

Munich Cancer Registry



- ▶ Survival
- ▶ Selection Matrix
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- ▶ *Deutsch*

ICD-10 C92.0: Acute myelobl. leukemia

Incidence and Mortality

Year of diagnosis	1998-2019
Patients	3,049
Diseases	3,051
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/bC920_E-ICD-10-C92.0-Acute-myelobl.-leukemia-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
C92.0	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	4.3	86.5	100.0
1999	30	2	6.7	13.4	4.2	83.3	100.0
2000	60	20	33.3	11.8	4.2	86.7	100.0
2001	84	45	53.6	13.3	4.1	90.5	98.8
2002	96	43	44.8	13.4	4.2	86.5	95.8 #
2003	127	62	48.8	16.4	4.2	91.3	99.2
2004	148	70	47.3	18.7	4.1	86.5	98.6
2005	131	59	45.0	19.8	4.0	88.5	96.9
2006	179	81	45.3	21.3	4.0	91.1	97.8
2007	153	56	36.6	21.5	4.0	88.2	98.0 #
2008	149	54	36.2	23.0	3.7	85.9	98.7
2009	168	42	25.0	23.9	3.7	86.9	100.0
2010	208	53	25.5	25.0	3.6	82.2	100.0
2011	162	36	22.2	25.9	3.3	80.2	98.8
2012	212	55	25.9	27.0	3.0	85.4	99.1
2013	196	60	30.6	27.8	2.7	82.7	99.0
2014	203	73	36.0	29.0	2.0	88.2	98.5
2015	197	55	27.9	29.1	1.1	89.8	98.5
2016	198	58	29.3	29.2	0.8	79.8	100.0
2017	178	48	27.0	29.5	0.3	78.7	100.0
2018	87	13	14.9	29.5	0.8	64.4	100.0
2019	48	7	14.6	29.7	0.0	66.7	89.6 ##
1998-2019	3051	993	32.5	29.7	4.3	84.8	98.8

3,051 cases diagnosed 1998-2019 are related to a total of 3,049 patients. Currently, in 1,044 (34.2 %) of these 3,049 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 838 / 174 / 32 (27.5 % / 5.7 % / 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 retrieved from the respective headings.

How to interpret:

In 2017, a subgroup of 178 cases has been diagnosed, of which 29.5 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 0.3 % 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 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	4.9	85.7	100.0 #
2003	65	51.2	29	44.6	13.0	5.0	93.8	100.0
2004	68	45.9	30	44.1	15.5	5.0	91.2	100.0
2005	63	48.1	26	41.3	18.6	4.9	85.7	96.8
2006	102	57.0	47	46.1	21.1	5.0	91.2	97.1
2007	85	55.6	32	37.6	21.8	4.9	89.4	100.0 #
2008	70	47.0	26	37.1	23.7	4.4	78.6	98.6
2009	77	45.8	20	26.0	25.1	4.2	87.0	100.0
2010	107	51.4	32	29.9	25.8	4.1	86.9	100.0
2011	82	50.6	17	20.7	27.0	3.9	85.4	98.8
2012	103	48.6	23	22.3	28.0	3.9	83.5	100.0
2013	114	58.2	38	33.3	29.3	3.5	80.7	99.1
2014	99	48.8	36	36.4	31.1	2.6	88.9	99.0
2015	103	52.3	29	28.2	30.4	1.7	89.3	98.1
2016	106	53.5	27	25.5	30.5	0.8	76.4	100.0
2017	92	51.7	20	21.7	31.2	0.7	79.3	100.0
2018	40	46.0	7	17.5	31.4	1.7	67.5	100.0
2019	22	45.8	4	18.2	31.3	0.0	72.7	90.9 ##
1998-2019	1556	51.0	498	32.0	31.3	5.0	85.2	99.2

1,556 cases diagnosed 1998-2019 are related to a total of 1,554 patients. Currently, in 561 (36.1 %) of these 1,554 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 449 / 94 / 18 (28.9 % / 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 92 cases has been diagnosed, of which 31.2 % 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 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	3.5	88.9	100.0
1999	13	43.3	1	7.7	16.1	3.5	76.9	100.0
2000	31	51.7	9	29.0	12.9	3.6	83.9	100.0
2001	40	47.6	23	57.5	16.7	3.5	90.0	97.5
2002	47	49.0	23	48.9	16.8	3.4	87.2	91.5 #
2003	62	48.8	33	53.2	19.9	3.3	88.7	98.4
2004	80	54.1	40	50.0	22.0	3.3	82.5	97.5
2005	68	51.9	33	48.5	20.9	3.1	91.2	97.1
2006	77	43.0	34	44.2	21.6	3.0	90.9	98.7
2007	68	44.4	24	35.3	21.2	3.1	86.8	95.6 #
2008	79	53.0	28	35.4	22.3	3.1	92.4	98.7
2009	91	54.2	22	24.2	22.7	3.2	86.8	100.0
2010	101	48.6	21	20.8	24.1	3.0	77.2	100.0
2011	80	49.4	19	23.8	24.8	2.7	75.0	98.8
2012	109	51.4	32	29.4	25.9	2.1	87.2	98.2
2013	82	41.8	22	26.8	26.2	1.7	85.4	98.8
2014	104	51.2	37	35.6	26.9	1.4	87.5	98.1
2015	94	47.7	26	27.7	27.7	0.6	90.4	98.9
2016	92	46.5	31	33.7	27.8	0.8	83.7	100.0
2017	86	48.3	28	32.6	27.6	0.0	77.9	100.0
2018	47	54.0	6	12.8	27.6	0.0	61.7	100.0
2019	26	54.2	3	11.5	28.0	0.0	61.5	88.5 ##
1998-2019	1495	49.0	495	33.1	28.0	3.5	84.3	98.3

