Munich Cancer Registry

ICD-10 C93-C95: Other leukaemias

Incidence and Mortality

Year of diagnosis	1998-2020
Patients	1,087
Diseases	1,090
Creation date	12/21/2021
Database export	12/20/2021
Population	4.95 m

BERLIN

GERMANY

BAVARIA

MUNICH

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https://www.tumorregister-muenchen.de/en

https://www.tumorregister-muenchen.de/en/facts/base/bC9395E-ICD-10-C93-C95-Other-leukaemias-incidence-and-mortality.pdf

Index of figures and tables

Global Statements about the statistics on the Internet −
Baseline Statistics (grey button ⬜), **Survival** (red button 🟥)

In these analyses, the clinics and physicians of Upper Bavaria and the city and county of Landshut[#], with a total of 4.69 million inhabitants, account for the frequency of cancer diseases[##] and the achieved long term results. Additionally, the long term survival evaluated by the Munich Cancer Registry (MCR) is compared with the results of the population-based registry in the USA (SEER), which is useful for checking the consistency of the data on an international level.

In comparing several tables, inconsistent figures may be detected. This is based on the fact that different patient cohorts are included in the base calculation, for example when proportions of multiple tumors or DCO-cases[###] are concerned. In other cases the individual tumor diagnosis is the basis for calculation, for example with incidence.

The foot notes describe the currentness of the data. The baseline statistics and survival data are updated annually. This yearly analysis comprises the Annual Report of the MCR.

Clinics and physicians have access to essentially more detailed data, with which they can check, compare and in the best case optimize their own data and results.

We would be pleased to receive corrections, critique and useful suggestions. Just send an e-mail to tumor@ibe.med.uni-muenchen.de.

Munich Cancer Registry, December 2021

[#]   Base data has been collected since 1998. An increase in new diseases is apparent, which is an effect of two extensions in the MCR catchment area (from a base population of 2.65 million to 4.10 in 2002, and to 4.69 million in 2007).

[##] Due to the high frequency and good prognosis of non-malignant skin cancer (C44), no systematic ascertainment is performed for this diagnosis. C44 is not designated as a primary, but rather as a secondary tumor.

[###] DCO (death certificate only) identifies a cancer case that first becomes available to the MCR through the death certificate.

Some remarks regarding this cancer type

The results for leukemias should be interpreted with caution. As with other primarily non-surgically or non-radiologically treated cancer diseases, the MCR hardly manages to obtain even the simplest information on this cancer. The proportion of DCO cases indicates a situation that is far away from a satisfying cooperation. In the group of institutions that potentially participate in reporting are a few hospitals that refuse any contribution to MCR.

ICD-10 codes (ICD-10 2018) used for specifying cancer site

Code	Description
C93.-	Monocytic leukaemia
C94.-	Other leukaemias of specified cell type
C95.-	Leukaemia of unspecified cell type

... **<u>excluding</u>** ...

ICD-10 codes (ICD-10 2018) used for specifying cancer site

Code	Description
C93.0	Acute monoblastic/monocytic leukaemia
C94.0	Acute erythroid leukaemia
C94.2	Acute megakaryoblastic leukaemia
C94.4	Acute panmyelosis with myelofibrosis

INCIDENCE

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                              Table 1

                   Cases by year of diagnosis, proportions of
         DCO, further malignancies, deaths, and active follow-up (ALL PATIENTS)
                                 (incl. DCO)
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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	41	26	63.4	12.2	8.8	97.6	100.0
1999	43	30	69.8	11.9	9.0	93.0	100.0
2000	43	33	76.7	15.0	9.2	90.7	97.7
2001	34	24	70.6	15.5	9.5	100.0	100.0
2002	64	53	82.8	17.8	9.7	98.4	100.0 #
2003	44	28	63.6	18.6	10.2	95.5	100.0
2004	54	39	72.2	19.8	10.0	94.4	98.1
2005	53	30	56.6	20.2	10.3	92.5	100.0
2006	38	23	60.5	19.1	10.3	92.1	97.4
2007	43	19	44.2	19.7	10.5	83.7	90.7 #
2008	50	30	60.0	19.5	10.8	90.0	100.0
2009	58	35	60.3	19.6	11.1	94.8	98.3
2010	48	21	43.8	19.9	12.1	85.4	97.9
2011	60	25	41.7	21.0	11.6	91.7	98.3
2012	70	36	51.4	21.9	11.3	88.6	95.7
2013	51	24	47.1	22.3	11.2	94.1	100.0
2014	66	25	37.9	22.9	10.4	84.8	98.5
2015	65	25	38.5	23.4	8.5	87.7	96.9
2016	61	26	42.6	23.2	8.8	77.0	100.0
2017	50	24	48.0	23.5	11.0	86.0	100.0
2018	36	18	50.0	23.7	12.0	86.1	100.0
2019	9	2	22.2	23.6	22.2	77.8	100.0
2020	9			23.5	22.2	66.7	100.0 ##
1998-2020	1090	596	54.7	23.5	8.8	90.1	98.5

1,090 cases diagnosed 1998-2020 are related to a total of 1,087 patients. Currently, in 353 (32.5 %) of these 1,087 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 282 / 51 / 20 (25.9 % / 4.7 % / 1.8 %) patients exist having 2 / 3 / 4+ malignancies.

\#   The increases of incident cases in 2002 and 2007 reflect the expansion to additional registry areas.

\## Please be aware that data of recent annual patient cohorts may not yet be fully processed. The years under evaluation can be retreived from the respective headings.

How to interpret:
In 2018, a subgroup of 36 cases has been diagnosed, of which 23.7 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 12.0 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1a

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

Year of diagnosis	Males n	Males %	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %	
1998	23	56.1	15	65.2	8.7	9.7	95.7	100.0	
1999	25	58.1	18	72.0	12.5	9.9	100.0	100.0	
2000	22	51.2	15	68.2	14.3	10.4	86.4	95.5	
2001	20	58.8	13	65.0	14.4	10.6	100.0	100.0	
2002	32	50.0	26	81.3	16.4	11.0	100.0	100.0	#
2003	25	56.8	14	56.0	17.0	11.3	96.0	100.0	
2004	26	48.1	20	76.9	19.7	11.1	96.2	96.2	
2005	34	64.2	20	58.8	20.8	11.2	91.2	100.0	
2006	21	55.3	9	42.9	19.3	11.4	90.5	95.2	
2007	28	65.1	14	50.0	19.9	11.2	85.7	92.9	#
2008	31	62.0	17	54.8	20.6	11.5	96.8	100.0	
2009	29	50.0	16	55.2	20.6	11.3	96.6	96.6	
2010	22	45.8	11	50.0	20.7	12.1	95.5	100.0	
2011	32	53.3	11	34.4	22.4	11.6	93.8	100.0	
2012	39	55.7	21	53.8	23.7	11.5	92.3	94.9	
2013	25	49.0	12	48.0	24.2	12.2	96.0	100.0	
2014	40	60.6	14	35.0	24.7	11.0	80.0	97.5	
2015	36	55.4	13	36.1	24.9	8.9	86.1	97.2	
2016	37	60.7	14	37.8	25.2	9.0	75.7	100.0	
2017	24	48.0	9	37.5	25.6	11.3	83.3	100.0	
2018	21	58.3	8	38.1	25.8	13.8	85.7	100.0	
2019	4	44.4	1	25.0	25.8	20.0	75.0	100.0	
2020	6	66.7			25.7	16.7	83.3	100.0	##
1998-2020	602	55.2	311	51.7	25.7	9.7	90.9	98.3	

