	11.7	100.0
2001	118	83.9	16.1	97.4
2002	122	91.0	9.0	99.2
2003	145	91.0	9.0	99.3
2004	140	92.1	7.9	97.8
2005	180	93.9	6.1	99.4
2006	168	94.6	5.4	98.8
2007	169	92.9	7.1	98.8
2008	167	86.8	13.2	95.1
2009	163	90.8	9.2	96.9
2010	201	93.0	7.0	98.0
2011	202	89.1	10.9	95.9
2012	207	90.8	9.2	98.5
2013	230	82.6	17.4	96.9
2014	191	82.7	17.3	94.7
1998-2014	2675	88.7	11.3	97.6

Table 11a

Medians 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 (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	48	65.0	65.7	62.7	66.1
1999	48	71.7	70.4	77.6	71.7
2000	57	69.0	67.7	72.7	69.3
2001	51	70.4	71.9	64.0	70.8
2002	57	67.9	67.8	69.4	69.1
2003	80	70.5	69.7	76.5	70.1
2004	71	73.5	73.6	64.7	73.5
2005	93	72.3	72.2	74.7	72.3
2006	98	72.0	72.2	71.9	71.9
2007	83	70.8	70.9	53.1	70.8
2008	88	72.1	72.9	67.2	72.5
2009	84	73.1	74.2	68.8	74.2
2010	104	73.6	73.1	80.3	73.3
2011	101	73.8	73.7	76.0	74.2
2012	109	73.8	73.2	81.4	73.4
2013	132	76.0	76.2	74.6	76.0
2014	104	75.3	75.4	74.2	75.4
1998-2014	1408	72.6	72.6	72.5	72.7

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

Medians 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 (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	44	62.0	61.1	72.3	61.9
1999	38	74.5	75.2	65.6	74.5
2000	37	76.1	74.9	87.3	76.1
2001	67	72.0	71.3	78.2	72.5
2002	65	73.6	73.2	82.7	73.7
2003	65	75.4	74.9	81.1	75.4
2004	69	74.6	74.5	74.6	74.6
2005	87	71.0	71.4	57.7	71.8
2006	70	76.1	76.1	71.9	76.1
2007	86	70.9	70.9	68.5	71.4
2008	79	75.1	72.8	85.0	73.9
2009	79	75.3	75.5	68.6	75.3
2010	97	77.7	78.2	69.5	78.2
2011	101	73.9	73.0	78.8	73.9
2012	98	73.1	73.6	72.1	73.9
2013	98	77.0	75.4	82.5	76.7
2014	87	75.9	75.6	77.5	76.0
1998-2014	1267	74.6	74.2	78.8	74.6

By 2010, life expectancy at birth was 77.5 years for boys and 82.6 years for girls.

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	35	3.2	0.80	2.3	0.85	3.0	0.80	3.8	0.79
1999	38	3.4	0.60	2.0	0.57	3.0	0.60	3.7	0.62
2000	51	4.5	0.77	2.8	0.63	4.0	0.73	5.2	0.82
2001	46	4.0	0.67	2.3	0.61	3.4	0.67	4.9	0.75
2002	52	2.8	0.57	1.7	0.52	2.4	0.56	3.1	0.57
2003	75	4.0	0.63	2.2	0.61	3.4	0.62	4.4	0.63
2004	65	3.5	0.59	1.8	0.52	2.8	0.58	4.0	0.66
2005	87	4.6	0.83	2.3	0.70	3.6	0.79	4.9	0.85
2006	91	4.8	0.65	2.4	0.58	3.7	0.62	5.0	0.66
2007	80	3.6	0.60	1.9	0.51	2.8	0.56	3.7	0.62
2008	76	3.4	0.58	1.7	0.46	2.5	0.54	3.4	0.58
2009	75	3.4	0.59	1.6	0.48	2.4	0.54	3.4	0.61
2010	94	4.2	0.58	2.0	0.50	3.1	0.55	4.0	0.56
2011	90	3.9	0.69	1.8	0.55	2.8	0.62	3.8	0.71
2012	97	4.2	0.63	1.9	0.55	3.0	0.60	4.0	0.62
2013	109	4.8	0.70	2.0	0.58	3.2	0.66	4.6	0.70
2014	85	3.7	0.83	1.5	0.77	2.5	0.80	3.5	0.81
1998-2014	1246	3.9	0.65	2.0	0.57	3.0	0.62	4.1	0.67

