

Munich Cancer Registry



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- ▶ *Deutsch*

ICD-10 C91-C95: Leukaemias

Incidence and Mortality

Year of diagnosis	1998-2016
Patients	10,227
Diseases	10,328
Creation date	08/21/2018
Export date	08/09/2018
Population	4.81 m



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

<https://www.tumorregister-muenchen.de/en/facts/base/bC9195E-ICD-10-C91-C95-Leukaemias-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, August 2018

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

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

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

Some remarks regarding this cancer type

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

ICD-10 codes (ICD-10 2015) used for specifying cancer site

Code	Description
C91.-	Lymphoid leukaemia
C92.-	Myeloid leukaemia
C93.-	Monocytic leukaemia
C94.-	Other leukaemias of specified cell type
C95.-	Leukaemia of unspecified cell type

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	306	91	29.7	11.4	10.3	83.0	97.4
1999	319	82	25.7	12.3	10.3	77.1	97.5
2000	337	97	28.8	12.4	10.3	74.8	97.0
2001	368	131	35.6	12.5	10.2	76.9	95.9
2002	564	196	34.8	13.0	10.2	78.4	94.3 #
2003	577	193	33.4	13.5	10.0	76.1	95.5
2004	622	195	31.4	14.3	9.9	70.4	92.6
2005	599	180	30.1	15.1	9.8	72.3	93.3
2006	613	176	28.7	16.2	9.4	74.6	91.4
2007	660	161	24.4	16.5	9.0	66.7	80.2 #
2008	656	168	25.6	17.3	8.7	64.3	77.7
2009	678	158	23.3	17.7	8.2	64.2	78.0
2010	699	157	22.5	18.4	7.7	64.9	77.3
2011	672	140	20.8	19.2	7.6	59.8	76.6
2012	721	174	24.1	19.8	7.1	62.8	76.4
2013	625	165	26.4	20.4	6.6	61.3	77.8
2014	581	168	28.9	20.9	5.8	61.1	82.8
2015	422	144	34.1	21.4	5.0	71.3	98.1
2016	309	134	43.4	21.7	4.6	64.7	89.3 ##
1998-2016	10328	2910	28.2	21.7	10.3	68.6	86.2

10,328 cases diagnosed 1998-2016 are related to a total of 10,227 patients. Currently, in 3,135 (30.7 %) of these 10,227 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 2,419 / 539 / 177 (23.7 % / 5.3 % / 1.7 %) 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 2014, a subgroup of 581 cases has been diagnosed, of which 20.9 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 5.8 % 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).

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	170	55.6	49	28.8	12.4	12.2	81.2	95.9
1999	174	54.5	43	24.7	12.5	12.2	81.0	98.3
2000	184	54.6	50	27.2	12.3	12.2	77.2	96.2
2001	199	54.1	61	30.7	12.0	12.0	75.4	95.5
2002	305	54.1	86	28.2	12.6	12.0	75.7	93.8 #
2003	320	55.5	89	27.8	13.2	11.8	74.7	93.8
2004	334	53.7	91	27.2	14.0	11.5	69.8	93.1
2005	346	57.8	95	27.5	15.2	11.3	73.1	93.4
2006	370	60.4	93	25.1	16.7	10.9	74.3	91.6
2007	371	56.2	77	20.8	16.9	10.4	64.7	78.2 #
2008	370	56.4	87	23.5	17.8	10.0	61.1	75.4
2009	362	53.4	76	21.0	18.2	9.4	61.3	77.1
2010	372	53.2	90	24.2	18.9	8.7	67.2	79.3
2011	370	55.1	65	17.6	19.7	8.4	59.2	76.5
2012	390	54.1	82	21.0	20.2	7.7	59.0	73.8
2013	362	57.9	93	25.7	21.0	7.2	59.9	77.9
2014	335	57.7	87	26.0	21.6	6.1	54.6	79.4
2015	225	53.3	71	31.6	21.9	4.9	70.2	98.7
2016	177	57.3	69	39.0	22.2	2.9	61.6	90.4 ##
1998-2016	5736	55.5	1454	25.3	22.2	12.2	67.2	85.5

5,736 cases diagnosed 1998-2016 are related to a total of 5,672 patients. Currently, in 1,844 (32.5 %) of these 5,672 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 1,388 / 333 / 123 (24.5 % / 5.9 % / 2.2 %) 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 2014, a subgroup of 335 cases has been diagnosed, of which 21.6 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 6.1 % 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	136	44.4	42	30.9	10.3	7.9	85.3	99.3
1999	145	45.5	39	26.9	12.1	8.0	72.4	96.6
2000	153	45.4	47	30.7	12.4	7.9	71.9	98.0
2001	169	45.9	70	41.4	13.1	7.9	78.7	96.4
2002	259	45.9	110	42.5	13.5	7.8	81.5	95.0 #
2003	257	44.5	104	40.5	13.9	7.8	77.8	97.7
2004	288	46.3	104	36.1	14.7	7.9	71.2	92.0
2005	253	42.2	85	33.6	15.0	7.8	71.1	93.3
2006	243	39.6	83	34.2	15.6	7.5	74.9	90.9
2007	289	43.8	84	29.1	15.9	7.2	69.2	82.7 #
2008	286	43.6	81	28.3	16.6	7.2	68.5	80.8
2009	316	46.6	82	25.9	17.0	6.9	67.4	79.1
2010	327	46.8	67	20.5	17.9	6.5	62.4	74.9
2011	302	44.9	75	24.8	18.6	6.6	60.6	76.8
2012	331	45.9	92	27.8	19.3	6.4	67.4	79.5
2013	263	42.1	72	27.4	19.5	5.8	63.1	77.6
2014	246	42.3	81	32.9	20.2	5.5	69.9	87.4
2015	197	46.7	73	37.1	20.8	5.2	72.6	97.5
2016	132	42.7	65	49.2	21.1	6.9	68.9	87.9 ##
1998-2016	4592	44.5	1456	31.7	21.1	7.9	70.4	87.0

4,592 cases diagnosed 1998-2016 are related to a total of 4,555 patients. Currently, in 1,291 (28.3 %) of these 4,555 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 1,031 / 206 / 54 (22.6 % / 4.5 % / 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 2014, a subgroup of 246 cases has been diagnosed, of which 20.2 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 5.5 % 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 4.81 m as of 2007, respectively)

Year of diagnosis	Males n	Females n	Males Inc. raw	Fem. Inc. raw	Males Inc. WS	Fem. Inc. WS	Males Inc. ES	Fem. Inc. ES	Males Inc. BRD-S	Fem. Inc. BRD-S
1998	170	136	15.3	11.6	10.4	6.3	14.3	8.2	17.7	9.9
1999	174	145	15.5	12.2	10.3	7.6	14.3	9.3	18.1	10.6
2000	184	153	16.2	12.7	11.8	7.4	15.3	9.4	18.7	11.0
2001	199	169	17.2	13.9	11.7	7.2	15.6	9.5	19.1	11.5
2002	305	259	16.4	13.2	10.9	6.4	14.4	8.7	17.9	10.8
2003	320	257	17.1	13.0	10.6	6.9	14.7	9.0	18.7	10.7
2004	334	288	17.8	14.6	11.4	7.9	15.1	10.2	18.6	12.1
2005	346	253	18.3	12.7	11.7	6.9	15.4	8.7	19.5	10.6
2006	370	243	19.3	12.1	12.3	6.0	16.2	7.7	20.0	9.7
2007	371	289	16.7	12.5	10.1	7.0	13.6	8.8	17.2	10.4
2008	370	286	16.6	12.3	10.8	6.3	13.5	8.2	16.5	10.0
2009	362	316	16.2	13.6	9.1	6.9	12.6	8.9	15.8	10.7
2010	372	327	16.5	14.0	9.7	7.0	13.0	9.0	16.3	11.0
2011	370	302	16.5	12.9	10.0	6.9	13.0	8.6	15.7	10.0
2012	390	331	17.2	14.0	9.7	7.9	12.8	9.7	16.5	11.2
2013	362	263	15.7	11.0	8.7	5.7	11.6	7.2	14.8	8.8
2014	335	246	14.4	10.2	7.1	4.3	10.2	5.9	13.1	7.7
2015	225	197	9.5	8.1	4.3	2.9	6.4	4.4	8.6	5.9
2016	177	132	7.4	5.4	3.4	2.0	5.0	2.9	6.7	3.7
1998-2016	5736	4592	15.6	12.0	9.3	6.1	12.5	7.9	15.6	9.6