1,495 cases diagnosed 1998-2019 are related to a total of 1,495 patients. Currently, in 483 (32.3 %) of these 1,495 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 389 / 80 / 14 (26.0 % / 5.4 % / 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 86 cases has been diagnosed, of which 27.6 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 0.0 % 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 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	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	68	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	79	3.1	3.4	2.0	1.6	2.5	2.3	3.1	2.9
2009	77	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	80	3.7	3.4	2.0	2.1	2.8	2.5	3.4	2.8
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	99	104	4.2	4.3	1.8	1.9	2.8	2.6	3.9	3.4
2015	103	94	4.3	3.9	2.0	1.5	3.0	2.3	3.9	2.9
2016	106	92	4.4	3.7	2.2	1.7	3.1	2.3	4.0	2.9
2017	92	86	3.8	3.5	1.8	1.6	2.6	2.2	3.4	2.7
2018	40	47	1.6	1.9	0.7	0.9	1.1	1.2	1.4	1.5
2019	22	26	0.9	1.0	0.4	0.4	0.6	0.6	0.8	0.8
1998-2019	1556	1495	3.5	3.3	1.9	1.6	2.7	2.1	3.5	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	Std.		Min.	Max.	Median				
		Mean	dev.			10%	25%	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	148	67.7	15.1	24.3	92.3	44.5	60.1	69.1	78.7	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	149	65.4	19.4	0.6	94.8	38.0	56.7	69.5	78.6	84.0
2009	168	66.0	18.6	5.5	99.2	37.6	53.1	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	162	64.7	19.4	0.3	98.4	40.1	56.3	69.8	77.1	85.0
2012	212	67.3	16.6	0.0	92.6	44.9	57.7	71.5	79.1	84.0
2013	196	70.4	16.2	0.5	92.7	52.8	65.3	74.2	79.9	85.2
2014	203	71.1	15.7	0.5	95.9	49.7	66.6	74.7	80.7	85.8
2015	197	70.6	14.3	1.8	92.7	50.3	62.2	74.7	80.2	86.6
2016	198	68.3	17.4	9.1	94.2	40.3	57.7	72.8	82.1	86.0
2017	178	68.9	14.6	18.8	94.8	49.7	61.3	72.2	78.8	84.4
2018	87	69.8	15.2	26.6	91.6	46.2	61.0	73.7	81.3	86.1
2019	48	69.5	16.0	21.1	86.3	53.1	59.7	74.7	80.8	84.8
1998-2019	3051	67.4	17.0	0.0	99.2	43.4	59.5	71.7	79.3	84.8

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	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	68	68.6	14.1	30.3	89.2	52.2	61.9	69.1	78.9	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	77	65.0	17.4	5.5	87.9	40.9	52.4	70.5	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	99	73.7	14.4	0.5	95.9	57.4	70.4	75.5	83.1	86.3
2015	103	70.1	15.0	1.8	92.5	50.3	61.9	73.9	79.9	86.0
2016	106	68.0	15.9	21.6	92.2	45.3	60.1	71.7	78.7	84.9
2017	92	69.5	12.6	24.8	91.2	52.7	63.2	72.0	78.2	81.9
2018	40	72.6	14.1	28.4	91.6	51.5	65.8	77.5	83.5	86.6
2019	22	70.2	17.7	21.1	86.0	55.3	63.2	76.2	81.7	83.9
1998-2019	1556	67.3	16.6	0.5	98.4	44.2	60.4	71.2	78.6	84.0

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	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	79	67.7	16.6	15.7	94.8	38.0	61.2	69.5	79.7	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	80	62.9	22.3	0.3	90.0	28.7	51.7	70.4	78.7	85.3
2012	109	66.5	17.6	0.0	92.4	43.8	57.3	71.8	78.4	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	94	71.2	13.6	30.6	92.7	50.7	63.4	74.9	80.5	87.5
2016	92	68.6	19.1	9.1	94.2	39.1	57.4	75.2	83.5	87.5
2017	86	68.4	16.6	18.8	94.8	39.4	59.5	72.7	80.0	85.2
2018	47	67.4	15.9	26.6	91.3	45.6	56.7	70.0	80.8	86.1
2019	26	68.9	14.7	27.0	86.3	53.1	58.2	71.3	80.6	84.8
1998-2019	1495	67.6	17.5	0.0	99.2	43.0	58.8	72.1	80.2	85.5

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	15	0.7	0.7	8	0.7	0.7	7	0.7	0.7
5-9	7	0.3	1.0	4	0.4	1.1	3	0.3	0.9
10-14	7	0.3	1.3	3	0.3	1.4	4	0.4	1.3
15-19	13	0.6	1.9	7	0.6	2.0	6	0.6	1.9
20-24	16	0.7	2.7	7	0.6	2.6	9	0.8	2.7
25-29	25	1.2	3.8	9	0.8	3.5	16	1.5	4.2
30-34	31	1.4	5.3	12	1.1	4.5	19	1.8	6.0
35-39	44	2.0	7.3	14	1.3	5.8	30	2.8	8.9
40-44	56	2.6	9.9	30	2.7	8.5	26	2.5	11.3
45-49	80	3.7	13.6	39	3.5	12.1	41	3.9	15.2
50-54	102	4.7	18.3	53	4.8	16.9	49	4.6	19.8
55-59	125	5.8	24.1	60	5.5	22.4	65	6.1	26.0
60-64	157	7.3	31.4	83	7.5	29.9	74	7.0	33.0
65-69	247	11.4	42.8	142	12.9	42.8	105	9.9	42.9
70-74	344	15.9	58.8	189	17.2	60.0	155	14.6	57.5
75-79	375	17.4	76.1	197	17.9	77.9	178	16.8	74.3
80-84	286	13.2	89.4	143	13.0	90.9	143	13.5	87.8
85+	229	10.6	100.0	100	9.1	100.0	129	12.2	100.0
All ages	2159	100.0		1100	100.0		1059	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=311 %	Females DCO rate n=299 %	Males	Females
							Prop.all cancers n=143063 %	Prop.all cancers n=144724 %
0- 4	8	7	0.5	0.5	12.5		3.8	4.3
5- 9	4	3	0.3	0.2			3.5	3.2
10-14	3	4	0.2	0.3		25.0	2.3	3.4
15-19	7	6	0.4	0.4			2.3	2.4
20-24	7	9	0.4	0.5	14.3		1.2	1.9
25-29	9	16	0.4	0.8			1.0	1.4
30-34	12	19	0.6	0.9		5.3	1.0	1.0
35-39	14	30	0.7	1.4	21.4	3.3	0.8	0.9
40-44	30	26	1.3	1.1	10.0	11.5	1.2	0.5
45-49	39	41	1.6	1.7	15.4	19.5	0.8	0.5
50-54	53	49	2.3	2.1	15.1	8.2	0.7	0.4
55-59	60	65	3.1	3.3	18.3	16.9	0.5	0.5
60-64	83	74	5.1	4.2	20.5	21.6	0.5	0.5
65-69	142	105	9.3	6.2	27.5	31.4	0.6	0.6
70-74	189	155	13.5	9.7	28.0	28.4	0.7	0.8
75-79	197	178	17.8	12.9	31.5	35.4	0.9	1.0
80-84	143	143	21.8	14.7	42.7	35.7	1.0	1.0
85+	100	129	23.5	13.4	46.0	48.8	1.0	0.8
All ages	1100	1059			28.3	28.2	0.8	0.7
Incidence								
Raw			3.7	3.4				
WS			1.9	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).

