Munich Cancer Registry

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ICD-10 C92.0: Acute myelobl. leukemia

Incidence and Mortality

Year of diagnosis	1998-2020
Patients	3,225
Diseases	3,228
Creation date	12/21/2021
Database export	12/20/2021
Population	4.95 m

Munich Cancer Registry
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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, December 2021

[#] 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	37	1	2.7	13.5	4.4	86.5	100.0
1999	30	2	6.7	13.4	4.4	86.7	100.0
2000	60	20	33.3	11.8	4.3	86.7	100.0
2001	84	45	53.6	13.3	4.3	91.7	100.0
2002	96	43	44.8	13.4	4.3	87.5	95.8 #
2003	127	62	48.8	16.4	4.3	91.3	99.2
2004	147	69	46.9	18.6	4.2	87.1	98.6
2005	131	59	45.0	19.7	4.2	88.5	98.5
2006	179	81	45.3	21.2	4.1	91.6	97.8
2007	153	56	36.6	21.5	4.1	88.9	98.0 #
2008	150	54	36.0	23.0	3.9	85.3	98.7
2009	169	42	24.9	24.0	3.8	86.4	100.0
2010	208	53	25.5	25.0	3.5	82.7	100.0
2011	163	37	22.7	26.0	3.3	81.6	98.8
2012	212	55	25.9	27.0	2.9	85.8	99.1
2013	196	60	30.6	27.9	2.6	84.2	99.0
2014	204	73	35.8	29.1	2.1	88.7	98.5
2015	200	52	26.0	29.1	1.4	90.5	99.5
2016	207	54	26.1	29.3	0.9	80.7	100.0
2017	184	44	23.9	29.7	0.6	81.5	100.0
2018	113	33	29.2	30.0	1.0	78.8	100.0
2019	87	6	6.9	30.3	1.1	62.1	100.0
2020	91	1	1.1	30.4	0.0	61.5	100.0 ##
1998-2020	3228	1002	31.0	30.4	4.4	84.7	99.1

3,228 cases diagnosed 1998-2020 are related to a total of 3,225 patients. Currently, in 1,124 (34.9 %) of these 3,225 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 893 / 191 / 40 (27.7 % / 5.9 % / 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 2018, a subgroup of 113 cases has been diagnosed, of which 30.0 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 1.0 % 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	19	51.4	1	5.3	5.3	5.0	84.2	100.0	
1999	17	56.7	1	5.9	11.1	4.9	88.2	100.0	
2000	29	48.3	11	37.9	10.8	4.8	89.7	100.0	
2001	44	52.4	22	50.0	10.1	4.8	90.9	100.0	
2002	49	51.0	20	40.8	10.1	5.0	87.8	100.0	#
2003	65	51.2	29	44.6	13.0	5.0	93.8	100.0	
2004	67	45.6	29	43.3	15.2	4.9	91.0	100.0	
2005	63	48.1	26	41.3	18.4	4.9	85.7	98.4	
2006	102	57.0	47	46.1	20.9	5.0	92.2	98.0	
2007	85	55.6	32	37.6	21.7	4.8	90.6	100.0	#
2008	70	46.7	26	37.1	23.6	4.3	78.6	98.6	
2009	78	46.2	20	25.6	25.1	4.1	85.9	100.0	
2010	107	51.4	32	29.9	25.8	3.9	86.9	100.0	
2011	82	50.3	17	20.7	27.0	3.7	86.6	98.8	
2012	103	48.6	23	22.3	28.0	3.6	84.5	100.0	
2013	114	58.2	38	33.3	29.3	3.2	83.3	99.1	
2014	100	49.0	36	36.0	31.1	2.4	90.0	99.0	
2015	103	51.5	27	26.2	30.4	1.6	90.3	99.0	
2016	108	52.2	23	21.3	30.5	0.9	79.6	100.0	
2017	94	51.1	18	19.1	31.3	0.9	79.8	100.0	
2018	55	48.7	18	32.7	31.9	1.4	83.6	100.0	
2019	43	49.4	3	7.0	31.9	1.1	69.8	100.0	
2020	45	49.5	1	2.2	32.0	0.0	71.1	100.0	##
1998-2020	1642	50.9	500	30.5	32.0	5.0	85.7	99.5	

1,642 cases diagnosed 1998-2020 are related to a total of 1,640 patients. Currently, in 600 (36.6 %) of these 1,640 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 473 / 103 / 24 (28.8 % / 6.3 % / 1.5 %) 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 2018, a subgroup of 55 cases has been diagnosed, of which 31.9 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 1.4 % 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	18	48.6			22.2	3.8	88.9	100.0	
1999	13	43.3	1	7.7	16.1	3.8	84.6	100.0	
2000	31	51.7	9	29.0	12.9	3.7	83.9	100.0	
2001	40	47.6	23	57.5	16.7	3.7	92.5	100.0	
2002	47	49.0	23	48.9	16.8	3.6	87.2	91.5	#
2003	62	48.8	33	53.2	19.9	3.5	88.7	98.4	
2004	80	54.4	40	50.0	22.0	3.5	83.8	97.5	
2005	68	51.9	33	48.5	20.9	3.4	91.2	98.5	
2006	77	43.0	34	44.2	21.6	3.2	90.9	97.4	
2007	68	44.4	24	35.3	21.2	3.4	86.8	95.6	#
2008	80	53.3	28	35.0	22.4	3.4	91.3	98.8	
2009	91	53.8	22	24.2	22.8	3.4	86.8	100.0	
2010	101	48.6	21	20.8	24.2	3.1	78.2	100.0	
2011	81	49.7	20	24.7	24.9	2.9	76.5	98.8	
2012	109	51.4	32	29.4	26.1	2.2	87.2	98.2	
2013	82	41.8	22	26.8	26.3	2.0	85.4	98.8	
2014	104	51.0	37	35.6	27.0	1.7	87.5	98.1	
2015	97	48.5	25	25.8	27.9	1.2	90.7	100.0	
2016	99	47.8	31	31.3	28.1	0.9	81.8	100.0	
2017	90	48.9	26	28.9	28.0	0.4	83.3	100.0	
2018	58	51.3	15	25.9	28.1	0.7	74.1	100.0	
2019	44	50.6	3	6.8	28.6	1.1	54.5	100.0	
2020	46	50.5			28.7	0.0	52.2	100.0	##
1998-2020	1586	49.1	502	31.7	28.7	3.8	83.7	98.7	

1,586 cases diagnosed 1998-2020 are related to a total of 1,585 patients. Currently, in 524 (33.1 %) of these 1,585 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 420 / 88 / 16 (26.5 % / 5.6 % / 1.0 %) 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 2018, a subgroup of 58 cases has been diagnosed, of which 28.1 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 0.7 % 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 4.94 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	19	18	1.7	1.5	1.4	1.1	1.7	1.3	2.0	1.4
1999	17	13	1.5	1.1	0.9	0.6	1.3	0.8	1.6	1.0
2000	29	31	2.5	2.6	1.8	1.6	2.3	2.0	2.9	2.4
2001	44	40	3.8	3.3	2.2	1.6	3.3	2.4	4.3	3.0
2002	49	47	2.6	2.4	1.8	1.1	2.3	1.6	2.9	2.0
2003	65	62	3.5	3.1	2.0	1.5	3.0	2.1	3.8	2.6
2004	67	80	3.6	4.0	1.9	2.0	2.9	2.8	3.8	3.4
2005	63	68	3.3	3.4	2.0	1.7	2.7	2.3	3.5	2.9
2006	102	77	5.3	3.8	2.9	1.7	4.2	2.4	5.5	3.1
2007	85	68	3.8	2.9	2.2	1.5	3.0	2.0	3.8	2.5
2008	70	80	3.1	3.4	2.0	1.7	2.5	2.3	3.1	2.9
2009	78	91	3.5	3.9	1.9	1.9	2.6	2.6	3.3	3.2
2010	107	101	4.7	4.3	2.6	1.9	3.6	2.7	4.6	3.4
2011	82	81	3.7	3.5	2.0	2.1	2.8	2.5	3.4	2.9
2012	103	109	4.5	4.6	2.3	2.3	3.3	3.1	4.3	3.8
2013	114	82	5.0	3.4	2.3	1.6	3.4	2.1	4.6	2.7
2014	100	104	4.3	4.3	1.8	1.9	2.8	2.6	3.9	3.4
2015	103	97	4.3	4.0	2.0	1.6	3.0	2.4	3.9	3.1
2016	108	99	4.5	4.0	2.2	1.9	3.1	2.5	4.1	3.1
2017	94	90	3.9	3.7	1.8	1.6	2.7	2.2	3.5	2.8
2018	55	58	2.3	2.3	0.9	1.0	1.4	1.4	2.0	1.8
2019	43	44	1.8	1.8	0.8	0.8	1.2	1.2	1.6	1.4
2020	45	46	1.8	1.9	0.8	0.8	1.2	1.2	1.6	1.5
1998-2020	1642	1586	3.5	3.3	1.9	1.6	2.7	2.2	3.4	2.7