Table 12b

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

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	33	2.8	0.69	2.0	0.80	2.3	0.75	2.5	0.72
1999	31	2.6	0.62	1.1	0.49	1.7	0.54	2.2	0.60
2000	32	2.7	0.51	1.1	0.37	1.7	0.42	2.2	0.49
2001	53	4.4	0.80	2.2	0.83	3.0	0.80	3.9	0.81
2002	59	3.0	0.66	1.3	0.58	1.9	0.61	2.5	0.67
2003	57	2.9	0.48	1.2	0.38	1.8	0.43	2.4	0.47
2004	64	3.2	0.55	1.4	0.41	2.0	0.47	2.7	0.52
2005	82	4.1	0.73	1.9	0.63	2.7	0.68	3.3	0.69
2006	68	3.4	0.65	1.3	0.58	2.0	0.63	2.8	0.66
2007	77	3.3	0.73	1.5	0.66	2.1	0.69	2.7	0.72
2008	69	3.0	0.58	1.2	0.53	1.8	0.56	2.4	0.57
2009	73	3.1	0.58	1.3	0.46	1.9	0.52	2.5	0.56
2010	93	4.0	0.60	1.4	0.44	2.1	0.49	2.9	0.55
2011	90	3.8	0.77	1.5	0.54	2.2	0.65	3.0	0.73
2012	91	3.9	0.59	1.7	0.47	2.4	0.51	3.1	0.57
2013	81	3.4	0.76	1.4	0.66	2.0	0.71	2.6	0.72
2014	73	3.1	0.83	1.1	0.73	1.7	0.78	2.3	0.79
1998-2014	1126	3.4	0.65	1.4	0.54	2.1	0.59	2.7	0.63

Table 13

Age distribution of age at death (cancer-related) for period 2007-2014
(**incl. multiple primaries**)

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
5-9	1	0.1	0.1			0.0	1	0.2	0.2
10-14	4	0.3	0.4	2	0.3	0.3	2	0.3	0.5
15-19	4	0.3	0.7	2	0.3	0.6	2	0.3	0.8
20-24	5	0.4	1.0	3	0.4	1.0	2	0.3	1.1
25-29	10	0.7	1.8	8	1.1	2.1	2	0.3	1.4
30-34	4	0.3	2.1	1	0.1	2.2	3	0.5	1.8
35-39	15	1.1	3.2	7	1.0	3.2	8	1.2	3.1
40-44	31	2.3	5.4	14	2.0	5.2	17	2.6	5.7
45-49	38	2.8	8.2	20	2.8	8.0	18	2.8	8.5
50-54	43	3.2	11.4	25	3.5	11.5	18	2.8	11.2
55-59	71	5.2	16.6	32	4.5	15.9	39	6.0	17.2
60-64	77	5.6	22.2	40	5.6	21.5	37	5.7	22.9
65-69	166	12.2	34.4	96	13.4	35.0	70	10.8	33.7
70-74	266	19.5	53.8	148	20.7	55.7	118	18.2	51.8
75-79	274	20.1	73.9	154	21.5	77.2	120	18.5	70.3
80-84	190	13.9	87.8	97	13.6	90.8	93	14.3	84.6
85+	166	12.2	100.0	66	9.2	100.0	100	15.4	100.0
All ages	1365	100.0		715	100.0		650	100.0	

Included in the statistics are 44.8% multiple primaries in males and 43.2% in females.

Table 14

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2014
(**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		1	0.0		0.1	0.33		5.6
10-14	2	2	0.2	0.25	0.2	0.40	11.1	10.0
15-19	2	2	0.2	0.13	0.2	0.40	5.6	9.1
20-24	3	2	0.3	0.30	0.2	0.22	6.3	7.1
25-29	8	2	0.7	0.50	0.2	0.22	12.9	3.1
30-34	1	3	0.1	0.07	0.2	0.21	1.1	2.7
35-39	7	8	0.5	0.33	0.6	0.33	4.0	3.1
40-44	14	17	0.9	0.34	1.1	0.55	3.0	2.7
45-49	20	18	1.3	0.43	1.2	0.35	2.0	1.5
50-54	25	18	1.9	0.46	1.4	0.35	1.3	1.0
55-59	32	39	3.0	0.64	3.5	0.65	1.0	1.5
60-64	40	37	4.1	0.47	3.5	0.57	0.8	1.0
65-69	96	70	10.0	0.67	6.7	0.69	1.3	1.3
70-74	148	118	16.3	0.79	11.3	0.84	1.6	1.8
75-79	154	120	28.0	0.91	16.8	0.85	1.8	1.9
80-84	97	93	27.8	0.72	16.6	0.78	1.3	1.4
85+	66	100	28.5	0.76	17.3	0.76	1.1	1.2
All ages	715	650					1.4	1.5
Mortality								
Raw			4.0	0.65	3.5	0.67		
WS			1.8	0.54	1.4	0.54		
ES			2.8	0.61	2.0	0.60		
BRD-S			3.9	0.65	2.7	0.64		
PYLL-70								
per 100,000			19.8		18.7			
ES			18.0		16.9			
AYLL-70			12.7		13.5			

