Munich Cancer Registry

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ICD-10 C92.0: Acute myelobl. leukemia

Incidence and Mortality

Year of diagnosis	1998-2016
Patients	3,070
Diseases	3,074
Creation date	08/21/2018
Export date	08/09/2018
Population	4.81 m

Munich Cancer Registry
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Marchioninistr. 15
Munich, 81377
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https://www.tumorregister-muenchen.de/en

https://www.tumorregister-muenchen.de/en/facts/base/bC920_E-ICD-10-C92.0-Acute-myelobl.-leukemia-incidence-and-mortality.pdf

Index of figures and tables

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 4.69 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, August 2018

[#] 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 2.65 million to 4.10 in 2002, and to 4.69 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
C92.0	Acute myeloblastic leukaemia [AML]

INCIDENCE

Table 1

Cases by year of diagnosis, proportions of DCO, further malignancies, deaths, and active follow-up (ALL PATIENTS) (incl. DCO)

Year of diagnosis	All cases n	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	50	4	8.0	14.0	4.6	86.0	98.0
1999	48	2	4.2	12.2	4.6	77.1	97.9
2000	81	20	24.7	11.7	4.5	76.5	98.8
2001	97	43	44.3	12.7	4.5	87.6	96.9
2002	120	41	34.2	13.1	4.5	83.3	93.3 #
2003	163	58	35.6	15.2	4.4	84.7	98.2
2004	167	66	39.5	17.1	4.5	82.6	95.8
2005	164	55	33.5	18.0	4.6	81.1	95.7
2006	190	73	38.4	19.6	4.5	90.0	96.8
2007	176	52	29.5	20.1	4.5	84.7	92.6 #
2008	178	50	28.1	21.3	4.4	81.5	88.2
2009	191	39	20.4	22.2	4.5	81.7	86.9
2010	247	48	19.4	23.6	4.4	79.4	83.8
2011	194	35	18.0	24.5	4.6	77.8	87.6
2012	244	52	21.3	25.5	4.6	80.7	86.9
2013	225	57	25.3	26.4	4.3	78.2	88.0
2014	226	66	29.2	27.5	3.8	78.3	91.6
2015	183	54	29.5	27.8	2.9	86.3	99.5
2016	130	53	40.8	28.0	3.2	76.2	94.6 ##
1998-2016	3074	868	28.2	28.0	4.6	81.7	92.0

3,074 cases diagnosed 1998-2016 are related to a total of 3,070 patients. Currently, in 1,004 (32.7 %) of these 3,070 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 801 / 168 / 35 (26.1 % / 5.5 % / 1.1 %) patients exist having 2 / 3 / 4+ malignancies.

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 retreived from the respective headings.

How to interpret:
In 2014, a subgroup of 226 cases has been diagnosed, of which 27.5 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 3.8 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1a

Cases by year of diagnosis, proportions of DCO, further malignancies, deaths, and active follow-up (MALES) (incl. DCO)

Year of diagnosis	Males n	Males %	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	24	48.0	4	16.7	12.5	5.3	83.3	95.8
1999	32	66.7	1	3.1	10.7	5.2	81.3	96.9
2000	39	48.1	11	28.2	10.5	5.1	76.9	97.4
2001	52	53.6	22	42.3	9.5	5.1	86.5	98.1
2002	63	52.5	18	28.6	10.0	5.2	82.5	95.2 #
2003	82	50.3	28	34.1	12.3	5.1	86.6	97.6
2004	76	45.5	28	36.8	14.1	5.3	88.2	97.4
2005	83	50.6	24	28.9	16.6	5.4	81.9	96.4
2006	109	57.4	42	38.5	19.1	5.3	89.9	96.3
2007	99	56.3	29	29.3	19.9	5.3	83.8	91.9 #
2008	90	50.6	24	26.7	21.5	5.0	73.3	83.3
2009	92	48.2	19	20.7	22.7	4.9	81.5	85.9
2010	125	50.6	30	24.0	23.8	4.9	84.8	87.2
2011	95	49.0	16	16.8	24.7	5.1	81.1	90.5
2012	115	47.1	20	17.4	25.6	5.7	80.9	87.0
2013	132	58.7	35	26.5	27.1	5.3	78.8	89.4
2014	108	47.8	33	30.6	28.5	4.4	76.9	88.9
2015	92	50.3	27	29.3	28.2	3.7	89.1	100.0
2016	74	56.9	24	32.4	28.5	2.8	70.3	93.2 ##
1998-2016	1582	51.5	435	27.5	28.5	5.3	82.0	92.1

1,582 cases diagnosed 1998-2016 are related to a total of 1,578 patients. Currently, in 526 (33.3 %) of these 1,578 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 419 / 90 / 17 (26.6 % / 5.7 % / 1.1 %) patients exist having 2 / 3 / 4+ malignancies.

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 retreived from the respective headings.

How to interpret:
In 2014, a subgroup of 108 cases has been diagnosed, of which 28.5 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 4.4 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1b

Cases by year of diagnosis, proportions of DCO, further malignancies, deaths, and active follow-up (FEMALES) (incl. DCO)

Year of diagnosis	Females n	Females %	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %	
1998	26	52.0			15.4	3.8	88.5	100.0	
1999	16	33.3	1	6.3	14.3	3.9	68.8	100.0	
2000	42	51.9	9	21.4	13.1	3.9	76.2	100.0	
2001	45	46.4	21	46.7	16.3	3.8	88.9	95.6	
2002	57	47.5	23	40.4	16.7	3.7	84.2	91.2	#
2003	81	49.7	30	37.0	18.4	3.7	82.7	98.8	
2004	91	54.5	38	41.8	20.1	3.7	78.0	94.5	
2005	81	49.4	31	38.3	19.4	3.7	80.2	95.1	
2006	81	42.6	31	38.3	20.2	3.6	90.1	97.5	
2007	77	43.8	23	29.9	20.3	3.8	85.7	93.5	#
2008	88	49.4	26	29.5	21.2	3.7	89.8	93.2	
2009	99	51.8	20	20.2	21.7	4.2	81.8	87.9	
2010	122	49.4	18	14.8	23.3	3.9	73.8	80.3	
2011	99	51.0	19	19.2	24.3	4.0	74.7	84.8	
2012	129	52.9	32	24.8	25.3	3.4	80.6	86.8	
2013	93	41.3	22	23.7	25.6	3.1	77.4	86.0	
2014	118	52.2	33	28.0	26.4	3.1	79.7	94.1	
2015	91	49.7	27	29.7	27.3	2.1	83.5	98.9	
2016	56	43.1	29	51.8	27.5	3.7	83.9	96.4	##
1998-2016	1492	48.5	433	29.0	27.5	3.8	81.3	91.9	

1,492 cases diagnosed 1998-2016 are related to a total of 1,492 patients. Currently, in 478 (32.0 %) of these 1,492 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 382 / 78 / 18 (25.6 % / 5.2 % / 1.2 %) patients exist having 2 / 3 / 4+ malignancies.

\# 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 retreived from the respective headings.

