

Munich Cancer Registry



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ICD-10 C92: Myeloid leukaemia

Incidence and Mortality

Year of diagnosis	1998-2019
Patients	4,680
Diseases	4,700
Creation date	01/26/2021
Database export	01/07/2021
Population	4.92 m



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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

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**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, January 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.-	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 with 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	89	27	30.3	9.0	5.8	87.6	100.0
1999	109	38	34.9	11.1	5.8	83.5	99.1
2000	121	42	34.7	11.0	5.8	81.0	100.0
2001	135	65	48.1	11.7	5.7	85.2	97.0
2002	172	65	37.8	11.5	5.7	79.7	96.5 #
2003	227	90	39.6	12.9	5.6	81.5	98.7
2004	220	92	41.8	14.4	5.7	80.0	98.6
2005	206	77	37.4	15.6	5.5	78.2	96.6
2006	243	103	42.4	17.1	5.3	86.0	96.3
2007	236	77	32.6	17.7	5.2	78.8	97.0 #
2008	241	83	34.4	19.1	4.8	78.0	98.3
2009	249	59	23.7	19.9	4.7	76.7	98.4
2010	314	74	23.6	21.3	4.6	75.5	99.7
2011	239	53	22.2	22.1	4.3	74.9	98.3
2012	301	71	23.6	23.1	4.1	77.4	99.0
2013	294	82	27.9	24.0	3.9	75.2	98.3
2014	296	91	30.7	25.1	3.4	76.4	96.6
2015	286	70	24.5	25.4	2.9	79.0	96.5
2016	265	76	28.7	25.5	2.1	72.1	99.6
2017	264	63	23.9	25.8	0.9	67.8	99.2
2018	119	14	11.8	25.9	0.5	55.5	100.0
2019	74	8	10.8	26.0	0.0	50.0	83.8 ##
1998-2019	4700	1420	30.2	26.0	5.8	76.8	98.0

4,700 cases diagnosed 1998-2019 are related to a total of 4,680 patients. Currently, in 1,474 (31.5 %) of these 4,680 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 1,162 / 261 / 51 (24.8 % / 5.6 % / 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 retrieved from the respective headings.

How to interpret:

In 2017, a subgroup of 264 cases has been diagnosed, of which 25.8 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 0.9 % 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	43	48.3	15	34.9	7.0	6.5	90.7	100.0
1999	60	55.0	17	28.3	9.7	6.5	80.0	98.3
2000	62	51.2	22	35.5	9.7	6.4	87.1	100.0
2001	69	51.1	29	42.0	9.4	6.4	82.6	97.1
2002	82	47.7	27	32.9	9.5	6.5	78.0	98.8 #
2003	114	50.2	40	35.1	10.7	6.4	83.3	98.2
2004	107	48.6	40	37.4	12.1	6.5	80.4	100.0
2005	98	47.6	32	32.7	14.3	6.3	80.6	95.9
2006	139	57.2	59	42.4	16.5	6.2	87.8	95.7
2007	133	56.4	42	31.6	17.3	6.1	78.2	97.7 #
2008	126	52.3	46	36.5	19.3	5.6	72.2	97.6
2009	123	49.4	31	25.2	20.2	5.3	74.8	98.4
2010	161	51.3	45	28.0	21.2	5.1	82.0	99.4
2011	124	51.9	27	21.8	22.1	4.9	75.0	98.4
2012	152	50.5	32	21.1	23.0	4.9	75.7	99.3
2013	171	58.2	51	29.8	24.3	4.8	74.9	99.4
2014	155	52.4	46	29.7	25.8	4.0	74.8	96.8
2015	147	51.4	38	25.9	25.6	3.3	81.0	97.3
2016	145	54.7	38	26.2	25.9	2.1	70.3	100.0
2017	139	52.7	26	18.7	26.5	1.3	66.9	99.3
2018	59	49.6	8	13.6	26.7	1.1	57.6	100.0
2019	38	51.4	5	13.2	26.8	0.0	50.0	89.5 ##
1998–2019	2447	52.1	716	29.3	26.8	6.5	76.9	98.2

2,447 cases diagnosed 1998-2019 are related to a total of 2,433 patients. Currently, in 791 (32.5 %) of these 2,433 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 616 / 145 / 30 (25.3 % / 6.0 % / 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 retrieved from the respective headings.

How to interpret:

In 2017, a subgroup of 139 cases has been diagnosed, of which 26.5 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 1.3 % 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	46	51.7	12	26.1	10.9	5.0	84.8	100.0
1999	49	45.0	21	42.9	12.6	5.1	87.8	100.0
2000	59	48.8	20	33.9	12.3	5.1	74.6	100.0
2001	66	48.9	36	54.5	14.1	5.0	87.9	97.0
2002	90	52.3	38	42.2	13.5	4.9	81.1	94.4 #
2003	113	49.8	50	44.2	15.1	4.8	79.6	99.1
2004	113	51.4	52	46.0	16.8	4.7	79.6	97.3
2005	108	52.4	45	41.7	16.8	4.6	75.9	97.2
2006	104	42.8	44	42.3	17.8	4.4	83.7	97.1
2007	103	43.6	35	34.0	18.1	4.3	79.6	96.1 #
2008	115	47.7	37	32.2	18.9	4.0	84.3	99.1
2009	126	50.6	28	22.2	19.7	4.1	78.6	98.4
2010	153	48.7	29	19.0	21.4	3.9	68.6	100.0
2011	115	48.1	26	22.6	22.1	3.6	74.8	98.3
2012	149	49.5	39	26.2	23.3	3.2	79.2	98.7
2013	123	41.8	31	25.2	23.7	3.0	75.6	96.7
2014	141	47.6	45	31.9	24.4	2.8	78.0	96.5
2015	139	48.6	32	23.0	25.2	2.5	77.0	95.7
2016	120	45.3	38	31.7	25.2	2.1	74.2	99.2
2017	125	47.3	37	29.6	25.0	0.5	68.8	99.2
2018	60	50.4	6	10.0	25.0	0.0	53.3	100.0
2019	36	48.6	3	8.3	25.2	0.0	50.0	77.8 ##
1998–2019	2253	47.9	704	31.2	25.2	5.0	76.7	97.6

2,253 cases diagnosed 1998-2019 are related to a total of 2,247 patients. Currently, in 683 (30.4 %) of these 2,247 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 546 / 116 / 21 (24.3 % / 5.2 % / 0.9 %) 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 retrieved from the respective headings.

How to interpret:

In 2017, a subgroup of 125 cases has been diagnosed, of which 25.0 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 0.5 % 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 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 4.92 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	43	46	3.9	3.9	2.7	2.4	3.7	3.0	4.7	3.4
1999	60	49	5.4	4.1	3.3	2.1	4.7	3.0	5.8	3.7
2000	62	59	5.4	4.9	4.0	2.8	5.1	3.7	6.1	4.4
2001	69	66	6.0	5.4	3.7	2.6	5.2	3.8	6.6	4.7
2002	82	90	4.4	4.6	2.9	2.3	3.9	3.2	5.0	3.9
2003	114	113	6.1	5.7	3.5	2.9	5.2	4.0	6.7	4.8
2004	107	113	5.7	5.7	3.2	3.0	4.6	4.1	5.9	4.9
2005	98	108	5.2	5.4	3.1	2.8	4.2	3.7	5.3	4.6
2006	139	104	7.3	5.2	4.0	2.4	5.8	3.2	7.5	4.2
2007	133	103	6.0	4.5	3.6	2.2	4.8	3.0	6.0	3.7
2008	126	115	5.7	5.0	3.4	2.3	4.4	3.2	5.6	4.1
2009	123	126	5.5	5.4	3.2	2.7	4.3	3.7	5.4	4.4
2010	161	153	7.1	6.5	4.0	3.1	5.5	4.3	7.1	5.2
2011	124	115	5.5	4.9	3.2	2.7	4.3	3.4	5.2	4.0
2012	152	149	6.7	6.3	3.5	3.2	4.9	4.2	6.4	5.1
2013	171	123	7.4	5.2	3.6	2.4	5.2	3.3	6.9	4.2
2014	155	141	6.6	5.9	3.1	2.6	4.6	3.6	6.1	4.7
2015	147	139	6.2	5.7	2.9	2.4	4.3	3.5	5.6	4.4
2016	145	120	6.0	4.9	3.1	2.2	4.4	3.0	5.5	3.7
2017	139	125	5.8	5.1	2.8	2.3	4.1	3.2	5.2	4.0
2018	59	60	2.4	2.4	1.2	1.2	1.7	1.6	2.2	2.0
2019	38	36	1.6	1.5	0.8	0.7	1.0	1.0	1.4	1.2
1998-2019	2447	2253	5.6	4.9	3.1	2.4	4.3	3.3	5.4	4.0