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

Table 3

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

Year of diagnosis	Cases n	Std.		Median						
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	306	64.6	20.2	0.9	95.8	37.3	55.6	68.2	78.9	86.5
1999	319	63.8	20.4	0.3	104	39.1	56.2	68.3	77.2	85.1
2000	337	62.6	20.5	0.4	97.6	35.1	53.7	66.7	76.6	85.4
2001	368	65.0	19.5	1.4	96.4	38.5	57.2	67.6	78.3	86.5
2002	564	65.9	19.5	1.0	99.3	39.6	58.6	69.5	78.9	86.4
2003	577	66.1	19.8	0.3	98.9	41.4	57.5	70.2	80.3	86.3
2004	622	65.3	19.9	0.4	98.6	39.1	58.6	68.8	79.3	85.5
2005	599	65.3	21.5	0.0	98.2	34.4	58.2	71.3	79.5	85.0
2006	613	66.6	20.5	0.6	95.4	38.7	61.0	71.6	79.6	86.0
2007	660	65.2	20.2	0.3	99.8	39.1	57.1	69.9	79.4	85.1
2008	656	65.6	21.3	0.4	98.1	35.3	60.1	70.9	79.5	85.5
2009	678	67.1	18.9	1.3	100	42.2	58.4	71.3	80.4	86.7
2010	699	67.4	20.3	0.3	101	42.6	59.3	72.1	81.1	87.8
2011	672	65.8	21.1	0.3	101	40.6	56.7	70.9	80.1	86.6
2012	721	66.2	21.5	0.0	102	35.4	58.1	72.2	80.8	86.5
2013	625	67.5	20.5	0.0	100	37.3	60.9	72.9	81.4	87.2
2014	581	70.6	17.5	0.5	98.3	46.9	64.9	74.5	82.2	87.9
2015	422	72.7	15.0	1.8	96.6	51.7	65.8	76.1	82.6	88.5
2016	309	72.7	16.6	3.2	97.5	50.1	65.8	76.5	84.0	88.9
1998-2016	10328	66.6	20.1	0.0	104	40.2	59.0	71.5	80.2	86.6

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	170	63.2	20.4	0.9	95.8	37.2	55.0	65.6	76.7	86.4
1999	174	63.7	19.0	0.3	94.1	39.6	56.1	67.6	77.6	83.1
2000	184	61.4	21.0	0.4	97.6	32.8	53.0	66.7	75.2	83.8
2001	199	61.7	18.7	1.4	96.4	37.9	54.5	64.8	75.1	81.0
2002	305	62.7	20.2	1.0	98.3	32.3	55.5	67.6	75.8	82.2
2003	320	64.8	19.1	1.6	93.6	40.2	57.9	68.3	77.9	84.0
2004	334	64.1	20.1	0.4	96.1	37.2	58.6	67.4	77.5	84.6
2005	346	64.2	21.6	0.0	94.6	34.0	56.7	70.7	78.2	84.1
2006	370	64.6	20.3	1.0	95.4	36.7	58.9	69.8	77.3	84.1
2007	371	64.3	19.2	0.3	97.8	39.6	55.9	69.3	77.9	83.2
2008	370	63.6	22.0	0.4	98.1	27.3	58.7	69.9	77.7	83.3
2009	362	66.5	17.6	2.2	97.0	45.0	58.0	70.2	77.9	84.5
2010	372	66.5	20.0	0.3	101	43.0	59.3	71.5	79.6	86.4
2011	370	64.8	20.4	2.5	101	41.0	56.4	69.6	78.0	85.0
2012	390	66.5	20.7	2.4	95.2	35.4	60.7	72.1	80.5	84.8
2013	362	67.2	19.8	0.5	100	38.5	60.9	72.3	78.8	86.1
2014	335	70.0	17.6	0.5	95.9	46.9	64.5	74.1	82.1	86.4
2015	225	71.7	15.3	1.8	96.6	51.5	65.6	75.5	81.6	86.6
2016	177	71.7	15.9	17.5	97.5	50.1	65.9	75.0	82.5	87.3
1998-2016	5736	65.5	19.8	0.0	101	39.4	58.1	70.3	78.6	84.9

Table 3b

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min. Max.		10% 25%		Median		
				Min.	Max.	10%	25%	50%	75%	90%
1998	136	66.3	19.8	1.3	93.9	38.4	57.6	71.4	81.4	86.7
1999	145	64.0	22.2	1.5	104	39.0	56.3	69.5	77.1	87.2
2000	153	64.0	19.9	2.1	95.1	36.3	54.5	68.1	77.3	86.1
2001	169	68.9	19.8	2.8	95.5	49.8	61.5	72.4	81.9	88.6
2002	259	69.8	17.8	2.9	99.3	46.9	61.5	73.2	82.6	89.0
2003	257	67.8	20.7	0.3	98.9	42.5	57.5	73.6	81.8	88.9
2004	288	66.8	19.7	0.7	98.6	41.0	58.5	69.9	80.8	86.9
2005	253	66.8	21.4	0.6	98.2	37.0	60.7	73.5	80.7	85.8
2006	243	69.6	20.4	0.6	95.1	43.5	64.7	74.8	82.6	88.4
2007	289	66.3	21.4	1.0	99.8	37.6	59.8	71.4	81.1	86.5
2008	286	68.2	20.0	1.4	97.4	41.4	61.0	72.6	82.0	87.3
2009	316	67.9	20.4	1.3	100	40.3	58.9	72.4	82.9	88.3
2010	327	68.4	20.6	0.8	98.7	42.5	59.2	73.1	82.7	88.9
2011	302	67.0	22.0	0.3	96.7	40.1	57.2	72.9	82.2	88.5
2012	331	65.8	22.4	0.0	102	34.4	56.6	72.2	81.2	87.6
2013	263	67.9	21.3	0.0	97.9	36.7	60.8	74.3	83.2	88.0
2014	246	71.2	17.4	2.7	98.3	45.6	65.6	75.0	83.0	89.6
2015	197	73.8	14.7	28.7	95.9	52.0	65.8	76.8	83.8	89.5
2016	132	74.0	17.5	3.2	96.0	50.1	64.7	79.0	86.1	90.4
1998-2016	4592	68.0	20.3	0.0	104	41.1	59.7	73.2	82.2	88.3

Table 4

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

Age at diagnosis Years	Cases n	Males			Females				
		%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4	114	1.9	1.9	64	1.9	1.9	50	1.9	1.9
5-9	70	1.2	3.1	37	1.1	3.0	33	1.2	3.1
10-14	53	0.9	3.9	29	0.9	3.9	24	0.9	4.0
15-19	59	1.0	4.9	39	1.2	5.1	20	0.7	4.7
20-24	51	0.8	5.8	29	0.9	5.9	22	0.8	5.5
25-29	53	0.9	6.6	28	0.8	6.8	25	0.9	6.5
30-34	63	1.0	7.7	32	1.0	7.7	31	1.2	7.6
35-39	99	1.6	9.3	47	1.4	9.1	52	1.9	9.6
40-44	149	2.5	11.8	82	2.5	11.6	67	2.5	12.0
45-49	210	3.5	15.3	119	3.6	15.2	91	3.4	15.4
50-54	251	4.2	19.5	150	4.5	19.7	101	3.8	19.2
55-59	331	5.5	25.0	176	5.3	25.0	155	5.8	25.0
60-64	399	6.6	31.6	232	7.0	31.9	167	6.2	31.2
65-69	689	11.4	43.0	422	12.7	44.6	267	9.9	41.1
70-74	878	14.6	57.6	538	16.1	60.7	340	12.6	53.7
75-79	880	14.6	72.2	504	15.1	75.8	376	14.0	67.7
80-84	805	13.4	85.6	447	13.4	89.2	358	13.3	81.0
85+	869	14.4	100.0	359	10.8	100.0	510	19.0	100.0
All ages	6023	100.0		3334	100.0		2689	100.0	

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 2007–2016

Age at diagnosis Years	Males n	Females n	Males Age- spec. incid.	Females Age- spec. incid.	Males DCO rate n=793 %	Females DCO rate n=770 %	Males	Females
							Prop.all cancers n=113978 %	Prop.all cancers n=112253 %
0– 4	64	50	5.7	4.7	1.6	2.0	32.7	33.6
5– 9	37	33	3.4	3.2	2.7		35.6	39.3
10–14	29	24	2.5	2.2		4.2	25.2	23.8
15–19	39	20	3.2	1.7			15.4	9.7
20–24	29	22	2.1	1.6	3.4	9.1	6.3	5.8
25–29	28	25	1.8	1.6		4.0	4.1	3.0
30–34	32	31	2.0	1.9	6.3	6.5	3.4	2.1
35–39	47	52	2.9	3.3	6.4	5.8	3.4	2.1
40–44	82	67	4.4	3.7	3.7	4.5	3.8	1.5
45–49	119	89	6.0	4.7	5.9	10.1	3.0	1.3
50–54	150	101	8.7	5.9	8.0	5.9	2.4	1.2
55–59	176	155	12.4	10.5	11.4	8.4	1.9	1.7
60–64	231	166	18.9	12.5	11.7	10.8	1.8	1.5
65–69	422	267	35.6	20.6	15.4	18.7	2.3	1.9
70–74	533	338	48.2	26.7	18.8	18.0	2.5	2.3
75–79	501	372	62.9	37.1	26.9	29.0	3.0	2.8
80–84	446	356	97.0	50.3	42.4	44.4	4.1	3.3
85+	359	508	117.3	69.2	63.2	65.7	4.5	4.0
All ages	3324	2676			23.9	28.8	2.9	2.4
Incidence								
Raw			14.5	11.3				
WS			8.2	5.6				
ES			11.0	7.3				
BRD-S			13.9	8.8				