How to interpret:
In 2014, a subgroup of 118 cases has been diagnosed, of which 26.4 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 3.1 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 2

Incidence measures by year of diagnosis including DCO cases
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.81 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	24	26	2.2	2.2	1.7	1.6	2.1	1.8	2.5	2.0
1999	32	16	2.9	1.3	1.8	0.9	2.5	1.1	2.9	1.2
2000	39	42	3.4	3.5	2.8	2.2	3.3	2.8	3.8	3.2
2001	52	45	4.5	3.7	2.6	1.8	3.8	2.7	5.0	3.3
2002	63	57	3.4	2.9	2.3	1.5	3.0	2.0	3.6	2.5
2003	82	81	4.4	4.1	2.4	2.3	3.7	3.0	4.8	3.5
2004	76	91	4.0	4.6	2.4	2.7	3.4	3.4	4.2	4.0
2005	83	81	4.4	4.1	2.7	2.3	3.6	2.9	4.6	3.5
2006	109	81	5.7	4.0	3.2	1.8	4.5	2.4	5.9	3.2
2007	99	77	4.5	3.3	2.8	1.8	3.7	2.3	4.5	2.9
2008	90	88	4.0	3.8	2.7	1.8	3.3	2.5	4.0	3.2
2009	92	99	4.1	4.3	2.4	2.1	3.2	2.9	4.0	3.5
2010	125	122	5.5	5.2	3.1	2.5	4.3	3.4	5.4	4.2
2011	95	99	4.2	4.2	2.5	2.5	3.3	3.0	4.0	3.5
2012	115	129	5.1	5.5	2.6	3.0	3.7	3.8	4.8	4.5
2013	132	93	5.7	3.9	2.8	1.8	4.0	2.5	5.4	3.1
2014	108	118	4.6	4.9	2.1	2.3	3.1	3.1	4.2	4.0
2015	92	91	3.9	3.7	1.8	1.5	2.7	2.2	3.5	2.8
2016	74	56	3.1	2.3	1.4	1.0	2.1	1.4	2.8	1.7
1998-2016	1582	1492	4.3	3.9	2.5	2.0	3.4	2.7	4.3	3.2

The computation of the incidence measures includes all cancers, 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	50	57.7	23.2	0.9	88.3	26.1	42.4	62.1	76.5	84.9
1999	48	61.6	18.0	12.6	88.2	38.9	54.2	63.8	75.0	79.3
2000	81	56.2	21.3	0.4	94.3	30.7	41.9	60.2	72.7	79.7
2001	97	65.4	13.9	26.8	92.7	45.0	57.2	66.2	76.3	81.0
2002	120	62.8	18.8	2.0	94.9	36.9	52.4	67.5	77.4	83.1
2003	163	65.3	17.3	1.0	93.6	42.5	55.1	66.7	79.4	83.6
2004	167	64.9	18.9	0.4	92.3	39.1	57.0	68.3	78.5	84.2
2005	164	62.8	20.2	0.6	91.3	34.4	52.0	68.0	78.3	83.1
2006	190	67.7	17.8	1.0	95.1	41.2	62.9	72.3	79.6	84.6
2007	176	63.1	19.1	3.0	94.5	36.4	55.3	68.4	75.9	82.3
2008	178	64.4	19.6	0.6	94.8	35.0	55.0	69.2	77.7	83.9
2009	191	65.0	18.9	4.2	99.2	37.6	52.8	70.5	78.4	86.3
2010	247	67.5	17.3	1.3	94.2	46.4	59.6	70.7	78.3	86.3
2011	194	63.8	19.9	0.3	98.4	39.2	54.0	69.7	77.1	84.7
2012	244	66.2	17.6	0.0	92.6	44.2	57.0	70.5	78.9	83.4
2013	225	69.4	16.7	0.5	92.7	48.8	64.6	73.7	79.7	84.8
2014	226	70.0	15.7	0.5	95.9	48.1	65.6	74.1	79.6	85.6
2015	183	71.0	14.6	1.8	92.7	49.9	62.2	75.0	80.7	87.5
2016	130	70.7	15.9	12.6	94.2	45.1	63.9	74.7	83.0	87.1
1998-2016	3074	66.0	18.2	0.0	99.2	40.5	57.3	70.5	78.6	84.4

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	24	57.0	24.3	0.9	88.3	24.3	40.8	63.2	75.9	84.3
1999	32	61.1	15.7	26.3	86.9	39.5	51.1	61.3	73.8	77.7
2000	39	53.8	24.2	0.4	86.5	8.6	37.0	61.2	72.7	80.3
2001	52	64.4	13.7	30.9	92.7	45.0	56.6	65.0	76.2	80.1
2002	63	60.2	20.3	2.0	94.9	30.6	51.9	64.1	73.8	81.2
2003	82	67.4	15.6	10.1	93.6	44.8	59.0	68.7	79.2	85.6
2004	76	66.1	17.8	0.4	89.2	40.2	60.9	68.5	78.6	85.0
2005	83	62.4	19.5	2.7	91.3	32.1	52.1	68.2	77.1	81.0
2006	109	65.8	17.2	1.0	93.6	40.8	60.7	70.6	76.3	81.6
2007	99	61.0	19.8	3.0	94.5	32.1	48.7	67.6	75.0	81.9
2008	90	61.2	22.3	0.6	93.8	26.3	49.1	68.9	75.6	82.4
2009	92	63.8	18.7	4.2	87.9	37.6	52.6	70.1	76.0	82.0
2010	125	66.6	16.6	2.9	92.8	47.8	60.3	69.9	76.9	83.4
2011	95	64.7	18.3	6.4	98.4	41.9	56.0	68.1	76.8	83.0
2012	115	67.8	15.3	9.9	92.6	47.0	59.5	70.6	79.4	84.4
2013	132	70.1	15.4	0.5	92.7	55.9	66.1	73.0	78.6	84.3
2014	108	72.2	15.2	0.5	95.9	53.3	68.7	75.1	81.4	86.0
2015	92	70.8	15.1	1.8	92.5	51.6	62.1	75.0	80.0	86.6
2016	74	70.9	14.2	24.8	92.2	50.1	65.8	73.8	82.3	85.4
1998-2016	1582	65.7	18.0	0.4	98.4	40.9	58.1	70.3	77.7	83.6

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	26	58.3	22.5	1.3	87.5	27.9	43.1	60.4	76.6	85.4
1999	16	62.7	22.6	12.6	88.2	15.1	54.6	70.1	76.6	87.9
2000	42	58.4	18.2	16.5	94.3	35.6	46.4	60.1	73.8	78.6
2001	45	66.5	14.2	26.8	89.5	49.8	57.3	71.1	76.3	81.9
2002	57	65.6	16.6	13.5	89.0	42.8	55.9	69.0	80.1	83.5
2003	81	63.2	18.7	1.0	89.1	40.2	50.0	65.3	79.4	82.7
2004	91	63.9	19.8	0.7	92.3	37.9	54.9	67.2	78.2	83.4
2005	81	63.3	20.9	0.6	90.8	38.6	51.8	66.8	80.4	83.9
2006	81	70.4	18.4	1.8	95.1	47.8	66.3	76.0	82.0	86.6
2007	77	65.8	17.9	3.5	94.3	42.1	60.4	69.5	76.8	84.3
2008	88	67.6	16.0	15.7	94.8	45.9	61.4	70.0	79.0	84.0
2009	99	66.2	19.1	17.8	99.2	37.0	53.9	71.7	81.2	87.0
2010	122	68.3	18.1	1.3	94.2	46.4	59.3	71.2	81.3	87.0
2011	99	63.0	21.3	0.3	90.0	35.2	49.4	70.5	78.5	85.4
2012	129	64.7	19.3	0.0	92.4	40.1	56.5	70.5	78.3	83.2
2013	93	68.3	18.4	11.1	91.2	37.9	60.7	74.3	82.0	86.3
2014	118	68.0	16.0	9.9	93.2	44.4	62.8	72.8	78.2	83.8
2015	91	71.2	14.2	30.6	92.7	49.9	63.1	75.1	80.8	87.5
2016	56	70.4	18.1	12.6	94.2	42.2	60.0	76.7	83.9	88.1
1998-2016	1492	66.2	18.5	0.0	99.2	40.2	57.0	70.9	79.4	85.3

Table 4

Age distribution by 5-year age group and sex for period 2007-2016
(incl. DCO)