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	Std.		Median						
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	89	61.1	21.9	0.9	94.1	29.0	43.1	68.2	77.1	86.3
1999	109	65.2	16.8	1.5	92.0	39.6	57.0	69.6	76.8	85.0
2000	121	60.5	19.6	0.5	97.6	34.4	48.5	63.6	74.7	81.0
2001	135	65.0	16.2	9.8	96.4	38.5	56.5	66.3	77.1	82.1
2002	172	63.8	17.9	7.7	96.1	38.0	52.9	67.8	77.8	83.1
2003	227	65.2	17.4	6.4	98.9	41.4	53.4	67.6	80.1	84.8
2004	220	66.3	15.9	9.8	93.3	44.0	57.2	68.0	78.3	84.6
2005	206	64.0	19.2	2.7	92.9	38.4	52.8	69.2	78.5	83.7
2006	243	67.9	17.4	1.8	95.1	41.5	62.5	72.3	79.6	84.8
2007	236	64.2	18.3	3.5	94.5	38.7	53.4	68.4	77.0	83.7
2008	241	66.1	18.7	0.6	98.1	41.2	57.9	70.4	78.9	84.2
2009	249	65.0	18.2	5.5	100	38.2	52.8	69.6	78.2	86.3
2010	314	67.8	17.1	1.3	94.2	47.8	59.5	71.0	78.8	86.3
2011	239	64.5	19.1	0.3	98.4	40.6	54.5	69.6	77.2	84.5
2012	301	66.9	17.7	0.0	98.7	43.7	57.3	71.6	79.7	84.7
2013	294	69.0	16.6	0.5	92.7	48.9	62.1	72.9	79.6	84.8
2014	296	69.9	16.1	0.5	95.9	47.4	63.6	74.2	80.8	85.9
2015	286	70.0	15.2	1.8	95.3	47.9	60.1	74.2	80.4	86.8
2016	265	67.9	17.5	9.1	96.0	40.3	56.9	72.2	81.6	86.8
2017	264	68.1	15.7	18.8	96.0	41.9	60.2	72.0	78.8	85.0
2018	119	68.7	15.3	18.9	91.6	46.7	61.0	71.6	80.7	86.1
2019	74	65.8	18.2	17.1	86.3	39.8	55.9	72.4	80.1	83.9
1998-2019	4700	66.6	17.5	0.0	100	41.4	57.3	70.8	79.1	85.0

Table 3a

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

Year of diagnosis	Cases n	Std.		Median						
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	43	62.1	22.1	0.9	94.1	32.4	48.5	70.1	76.5	86.3
1999	60	63.8	17.5	1.5	91.5	38.2	57.0	68.5	74.9	83.3
2000	62	58.1	20.6	0.5	97.6	32.8	46.4	62.8	72.7	79.6
2001	69	61.9	17.1	9.8	96.4	37.9	51.8	63.1	76.3	80.9
2002	82	60.9	19.2	7.7	94.9	32.7	47.5	64.1	75.5	80.5
2003	114	64.9	17.2	10.1	93.6	39.3	53.1	67.6	78.7	85.1
2004	107	66.8	14.9	19.4	90.1	44.6	60.2	67.5	78.3	84.7
2005	98	62.1	19.6	2.7	91.3	32.1	46.4	68.2	77.7	81.5
2006	139	67.1	15.7	10.7	93.6	42.0	61.0	70.7	76.8	82.8
2007	133	62.0	18.8	10.6	94.5	34.9	48.4	67.6	75.1	82.2
2008	126	63.7	20.2	0.6	98.1	39.0	53.6	68.9	77.7	83.7
2009	123	63.7	17.8	5.5	92.2	38.2	51.4	69.5	76.1	82.7
2010	161	66.9	16.8	2.9	93.4	48.5	60.6	70.8	77.5	83.0
2011	124	64.5	17.6	6.4	98.4	43.2	55.3	67.9	75.5	83.4
2012	152	67.1	17.2	9.9	94.0	43.0	58.3	70.9	80.1	84.7
2013	171	69.5	15.0	0.5	92.7	50.3	65.3	72.3	78.5	83.9
2014	155	71.2	15.5	0.5	95.9	52.2	66.0	74.2	81.4	86.0
2015	147	69.7	15.5	1.8	92.5	47.9	60.5	73.8	80.3	86.5
2016	145	67.4	16.3	21.6	96.0	43.6	57.0	71.2	78.7	84.9
2017	139	67.7	15.3	22.8	96.0	43.0	59.6	71.9	78.0	83.2
2018	59	70.0	15.7	18.9	91.6	47.8	63.0	74.1	80.8	86.1
2019	38	66.8	19.3	17.1	86.0	27.4	56.3	75.0	80.4	83.9
1998-2019	2447	66.0	17.4	0.5	98.4	40.9	57.1	70.3	78.2	83.9

Table 3b

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

Year of diagnosis	Cases n	Std.		Median						
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	46	60.1	21.9	1.3	87.5	27.9	42.4	62.0	78.9	86.3
1999	49	66.9	15.9	12.6	92.0	44.5	57.0	71.3	77.1	85.0
2000	59	63.1	18.4	16.5	93.9	36.3	51.7	65.0	77.0	86.2
2001	66	68.1	14.7	26.8	91.1	52.7	59.5	71.2	79.3	84.4
2002	90	66.5	16.3	13.5	96.1	43.0	55.9	69.2	80.1	85.4
2003	113	65.6	17.6	6.4	98.9	42.2	53.5	66.4	81.2	84.2
2004	113	65.9	16.8	9.8	93.3	43.5	56.6	68.1	78.2	84.2
2005	108	65.8	18.8	8.7	92.9	41.6	58.0	69.4	80.1	84.7
2006	104	69.0	19.4	1.8	95.1	38.0	65.2	74.7	81.4	86.6
2007	103	67.2	17.2	3.5	94.3	43.8	57.0	69.8	79.7	86.0
2008	115	68.7	16.6	15.7	94.9	45.9	61.2	72.2	81.3	86.5
2009	126	66.3	18.6	17.8	100	38.7	54.5	70.8	79.8	87.0
2010	153	68.7	17.4	1.3	94.2	47.6	58.5	71.5	82.2	87.5
2011	115	64.4	20.6	0.3	90.0	38.3	54.2	70.9	79.8	85.2
2012	149	66.6	18.2	0.0	98.7	43.7	57.0	71.9	79.0	85.0
2013	123	68.3	18.6	9.4	92.4	38.9	59.6	74.3	82.1	86.3
2014	141	68.5	16.6	9.9	93.2	44.6	62.5	74.1	79.0	84.6
2015	139	70.2	14.9	30.6	95.3	47.3	59.3	74.5	80.7	87.9
2016	120	68.6	19.0	9.1	94.8	39.4	56.5	74.8	83.9	88.3
2017	125	68.6	16.1	18.8	95.2	41.6	61.3	72.2	80.8	85.5
2018	60	67.4	15.0	26.6	91.3	46.2	60.6	69.3	80.1	85.4
2019	36	64.8	17.2	25.1	86.3	39.8	55.8	69.3	79.3	84.2
1998-2019	2253	67.2	17.6	0.0	100	41.9	57.5	71.5	80.4	86.0

Table 4

Age distribution by 5-year age group and sex for period 2007–2019
(incl. DCO)

Age at diagnosis Years	Cases			Males			Females		
	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0–4	16	0.5	0.5	8	0.5	0.5	8	0.5	0.5
5–9	11	0.3	0.8	6	0.4	0.8	5	0.3	0.9
10–14	13	0.4	1.3	8	0.5	1.3	5	0.3	1.2
15–19	22	0.7	2.0	16	1.0	2.3	6	0.4	1.6
20–24	28	0.9	2.8	17	1.0	3.3	11	0.7	2.3
25–29	45	1.4	4.2	23	1.4	4.7	22	1.5	3.8
30–34	46	1.4	5.7	20	1.2	5.9	26	1.7	5.5
35–39	78	2.5	8.1	33	2.0	7.8	45	3.0	8.5
40–44	102	3.2	11.4	58	3.5	11.3	44	2.9	11.4
45–49	133	4.2	15.5	64	3.8	15.1	69	4.6	16.0
50–54	166	5.2	20.8	89	5.3	20.4	77	5.1	21.1
55–59	194	6.1	26.9	94	5.6	26.1	100	6.6	27.8
60–64	229	7.2	34.1	119	7.1	33.2	110	7.3	35.1
65–69	362	11.4	45.5	214	12.8	46.0	148	9.8	44.9
70–74	476	15.0	60.4	269	16.1	62.0	207	13.8	58.7
75–79	507	16.0	76.4	282	16.9	78.9	225	15.0	73.6
80–84	410	12.9	89.3	207	12.4	91.3	203	13.5	87.1
85+	340	10.7	100.0	146	8.7	100.0	194	12.9	100.0
All ages	3178	100.0		1673	100.0		1505	100.0	