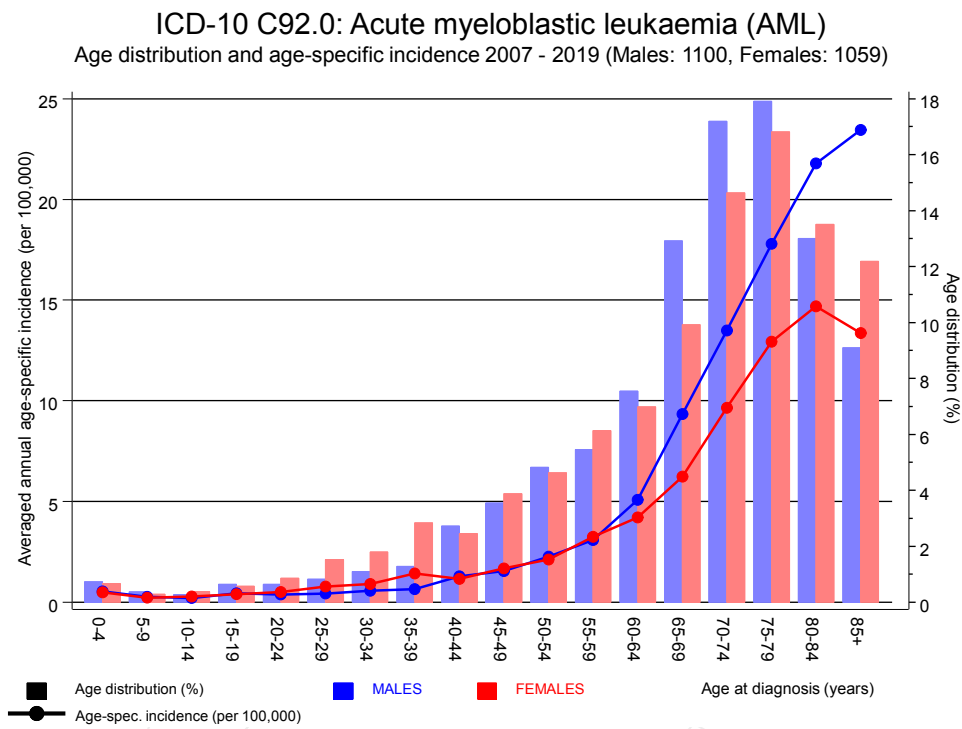


Figure 6. Age distribution (males: mean=68.4 yrs, median=72.2 yrs; females: mean=68.0 yrs, median=72.5 yrs) and age-specific incidence.

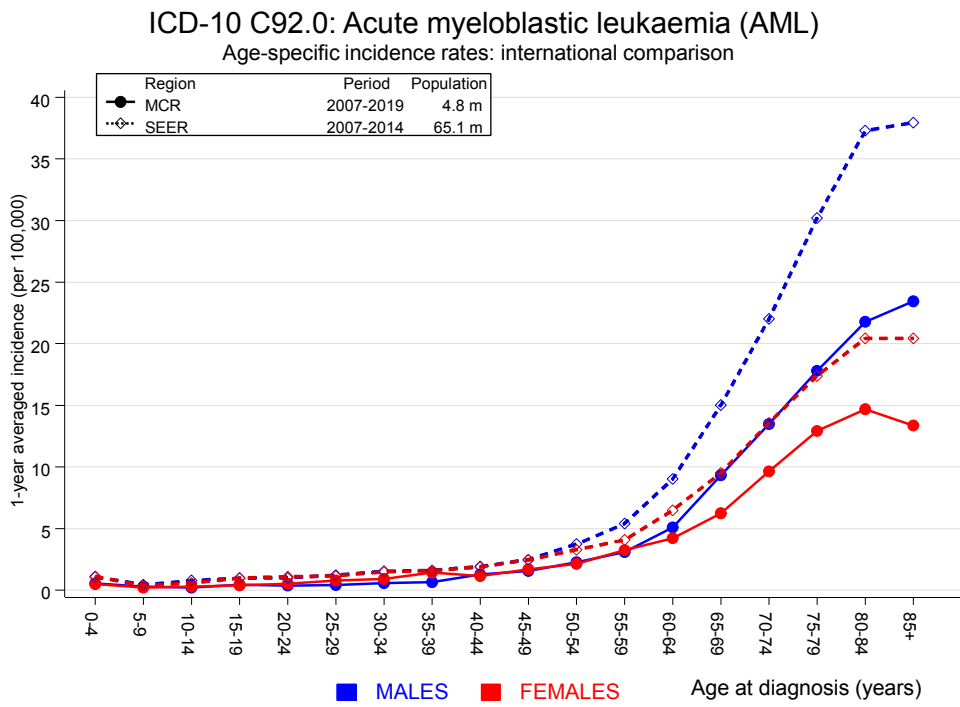


Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

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 %
C09–C10 Oropharynx	1	0.3	3.9	0.1	22.0	3.9	
C12–C13 Hypopharynx	1	0.1	7.3	0.2	40.6	4.5	
C15 Oesophagus	2	0.5	4.4	0.5	15.8	8.1	50.0
C16 Stomach	1	0.8	1.2	0.0	6.8	0.9	
C18 Colon	4	2.0	2.0	0.5	5.0	10.4	
C19–C20 Rectum	2	1.2	1.7	0.2	6.2	4.4	
C23–C24 Bile	1	0.2	4.4	0.1	24.8	4.1	
C25 Pancreas	2	0.8	2.4	0.3	8.6	6.1	
C32 Larynx	1	0.2	4.4	0.1	24.4	4.1	100.0
C33–C34 Lung	9	2.6	3.4	1.6	6.5 #	33.5	11.1
C38,C45 Mesothelioma	1	0.1	6.8	0.2	37.9	4.5	
C43 Malign. melanoma	1	1.0	1.0	0.0	5.4	-0.1	
C46,C49 Soft tissue	4	0.1	31.7	8.6	81.1 #	20.4	
C50 Breast	2	0.1	33.2	4.0	119.9 #	10.2	
C61 Prostate	7	6.2	1.1	0.5	2.3	4.4	14.3
C62 Testis	1	0.1	8.3	0.2	46.1	4.6	
C67 Bladder	1	0.9	1.1	0.0	5.9	0.3	
C70–C72 CNS cancer	2	0.3	6.8	0.8	24.5	9.0	
C73 Thyroid	1	0.2	5.8	0.1	32.5	4.4	
C81 Hodgkin lymphoma	2	0.1	31.2	3.8	112.7 #	10.2	
C82–C85 NHL	7	0.9	7.6	3.0	15.6 #	32.0	
C90 Mult. myeloma	3	0.3	10.7	2.2	31.3 #	14.3	
C91–C96 Leukaemia	8	0.3	24.1	10.4	47.6 #	40.4	50.0
Not observed	0	2.7	0.0	0.0	1.3	-14.4	
All further malignancies	64	22.2	2.9	2.2	3.7 #	220.2	12.5
Patients		1241					
Median age at next malignancy (years)		69.2					
Person-years		1898					
Mean observation time (years)		1.5					
Median observation time (years)		0.5					

The occurrence of further specified malignancy is statistically significant.