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	21	1.1	1.1	11	1.1	1.1	10	1.0	1.0
5-9	8	0.4	1.5	6	0.6	1.7	2	0.2	1.2
10-14	12	0.6	2.1	6	0.6	2.3	6	0.6	1.9
15-19	14	0.7	2.8	9	0.9	3.1	5	0.5	2.4
20-24	19	1.0	3.7	8	0.8	3.9	11	1.1	3.5
25-29	21	1.1	4.8	11	1.1	5.0	10	1.0	4.5
30-34	28	1.4	6.2	11	1.1	6.1	17	1.7	6.3
35-39	43	2.2	8.3	16	1.6	7.6	27	2.8	9.1
40-44	64	3.2	11.5	33	3.2	10.9	31	3.2	12.2
45-49	85	4.3	15.8	40	3.9	14.8	45	4.6	16.9
50-54	89	4.5	20.3	49	4.8	19.6	40	4.1	21.0
55-59	111	5.6	25.8	48	4.7	24.3	63	6.5	27.5
60-64	146	7.3	33.1	76	7.4	31.7	70	7.2	34.7
65-69	237	11.9	45.0	135	13.2	44.9	102	10.5	45.2
70-74	318	15.9	61.0	180	17.6	62.5	138	14.2	59.4
75-79	336	16.9	77.8	175	17.1	79.6	161	16.6	75.9
80-84	241	12.1	89.9	122	11.9	91.6	119	12.2	88.2
85+	201	10.1	100.0	86	8.4	100.0	115	11.8	100.0
All ages	1994	100.0		1022	100.0		972	100.0	

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 2007-2016

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males DCO rate n=257 %	Females DCO rate n=249 %	Males Prop.all cancers n=113978 %	Females Prop.all cancers n=112253 %
0- 4	11	10	1.0	0.9	9.1		5.6	6.7
5- 9	6	2	0.5	0.2			5.8	2.4
10-14	6	6	0.5	0.6		16.7	5.2	5.9
15-19	9	5	0.7	0.4			3.6	2.4
20-24	8	11	0.6	0.8			1.7	2.9
25-29	11	10	0.7	0.6			1.6	1.2
30-34	11	17	0.7	1.1		5.9	1.2	1.2
35-39	16	27	1.0	1.7	18.8	3.7	1.2	1.1
40-44	33	31	1.8	1.7	9.1	9.7	1.5	0.7
45-49	40	45	2.0	2.4	12.5	17.8	1.0	0.7
50-54	49	40	2.8	2.3	16.3	10.0	0.8	0.5
55-59	48	63	3.4	4.3	16.7	14.3	0.5	0.7
60-64	76	70	6.2	5.3	17.1	15.7	0.6	0.6
65-69	135	102	11.4	7.9	23.0	28.4	0.7	0.7
70-74	179	138	16.2	10.9	26.8	25.4	0.9	0.9
75-79	175	161	22.0	16.1	26.9	32.9	1.1	1.2
80-84	122	119	26.5	16.8	42.6	38.7	1.1	1.1
85+	86	115	28.1	15.7	44.2	41.7	1.1	0.9
All ages	1021	972			25.2	25.6	0.9	0.9
Incidence								
Raw			4.5	4.1				
WS			2.4	2.0				
ES			3.3	2.7				
BRD-S			4.2	3.3				

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).

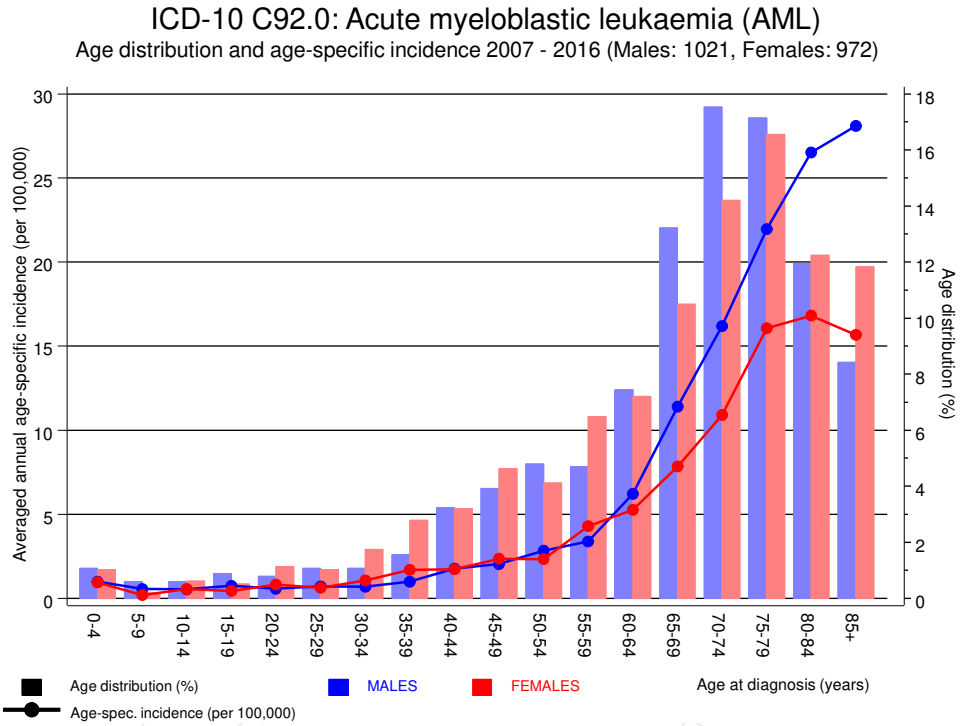


Figure 6. Age distribution (males: mean=67.0 yrs, median=71.4 yrs; females: mean=67.2 yrs, median=71.9 yrs) and age-specific incidence.

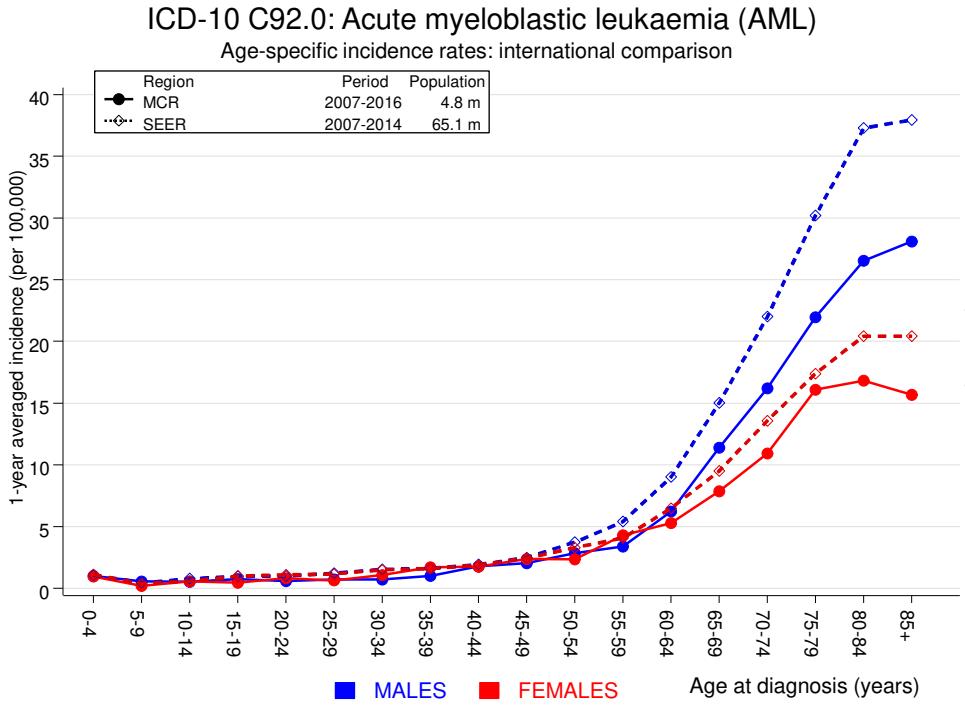


Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

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.