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 2007–2019

Age at diagnosis Years	Males n	Females n	Males Age- spec. incid.	Females Age- spec. incid.	Males DCO rate n=432 %	Females DCO rate n=386 %	Males	Females
							Prop.all cancers n=143063 %	Prop.all cancers n=144724 %
0- 4	8	8	0.5	0.6	12.5		3.8	5.0
5- 9	6	5	0.4	0.4			5.3	5.4
10-14	8	5	0.5	0.4		20.0	6.0	4.3
15-19	16	6	1.0	0.4			5.4	2.4
20-24	17	11	0.9	0.6	5.9		2.9	2.3
25-29	23	22	1.1	1.1			2.6	2.0
30-34	20	26	0.9	1.2		3.8	1.7	1.3
35-39	33	45	1.5	2.1	9.1	2.2	1.9	1.4
40-44	58	44	2.5	1.9	6.9	6.8	2.2	0.8
45-49	63	69	2.5	2.8	11.1	11.6	1.3	0.8
50-54	89	77	3.8	3.3	10.1	5.2	1.1	0.7
55-59	94	100	4.8	5.0	16.0	12.0	0.8	0.8
60-64	119	110	7.3	6.3	17.6	15.5	0.7	0.8
65-69	214	148	14.1	8.8	22.0	25.0	0.9	0.8
70-74	267	207	19.1	12.9	28.5	24.2	1.0	1.1
75-79	281	225	25.4	16.3	29.2	32.9	1.3	1.2
80-84	206	203	31.4	20.9	45.1	36.0	1.5	1.4
85+	144	194	33.8	20.1	50.7	54.1	1.5	1.3
All ages	1666	1505			25.9	25.6	1.2	1.0
Incidence								
Raw			5.5	4.8				
WS			2.9	2.3				
ES			4.1	3.1				
BRD-S			5.2	3.9				

The age-specific incidence characterizes the disease risk in a particular age group. The age distribution depends on the patient population frequency in each age group and reflects the tangible clinical picture of everyday patients care (see following chart).

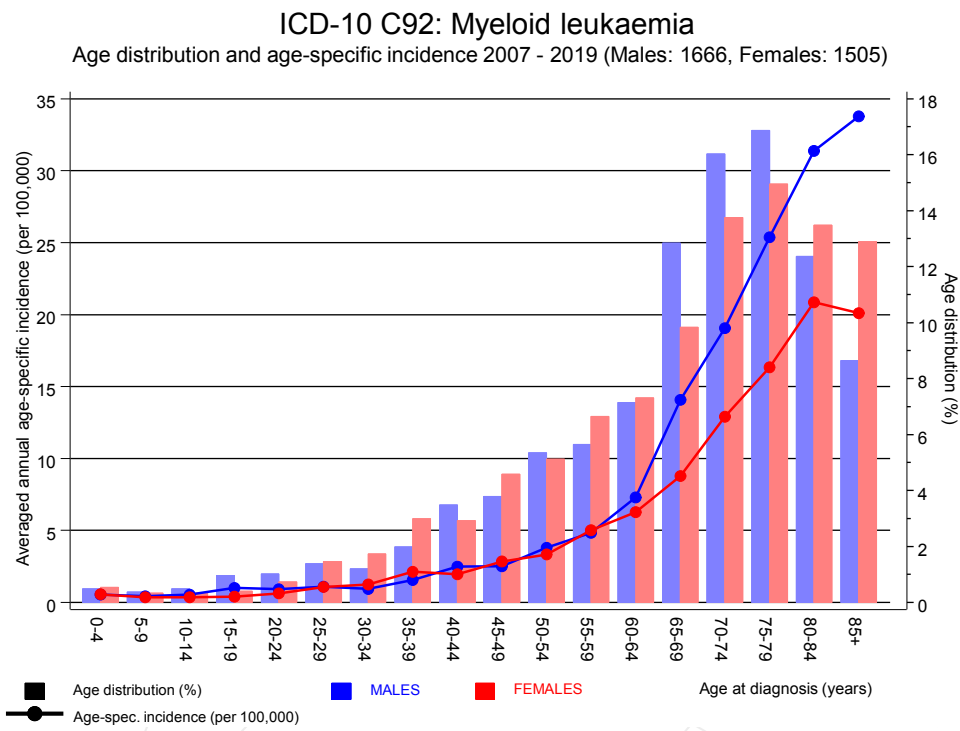


Figure 6. Age distribution (males: mean=67.0 yrs, median=71.3 yrs; females: mean=67.8 yrs, median=72.1 yrs) and age-specific incidence.

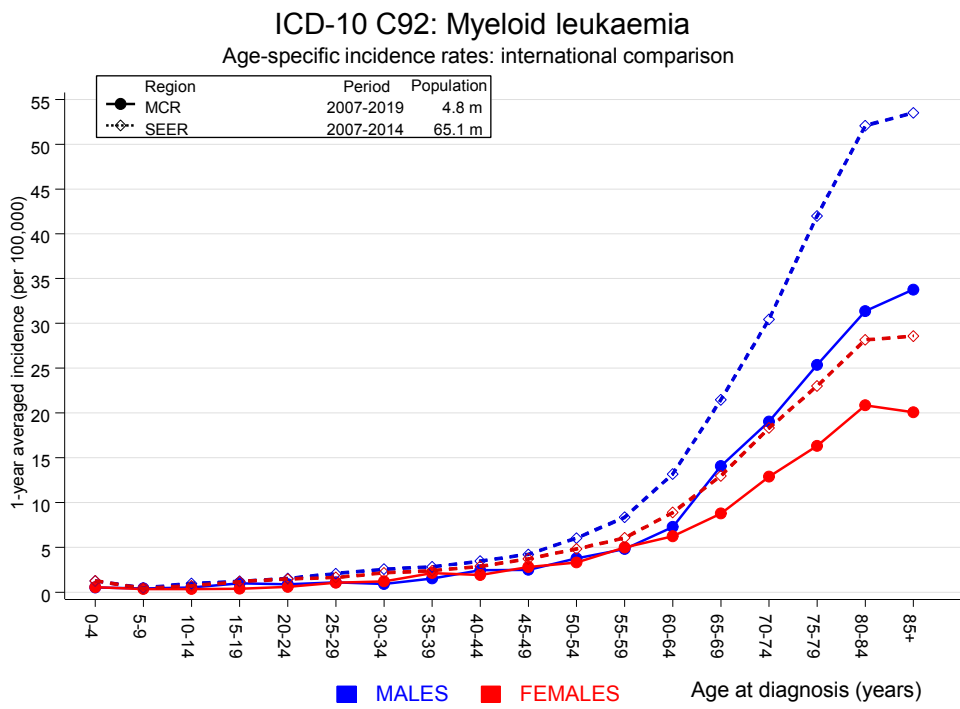


Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 18 Regs Research Data, released April 2019, based on the November 2018 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 1998-2019

MALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C03-C06 Oral cavity	1	0.5	2.2	0.1	12.2	1.3	
C09-C10 Oropharynx	2	0.6	3.6	0.4	12.9	3.4	
C12-C13 Hypopharynx	1	0.3	3.3	0.1	18.4	1.7	
C15 Oesophagus	5	1.0	5.1	1.6	11.8 #	9.5	20.0
C16 Stomach	3	1.8	1.6	0.3	4.7	2.7	
C17 Small intestine	2	0.3	6.7	0.8	24.3	4.0	
C18 Colon	13	4.5	2.9	1.5	4.9 #	20.1	
C19-C20 Rectum	4	2.6	1.5	0.4	4.0	3.4	
C22 Liver	3	1.4	2.1	0.4	6.2	3.8	
C23-C24 Bile	2	0.5	4.1	0.5	14.7	3.6	
C25 Pancreas	5	1.8	2.7	0.9	6.3	7.5	
C32 Larynx	1	0.5	2.0	0.1	11.0	1.2	100.0
C33-C34 Lung	14	5.8	2.4	1.3	4.1 #	19.5	7.1
C38,C45 Mesothelioma	1	0.3	3.1	0.1	17.1	1.6	
C40-C41 Bone	2	0.0	43.6	5.3	157.4 #	4.6	
C43 Malign. melanoma	8	2.3	3.5	1.5	7.0 #	13.6	
C46,C49 Soft tissue	4	0.3	14.4	3.9	36.8 #	8.8	
C50 Breast	2	0.1	15.2	1.8	55.0 #	4.4	
C61 Prostate	23	13.6	1.7	1.1	2.5 #	22.3	4.3
C62 Testis	1	0.3	3.3	0.1	18.6	1.7	
C64 Kidney	4	1.7	2.3	0.6	5.9	5.4	
C67 Bladder	4	2.1	1.9	0.5	4.9	4.5	
C70-C72 CNS cancer	2	0.7	3.0	0.4	10.9	3.2	
C73 Thyroid	2	0.4	5.2	0.6	18.9	3.8	
C76-C79 CUP	1	0.8	1.3	0.0	7.0	0.5	
C81 Hodgkin lymphoma	3	0.1	20.7	4.3	60.5 #	6.8	
C82-C85 NHL	15	2.1	7.3	4.1	12.0 #	30.7	6.7
C90 Mult. myeloma	5	0.6	8.0	2.6	18.7 #	10.4	
C91-C96 Leukaemia	15	0.7	20.3	11.4	33.5 #	33.8	33.3
Not observed	0	1.3	0.0	0.0	2.9	-3.1	
All further malignancies	148	49.0	3.0	2.6	3.5 #	234.4	6.8
Patients		1952					
Median age at next malignancy (years)		69.2					
Person-years		4222					
Mean observation time (years)		2.2					
Median observation time (years)		0.7					

The occurrence of further specified malignancy is statistically significant.

