Munich Cancer Registry

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ICD-10 C92: Myeloid leukaemia

Incidence and Mortality

Year of diagnosis	1998-2016
Patients	4,202
Diseases	4,218
Creation date	08/21/2018
Export date	08/09/2018
Population	4.81 m

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

https://www.tumorregister-muenchen.de/en/facts/base/bC92__E-ICD-10-C92-Myeloid-leukaemia-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.-	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

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	95	29	30.5	10.5	5.7	88.4	98.9
1999	117	36	30.8	11.8	5.7	82.1	99.1
2000	132	41	31.1	11.3	5.6	76.5	99.2
2001	139	61	43.9	12.0	5.6	83.5	97.1
2002	182	63	34.6	11.9	5.6	78.0	92.9 #
2003	239	85	35.6	13.2	5.5	79.9	97.5
2004	228	87	38.2	14.6	5.6	78.9	95.6
2005	220	73	33.2	15.5	5.5	77.3	95.9
2006	247	95	38.5	17.1	5.3	85.4	93.9
2007	239	72	30.1	17.7	5.1	77.4	88.7 #
2008	250	77	30.8	19.1	4.7	75.6	84.8
2009	256	56	21.9	19.8	4.7	73.8	82.8
2010	322	66	20.5	21.2	4.6	73.3	80.7
2011	252	51	20.2	22.0	4.6	74.6	85.7
2012	312	68	21.8	23.0	4.5	73.1	81.7
2013	291	79	27.1	23.9	4.4	71.5	84.5
2014	291	83	28.5	24.9	3.9	69.4	85.6
2015	242	69	28.5	25.3	3.3	76.9	99.2
2016	164	68	41.5	25.5	3.8	70.7	94.5 ##
1998-2016	4218	1259	29.8	25.5	5.7	76.3	90.0

4,218 cases diagnosed 1998-2016 are related to a total of 4,202 patients. Currently, in 1,300 (30.9 %) of these 4,202 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 1,033 / 219 / 48 (24.6 % / 5.2 % / 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 291 cases has been diagnosed, of which 24.9 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 3.9 % 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	47	49.5	17	36.2	10.6	6.3	89.4	97.9
1999	66	56.4	17	25.8	10.6	6.2	80.3	98.5
2000	67	50.8	21	31.3	10.0	6.1	79.1	98.5
2001	71	51.1	28	39.4	9.6	6.1	81.7	97.2
2002	91	50.0	25	27.5	9.6	6.3	76.9	94.5 #
2003	120	50.2	39	32.5	11.0	6.1	81.7	95.8
2004	111	48.7	38	34.2	12.2	6.3	79.3	97.3
2005	106	48.2	30	28.3	14.1	6.1	81.1	97.2
2006	142	57.5	54	38.0	16.4	5.9	86.6	94.4
2007	134	56.1	38	28.4	17.3	5.8	75.4	86.6 #
2008	132	52.8	43	32.6	19.1	5.2	69.7	80.3
2009	128	50.0	30	23.4	20.0	5.0	74.2	81.3
2010	165	51.2	42	25.5	21.2	5.0	80.0	85.5
2011	131	52.0	26	19.8	21.9	4.9	74.8	84.7
2012	155	49.7	29	18.7	22.7	5.4	71.6	80.6
2013	172	59.1	48	27.9	24.1	5.3	72.7	86.6
2014	149	51.2	43	28.9	25.4	4.5	65.1	81.2
2015	124	51.2	36	29.0	25.3	3.3	77.4	99.2
2016	91	55.5	33	36.3	25.7	2.2	69.2	94.5 ##
1998-2016	2202	52.2	637	28.9	25.7	6.3	76.3	89.6

2,202 cases diagnosed 1998-2016 are related to a total of 2,190 patients. Currently, in 683 (31.2 %) of these 2,190 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 538 / 120 / 25 (24.6 % / 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 149 cases has been diagnosed, of which 25.4 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 4.5 % 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	48	50.5	12	25.0	10.4	4.9	87.5	100.0	
1999	51	43.6	19	37.3	13.1	5.1	84.3	100.0	
2000	65	49.2	20	30.8	12.8	5.1	73.8	100.0	
2001	68	48.9	33	48.5	14.7	5.0	85.3	97.1	
2002	91	50.0	38	41.8	14.2	4.8	79.1	91.2	#
2003	119	49.8	46	38.7	15.4	4.8	78.2	99.2	
2004	117	51.3	49	41.9	17.0	4.8	78.6	94.0	
2005	114	51.8	43	37.7	16.9	4.8	73.7	94.7	
2006	105	42.5	41	39.0	17.9	4.5	83.8	93.3	
2007	105	43.9	34	32.4	18.1	4.4	80.0	91.4	#
2008	118	47.2	34	28.8	19.0	4.1	82.2	89.8	
2009	128	50.0	26	20.3	19.7	4.4	73.4	84.4	
2010	157	48.8	24	15.3	21.2	4.1	66.2	75.8	
2011	121	48.0	25	20.7	22.1	4.2	74.4	86.8	
2012	157	50.3	39	24.8	23.3	3.5	74.5	82.8	
2013	119	40.9	31	26.1	23.6	3.4	69.7	81.5	
2014	142	48.8	40	28.2	24.4	3.4	73.9	90.1	
2015	118	48.8	33	28.0	25.3	3.2	76.3	99.2	
2016	73	44.5	35	47.9	25.4	5.6	72.6	94.5	##
1998-2016	2016	47.8	622	30.9	25.4	4.9	76.2	90.4	

2,016 cases diagnosed 1998-2016 are related to a total of 2,012 patients. Currently, in 617 (30.7 %) of these 2,012 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 495 / 99 / 23 (24.6 % / 4.9 % / 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 142 cases has been diagnosed, of which 24.4 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 3.4 % 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 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	47	48	4.2	4.1	2.9	2.5	4.0	3.1	5.1	3.5
1999	66	51	5.9	4.3	3.7	2.3	5.2	3.1	6.3	3.9
2000	67	65	5.9	5.4	4.5	3.1	5.6	4.1	6.5	4.7
2001	71	68	6.1	5.6	3.8	2.7	5.3	3.9	6.7	4.9
2002	91	91	4.9	4.6	3.3	2.4	4.3	3.3	5.4	3.9
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	106	114	5.6	5.7	3.4	3.1	4.5	4.0	5.8	4.9
2006	142	105	7.4	5.2	4.2	2.3	5.9	3.2	7.7	4.2
2007	134	105	6.0	4.5	3.8	2.3	4.9	3.1	6.1	3.8
2008	132	118	5.9	5.1	3.7	2.3	4.7	3.3	5.9	4.2
2009	128	128	5.7	5.5	3.4	2.8	4.5	3.7	5.5	4.5
2010	165	157	7.3	6.7	4.1	3.2	5.7	4.4	7.2	5.3
2011	131	121	5.9	5.2	3.4	2.9	4.6	3.6	5.5	4.3
2012	155	157	6.8	6.7	3.5	3.6	5.0	4.6	6.5	5.4
2013	172	119	7.5	5.0	3.6	2.3	5.2	3.2	6.9	4.0
2014	149	142	6.4	5.9	2.9	2.7	4.4	3.7	5.8	4.7
2015	124	118	5.2	4.8	2.4	1.9	3.6	2.8	4.7	3.7
2016	91	73	3.8	3.0	1.7	1.3	2.6	1.8	3.4	2.2
1998-2016	2202	2016	6.0	5.3	3.4	2.6	4.7	3.5	6.0	4.3