Table 7b

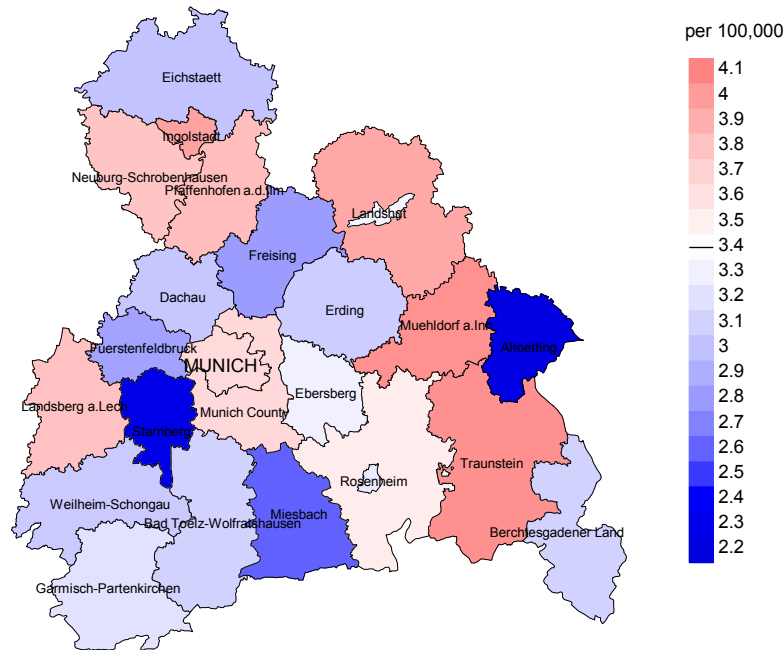
Standardized incidence ratio (SIR, with 95% confidence limits),
excess absolute risk (EAR) and DCO rate of further malignancies
for period 1998–2019

FEMALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C03–C06 Oral cavity	2	0.1	24.7	3.0	89.2 #	11.2	
C15 Oesophagus	3	0.1	34.2	7.1	100.1 #	17.0	
C18 Colon	1	1.1	0.9	0.0	4.9	-0.9	
C19–C20 Rectum	1	0.5	2.0	0.1	11.1	2.9	
C22 Liver	1	0.2	6.5	0.2	36.4	4.9	
C25 Pancreas	1	0.6	1.8	0.0	10.0	2.6	
C33–C34 Lung	4	1.0	3.9	1.1	9.9 #	17.3	
C50 Breast	7	4.5	1.6	0.6	3.2	14.6	14.3
C53 Cervix uteri	3	0.2	13.1	2.7	38.3 #	16.1	66.7
C54 Corpus uteri	4	0.8	5.2	1.4	13.4 #	18.8	
C56 Ovary	1	0.5	1.8	0.0	10.2	2.6	
C70–C72 CNS cancer	1	0.2	5.5	0.1	30.7	4.8	
C76–C79 CUP	1	0.2	4.8	0.1	26.9	4.6	
C82–C85 NHL	2	0.5	4.0	0.5	14.4	8.7	
C90 Mult. myeloma	1	0.2	6.5	0.2	36.3	4.9	
C91–C96 Leukaemia	1	0.2	5.3	0.1	29.3	4.7	
C96 Systemic	1	0.0	386.4	9.8	2153 #	5.8	100.0
Not observed	0	2.8	0.0	0.0	1.3	-16.3	
All further malignancies	35	13.6	2.6	1.8	3.6 #	124.4	11.4
Patients		1168					
Median age at next malignancy (years)		67.9					
Person-years		1718					
Mean observation time (years)		1.5					
Median observation time (years)		0.5					

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

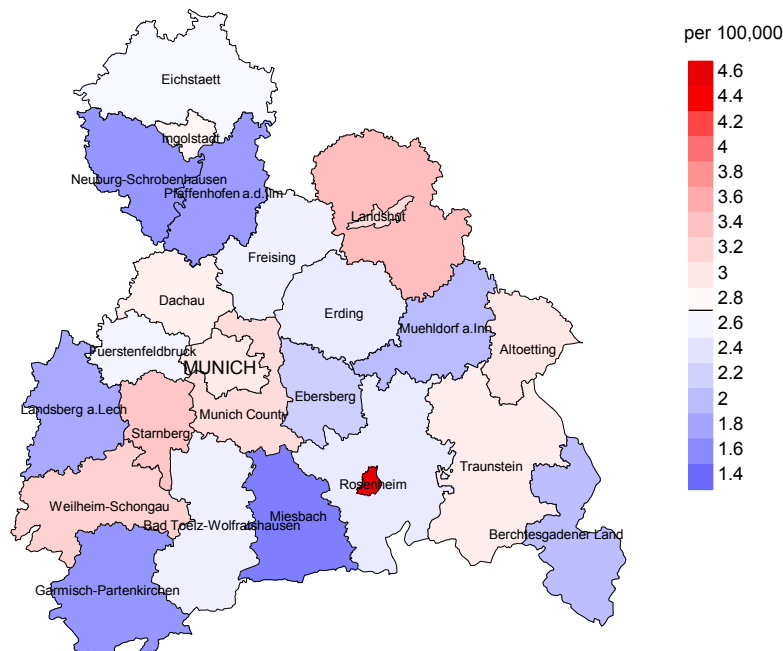
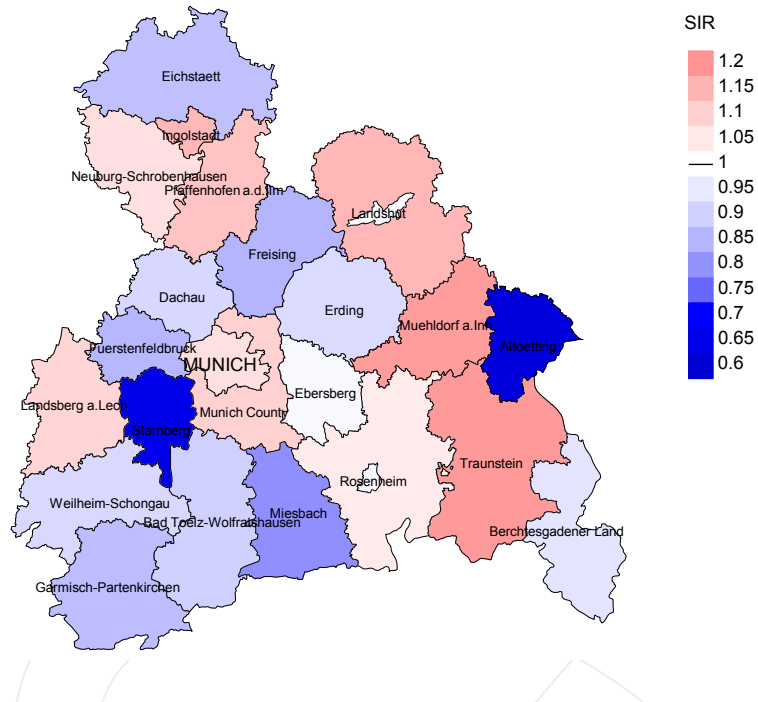


Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 3.4/100,000 WS N=1,100, females 2.7/100,000 WS N=1,059).