Table 7b

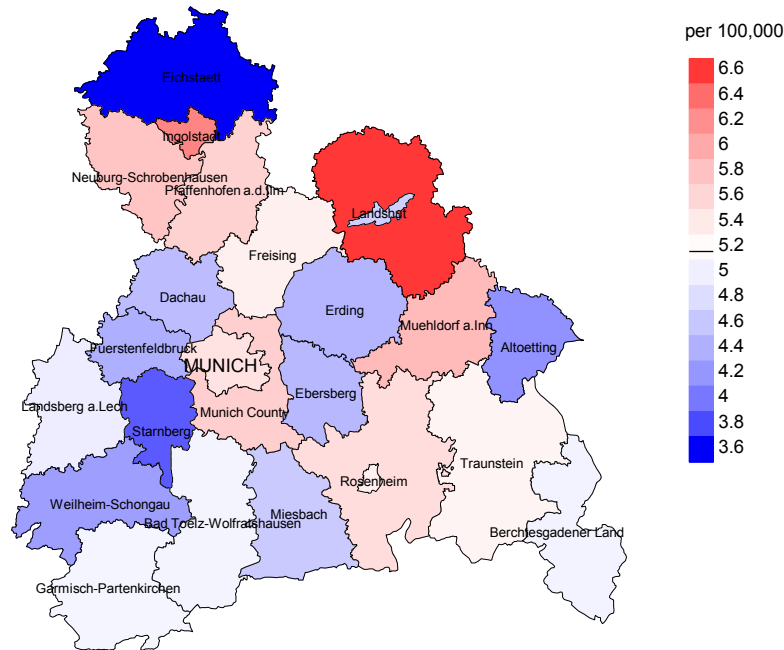
Standardized incidence ratio (SIR, with 95% confidence limits),
excess absolute risk (EAR) and DCO rate of further malignancies
for period 1998–2019

FEMALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C03–C06 Oral cavity	2	0.2	10.9	1.3	39.3 #	5.0	
C09–C10 Oropharynx	1	0.1	7.1	0.2	39.4	2.3	
C15 Oesophagus	3	0.2	15.3	3.2	44.7 #	7.6	
C16 Stomach	2	0.9	2.1	0.3	7.8	2.9	
C18 Colon	4	2.7	1.5	0.4	3.9	3.7	
C19–C20 Rectum	1	1.2	0.9	0.0	4.8	-0.4	
C21 Anus/canal	1	0.2	5.8	0.1	32.3	2.3	100.0
C22 Liver	2	0.3	5.7	0.7	20.8	4.5	
C25 Pancreas	2	1.3	1.6	0.2	5.7	2.0	50.0
C33–C34 Lung	7	2.3	3.0	1.2	6.2 #	12.7	
C43 Malign. melanoma	2	1.3	1.6	0.2	5.7	2.0	
C46,C49 Soft tissue	1	0.2	5.8	0.1	32.1	2.3	
C50 Breast	23	10.0	2.3	1.5	3.5 #	35.5	4.3
C51 Vulva	2	0.3	6.8	0.8	24.4	4.6	
C53 Cervix uteri	4	0.5	7.9	2.2	20.3 #	9.5	50.0
C54 Corpus uteri	7	1.7	4.1	1.6	8.4 #	14.4	
C56 Ovary	1	1.2	0.8	0.0	4.5	-0.7	
C70–C72 CNS cancer	1	0.4	2.4	0.1	13.4	1.6	
C76–C79 CUP	1	0.5	2.1	0.1	11.4	1.4	
C82–C85 NHL	6	1.1	5.2	1.9	11.4 #	13.2	16.7
C90 Mult. myeloma	3	0.4	8.5	1.7	24.7 #	7.2	
C91–C96 Leukaemia	6	0.4	13.9	5.1	30.2 #	15.2	16.7
C96 Systemic	1	0.0	164.9	4.2	918.8 #	2.7	100.0
Not observed	0	3.4	0.0	0.0	1.1	-9.3	
All further malignancies	83	30.8	2.7	2.1	3.3 #	142.3	9.6
Patients		1753					
Median age at next malignancy (years)		67.9					
Person-years		3665					
Mean observation time (years)		2.1					
Median observation time (years)		0.6					

The occurrence of further specified malignancy is statistically significant.

Average incidence (Germany 1987 standard population) 2007 - 2019: Males



Average incidence (Germany 1987 standard population) 2007 - 2019: Females

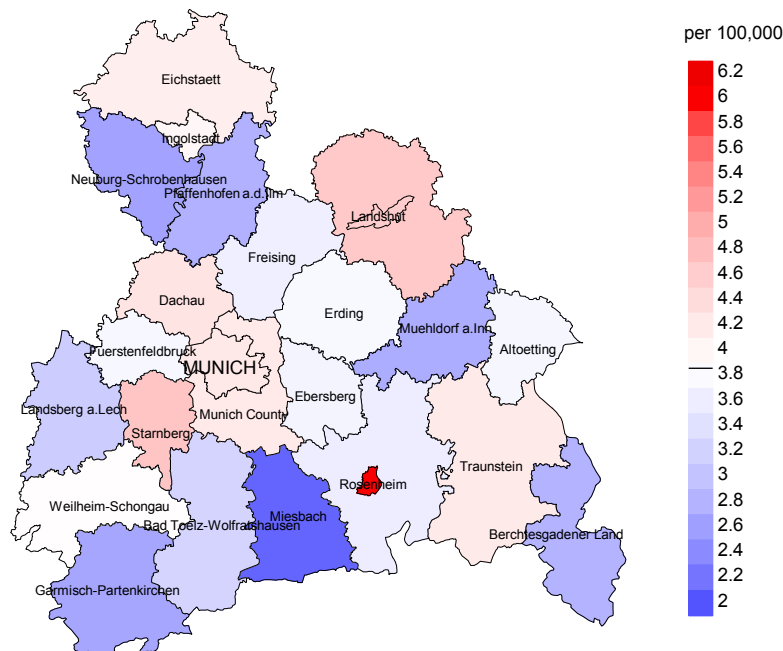
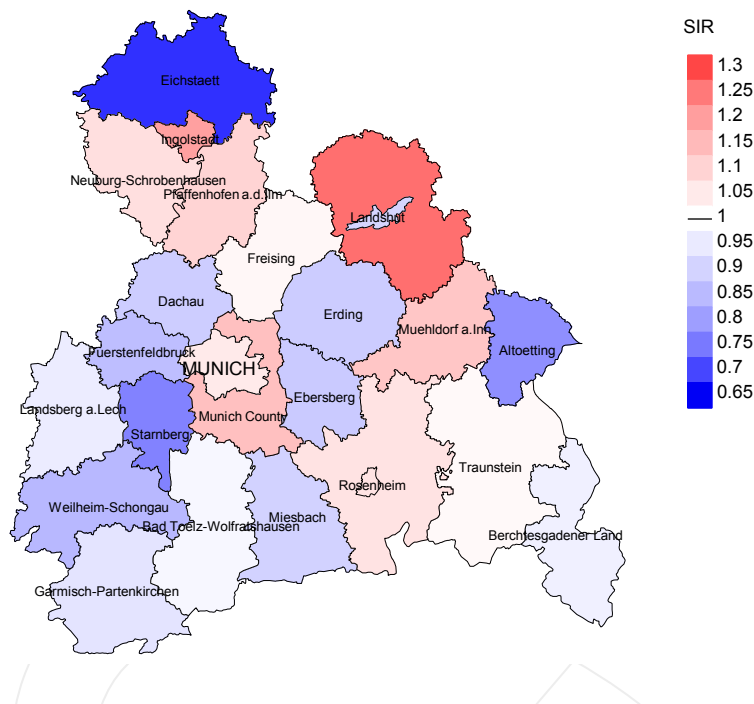


Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 5.2/100,000 WS N=1,666, females 3.9/100,000 WS N=1,505).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,462 female residents (averaged) in the period from 2007 to 2019 a total of 38 women were identified with newly diagnosed myeloid leukaemia. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 3.7/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 2.3 and 5.6/100,000.