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	95	62.0	21.5	0.9	94.1	32.4	48.5	68.2	77.8	86.3
1999	117	64.5	17.4	1.5	92.0	39.5	55.6	69.5	76.8	85.0
2000	132	59.5	20.9	0.4	97.6	32.8	46.6	63.2	74.5	81.3
2001	139	64.6	16.5	9.8	96.4	38.2	56.5	66.2	77.1	82.1
2002	182	63.3	18.2	2.0	96.1	38.0	52.8	67.5	77.3	83.0
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	220	63.8	19.3	0.6	92.9	38.5	53.7	69.2	78.3	83.5
2006	247	67.9	17.4	1.0	95.1	40.9	62.5	72.3	79.5	84.8
2007	239	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	256	64.8	18.4	4.2	100	38.2	52.8	69.3	77.5	86.3
2010	322	67.6	17.3	1.3	94.2	47.1	59.3	71.0	79.0	86.4
2011	252	64.3	19.1	0.3	98.4	41.3	54.2	69.6	77.3	84.1
2012	312	66.3	18.2	0.0	98.7	43.0	57.0	71.1	79.4	84.5
2013	291	69.0	16.7	0.5	92.7	48.8	63.3	72.9	79.7	84.8
2014	291	69.9	16.2	0.5	95.9	46.9	64.2	74.1	80.7	85.8
2015	242	71.1	15.2	1.8	95.3	48.7	62.2	75.1	81.4	87.6
2016	164	70.9	16.5	12.6	96.0	44.3	63.8	75.1	83.3	88.0
1998-2016	4218	66.2	18.1	0.0	100	40.6	57.0	70.6	78.9	85.0

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	47	62.9	21.6	0.9	94.1	32.4	48.7	70.1	76.7	86.5
1999	66	63.1	17.3	1.5	91.5	38.9	55.0	66.4	74.8	81.5
2000	67	56.8	22.3	0.4	97.6	22.7	43.0	62.5	72.7	79.7
2001	71	61.4	17.3	9.8	96.4	37.9	51.2	63.1	76.3	80.8
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	106	62.6	19.0	2.7	91.3	36.4	51.1	68.8	77.1	81.1
2006	142	66.5	16.6	1.0	93.6	41.9	60.7	70.7	76.5	82.2
2007	134	61.3	19.6	3.0	94.5	32.6	48.2	67.2	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	63.4	18.2	4.2	92.2	37.6	51.9	69.3	75.7	82.7
2010	165	66.8	16.9	2.9	93.4	47.8	60.3	70.7	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	155	67.0	17.1	9.9	94.0	43.0	57.7	70.6	80.1	84.7
2013	172	69.3	15.8	0.5	92.7	49.6	65.4	72.5	78.4	84.3
2014	149	71.1	15.7	0.5	95.9	52.2	66.4	74.2	81.3	86.0
2015	124	70.6	15.6	1.8	92.5	47.9	62.1	75.0	80.9	86.8
2016	91	71.1	14.9	24.8	96.0	50.1	65.8	74.4	82.3	86.0
1998-2016	2202	65.5	18.0	0.4	98.4	40.1	57.0	70.1	77.8	83.9

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	51	66.3	17.5	12.6	92.0	44.5	55.6	71.3	77.3	85.0
2000	65	62.3	19.0	16.5	94.3	35.6	49.8	64.6	76.1	86.2
2001	68	67.9	14.9	26.8	91.1	49.8	58.7	71.2	79.5	84.4
2002	91	66.4	16.3	13.5	96.1	43.2	55.9	69.0	80.1	85.1
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	114	64.8	19.6	0.6	92.9	40.9	56.5	69.2	79.7	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	128	66.1	18.5	17.8	100	38.7	54.2	69.3	79.7	87.0
2010	157	68.4	17.7	1.3	94.2	46.5	58.4	71.5	82.4	87.8
2011	121	64.2	20.4	0.3	90.0	40.1	51.4	70.7	79.1	85.2
2012	157	65.5	19.4	0.0	98.7	41.4	56.6	71.1	78.6	84.0
2013	119	68.5	18.0	11.1	92.4	38.9	59.6	74.1	82.4	87.0
2014	142	68.5	16.6	9.9	93.2	44.4	62.7	73.6	79.0	84.6
2015	118	71.6	14.7	30.6	95.3	49.0	63.1	75.2	81.7	88.5
2016	73	70.8	18.5	12.6	94.8	42.2	59.3	77.9	84.3	88.9
1998-2016	2016	66.9	18.1	0.0	100	41.4	57.0	71.4	80.3	86.1

Table 4

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

Age at diagnosis Years	Cases n	%	Males Cum.%	n	%	Females Cum.%	n	%	Cum.%
0-4	21	0.8	0.8	11	0.8	0.8	10	0.8	0.8
5-9	9	0.3	1.1	6	0.4	1.2	3	0.2	1.1
10-14	14	0.5	1.7	8	0.6	1.8	6	0.5	1.5
15-19	20	0.8	2.4	15	1.1	2.9	5	0.4	1.9
20-24	25	1.0	3.4	14	1.0	3.9	11	0.9	2.8
25-29	33	1.3	4.7	18	1.3	5.2	15	1.2	4.0
30-34	36	1.4	6.0	16	1.2	6.4	20	1.6	5.7
35-39	61	2.3	8.4	27	2.0	8.3	34	2.7	8.4
40-44	87	3.3	11.7	48	3.5	11.8	39	3.2	11.6
45-49	117	4.5	16.2	55	4.0	15.8	62	5.0	16.6
50-54	126	4.8	21.0	65	4.7	20.5	61	4.9	21.5
55-59	149	5.7	26.7	69	5.0	25.5	80	6.5	27.9
60-64	180	6.9	33.5	99	7.2	32.7	81	6.5	34.5
65-69	300	11.5	45.0	177	12.8	45.5	123	9.9	44.4
70-74	407	15.5	60.5	237	17.2	62.6	170	13.7	58.2
75-79	412	15.7	76.3	223	16.1	78.8	189	15.3	73.4
80-84	333	12.7	89.0	172	12.5	91.2	161	13.0	86.4
85+	289	11.0	100.0	121	8.8	100.0	168	13.6	100.0
All ages	2619	100.0		1381	100.0		1238	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=367 %	Females DCO rate n=321 %	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	3	0.5	0.3			5.8	3.6
10-14	8	6	0.7	0.6		16.7	7.0	5.9
15-19	15	5	1.2	0.4			5.9	2.4
20-24	14	11	1.0	0.8			3.0	2.9
25-29	18	15	1.1	1.0			2.6	1.8
30-34	16	20	1.0	1.3		5.0	1.7	1.4
35-39	27	34	1.7	2.1	11.1	2.9	2.0	1.4
40-44	48	39	2.6	2.2	6.3	7.7	2.2	0.9
45-49	55	62	2.8	3.2	10.9	12.9	1.4	0.9
50-54	65	61	3.8	3.6	13.8	6.6	1.1	0.7
55-59	69	80	4.9	5.4	17.4	12.5	0.7	0.9
60-64	99	81	8.1	6.1	17.2	13.6	0.8	0.7
65-69	177	123	14.9	9.5	22.0	26.0	0.9	0.9
70-74	235	170	21.2	13.4	29.8	23.5	1.1	1.2
75-79	222	189	27.9	18.9	28.8	33.3	1.3	1.4
80-84	171	161	37.2	22.8	46.8	38.5	1.6	1.5
85+	121	168	39.5	22.9	52.1	50.6	1.5	1.3
All ages	1377	1238			26.7	25.9	1.2	1.1
Incidence								
Raw			6.0	5.2				
WS			3.2	2.5				
ES			4.5	3.4				
BRD-S			5.7	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).