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

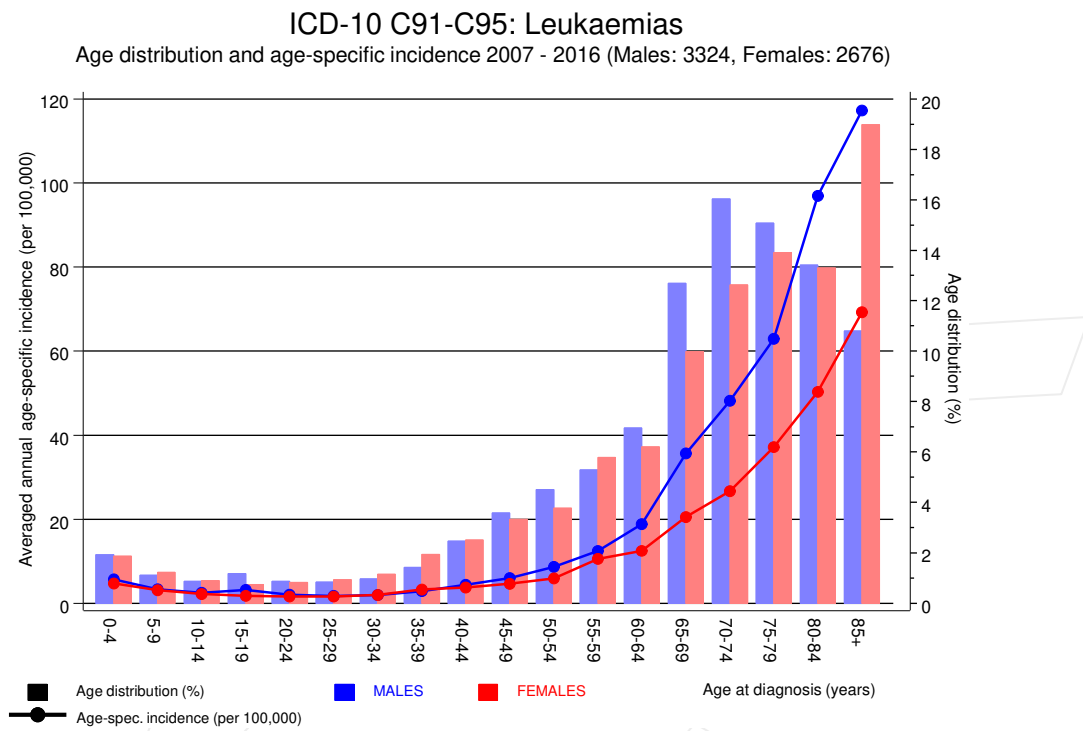


Figure 6. Age distribution (males: mean=66.8 yrs, median=71.7 yrs; females: mean=68.5 yrs, median=73.8 yrs) and age-specific incidence.

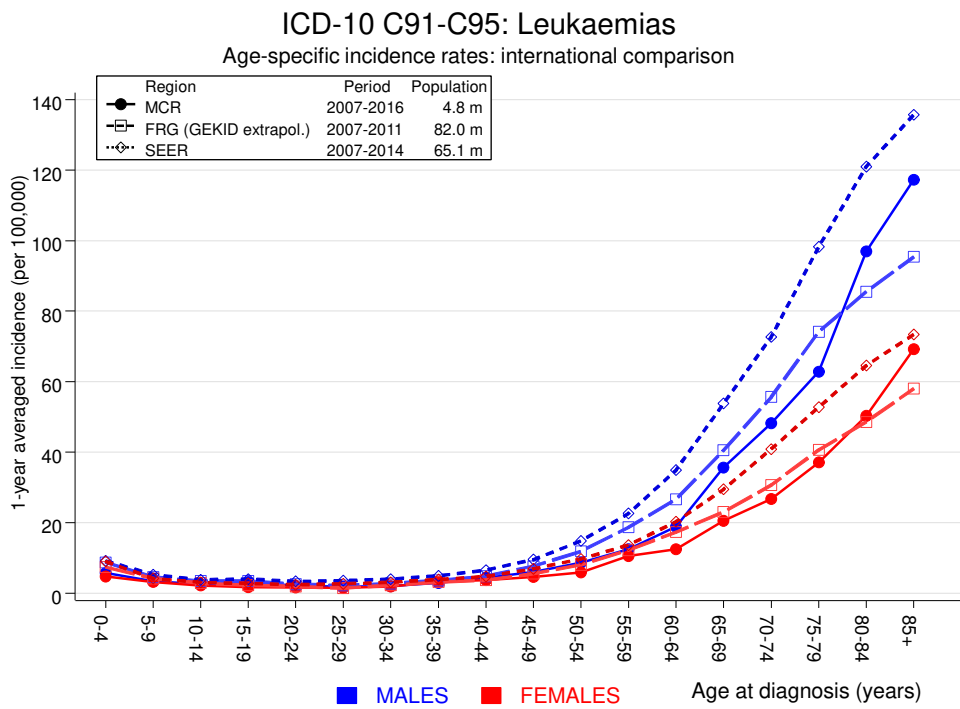


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

Extrapolated age-specific patient population of Germany, data status middle of 2010. Association of Population-based Cancer Registries in Germany (GEKID e.V.). Berlin, 2014. <http://www.gekid.de>. Last access: 02/11/2015
 Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 18 Regs Research Data, released April 2014, based on the November 2013 submission. <http://www.seer.cancer.gov>.

Table 7a

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

MALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C03-C06 Oral cavity	3	1.7	1.8	0.4	5.1	0.9	
C07-C08 Salivary gland	5	0.5	10.3	3.4	24.1 #	3.3	
C09-C10 Oropharynx	4	2.1	1.9	0.5	4.9	1.4	
C12-C13 Hypopharynx	2	1.2	1.7	0.2	6.3	0.6	
C15 Oesophagus	10	3.8	2.6	1.3	4.8 #	4.5	10.0
C16 Stomach	22	8.3	2.6	1.7	4.0 #	9.9	
C17 Small intestine	2	1.1	1.8	0.2	6.4	0.6	
C18 Colon	42	20.1	2.1	1.5	2.8 #	15.8	2.4
C19-C20 Rectum	25	11.1	2.3	1.5	3.3 #	10.0	
C22 Liver	10	5.9	1.7	0.8	3.1	3.0	10.0
C23-C24 Bile	2	2.0	1.0	0.1	3.5	-0.0	
C25 Pancreas	15	7.7	1.9	1.1	3.2 #	5.2	
C32 Larynx	2	2.1	0.9	0.1	3.4	-0.1	50.0
C33-C34 Lung	63	24.5	2.6	2.0	3.3 #	27.8	6.3
C38,C45 Mesothelioma	3	1.4	2.1	0.4	6.1	1.1	33.3
C40-C41 Bone	2	0.2	10.8	1.3	39.0 #	1.3	
C43 Malign. melanoma	47	9.0	5.2	3.8	6.9 #	27.4	
C46,C49 Soft tissue	7	1.2	6.0	2.4	12.3 #	4.2	
C50 Breast	2	0.5	3.8	0.5	13.6	1.1	
C61 Prostate	119	59.7	2.0	1.7	2.4 #	42.8	6.7
C62 Testis	3	0.7	4.4	0.9	12.8	1.7	
C64 Kidney	17	7.3	2.3	1.4	3.7 #	7.0	
C65 Renal pelvis	2	0.9	2.2	0.3	8.0	0.8	
C67 Bladder	22	9.3	2.4	1.5	3.6 #	9.1	4.5
C70-C72 CNS cancer	10	2.7	3.7	1.8	6.7 #	5.2	10.0
C73 Thyroid	4	1.4	2.9	0.8	7.5	1.9	
C76-C79 CUP	7	3.5	2.0	0.8	4.1	2.5	
C81 Hodgkin lymphoma	9	0.5	17.6	8.0	33.4 #	6.1	
C82-C85 NHL	46	8.6	5.4	3.9	7.2 #	27.0	8.7
C90 Mult. myeloma	12	2.7	4.4	2.3	7.7 #	6.7	
C91-C96 Leukaemia	53	3.5	15.2	11.4	19.9 #	35.7	24.5
Others, specified	6	2.3	2.6	0.9	5.6	2.6	
Not observed	0	1.7	0.0	0.0	2.2	-1.2	
All further malignancies	578	209.3	2.8	2.5	3.0 #	266.1	6.2

Patients	4445
Median age at next malignancy (years)	72.7
Person-years	13854
Mean observation time (years)	3.1
Median observation time (years)	1.5

The occurrence of further malignancy listed is statistically significant.