Standardized incidence ratio (SIR) 2007 - 2019: Males



Standardized incidence ratio (SIR) 2007 - 2019: Females

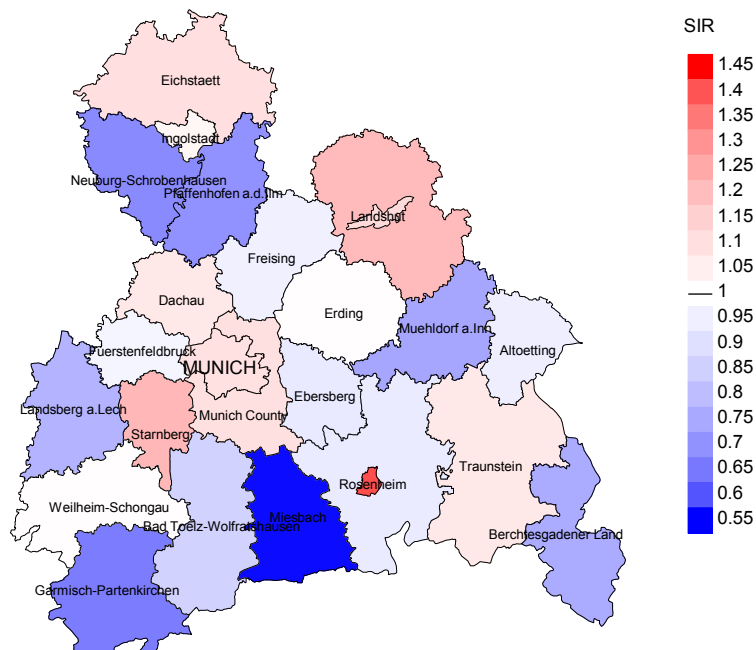


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=1,666, females N=1,505).

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 2019 a total of 38 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 0.93. Though, the value of this parameter may vary with an underlying probability of 99% between 0.58 and 1.39, 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 4.92 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	89	100.0	30.3	78	87.6	97.4
1999	109	99.1	34.9	91	83.5	98.9
2000	121	100.0	34.7	98	81.0	96.9
2001	135	97.0	48.1	115	85.2	99.1
2002	172	96.5	37.8	137	79.7	96.4
2003	227	98.7	39.6	185	81.5	98.9
2004	220	98.6	41.8	176	80.0	98.9
2005	206	96.6	37.4	161	78.2	98.8
2006	243	96.3	42.4	209	86.0	98.6
2007	236	97.0	32.6	186	78.8	97.3
2008	241	98.3	34.4	188	78.0	98.4
2009	249	98.4	23.7	191	76.7	98.4
2010	314	99.7	23.6	237	75.5	97.5
2011	239	98.3	22.2	179	74.9	96.1
2012	301	99.0	23.6	233	77.4	97.4
2013	294	98.3	27.9	221	75.2	95.0
2014	296	96.6	30.7	226	76.4	96.0
2015	286	96.5	24.5	226	79.0	96.0
2016	265	99.6	28.7	191	72.1	93.2
2017	264	99.2	23.9	179	67.8	82.7
2018	119	100.0	11.8	66	55.5	42.4
2019	74	83.8	10.8	37	50.0	64.9
1998-2019	4700	98.0	30.2	3610	76.8	95.2

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 4.92 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	89	85	100.0	44	49.4
1999	109	81	97.5	43	39.4
2000	121	90	96.7	54	44.6
2001	135	115	97.4	67	49.6
2002	172	116	99.1	78	45.3
2003	227	133	98.5	105	46.3
2004	220	137	98.5	99	45.0
2005	206	168	99.4	103	50.0
2006	243	159	99.4	138	56.8
2007	236	163	98.8	107	45.3
2008	241	162	97.5	112	46.5
2009	249	159	97.5	111	44.6
2010	314	196	98.0	136	43.3
2011	239	192	97.4	103	43.1
2012	301	197	99.0	127	42.2
2013	294	219	97.7	137	46.6
2014	296	218	98.6	139	47.0
2015	286	213	99.5	139	48.6
2016	265	184	99.5	128	48.3
2017	264	199	98.0	130	49.2
2018	119	120	36.7	41	34.5
2019	74	98	44.9	27	36.5
1998–2019	4700	3404	94.7	2168	46.1

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 4.92 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer- related %	Prop. non-cancer- related %	Prop. cancer recorded on death certificate %
1998	85	76.5	23.5	96.5
1999	81	77.8	22.2	97.5
2000	90	86.7	13.3	100.0
2001	115	82.6	17.4	97.3
2002	116	90.5	9.5	99.1
2003	133	88.7	11.3	99.2
2004	137	92.7	7.3	97.8
2005	168	93.5	6.5	99.4
2006	159	95.0	5.0	98.7
2007	163	92.6	7.4	99.4
2008	162	87.0	13.0	96.2
2009	159	89.9	10.1	97.4
2010	196	92.9	7.1	98.4
2011	192	88.5	11.5	95.7
2012	197	89.8	10.2	98.5
2013	219	83.1	16.9	97.2
2014	218	84.9	15.1	95.3
2015	213	86.4	13.6	94.8
2016	184	87.0	13.0	96.7
2017	199	84.4	15.6	97.4
2018	120	46.7	53.3	88.6
2019	98	49.0	51.0	93.2
1998–2019	3404	85.4	14.6	97.3

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	44	66.1	65.7	66.4	66.4
1999	44	71.3	70.9	74.8	71.3
2000	55	67.7	66.1	72.7	68.4
2001	51	70.4	72.5	63.8	70.8
2002	54	69.3	68.5	70.6	69.4
2003	69	72.4	72.4	74.1	72.5
2004	71	73.6	74.4	64.7	74.0
2005	86	72.3	72.2	74.7	72.3
2006	93	72.3	72.3	72.0	72.2
2007	80	70.2	70.8	53.1	70.8
2008	83	72.0	73.0	61.8	72.7
2009	81	73.4	74.3	71.2	74.3
2010	102	73.6	73.1	80.3	73.3
2011	96	74.2	74.3	71.6	74.6
2012	103	74.2	73.2	81.4	73.4
2013	124	76.4	76.5	76.3	76.3
2014	117	74.8	74.8	74.9	75.3
2015	106	75.6	75.8	75.5	75.7
2016	101	76.2	76.2	77.3	76.2
2017	102	74.3	74.0	74.4	74.5
2018	70	74.5	71.9	74.9	75.5
2019	52	78.9	75.9	80.2	77.4
1998-2019	1784	73.7	73.5	74.4	73.6

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	41	61.5	60.4	69.5	61.5
1999	37	74.3	75.0	65.6	74.3
2000	35	76.1	75.2	86.5	76.1
2001	64	73.4	72.3	78.2	73.8
2002	62	73.7	73.2	82.8	73.7
2003	64	75.4	75.1	79.8	75.4
2004	66	74.7	74.5	77.7	74.7
2005	82	72.4	73.0	57.7	73.1
2006	66	76.1	76.1	71.9	76.1
2007	83	70.9	71.4	68.5	71.9
2008	79	75.1	72.8	85.0	73.9
2009	78	74.1	75.5	63.8	74.1
2010	94	78.0	78.3	69.5	78.2
2011	96	73.8	72.9	79.2	73.8
2012	94	73.1	73.1	74.7	73.6
2013	95	77.0	75.8	82.5	77.0
2014	101	75.9	75.8	76.3	76.0
2015	107	76.5	75.6	78.9	76.5
2016	83	78.0	76.8	83.5	77.9
2017	97	75.8	74.7	79.1	76.5
2018	50	78.8	76.4	79.6	76.6
2019	46	74.4	77.0	68.9	77.0
1998-2019	1620	75.1	74.7	78.2	75.1