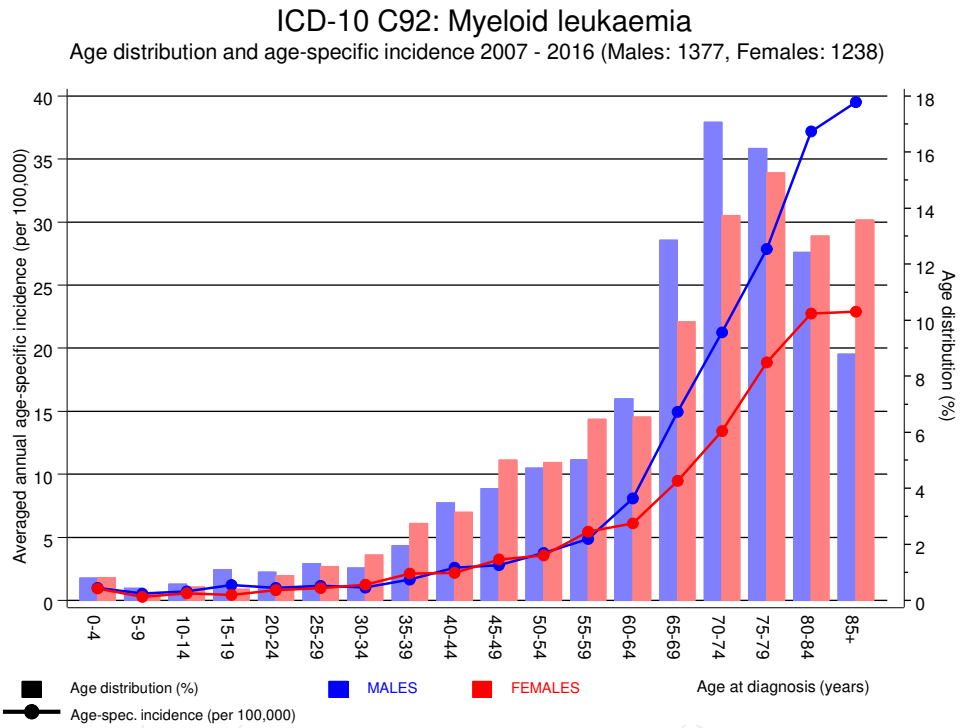


Figure 6. Age distribution (males: mean=66.8 yrs, median=71.4 yrs; females: mean=67.8 yrs, median=72.3 yrs) and age-specific incidence.

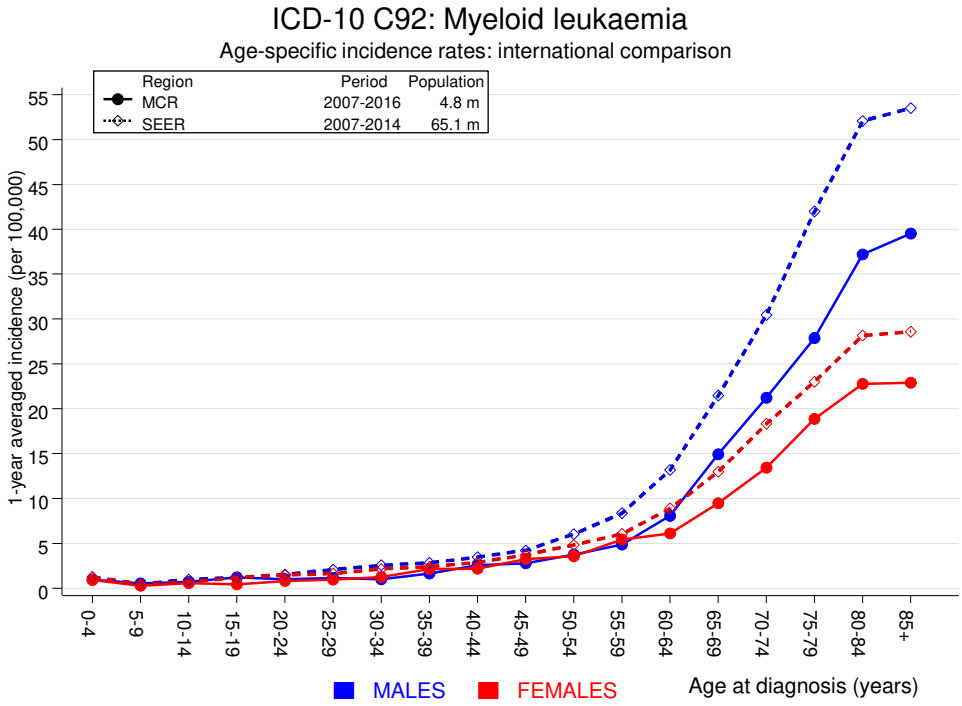


Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

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 %
C09–C10	Oropharynx	2	0.5	4.3	0.5	15.6		4.5	
C15	Oesophagus	5	0.8	6.5	2.1	15.2	#	12.5	20.0
C16	Stomach	2	1.5	1.3	0.2	4.8		1.4	
C18	Colon	12	3.6	3.3	1.7	5.8	#	24.6	
C19–C20	Rectum	2	2.1	0.9	0.1	3.4		−0.4	
C22	Liver	3	1.1	2.7	0.5	7.8		5.5	
C23–C24	Bile	2	0.4	5.4	0.7	19.4		4.8	
C25	Pancreas	4	1.4	2.8	0.8	7.2		7.6	
C33–C34	Lung	11	4.7	2.4	1.2	4.2	#	18.6	9.1
C40–C41	Bone	2	0.0	50.1	6.1	180.9	#	5.8	
C43	Malign. melanoma	8	1.8	4.4	1.9	8.7	#	18.2	
C46,C49	Soft tissue	2	0.2	8.8	1.1	31.9	#	5.2	
C61	Prostate	24	11.2	2.1	1.4	3.2	#	37.6	8.3
C64	Kidney	3	1.4	2.1	0.4	6.2		4.7	
C67	Bladder	3	1.6	1.8	0.4	5.3		4.0	
C70–C72	CNS cancer	2	0.6	3.6	0.4	13.0		4.3	
C81	Hodgkin lymphoma	3	0.1	25.4	5.2	74.3	#	8.5	
C82–C85	NHL	12	1.6	7.5	3.9	13.0	#	30.6	8.3
C90	Mult. myeloma	5	0.5	10.0	3.2	23.3	#	13.3	
C91–C96	Leukaemia	17	0.6	26.5	15.4	42.5	#	48.2	47.1
	Others, specified	6	2.3	2.6	1.0	5.7		11.0	16.7
	Not observed	0	1.6	0.0	0.0	2.3		−4.6	
	All further malignancies	130	39.7	3.3	2.7	3.9	#	266.0	10.8

Patients	1710
Median age at next malignancy (years)	69.5
Person-years	3393
Mean observation time (years)	2.0
Median observation time (years)	0.6

The occurrence of further malignancy listed is statistically significant.