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	37	55.7	24.2	0.9	88.0	24.3	41.4	54.2	75.2	84.3
1999	30	64.4	17.5	12.6	88.2	40.3	57.0	69.7	75.3	82.3
2000	60	58.8	19.7	0.5	85.9	33.5	45.0	63.0	73.7	80.0
2001	84	66.1	13.4	26.8	92.7	49.8	57.9	66.8	76.4	81.0
2002	96	64.3	18.2	7.7	94.9	39.6	52.7	68.5	78.5	83.1
2003	127	67.6	16.3	6.4	93.6	44.8	58.5	69.0	80.9	85.9
2004	147	67.6	15.1	24.3	92.3	44.5	60.0	69.0	78.9	85.0
2005	131	65.1	18.5	9.4	91.3	40.4	54.7	69.8	78.9	83.4
2006	179	68.1	17.1	1.8	95.1	41.9	63.1	72.3	79.6	84.4
2007	153	65.1	17.2	3.5	94.5	41.1	57.3	68.9	76.0	82.3
2008	150	65.4	19.4	0.6	94.8	38.5	56.7	69.4	78.6	84.0
2009	169	66.1	18.5	5.5	99.2	37.6	53.9	71.9	79.4	86.6
2010	208	69.0	16.0	2.9	94.2	48.8	60.8	71.4	78.8	86.4
2011	163	64.5	19.4	0.3	98.4	40.1	56.0	69.7	77.1	85.0
2012	212	67.3	16.6	0.0	92.6	44.9	57.7	71.5	78.9	84.0
2013	196	70.4	16.2	0.5	92.7	52.8	65.3	74.2	79.9	85.2
2014	204	71.1	15.7	0.5	95.9	49.7	66.5	74.7	80.6	85.8
2015	200	70.5	14.2	1.8	92.7	50.5	62.1	74.5	80.1	86.5
2016	207	68.4	17.2	9.1	94.2	42.2	57.7	72.9	81.9	85.9
2017	184	69.2	14.5	18.8	94.8	50.6	62.8	72.5	78.8	84.7
2018	113	71.9	14.8	26.6	96.5	50.7	64.9	75.6	83.4	87.0
2019	87	67.4	16.0	21.1	88.6	49.8	58.4	70.4	79.8	83.9
2020	91	69.4	14.1	19.4	91.6	50.9	60.9	72.4	79.6	83.7
1998-2020	3228	67.6	16.9	0.0	99.2	43.5	59.6	71.7	79.3	84.8

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	19	53.6	25.7	0.9	88.0	8.1	34.4	55.3	75.2	84.3
1999	17	64.0	16.2	26.3	86.9	39.6	58.4	68.8	73.9	85.2
2000	29	57.6	21.4	0.5	81.5	23.2	40.3	63.3	73.5	80.3
2001	44	65.5	13.3	36.1	92.7	48.5	58.4	65.7	76.7	80.8
2002	49	61.8	20.2	7.7	94.9	26.9	51.9	67.5	75.1	82.5
2003	65	67.6	16.4	10.1	93.6	44.8	59.0	68.7	80.6	86.7
2004	67	68.4	14.2	30.3	89.2	52.2	61.8	69.0	79.3	85.4
2005	63	63.1	18.7	17.8	91.3	36.4	51.1	69.4	78.1	81.1
2006	102	66.9	15.6	10.7	93.6	42.2	61.2	70.8	76.4	81.2
2007	85	63.9	17.1	10.9	94.5	40.8	55.5	68.1	75.8	81.9
2008	70	62.7	22.0	0.6	93.8	35.2	49.3	69.0	76.7	83.9
2009	78	65.0	17.3	5.5	87.9	40.9	52.4	70.3	76.2	82.7
2010	107	67.5	16.1	2.9	92.8	48.7	60.7	70.7	77.5	83.4
2011	82	66.4	16.1	6.4	98.4	46.5	57.0	68.5	76.8	83.0
2012	103	68.3	15.5	9.9	92.6	47.0	61.3	71.1	80.0	84.4
2013	114	71.2	14.3	0.5	92.7	57.0	67.0	73.5	78.6	84.3
2014	100	73.6	14.3	0.5	95.9	58.4	70.2	75.5	82.7	86.2
2015	103	70.1	15.0	1.8	92.5	50.3	61.9	73.9	79.9	86.0
2016	108	68.4	15.9	21.6	92.2	45.3	60.5	72.4	79.2	84.9
2017	94	69.4	12.4	24.8	91.2	52.7	63.3	72.0	77.7	81.9
2018	55	73.8	14.2	28.4	96.5	55.2	66.7	77.8	83.8	86.1
2019	43	67.6	17.5	21.1	86.0	32.4	61.1	74.4	80.1	82.8
2020	45	69.8	14.7	32.7	91.6	49.5	60.9	73.5	80.1	83.7
1998-2020	1642	67.5	16.5	0.5	98.4	44.3	60.6	71.4	78.6	84.0

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	18	57.9	23.0	1.3	87.5	27.9	42.4	54.1	76.6	86.6
1999	13	64.8	19.7	12.6	88.2	44.5	54.9	72.3	76.4	79.3
2000	31	60.0	18.2	16.5	85.9	36.7	46.4	62.8	75.3	78.6
2001	40	66.8	13.6	26.8	86.2	53.0	57.9	71.2	76.2	81.6
2002	47	66.9	15.5	36.6	89.0	42.8	55.9	69.3	81.4	83.5
2003	62	67.6	16.3	6.4	89.1	45.2	57.5	70.2	81.2	84.2
2004	80	66.9	15.9	24.3	92.3	43.1	57.0	68.8	78.7	84.1
2005	68	66.9	18.3	9.4	90.8	43.0	58.6	70.7	80.8	84.8
2006	77	69.7	19.0	1.8	95.1	38.7	65.3	75.2	81.9	85.1
2007	68	66.5	17.4	3.5	94.3	43.8	60.4	70.5	77.7	84.7
2008	80	67.7	16.5	15.7	94.8	42.0	61.4	69.5	79.6	84.0
2009	91	67.0	19.6	17.8	99.2	37.0	53.9	72.7	82.1	87.0
2010	101	70.5	15.9	4.4	94.2	51.3	61.4	71.8	81.3	87.0
2011	81	62.6	22.2	0.3	90.0	30.3	51.1	70.4	78.5	85.2
2012	109	66.4	17.6	0.0	92.4	43.8	57.3	71.8	78.3	83.9
2013	82	69.2	18.6	11.1	91.2	44.5	61.5	75.2	82.1	86.3
2014	104	68.7	16.5	9.9	93.2	44.6	63.1	74.1	78.9	84.0
2015	97	71.0	13.4	30.6	92.7	50.7	63.4	74.7	80.2	87.5
2016	99	68.3	18.6	9.1	94.2	39.1	57.1	74.1	82.4	87.5
2017	90	69.0	16.6	18.8	94.8	40.1	60.1	73.7	81.3	85.5
2018	58	70.0	15.2	26.6	92.9	46.2	61.6	73.1	81.7	87.3
2019	44	67.2	14.6	27.0	88.6	51.1	57.1	69.1	78.3	84.8
2020	46	69.0	13.7	19.4	87.0	50.9	61.3	69.8	79.3	83.7
1998-2020	1586	67.7	17.3	0.0	99.2	43.2	58.8	72.0	80.1	85.5

Table 4

Age distribution by 5-year age group and sex for period 2007-2020 (incl. DCO)