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	33	3.0	0.77	2.2	0.83	2.8	0.78	3.6	0.75
1999	35	3.1	0.58	1.9	0.56	2.8	0.58	3.4	0.59
2000	49	4.3	0.79	2.7	0.69	3.9	0.76	5.0	0.83
2001	45	3.9	0.65	2.2	0.60	3.4	0.65	4.8	0.73
2002	48	2.6	0.59	1.4	0.51	2.2	0.56	2.8	0.57
2003	63	3.4	0.55	1.9	0.53	2.8	0.54	3.8	0.57
2004	65	3.5	0.61	1.8	0.57	2.8	0.61	4.0	0.68
2005	80	4.2	0.82	2.2	0.69	3.3	0.78	4.5	0.84
2006	87	4.5	0.63	2.3	0.57	3.5	0.61	4.8	0.64
2007	77	3.5	0.58	1.8	0.51	2.7	0.55	3.6	0.60
2008	72	3.2	0.57	1.6	0.45	2.4	0.53	3.2	0.58
2009	72	3.2	0.59	1.5	0.49	2.3	0.54	3.3	0.61
2010	92	4.1	0.58	2.0	0.50	3.0	0.54	3.9	0.56
2011	85	3.8	0.69	1.8	0.55	2.7	0.62	3.7	0.71
2012	91	4.0	0.60	1.8	0.52	2.8	0.57	3.8	0.59
2013	103	4.5	0.61	1.7	0.49	2.8	0.55	4.1	0.60
2014	99	4.2	0.64	1.7	0.56	2.8	0.60	3.8	0.62
2015	92	3.9	0.63	1.7	0.59	2.6	0.60	3.5	0.62
2016	87	3.6	0.60	1.5	0.49	2.3	0.54	3.2	0.59
2017	85	3.5	0.62	1.6	0.58	2.4	0.59	3.2	0.62
2018	31	1.3	0.53	0.6	0.52	0.9	0.54	1.2	0.54
2019	28	1.2	0.74	0.5	0.63	0.8	0.73	1.0	0.71
1998-2019	1519	3.4	0.62	1.7	0.55	2.5	0.59	3.4	0.63

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	32	2.7	0.70	2.0	0.80	2.3	0.75	2.4	0.72
1999	28	2.4	0.57	1.0	0.49	1.5	0.52	2.1	0.56
2000	29	2.4	0.49	1.0	0.35	1.5	0.40	2.0	0.47
2001	50	4.1	0.76	2.0	0.77	2.8	0.75	3.6	0.77
2002	57	2.9	0.63	1.3	0.55	1.9	0.57	2.5	0.63
2003	55	2.8	0.49	1.1	0.39	1.7	0.43	2.3	0.47
2004	62	3.1	0.55	1.3	0.44	2.0	0.49	2.6	0.53
2005	77	3.9	0.71	1.7	0.59	2.4	0.65	3.1	0.67
2006	64	3.2	0.62	1.3	0.53	1.9	0.59	2.6	0.63
2007	74	3.2	0.72	1.4	0.64	2.0	0.67	2.6	0.70
2008	69	3.0	0.60	1.2	0.54	1.8	0.57	2.4	0.58
2009	71	3.1	0.56	1.2	0.44	1.8	0.50	2.4	0.54
2010	90	3.8	0.59	1.3	0.43	2.0	0.48	2.8	0.55
2011	85	3.6	0.74	1.4	0.52	2.2	0.63	2.8	0.70
2012	86	3.6	0.58	1.5	0.47	2.2	0.52	2.9	0.56
2013	79	3.3	0.64	1.3	0.53	1.9	0.59	2.5	0.61
2014	86	3.6	0.61	1.3	0.48	1.9	0.53	2.6	0.56
2015	92	3.8	0.66	1.4	0.58	2.1	0.61	2.8	0.65
2016	73	3.0	0.61	1.3	0.56	1.7	0.57	2.2	0.57
2017	83	3.4	0.66	1.3	0.58	2.0	0.61	2.5	0.63
2018	26	1.0	0.43	0.4	0.35	0.6	0.36	0.8	0.41
2019	20	0.8	0.56	0.3	0.40	0.4	0.44	0.6	0.47
1998-2019	1388	3.0	0.62	1.2	0.52	1.8	0.56	2.4	0.59

Table 12

Age distribution of age at death (cancer-related) for period 2007-2019
(incl. multiple malignancies)

Age at death Years	Cases			Males			Females		
	n	%	Cum.%	n	%	Cum.%	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	0.3	0.4
15-19	4	0.2	0.6	2	0.2	0.5	2	0.2	0.6
20-24	8	0.4	1.0	5	0.5	1.0	3	0.3	1.0
25-29	11	0.6	1.5	8	0.8	1.8	3	0.3	1.3
30-34	7	0.4	1.9	1	0.1	1.9	6	0.6	1.9
35-39	21	1.1	3.0	10	1.0	2.9	11	1.2	3.1
40-44	34	1.7	4.7	14	1.4	4.2	20	2.1	5.2
45-49	51	2.6	7.3	25	2.5	6.7	26	2.8	8.0
50-54	65	3.3	10.7	35	3.5	10.2	30	3.2	11.2
55-59	99	5.1	15.8	41	4.0	14.2	58	6.2	17.5
60-64	124	6.4	22.1	63	6.2	20.4	61	6.5	24.0
65-69	222	11.4	33.5	135	13.3	33.7	87	9.3	33.3
70-74	354	18.2	51.7	197	19.4	53.2	157	16.8	50.1
75-79	402	20.6	72.3	225	22.2	75.3	177	19.0	69.1
80-84	278	14.3	86.6	137	13.5	88.9	141	15.1	84.2
85+	261	13.4	100.0	113	11.1	100.0	148	15.8	100.0
All ages	1948	100.0		1014	100.0		934	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007–2019
(incl. multiple malignancies)

Age at death Years	Males		Males		Females		Females	
	n	n	Age- spec. mortal.	MI-index	Age- spec. mortal.	MI-index	Prop.all cancers %	Prop.all cancers %
0– 4	1		0.1	0.13			5.3	
5– 9		1			0.1	0.20		4.3
10–14	2	3	0.1	0.25	0.2	0.60	7.4	13.0
15–19	2	2	0.1	0.13	0.1	0.33	4.3	8.0
20–24	5	3	0.3	0.29	0.2	0.27	7.5	7.7
25–29	8	3	0.4	0.35	0.1	0.14	9.4	3.2
30–34	1	6	0.0	0.05	0.3	0.23	0.8	3.8
35–39	10	11	0.5	0.30	0.5	0.24	4.1	3.0
40–44	14	20	0.6	0.24	0.9	0.45	2.4	2.5
45–49	25	26	1.0	0.40	1.1	0.38	1.9	1.6
50–54	35	30	1.5	0.39	1.3	0.39	1.4	1.2
55–59	41	58	2.1	0.44	2.9	0.58	1.0	1.6
60–64	63	61	3.9	0.53	3.5	0.55	1.1	1.3
65–69	135	87	8.9	0.63	5.2	0.59	1.6	1.3
70–74	197	157	14.1	0.74	9.8	0.76	1.8	1.9
75–79	225	177	20.3	0.80	12.9	0.79	2.0	2.0
80–84	137	141	20.9	0.67	14.5	0.69	1.5	1.7
85+	113	148	26.5	0.78	15.3	0.76	1.4	1.3
All ages	1014	934					1.6	1.6
Mortality								
Raw			3.4	0.61	3.0	0.62		
WS			1.5	0.52	1.2	0.51		
ES			2.3	0.57	1.7	0.55		
BRD-S			3.1	0.60	2.3	0.59		
PYLL-70								
per 100,000			15.5		16.2			
ES			14.0		14.6			
AYLL-70			12.0		13.7			

Table 14a

Further malignancies in deaths in period 1998-2019

MALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C03-C06 Oral cavity	6	0.9	3	50.0			3	50.0
C07-C08 Salivary gland	1	0.2	1	100.0				
C09-C10 Oropharynx	5	0.8	2	40.0	1	20.0	2	40.0
C12-C13 Hypopharynx	1	0.2					1	100.0
C15 Oesophagus	9	1.4	2	22.2			7	77.8
C16 Stomach	9	1.4	7	77.8	1	11.1	1	11.1
C17 Small intestine	3	0.5	2	66.7			1	33.3
C18 Colon	43	6.8	31	72.1	3	7.0	9	20.9
C19-C20 Rectum	20	3.2	15	75.0	3	15.0	2	10.0
C22 Liver	7	1.1	3	42.9	1	14.3	3	42.9
C23-C24 Bile	1	0.2					1	100.0
C25 Pancreas	9	1.4	1	11.1	1	11.1	7	77.8
C30-C31 Sinuses	1	0.2	1	100.0				
C32 Larynx	4	0.6	3	75.0	1	25.0		
C33-C34 Lung	31	4.9	14	45.2	6	19.4	11	35.5
C38,C45 Mesothelioma	2	0.3	1	50.0	1	50.0		
C40-C41 Bone	3	0.5	1	33.3			2	66.7
C43 Malign. melanoma	17	2.7	15	88.2	1	5.9	1	5.9
C44 Skin others	33	5.2	17	51.5	2	6.1	14	42.4
C46,C49 Soft tissue	6	0.9	1	16.7	1	16.7	4	66.7
C48 Peritoneal	2	0.3	2	100.0				
C61 Prostate	120	18.9	107	89.2	5	4.2	8	6.7
C62 Testis	3	0.5	3	100.0				
C64 Kidney	15	2.4	15	100.0				
C65 Renal pelvis	1	0.2	1	100.0				
C67 Bladder	17	2.7	14	82.4	2	11.8	1	5.9
C68 Urinary org.	2	0.3	1	50.0			1	50.0
C70-C72 CNS cancer	5	0.8	2	40.0	1	20.0	2	40.0
C73 Thyroid	4	0.6	4	100.0				
C74-C80 Cancer others	1	0.2	1	100.0				
C76-C79 CUP	3	0.5	2	66.7	1	33.3		
C81 Hodgkin lymphoma	6	0.9	4	66.7			2	33.3
C82-C85 NHL	47	7.4	32	68.1	5	10.6	10	21.3
C90 Mult. myeloma	9	1.4	7	77.8	2	22.2		
C91-C96 Leukaemia	186	29.3			49	26.3	137	73.7
C96 Systemic	2	0.3	1	50.0	1	50.0		
All further malignancies	634	100.0	316	49.8	88	13.9	230	36.3