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

Table 7b

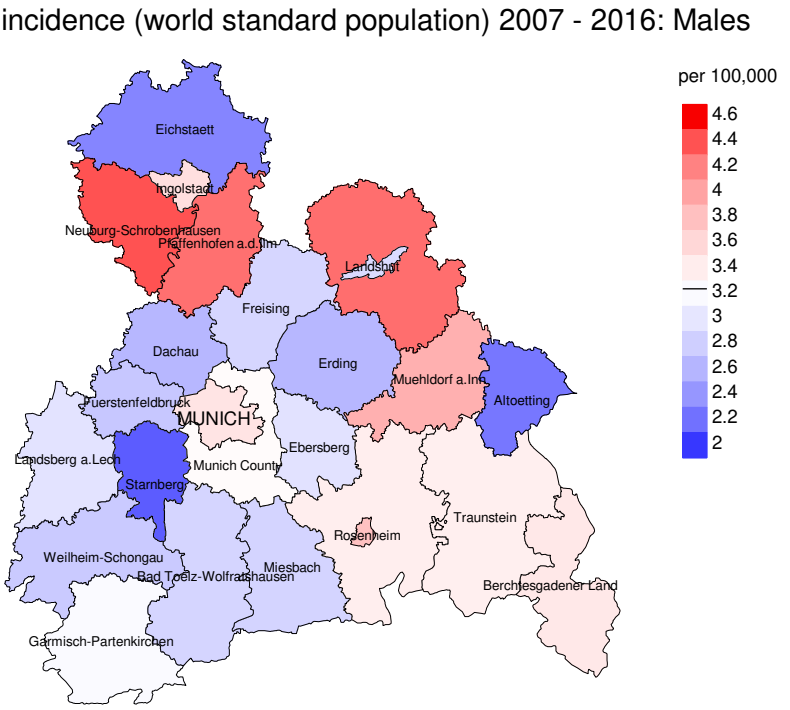
Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of further malignancies for period 1998–2016
FEMALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C15	Oesophagus	2	0.2	12.6	1.5	45.4	#	6.1	
C18	Colon	3	2.2	1.3	0.3	3.9		2.5	
C25	Pancreas	2	1.0	1.9	0.2	7.0		3.2	50.0
C33–C34	Lung	6	1.9	3.2	1.2	6.9	#	13.6	
C43	Malign. melanoma	2	1.1	1.9	0.2	6.8		3.1	
C50	Breast	18	8.2	2.2	1.3	3.5	#	32.5	5.6
C53	Cervix uteri	5	0.4	12.0	3.9	27.9	#	15.2	40.0
C54	Corpus uteri	7	1.4	4.9	2.0	10.1	#	18.5	
C82–C85	NHL	4	0.9	4.2	1.2	10.8	#	10.1	25.0
C90	Mult. myeloma	2	0.3	6.7	0.8	24.3		5.6	
C91–C96	Leukaemia	5	0.4	12.7	4.1	29.6	#	15.2	40.0
Others, specified		9	4.4	2.1	0.9	3.9		15.3	11.1
Not observed		0	3.2	0.0	0.0	1.2		−10.5	
All further malignancies		65	25.6	2.5	2.0	3.2	#	130.4	12.3

Patients	1546
Median age at next malignancy (years)	68.7
Person-years	3023
Mean observation time (years)	2.0
Median observation time (years)	0.6

The occurrence of further malignancy listed is statistically significant.

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



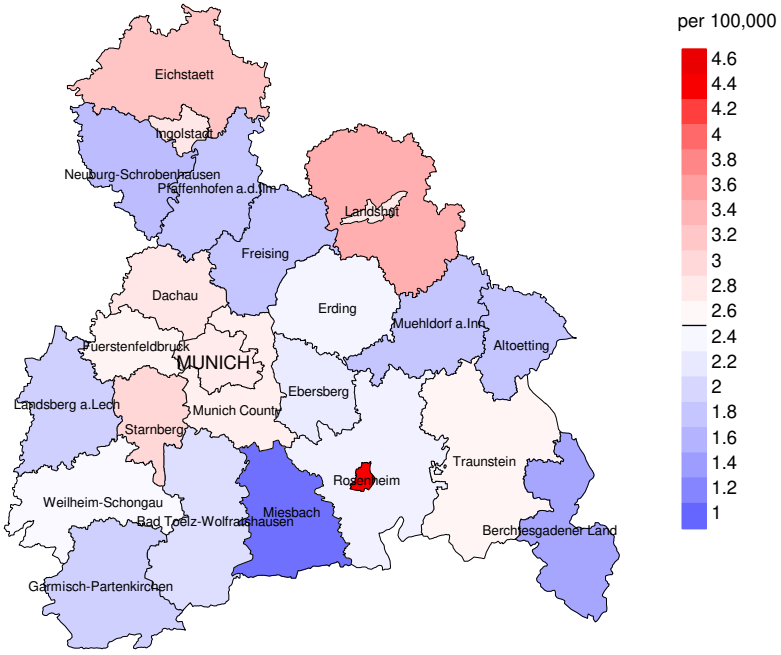


Figure 8a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 3.2/100,000 WS N=1,377, females 2.5/100,000 WS N=1,238).

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 28 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 1.1 and 4.2/100,000.