602 cases diagnosed 1998-2020 are related to a total of 599 patients. Currently, in 212 (35.4 %) of these 599 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 164 / 36 / 12 (27.4 % / 6.0 % / 2.0 %) 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 2018, a subgroup of 21 cases has been diagnosed, of which 25.8 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 13.8 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

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                              Table 1b

                  Cases by year of diagnosis, proportions of
           DCO, further malignancies, deaths, and active follow-up (FEMALES)
                              (incl. DCO)
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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	43.9	11	61.1	16.7	7.6	100.0	100.0
1999	18	41.9	12	66.7	11.1	7.9	83.3	100.0
2000	21	48.8	18	85.7	15.8	7.7	95.2	100.0
2001	14	41.2	11	78.6	16.9	8.1	100.0	100.0
2002	32	50.0	27	84.4	19.4	8.1	96.9	100.0 #
2003	19	43.2	14	73.7	20.5	8.8	94.7	100.0
2004	28	51.9	19	67.9	20.0	8.7	92.9	100.0
2005	19	35.8	10	52.6	19.5	9.1	94.7	100.0
2006	17	44.7	14	82.4	18.8	9.0	94.1	100.0
2007	15	34.9	5	33.3	19.4	9.5	80.0	86.7 #
2008	19	38.0	13	68.4	18.2	10.0	78.9	100.0
2009	29	50.0	19	65.5	18.5	10.8	93.1	100.0
2010	26	54.2	10	38.5	18.9	12.1	76.9	96.2
2011	28	46.7	14	50.0	19.1	11.6	89.3	96.4
2012	31	44.3	15	48.4	19.8	11.1	83.9	96.8
2013	26	51.0	12	46.2	20.0	9.9	92.3	100.0
2014	26	39.4	11	42.3	20.7	9.6	92.3	100.0
2015	29	44.6	12	41.4	21.4	8.1	89.7	96.6
2016	24	39.3	12	50.0	20.7	8.5	79.2	100.0
2017	26	52.0	15	57.7	20.9	10.6	88.5	100.0
2018	15	41.7	10	66.7	21.0	9.5	86.7	100.0
2019	5	55.6	1	20.0	20.8	25.0	80.0	100.0
2020	3	33.3			20.7	33.3	33.3	100.0 ##
1998-2020	488	44.8	285	58.4	20.7	7.6	89.1	98.8

488 cases diagnosed 1998-2020 are related to a total of 488 patients. Currently, in 141 (28.9 %) of these 488 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 118 / 15 / 8 (24.2 % / 3.1 % / 1.6 %) patients exist having 2 / 3 / 4+ malignancies.

\#   The increases of incident cases in 2002 and 2007 reflect the expansion to additional registry areas.

\## Please be aware that data of recent annual patient cohorts may not yet be fully processed. The years under evaluation can be retreived from the respective headings.

How to interpret:
In 2018, a subgroup of 15 cases has been diagnosed, of which 21.0 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 9.5 % 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 4.94 m as of 2007, respectively)

Year of diagnosis	Males n	Females n	Males Inc. raw	Fem. Inc. raw	Males Inc. WS	Fem. Inc. WS	Males Inc. ES	Fem. Inc. ES	Males Inc. BRD-S	Fem. Inc. BRD-S
1998	23	18	2.1	1.5	1.2	0.6	1.9	1.0	2.5	1.3
1999	25	18	2.2	1.5	1.3	0.6	2.1	0.8	3.0	1.2
2000	22	21	1.9	1.7	1.2	0.6	1.8	1.0	2.6	1.4
2001	20	14	1.7	1.2	1.0	0.2	1.5	0.5	2.0	0.7
2002	32	32	1.7	1.6	0.8	0.6	1.4	0.8	2.1	1.2
2003	25	19	1.3	1.0	0.6	0.3	1.1	0.5	1.6	0.6
2004	26	28	1.4	1.4	0.6	0.6	1.1	0.8	1.7	1.1
2005	34	19	1.8	1.0	0.9	0.3	1.4	0.5	2.1	0.7
2006	21	17	1.1	0.8	0.7	0.3	0.9	0.4	1.2	0.6
2007	28	15	1.3	0.6	0.6	0.3	0.9	0.4	1.4	0.5
2008	31	19	1.4	0.8	0.7	0.3	1.1	0.5	1.5	0.6
2009	29	29	1.3	1.2	0.5	0.4	0.9	0.7	1.3	0.9
2010	22	26	1.0	1.1	0.4	0.5	0.7	0.7	0.9	0.9
2011	32	28	1.4	1.2	0.7	0.4	1.1	0.6	1.5	0.8
2012	39	31	1.7	1.3	0.6	0.5	1.1	0.7	1.7	1.0
2013	25	26	1.1	1.1	0.5	0.5	0.8	0.6	1.1	0.8
2014	40	26	1.7	1.1	0.6	0.3	1.0	0.5	1.6	0.7
2015	36	29	1.5	1.2	0.7	0.4	1.0	0.6	1.4	0.8
2016	37	24	1.5	1.0	0.7	0.5	1.0	0.6	1.4	0.7
2017	24	26	1.0	1.1	0.4	0.3	0.7	0.5	0.8	0.7
2018	21	15	0.9	0.6	0.3	0.1	0.5	0.2	0.8	0.3
2019	4	5	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
2020	6	3	0.2	0.1	0.1	0.0	0.2	0.0	0.2	0.1
1998−2020	602	488	1.3	1.0	0.6	0.4	0.9	0.5	1.3	0.7

The computation of the incidence measures includes all cancers, irrespective of first or subsequent malignancy.