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

Table 15a

Multiple primaries in deaths in period 1998–2014
MALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C16	Stomach	7	1.3	6	85.7			1	14.3
C18	Colon	33	6.2	22	66.7	4	12.1	7	21.2
C19–C20	Rectum	12	2.2	9	75.0	2	16.7	1	8.3
C25	Pancreas	7	1.3	1	14.3			6	85.7
C33–C34	Lung	24	4.5	11	45.8	5	20.8	8	33.3
C43	Malign. melanoma	15	2.8	13	86.7	1	6.7	1	6.7
C44	Skin others	29	5.4	12	41.4	5	17.2	12	41.4
C61	Prostate	93	17.4	84	90.3	5	5.4	4	4.3
C64	Kidney	14	2.6	14	100.0				
C67	Bladder	30	5.6	27	90.0	1	3.3	2	6.7
C70–C72	CNS cancer	8	1.5	3	37.5	2	25.0	3	37.5
C81	Hodgkin lymphoma	6	1.1	5	83.3			1	16.7
C82–C85	NHL	37	6.9	23	62.2	5	13.5	9	24.3
C90	Mult. myeloma	8	1.5	7	87.5	1	12.5		
C91–C96	Leukaemia	168	31.4			49	29.2	119	70.8
Other primaries		44	8.2	28	63.6	5	11.4	11	25.0
All mult. primaries		535	100.0	265	49.5	85	15.9	185	34.6

Multiple primaries with number of cases 1 to 5 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 1998–2014
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C18	Colon	12	2.6	10	83.3	1	8.3	1	8.3
C19–C20	Rectum	11	2.4	7	63.6	2	18.2	2	18.2
C33–C34	Lung	11	2.4	7	63.6	2	18.2	2	18.2
C43	Malign. melanoma	9	1.9	9	100.0				
C44	Skin others	13	2.8	8	61.5			5	38.5
C50	Breast	126	27.0	114	90.5	5	4.0	7	5.6
C53	Cervix uteri	11	2.4	8	72.7	2	18.2	1	9.1
C54	Corpus uteri	26	5.6	20	76.9	2	7.7	4	15.4
C56	Ovary	8	1.7	6	75.0			2	25.0
C67	Bladder	11	2.4	9	81.8	1	9.1	1	9.1
C70–C72	CNS cancer	8	1.7	5	62.5			3	37.5
C73	Thyroid	11	2.4	11	100.0				
C81	Hodgkin lymphoma	6	1.3	5	83.3	1	16.7		
C82–C85	NHL	20	4.3	18	90.0	1	5.0	1	5.0
C90	Mult. myeloma	10	2.1	6	60.0	3	30.0	1	10.0
C91–C96	Leukaemia	133	28.5			38	28.6	95	71.4
Other primaries		40	8.6	20	50.0	2	5.0	18	45.0
All mult. primaries		466	100.0	263	56.4	60	12.9	143	30.7