Table 7a

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of further malignancies for period 1998-2016
MALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C15	Oesophagus	2	0.4	4.7	0.6	16.9		8.1	50.0
C18	Colon	6	2.0	3.0	1.1	6.5	#	20.6	
C33-C34	Lung	6	2.6	2.3	0.8	5.0		17.5	16.7
C43	Malign. melanoma	2	1.0	2.0	0.2	7.2		5.1	
C46,C49	Soft tissue	2	0.1	15.8	1.9	57.1	#	9.6	
C61	Prostate	13	6.2	2.1	1.1	3.6	#	34.9	15.4
C70-C72	CNS cancer	2	0.3	6.5	0.8	23.4		8.7	
C81	Hodgkin lymphoma	2	0.1	30.5	3.7	110.2	#	10.0	
C82-C85	NHL	8	0.9	9.0	3.9	17.8	#	36.6	
C90	Mult. myeloma	4	0.3	14.5	4.0	37.2	#	19.2	
C91-C96	Leukaemia	12	0.4	33.8	17.5	59.0	#	59.9	50.0
Others, specified		10	3.4	3.0	1.4	5.5	#	34.1	10.0
Not observed		0	4.4	0.0	0.0	0.8	#	-22.5	
All further malignancies		69	22.0	3.1	2.4	4.0	#	241.8	15.9

Patients	1258
Median age at next malignancy (years)	67.6
Person-years	1944
Mean observation time (years)	1.5
Median observation time (years)	0.5

The occurrence of further malignancy listed is statistically significant.

Observed further malignancies with count 1 are pooled in category “Others, specified”.

Table 7b

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of further malignancies for period 1998–2016
FEMALES

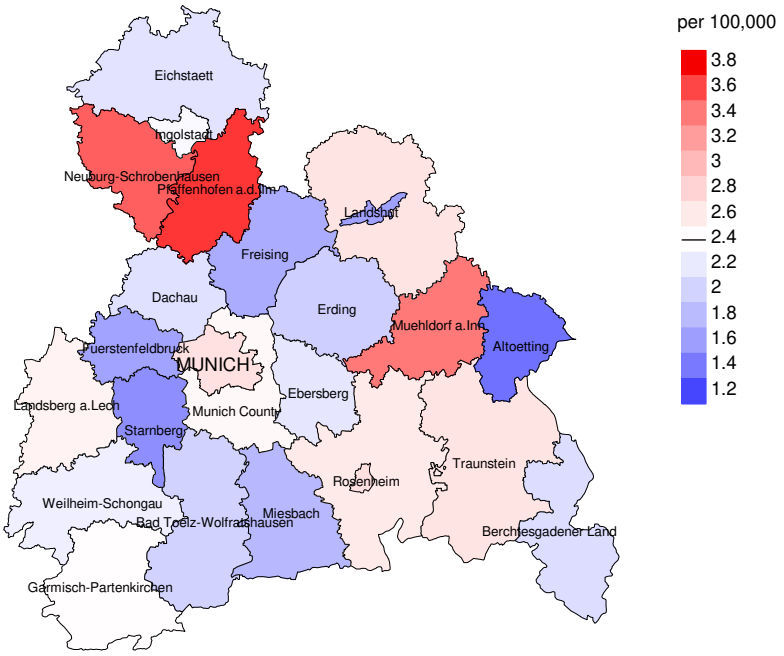
Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C15	Oesophagus	2	0.1	22.8	2.8	82.3	#	10.8	
C33–C34	Lung	4	1.0	3.9	1.1	9.9	#	16.8	
C50	Breast	8	4.6	1.8	0.8	3.5		19.5	12.5
C53	Cervix uteri	3	0.2	12.8	2.6	37.4	#	15.7	66.7
C54	Corpus uteri	4	0.8	5.2	1.4	13.2	#	18.3	
C91–C96	Leukaemia	2	0.2	9.5	1.2	34.4	#	10.1	50.0
Others, specified		11	4.8	2.3	1.1	4.1	#	35.2	9.1
Not observed		0	2.2	0.0	0.0	1.7		−12.4	
All further malignancies		34	13.9	2.5	1.7	3.4	#	114.0	14.7

Patients	1180
Median age at next malignancy (years)	68.4
Person-years	1766
Mean observation time (years)	1.5
Median observation time (years)	0.5

The occurrence of further malignancy listed is statistically significant.

Observed further malignancies with count 1 are pooled in category “Others, specified”.

Average incidence (world standard population) 2007 - 2016: Males



Average incidence (world standard population) 2007 - 2016: Females

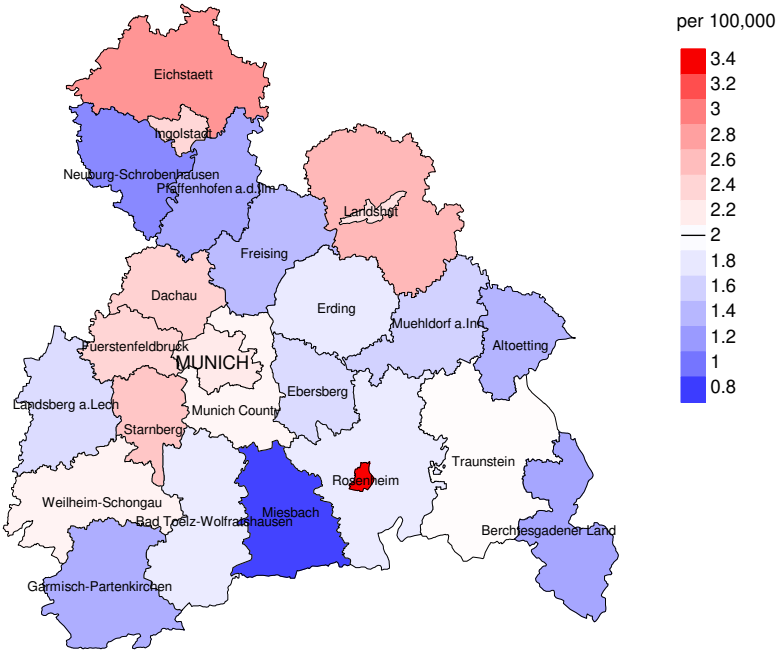
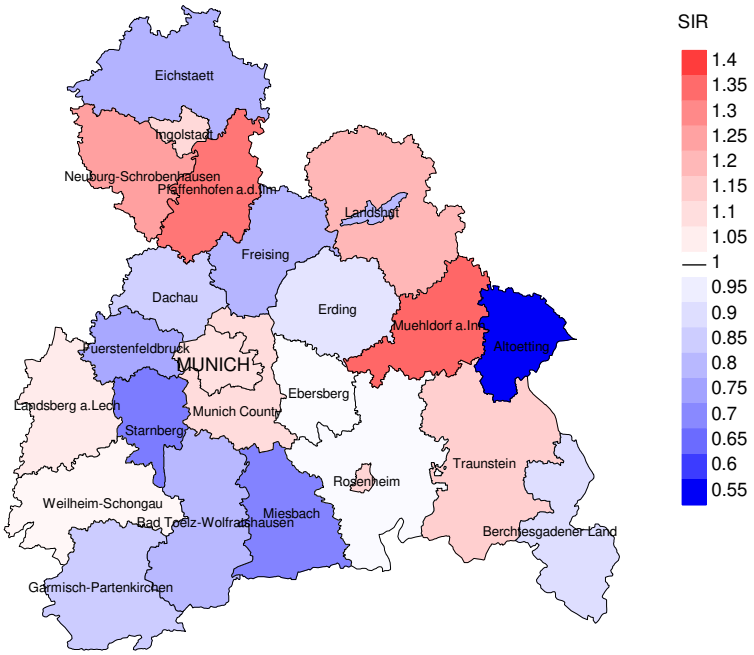


Figure 8a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 2.4/100,000 WS N=1,021, females 2.0/100,000 WS N=972).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 20 women were identified with newly diagnosed acute myelobl. leukemia. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 1.7/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.7 and 3.5/100,000.