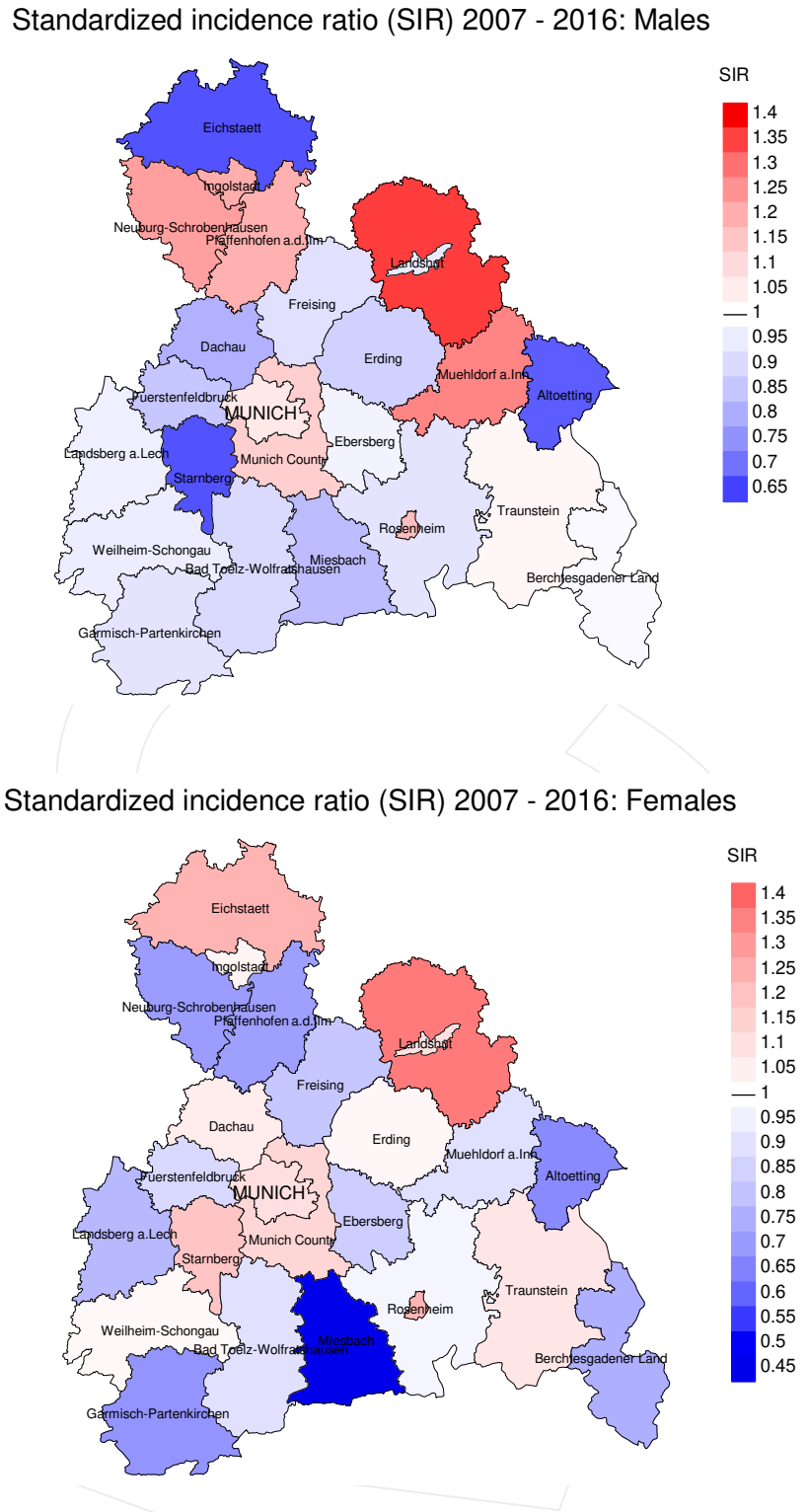


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=1,377, females N=1,238).

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 28 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 0.83. Though, the value of this parameter may vary with an underlying probability of 99% between 0.48 and 1.33, 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	95	98.9	30.5	84	88.4	97.6
1999	117	99.1	30.8	96	82.1	96.9
2000	132	99.2	31.1	101	76.5	97.0
2001	139	97.1	43.9	116	83.5	99.1
2002	182	92.9	34.6	142	78.0	97.9
2003	239	97.5	35.6	191	79.9	99.5
2004	228	95.6	38.2	180	78.9	98.9
2005	220	95.9	33.2	170	77.3	99.4
2006	247	93.9	38.5	211	85.4	98.6
2007	239	88.7	30.1	185	77.4	97.8
2008	250	84.8	30.8	189	75.6	99.5
2009	256	82.8	21.9	189	73.8	99.5
2010	322	80.7	20.5	236	73.3	98.3
2011	252	85.7	20.2	188	74.6	97.3
2012	312	81.7	21.8	228	73.1	97.4
2013	291	84.5	27.1	208	71.5	97.1
2014	291	85.6	28.5	202	69.4	98.5
2015	242	99.2	28.5	186	76.9	93.5
2016	164	94.5	41.5	116	70.7	87.9
1998-2016	4218	90.0	29.8	3218	76.3	97.7

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	95	92	98.9	49	51.6
1999	117	86	97.7	46	39.3
2000	132	94	96.8	56	42.4
2001	139	118	97.5	67	48.2
2002	182	122	98.4	79	43.4
2003	239	145	98.6	109	45.6
2004	228	140	98.6	100	43.9
2005	220	180	99.4	107	48.6
2006	247	168	98.8	140	56.7
2007	239	169	98.8	108	45.2
2008	250	167	97.6	117	46.8
2009	256	163	97.5	111	43.4
2010	322	201	98.0	139	43.2
2011	252	202	97.5	108	42.9
2012	312	206	98.5	129	41.3
2013	291	232	97.8	141	48.5
2014	291	223	98.7	140	48.1
2015	242	217	99.1	141	58.3
2016	164	138	98.6	102	62.2
1998-2016	4218	3063	98.3	1989	47.2

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	92	73.9	26.1	95.6
1999	86	76.7	23.3	97.6
2000	94	87.2	12.8	100.0
2001	118	83.1	16.9	97.4
2002	122	89.3	10.7	99.2
2003	145	89.7	10.3	99.3
2004	140	92.1	7.9	97.8
2005	180	93.3	6.7	99.4
2006	168	94.6	5.4	98.8
2007	169	92.9	7.1	98.8
2008	167	86.2	13.8	95.1
2009	163	89.0	11.0	96.9
2010	201	92.5	7.5	98.0
2011	202	88.1	11.9	95.9
2012	206	90.3	9.7	98.5
2013	232	82.3	17.7	96.9
2014	223	83.9	16.1	95.5
2015	217	85.7	14.3	94.9
2016	138	85.5	14.5	97.8
1998-2016	3063	87.7	12.3	97.4

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	48	65.0	65.7	62.7	66.1
1999	48	71.7	71.3	73.3	71.7
2000	57	69.0	67.7	72.7	69.3
2001	51	70.4	72.5	63.8	70.8
2002	57	67.9	67.8	69.4	69.1
2003	80	70.5	69.9	74.1	70.1
2004	71	73.5	73.6	64.7	73.5
2005	93	72.3	72.2	73.5	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	66.3	72.5
2009	84	73.1	73.8	70.0	74.2
2010	104	73.6	73.1	80.3	73.3
2011	101	73.8	73.8	73.8	74.2
2012	108	74.0	73.2	81.4	73.6
2013	134	76.0	76.0	75.5	75.7
2014	120	75.0	74.8	75.6	75.3
2015	111	75.6	75.6	75.5	75.5
2016	77	75.0	75.4	74.6	75.5
1998-2016	1613	73.1	73.2	72.7	73.2

Deaths of patients are considered to be cancer-related, in case that fact was recorded on the death certificate, or patients had suffered from metastasis or recurrence.

Table 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	44	62.0	61.1	72.3	61.9
1999	38	74.5	75.3	64.7	74.5
2000	37	76.1	75.2	86.5	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	75.0	79.8	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	76.6	65.8	75.3
2010	97	77.7	78.3	68.4	78.2
2011	101	73.9	72.9	79.0	73.9
2012	98	73.1	73.1	74.7	73.9
2013	98	77.0	75.4	82.5	76.7
2014	103	75.9	75.8	76.3	76.0
2015	106	76.1	75.0	78.9	75.7
2016	61	75.9	74.9	84.5	75.3
1998-2016	1450	74.9	74.4	78.8	74.8

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	35	3.2	0.74	2.3	0.81	3.0	0.75	3.8	0.74
1999	36	3.2	0.55	1.9	0.52	2.8	0.54	3.5	0.56
2000	51	4.5	0.76	2.8	0.62	4.0	0.72	5.2	0.80
2001	45	3.9	0.63	2.2	0.58	3.4	0.63	4.8	0.71
2002	50	2.7	0.55	1.6	0.50	2.3	0.54	3.0	0.55
2003	74	3.9	0.62	2.2	0.60	3.3	0.61	4.4	0.62
2004	65	3.5	0.59	1.8	0.52	2.8	0.58	4.0	0.66
2005	86	4.5	0.81	2.3	0.69	3.5	0.78	4.8	0.84
2006	91	4.8	0.64	2.4	0.57	3.7	0.62	5.0	0.65
2007	80	3.6	0.60	1.9	0.51	2.8	0.56	3.7	0.62
2008	75	3.4	0.57	1.7	0.46	2.5	0.53	3.4	0.57
2009	74	3.3	0.58	1.6	0.48	2.4	0.53	3.3	0.60
2010	94	4.2	0.57	2.0	0.50	3.1	0.54	4.0	0.56
2011	89	4.0	0.68	1.8	0.54	2.8	0.61	3.8	0.70
2012	96	4.2	0.62	1.9	0.54	2.9	0.59	3.9	0.61
2013	110	4.8	0.65	1.9	0.53	3.1	0.60	4.4	0.64
2014	101	4.3	0.68	1.8	0.60	2.8	0.64	3.9	0.66
2015	95	4.0	0.77	1.8	0.73	2.7	0.74	3.6	0.76
2016	65	2.7	0.71	1.1	0.66	1.8	0.69	2.4	0.71
1998-2016	1412	3.8	0.64	1.9	0.56	2.9	0.61	3.9	0.65