Multiple primaries with number of cases 1 to 4 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 2007-2014
(**First primaries only** *)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	Males MI-index	Females Age-spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4			0.0		0.0			
5- 9		1	0.0		0.1	0.50		5.6
10-14	2	2	0.2	0.29	0.2	0.40	11.1	10.5
15-19	2	2	0.2	0.15	0.2	0.40	6.1	10.0
20-24	3	1	0.3	0.33	0.1	0.11	7.0	3.8
25-29	7	2	0.6	0.44	0.2	0.25	12.7	3.4
30-34	1	3	0.1	0.08	0.2	0.25	1.2	3.2
35-39	5	8	0.4	0.26	0.6	0.35	3.0	3.5
40-44	13	13	0.8	0.36	0.8	0.50	3.1	2.3
45-49	16	14	1.0	0.41	0.9	0.37	1.7	1.4
50-54	18	12	1.4	0.41	0.9	0.34	1.1	0.8
55-59	25	28	2.4	0.66	2.5	0.65	1.0	1.3
60-64	25	25	2.5	0.42	2.4	0.56	0.6	0.9
65-69	58	52	6.0	0.65	5.0	0.75	1.0	1.3
70-74	84	60	9.2	0.80	5.7	0.68	1.2	1.2
75-79	90	76	16.3	0.88	10.7	0.84	1.4	1.6
80-84	60	60	17.2	0.75	10.7	0.83	1.1	1.2
85+	34	68	14.7	0.69	11.8	0.77	0.8	1.0
All ages	443	427					1.2	1.2
Mortality								
Raw			2.5	0.61	2.3	0.64		
WS			1.2	0.49	1.0	0.50		
ES			1.8	0.55	1.4	0.56		
BRD-S			2.4	0.61	1.8	0.61		
PYLL-70								
per 100,000			15.8		14.8			
ES			14.5		13.5			
AYLL-70			14.5		14.3			

* See corresponding tables with multiple primaries.

Table 17

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2014
(**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		1	0.0		0.1	0.50		5.6
10-14	2	2	0.2	0.29	0.2	0.40	11.1	11.1
15-19	2	2	0.2	0.15	0.2	0.40	6.1	11.1
20-24	3	1	0.3	0.38	0.1	0.11	7.7	4.2
25-29	7	2	0.6	0.44	0.2	0.25	13.7	3.6
30-34	1	3	0.1	0.08	0.2	0.25	1.2	3.6
35-39	5	5	0.4	0.26	0.4	0.24	3.2	2.4
40-44	11	12	0.7	0.31	0.8	0.46	2.8	2.4
45-49	13	13	0.8	0.35	0.9	0.36	1.5	1.4
50-54	16	11	1.2	0.39	0.9	0.37	1.1	0.8
55-59	23	24	2.2	0.64	2.1	0.60	1.0	1.3
60-64	23	23	2.3	0.43	2.2	0.58	0.7	0.9
65-69	50	45	5.2	0.61	4.3	0.68	1.1	1.3
70-74	79	56	8.7	0.81	5.4	0.67	1.4	1.4
75-79	82	70	14.9	0.84	9.8	0.80	1.7	1.8
80-84	57	57	16.3	0.72	10.2	0.85	1.4	1.4
85+	32	65	13.8	0.68	11.2	0.75	0.9	1.2
All ages	406	392					1.3	1.4
Mortality								
Raw			2.2	0.58	2.1	0.62		
WS			1.1	0.47	0.9	0.48		
ES			1.6	0.53	1.3	0.54		
BRD-S			2.2	0.59	1.6	0.59		
PYLL-70								
per 100,000			14.5		13.2			
ES			13.4		12.2			
AYLL-70			14.9		14.5			

* See corresponding tables with multiple primaries.