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	15	0.6	0.6	8	0.7	0.7	7	0.6	0.6
5-9	7	0.3	0.9	4	0.3	1.0	3	0.3	0.9
10-14	7	0.3	1.2	3	0.3	1.3	4	0.3	1.2
15-19	14	0.6	1.8	7	0.6	1.9	7	0.6	1.8
20-24	17	0.7	2.6	8	0.7	2.5	9	0.8	2.6
25-29	25	1.1	3.6	9	0.8	3.3	16	1.4	4.0
30-34	37	1.6	5.2	17	1.4	4.7	20	1.7	5.7
35-39	45	1.9	7.1	15	1.3	6.0	30	2.6	8.3
40-44	59	2.5	9.7	31	2.6	8.6	28	2.4	10.8
45-49	82	3.5	13.2	40	3.4	12.0	42	3.7	14.4
50-54	113	4.8	18.0	56	4.7	16.7	57	5.0	19.4
55-59	138	5.9	23.9	65	5.5	22.2	73	6.3	25.7
60-64	169	7.2	31.2	88	7.4	29.6	81	7.0	32.8
65-69	275	11.8	42.9	151	12.7	42.3	124	10.8	43.6
70-74	367	15.7	58.6	203	17.1	59.4	164	14.3	57.8
75-79	412	17.6	76.3	216	18.2	77.6	196	17.0	74.9
80-84	309	13.2	89.5	160	13.5	91.1	149	13.0	87.8
85+	246	10.5	100.0	106	8.9	100.0	140	12.2	100.0
All ages	2337	100.0		1187	100.0		1150	100.0	

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 2007–2020

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males DCO rate n=314 %	Females DCO rate n=306 %	Males Prop.all cancers n=153686 %	Females Prop.all cancers n=155051 %
0- 4	8	7	0.5	0.5	12.5		3.6	4.1
5- 9	4	3	0.3	0.2			3.4	3.0
10-14	3	4	0.2	0.3		25.0	2.2	3.1
15-19	7	7	0.4	0.4			2.2	2.6
20-24	8	9	0.4	0.5	12.5		1.3	1.7
25-29	9	16	0.4	0.7			0.9	1.4
30-34	17	20	0.7	0.9		5.0	1.3	0.9
35-39	15	30	0.6	1.3	20.0	3.3	0.8	0.9
40-44	31	28	1.2	1.2	9.7	14.3	1.1	0.5
45-49	40	42	1.5	1.6	17.5	19.0	0.8	0.4
50-54	56	57	2.2	2.3	14.3	7.0	0.7	0.5
55-59	65	73	3.1	3.4	15.4	15.1	0.5	0.5
60-64	88	81	5.0	4.3	19.3	18.5	0.5	0.5
65-69	151	124	9.3	6.8	25.8	29.0	0.6	0.7
70-74	203	164	13.5	9.5	25.6	26.8	0.7	0.8
75-79	216	196	17.9	13.1	28.2	32.7	0.9	1.0
80-84	160	149	22.1	14.0	40.6	34.9	1.0	1.0
85+	106	140	22.7	13.4	44.3	46.4	1.0	0.9
All ages	1187	1150			26.5	26.6	0.8	0.7
Incidence								
Raw			3.6	3.4				
WS			1.8	1.6				
ES			2.6	2.2				
BRD-S			3.4	2.7				

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).

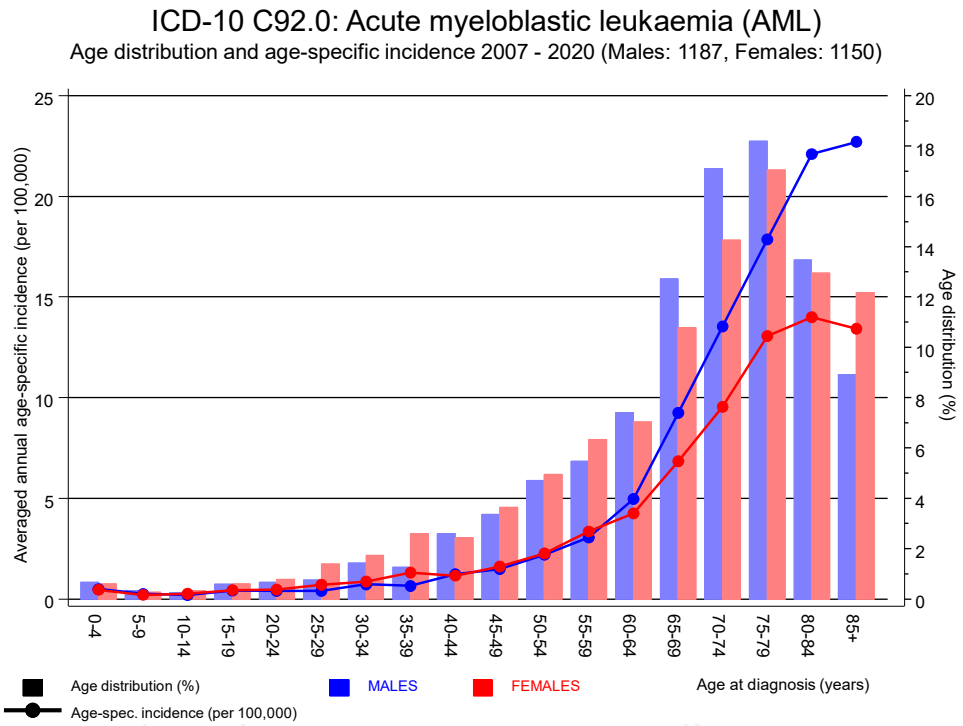


Figure 6. Age distribution (males: mean=68.5 yrs, median=72.4 yrs; females: mean=68.1 yrs, median=72.4 yrs) and age-specific incidence.

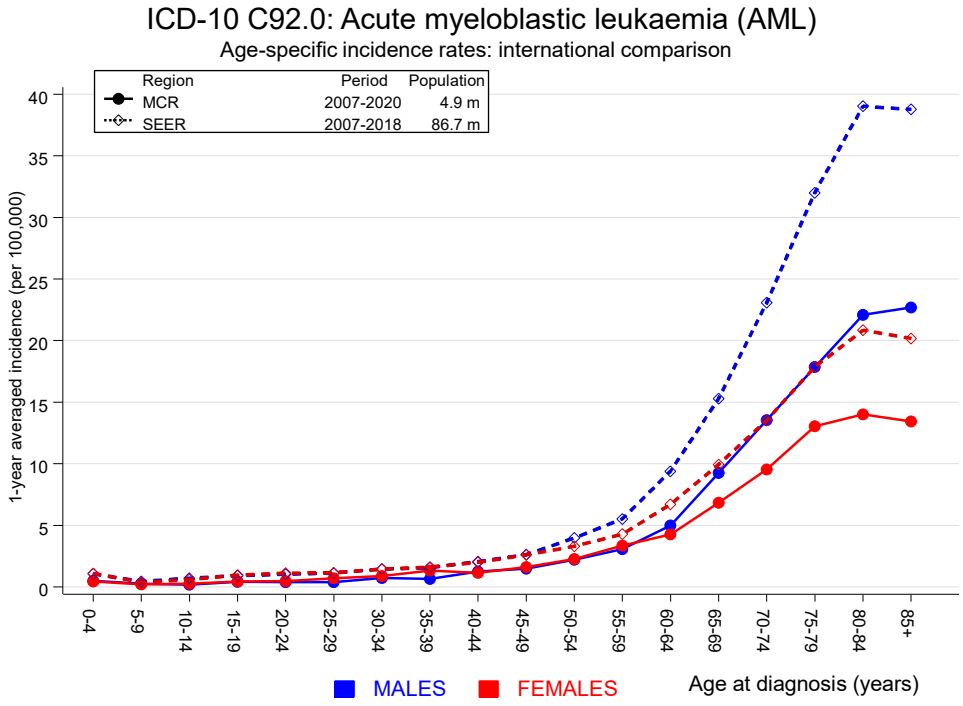


Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:
Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 21 Regs Research Data, released April 2021, based on the November 2020 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 1998–2020

MALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C09–C10	Oropharynx	1	0.3	3.6	0.1	19.8		3.3	
C12–C13	Hypopharynx	1	0.2	6.6	0.2	37.0		3.9	
C15	Oesophagus	2	0.5	3.8	0.5	13.7		6.8	50.0
C16	Stomach	1	0.9	1.1	0.0	6.1		0.4	
C18	Colon	4	2.3	1.8	0.5	4.5		8.1	
C19–C20	Rectum	3	1.3	2.3	0.5	6.7		7.8	
C23–C24	Bile	1	0.3	3.9	0.1	21.8		3.4	
C25	Pancreas	2	1.0	2.1	0.3	7.6		4.8	
C32	Larynx	1	0.3	4.0	0.1	22.2		3.5	100.0
C33–C34	Lung	9	2.9	3.1	1.4	5.8	#	28.1	11.1
C38,C45	Mesothelioma	1	0.2	6.2	0.2	34.3		3.9	
C43	Malign. melanoma	1	1.2	0.9	0.0	4.7		−0.8	
C46,C49	Soft tissue	4	0.1	27.6	7.5	70.6	#	17.8	
C50	Breast	2	0.1	29.7	3.6	107.1	#	8.9	
C61	Prostate	9	6.9	1.3	0.6	2.5		9.8	11.1
C62	Testis	1	0.1	7.3	0.2	40.7		4.0	
C67	Bladder	1	1.1	0.9	0.0	5.2		−0.3	
C70–C72	CNS cancer	2	0.3	6.1	0.7	21.9		7.7	
C73	Thyroid	1	0.2	5.3	0.1	29.4		3.7	
C81	Hodgkin lymphoma	2	0.1	27.9	3.4	100.7	#	8.9	
C82–C85	NHL	8	1.0	7.8	3.4	15.4	#	32.2	
C90	Mult. myeloma	3	0.3	9.7	2.0	28.3	#	12.4	
C91–C96	Leukaemia	6	0.4	16.3	6.0	35.6	#	26.0	33.3
Not observed		0	3.1	0.0	0.0	1.2		−14.1	
All further malignancies		66	24.8	2.7	2.1	3.4	#	190.5	9.1

Patients	1336
Median age at next malignancy (years)	69.7
Person-years	2163
Mean observation time (years)	1.6
Median observation time (years)	0.5

The occurrence of further specified malignancy is statistically significant.