Table 3

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	41	72.4	15.7	36.8	93.5	45.9	59.2	76.0	85.2	88.3
1999	43	73.1	15.4	22.0	95.6	50.8	63.9	76.3	84.0	90.8
2000	43	72.2	18.5	6.2	95.1	53.4	68.7	76.3	84.5	89.7
2001	34	76.2	13.9	30.9	95.5	57.2	68.1	80.6	86.8	90.7
2002	64	76.6	12.7	4.2	99.3	65.8	72.0	77.9	82.1	90.6
2003	44	78.7	10.4	58.0	95.1	63.1	69.7	80.5	87.5	91.3
2004	54	77.1	13.9	14.3	96.1	62.8	73.0	79.9	85.4	88.6
2005	53	75.4	17.4	3.5	98.2	53.0	72.9	79.5	85.2	90.2
2006	38	71.6	22.4	0.6	94.8	34.4	67.8	76.9	87.1	92.0
2007	43	72.3	13.8	33.7	89.9	46.3	69.2	77.0	81.2	85.1
2008	50	72.5	16.1	0.5	95.3	55.2	66.3	76.8	82.0	87.1
2009	58	76.1	12.0	36.7	93.8	59.8	69.4	78.5	84.1	88.7
2010	48	74.2	16.7	17.3	98.9	60.7	67.9	78.2	84.7	89.3
2011	60	75.4	15.8	16.9	94.9	54.3	67.4	80.1	85.6	89.8
2012	70	76.9	11.1	48.3	94.5	59.5	71.3	78.7	84.3	89.7
2013	51	73.0	19.0	0.4	95.2	58.1	66.6	78.4	86.1	89.4
2014	66	78.8	10.6	44.2	94.9	65.0	74.1	80.5	86.0	90.1
2015	65	73.7	15.1	13.3	94.9	54.7	68.8	76.2	83.6	87.7
2016	61	71.3	19.6	3.2	96.4	39.1	64.0	77.4	84.6	89.8
2017	50	76.4	13.4	20.2	99.2	65.1	70.5	77.4	85.1	91.7
2018	36	78.3	11.1	47.6	92.9	60.3	73.7	81.1	86.6	89.2
2019	9	75.8	14.7	42.4	90.2	42.4	76.1	77.7	83.7	90.2
2020	9	77.2	7.3	64.4	88.9	64.4	72.2	78.3	78.4	88.9
1998–2020	1090	75.0	15.1	0.4	99.3	57.3	69.2	78.2	84.9	89.6

Table 3a

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	23	73.1	14.5	41.7	90.1	56.6	59.2	78.3	86.4	88.3
1999	25	71.2	11.9	48.4	90.8	50.6	64.1	71.0	81.1	84.0
2000	22	69.6	22.5	6.2	90.6	36.3	59.4	76.9	84.5	89.7
2001	20	70.2	14.6	30.9	93.5	55.1	60.9	71.1	81.1	87.3
2002	32	75.8	8.2	58.5	98.3	67.4	71.6	75.0	81.0	84.4
2003	25	76.3	9.2	61.0	91.2	62.4	68.6	77.1	83.5	85.1
2004	26	79.9	9.4	52.3	96.1	72.2	74.5	79.7	87.5	92.2
2005	34	74.0	17.9	3.5	91.9	52.0	72.9	78.3	84.3	86.5
2006	21	65.7	21.9	9.6	93.4	34.4	58.9	68.1	79.3	90.4
2007	28	73.2	14.2	37.5	89.9	45.7	69.9	78.7	81.1	86.8
2008	31	72.2	16.2	0.5	89.0	59.0	66.3	77.1	81.9	83.4
2009	29	75.6	11.2	39.9	93.4	58.7	73.4	77.9	82.2	85.7
2010	22	77.8	10.2	61.2	98.9	65.9	68.7	78.2	86.7	89.0
2011	32	72.9	17.5	16.9	94.9	51.9	65.7	79.6	85.1	86.9
2012	39	78.0	9.1	54.0	94.3	64.2	73.4	79.4	83.9	89.3
2013	25	72.0	19.2	19.7	95.2	49.4	67.5	75.2	83.7	90.1
2014	40	78.6	10.2	44.2	94.9	66.3	74.3	79.1	85.4	90.3
2015	36	70.3	16.9	13.3	89.7	52.6	64.7	75.1	81.6	85.9
2016	37	73.7	13.7	28.1	93.2	58.5	65.9	77.4	83.9	86.4
2017	24	76.1	12.3	43.9	95.8	58.3	70.4	77.4	85.7	88.6
2018	21	76.1	9.9	47.6	89.5	67.1	72.0	77.3	82.8	87.1
2019	4	78.7	10.9	64.8	90.2	64.8	70.5	79.9	86.9	90.2
2020	6	75.6	8.3	64.4	88.9	64.4	71.3	75.3	78.4	88.9
1998-2020	602	74.2	14.3	0.5	98.9	57.9	68.6	77.3	83.7	88.1

Table 3b

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	18	71.4	17.4	36.8	93.5	45.3	57.0	75.7	84.7	89.4
1999	18	75.8	19.2	22.0	95.6	50.8	63.0	80.9	88.3	94.8
2000	21	75.1	13.0	35.1	95.1	64.9	70.7	76.3	83.0	87.7
2001	14	84.7	6.6	70.4	95.5	75.8	81.2	86.4	88.5	91.4
2002	32	77.4	16.1	4.2	99.3	65.7	75.3	80.7	84.8	90.9
2003	19	81.8	11.3	58.0	95.1	64.0	70.2	86.3	91.3	93.3
2004	28	74.5	16.9	14.3	95.4	48.1	69.1	79.9	84.9	88.4
2005	19	77.7	16.7	30.3	98.2	53.0	67.2	80.6	88.2	97.8
2006	17	78.8	21.4	0.6	94.8	71.4	76.9	82.7	89.2	93.2
2007	15	70.6	13.5	33.7	85.9	54.4	62.6	72.0	82.1	83.6
2008	19	72.9	16.5	36.5	95.3	48.7	56.9	76.5	86.9	94.8
2009	29	76.7	13.0	36.7	93.8	59.8	69.4	79.8	85.7	90.9
2010	26	71.3	20.4	17.3	98.7	31.3	63.4	77.9	82.4	89.3
2011	28	78.3	13.3	45.4	94.5	57.3	71.1	82.7	87.3	93.8
2012	31	75.5	13.2	48.3	94.5	54.5	67.7	77.4	86.7	89.9
2013	26	74.0	19.1	0.4	92.4	58.8	64.2	81.3	86.1	87.3
2014	26	79.0	11.4	49.7	93.2	64.5	74.1	81.2	87.8	90.1
2015	29	78.0	11.4	36.6	94.9	66.2	74.1	79.6	84.5	90.6
2016	24	67.7	26.2	3.2	96.4	32.4	50.4	77.1	86.9	94.3
2017	26	76.6	14.6	20.2	99.2	65.9	70.5	77.4	83.0	92.8
2018	15	81.5	12.3	49.4	92.9	57.3	77.6	86.0	89.0	89.3
2019	5	73.5	18.0	42.4	89.3	42.4	77.5	77.7	80.5	89.3
2020	3	80.4	3.9	78.0	84.9	78.0	78.0	78.3	84.9	84.9
1998-2020	488	76.0	16.1	0.4	99.3	56.5	69.9	79.9	86.5	91.0