Standardized incidence ratio (SIR) 2007 - 2016: Males



Standardized incidence ratio (SIR) 2007 - 2016: Females

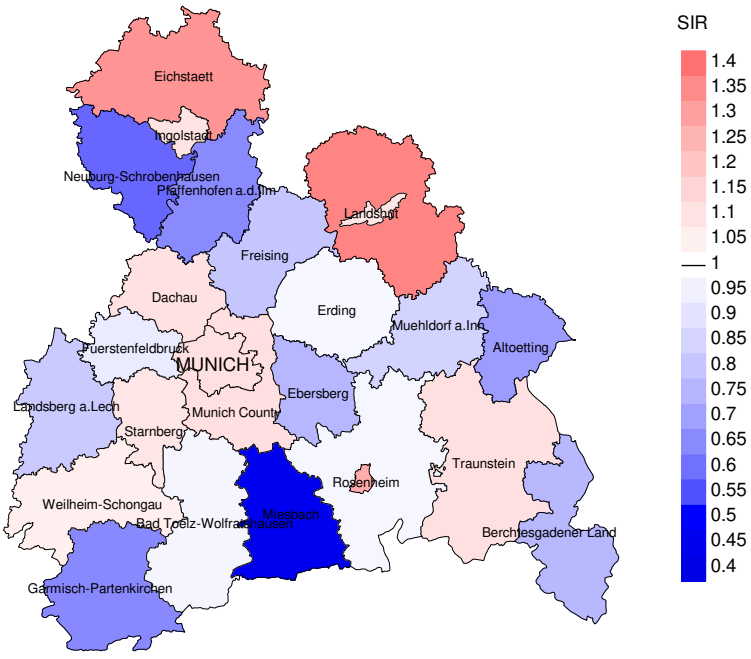


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=1,021, females N=972).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 20 women were identified with newly diagnosed acute myelobl. leukemia. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.76. Though, the value of this parameter may vary with an underlying probability of 99% between 0.39 and 1.31, and is therefore not statistically striking.

MORTALITY

Table 9a

Annual cohorts: Incident cancers, follow-up status, proportion of DCO, deaths among the annual cohorts and proportion of available death certificates (with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.81 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	50	98.0	8.0	43	86.0	97.7
1999	48	97.9	4.2	37	77.1	94.6
2000	81	98.8	24.7	62	76.5	95.2
2001	97	96.9	44.3	85	87.6	100.0
2002	120	93.3	34.2	100	83.3	97.0
2003	163	98.2	35.6	138	84.7	99.3
2004	167	95.8	39.5	138	82.6	99.3
2005	164	95.7	33.5	133	81.1	99.2
2006	190	96.8	38.4	171	90.0	98.2
2007	176	92.6	29.5	149	84.7	97.3
2008	178	88.2	28.1	145	81.5	99.3
2009	191	86.9	20.4	156	81.7	99.4
2010	247	83.8	19.4	196	79.4	98.0
2011	194	87.6	18.0	151	77.8	97.4
2012	244	86.9	21.3	197	80.7	97.0
2013	225	88.0	25.3	176	78.2	96.6
2014	226	91.6	29.2	177	78.3	98.3
2015	183	99.5	29.5	158	86.3	93.0
2016	130	94.6	40.8	99	76.2	86.9
1998-2016	3074	92.0	28.2	2511	81.7	97.3

Table 9b

Annual cohorts of incident cancers and deaths, proportion of death certificates and cases deceased within the same year of being diagnosed with cancer (incl. DCO)
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.81 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	50	47	97.9	23	46.0
1999	48	30	96.7	11	22.9
2000	81	52	98.1	33	40.7
2001	97	86	97.7	51	52.6
2002	120	84	97.6	54	45.0
2003	163	113	98.2	82	50.3
2004	167	102	99.0	79	47.3
2005	164	142	99.3	86	52.4
2006	190	130	98.5	112	58.9
2007	176	138	98.6	85	48.3
2008	178	138	97.8	88	49.4
2009	191	135	97.0	90	47.1
2010	247	177	97.7	119	48.2
2011	194	165	97.0	87	44.8
2012	244	177	98.9	111	45.5
2013	225	188	97.9	117	52.0
2014	226	174	98.3	119	52.7
2015	183	174	99.4	117	63.9
2016	130	117	98.3	86	66.2
1998-2016	3074	2369	98.2	1550	50.4

Table 9c

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 2.65 to 4.10 m as of 2002, and from 4.10 to 4.81 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. non-cancer-related %	Prop. cancer recorded on death certificate %
1998	47	80.9	19.1	95.7
1999	30	73.3	26.7	96.6
2000	52	94.2	5.8	100.0
2001	86	87.2	12.8	98.8
2002	84	92.9	7.1	100.0
2003	113	92.9	7.1	99.1
2004	102	96.1	3.9	99.0
2005	142	95.8	4.2	100.0
2006	130	94.6	5.4	98.4
2007	138	94.2	5.8	98.5
2008	138	92.8	7.2	96.3
2009	135	93.3	6.7	96.9
2010	177	94.9	5.1	98.8
2011	165	90.9	9.1	96.9
2012	177	95.5	4.5	99.4
2013	188	87.2	12.8	99.5
2014	174	87.9	12.1	97.1
2015	174	89.7	10.3	96.5
2016	117	88.0	12.0	97.4
1998-2016	2369	91.6	8.4	98.2

Table 10a

Medians of age at death according to the grouping in Table 9
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	24	60.8	61.4	57.0	61.4
1999	17	63.3	62.9	71.9	67.1
2000	33	63.4	63.4	61.4	65.6
2001	44	71.2	73.4	63.6	71.2
2002	43	69.1	68.5	74.2	69.3
2003	64	70.5	70.1	71.8	70.1
2004	50	71.8	72.7	64.7	72.0
2005	70	71.5	71.5	70.9	71.5
2006	76	71.5	71.5	71.0	71.1
2007	69	70.8	71.1	28.3	70.8
2008	73	72.2	72.9	68.1	72.5
2009	67	72.0	72.9	67.6	72.9
2010	86	72.2	72.2	67.5	72.2
2011	79	73.4	73.8	66.4	73.6
2012	87	73.2	73.2	48.8	73.2
2013	107	75.7	75.7	76.3	75.7
2014	92	75.6	75.6	74.7	75.7
2015	91	75.5	75.5	61.3	74.9
2016	65	74.9	75.1	74.9	75.5
1998-2016	1237	72.8	73.1	70.1	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 10b

Medians of age at death according to the grouping in Table 9
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	23	61.9	57.5	83.7	61.5
1999	13	74.3	75.8	63.9	74.7
2000	19	64.6	69.9	29.9	64.6
2001	42	68.7	69.6	61.7	69.6
2002	41	73.7	73.6	81.1	73.8
2003	49	71.2	72.9	52.5	71.2
2004	52	74.5	74.5	76.9	74.7
2005	72	71.0	71.4	29.8	71.0
2006	54	77.1	77.2	76.7	77.1
2007	69	70.1	70.6	55.7	70.5
2008	65	73.2	72.9	84.3	72.9
2009	68	74.0	74.1	63.8	74.0
2010	91	77.4	78.0	68.4	77.7
2011	86	72.9	72.9	78.2	73.0
2012	90	72.2	72.4	72.1	72.3
2013	81	75.8	74.0	79.4	74.6
2014	82	74.9	75.3	63.3	75.3
2015	83	74.9	74.8	77.7	74.9
2016	52	74.7	74.1	80.4	74.2
1998-2016	1132	73.8	74.1	72.1	74.0