Table 7b

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of further malignancies for period 1998–2020
FEMALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C03–C06	Oral cavity	2	0.1	22.6	2.7	81.7	#	10.0	
C15	Oesophagus	3	0.1	30.8	6.3	89.9	#	15.2	
C18	Colon	1	1.2	0.8	0.0	4.5		−1.3	
C19–C20	Rectum	1	0.5	1.8	0.0	10.3		2.4	
C22	Liver	1	0.2	6.0	0.2	33.2		4.3	
C25	Pancreas	1	0.6	1.6	0.0	9.2		2.0	
C33–C34	Lung	5	1.1	4.4	1.4	10.3	#	20.2	
C50	Breast	10	4.9	2.0	1.0	3.7		26.5	10.0
C53	Cervix uteri	3	0.3	11.8	2.4	34.6	#	14.3	66.7
C54	Corpus uteri	4	0.8	4.8	1.3	12.4	#	16.6	
C56	Ovary	1	0.6	1.7	0.0	9.4		2.1	
C70–C72	CNS cancer	1	0.2	5.1	0.1	28.4		4.2	
C76–C79	CUP	1	0.2	4.5	0.1	25.0		4.1	
C82–C85	NHL	3	0.5	5.5	1.1	16.2	#	12.8	
C90	Mult. myeloma	2	0.2	12.2	1.5	44.0	#	9.6	
C91–C96	Leukaemia	2	0.2	9.7	1.2	35.0	#	9.4	50.0
C96	Systemic	1	0.0	374.1	9.5	2085	#	5.2	100.0
Not observed		0	3.1	0.0	0.0	1.2		−16.0	
All further malignancies		42	14.9	2.8	2.0	3.8	#	141.7	11.9

Patients	1261
Median age at next malignancy (years)	66.1
Person-years	1914
Mean observation time (years)	1.5
Median observation time (years)	0.5

The occurrence of further specified malignancy is statistically significant.

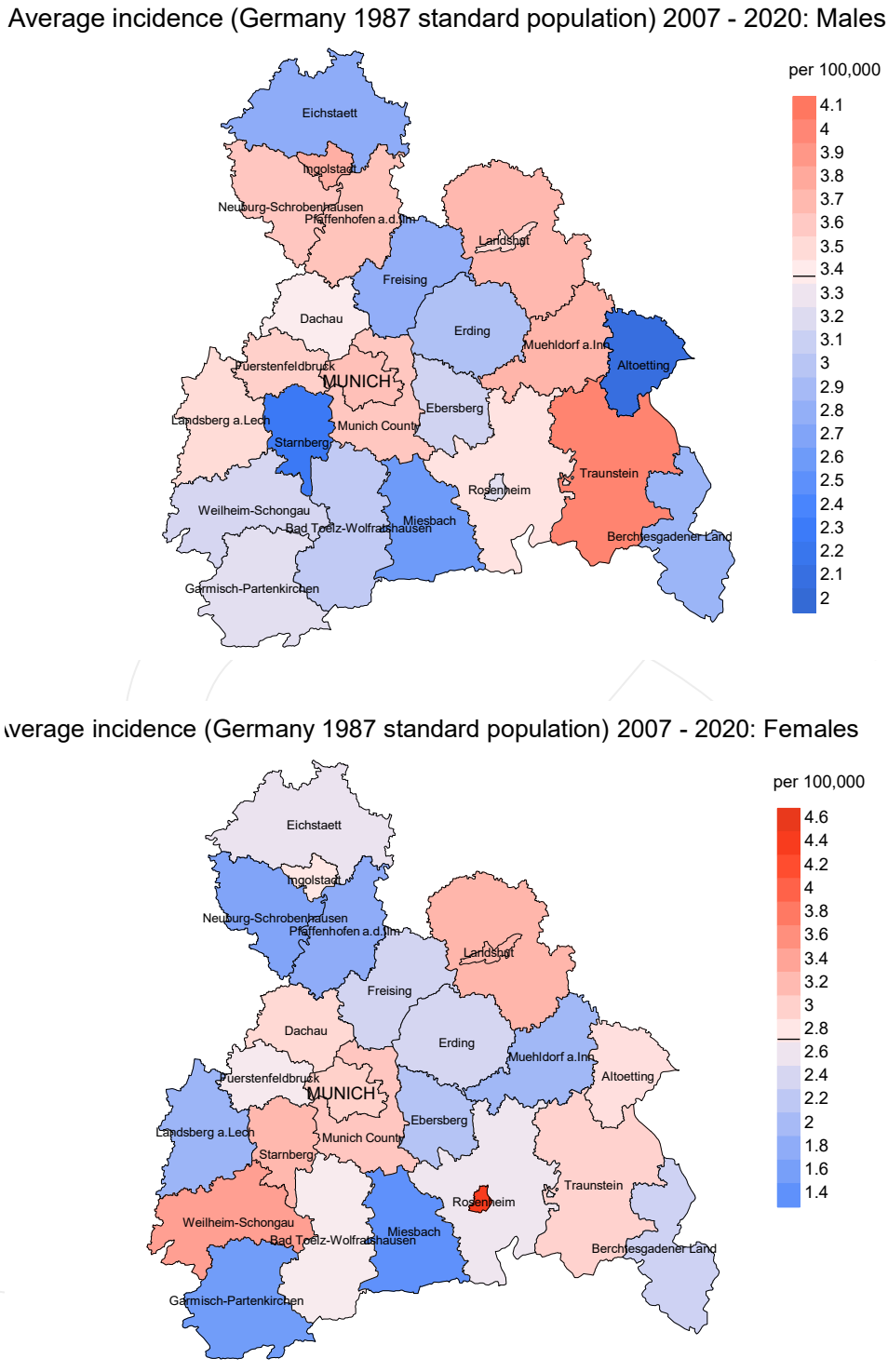
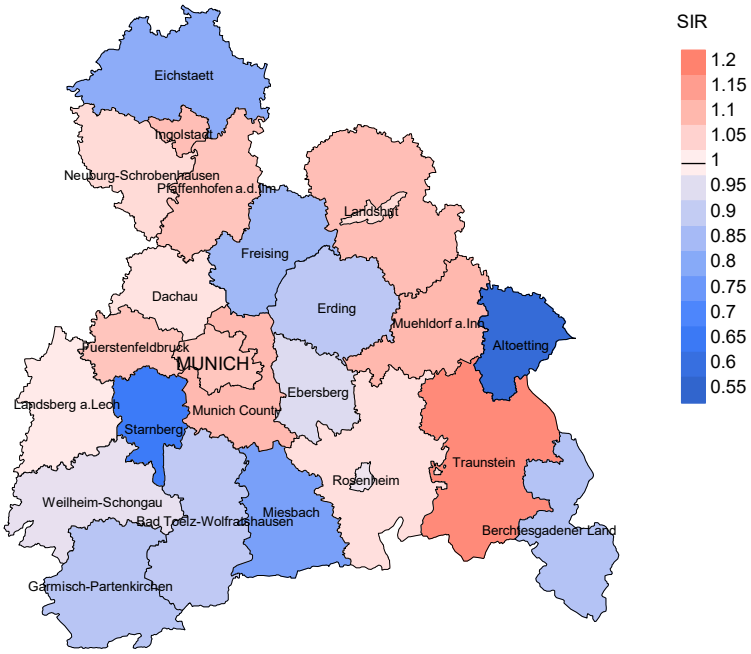


Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 3.4/100,000 WS N=1,187, females 2.7/100,000 WS N=1,150).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,727 female residents (averaged) in the period from 2007 to 2020 a total of 23 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 2.1/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 1.1 and 3.6/100,000.