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 22 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 2.2/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 1.2 and 3.7/100,000.

Standardized incidence ratio (SIR) 2007 - 2019: Males



Standardized incidence ratio (SIR) 2007 - 2019: Females

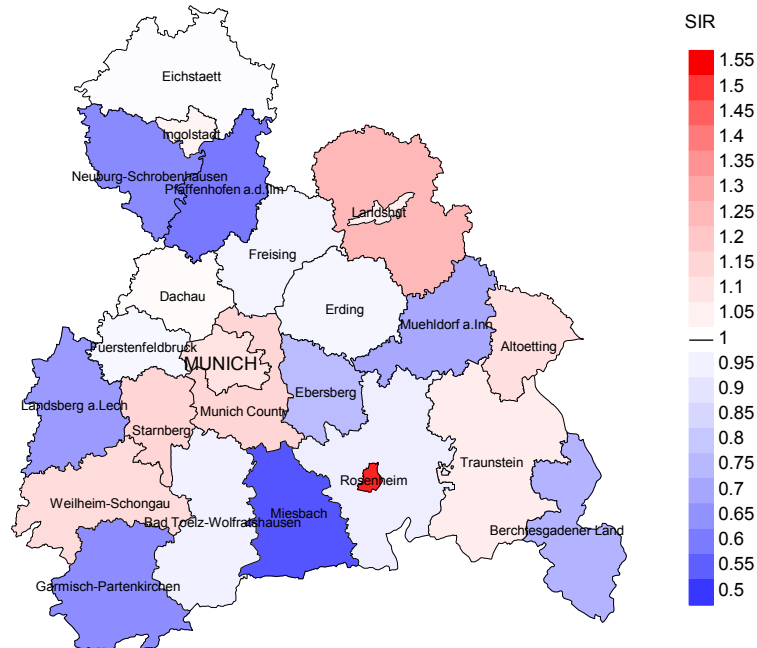


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=1,100, females N=1,059).

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 22 women were identified with newly diagnosed acute myelobl. leukemia. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.76. Though, the value of this parameter may vary with an underlying probability of 99% between 0.41 and 1.29, 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	37	100.0	2.7	32	86.5	96.9
1999	30	100.0	6.7	25	83.3	100.0
2000	60	100.0	33.3	52	86.7	96.2
2001	84	98.8	53.6	76	90.5	100.0
2002	96	95.8	44.8	83	86.5	98.8
2003	127	99.2	48.8	116	91.3	99.1
2004	148	98.6	47.3	128	86.5	99.2
2005	131	96.9	45.0	116	88.5	98.3
2006	179	97.8	45.3	163	91.1	98.8
2007	153	98.0	36.6	135	88.2	97.8
2008	149	98.7	36.2	128	85.9	98.4
2009	168	100.0	25.0	146	86.9	98.6
2010	208	100.0	25.5	171	82.2	98.2
2011	162	98.8	22.2	130	80.2	96.9
2012	212	99.1	25.9	181	85.4	98.3
2013	196	99.0	30.6	162	82.7	95.1
2014	203	98.5	36.0	179	88.2	97.2
2015	197	98.5	27.9	177	89.8	96.6
2016	198	100.0	29.3	158	79.8	94.9
2017	178	100.0	27.0	140	78.7	82.1
2018	87	100.0	14.9	56	64.4	42.9
2019	48	89.6	14.6	32	66.7	59.4
1998-2019	3051	98.8	32.5	2586	84.8	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	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	148	94	98.9	78	52.7
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	149	118	98.3	77	51.7
2009	168	120	97.5	87	51.8
2010	208	152	98.7	105	50.5
2011	162	143	97.9	80	49.4
2012	212	149	99.3	104	49.1
2013	196	161	97.5	102	52.0
2014	203	157	98.1	116	57.1
2015	197	158	99.4	110	55.8
2016	198	149	99.3	109	55.1
2017	178	148	99.3	97	54.5
2018	87	80	37.5	34	39.1
2019	48	73	42.5	24	50.0
1998–2019	3051	2397	94.9	1611	52.8

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	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	158	90.5	9.5	96.2
2016	149	89.3	10.7	96.6
2017	148	90.5	9.5	97.3
2018	80	51.3	48.8	93.3
2019	73	52.1	47.9	96.8
1998–2019	2397	89.9	10.1	98.2

Table 10a

Medians of age at death according to the grouping in Table 9
 MALES

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	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	81	74.9	74.9	78.4	75.3
2017	74	73.9	74.0	69.2	74.2
2018	44	74.2	73.5	74.9	76.0
2019	36	76.8	74.5	79.9	76.7
1998-2019	1238	73.4	73.5	72.3	73.5

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	75	75.7	75.5	78.1	75.6
2016	68	77.3	76.6	81.9	76.8
2017	74	74.8	74.7	74.9	74.7
2018	36	78.0	78.0	77.4	76.6
2019	37	68.9	75.0	68.8	75.0
1998-2019	1159	74.6	74.7	73.0	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	0.70	1.2	0.63	1.8	0.68	2.4	0.73
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	0.75	1.2	0.68	2.0	0.72	2.8	0.73
2015	74	3.1	0.72	1.4	0.67	2.1	0.68	2.8	0.72
2016	71	3.0	0.67	1.3	0.57	1.9	0.62	2.7	0.66
2017	67	2.8	0.73	1.3	0.73	1.9	0.72	2.5	0.74
2018	21	0.9	0.53	0.4	0.56	0.6	0.55	0.8	0.54
2019	23	0.9	1.05	0.4	1.07	0.6	1.14	0.8	1.03
1998-2019	1113	2.5	0.72	1.2	0.65	1.8	0.69	2.5	0.72