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 11a

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	19	1.7	0.79	1.5	0.92	1.7	0.83	2.0	0.78
1999	12	1.1	0.38	0.6	0.34	0.9	0.36	1.1	0.36
2000	31	2.7	0.79	1.7	0.59	2.4	0.72	3.0	0.81
2001	39	3.4	0.75	1.9	0.74	3.0	0.77	4.2	0.85
2002	40	2.1	0.63	1.3	0.57	1.9	0.62	2.4	0.65
2003	59	3.1	0.72	1.8	0.72	2.6	0.71	3.5	0.72
2004	48	2.6	0.64	1.4	0.58	2.1	0.63	2.9	0.71
2005	66	3.5	0.80	1.8	0.66	2.7	0.76	3.7	0.82
2006	70	3.7	0.64	1.8	0.57	2.8	0.61	3.8	0.64
2007	67	3.0	0.68	1.6	0.57	2.3	0.63	3.2	0.71
2008	66	3.0	0.73	1.5	0.56	2.2	0.66	3.0	0.74
2009	63	2.8	0.68	1.4	0.58	2.0	0.65	2.8	0.71
2010	82	3.6	0.66	1.8	0.58	2.7	0.62	3.5	0.64
2011	71	3.2	0.75	1.5	0.60	2.2	0.67	3.1	0.77
2012	83	3.7	0.72	1.7	0.66	2.6	0.70	3.4	0.71
2013	94	4.1	0.72	1.7	0.60	2.6	0.66	3.8	0.71
2014	80	3.4	0.74	1.4	0.65	2.2	0.70	3.1	0.73
2015	80	3.4	0.87	1.5	0.84	2.2	0.84	3.0	0.87
2016	56	2.3	0.76	1.0	0.70	1.5	0.72	2.1	0.75
1998-2016	1126	3.1	0.71	1.5	0.63	2.3	0.68	3.1	0.72

Table 11b

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	19	1.6	0.73	1.2	0.79	1.4	0.76	1.5	0.78
1999	10	0.8	0.63	0.3	0.36	0.5	0.47	0.7	0.55
2000	18	1.5	0.43	0.7	0.30	1.0	0.34	1.2	0.38
2001	36	3.0	0.80	1.6	0.88	2.2	0.81	2.7	0.80
2002	38	1.9	0.67	0.9	0.58	1.2	0.61	1.6	0.67
2003	46	2.3	0.57	1.0	0.44	1.5	0.50	1.9	0.55
2004	50	2.5	0.55	1.1	0.40	1.6	0.47	2.0	0.51
2005	70	3.5	0.86	1.7	0.72	2.3	0.79	2.8	0.82
2006	53	2.6	0.65	1.0	0.58	1.5	0.63	2.2	0.67
2007	63	2.7	0.82	1.3	0.74	1.8	0.77	2.3	0.80
2008	62	2.7	0.70	1.1	0.59	1.6	0.64	2.1	0.66
2009	63	2.7	0.64	1.1	0.52	1.7	0.59	2.2	0.63
2010	86	3.7	0.70	1.3	0.52	2.0	0.58	2.7	0.66
2011	79	3.4	0.80	1.3	0.53	2.0	0.66	2.6	0.74
2012	86	3.6	0.67	1.6	0.53	2.2	0.58	2.9	0.63
2013	70	2.9	0.75	1.2	0.66	1.8	0.71	2.3	0.73
2014	73	3.0	0.62	1.1	0.49	1.7	0.54	2.2	0.57
2015	76	3.1	0.84	1.2	0.82	1.8	0.83	2.4	0.84
2016	47	1.9	0.84	0.9	0.91	1.2	0.89	1.5	0.85
1998-2016	1045	2.7	0.70	1.2	0.59	1.7	0.64	2.2	0.68

Table 12

Age distribution of age at death (cancer-related) for period 2007-2016
(**incl. multiple malignancies**)

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	1	0.1	0.1	1	0.1	0.1			0.0
5-9	1	0.1	0.1			0.1	1	0.1	0.1
10-14	6	0.4	0.6	2	0.3	0.4	4	0.6	0.7
15-19	4	0.3	0.8	2	0.3	0.7	2	0.3	1.0
20-24	6	0.4	1.2	4	0.5	1.2	2	0.3	1.3
25-29	11	0.8	2.0	9	1.2	2.4	2	0.3	1.6
30-34	5	0.3	2.3	1	0.1	2.6	4	0.6	2.1
35-39	15	1.0	3.4	8	1.1	3.6	7	1.0	3.1
40-44	29	2.0	5.4	11	1.5	5.1	18	2.6	5.7
45-49	45	3.1	8.5	23	3.1	8.2	22	3.1	8.8
50-54	49	3.4	11.9	28	3.8	12.0	21	3.0	11.8
55-59	68	4.7	16.6	24	3.2	15.2	44	6.2	18.0
60-64	93	6.4	23.0	47	6.3	21.6	46	6.5	24.5
65-69	169	11.7	34.7	97	13.1	34.6	72	10.2	34.8
70-74	287	19.8	54.5	153	20.6	55.3	134	19.0	53.8
75-79	293	20.2	74.8	164	22.1	77.4	129	18.3	72.1
80-84	197	13.6	88.4	96	12.9	90.3	101	14.3	86.4
85+	168	11.6	100.0	72	9.7	100.0	96	13.6	100.0
All ages	1447	100.0		742	100.0		705	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2016
(**incl. multiple malignancies**)

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	1		0.1	0.09			6.7	
5- 9		1			0.1	0.50		5.6
10-14	2	4	0.2	0.33	0.4	0.67	8.7	16.7
15-19	2	2	0.2	0.22	0.2	0.40	4.5	9.1
20-24	4	2	0.3	0.50	0.1	0.18	7.0	6.1
25-29	9	2	0.6	0.82	0.1	0.20	12.2	2.7
30-34	1	4	0.1	0.09	0.3	0.24	1.0	3.3
35-39	8	7	0.5	0.50	0.4	0.26	4.0	2.5
40-44	11	18	0.6	0.33	1.0	0.58	2.2	2.7
45-49	23	22	1.2	0.58	1.2	0.49	2.0	1.7
50-54	28	21	1.6	0.57	1.2	0.53	1.4	1.1
55-59	24	44	1.7	0.50	3.0	0.70	0.7	1.5
60-64	47	46	3.8	0.62	3.5	0.66	0.9	1.2
65-69	97	72	8.2	0.72	5.5	0.71	1.3	1.4
70-74	153	134	13.8	0.85	10.6	0.97	1.6	2.0
75-79	164	129	20.6	0.94	12.9	0.80	1.8	1.8
80-84	96	101	20.9	0.79	14.3	0.85	1.3	1.5
85+	72	96	23.5	0.84	13.1	0.83	1.1	1.0
All ages	742	705					1.4	1.5
Mortality								
Raw			3.2	0.73	3.0	0.73		
WS			1.5	0.63	1.2	0.60		
ES			2.3	0.68	1.8	0.65		
BRD-S			3.1	0.73	2.3	0.69		
PYLL-70								
per 100,000			16.7		17.0			
ES			15.3		15.5			
AYLL-70			13.1		13.8			

Table 14a

Further malignancies in deaths in period 1998–2016
MALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C16	Stomach	4	1.1	4	100.0				
C18	Colon	32	9.2	25	78.1	3	9.4	4	12.5
C19–C20	Rectum	11	3.2	9	81.8	1	9.1	1	9.1
C25	Pancreas	5	1.4			1	20.0	4	80.0
C33–C34	Lung	18	5.2	10	55.6	4	22.2	4	22.2
C43	Malign. melanoma	12	3.4	12	100.0				
C44	Skin others	23	6.6	13	56.5	4	17.4	6	26.1
C61	Prostate	89	25.6	80	89.9	3	3.4	6	6.7
C64	Kidney	11	3.2	11	100.0				
C67	Bladder	13	3.7	11	84.6	2	15.4		
C70–C72	CNS cancer	4	1.1	1	25.0	1	25.0	2	50.0
C81	Hodgkin lymphoma	8	2.3	6	75.0			2	25.0
C82–C85	NHL	42	12.1	30	71.4	5	11.9	7	16.7
C90	Mult. myeloma	5	1.4	3	60.0	2	40.0		
C91–C96	Leukaemia	38	10.9			9	23.7	29	76.3
Others, specified		33	9.5	22	66.7	4	12.1	7	21.2
All further malignancies		348	100.0	237	68.1	39	11.2	72	20.7

Further malignancies with number of cases 1 to 3 are pooled in category “Others, specified”.