Standardized incidence ratio (SIR) 2007 - 2020: Males



Standardized incidence ratio (SIR) 2007 - 2020: Females

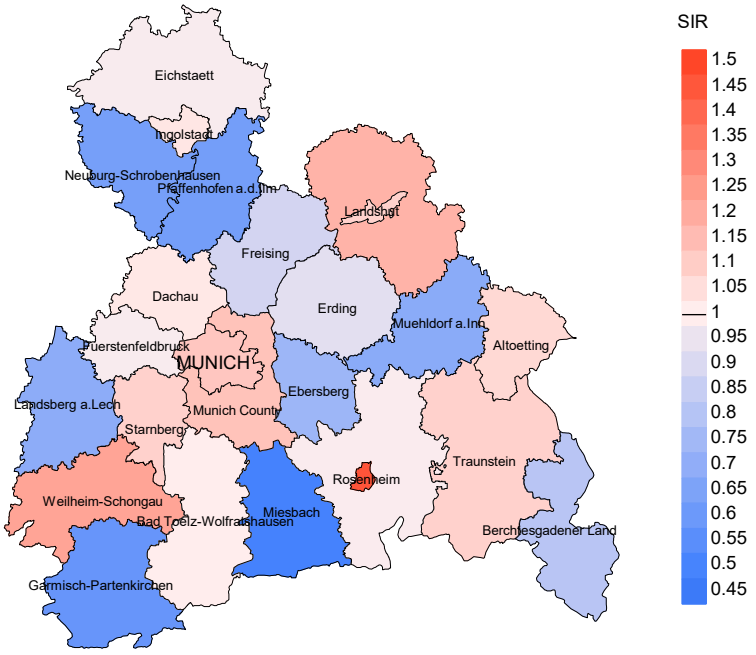


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=1,187, females N=1,150).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2020 a total of 23 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 0.73. Though, the value of this parameter may vary with an underlying probability of 99% between 0.40 and 1.23, 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 4.94 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	37	100.0	2.7	32	86.5	96.9
1999	30	100.0	6.7	26	86.7	96.2
2000	60	100.0	33.3	52	86.7	96.2
2001	84	100.0	53.6	77	91.7	100.0
2002	96	95.8	44.8	84	87.5	98.8
2003	127	99.2	48.8	116	91.3	99.1
2004	147	98.6	46.9	128	87.1	99.2
2005	131	98.5	45.0	116	88.5	98.3
2006	179	97.8	45.3	164	91.6	98.8
2007	153	98.0	36.6	136	88.9	97.8
2008	150	98.7	36.0	128	85.3	100.0
2009	169	100.0	24.9	146	86.4	98.6
2010	208	100.0	25.5	172	82.7	98.3
2011	163	98.8	22.7	133	81.6	96.2
2012	212	99.1	25.9	182	85.8	98.4
2013	196	99.0	30.6	165	84.2	95.2
2014	204	98.5	35.8	181	88.7	97.8
2015	200	99.5	26.0	181	90.5	96.7
2016	207	100.0	26.1	167	80.7	96.4
2017	184	100.0	23.9	150	81.5	88.0
2018	113	100.0	29.2	89	78.8	71.9
2019	87	100.0	6.9	54	62.1	74.1
2020	91	100.0	1.1	56	61.5	94.6
1998-2020	3228	99.1	31.0	2735	84.7	95.9

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 4.94 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	37	37	100.0	16	43.2
1999	30	19	94.7	5	16.7
2000	60	41	100.0	28	46.7
2001	84	78	97.4	50	59.5
2002	96	71	100.0	51	53.1
2003	127	90	97.8	74	58.3
2004	147	94	98.9	77	52.4
2005	131	118	100.0	78	59.5
2006	179	117	99.1	107	59.8
2007	153	124	98.4	79	51.6
2008	150	118	98.3	77	51.3
2009	169	120	97.5	87	51.5
2010	208	152	98.7	105	50.5
2011	163	143	97.9	80	49.1
2012	212	149	99.3	104	49.1
2013	196	161	97.5	102	52.0
2014	204	157	98.1	116	56.9
2015	200	159	99.4	111	55.5
2016	207	151	99.3	109	52.7
2017	184	160	99.4	98	53.3
2018	113	105	77.1	58	51.3
2019	87	91	42.9	30	34.5
2020	91	91	93.4	41	45.1
1998–2020	3228	2546	95.6	1683	52.1

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 4.94 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. non-cancer-related %	Prop. cancer recorded on death certificate %
1998	37	86.5	13.5	97.3
1999	19	78.9	21.1	100.0
2000	41	97.6	2.4	100.0
2001	78	85.9	14.1	98.7
2002	71	94.4	5.6	100.0
2003	90	93.3	6.7	98.9
2004	94	96.8	3.2	98.9
2005	118	96.6	3.4	100.0
2006	117	94.9	5.1	98.3
2007	124	93.5	6.5	99.2
2008	118	94.1	5.9	97.4
2009	120	95.0	5.0	98.3
2010	152	96.1	3.9	100.0
2011	143	90.9	9.1	96.4
2012	149	95.3	4.7	99.3
2013	161	88.8	11.2	100.0
2014	157	90.4	9.6	97.4
2015	159	90.6	9.4	96.2
2016	151	89.4	10.6	96.7
2017	160	88.8	11.3	96.9
2018	105	76.2	23.8	84.0
2019	91	57.1	42.9	94.9
2020	91	81.3	18.7	90.6
1998-2020	2546	90.0	10.0	97.5

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	18	60.8	60.2	72.1	60.8
1999	8	61.7	61.7		61.7
2000	26	62.8	62.8		62.8
2001	42	71.2	73.4	63.6	71.2
2002	37	69.5	69.1	78.9	69.5
2003	47	72.9	73.1	71.8	73.1
2004	48	71.8	72.7	64.7	72.0
2005	58	72.1	72.0	77.9	72.1
2006	69	71.4	71.5	70.1	71.1
2007	61	69.1	69.6	28.3	69.3
2008	59	72.2	73.2	64.1	72.9
2009	56	72.4	72.4	66.4	72.4
2010	72	73.3	73.4	54.5	73.4
2011	69	73.4	73.9	64.9	73.8
2012	77	72.8	73.0	12.4	72.8
2013	91	76.5	76.4	78.6	76.4
2014	82	75.7	75.6	77.8	75.7
2015	83	75.6	75.7	61.3	75.6
2016	82	75.3	74.9	81.8	75.6
2017	78	74.5	74.6	69.2	74.6
2018	57	75.5	76.0	74.9	77.7
2019	48	76.8	75.9	79.9	77.7
2020	51	75.2	75.8	71.5	76.4
1998-2020	1319	73.7	73.8	72.1	73.8

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	19	57.5	57.4	79.9	57.4
1999	11	74.3	75.2	68.5	74.7
2000	15	75.2	75.6	29.9	75.2
2001	36	69.3	71.0	61.7	71.0
2002	34	74.2	73.8	83.8	74.2
2003	43	74.7	74.8	50.5	74.7
2004	46	74.9	74.9	83.1	74.9
2005	60	74.7	75.7	42.8	74.7
2006	48	76.9	77.0	76.7	76.9
2007	63	70.1	70.6	55.7	70.5
2008	59	74.6	73.2	84.3	73.2
2009	64	74.0	74.7	61.6	74.1
2010	80	77.3	77.7	68.4	77.4
2011	74	73.0	73.0	75.0	73.5
2012	72	72.2	72.4	70.8	72.2
2013	70	76.9	74.5	79.4	76.0
2014	75	74.7	75.3	63.3	75.2
2015	76	75.6	75.2	78.1	75.5
2016	69	76.8	76.6	80.4	76.6
2017	82	74.8	73.3	77.2	74.7
2018	48	76.6	76.1	82.1	75.2
2019	43	69.6	72.6	68.8	75.0
2020	40	78.5	77.6	86.3	78.5
1998–2020	1227	74.7	74.7	73.6	74.7