Table 4

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

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	3	0.4	0.4	1	0.3	0.3	2	0.7	0.7
5-9	0	0.0	0.4			0.3			0.7
10-14	1	0.1	0.6	1	0.3	0.5			0.7
15-19	4	0.6	1.2	2	0.5	1.1	2	0.7	1.3
20-24	4	0.6	1.8	2	0.5	1.6	2	0.7	2.0
25-29	1	0.1	1.9	1	0.3	1.9			2.0
30-34	4	0.6	2.5	1	0.3	2.1	3	1.0	3.0
35-39	9	1.3	3.8	4	1.1	3.2	5	1.7	4.6
40-44	6	0.9	4.7	4	1.1	4.3	2	0.7	5.3
45-49	13	1.9	6.7	5	1.3	5.6	8	2.6	7.9
50-54	13	1.9	8.6	8	2.1	7.8	5	1.7	9.6
55-59	25	3.7	12.3	12	3.2	11.0	13	4.3	13.9
60-64	37	5.5	17.8	20	5.3	16.3	17	5.6	19.5
65-69	61	9.0	26.8	37	9.9	26.2	24	7.9	27.5
70-74	78	11.5	38.3	52	13.9	40.1	26	8.6	36.1
75-79	124	18.3	56.7	74	19.8	59.9	50	16.6	52.6
80-84	128	18.9	75.6	77	20.6	80.5	51	16.9	69.5
85+	165	24.4	100.0	73	19.5	100.0	92	30.5	100.0
All ages	676	100.0		374	100.0		302	100.0	

Table 5

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

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males DCO rate n=161 %	Females DCO rate n=149 %	Males Prop.all cancers n=153686 %	Females Prop.all cancers n=155051 %
0- 4	1	2	0.1	0.1		50.0	0.5	1.2
5- 9								
10-14	1		0.1				0.7	
15-19	2	2	0.1	0.1			0.6	0.8
20-24	2	2	0.1	0.1	50.0		0.3	0.4
25-29	1		0.0				0.1	
30-34	1	3	0.0	0.1	100.0		0.1	0.1
35-39	4	5	0.2	0.2		20.0	0.2	0.1
40-44	4	2	0.2	0.1			0.1	0.0
45-49	5	8	0.2	0.3	20.0	12.5	0.1	0.1
50-54	8	5	0.3	0.2			0.1	0.0
55-59	12	13	0.6	0.6	16.7	15.4	0.1	0.1
60-64	20	17	1.1	0.9	5.0	5.9	0.1	0.1
65-69	37	24	2.3	1.3	24.3	25.0	0.2	0.1
70-74	52	26	3.5	1.5	26.9	26.9	0.2	0.1
75-79	74	50	6.1	3.3	39.2	34.0	0.3	0.3
80-84	77	51	10.6	4.8	62.3	64.7	0.5	0.3
85+	73	92	15.6	8.8	75.3	87.0	0.7	0.6
All ages	374	302			43.0	49.3	0.2	0.2
Incidence								
Raw			1.1	0.9				
WS			0.5	0.3				
ES			0.8	0.5				
BRD-S			1.1	0.6				

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).

ICD-10 C93-C95: Other leukaemias
Age distribution and age-specific incidence 2007 - 2020 (Males: 374, Females: 302)

Figure 6. Age distribution (males: mean=74.8 yrs, median=78.0 yrs; females: mean=75.3 yrs, median=78.7 yrs) and age-specific incidence.

ICD-10 C93-C95: Other leukaemias
Age-specific incidence rates: international comparison

Region	Period	Population
MCR	2007-2020	4.9 m
SEER	2007-2018	86.7 m
FRG (RKI estimates)	2007-2017	82.8 m

MALES   FEMALES   Age at diagnosis (years)

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

Reference:

Estimated age-specific patient population of Germany, latest update: 16 March 2021. German Centre for Cancer Registry Data, Robert Koch Institute (RKI), based on data of the population based cancer registries. http://www.krebsdaten.de. Last access: 08/17/2021
Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 21 Regs Research Data, released April 2021, based on the November 2020 submission. http://www.seer.cancer.gov.

Table 7a

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

MALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C03-C06 Oral cavity	1	0.1	11.6	0.3	64.4	12.8	100.0
C09-C10 Oropharynx	1	0.1	9.8	0.2	54.5	12.5	
C16 Stomach	1	0.5	2.1	0.1	11.5	7.2	
C18 Colon	3	1.2	2.5	0.5	7.4	25.4	
C19-C20 Rectum	1	0.6	1.6	0.0	9.0	5.3	
C22 Liver	1	0.3	2.9	0.1	16.0	9.1	
C25 Pancreas	2	0.5	4.2	0.5	15.1	21.2	
C33-C34 Lung	1	1.4	0.7	0.0	4.0	-5.3	100.0
C43 Malign. melanoma	1	0.5	1.9	0.0	10.5	6.6	
C61 Prostate	6	3.4	1.8	0.7	3.9	36.9	33.3
C64 Kidney	3	0.4	7.6	1.6	22.2 #	36.4	
C76-C79 CUP	2	0.2	9.8	1.2	35.4 #	25.1	
C82-C85 NHL	8	0.5	15.8	6.8	31.1 #	104.6	
C90 Mult. myeloma	1	0.2	6.3	0.2	35.4	11.8	
C91-C96 Leukaemia	23	0.2	121.3	76.9	182.0 #	318.6	13.0
Not observed	0	2.0	0.0	0.0	1.9	-27.7	
All further malignancies	55	12.0	4.6	3.5	6.0 #	600.5	12.7

Patients	358
Median age at next malignancy (years)	74.3
Person-years	716
Mean observation time (years)	2.0
Median observation time (years)	0.9

The occurrence of further specified malignancy is statistically significant.
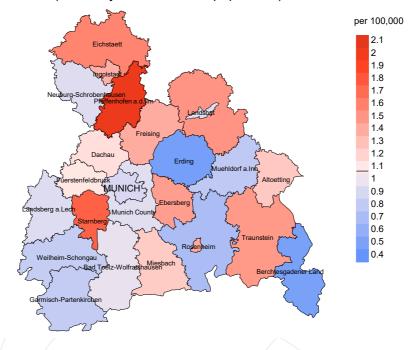
Table 7b

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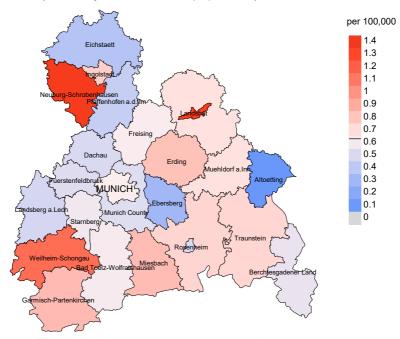for period 1998-2020

FEMALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C18	Colon	6	0.5	11.1	4.1	24.2	#	111.3	16.7
C22	Liver	1	0.1	14.3	0.4	79.6		19.0	100.0
C33-C34	Lung	1	0.4	2.4	0.1	13.2		11.8	
C50	Breast	9	1.6	5.7	2.6	10.8	#	151.3	
C51	Vulva	1	0.1	16.6	0.4	92.5		19.2	
C54	Corpus uteri	1	0.3	3.4	0.1	18.8		14.4	
C64	Kidney	1	0.1	7.7	0.2	42.8		17.7	100.0
C82-C85	NHL	2	0.2	9.2	1.1	33.3	#	36.4	
C91-C96	Leukaemia	12	0.1	141.5	73.1	247.1	#	243.0	8.3
Not observed		0	2.0	0.0	0.0	1.8		-41.4	
All further malignancies		34	5.4	6.3	4.3	8.8	#	582.6	11.8

Patients	259
Median age at next malignancy (years)	75.3
Person-years	490
Mean observation time (years)	1.9
Median observation time (years)	0.5

The occurrence of further specified malignancy is statistically significant.

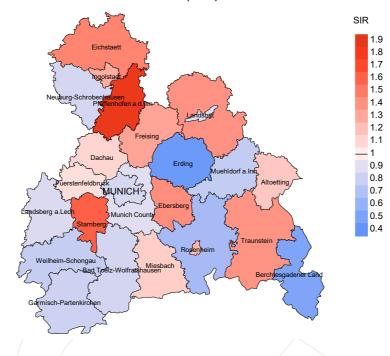Average incidence (Germany 1987 standard population) 2007 - 2020: Males

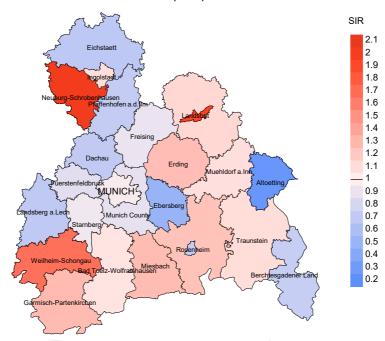Average incidence (Germany 1987 standard population) 2007 - 2020: Females

Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 1.1/100,000 WS N=374, females 0.6/100,000 WS N=302).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,727 female residents (averaged) in the period from 2007 to 2020 a total of 4 women were identified with newly diagnosed other leukaemias. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 0.3/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.0 and 1.0/100,000.

Standardized incidence ratio (SIR) 2007 - 2020: Males

Standardized incidence ratio (SIR) 2007 - 2020: Females

Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=374, females N=302).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2020 a total of 4 women were identified with newly diagnosed other leukaemias. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.50. Though, the value of this parameter may vary with an underlying probability of 99% between 0.08 and 1.57, and is therefore not statistically striking.

MORTALITY

Table 9a

Annual cohorts: Incident cancers, follow-up status,
proportion of DCO, deaths among the annual cohorts
and proportion of available death certificates
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.94 m as of 2007, respectively)

Year of diagnosis	Incident cases n	Prop. actively followed %	Prop. DCO %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	41	100.0	63.4	40	97.6	97.5
1999	43	100.0	69.8	40	93.0	97.5
2000	43	97.7	76.7	39	90.7	100.0
2001	34	100.0	70.6	34	100.0	97.1
2002	64	100.0	82.8	63	98.4	98.4
2003	44	100.0	63.6	42	95.5	95.2
2004	54	98.1	72.2	51	94.4	100.0
2005	53	100.0	56.6	49	92.5	98.0
2006	38	97.4	60.5	35	92.1	97.1
2007	43	90.7	44.2	36	83.7	100.0
2008	50	100.0	60.0	45	90.0	97.8
2009	58	98.3	60.3	55	94.8	100.0
2010	48	97.9	43.8	41	85.4	100.0
2011	60	98.3	41.7	55	91.7	100.0
2012	70	95.7	51.4	62	88.6	98.4
2013	51	100.0	47.1	48	94.1	95.8
2014	66	98.5	37.9	56	84.8	96.4
2015	65	96.9	38.5	57	87.7	89.5
2016	61	100.0	42.6	47	77.0	93.6
2017	50	100.0	48.0	43	86.0	88.4
2018	36	100.0	50.0	31	86.1	87.1
2019	9	100.0	22.2	7	77.8	85.7
2020	9	100.0		6	66.7	100.0
1998–2020	1090	98.5	54.7	982	90.1	96.6

Table 9b

Annual cohorts of incident cancers and deaths, proportion of death certificates
and cases deceased within the same year of being diagnosed with cancer
(incl. DCO)
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.94 m as of 2007, respectively)

Year of diagnosis/ death	Incident cases n	Deaths n	Prop. deaths with death certific. %	Deaths in same year n	Prop. deaths in same year %
1998	41	35	97.1	31	75.6
1999	43	39	100.0	32	74.4
2000	43	46	97.8	33	76.7
2001	34	29	100.0	22	64.7
2002	64	54	98.1	53	82.8
2003	44	27	96.3	31	70.5
2004	54	34	100.0	42	77.8
2005	53	27	100.0	33	62.3
2006	38	27	100.0	22	57.9
2007	43	29	100.0	22	51.2
2008	50	23	95.7	27	54.0
2009	58	44	97.7	42	72.4
2010	48	29	93.1	24	50.0
2011	60	40	100.0	38	63.3
2012	70	40	97.5	39	55.7
2013	51	42	100.0	31	60.8
2014	66	37	100.0	32	48.5
2015	65	40	100.0	38	58.5
2016	61	36	100.0	32	52.5
2017	50	34	97.1	30	60.0
2018	36	37	67.6	21	58.3
2019	9	19	47.4	3	33.3
2020	9	19	100.0	3	33.3
1998–2020	1090	787	95.9	681	62.5

Table 9c

Annual cohorts of deaths, proportion of cancer-related and non-cancer-
related deaths, and cancer recorded on death certificates
(incl. DCO)
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.94 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. non-cancer-related %	Prop. cancer recorded on death certificate %
1998	35	54.3	45.7	97.1
1999	39	61.5	38.5	100.0
2000	46	69.6	30.4	97.8
2001	29	62.1	37.9	100.0
2002	54	68.5	31.5	98.1
2003	27	66.7	33.3	96.2
2004	34	76.5	23.5	97.1
2005	27	70.4	29.6	96.3
2006	27	85.2	14.8	100.0
2007	29	89.7	10.3	100.0
2008	23	78.3	21.7	95.5
2009	44	81.8	18.2	88.4
2010	29	72.4	27.6	96.3
2011	40	90.0	10.0	97.5
2012	40	75.0	25.0	87.2
2013	42	78.6	21.4	85.7
2014	37	81.1	18.9	91.9
2015	40	72.5	27.5	92.5
2016	36	80.6	19.4	91.7
2017	34	79.4	20.6	87.9
2018	37	67.6	32.4	84.0
2019	19	47.4	52.6	77.8
2020	19	78.9	21.1	100.0
1998-2020	787	73.7	26.3	94.2
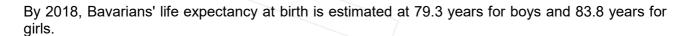
Table 10a