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	33	2.8	0.69	2.0	0.80	2.3	0.75	2.5	0.72
1999	30	2.5	0.59	1.1	0.46	1.6	0.51	2.2	0.57
2000	31	2.6	0.48	1.0	0.33	1.6	0.39	2.1	0.45
2001	53	4.4	0.78	2.2	0.80	3.0	0.78	3.9	0.79
2002	59	3.0	0.65	1.3	0.56	1.9	0.59	2.5	0.65
2003	56	2.8	0.47	1.2	0.37	1.8	0.41	2.3	0.46
2004	64	3.2	0.55	1.4	0.41	2.0	0.47	2.7	0.52
2005	82	4.1	0.72	1.9	0.62	2.7	0.66	3.3	0.68
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	71	3.1	0.55	1.2	0.43	1.8	0.48	2.4	0.53
2010	92	3.9	0.59	1.4	0.43	2.1	0.48	2.9	0.54
2011	89	3.8	0.74	1.5	0.51	2.2	0.62	2.9	0.69
2012	90	3.8	0.57	1.7	0.46	2.3	0.51	3.0	0.56
2013	81	3.4	0.68	1.3	0.58	2.0	0.63	2.6	0.64
2014	86	3.6	0.61	1.3	0.47	1.9	0.53	2.6	0.55
2015	91	3.7	0.77	1.4	0.74	2.1	0.75	2.8	0.77
2016	53	2.2	0.73	1.0	0.77	1.3	0.75	1.6	0.72
1998-2016	1275	3.3	0.63	1.4	0.53	2.0	0.58	2.7	0.61

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	0.5	2	0.2	0.3	4	0.5	0.6
15-19	4	0.2	0.7	2	0.2	0.6	2	0.3	0.9
20-24	6	0.4	1.1	4	0.5	1.0	2	0.3	1.1
25-29	11	0.7	1.7	9	1.0	2.0	2	0.3	1.4
30-34	5	0.3	2.0	1	0.1	2.2	4	0.5	1.9
35-39	17	1.0	3.0	9	1.0	3.2	8	1.0	2.9
40-44	31	1.8	4.9	13	1.5	4.7	18	2.3	5.1
45-49	48	2.9	7.7	23	2.6	7.3	25	3.1	8.3
50-54	55	3.3	11.0	32	3.6	10.9	23	2.9	11.1
55-59	83	4.9	16.0	34	3.9	14.8	49	6.1	17.3
60-64	101	6.0	22.0	52	5.9	20.7	49	6.1	23.4
65-69	196	11.7	33.7	117	13.3	34.0	79	9.9	33.3
70-74	326	19.4	53.1	180	20.5	54.5	146	18.3	51.6
75-79	335	20.0	73.1	188	21.4	75.9	147	18.4	70.0
80-84	235	14.0	87.1	119	13.5	89.4	116	14.5	84.5
85+	217	12.9	100.0	93	10.6	100.0	124	15.5	100.0
All ages	1678	100.0		879	100.0		799	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.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4	1		0.1	0.09			6.7	
5- 9		1			0.1	0.33		5.6
10-14	2	4	0.2	0.25	0.4	0.67	8.7	16.7
15-19	2	2	0.2	0.13	0.2	0.40	4.5	9.1
20-24	4	2	0.3	0.29	0.1	0.18	7.0	6.1
25-29	9	2	0.6	0.50	0.1	0.13	12.2	2.7
30-34	1	4	0.1	0.06	0.3	0.20	1.0	3.3
35-39	9	8	0.6	0.33	0.5	0.24	4.5	2.8
40-44	13	18	0.7	0.27	1.0	0.46	2.6	2.7
45-49	23	25	1.2	0.42	1.3	0.40	2.0	1.9
50-54	32	23	1.9	0.49	1.3	0.38	1.6	1.2
55-59	34	49	2.4	0.49	3.3	0.61	1.0	1.7
60-64	52	49	4.2	0.53	3.7	0.60	1.0	1.3
65-69	117	79	9.9	0.66	6.1	0.64	1.6	1.5
70-74	180	146	16.3	0.77	11.5	0.86	1.9	2.2
75-79	188	147	23.6	0.85	14.7	0.78	2.1	2.1
80-84	119	116	25.9	0.70	16.4	0.72	1.6	1.7
85+	93	124	30.4	0.77	16.9	0.74	1.4	1.3
All ages	879	799					1.7	1.7
Mortality								
Raw			3.8	0.64	3.4	0.65		
WS			1.8	0.54	1.3	0.53		
ES			2.7	0.60	2.0	0.58		
BRD-S			3.6	0.64	2.6	0.62		
PYLL-70								
per 100,000			18.5		18.2			
ES			16.9		16.5			
AYLL-70			12.5		13.6			

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 ←%
C09-C10	Oropharynx	5	1.2	2	40.0	1	20.0	2	40.0
C15	Oesophagus	5	1.2	1	20.0			4	80.0
C16	Stomach	8	1.8	7	87.5			1	12.5
C18	Colon	37	8.5	27	73.0	3	8.1	7	18.9
C19-C20	Rectum	15	3.5	11	73.3	3	20.0	1	6.7
C22	Liver	7	1.6	3	42.9	1	14.3	3	42.9
C25	Pancreas	9	2.1	1	11.1	1	11.1	7	77.8
C33-C34	Lung	27	6.2	15	55.6	5	18.5	7	25.9
C43	Malign. melanoma	14	3.2	12	85.7	1	7.1	1	7.1
C44	Skin others	28	6.5	15	53.6	4	14.3	9	32.1
C61	Prostate	104	24.0	92	88.5	5	4.8	7	6.7
C64	Kidney	16	3.7	16	100.0				
C67	Bladder	17	3.9	14	82.4	2	11.8	1	5.9
C81	Hodgkin lymphoma	8	1.8	6	75.0			2	25.0
C82-C85	NHL	47	10.8	32	68.1	5	10.6	10	21.3
C90	Mult. myeloma	7	1.6	5	71.4	2	28.6		
C91-C96	Leukaemia	41	9.4			10	24.4	31	75.6
Others, specified		39	9.0	26	66.7	5	12.8	8	20.5
All further malignancies		434	100.0	285	65.7	48	11.1	101	23.3