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 1998-2019
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	3	0.6	2	66.7			1	33.3
C09-C10 Oropharynx	2	0.4	1	50.0			1	50.0
C12-C13 Hypopharynx	1	0.2	1	100.0				
C15 Oesophagus	3	0.6					3	100.0
C16 Stomach	6	1.2	5	83.3			1	16.7
C18 Colon	14	2.7	11	78.6	1	7.1	2	14.3
C19-C20 Rectum	11	2.1	7	63.6	2	18.2	2	18.2
C21 Anus/canal	3	0.6	2	66.7			1	33.3
C22 Liver	3	0.6					3	100.0
C23-C24 Bile	3	0.6	3	100.0				
C25 Pancreas	3	0.6			2	66.7	1	33.3
C26 GI cancer	1	0.2	1	100.0				
C33-C34 Lung	14	2.7	7	50.0	3	21.4	4	28.6
C43 Malign. melanoma	11	2.1	10	90.9	1	9.1		
C44 Skin others	16	3.1	9	56.3	1	6.3	6	37.5
C46,C49 Soft tissue	3	0.6	2	66.7			1	33.3
C48 Peritoneal	3	0.6	3	100.0				
C50 Breast	130	25.0	116	89.2	6	4.6	8	6.2
C51 Vulva	3	0.6	2	66.7			1	33.3
C52 Vagina	2	0.4	1	50.0			1	50.0
C53 Cervix uteri	12	2.3	9	75.0	2	16.7	1	8.3
C54 Corpus uteri	29	5.6	23	79.3	2	6.9	4	13.8
C56 Ovary	8	1.5	6	75.0			2	25.0
C61 Prostate	1	0.2	1	100.0				
C64 Kidney	6	1.2	4	66.7	2	33.3		
C65 Renal pelvis	1	0.2					1	100.0
C66 Ureter	1	0.2	1	100.0				
C67 Bladder	5	1.0	4	80.0	1	20.0		
C70-C72 CNS cancer	4	0.8	2	50.0			2	50.0
C73 Thyroid	11	2.1	10	90.9	1	9.1		
C76-C79 CUP	5	1.0	1	20.0	1	20.0	3	60.0
C81 Hodgkin lymphoma	6	1.2	5	83.3	1	16.7		
C82-C85 NHL	27	5.2	22	81.5	3	11.1	2	7.4
C90 Mult. myeloma	8	1.5	5	62.5	2	25.0	1	12.5
C91-C96 Leukaemia	157	30.3			41	26.1	116	73.9
C96 Systemic	2	0.4	1	50.0			1	50.0
All further malignancies	519	100.0	277	53.4	72	13.9	170	32.8

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 2007-2019
(**First primaries only** *)

Age at death Years	Males		Males Age- spec. mortal.		Females		Females Age- spec. mortal.		Males	Females
	n	n	MI-index	MI-index	MI-index	MI-index	Prop.all cancers %	Prop.all cancers %		
0- 4	1		0.1	0.13			5.3			
5- 9		1			0.1	0.25		4.3		
10-14	2	1	0.1	0.29	0.1	0.25	7.4	5.3		
15-19	2	2	0.1	0.14	0.1	0.40	4.4	8.7		
20-24	3	2	0.2	0.19	0.1	0.18	5.0	5.4		
25-29	8	3	0.4	0.35	0.1	0.17	10.4	3.5		
30-34	1	6	0.0	0.06	0.3	0.25	0.8	4.3		
35-39	7	11	0.3	0.23	0.5	0.25	3.1	3.3		
40-44	13	16	0.6	0.25	0.7	0.43	2.5	2.3		
45-49	21	20	0.8	0.38	0.8	0.37	1.7	1.5		
50-54	28	23	1.2	0.36	1.0	0.40	1.3	1.1		
55-59	33	40	1.7	0.43	2.0	0.56	0.9	1.3		
60-64	45	44	2.8	0.51	2.5	0.54	0.9	1.2		
65-69	81	60	5.3	0.61	3.6	0.61	1.2	1.2		
70-74	116	83	8.3	0.76	5.2	0.64	1.4	1.3		
75-79	131	110	11.8	0.82	8.0	0.77	1.6	1.6		
80-84	83	96	12.6	0.66	9.9	0.73	1.2	1.5		
85+	67	99	15.7	0.86	10.3	0.75	1.1	1.1		
All ages	642	617					1.3	1.4		
Mortality										
Raw			2.1	0.57	2.0	0.59				
WS			1.0	0.47	0.8	0.47				
ES			1.5	0.52	1.2	0.51				
BRD-S			2.0	0.57	1.5	0.55				
PYLL-70										
per 100,000			12.5		12.6					
ES			11.4		11.3					
AYLL-70			13.5		14.4					

* See corresponding tables with multiple malignancies.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2019
(**Single primaries only** *)

Age at death Years	Males		Males Age- spec. mortal. MI-index		Females		Females Age- spec. mortal. MI-index		Males	Females
	n	n							Prop.all cancers %	Prop.all cancers %
0- 4	1		0.1	0.13					5.3	
5- 9		1			0.1	0.33				4.3
10-14	2	1	0.1	0.29	0.1	0.25			7.4	5.3
15-19	2	2	0.1	0.15	0.1	0.40			4.4	9.1
20-24	3	2	0.2	0.20	0.1	0.18			5.0	5.6
25-29	8	3	0.4	0.36	0.1	0.20			10.4	3.6
30-34	1	6	0.0	0.06	0.3	0.26			0.8	4.4
35-39	7	7	0.3	0.23	0.3	0.18			3.1	2.1
40-44	11	12	0.5	0.22	0.5	0.33			2.1	1.7
45-49	18	19	0.7	0.35	0.8	0.37			1.5	1.4
50-54	26	22	1.1	0.36	1.0	0.43			1.2	1.1
55-59	29	35	1.5	0.43	1.8	0.51			0.8	1.2
60-64	40	41	2.5	0.49	2.3	0.54			0.8	1.1
65-69	73	52	4.8	0.62	3.1	0.55			1.1	1.0
70-74	103	76	7.4	0.73	4.7	0.61			1.3	1.2
75-79	119	104	10.7	0.77	7.6	0.76			1.5	1.6
80-84	80	92	12.2	0.65	9.5	0.74			1.3	1.5
85+	61	96	14.3	0.82	9.9	0.73			1.1	1.2
All ages	584	571							1.2	1.3
Mortality										
Raw			1.9	0.55	1.8	0.57				
WS			0.9	0.46	0.7	0.45				
ES			1.4	0.51	1.1	0.50				
BRD-S			1.8	0.55	1.4	0.54				
PYLL-70										
per 100,000			11.5		11.1					
ES			10.6		10.0					
AYLL-70			13.8		14.4					

* See corresponding tables with multiple malignancies.