Table 11b

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

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	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	0.71	1.0	0.59	1.4	0.63	1.9	0.66
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	0.85	1.1	0.55	1.7	0.69	2.2	0.79
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	69	2.8	0.73	1.0	0.67	1.6	0.69	2.1	0.72
2016	62	2.5	0.67	1.1	0.65	1.5	0.65	1.9	0.64
2017	67	2.7	0.78	1.1	0.70	1.6	0.73	2.0	0.75
2018	20	0.8	0.43	0.3	0.31	0.4	0.33	0.6	0.39
2019	15	0.6	0.58	0.3	0.56	0.4	0.55	0.4	0.55
1998-2019	1041	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 2007-2019
(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	0.5	2	0.3	0.4	3	0.4	0.5
15-19	4	0.3	0.7	2	0.3	0.6	2	0.3	0.8
20-24	8	0.5	1.2	5	0.6	1.3	3	0.4	1.2
25-29	6	0.4	1.6	3	0.4	1.7	3	0.4	1.6
30-34	6	0.4	2.0	1	0.1	1.8	5	0.7	2.3
35-39	17	1.1	3.1	8	1.0	2.8	9	1.2	3.5
40-44	29	1.9	5.0	10	1.3	4.1	19	2.5	6.0
45-49	44	2.9	7.9	24	3.1	7.1	20	2.7	8.7
50-54	53	3.5	11.4	26	3.3	10.4	27	3.6	12.3
55-59	72	4.7	16.0	29	3.7	14.1	43	5.7	18.0
60-64	102	6.7	22.7	52	6.6	20.8	50	6.7	24.7
65-69	175	11.4	34.1	107	13.6	34.4	68	9.1	33.8
70-74	282	18.4	52.5	152	19.4	53.8	130	17.4	51.2
75-79	318	20.7	73.3	175	22.3	76.1	143	19.1	70.3
80-84	220	14.4	87.6	106	13.5	89.6	114	15.2	85.6
85+	190	12.4	100.0	82	10.4	100.0	108	14.4	100.0
All ages	1533	100.0		785	100.0		748	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		Females		Males		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	0.33		4.3
10-14	2	3	0.1	0.67	0.2	0.75	7.4	13.0
15-19	2	2	0.1	0.29	0.1	0.33	4.3	8.0
20-24	5	3	0.3	0.71	0.2	0.33	7.5	7.7
25-29	3	3	0.1	0.33	0.1	0.19	3.5	3.2
30-34	1	5	0.0	0.08	0.2	0.26	0.8	3.1
35-39	8	9	0.4	0.57	0.4	0.30	3.3	2.5
40-44	10	19	0.4	0.33	0.8	0.73	1.7	2.4
45-49	24	20	1.0	0.62	0.8	0.49	1.8	1.3
50-54	26	27	1.1	0.49	1.2	0.55	1.0	1.1
55-59	29	43	1.5	0.48	2.2	0.66	0.7	1.2
60-64	52	50	3.2	0.63	2.8	0.68	0.9	1.1
65-69	107	68	7.0	0.75	4.0	0.65	1.2	1.0
70-74	152	130	10.8	0.80	8.1	0.84	1.4	1.6
75-79	175	143	15.8	0.89	10.4	0.80	1.5	1.6
80-84	106	114	16.1	0.74	11.7	0.80	1.1	1.3
85+	82	108	19.2	0.82	11.2	0.84	1.0	1.0
All ages	785	748					1.2	1.3
Mortality								
Raw			2.6	0.71	2.4	0.71		
WS			1.2	0.64	1.0	0.60		
ES			1.8	0.68	1.4	0.64		
BRD-S			2.4	0.71	1.8	0.68		
PYLL-70								
per 100,000			12.2		13.8			
ES			11.1		12.6			
AYLL-70			12.0		14.3			

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	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	0.8	2	50.0			2	50.0
C16 Stomach	5	1.0	4	80.0	1	20.0		
C17 Small intestine	2	0.4	2	100.0				
C18 Colon	33	6.6	28	84.8	3	9.1	2	6.1
C19-C20 Rectum	14	2.8	12	85.7	1	7.1	1	7.1
C22 Liver	1	0.2	1	100.0				
C23-C24 Bile	1	0.2					1	100.0
C25 Pancreas	5	1.0			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	21	4.2	9	42.9	5	23.8	7	33.3
C38,C45 Mesothelioma	2	0.4	1	50.0	1	50.0		
C40-C41 Bone	1	0.2	1	100.0				
C43 Malign. melanoma	12	2.4	12	100.0				
C44 Skin others	25	5.0	14	56.0	2	8.0	9	36.0
C46,C49 Soft tissue	6	1.2	1	16.7	1	16.7	4	66.7
C48 Peritoneal	1	0.2	1	100.0				
C61 Prostate	94	18.9	86	91.5	3	3.2	5	5.3
C62 Testis	2	0.4	2	100.0				
C64 Kidney	8	1.6	8	100.0				
C67 Bladder	13	2.6	11	84.6	2	15.4		
C68 Urinary org.	2	0.4	1	50.0			1	50.0
C70-C72 CNS cancer	5	1.0	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	6	1.2	4	66.7			2	33.3
C82-C85 NHL	38	7.6	29	76.3	4	10.5	5	13.2
C90 Mult. myeloma	5	1.0	3	60.0	2	40.0		
C91-C96 Leukaemia	174	34.9			46	26.4	128	73.6
C96 Systemic	2	0.4	1	50.0	1	50.0		
All further malignancies	498	100.0	247	49.6	76	15.3	175	35.1

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 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	2	0.5	2	100.0				
C15 Oesophagus	2	0.5					2	100.0
C16 Stomach	5	1.2	5	100.0				
C18 Colon	12	3.0	10	83.3	1	8.3	1	8.3
C19-C20 Rectum	6	1.5	4	66.7	1	16.7	1	16.7
C21 Anus/canal	2	0.5	2	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	8	2.0	5	62.5	2	25.0	1	12.5
C43 Malign. melanoma	7	1.7	6	85.7	1	14.3		
C44 Skin others	11	2.7	7	63.6	1	9.1	3	27.3
C46,C49 Soft tissue	3	0.7	2	66.7			1	33.3
C48 Peritoneal	2	0.5	2	100.0				
C50 Breast	100	24.9	93	93.0	5	5.0	2	2.0
C51 Vulva	1	0.2	1	100.0				
C52 Vagina	1	0.2					1	100.0
C53 Cervix uteri	9	2.2	7	77.8	1	11.1	1	11.1
C54 Corpus uteri	20	5.0	15	75.0	2	10.0	3	15.0
C56 Ovary	7	1.7	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	2	0.5	1	50.0	1	50.0		
C70-C72 CNS cancer	2	0.5	1	50.0			1	50.0
C73 Thyroid	9	2.2	8	88.9	1	11.1		
C76-C79 CUP	5	1.2	1	20.0	1	20.0	3	60.0
C81 Hodgkin lymphoma	4	1.0	4	100.0				
C82-C85 NHL	22	5.5	19	86.4	2	9.1	1	4.5
C90 Mult. myeloma	7	1.7	5	71.4	2	28.6		
C91-C96 Leukaemia	140	34.8			40	28.6	100	71.4
C96 Systemic	2	0.5	1	50.0			1	50.0
All further malignancies	402	100.0	212	52.7	63	15.7	127	31.6