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 further malignancy.

Table 14b

Further malignancies in deaths in period 1998-2016
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C16	Stomach	4	1.3	4	100.0				
C18	Colon	12	4.0	10	83.3	1	8.3	1	8.3
C19-C20	Rectum	7	2.3	4	57.1	1	14.3	2	28.6
C33-C34	Lung	10	3.3	6	60.0	2	20.0	2	20.0
C43	Malign. melanoma	9	3.0	9	100.0				
C44	Skin others	10	3.3	7	70.0			3	30.0
C50	Breast	111	36.6	102	91.9	5	4.5	4	3.6
C53	Cervix uteri	7	2.3	6	85.7	1	14.3		
C54	Corpus uteri	25	8.3	20	80.0	2	8.0	3	12.0
C56	Ovary	7	2.3	6	85.7			1	14.3
C64	Kidney	4	1.3	2	50.0	2	50.0		
C67	Bladder	4	1.3	4	100.0				
C73	Thyroid	12	4.0	11	91.7	1	8.3		
C76-C79	CUP	5	1.7	2	40.0	1	20.0	2	40.0
C81	Hodgkin lymphoma	5	1.7	5	100.0				
C82-C85	NHL	22	7.3	19	86.4	3	13.6		
C90	Mult. myeloma	6	2.0	5	83.3	1	16.7		
C91-C96	Leukaemia	21	6.9			2	9.5	19	90.5
Others, specified		22	7.3	12	54.5			10	45.5
All further malignancies		303	100.0	234	77.2	22	7.3	47	15.5

Further malignancies with number of cases 1 to 3 are pooled in category “Others, specified”.

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 further malignancy.

Table 15

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2016
(**First 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	1		0.1	0.09			7.1	
5- 9		1			0.1	1.00		5.6
10-14	2	2	0.2	0.40	0.2	0.40	8.7	9.5
15-19	2	2	0.2	0.29	0.2	0.40	4.8	10.0
20-24	3	1	0.2	0.50	0.1	0.09	5.9	3.2
25-29	8	2	0.5	0.73	0.1	0.25	11.9	3.0
30-34	1	4	0.1	0.11	0.3	0.27	1.0	3.8
35-39	7	7	0.4	0.47	0.4	0.27	3.7	2.7
40-44	10	14	0.5	0.33	0.8	0.58	2.2	2.4
45-49	19	15	1.0	0.61	0.8	0.48	1.8	1.3
50-54	21	15	1.2	0.51	0.9	0.56	1.2	0.9
55-59	19	28	1.3	0.49	1.9	0.61	0.6	1.2
60-64	30	31	2.4	0.54	2.3	0.62	0.7	1.0
65-69	56	52	4.7	0.69	4.0	0.79	1.0	1.2
70-74	85	71	7.7	0.85	5.6	0.85	1.2	1.3
75-79	94	77	11.8	0.93	7.7	0.80	1.4	1.4
80-84	58	70	12.6	0.81	9.9	0.93	1.1	1.3
85+	38	59	12.4	0.84	8.0	0.79	0.8	0.8
All ages	454	451					1.1	1.2
Mortality								
Raw			2.0	0.68	1.9	0.69		
WS			1.0	0.57	0.8	0.54		
ES			1.4	0.63	1.2	0.61		
BRD-S			1.9	0.68	1.5	0.65		
PYLL-70								
per 100,000			13.4		12.5			
ES			12.5		11.4			
AYLL-70			15.1		14.3			

* See corresponding tables with multiple malignancies.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2016
(**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	1		0.1	0.09			7.1	
5- 9		1			0.1	1.00		5.6
10-14	2	2	0.2	0.40	0.2	0.40	8.7	9.5
15-19	2	2	0.2	0.33	0.2	0.40	4.8	10.5
20-24	3	1	0.2	0.50	0.1	0.09	5.9	3.2
25-29	8	2	0.5	0.73	0.1	0.33	11.9	3.1
30-34	1	4	0.1	0.11	0.3	0.27	1.0	3.8
35-39	7	5	0.4	0.47	0.3	0.23	3.7	2.0
40-44	10	12	0.5	0.34	0.7	0.52	2.2	2.0
45-49	16	14	0.8	0.55	0.7	0.45	1.5	1.3
50-54	19	15	1.1	0.51	0.9	0.68	1.1	0.9
55-59	16	25	1.1	0.44	1.7	0.56	0.6	1.1
60-64	29	29	2.4	0.56	2.2	0.64	0.7	1.0
65-69	49	45	4.1	0.65	3.5	0.71	0.9	1.1
70-74	81	68	7.3	0.87	5.4	0.85	1.2	1.3
75-79	87	73	10.9	0.90	7.3	0.78	1.4	1.4
80-84	57	68	12.4	0.80	9.6	0.92	1.1	1.3
85+	35	57	11.4	0.83	7.8	0.77	0.8	0.8
All ages	423	423					1.1	1.2
Mortality								
Raw			1.9	0.67	1.8	0.68		
WS			0.9	0.56	0.7	0.53		
ES			1.3	0.62	1.1	0.59		
BRD-S			1.8	0.67	1.4	0.64		
PYLL-70								
per 100,000			12.6		11.4			
ES			11.8		10.5			
AYLL-70			15.6		14.5			

* See corresponding tables with multiple malignancies.

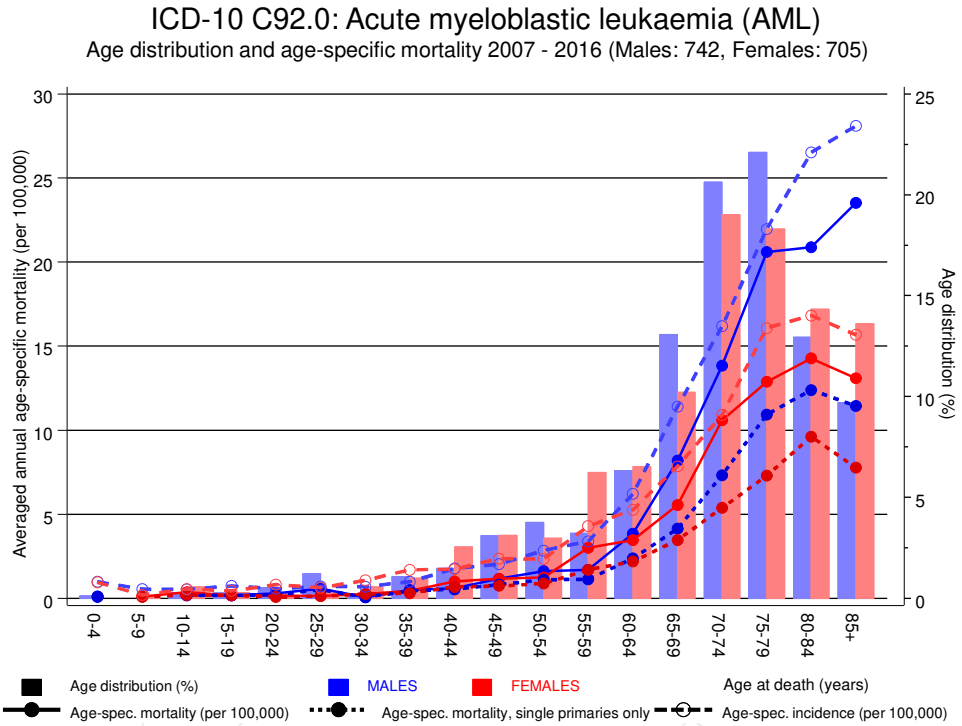


Figure 17. Distribution of age at death (bars; males: mean=70.0 yrs, median=73.0 yrs; females: mean=70.3 yrs, median=73.0 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