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	78.6	69.7	78.9	78.9
1999	23	72.5	71.8	74.2	72.5
2000	24	76.6	75.4	82.3	76.8
2001	18	74.2	68.5	81.6	74.2
2002	26	75.4	75.1	76.2	75.7
2003	13	75.1	74.9	85.1	75.1
2004	17	83.1	82.9	92.2	83.1
2005	15	78.8	78.6	80.2	79.1
2006	13	79.3	79.3	76.0	79.3
2007	19	78.2	77.9	82.5	78.2
2008	17	74.2	73.8	78.5	76.2
2009	20	78.9	78.9	81.0	80.1
2010	19	78.7	73.2	81.3	78.7
2011	24	74.4	74.4		74.4
2012	27	79.8	77.9	82.0	77.9
2013	22	79.2	78.6	81.7	79.2
2014	14	78.1	79.1	74.9	79.1
2015	22	79.1	79.7	77.1	79.1
2016	18	77.1	77.1	76.2	76.5
2017	14	84.0	84.3	67.4	79.1
2018	22	78.1	77.2	78.4	77.2
2019	14	73.6	68.8	76.9	68.8
2020	13	78.5	78.2	86.8	78.5
1998−2020	432	77.9	76.8	79.3	78.0

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	17	82.9	76.8	85.0	82.9
1999	16	85.1	80.6	88.6	85.1
2000	22	76.7	75.6	86.1	77.1
2001	11	85.9	82.1	88.7	85.9
2002	28	80.9	80.6	81.5	80.7
2003	14	87.5	75.8	89.3	87.5
2004	17	84.3	84.9	82.4	84.9
2005	12	85.8	86.7	84.5	85.8
2006	14	84.6	86.3	82.3	84.6
2007	10	75.2	73.3	79.6	75.2
2008	6	75.8	73.0	78.7	78.7
2009	24	83.2	82.2	91.7	83.1
2010	10	80.4	80.4	79.2	81.8
2011	16	74.9	74.9	78.4	73.9
2012	13	82.0	82.8	76.3	84.4
2013	20	83.6	83.6	83.3	83.6
2014	23	79.1	79.2	79.1	79.4
2015	18	77.5	75.6	84.5	83.9
2016	18	79.2	74.6	87.6	75.5
2017	20	80.1	76.9	84.2	82.5
2018	15	81.3	80.2	84.6	80.7
2019	5	76.2	77.7	76.0	77.7
2020	6	79.7	81.2	78.6	79.7
1998–2020	355	81.1	79.7	83.8	81.5

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	11	1.0	0.48	0.6	0.50	0.9	0.48	1.2	0.46
1999	14	1.3	0.56	0.7	0.56	1.2	0.57	1.7	0.55
2000	17	1.5	0.77	0.8	0.66	1.4	0.75	1.9	0.73
2001	11	0.9	0.55	0.6	0.56	0.9	0.55	1.1	0.54
2002	19	1.0	0.61	0.5	0.62	0.9	0.64	1.3	0.62
2003	10	0.5	0.40	0.3	0.45	0.5	0.44	0.6	0.38
2004	14	0.7	0.54	0.3	0.48	0.6	0.50	1.0	0.55
2005	9	0.5	0.26	0.2	0.25	0.4	0.27	0.5	0.26
2006	12	0.6	0.57	0.3	0.40	0.5	0.52	0.7	0.60
2007	18	0.8	0.64	0.4	0.65	0.6	0.65	0.9	0.69
2008	15	0.7	0.48	0.3	0.41	0.5	0.44	0.7	0.44
2009	14	0.6	0.48	0.3	0.52	0.4	0.50	0.7	0.50
2010	13	0.6	0.59	0.3	0.72	0.4	0.60	0.5	0.57
2011	24	1.1	0.75	0.6	0.82	0.8	0.76	1.1	0.75
2012	22	1.0	0.56	0.4	0.57	0.6	0.56	0.9	0.55
2013	15	0.7	0.60	0.3	0.51	0.4	0.54	0.7	0.61
2014	12	0.5	0.30	0.2	0.29	0.3	0.29	0.5	0.30
2015	18	0.8	0.50	0.3	0.39	0.5	0.44	0.7	0.51
2016	16	0.7	0.43	0.3	0.39	0.4	0.41	0.6	0.43
2017	13	0.5	0.54	0.2	0.44	0.3	0.49	0.4	0.53
2018	14	0.6	0.67	0.2	0.75	0.4	0.72	0.5	0.67
2019	6	0.2	1.50	0.1	2.39	0.2	1.99	0.2	1.64
2020	11	0.5	1.83	0.2	1.77	0.3	1.73	0.4	1.83
1998-2020	328	0.7	0.55	0.3	0.53	0.5	0.54	0.7	0.55

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	8	0.7	0.44	0.2	0.35	0.4	0.39	0.6	0.43
1999	10	0.8	0.56	0.3	0.62	0.5	0.59	0.6	0.56
2000	15	1.2	0.71	0.5	0.78	0.8	0.76	1.0	0.75
2001	7	0.6	0.50	0.1	0.48	0.2	0.50	0.4	0.55
2002	18	0.9	0.56	0.3	0.52	0.5	0.55	0.7	0.57
2003	8	0.4	0.42	0.2	0.53	0.2	0.50	0.3	0.47
2004	12	0.6	0.43	0.1	0.25	0.3	0.33	0.4	0.38
2005	10	0.5	0.53	0.1	0.46	0.2	0.48	0.3	0.44
2006	11	0.5	0.65	0.1	0.44	0.2	0.56	0.3	0.58
2007	8	0.3	0.53	0.1	0.47	0.2	0.49	0.3	0.49
2008	3	0.1	0.16	0.1	0.17	0.1	0.17	0.1	0.15
2009	22	0.9	0.76	0.3	0.65	0.5	0.68	0.7	0.75
2010	8	0.3	0.31	0.1	0.19	0.2	0.25	0.2	0.27
2011	12	0.5	0.43	0.2	0.58	0.3	0.56	0.4	0.53
2012	8	0.3	0.26	0.1	0.19	0.1	0.21	0.2	0.24
2013	18	0.8	0.69	0.2	0.47	0.4	0.58	0.5	0.66
2014	18	0.7	0.69	0.2	0.70	0.4	0.70	0.5	0.76
2015	11	0.5	0.38	0.1	0.40	0.2	0.40	0.3	0.37
2016	13	0.5	0.54	0.2	0.38	0.3	0.47	0.4	0.52
2017	14	0.6	0.54	0.2	0.56	0.3	0.57	0.4	0.53
2018	11	0.4	0.73	0.1	0.86	0.2	0.79	0.3	0.95
2019	3	0.1	0.60	0.1	1.09	0.1	0.78	0.1	0.85
2020	4	0.2	1.33	0.1	2.46	0.1	1.99	0.1	1.20
1998-2020	252	0.5	0.52	0.2	0.46	0.3	0.50	0.4	0.51