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

Table 7b

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

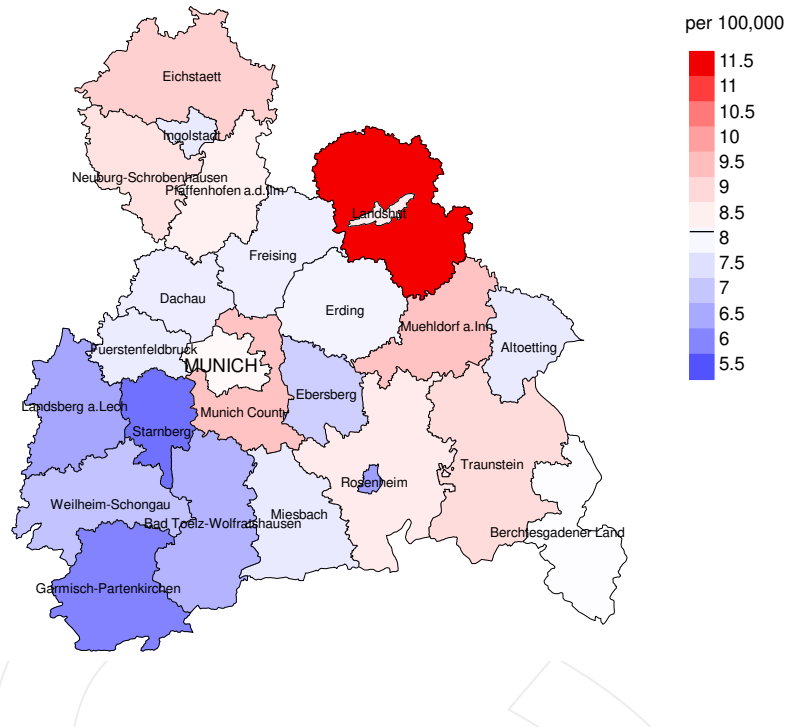
FEMALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C09–C10 Oropharynx	3	0.4	7.8	1.6	22.7 #	2.7	
C15 Oesophagus	2	0.6	3.3	0.4	11.9	1.4	
C16 Stomach	6	3.5	1.7	0.6	3.8	2.6	
C18 Colon	23	9.7	2.4	1.5	3.6 #	13.8	17.4
C19–C20 Rectum	6	4.1	1.5	0.5	3.2	2.0	
C21 Anus/canal	2	0.5	3.8	0.5	13.9	1.5	
C22 Liver	3	1.2	2.5	0.5	7.3	1.9	33.3
C23–C24 Bile	3	1.4	2.1	0.4	6.2	1.6	33.3
C25 Pancreas	8	4.5	1.8	0.8	3.5	3.6	12.5
C33–C34 Lung	26	7.3	3.6	2.3	5.2 #	19.4	3.8
C43 Malign. melanoma	12	3.7	3.2	1.7	5.7 #	8.6	
C50 Breast	72	29.4	2.5	1.9	3.1 #	44.0	1.4
C53 Cervix uteri	5	1.3	3.9	1.3	9.1 #	3.8	40.0
C54 Corpus uteri	15	5.5	2.7	1.5	4.5 #	9.8	
C56 Ovary	6	4.0	1.5	0.5	3.2	2.0	
C64 Kidney	10	2.5	4.0	1.9	7.4 #	7.8	10.0
C70–C72 CNS cancer	4	1.4	2.9	0.8	7.4	2.7	
C73 Thyroid	5	1.7	3.0	1.0	6.9	3.4	
C76–C79 CUP	5	1.8	2.8	0.9	6.6	3.3	
C81 Hodgkin lymphoma	2	0.2	9.8	1.2	35.4 #	1.9	
C82–C85 NHL	28	3.9	7.2	4.8	10.4 #	24.9	10.7
C90 Mult. myeloma	6	1.3	4.8	1.8	10.4 #	4.9	
C91–C96 Leukaemia	25	1.6	15.3	9.9	22.6 #	24.1	12.0
Others, specified	10	2.8	3.5	1.7	6.5 #	7.4	10.0
Not observed	0	4.8	0.0	0.0	0.8 #	-4.9	
All further malignancies	287	98.9	2.9	2.6	3.3 #	194.4	6.6
Patients		3326					
Median age at next malignancy (years)		72.0					
Person-years		9677					
Mean observation time (years)		2.9					
Median observation time (years)		1.2					

The occurrence of further malignancy listed is statistically significant.

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

Average incidence (world standard population) 2007 - 2016: Males



Average incidence (world standard population) 2007 - 2016: Females

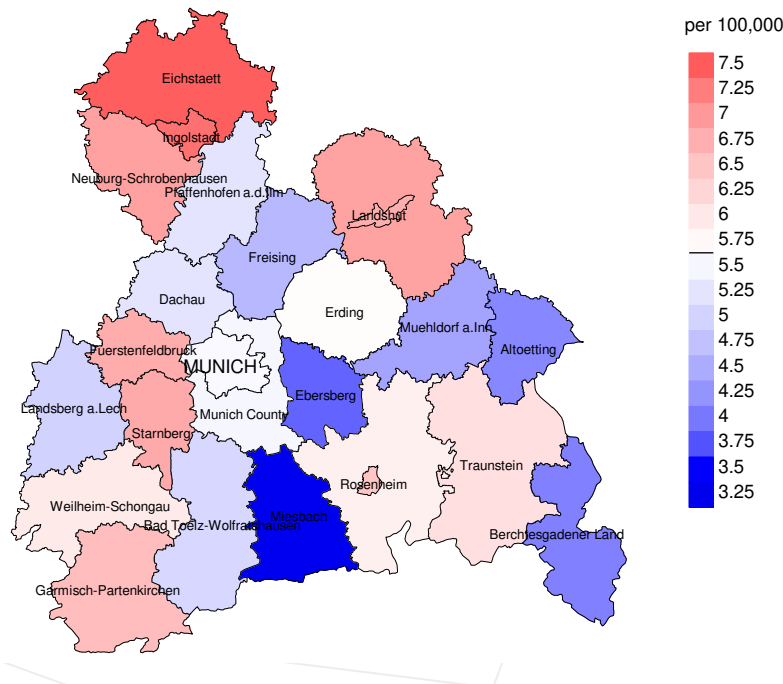
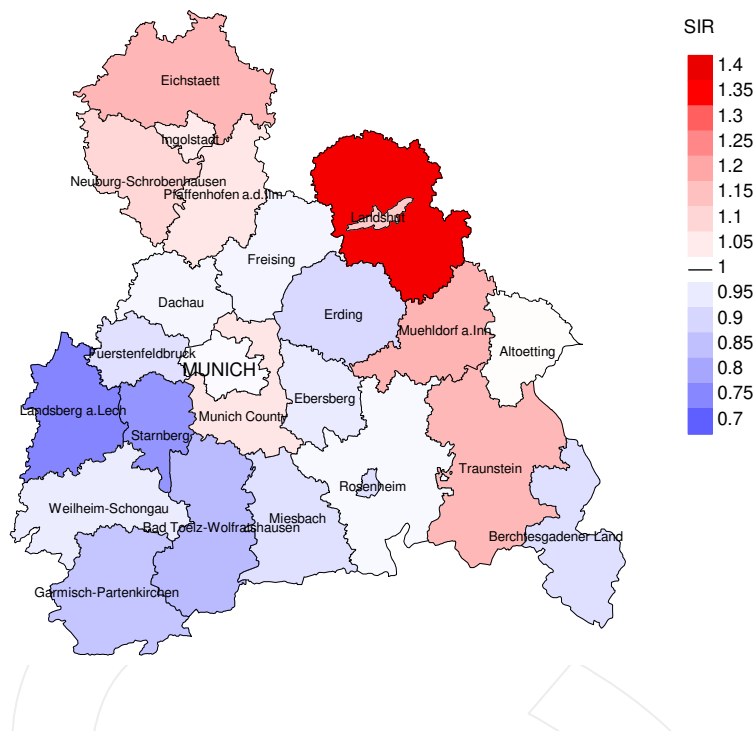


Figure 8a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 8.2/100,000 WS N=3,324, females 5.6/100,000 WS N=2,676).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 58 women were identified with newly diagnosed leukaemias. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 3.9/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 2.4 and 6.0/100,000.

Standardized incidence ratio (SIR) 2007 - 2016: Males



Standardized incidence ratio (SIR) 2007 - 2016: Females

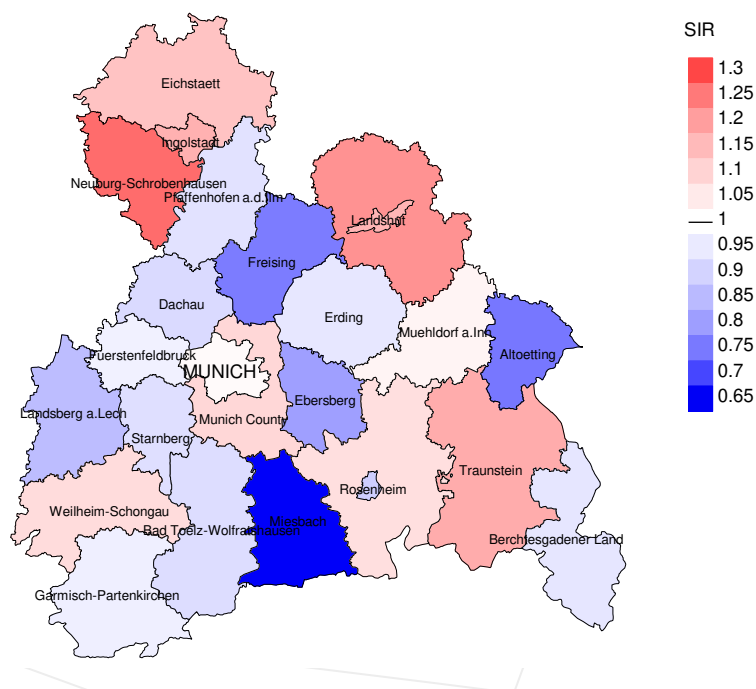


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=3,324, females N=2,676).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 58 women were identified with newly diagnosed leukaemias. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.80. Though, the value of this parameter may vary with an underlying probability of 99% between 0.56 and 1.12, and is therefore not statistically striking.