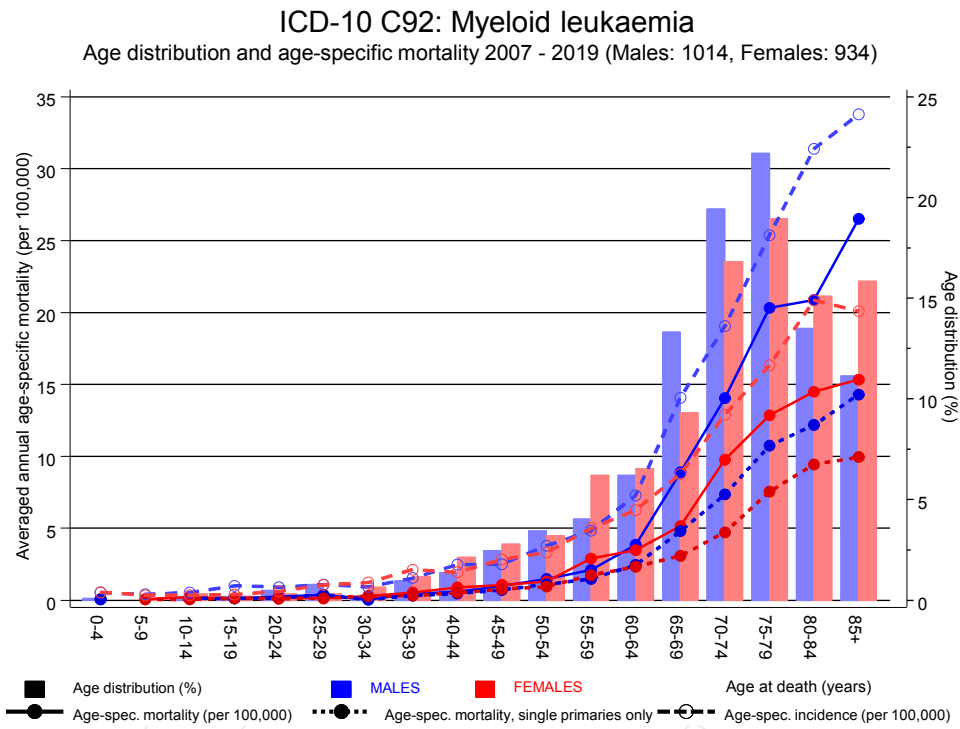
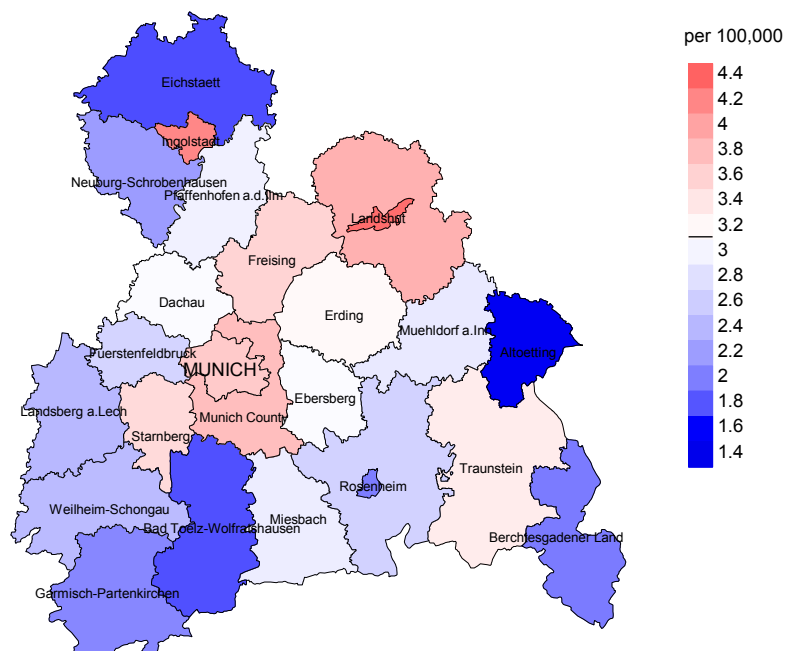


Figure 17. Distribution of age at death (bars; males: mean=70.4 yrs, median=73.1 yrs; females: mean=70.7 yrs, median=74.1 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

Average mortality (Germany 1987 standard population) 2007 - 2019: Males



Average mortality (Germany 1987 standard population) 2007 - 2019: Females

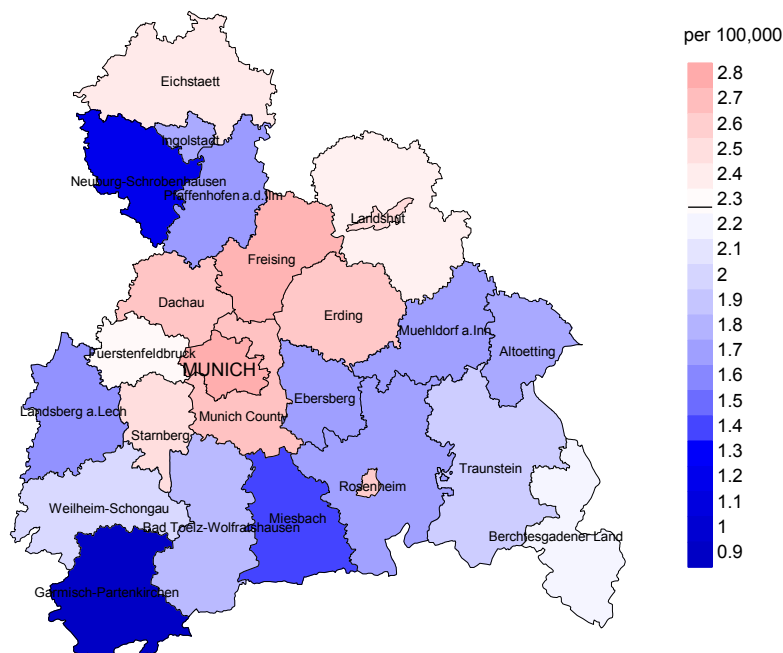
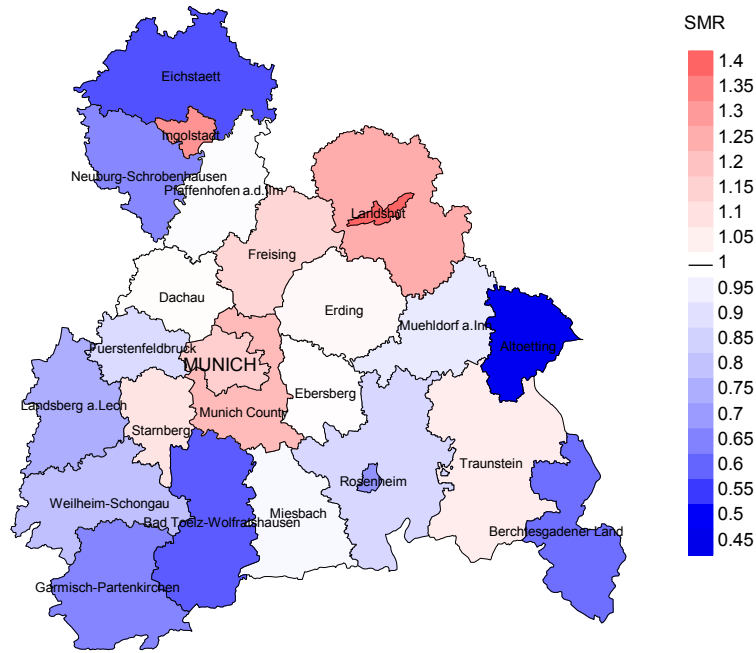


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2019. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 3.1/100,000 WS N=1,014, females 2.3/100,000 WS N=934).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,462 female residents (averaged) in the period from 2007 to 2019 a total of 18 women died from myeloid leukaemia. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 1.7/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.8 and 3.1/100,000.

Standardized mortality ratio (SMR) 2007 - 2019: Males



Standardized mortality ratio (SMR) 2007 - 2019: Females

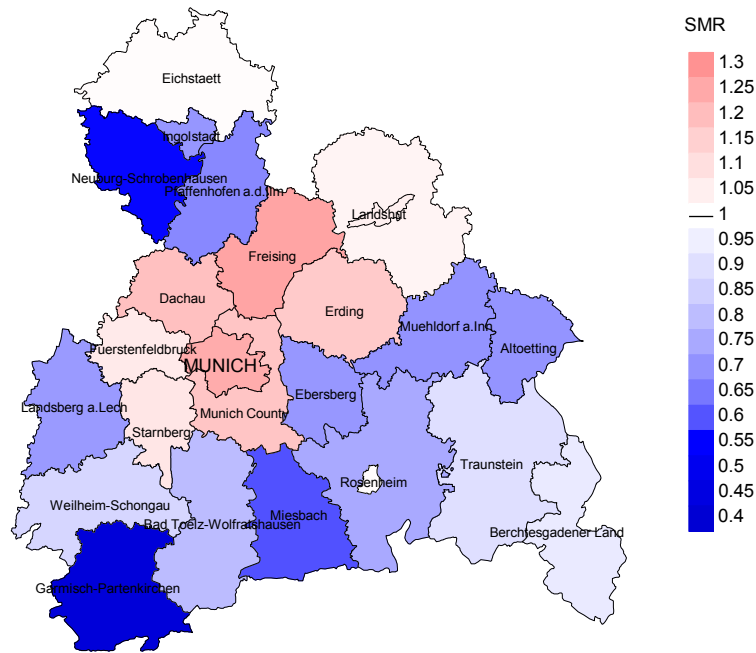


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=1,014, females N=934).

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 2019 a total of 18 women died from myeloid leukaemia. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.71. Though, the value of this parameter may vary with an underlying probability of 99% between 0.35 and 1.27, 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

Recommended Citation

Munich Cancer Registry. ICD-10 C92: Myeloid leukaemia - Incidence and Mortality [Internet]. 2021 [updated 2021 Jan 26; cited 2021 Mar 1]. Available from: https://www.tumorregister-muenchen.de/en/facts/base/bC92__E-ICD-10-C92-Myeloid-leukaemia-incidence-and-mortality.pdf

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