Further malignancies with number of cases 1 to 4 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	1.1	4	100.0				
C18	Colon	13	3.6	10	76.9	1	7.7	2	15.4
C19-C20	Rectum	11	3.1	7	63.6	2	18.2	2	18.2
C33-C34	Lung	13	3.6	7	53.8	3	23.1	3	23.1
C43	Malign. melanoma	10	2.8	10	100.0				
C44	Skin others	14	3.9	8	57.1			6	42.9
C50	Breast	127	35.3	114	89.8	6	4.7	7	5.5
C53	Cervix uteri	10	2.8	8	80.0	2	20.0		
C54	Corpus uteri	29	8.1	23	79.3	2	6.9	4	13.8
C56	Ovary	8	2.2	6	75.0			2	25.0
C64	Kidney	5	1.4	3	60.0	2	40.0		
C67	Bladder	5	1.4	5	100.0				
C70-C72	CNS cancer	4	1.1	2	50.0			2	50.0
C73	Thyroid	13	3.6	12	92.3	1	7.7		
C76-C79	CUP	5	1.4	2	40.0	1	20.0	2	40.0
C81	Hodgkin lymphoma	6	1.7	5	83.3	1	16.7		
C82-C85	NHL	24	6.7	20	83.3	3	12.5	1	4.2
C90	Mult. myeloma	7	1.9	5	71.4	1	14.3	1	14.3
C91-C96	Leukaemia	21	5.8			2	9.5	19	90.5
Others, specified		31	8.6	17	54.8	2	6.5	12	38.7
All further malignancies		360	100.0	268	74.4	29	8.1	63	17.5

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	0.50		5.6
10-14	2	2	0.2	0.29	0.2	0.40	8.7	9.5
15-19	2	2	0.2	0.15	0.2	0.40	4.8	10.0
20-24	3	1	0.2	0.25	0.1	0.09	5.9	3.2
25-29	8	2	0.5	0.44	0.1	0.15	11.9	3.0
30-34	1	4	0.1	0.07	0.3	0.22	1.0	3.8
35-39	7	8	0.4	0.28	0.5	0.24	3.7	3.1
40-44	12	14	0.6	0.28	0.8	0.44	2.6	2.4
45-49	19	18	1.0	0.41	0.9	0.40	1.8	1.6
50-54	24	16	1.4	0.44	0.9	0.36	1.3	1.0
55-59	27	33	1.9	0.47	2.2	0.58	0.9	1.4
60-64	35	33	2.9	0.47	2.5	0.57	0.8	1.1
65-69	70	57	5.9	0.63	4.4	0.68	1.2	1.3
70-74	107	79	9.7	0.78	6.2	0.75	1.5	1.5
75-79	111	90	13.9	0.82	9.0	0.78	1.7	1.7
80-84	75	78	16.3	0.74	11.0	0.79	1.4	1.5
85+	54	84	17.6	0.79	11.4	0.74	1.1	1.1
All ages	558	522					1.4	1.4
Mortality								
Raw			2.4	0.60	2.2	0.61		
WS			1.2	0.49	0.9	0.48		
ES			1.7	0.55	1.3	0.54		
BRD-S			2.3	0.60	1.7	0.58		
PYLL-70								
per 100,000			14.8		13.5			
ES			13.7		12.3			
AYLL-70			14.2		14.1			

* 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	0.50		5.6
10-14	2	2	0.2	0.29	0.2	0.40	8.7	9.5
15-19	2	2	0.2	0.17	0.2	0.40	4.8	10.5
20-24	3	1	0.2	0.27	0.1	0.09	5.9	3.2
25-29	8	2	0.5	0.47	0.1	0.18	11.9	3.1
30-34	1	4	0.1	0.07	0.3	0.22	1.0	3.8
35-39	7	5	0.4	0.28	0.3	0.17	3.7	2.0
40-44	10	12	0.5	0.24	0.7	0.39	2.2	2.0
45-49	16	17	0.8	0.37	0.9	0.40	1.5	1.5
50-54	22	15	1.3	0.44	0.9	0.39	1.2	0.9
55-59	24	29	1.7	0.46	2.0	0.54	0.8	1.2
60-64	32	31	2.6	0.48	2.3	0.58	0.8	1.0
65-69	62	49	5.2	0.61	3.8	0.60	1.1	1.2
70-74	98	73	8.9	0.78	5.8	0.72	1.4	1.4
75-79	102	85	12.8	0.78	8.5	0.77	1.6	1.6
80-84	72	75	15.7	0.71	10.6	0.82	1.4	1.5
85+	50	82	16.3	0.77	11.2	0.73	1.1	1.2
All ages	512	485					1.3	1.3
Mortality								
Raw			2.2	0.58	2.0	0.60		
WS			1.1	0.48	0.8	0.47		
ES			1.6	0.53	1.2	0.52		
BRD-S			2.1	0.58	1.6	0.57		
PYLL-70								
per 100,000			13.6		12.1			
ES			12.7		11.1			
AYLL-70			14.5		14.2			

* See corresponding tables with multiple malignancies.

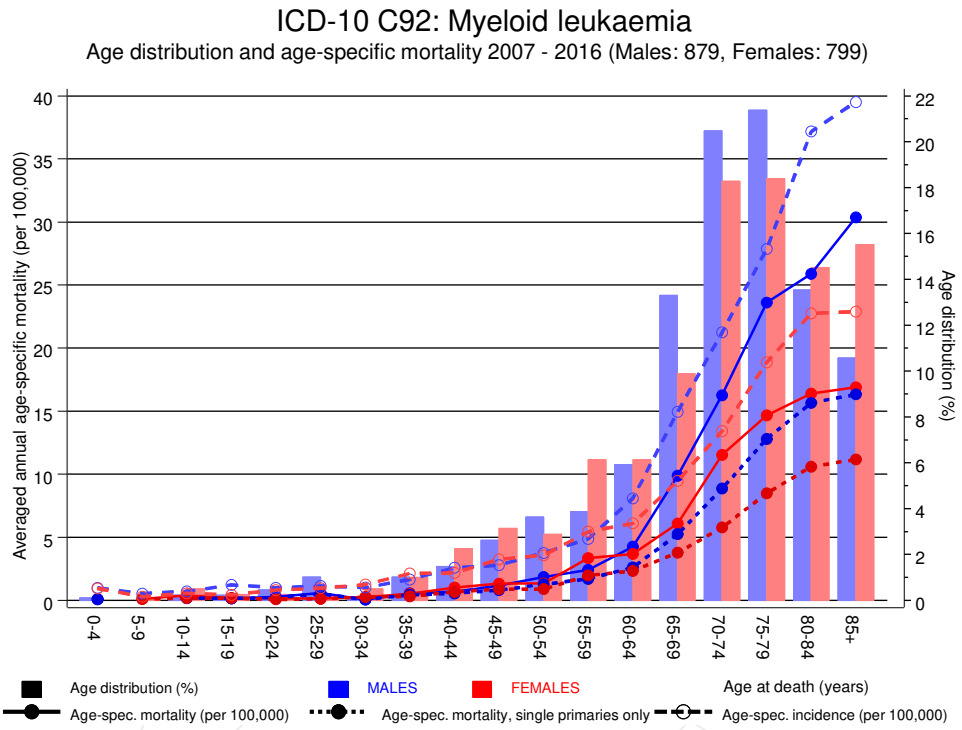


Figure 17. Distribution of age at death (bars; males: mean=70.2 yrs, median=73.0 yrs; females: mean=70.7 yrs, median=74.0 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