MORTALITY

Table 9a

Annual cohorts: Incident cancers, follow-up status, proportion of DCO, deaths among the annual cohorts and proportion of available death certificates (with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.81 m as of 2007, respectively)

Year of diagnosis	Incident cases n	Prop. actively followed %	Prop. DCO %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	306	97.4	29.7	254	83.0	98.0
1999	319	97.5	25.7	246	77.1	96.7
2000	337	97.0	28.8	252	74.8	97.2
2001	368	95.9	35.6	283	76.9	97.9
2002	564	94.3	34.8	442	78.4	98.2
2003	577	95.5	33.4	439	76.1	99.3
2004	622	92.6	31.4	438	70.4	98.6
2005	599	93.3	30.1	433	72.3	98.4
2006	613	91.4	28.7	457	74.6	98.2
2007	660	80.2	24.4	440	66.7	98.4
2008	656	77.7	25.6	422	64.3	98.8
2009	678	78.0	23.3	435	64.2	98.9
2010	699	77.3	22.5	454	64.9	98.7
2011	672	76.6	20.8	402	59.8	97.8
2012	721	76.4	24.1	453	62.8	97.8
2013	625	77.8	26.4	383	61.3	97.4
2014	581	82.8	28.9	355	61.1	98.0
2015	422	98.1	34.1	301	71.3	94.7
2016	309	89.3	43.4	200	64.7	90.5
1998-2016	10328	86.2	28.2	7089	68.6	97.9

Table 9b

Annual cohorts of incident cancers and deaths, proportion of death certificates and cases deceased within the same year of being diagnosed with cancer (incl. DCO)

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.81 m as of 2007, respectively)

Year of diagnosis/ death	Incident cases n	Deaths n	Prop. deaths with death certific. %	Deaths in same year n	Prop. deaths in same year %
1998	306	222	98.2	119	38.9
1999	319	204	96.6	100	31.3
2000	337	222	96.4	118	35.0
2001	368	268	97.0	140	38.0
2002	564	342	98.2	225	39.9
2003	577	336	98.2	234	40.6
2004	622	339	98.8	221	35.5
2005	599	405	99.8	232	38.7
2006	613	379	98.7	242	39.5
2007	660	399	98.2	217	32.9
2008	656	404	98.3	218	33.2
2009	678	398	97.7	230	33.9
2010	699	445	98.0	251	35.9
2011	672	461	98.7	221	32.9
2012	721	480	98.3	249	34.5
2013	625	501	98.4	253	40.5
2014	581	474	99.2	243	41.8
2015	422	457	98.5	239	56.6
2016	309	333	98.2	181	58.6
1998-2016	10328	7069	98.3	3933	38.1

Table 9c

Annual cohorts of deaths, proportion of cancer-related and non-cancer-related deaths, and cancer recorded on death certificates
(incl. DCO)

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.81 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. non-cancer-related %	Prop. cancer recorded on death certificate %
1998	222	64.9	35.1	95.9
1999	204	68.6	31.4	95.4
2000	222	73.9	26.1	97.7
2001	268	69.8	30.2	95.8
2002	342	80.4	19.6	97.3
2003	336	82.4	17.6	95.8
2004	339	86.1	13.9	96.1
2005	405	85.7	14.3	97.5
2006	379	85.8	14.2	95.7
2007	399	84.2	15.8	95.4
2008	404	81.2	18.8	91.4
2009	398	83.4	16.6	93.1
2010	445	83.1	16.9	95.0
2011	461	82.6	17.4	93.0
2012	480	81.3	18.8	92.4
2013	501	76.2	23.8	90.1
2014	474	76.2	23.8	90.2
2015	457	78.3	21.7	90.2
2016	333	74.8	25.2	91.4
1998-2016	7069	79.8	20.2	93.8

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	122	69.7	67.9	73.8	69.8
1999	116	72.4	69.0	80.6	71.8
2000	133	72.1	70.7	76.6	72.1
2001	131	72.5	71.9	74.2	72.2
2002	176	73.2	72.6	74.8	73.8
2003	181	72.3	71.2	76.0	72.0
2004	184	74.7	74.4	79.6	74.7
2005	227	75.2	73.9	78.3	74.4
2006	224	74.0	73.0	79.5	73.9
2007	214	73.8	73.1	80.5	73.5
2008	232	73.4	73.3	77.3	73.6
2009	211	75.2	74.8	79.3	75.3
2010	245	75.7	74.6	80.0	75.8
2011	253	75.3	74.7	77.8	75.3
2012	281	76.6	75.0	81.5	75.8
2013	293	76.2	75.2	78.6	76.0
2014	272	77.2	76.3	80.5	76.8
2015	250	76.8	76.2	79.7	76.4
2016	195	78.1	77.8	80.5	77.9
1998-2016	3940	75.1	74.3	78.8	75.0

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	100	76.0	74.0	82.0	76.0
1999	88	77.0	76.0	82.8	76.7
2000	89	77.7	75.4	85.8	77.7
2001	137	77.0	75.3	82.4	76.5
2002	166	77.4	74.2	85.7	77.0
2003	155	77.9	75.8	84.5	77.8
2004	155	77.1	76.4	82.8	76.9
2005	178	77.9	76.0	85.0	77.9
2006	155	77.3	77.0	81.8	77.0
2007	185	76.0	74.1	85.5	76.0
2008	172	78.7	76.4	84.7	77.9
2009	187	79.0	77.8	82.5	78.5
2010	200	80.5	78.9	82.6	80.7
2011	208	77.8	73.9	83.6	76.0
2012	199	76.9	76.0	82.1	76.9
2013	208	79.0	77.6	82.7	78.3
2014	202	78.5	76.9	81.1	78.3
2015	207	77.7	75.8	81.4	76.7
2016	138	79.8	76.9	82.9	78.0
1998-2016	3129	77.8	76.3	83.4	77.5

By 2010, life expectancy at birth was 77.5 years for boys and 82.6 years for girls.

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

Table 11a

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

MALES

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	84	7.6	0.49	5.3	0.50	7.2	0.50	8.9	0.50
1999	76	6.8	0.44	4.5	0.44	6.3	0.44	7.9	0.44
2000	102	9.0	0.55	5.8	0.50	8.3	0.54	10.9	0.58
2001	97	8.4	0.49	4.9	0.42	7.4	0.47	10.1	0.53
2002	145	7.8	0.48	4.4	0.40	6.6	0.46	9.1	0.51
2003	155	8.3	0.48	4.6	0.43	7.0	0.47	9.3	0.50
2004	159	8.5	0.48	4.4	0.39	6.9	0.46	9.7	0.52
2005	190	10.0	0.55	5.2	0.45	7.9	0.52	11.0	0.57
2006	190	9.9	0.51	4.9	0.40	7.6	0.47	10.4	0.52
2007	186	8.4	0.50	4.4	0.43	6.4	0.47	8.9	0.52
2008	192	8.6	0.52	4.2	0.39	6.3	0.47	8.7	0.53
2009	177	7.9	0.49	3.7	0.41	5.7	0.46	8.0	0.51
2010	200	8.9	0.54	4.0	0.42	6.2	0.48	8.7	0.54
2011	216	9.7	0.58	4.5	0.44	6.8	0.52	9.4	0.60
2012	223	9.8	0.57	4.4	0.45	6.8	0.53	9.3	0.57
2013	219	9.5	0.61	4.0	0.46	6.2	0.54	8.8	0.60
2014	208	8.9	0.62	3.5	0.50	5.7	0.56	8.1	0.62
2015	202	8.5	0.90	3.7	0.86	5.6	0.87	7.7	0.90
2016	150	6.2	0.85	2.4	0.71	3.8	0.77	5.6	0.83
1998-2016	3171	8.6	0.55	4.2	0.45	6.4	0.51	8.8	0.57