By 2018, Bavarians' life expectancy at birth is estimated at 79.3 years for boys and 83.8 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	15	1.4	0.79	1.3	0.92	1.4	0.82	1.6	0.77
1999	8	0.7	0.47	0.4	0.45	0.6	0.46	0.7	0.43
2000	26	2.3	0.90	1.4	0.77	2.0	0.86	2.5	0.87
2001	37	3.2	0.84	1.8	0.83	2.8	0.86	4.0	0.94
2002	35	1.9	0.71	1.1	0.61	1.6	0.69	2.1	0.70
2003	42	2.2	0.65	1.2	0.60	1.9	0.63	2.5	0.66
2004	46	2.4	0.69	1.3	0.68	2.0	0.69	2.8	0.75
2005	55	2.9	0.87	1.5	0.77	2.3	0.85	3.1	0.89
2006	64	3.3	0.63	1.7	0.58	2.6	0.61	3.5	0.63
2007	59	2.7	0.69	1.5	0.66	2.1	0.68	2.8	0.74
2008	55	2.5	0.79	1.2	0.57	1.8	0.70	2.4	0.79
2009	54	2.4	0.69	1.2	0.62	1.8	0.67	2.4	0.72
2010	69	3.1	0.64	1.5	0.56	2.2	0.61	2.9	0.63
2011	62	2.8	0.76	1.3	0.66	2.0	0.70	2.7	0.79
2012	74	3.3	0.72	1.5	0.67	2.3	0.70	3.1	0.71
2013	82	3.6	0.72	1.4	0.60	2.3	0.67	3.3	0.71
2014	74	3.2	0.74	1.2	0.67	2.0	0.71	2.8	0.72
2015	74	3.1	0.72	1.4	0.67	2.1	0.68	2.8	0.72
2016	73	3.0	0.68	1.3	0.59	2.0	0.63	2.7	0.66
2017	71	2.9	0.76	1.3	0.73	2.0	0.73	2.6	0.76
2018	44	1.8	0.80	0.7	0.82	1.1	0.82	1.6	0.81
2019	32	1.3	0.74	0.5	0.65	0.8	0.72	1.1	0.72
2020	38	1.6	0.84	0.7	0.80	1.0	0.79	1.4	0.85
1998-2020	1189	2.6	0.72	1.2	0.66	1.8	0.69	2.5	0.73

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	17	1.4	0.94	1.2	1.09	1.3	1.02	1.4	1.02
1999	7	0.6	0.54	0.2	0.35	0.4	0.42	0.5	0.49
2000	14	1.2	0.45	0.5	0.28	0.7	0.35	0.9	0.40
2001	30	2.5	0.75	1.3	0.82	1.8	0.76	2.2	0.75
2002	32	1.6	0.68	0.7	0.62	1.0	0.63	1.4	0.70
2003	42	2.1	0.68	0.9	0.60	1.3	0.65	1.7	0.67
2004	45	2.3	0.56	0.9	0.47	1.4	0.50	1.8	0.54
2005	59	3.0	0.87	1.2	0.69	1.8	0.78	2.4	0.83
2006	47	2.3	0.61	0.9	0.54	1.4	0.59	2.0	0.64
2007	57	2.5	0.84	1.1	0.75	1.6	0.79	2.1	0.81
2008	56	2.4	0.70	1.0	0.58	1.4	0.62	1.9	0.65
2009	60	2.6	0.66	1.0	0.55	1.6	0.61	2.1	0.65
2010	77	3.3	0.76	1.2	0.62	1.8	0.65	2.5	0.72
2011	68	2.9	0.84	1.1	0.54	1.7	0.68	2.2	0.78
2012	68	2.9	0.62	1.2	0.53	1.8	0.57	2.3	0.60
2013	61	2.6	0.74	1.0	0.66	1.5	0.72	2.0	0.73
2014	68	2.8	0.65	1.1	0.55	1.6	0.59	2.1	0.60
2015	70	2.9	0.72	1.0	0.65	1.6	0.67	2.2	0.71
2016	62	2.5	0.63	1.1	0.60	1.5	0.60	1.9	0.59
2017	71	2.9	0.79	1.2	0.73	1.7	0.76	2.2	0.77
2018	36	1.5	0.62	0.5	0.51	0.8	0.54	1.1	0.59
2019	20	0.8	0.45	0.3	0.42	0.5	0.42	0.6	0.43
2020	36	1.5	0.78	0.5	0.65	0.8	0.68	1.1	0.73
1998-2020	1103	2.3	0.70	0.9	0.60	1.4	0.64	1.8	0.67

Table 12

Age distribution of age at death (cancer-related) for period 2007-2020
(**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	5	0.3	0.4	2	0.2	0.3	3	0.4	0.5
15-19	4	0.2	0.7	2	0.2	0.6	2	0.2	0.7
20-24	9	0.5	1.2	6	0.7	1.3	3	0.4	1.1
25-29	8	0.5	1.7	4	0.5	1.7	4	0.5	1.6
30-34	7	0.4	2.1	2	0.2	2.0	5	0.6	2.2
35-39	18	1.1	3.2	9	1.0	3.0	9	1.1	3.3
40-44	32	1.9	5.1	10	1.2	4.2	22	2.7	6.0
45-49	45	2.7	7.8	25	2.9	7.1	20	2.5	8.5
50-54	56	3.4	11.1	27	3.1	10.2	29	3.6	12.1
55-59	78	4.7	15.8	32	3.7	13.9	46	5.7	17.8
60-64	109	6.5	22.3	55	6.4	20.3	54	6.7	24.4
65-69	191	11.4	33.8	113	13.1	33.4	78	9.6	34.1
70-74	302	18.1	51.8	164	19.0	52.5	138	17.0	51.1
75-79	350	20.9	72.8	193	22.4	74.9	157	19.4	70.5
80-84	249	14.9	87.7	128	14.9	89.8	121	14.9	85.4
85+	206	12.3	100.0	88	10.2	100.0	118	14.6	100.0
All ages	1671	100.0		861	100.0		810	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**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	0.13			5.3	
5- 9		1			0.1	0.33		4.0
10-14	2	3	0.1	0.67	0.2	0.75	7.1	13.0
15-19	2	2	0.1	0.29	0.1	0.29	4.2	8.0
20-24	6	3	0.3	0.75	0.2	0.33	8.2	7.0
25-29	4	4	0.2	0.44	0.2	0.25	4.3	4.0
30-34	2	5	0.1	0.12	0.2	0.25	1.4	2.8
35-39	9	9	0.4	0.60	0.4	0.30	3.4	2.2
40-44	10	22	0.4	0.32	0.9	0.79	1.7	2.6
45-49	25	20	0.9	0.63	0.8	0.48	1.8	1.2
50-54	27	29	1.1	0.48	1.2	0.51	1.0	1.1
55-59	32	46	1.5	0.49	2.1	0.63	0.7	1.2
60-64	55	54	3.1	0.63	2.8	0.67	0.9	1.1
65-69	113	78	6.9	0.75	4.3	0.63	1.2	1.1
70-74	164	138	10.9	0.81	8.0	0.84	1.4	1.6
75-79	193	157	16.0	0.89	10.5	0.80	1.5	1.6
80-84	128	121	17.7	0.80	11.4	0.81	1.2	1.3
85+	88	118	18.8	0.83	11.3	0.84	1.0	1.0
All ages	861	810					1.2	1.3
Mortality								
Raw			2.6	0.73	2.4	0.70		
WS			1.2	0.65	1.0	0.60		
ES			1.8	0.69	1.4	0.64		
BRD-S			2.5	0.72	1.8	0.67		
PYLL-70								
per 100,000			12.3		13.7			
ES			11.2		12.4			
AYLL-70			12.2		14.0			

Table 14a

Further malignancies in deaths in period 1998–2020
MALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03–C06	Oral cavity	2	0.4	2	100.0				
C07–C08	Salivary gland	1	0.2	1	100.0				
C09–C10	Oropharynx	3	0.6	1	33.3	1	33.3	1	33.3
C12–C13	Hypopharynx	1	0.2					1	100.0
C15	Oesophagus	4	0.7	2	50.0			2	50.0
C16	Stomach	5	0.9	4	80.0	1	20.0		
C17	Small intestine	2	0.4	2	100.0				
C18	Colon	35	6.5	30	85.7	3	8.6	2	5.7
C19–C20	Rectum	16	3.0	12	75.0	1	6.3	3	18.8
C22	Liver	1	0.2	1	100.0				
C23–C24	Bile	1	0.2					1	100.0
C25	Pancreas	5	0.9			1	20.0	4	80.0
C30–C31	Sinuses	1	0.2	1	100.0				
C32	Larynx	3	0.6	2	66.7	1	33.3		
C33–C34	Lung	23	4.3	9	39.1	7	30.4	7	30.4
C38,C45	Mesothelioma	2	0.4	1	50.0	1	50.0		
C40–C41	Bone	1	0.2	1	100.0				
C43	Malign. melanoma	14	2.6	14	100.0				
C44	Skin others	26	4.8	15	57.7	2	7.7	9	34.6
C46,C49	Soft tissue	7	1.3	2	28.6	1	14.3	4	57.1
C48	Peritoneal	1	0.2	1	100.0				
C61	Prostate	105	19.5	95	90.5	3	2.9	7	6.7
C62	Testis	3	0.6	3	100.0				
C64	Kidney	9	1.7	9	100.0				
C67	Bladder	13	2.4	11	84.6	2	15.4		
C68	Urinary org.	2	0.4	1	50.0			1	50.0
C70–C72	CNS cancer	5	0.9	2	40.0	1	20.0	2	40.0
C73	Thyroid	3	0.6	3	100.0				
C74–C80	Cancer others	1	0.2	1	100.0				
C76–C79	CUP	1	0.2	1	100.0				
C81	Hodgkin lymphoma	7	1.3	5	71.4			2	28.6
C82–C85	NHL	45	8.3	34	75.6	5	11.1	6	13.3
C90	Mult. myeloma	5	0.9	3	60.0	2	40.0		
C91–C96	Leukaemia	184	34.1			45	24.5	139	75.5
C96	Systemic	2	0.4	1	50.0	1	50.0		
All further malignancies		539	100.0	270	50.1	78	14.5	191	35.4