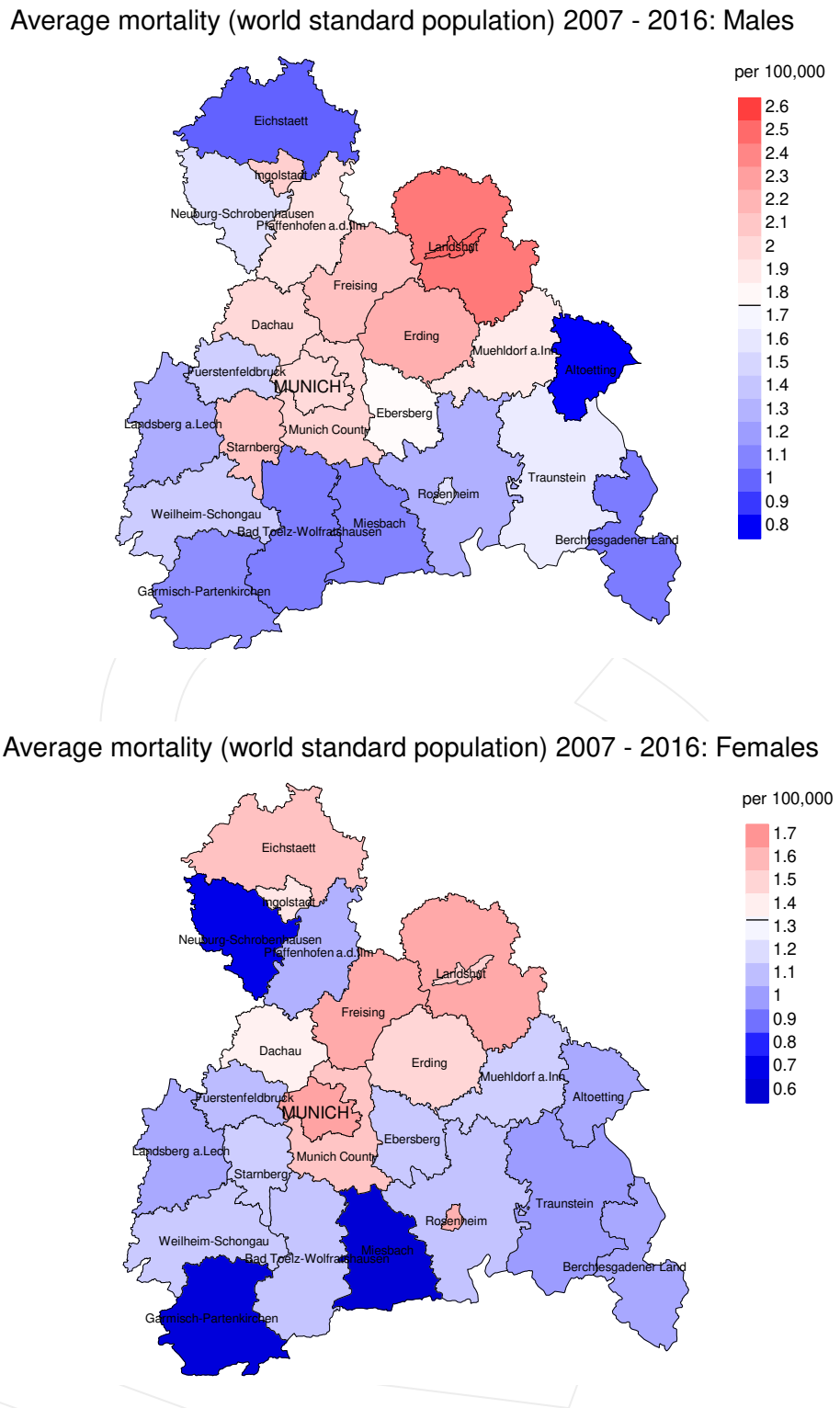
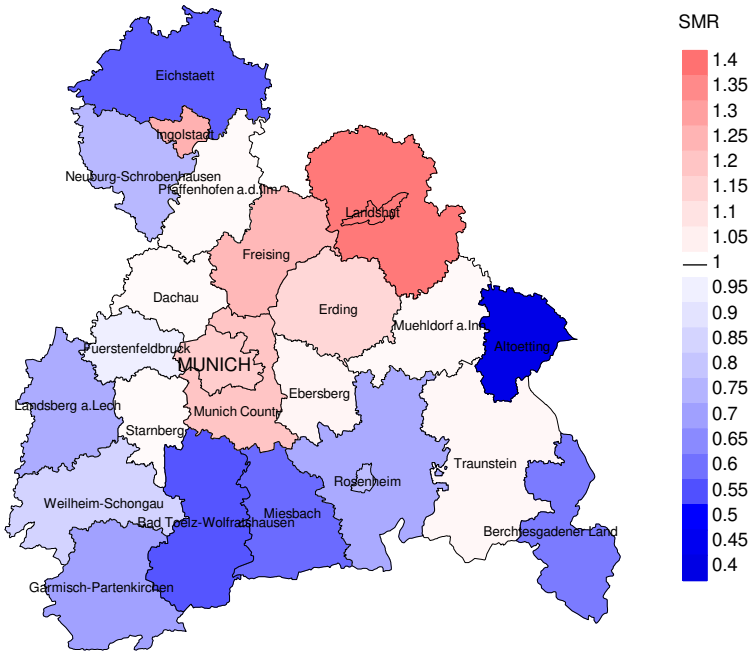


Figure 18a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2016. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 1.8/100,000 WS N=879, females 1.3/100,000 WS N=799).

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 17 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 0.5 and 2.4/100,000.

Standardized mortality ratio (SMR) 2007 - 2016: Males



Standardized mortality ratio (SMR) 2007 - 2016: Females

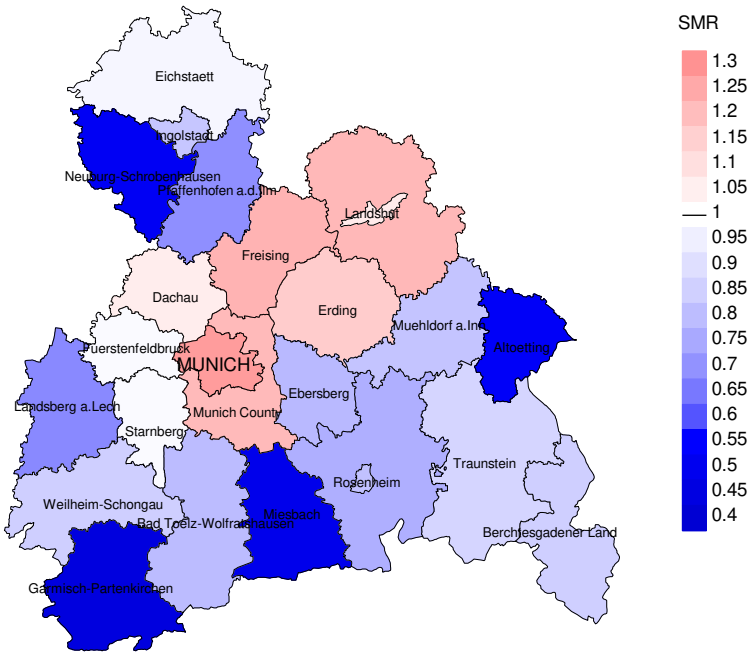


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=879, females N=799).

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 17 women died from myeloid leukaemia. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.79. Though, the value of this parameter may vary with an underlying probability of 99% between 0.38 and 1.43, 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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