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		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	0.50		4.3
10-14	2	1	0.1	1.00	0.1	0.33	7.4	5.3
15-19	2	2	0.1	0.40	0.1	0.40	4.4	8.7
20-24	3	2	0.2	0.50	0.1	0.22	5.0	5.4
25-29	3	3	0.1	0.33	0.1	0.25	3.9	3.5
30-34	1	5	0.0	0.11	0.2	0.29	0.8	3.6
35-39	6	9	0.3	0.43	0.4	0.31	2.6	2.7
40-44	9	15	0.4	0.33	0.7	0.75	1.7	2.1
45-49	20	15	0.8	0.63	0.6	0.50	1.6	1.1
50-54	21	21	0.9	0.46	0.9	0.62	0.9	1.0
55-59	23	28	1.2	0.49	1.4	0.61	0.6	0.9
60-64	34	36	2.1	0.57	2.1	0.67	0.7	1.0
65-69	63	45	4.1	0.78	2.7	0.67	0.9	0.9
70-74	80	68	5.7	0.77	4.2	0.71	0.9	1.1
75-79	98	88	8.9	0.92	6.4	0.79	1.2	1.3
80-84	61	79	9.3	0.73	8.1	0.83	0.9	1.2
85+	44	67	10.3	0.86	6.9	0.79	0.7	0.8
All ages	471	485					0.9	1.1
Mortality								
Raw			1.6	0.68	1.6	0.67		
WS			0.7	0.59	0.7	0.56		
ES			1.1	0.64	0.9	0.61		
BRD-S			1.5	0.68	1.2	0.64		
PYLL-70								
per 100,000			9.6		10.6			
ES			8.9		9.6			
AYLL-70			13.6		15.2			

* 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		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	0.50		4.3
10-14	2	1	0.1	1.00	0.1	0.33	7.4	5.3
15-19	2	2	0.1	0.40	0.1	0.40	4.4	9.1
20-24	3	2	0.2	0.50	0.1	0.22	5.0	5.6
25-29	3	3	0.1	0.33	0.1	0.33	3.9	3.6
30-34	1	5	0.0	0.11	0.2	0.29	0.8	3.6
35-39	6	6	0.3	0.43	0.3	0.23	2.7	1.8
40-44	9	11	0.4	0.35	0.5	0.58	1.7	1.6
45-49	17	15	0.7	0.57	0.6	0.50	1.4	1.1
50-54	19	21	0.8	0.45	0.9	0.70	0.9	1.0
55-59	20	25	1.0	0.49	1.3	0.56	0.6	0.9
60-64	33	34	2.0	0.58	1.9	0.67	0.7	0.9
65-69	56	40	3.7	0.76	2.4	0.63	0.8	0.8
70-74	75	65	5.4	0.77	4.0	0.71	0.9	1.1
75-79	90	84	8.1	0.87	6.1	0.77	1.1	1.3
80-84	60	77	9.1	0.72	7.9	0.82	0.9	1.2
85+	41	66	9.6	0.85	6.8	0.79	0.8	0.8
All ages	438	458					0.9	1.0
Mortality								
Raw			1.5	0.67	1.5	0.66		
WS			0.7	0.58	0.6	0.54		
ES			1.0	0.62	0.9	0.59		
BRD-S			1.4	0.66	1.1	0.63		
PYLL-70								
per 100,000			9.0		9.6			
ES			8.4		8.7			
AYLL-70			13.9		15.1			

* See corresponding tables with multiple malignancies.

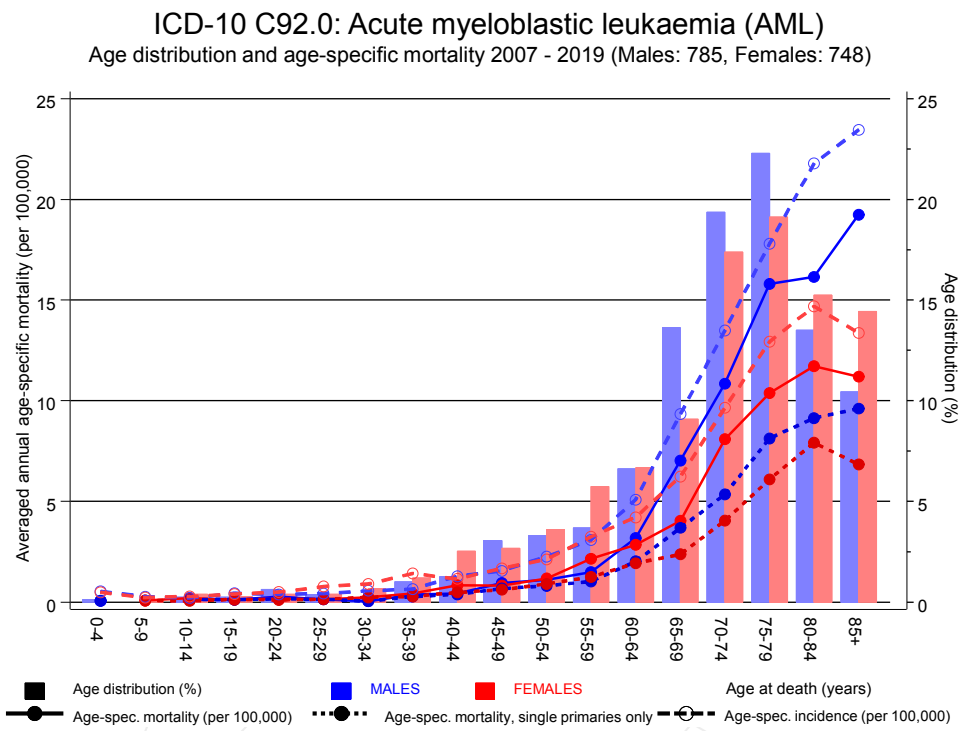
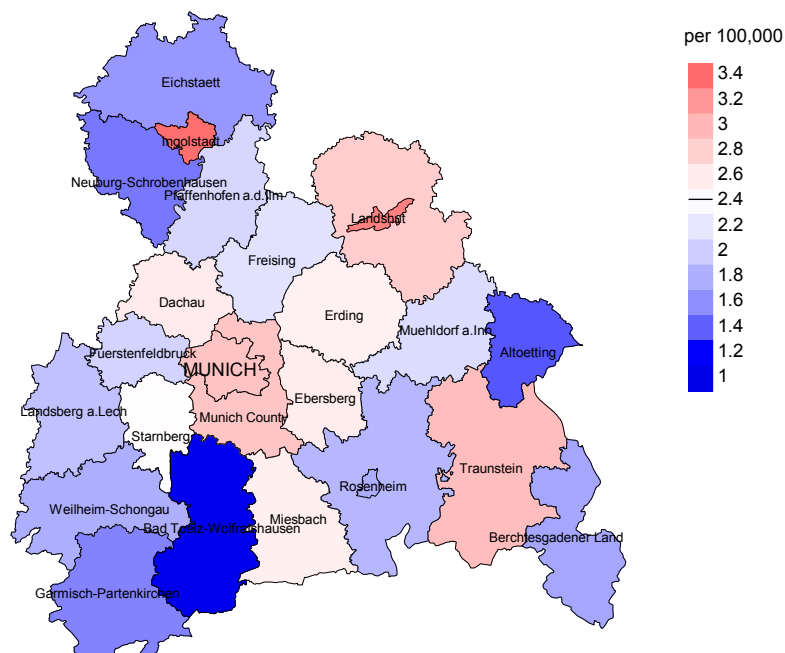