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 1998–2020
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03–C06	Oral cavity	1	0.2					1	100.0
C07–C08	Salivary gland	2	0.5	2	100.0				
C15	Oesophagus	2	0.5					2	100.0
C16	Stomach	5	1.2	5	100.0				
C18	Colon	13	3.0	11	84.6	1	7.7	1	7.7
C19–C20	Rectum	6	1.4	4	66.7	1	16.7	1	16.7
C21	Anus/canal	3	0.7	3	100.0				
C22	Liver	1	0.2					1	100.0
C25	Pancreas	1	0.2					1	100.0
C26	GI cancer	1	0.2	1	100.0				
C33–C34	Lung	10	2.3	6	60.0	2	20.0	2	20.0
C43	Malign. melanoma	11	2.5	10	90.9	1	9.1		
C44	Skin others	11	2.5	7	63.6	1	9.1	3	27.3
C46,C49	Soft tissue	4	0.9	3	75.0			1	25.0
C48	Peritoneal	2	0.5	2	100.0				
C50	Breast	105	24.2	98	93.3	5	4.8	2	1.9
C51	Vulva	1	0.2	1	100.0				
C52	Vagina	1	0.2					1	100.0
C53	Cervix uteri	9	2.1	7	77.8	1	11.1	1	11.1
C54	Corpus uteri	20	4.6	15	75.0	2	10.0	3	15.0
C56	Ovary	7	1.6	6	85.7			1	14.3
C64	Kidney	5	1.2	3	60.0	2	40.0		
C65	Renal pelvis	1	0.2					1	100.0
C66	Ureter	1	0.2	1	100.0				
C67	Bladder	3	0.7	2	66.7	1	33.3		
C70–C72	CNS cancer	3	0.7	2	66.7			1	33.3
C73	Thyroid	9	2.1	8	88.9	1	11.1		
C76–C79	CUP	5	1.2	1	20.0	1	20.0	3	60.0
C81	Hodgkin lymphoma	5	1.2	5	100.0				
C82–C85	NHL	24	5.5	21	87.5	2	8.3	1	4.2
C90	Mult. myeloma	7	1.6	5	71.4	2	28.6		
C91–C96	Leukaemia	152	35.1			41	27.0	111	73.0
C96	Systemic	2	0.5	1	50.0			1	50.0
All further malignancies		433	100.0	230	53.1	64	14.8	139	32.1

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 2007-2020
(**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	0.13			5.3	
5- 9		1			0.1	0.50		4.0
10-14	2	1	0.1	1.00	0.1	0.33	7.1	5.3
15-19	2	2	0.1	0.40	0.1	0.33	4.3	8.7
20-24	4	2	0.2	0.57	0.1	0.22	6.1	4.9
25-29	4	3	0.2	0.44	0.1	0.25	4.7	3.3
30-34	1	5	0.0	0.08	0.2	0.28	0.7	3.1
35-39	7	9	0.3	0.47	0.4	0.31	2.8	2.4
40-44	9	18	0.4	0.32	0.7	0.82	1.6	2.4
45-49	21	15	0.8	0.64	0.6	0.48	1.6	1.0
50-54	21	22	0.8	0.43	0.9	0.56	0.9	1.0
55-59	25	29	1.2	0.50	1.3	0.57	0.6	0.9
60-64	35	40	2.0	0.54	2.1	0.68	0.7	1.0
65-69	66	51	4.0	0.78	2.8	0.67	0.9	0.9
70-74	88	72	5.9	0.79	4.2	0.72	1.0	1.1
75-79	107	94	8.8	0.93	6.3	0.79	1.2	1.3
80-84	72	85	9.9	0.80	8.0	0.85	1.0	1.2
85+	47	75	10.1	0.85	7.2	0.81	0.7	0.8
All ages	512	524					1.0	1.1
Mortality								
Raw			1.6	0.69	1.6	0.68		
WS			0.7	0.60	0.6	0.56		
ES			1.1	0.64	0.9	0.61		
BRD-S			1.5	0.69	1.2	0.64		
PYLL-70								
per 100,000			9.6		10.4			
ES			8.8		9.4			
AYLL-70			13.8		14.8			

* See corresponding tables with multiple malignancies.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**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	0.13			5.3	
5- 9		1			0.1	0.50		4.0
10-14	2	1	0.1	1.00	0.1	0.33	7.1	5.3
15-19	2	2	0.1	0.40	0.1	0.33	4.3	9.1
20-24	4	2	0.2	0.57	0.1	0.25	6.1	5.0
25-29	4	3	0.2	0.44	0.1	0.33	4.7	3.4
30-34	1	5	0.0	0.08	0.2	0.28	0.7	3.2
35-39	7	6	0.3	0.47	0.3	0.23	2.8	1.6
40-44	9	14	0.4	0.33	0.6	0.74	1.6	1.9
45-49	18	15	0.7	0.58	0.6	0.48	1.4	1.1
50-54	19	21	0.7	0.42	0.8	0.60	0.8	1.0
55-59	22	26	1.0	0.50	1.2	0.52	0.6	0.8
60-64	34	38	1.9	0.55	2.0	0.69	0.6	1.0
65-69	59	46	3.6	0.76	2.5	0.63	0.8	0.9
70-74	82	69	5.5	0.78	4.0	0.72	0.9	1.1
75-79	99	90	8.2	0.90	6.0	0.77	1.1	1.2
80-84	70	83	9.7	0.79	7.8	0.84	1.0	1.2
85+	44	74	9.4	0.85	7.1	0.80	0.7	0.8
All ages	477	496					0.9	1.0
Mortality								
Raw			1.5	0.68	1.5	0.66		
WS			0.7	0.58	0.6	0.55		
ES			1.0	0.63	0.9	0.60		
BRD-S			1.4	0.68	1.1	0.63		
PYLL-70								
per 100,000			9.0		9.4			
ES			8.4		8.5			
AYLL-70			14.1		14.7			

* See corresponding tables with multiple malignancies.

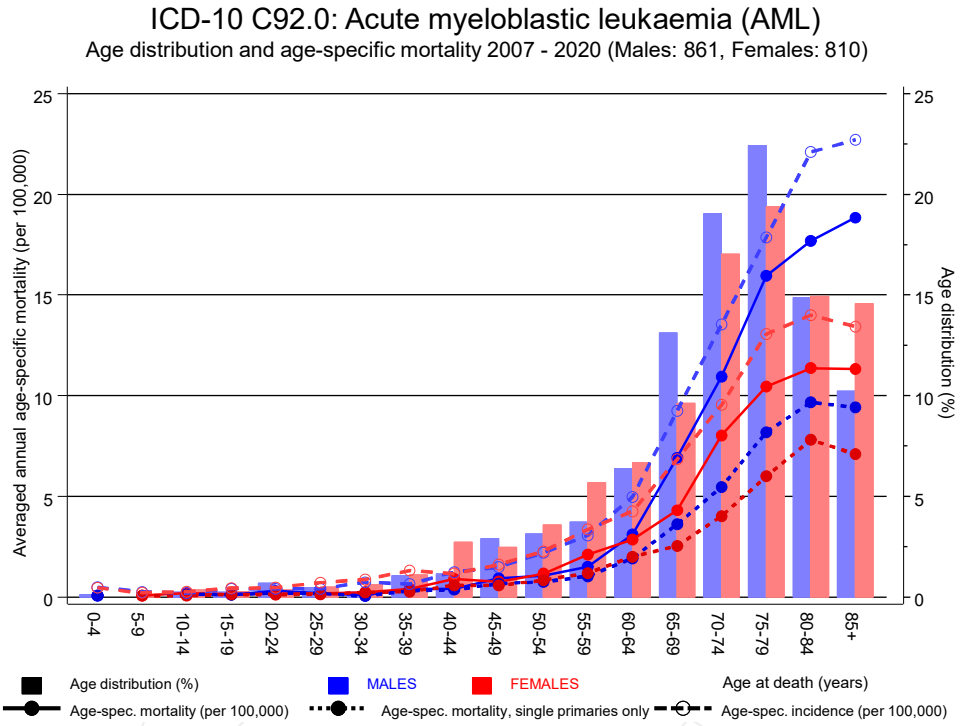


Figure 17. Distribution of age at death (bars; males: mean=70.7 yrs, median=73.6 yrs; females: mean=70.7 yrs, median=74.0 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