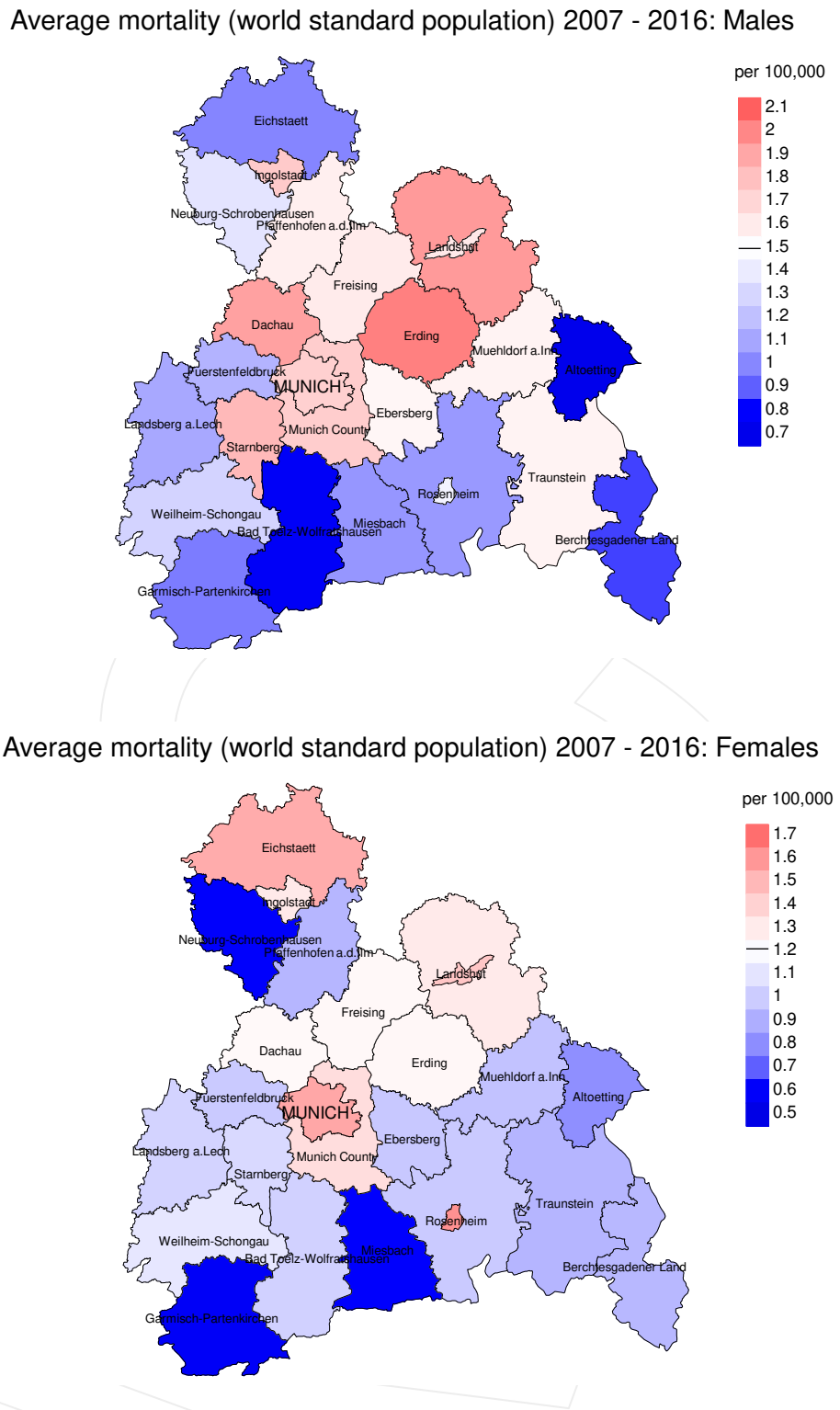
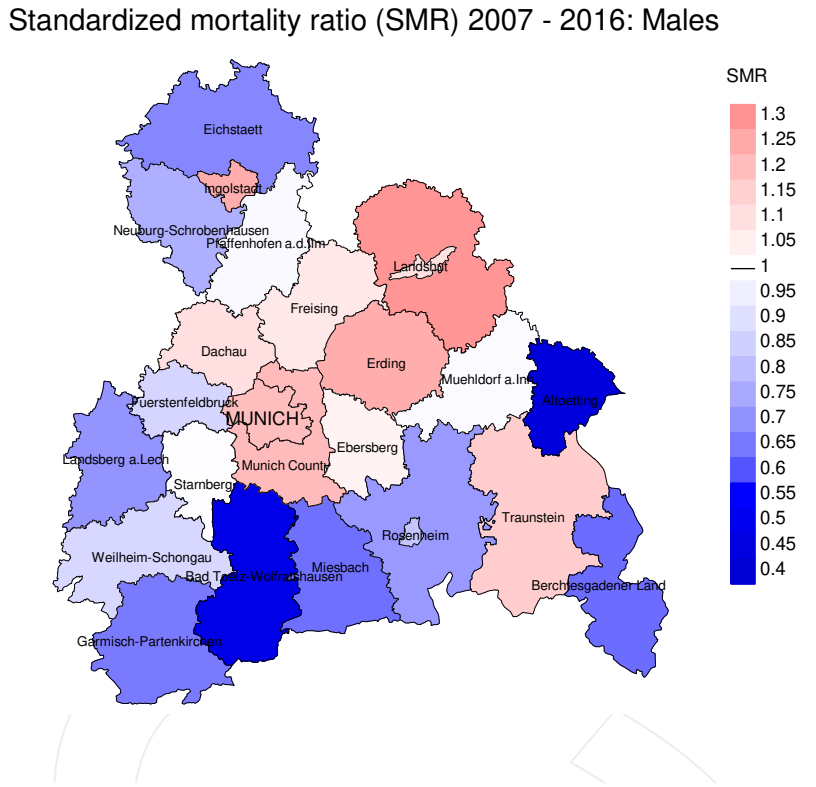


Figure 18a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2016. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 1.5/100,000 WS N=742, females 1.2/100,000 WS N=705).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 14 women died from acute myelobl. leukemia. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 1.0/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.4 and 2.2/100,000.



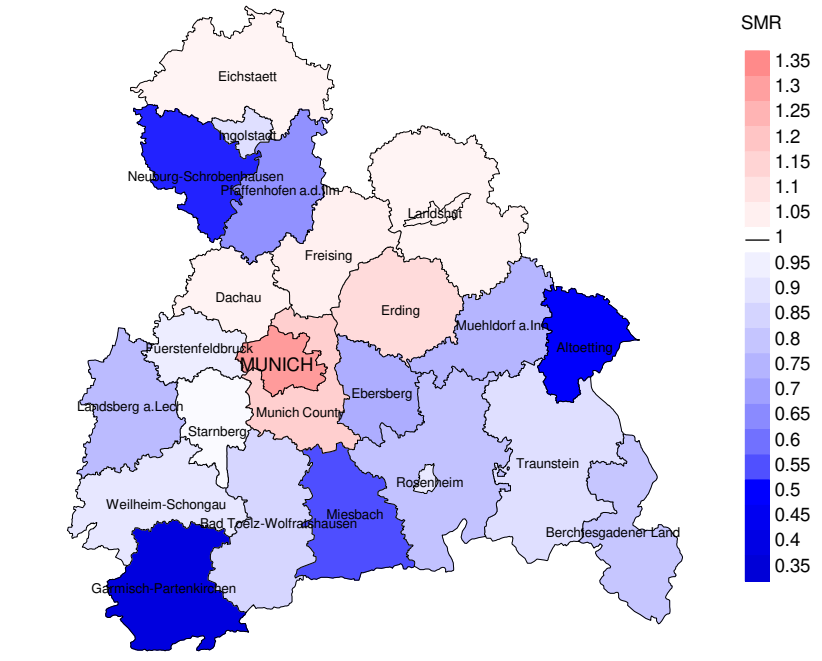


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=742, females N=705).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 14 women died from acute myelobl. leukemia. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.74. Though, the value of this parameter may vary with an underlying probability of 99% between 0.33 and 1.41, 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

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

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