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	60	5.1	0.44	2.9	0.46	3.6	0.44	4.3	0.44
1999	64	5.4	0.44	2.3	0.30	3.4	0.36	4.5	0.42
2000	62	5.2	0.41	2.3	0.32	3.3	0.35	4.3	0.39
2001	90	7.4	0.54	3.2	0.45	4.7	0.50	6.3	0.55
2002	130	6.6	0.50	2.9	0.46	4.2	0.48	5.5	0.52
2003	122	6.2	0.47	2.5	0.36	3.8	0.42	5.0	0.47
2004	133	6.7	0.46	2.7	0.35	4.0	0.39	5.4	0.44
2005	157	7.9	0.62	3.2	0.47	4.7	0.54	6.1	0.58
2006	135	6.7	0.56	2.6	0.44	3.9	0.51	5.4	0.56
2007	150	6.5	0.52	2.8	0.39	3.9	0.45	5.1	0.49
2008	136	5.9	0.48	2.3	0.37	3.4	0.42	4.5	0.46
2009	155	6.7	0.49	2.6	0.38	3.8	0.43	5.2	0.48
2010	170	7.3	0.52	2.5	0.36	3.8	0.43	5.3	0.49
2011	165	7.1	0.55	2.8	0.40	4.1	0.48	5.4	0.54
2012	167	7.1	0.51	2.7	0.34	3.9	0.41	5.3	0.47
2013	164	6.9	0.62	2.5	0.44	3.7	0.51	5.0	0.57
2014	153	6.4	0.63	2.3	0.54	3.4	0.57	4.5	0.59
2015	156	6.4	0.79	2.4	0.81	3.5	0.80	4.8	0.81
2016	100	4.1	0.76	1.6	0.77	2.3	0.78	2.9	0.77
1998-2016	2469	6.4	0.54	2.6	0.42	3.7	0.47	5.0	0.52

Table 12

Age distribution of age at death (cancer-related) for period 2007-2016
(incl. multiple malignancies)

Age at death Years	Cases			Males			Females		
	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4	4	0.1	0.1	1	0.1	0.1	3	0.2	0.2
5-9	9	0.3	0.4	5	0.3	0.3	4	0.3	0.5
10-14	16	0.5	0.8	4	0.2	0.5	12	0.8	1.3
15-19	14	0.4	1.2	9	0.5	1.0	5	0.3	1.6
20-24	16	0.5	1.7	11	0.6	1.5	5	0.3	1.9
25-29	18	0.5	2.2	15	0.8	2.3	3	0.2	2.1
30-34	17	0.5	2.7	9	0.5	2.7	8	0.5	2.6
35-39	29	0.8	3.5	16	0.8	3.5	13	0.9	3.5
40-44	48	1.4	4.9	25	1.3	4.8	23	1.5	5.0
45-49	69	2.0	6.9	30	1.5	6.3	39	2.6	7.6
50-54	87	2.5	9.4	52	2.6	9.0	35	2.3	9.9
55-59	143	4.1	13.5	70	3.5	12.5	73	4.8	14.7
60-64	209	6.0	19.5	126	6.4	18.9	83	5.5	20.2
65-69	357	10.2	29.7	226	11.5	30.4	131	8.6	28.8
70-74	610	17.5	47.2	367	18.6	49.0	243	16.0	44.9
75-79	662	19.0	66.2	399	20.2	69.2	263	17.3	62.2
80-84	598	17.1	83.3	336	17.0	86.2	262	17.3	79.5
85+	583	16.7	100.0	272	13.8	100.0	311	20.5	100.0
All ages	3489	100.0		1973	100.0		1516	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2016
(incl. multiple malignancies)

Age at death Years	Males		Males		Females		Females	
	n	n	Age- spec. mortal.	MI-index	Age- spec. mortal.	MI-index	Prop.all cancers %	Prop.all cancers %
0- 4	1	3	0.1	0.02	0.3	0.06	6.7	20.0
5- 9	5	4	0.5	0.14	0.4	0.12	20.8	22.2
10-14	4	12	0.3	0.14	1.1	0.50	17.4	50.0
15-19	9	5	0.7	0.23	0.4	0.25	20.5	22.7
20-24	11	5	0.8	0.38	0.4	0.23	19.3	15.2
25-29	15	3	1.0	0.54	0.2	0.12	20.3	4.1
30-34	9	8	0.6	0.28	0.5	0.26	8.7	6.7
35-39	16	13	1.0	0.34	0.8	0.25	8.0	4.6
40-44	25	23	1.3	0.30	1.3	0.34	5.1	3.4
45-49	30	39	1.5	0.25	2.0	0.44	2.6	3.0
50-54	52	35	3.0	0.35	2.0	0.35	2.5	1.8
55-59	70	73	4.9	0.40	5.0	0.47	2.1	2.6
60-64	126	83	10.3	0.55	6.2	0.50	2.5	2.2
65-69	226	131	19.1	0.54	10.1	0.49	3.1	2.5
70-74	367	243	33.2	0.69	19.2	0.72	3.9	3.6
75-79	399	263	50.1	0.80	26.3	0.71	4.4	3.8
80-84	336	262	73.1	0.75	37.0	0.74	4.5	3.8
85+	272	311	88.8	0.76	42.4	0.61	4.2	3.4
All ages	1973	1516					3.8	3.3
Mortality								
Raw			8.6	0.59	6.4	0.57		
WS			3.9	0.47	2.4	0.43		
ES			5.9	0.54	3.6	0.49		
BRD-S			8.3	0.60	4.8	0.54		
PYLL-70								
per 100,000			38.4		32.4			
ES			36.4		31.7			
AYLL-70			13.0		14.8			

Table 14a

Further malignancies in deaths in period 1998–2016
MALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C03–C06 Oral cavity	11	0.8	5	45.5	2	18.2	4	36.4
C15 Oesophagus	13	0.9	4	30.8			9	69.2
C16 Stomach	31	2.3	14	45.2	3	9.7	14	45.2
C18 Colon	107	7.8	53	49.5	12	11.2	42	39.3
C19–C20 Rectum	56	4.1	22	39.3	9	16.1	25	44.6
C22 Liver	13	0.9	3	23.1	2	15.4	8	61.5
C25 Pancreas	25	1.8	1	4.0	6	24.0	18	72.0
C32 Larynx	13	0.9	10	76.9	2	15.4	1	7.7
C33–C34 Lung	119	8.7	30	25.2	24	20.2	65	54.6
C43 Malign. melanoma	53	3.9	27	50.9	5	9.4	21	39.6
C44 Skin others	276	20.1	53	19.2	22	8.0	201	72.8
C46,C49 Soft tissue	18	1.3	8	44.4	1	5.6	9	50.0
C61 Prostate	272	19.8	181	66.5	24	8.8	67	24.6
C64 Kidney	41	3.0	30	73.2	3	7.3	8	19.5
C67 Bladder	48	3.5	25	52.1	6	12.5	17	35.4
C70–C72 CNS cancer	13	0.9	1	7.7	2	15.4	10	76.9
C76–C79 CUP	14	1.0	2	14.3	3	21.4	9	64.3
C81 Hodgkin lymphoma	21	1.5	10	47.6	2	9.5	9	42.9
C82–C85 NHL	56	4.1			8	14.3	48	85.7
C90 Mult. myeloma	18	1.3	9	50.0	6	33.3	3	16.7
C91–C96 Leukaemia	86	6.3			13	15.1	73	84.9
Others, specified	67	4.9	30	44.8	9	13.4	28	41.8
All further malignancies	1371	100.0	518	37.8	164	12.0	689	50.3

Further malignancies with number of cases 1 to 10 are pooled in category “Others, specified”.

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

Table 14b

Further malignancies in deaths in period 1998–2016
FEMALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C16 Stomach	15	1.9	6	40.0	4	26.7	5	33.3
C18 Colon	52	6.5	25	48.1	7	13.5	20	38.5
C19–C20 Rectum	23	2.9	14	60.9	3	13.0	6	26.1
C25 Pancreas	14	1.7	1	7.1	3	21.4	10	71.4
C33–C34 Lung	44	5.5	9	20.5	8	18.2	27	61.4
C43 Malign. melanoma	28	3.5	22	78.6			6	21.4
C44 Skin others	92	11.5	36	39.1	4	4.3	52	56.5
C50 Breast	218	27.1	166	76.1	17	7.8	35	16.1
C53 Cervix uteri	17	2.1	14	82.4	2	11.8	1	5.9
C54 Corpus uteri	47	5.9	34	72.3	4	8.5	9	19.1
C56 Ovary	19	2.4	9	47.4	3	15.8	7	36.8
C64 Kidney	17	2.1	5	29.4	5	29.4	7	41.2
C67 Bladder	11	1.4	9	81.8	1	9.1	1	9.1
C70–C72 CNS cancer	16	2.0	5	31.3	3	18.8	8	50.0
C73 Thyroid	21	2.6	19	90.5	1	4.8	1	4.8
C76–C79 CUP	10	1.2	4	40.0	1	10.0	5	50.0
C82–C85 NHL	28	3.5			3	10.7	25	89.3
C90 Mult. myeloma	11	1.4	5	45.5	2	18.2	4	36.4
C91–C96 Leukaemia	53	6.6			5	9.4	48	90.6
Others, specified	67	8.3	34	50.7	4	6.0	29	43.3
All further malignancies	803	100.0	417	51.9	80	10.0	306	38.1

Further malignancies with number of cases 1 to 7 are pooled in category "Others, specified".