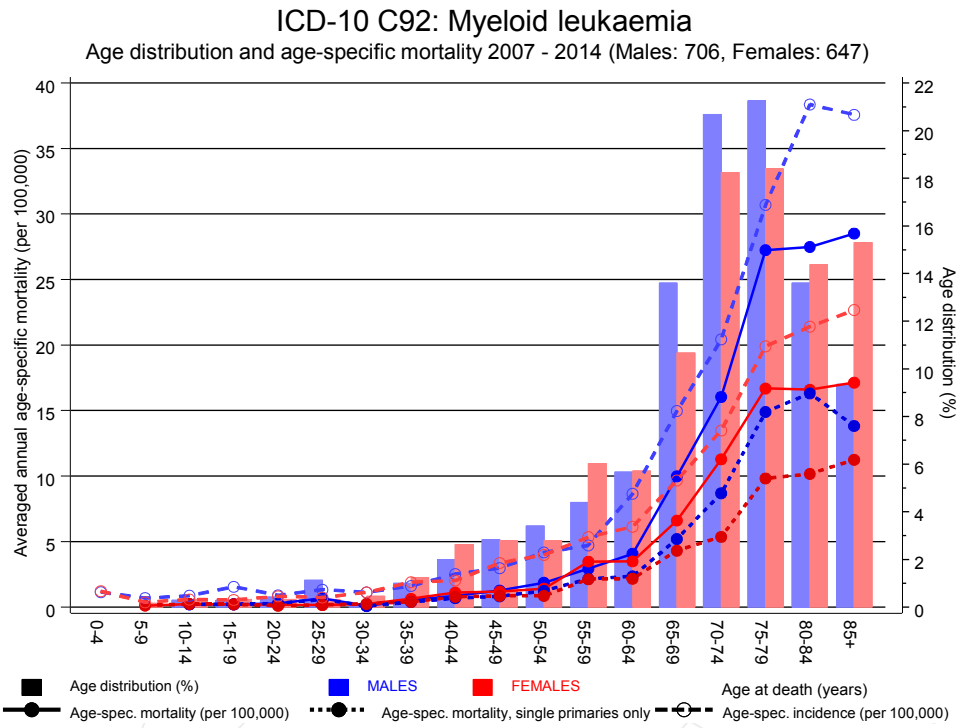
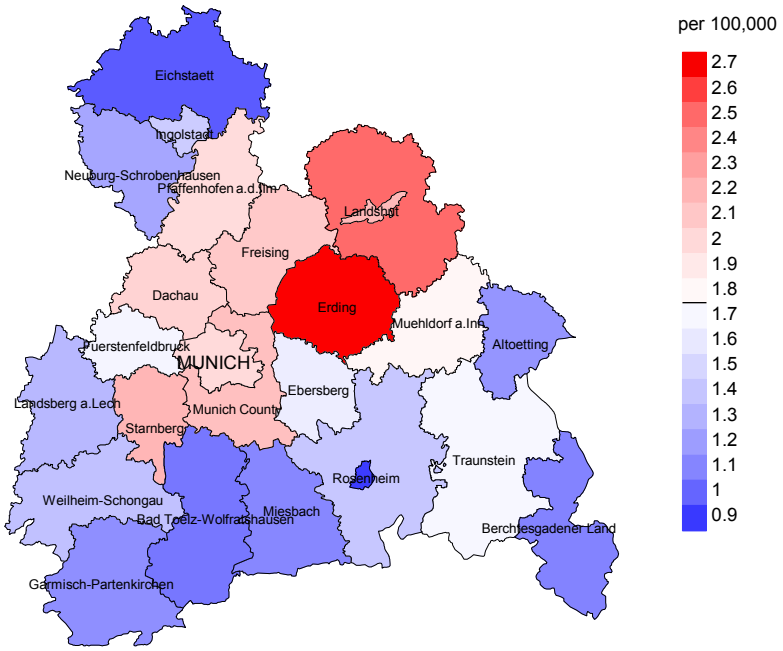


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

Average mortality (world standard population) 2007 - 2014: Males



Average mortality (world standard population) 2007 - 2014: Females

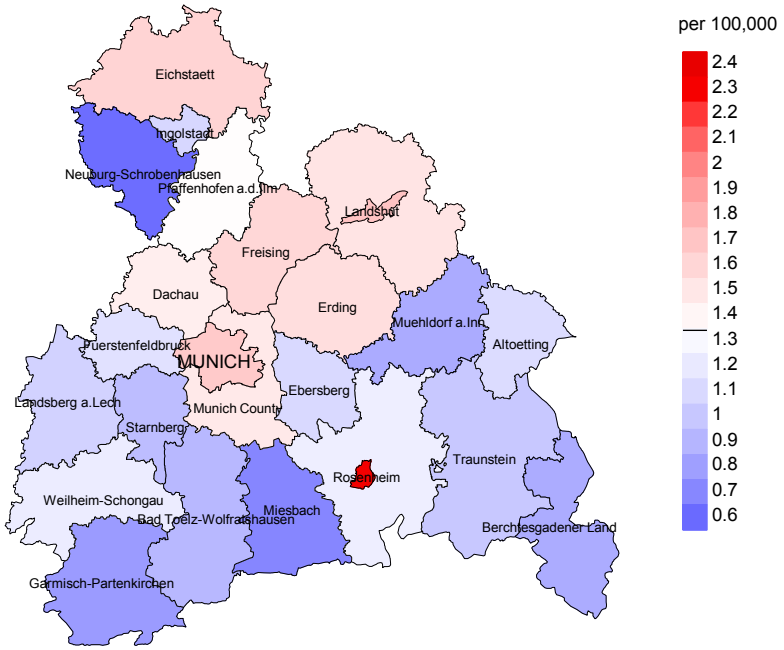
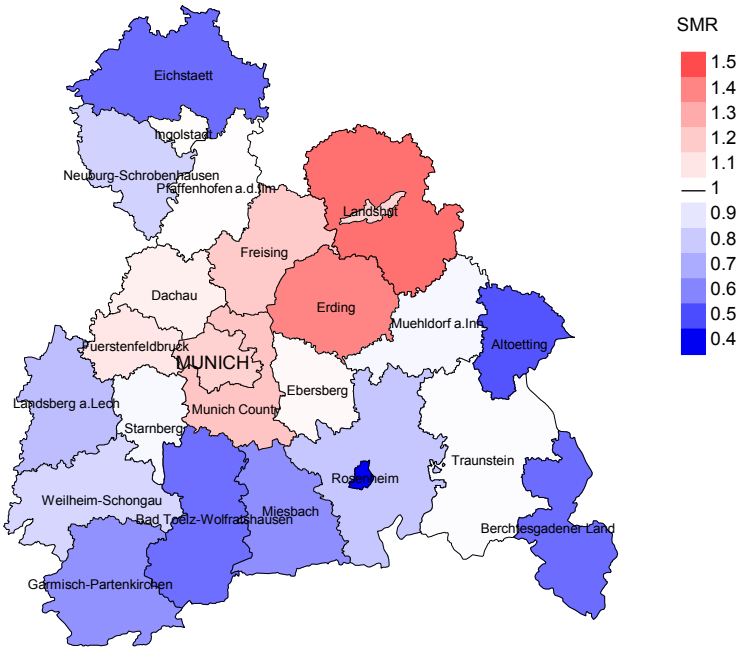


Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2014. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 1.8/100,000 WS N=686, females 1.3/100,000 WS N=632).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 65,347 female residents (averaged) in the period from 2007 to 2014 a total of 13 women died from myeloid leukaemia. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 1.1/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.4 and 2.4/100,000.

Standardized mortality ratio (SMR) 2007 - 2014: Males



Standardized mortality ratio (SMR) 2007 - 2014: Females

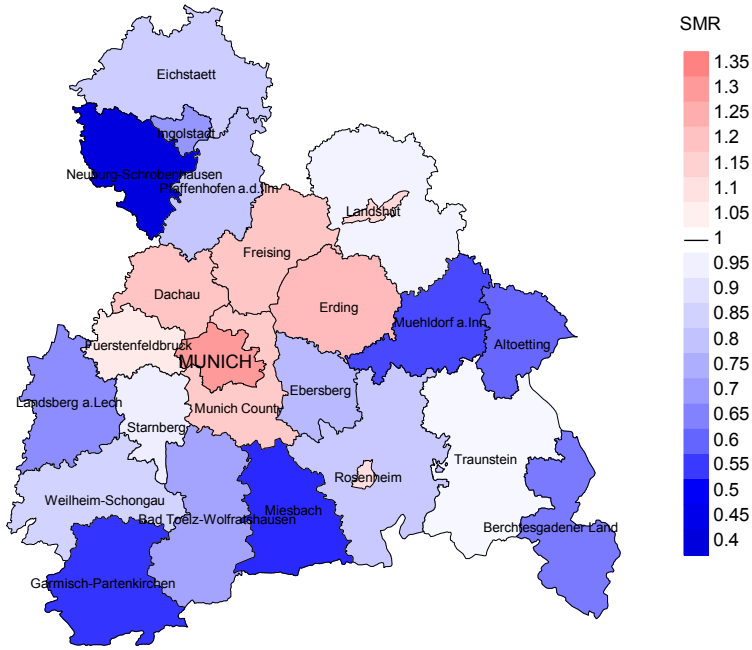


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2014. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=686, females N=632).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,924 female residents (averaged) in the period from 2007 to 2014 a total of 13 women died from myeloid leukaemia. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.78. Though, the value of this parameter may vary with an underlying probability of 99% between 0.33 and 1.53, 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, where applicable. For mortality statistics patients, diagnoses and progressive course of disease are presented. In the calculations, all courses of disease are considered whereby progressions occurred and/or death certificate identified progressive cancers were ascertained. Additionally there are three groups of disease course to consider:

1. **All multiple primaries included**

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

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

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

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

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

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

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

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

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

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

Shortcuts

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

Recommended Citation

Munich Cancer Registry. ICD-10 C92: Myeloid leukaemia - Incidence and Mortality [Internet]. 2016 [updated 2016 Apr 13; cited 2016 Jun 1]. Available from: http://www.tumorregister-muenchen.de/en/facts/base/bC92__E-ICD-10-C92-Myeloid-leukaemia-incidence-and-mortality.pdf

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