Table 12

Age distribution of age at death (cancer–related) for period 2007–2020
(**incl. multiple malignancies**)

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0–4									
5–9									
10–14									
15–19	2	0.5	0.5	2	0.9	0.9			0.0
20–24	3	0.8	1.4	2	0.9	1.9	1	0.7	0.7
25–29	1	0.3	1.6	1	0.5	2.4			0.7
30–34	1	0.3	1.9	1	0.5	2.8			0.7
35–39	2	0.5	2.5	1	0.5	3.3	1	0.7	1.3
40–44	4	1.1	3.6	4	1.9	5.2			1.3
45–49	4	1.1	4.7	1	0.5	5.7	3	2.0	3.3
50–54	6	1.6	6.3	3	1.4	7.1	3	2.0	5.2
55–59	11	3.0	9.3	2	0.9	8.1	9	5.9	11.1
60–64	23	6.3	15.7	16	7.6	15.6	7	4.6	15.7
65–69	35	9.6	25.3	20	9.5	25.1	15	9.8	25.5
70–74	48	13.2	38.5	32	15.2	40.3	16	10.5	35.9
75–79	71	19.5	58.0	43	20.4	60.7	28	18.3	54.2
80–84	79	21.7	79.7	47	22.3	82.9	32	20.9	75.2
85+	74	20.3	100.0	36	17.1	100.0	38	24.8	100.0
All ages	364	100.0		211	100.0		153	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**incl. multiple malignancies**)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19	2		0.1	1.00			4.2	
20-24	2	1	0.1	1.00	0.1	0.50	2.7	2.3
25-29	1		0.0	1.00			1.1	
30-34	1		0.0	1.00			0.7	
35-39	1	1	0.0	0.25	0.0	0.20	0.4	0.2
40-44	4		0.2	1.00			0.7	
45-49	1	3	0.0	0.20	0.1	0.38	0.1	0.2
50-54	3	3	0.1	0.38	0.1	0.60	0.1	0.1
55-59	2	9	0.1	0.17	0.4	0.69	0.0	0.2
60-64	16	7	0.9	0.80	0.4	0.41	0.2	0.1
65-69	20	15	1.2	0.54	0.8	0.63	0.2	0.2
70-74	32	16	2.1	0.62	0.9	0.62	0.3	0.2
75-79	43	28	3.6	0.58	1.9	0.56	0.3	0.3
80-84	47	32	6.5	0.61	3.0	0.63	0.4	0.3
85+	36	38	7.7	0.49	3.6	0.41	0.4	0.3
All ages	211	153					0.3	0.2
Mortality								
Raw			0.6	0.56	0.5	0.51		
WS			0.3	0.56	0.1	0.46		
ES			0.4	0.56	0.2	0.49		
BRD-S			0.6	0.57	0.3	0.51		
PYLL-70								
per 100,000			2.4		1.4			
ES			2.3		1.2			
AYLL-70			13.1		10.3			

Table 14a

Further malignancies in deaths in period 1998-2020
MALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C03-C06 Oral cavity	2	1.5	1	50.0			1	50.0
C07-C08 Salivary gland	1	0.7	1	100.0				
C09-C10 Oropharynx	1	0.7					1	100.0
C15 Oesophagus	1	0.7	1	100.0				
C16 Stomach	3	2.2	3	100.0				
C18 Colon	10	7.4	8	80.0	1	10.0	1	10.0
C19-C20 Rectum	6	4.4	2	33.3			4	66.7
C22 Liver	1	0.7					1	100.0
C23-C24 Bile	1	0.7	1	100.0				
C25 Pancreas	1	0.7					1	100.0
C32 Larynx	1	0.7	1	100.0				
C33-C34 Lung	7	5.2	4	57.1	1	14.3	2	28.6
C43 Malign. melanoma	4	3.0	3	75.0	1	25.0		
C44 Skin others	13	9.6	7	53.8	2	15.4	4	30.8
C46,C49 Soft tissue	2	1.5	2	100.0				
C61 Prostate	24	17.8	18	75.0	3	12.5	3	12.5
C64 Kidney	8	5.9	4	50.0	1	12.5	3	37.5
C67 Bladder	1	0.7	1	100.0				
C76-C79 CUP	2	1.5			1	50.0	1	50.0
C82-C85 NHL	6	4.4	1	16.7	2	33.3	3	50.0
C90 Mult. myeloma	1	0.7	1	100.0				
C91-C96 Leukaemia	38	28.1			11	28.9	27	71.1
C96 Systemic	1	0.7					1	100.0
All further malignancies	135	100.0	59	43.7	23	17.0	53	39.3

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 1998-2020
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C00	Lip	1	1.1					1	100.0
C17	Small intestine	1	1.1					1	100.0
C18	Colon	13	13.7	8	61.5	2	15.4	3	23.1
C19-C20	Rectum	3	3.2	2	66.7			1	33.3
C21	Anus/canal	1	1.1	1	100.0				
C22	Liver	1	1.1					1	100.0
C23-C24	Bile	1	1.1	1	100.0				
C25	Pancreas	2	2.1	1	50.0	1	50.0		
C33-C34	Lung	3	3.2			1	33.3	2	66.7
C43	Malign. melanoma	4	4.2	4	100.0				
C44	Skin others	1	1.1	1	100.0				
C50	Breast	22	23.2	13	59.1	2	9.1	7	31.8
C52	Vagina	2	2.1	2	100.0				
C54	Corpus uteri	7	7.4	4	57.1			3	42.9
C55,C57	Fem. genitals un	1	1.1			1	100.0		
C56	Ovary	1	1.1			1	100.0		
C64	Kidney	1	1.1					1	100.0
C67	Bladder	2	2.1	1	50.0			1	50.0
C70-C72	CNS cancer	1	1.1	1	100.0				
C73	Thyroid	3	3.2	3	100.0				
C82-C85	NHL	5	5.3	3	60.0			2	40.0
C91-C96	Leukaemia	19	20.0			4	21.1	15	78.9
All further malignancies		95	100.0	45	47.4	12	12.6	38	40.0

ICD-10 C44 (Other malignant neoplasms of skin) is not systematically recorded by MCR and therefore not considered for evaluation as a particular primary but at least as a further malignancy.