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

Table 15

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2016
(First primaries only *)

Age at death Years	Males		Males		Females		Females	
	n	n	Age- spec. mortal.	MI-index	Age- spec. mortal.	MI-index	Prop.all cancers %	Prop.all cancers %
0- 4	1	3	0.1	0.02	0.3	0.06	7.1	20.0
5- 9	5	4	0.5	0.14	0.4	0.13	21.7	22.2
10-14	4	10	0.3	0.14	0.9	0.43	17.4	47.6
15-19	9	4	0.7	0.24	0.3	0.21	21.4	20.0
20-24	10	4	0.7	0.37	0.3	0.18	19.6	12.9
25-29	14	3	0.9	0.50	0.2	0.13	20.9	4.5
30-34	9	8	0.6	0.30	0.5	0.28	8.8	7.5
35-39	14	13	0.9	0.31	0.8	0.27	7.4	5.1
40-44	23	18	1.2	0.30	1.0	0.32	5.0	3.0
45-49	26	30	1.3	0.25	1.6	0.44	2.5	2.6
50-54	40	27	2.3	0.30	1.6	0.34	2.2	1.6
55-59	59	51	4.2	0.38	3.5	0.44	2.0	2.1
60-64	88	59	7.2	0.51	4.4	0.47	2.1	1.9
65-69	155	94	13.1	0.51	7.2	0.50	2.6	2.2
70-74	256	157	23.1	0.73	12.4	0.69	3.6	3.0
75-79	272	176	34.1	0.85	17.6	0.71	4.1	3.2
80-84	233	193	50.7	0.84	27.3	0.78	4.2	3.6
85+	169	234	55.2	0.78	31.9	0.61	3.5	3.2
All ages	1387	1088					3.4	2.9
Mortality								
Raw			6.1	0.58	4.6	0.55		
WS			2.8	0.43	1.8	0.39		
ES			4.2	0.51	2.6	0.46		
BRD-S			5.8	0.58	3.4	0.52		
PYLL-70								
per 100,000			32.9		26.2			
ES			31.7		26.1			
AYLL-70			14.5		16.0			

* See corresponding tables with multiple malignancies.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2016
(**Single primaries only** *)

Age at death Years	Males		Males		Females		Females	
	n	n	Age- spec. mortal.	MI-index	Age- spec. mortal.	MI-index	Prop.all cancers %	Prop.all cancers %
0- 4	1	3	0.1	0.02	0.3	0.06	7.1	20.0
5- 9	5	4	0.5	0.14	0.4	0.13	21.7	22.2
10-14	4	9	0.3	0.15	0.8	0.39	17.4	42.9
15-19	9	4	0.7	0.26	0.3	0.21	21.4	21.1
20-24	9	4	0.6	0.35	0.3	0.18	17.6	12.9
25-29	12	3	0.8	0.44	0.2	0.14	17.9	4.6
30-34	9	8	0.6	0.30	0.5	0.29	8.8	7.7
35-39	12	10	0.7	0.27	0.6	0.22	6.4	4.0
40-44	20	16	1.1	0.27	0.9	0.29	4.4	2.7
45-49	21	26	1.1	0.21	1.4	0.43	2.0	2.3
50-54	36	22	2.1	0.29	1.3	0.33	2.0	1.3
55-59	48	44	3.4	0.34	3.0	0.43	1.7	1.9
60-64	63	50	5.1	0.42	3.8	0.45	1.5	1.7
65-69	116	80	9.8	0.46	6.2	0.48	2.0	1.9
70-74	195	133	17.6	0.70	10.5	0.64	2.8	2.6
75-79	208	146	26.1	0.73	14.6	0.67	3.3	2.8
80-84	187	167	40.7	0.73	23.6	0.73	3.6	3.3
85+	137	211	44.7	0.66	28.7	0.56	3.1	3.0
All ages	1092	940					2.8	2.6
Mortality								
Raw			4.8	0.51	4.0	0.51		
WS			2.3	0.38	1.6	0.37		
ES			3.4	0.45	2.2	0.43		
BRD-S			4.6	0.51	2.9	0.48		
PYLL-70								
per 100,000			28.6		23.3			
ES			27.8		23.5			
AYLL-70			15.8		16.5			

* See corresponding tables with multiple malignancies.

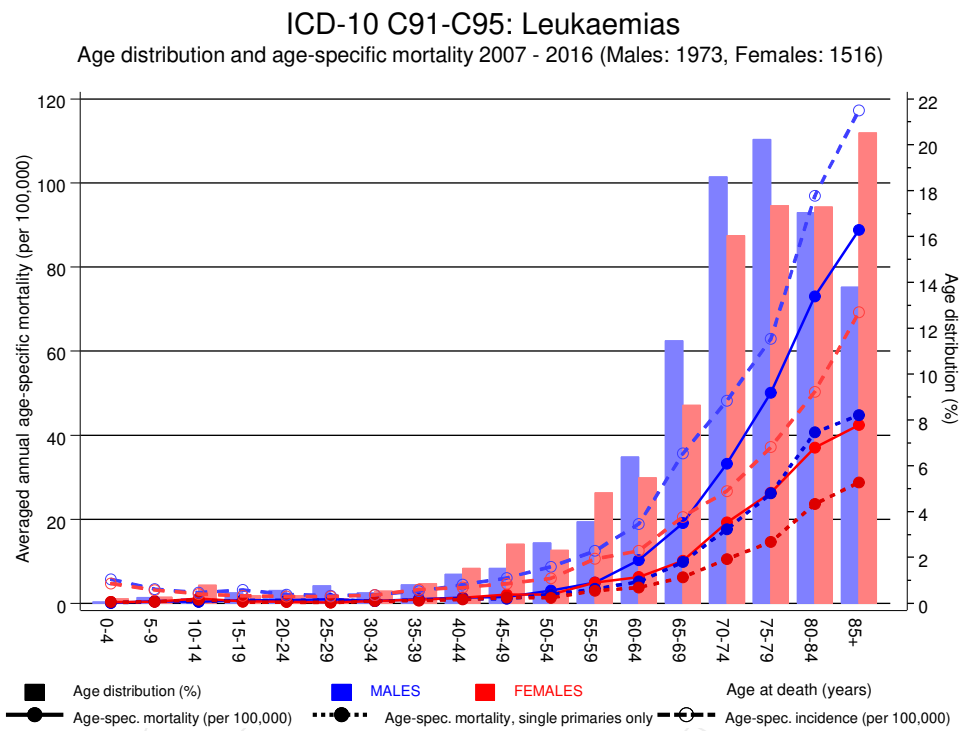
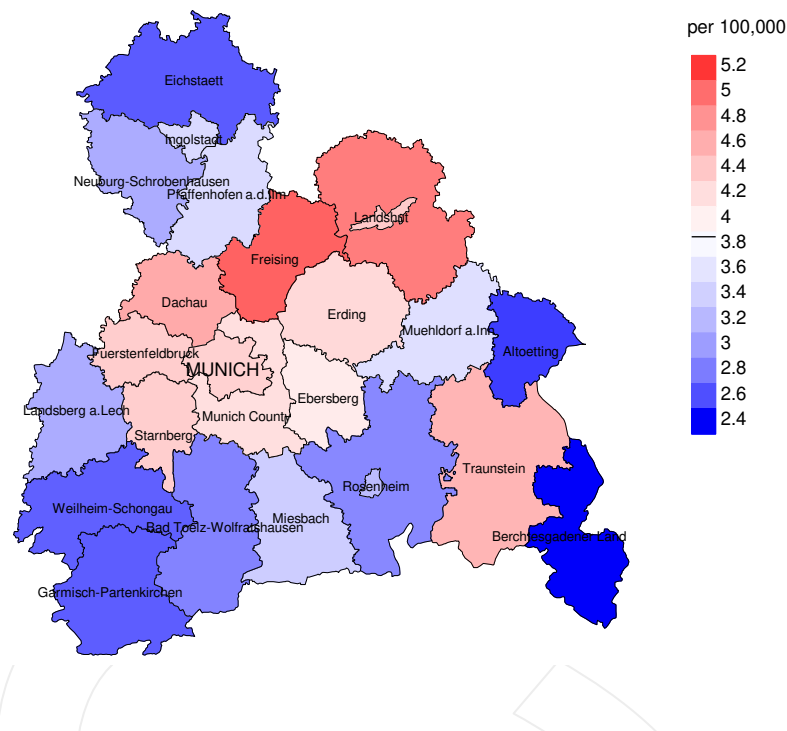


Figure 17. Distribution of age at death (bars; males: mean=69.0 yrs, median=71.7 yrs; females: mean=70.5 yrs, median=73.6 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