Figure 17. Distribution of age at death (bars; males: mean=70.6 yrs, median=73.3 yrs; females: mean=70.6 yrs, median=74.1 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

The difference between age at diagnosis (Table 3) and age at acute myelobl. leukemia-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

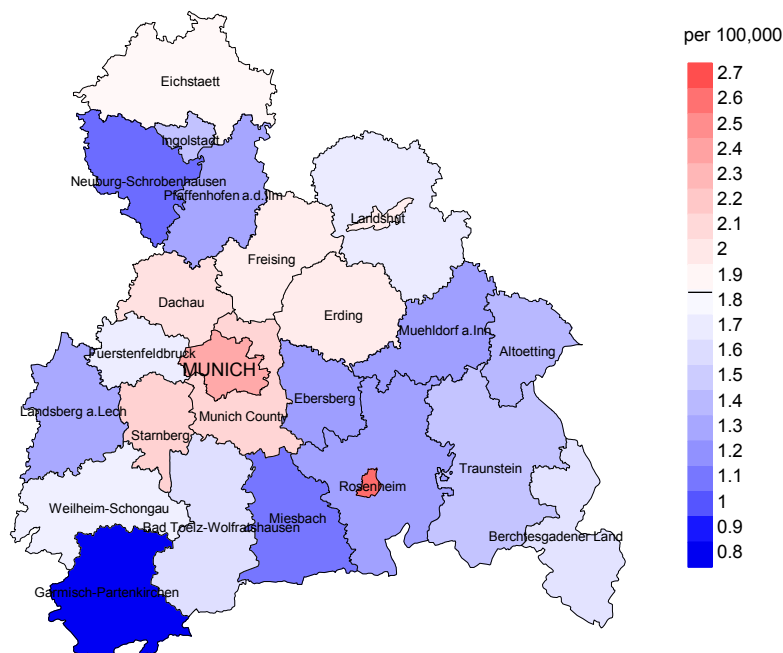
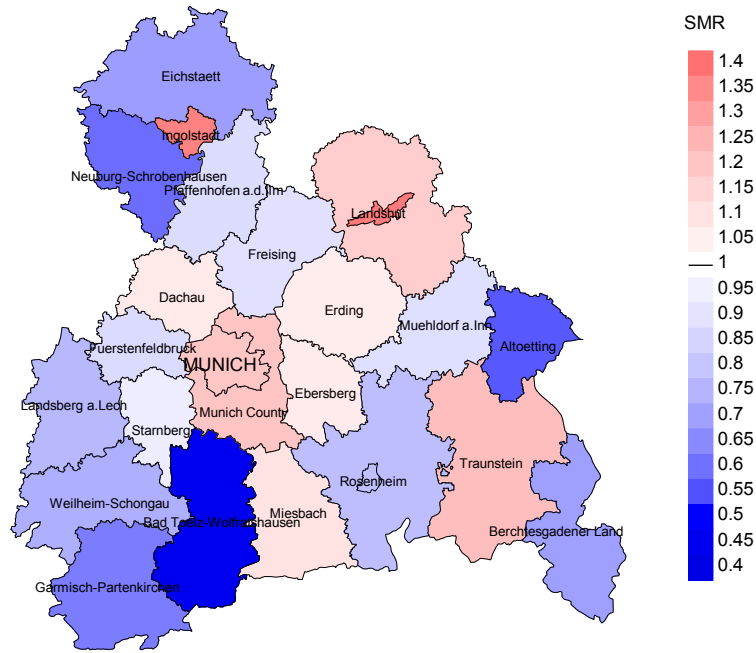


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2019. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 2.4/100,000 WS N=785, females 1.8/100,000 WS N=748).

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 13 women died from acute myelobl. leukemia. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 1.3/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.5 and 2.5/100,000.

Standardized mortality ratio (SMR) 2007 - 2019: Males



Standardized mortality ratio (SMR) 2007 - 2019: Females

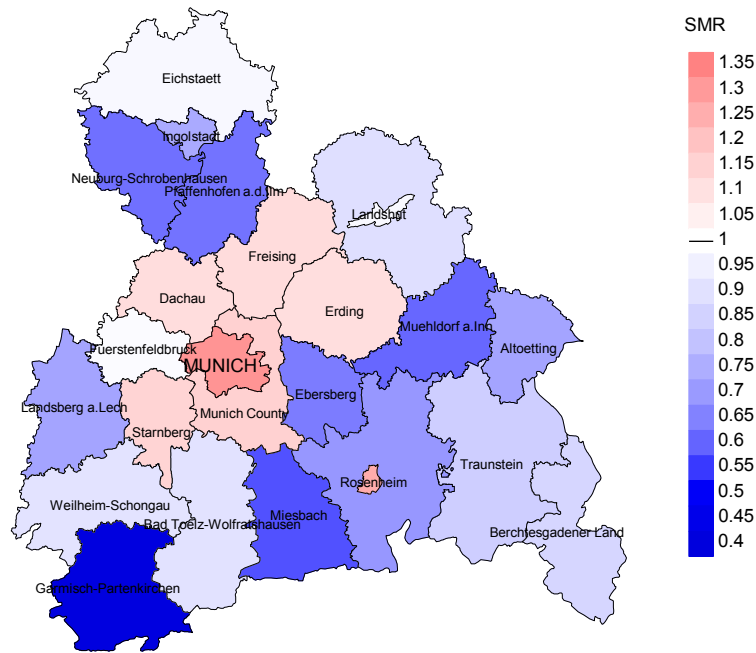


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=785, females N=748).

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 13 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 0.27 and 1.26, 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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