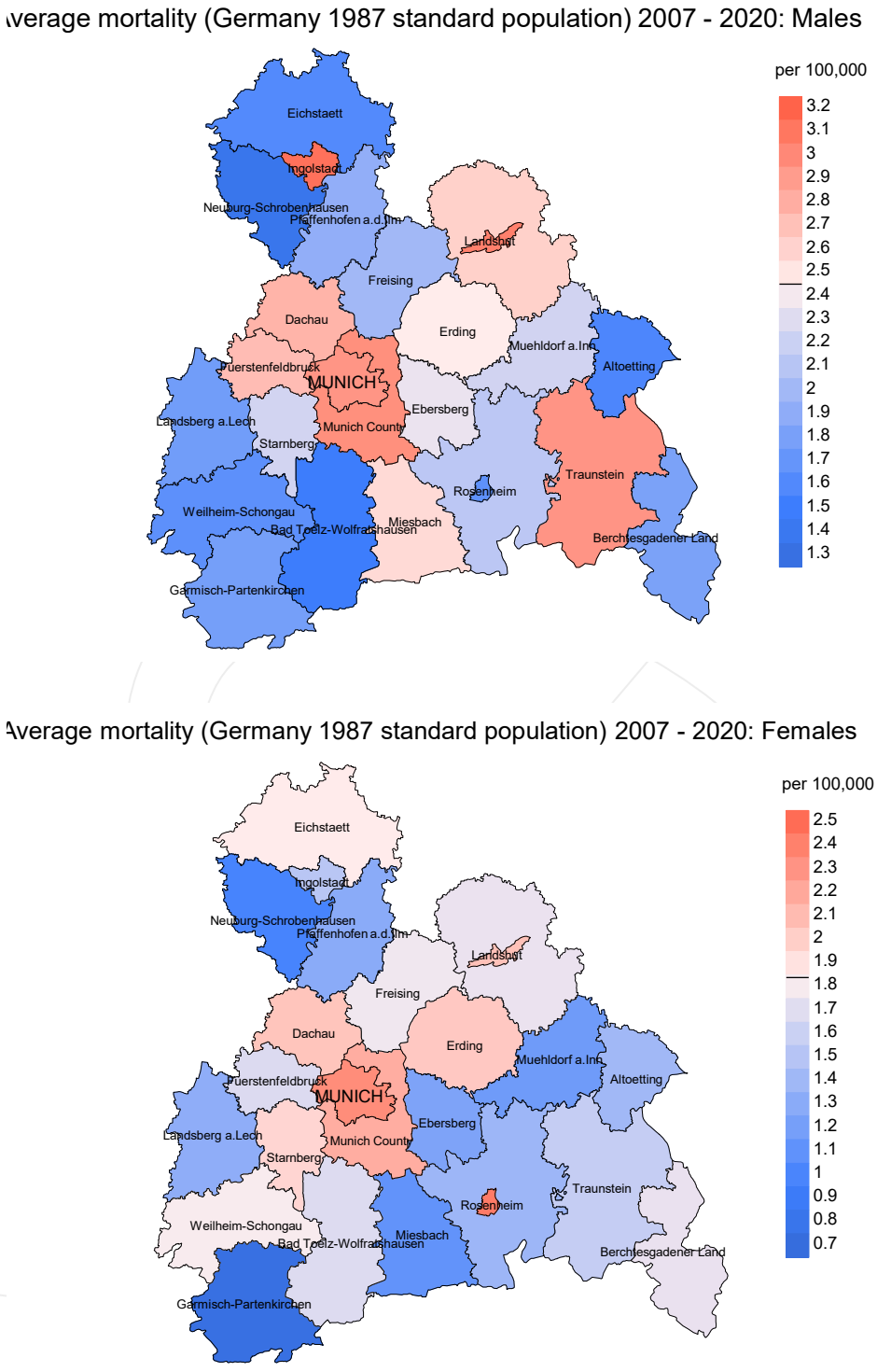
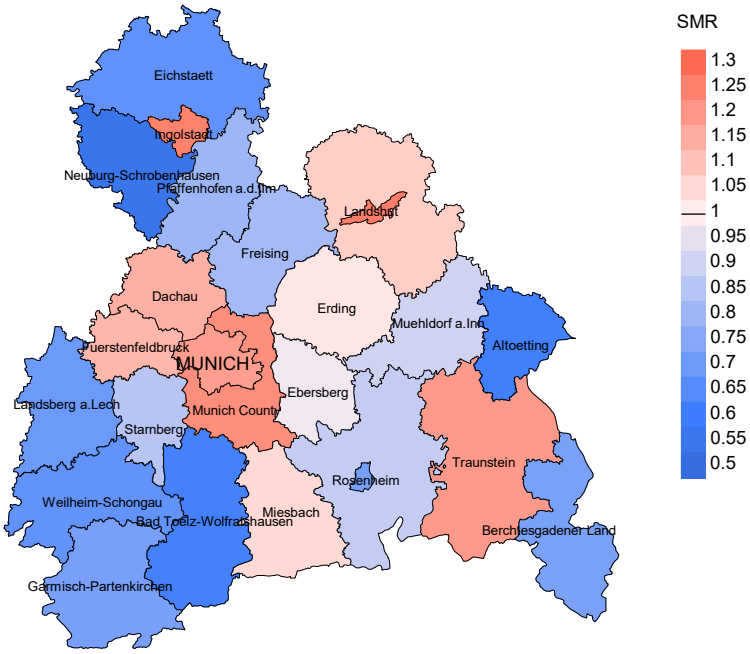


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2020. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 2.5/100,000 WS N=861, females 1.8/100,000 WS N=810).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,727 female residents (averaged) in the period from 2007 to 2020 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 1.2/100,000 (german 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 - 2020: Males



Standardized mortality ratio (SMR) 2007 - 2020: Females

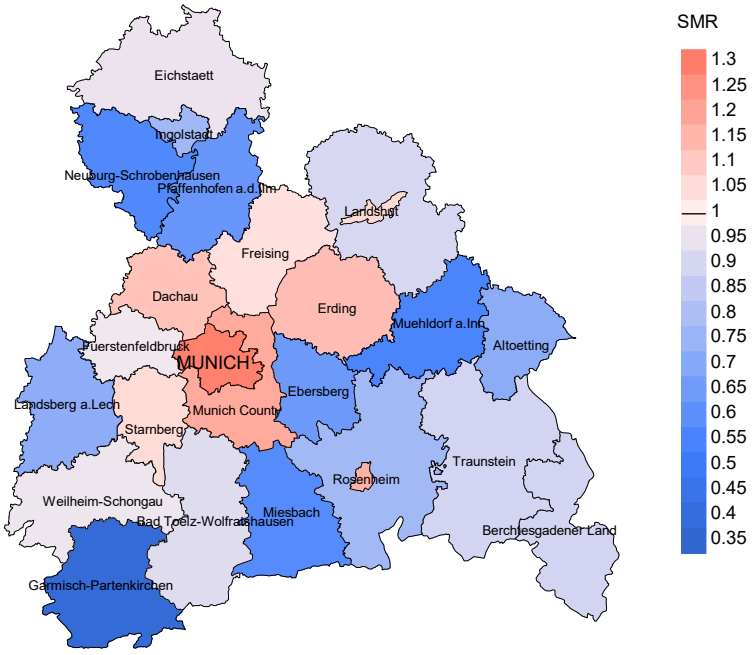


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=861, females N=810).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2020 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 0.64. Though, the value of this parameter may vary with an underlying probability of 99% between 0.28 and 1.22, 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 ratio of mortality and incidence (mortality-to-incidence ratio, **MIR**, **MI-Index**) is a statistical index 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 MIR. 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 (FRG) 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 of mortality to incidence, MIR
FRG	Federal Republic of Germany

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