Average mortality (world standard population) 2007 - 2016: Males



Average mortality (world standard population) 2007 - 2016: Females

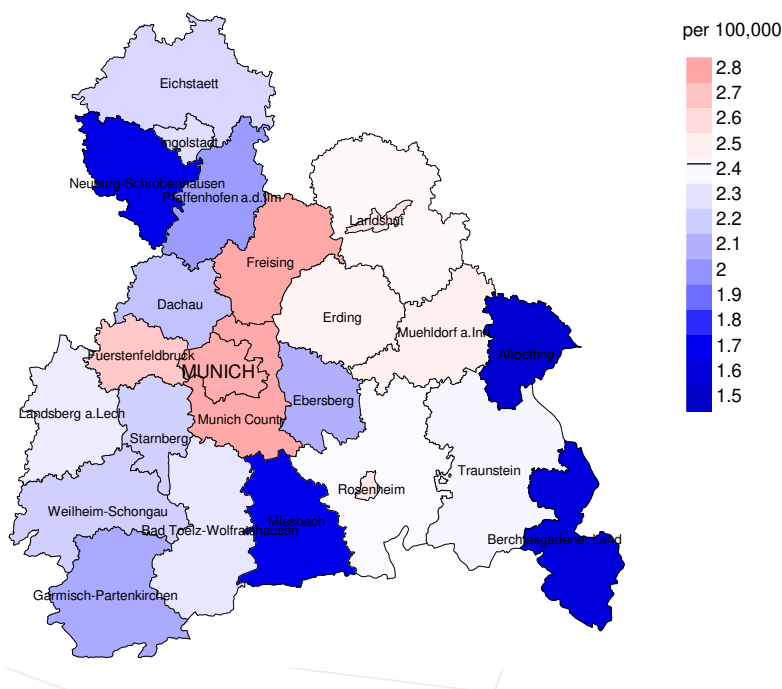
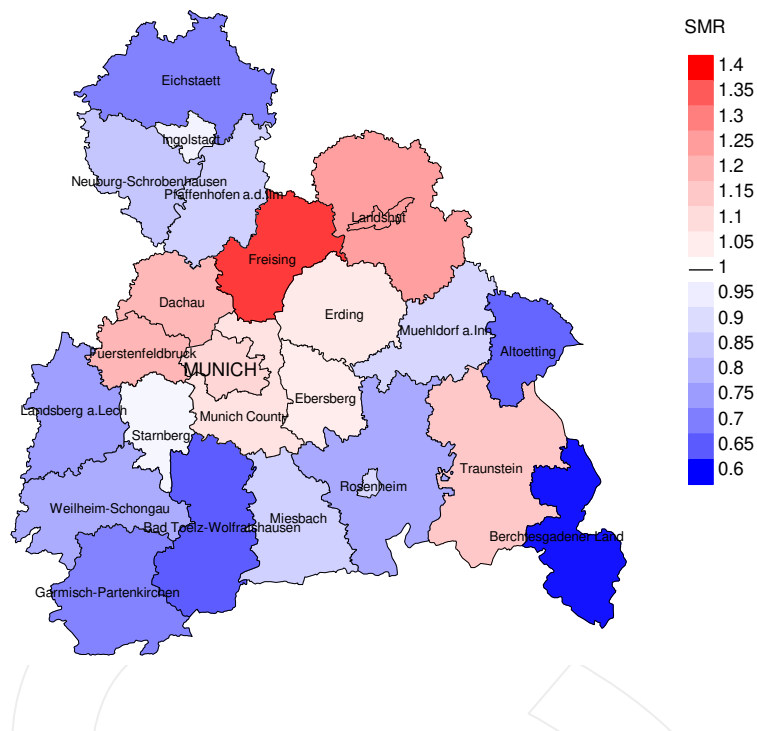


Figure 18a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2016. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 3.9/100,000 WS N=1,973, females 2.4/100,000 WS N=1,516).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 39 women died from leukaemias. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 2.1/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 1.2 and 3.5/100,000.

Standardized mortality ratio (SMR) 2007 - 2016: Males



Standardized mortality ratio (SMR) 2007 - 2016: Females

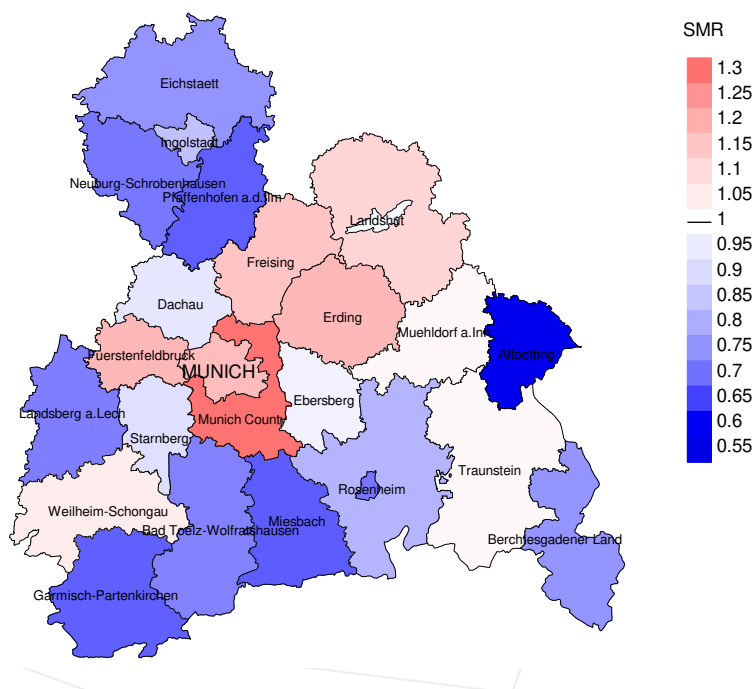


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=1,973, females N=1,516).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 39 women died from leukaemias. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.96. Though, the value of this parameter may vary with an underlying probability of 99% between 0.61 and 1.44, and is therefore not statistically striking.

Statistical Notes

In all tables and figures the respective reference values should be carefully considered. The incidence rates include diagnoses (with multiple primary), and death certificate only (DCO) cases, where applicable. For mortality statistics patients, diagnoses and progressive course of disease are presented. In the calculations, all courses of disease are considered whereby progressions occurred and/or death certificate identified progressive cancers were ascertained. Additionally there are three groups of disease course to consider:

1. All multiple primaries included

The mortality statistic describes the tumor-specific death, independent of any malignancy. The patient perspective, induced secondary malignancies, and the problem of multiple malignancies from the same primary tumor all have reasons for their inclusion.

2. First singular primary (no information about other prior or synchronous malignancy)

The mortality statistic describes the cancer-related death for patients who have no therapeutic restrictions due to a previous or synchronous cancer. These statistics are comparable to studies that have exclusion criteria based on a second malignancy.

3. Single primary (no information about other prior, syn- or metachronous malignancy)

The mortality statistic describes the tumor-specific death that occurs without any impact through secondary primaries, earlier, synchronous, later or induced. Precisely the difference between disease group 1 and 2 highlight the magnitude of the problem of secondary malignancies.

For this reason differences appear concerning official mono-causal mortality statistics. To judge the maximum deviation, 2 further tables are presented. In the first table the distribution of secondary malignancies before, at or after the described cancer are shown, that could be an alternative cause of death. In the second table, the age-specific mortality rates for all courses of disease, without designation of secondary malignancies are shown.

A previously minimally acknowledged statistic is the **age at death**, which allows for a good assessment of the quality of classification of the apparent tumor-specific death. For assumed tumor-independent deaths, the age of death should be estimated from the age of diagnosis and the normal life expectancy, whereas tumor-dependent deaths can be estimated from the age of diagnosis plus the average tumor-specific life expectancy. The comparison of different tumors demonstrates this association, if the causes of cancer and the competing cause of death are independent of each other (e.g. breast and colon versus head/neck and lung).

The index from mortality and incidence (Mortality-Incidence ratio, **MI-index**) is a statistic that allows for the evaluation of the quality of data. For diseases with poor prognoses, comparable values are obtained from all age groups, because to a large extent, the numerator and denominator contain the same cases. For tumors with a good prognosis, increasing and decreasing incidence and age-specific differences in prognosis can more strongly alter the MI- index. Additionally, attention should be paid to the confidence intervals where fewer cases are reported.

The complexity of problems identified here emphasizes the importance of relative survival data for the appropriate analysis of long term results.

As a measurement of the burden of disease, the number of potential life years loss due to premature deaths in a cohort can be calculated (**PYLL**, potential years of life lost, standardized per 100,000 persons or per European standard) as well as the average loss of life years per individual (**AYLL**, average years of life lost). Depending upon the analytic aim (health economy, prevention, health care research) different methods exist for the generation of these measurements. In the results presented here, the age for a premature death is considered to be before 70 years, according to the guidelines of the OECD and the WHO (as seen in the abbreviation PYLL-70 or AYLL-70).

Shortcuts

MCR	Munich Cancer Registry (Tumorregister München)
GEKID	Association of Population-based Cancer Registries in Germany (Gesellschaft der epidemiologischen Krebsregister in Deutschland e.V.)
SEER	Surveillance, Epidemiology, and End Results (USA)
DCO	Death certificate only
BRD-S	German standard population
ES	European standard population (old)
WS	World standard population
SIR	Standardized incidence ratio
CI	Confidence interval
EAR	Excess absolute risk = excess cancer cases (O - E) per 10,000 person-years
PYLL-70	Potential years of life lost prior to age 70 given a person dies before that age
AYLL-70	Average years of life lost prior to age 70 given a person dies before that age
SMR	Standardized mortality ratio
MI-index	Ratio between mortality and incidence
FRG	Federal Republic of Germany

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