Table 15

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**First primaries only** *)
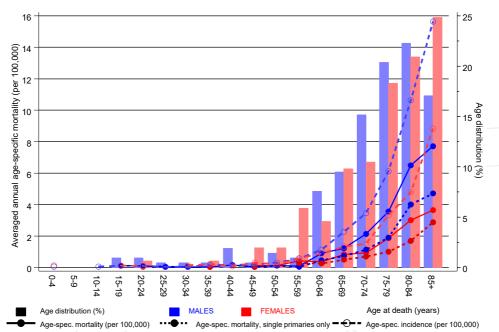
Age at death Years	Males n	Females n	Males Age- spec. mortal.	MI-index	Females Age- spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19	2		0.1	1.00			4.3	
20-24	2	1	0.1	1.00	0.1	0.50	3.0	2.4
25-29	1		0.0	1.00			1.2	
30-34	1		0.0	1.00			0.7	
35-39	1	1	0.0	0.25	0.0	0.25	0.4	0.3
40-44	4		0.2	1.00			0.7	
45-49	1	2	0.0	0.20	0.1	0.33	0.1	0.1
50-54	3	3	0.1	0.50	0.1	0.60	0.1	0.1
55-59	1	8	0.0	0.10	0.4	0.67	0.0	0.3
60-64	12	5	0.7	0.80	0.3	0.38	0.2	0.1
65-69	19	11	1.2	0.58	0.6	0.69	0.3	0.2
70-74	26	13	1.7	0.70	0.8	0.68	0.3	0.2
75-79	28	20	2.3	0.67	1.3	0.57	0.3	0.3
80-84	32	23	4.4	0.68	2.2	0.62	0.4	0.3
85+	24	33	5.1	0.53	3.2	0.47	0.4	0.4
All ages	157	120					0.3	0.2
Mortality								
Raw			0.5	0.61	0.4	0.53		
WS			0.2	0.60	0.1	0.46		
ES			0.3	0.60	0.2	0.50		
BRD-S			0.5	0.62	0.3	0.52		
PYLL-70								
per 100,000			2.3		1.2			
ES			2.2		1.1			
AYLL-70			13.8		11.0			

* See corresponding tables with multiple malignancies.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**Single primaries only** *)

Age at death Years	Males n	Females n	Males Age- spec. mortal.	MI-index	Females Age- spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19	2		0.1	1.00			4.3	
20-24	2		0.1	1.00			3.0	
25-29	1		0.0	1.00			1.2	
30-34	1		0.0	1.00			0.7	
35-39		1			0.0	0.25		0.3
40-44	4		0.2	1.00			0.7	
45-49	1	1	0.0	0.20	0.0	0.20	0.1	0.1
50-54	3		0.1	0.50			0.1	
55-59	1	6	0.0	0.14	0.3	0.60	0.0	0.2
60-64	8	5	0.5	0.89	0.3	0.42	0.2	0.1
65-69	12	9	0.7	0.55	0.5	0.60	0.2	0.2
70-74	17	12	1.1	0.55	0.7	0.75	0.2	0.2
75-79	23	15	1.9	0.62	1.0	0.50	0.3	0.2
80-84	29	18	4.0	0.64	1.7	0.56	0.4	0.3
85+	22	30	4.7	0.50	2.9	0.43	0.4	0.3
All ages	126	97					0.2	0.2
Mortality								
Raw			0.4	0.57	0.3	0.47		
WS			0.2	0.56	0.1	0.39		
ES			0.3	0.56	0.1	0.43		
BRD-S			0.4	0.57	0.2	0.46		
PYLL-70								
per 100,000			2.0		0.7			
ES			1.9		0.6			
AYLL-70			16.2		8.6			

* See corresponding tables with multiple malignancies.

ICD-10 C93-C95: Other leukaemias
Age distribution and age-specific mortality 2007 - 2020 (Males: 211, Females: 153)
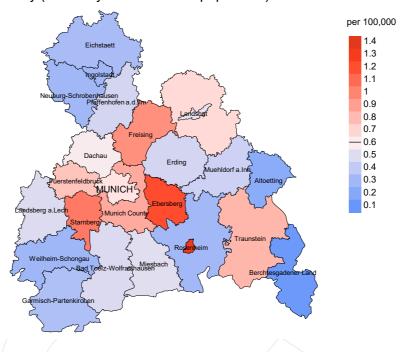
Figure 17. Distribution of age at death (bars; males: mean=72.5 yrs, median=75.4 yrs; females: mean=73.7 yrs, median=77.5 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).
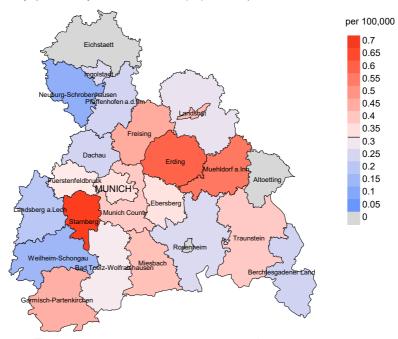
The difference between age at diagnosis (Table 3) and age at other leukaemias-related death (see Table 10) should be considered.

Average mortality (Germany 1987 standard population) 2007 - 2020: Males
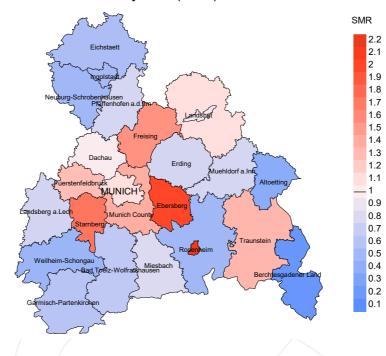
Average mortality (Germany 1987 standard population) 2007 - 2020: Females
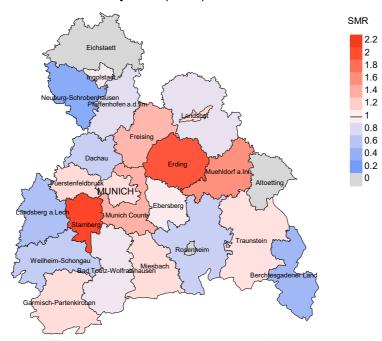
Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2020. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.6/100,000 WS N=211, females 0.3/100,000 WS N=153).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,727 female residents (averaged) in the period from 2007 to 2020 a total of 4 women died from other leukaemias. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.3/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.1 and 1.1/100,000.

Standardized mortality ratio (SMR) 2007 - 2020: Males

Standardized mortality ratio (SMR) 2007 - 2020: Females

Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=211, females N=153).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2020 a total of 4 women died from other leukaemias. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.98. Though, the value of this parameter may vary with an underlying probability of 99% between 0.17 and 3.09, 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 C93-C95: Other leukaemias - Incidence and Mortality [Internet]. 2021
[updated 2021 Dec 21; cited 2022 Feb 1]. Available from: https://www.tumorregister-
muenchen.de/en/facts/base/bC9395E-ICD-10-C93-C95-Other-leukaemias-incidence-and-mortality.pdf

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