

Munich Cancer Registry



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

ICD-10 C92.1: Chronic myel. leukaemia

Incidence and Mortality

Year of diagnosis	1998-2016
Patients	1,017
Diseases	1,017
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/bC921_E-ICD-10-C92.1-Chronic-myel.-leukaemia-incidence-and-mortality.pdf

Index of figures and tables

Fig./Tbl.		Page
1	Annual cases, DCO, mult. malignancies, follow-up / yr	4
2	Incidence by year of diagnosis	7
3	Age distribution parameters by year of diagnosis	8
4	Age distribution by 5-year age group and sex	9
5	Age-specific incidence, DCO rate, proportion malignancies	10
6	Age distribution and age-specific incidence (chart)	11
6a	Age-specific incidence internationally (chart)	12
7	Standardized incidence ratio of further malignancies	13
8a	Map of cancer incidence (WS) by county (chart)	15
8b	Standardized incidence ratio (SIR) by county (chart)	16
9a	Pts incident cohorts and mortality / yr	17
9b	Incidence and mortality by year of diagnosis	18
9c	Cancer-related deaths, death certification available / yr	19
10	Medians of age at death / yr	20
11	Mortality by year of death	22
12	Distribution of age at death	23
13	Age-specific mortality	24
14	Further malignancies in deaths	25
15	Age-specific mortality (first primaries)	27
16	Age-specific mortality (single primaries)	28
17	Age distribution and age-specific mortality (chart)	29
18a	Map of cancer mortality (WS) by county (chart)	30
18b	Standardized mortality ratio (SMR) by county (chart)	31

**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
C92.1	Chronic myeloid leukaemia [CML], BCR/ABL-positive

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	18	1	5.6	0.0	9.4	77.8	100.0
1999	35	5	14.3	1.9	9.3	71.4	100.0
2000	37	10	27.0	3.3	9.2	67.6	100.0
2001	41	18	43.9	6.1	9.1	73.2	97.6
2002	59	22	37.3	6.3	9.1	69.5	91.5 #
2003	72	25	34.7	7.3	8.8	69.4	97.2
2004	59	20	33.9	8.1	9.3	67.8	94.9
2005	52	18	34.6	8.8	8.6	63.5	96.2
2006	56	22	39.3	10.5	8.1	69.6	83.9
2007	61	19	31.1	11.4	7.3	55.7	77.0 #
2008	69	25	36.2	13.4	6.0	60.9	76.8
2009	60	14	23.3	13.9	5.8	50.0	71.7
2010	70	17	24.3	15.2	5.4	50.0	68.6
2011	57	15	26.3	15.8	5.0	63.2	78.9
2012	66	16	24.2	16.7	4.9	43.9	62.1
2013	62	20	32.3	17.5	5.4	45.2	71.0
2014	59	14	23.7	18.4	5.0	33.9	62.7
2015	52	13	25.0	18.8	4.8	40.4	98.1
2016	32	14	43.8	18.9	6.3	46.9	93.8 ##
1998-2016	1017	308	30.3	18.9	9.4	57.7	83.2

1,017 cases diagnosed 1998-2016 are related to a total of 1,017 patients. Currently, in 279 (27.4 %) of these 1,017 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 216 / 52 / 11 (21.2 % / 5.1 % / 1.1 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2014, a subgroup of 59 cases has been diagnosed, of which 18.4 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 5.0 % 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	8	44.4			0.0	9.6	87.5	100.0
1999	19	54.3	2	10.5	0.0	9.3	63.2	100.0
2000	19	51.4	4	21.1	0.0	9.1	73.7	100.0
2001	19	46.3	6	31.6	3.1	9.0	68.4	94.7
2002	25	42.4	7	28.0	4.4	9.2	68.0	92.0 #
2003	34	47.2	9	26.5	5.6	8.8	70.6	94.1
2004	35	59.3	10	28.6	6.3	9.3	60.0	97.1
2005	22	42.3	6	27.3	6.6	8.3	77.3	100.0
2006	32	57.1	12	37.5	8.9	7.7	75.0	87.5
2007	34	55.7	9	26.5	10.1	7.2	50.0	70.6 #
2008	40	58.0	18	45.0	13.2	6.0	62.5	75.0
2009	31	51.7	8	25.8	13.2	5.8	54.8	71.0
2010	35	50.0	11	31.4	14.7	5.2	60.0	77.1
2011	35	61.4	9	25.7	15.2	4.6	57.1	68.6
2012	40	60.6	9	22.5	15.9	5.0	45.0	62.5
2013	38	61.3	13	34.2	17.0	5.7	50.0	76.3
2014	39	66.1	8	20.5	18.0	4.8	30.8	59.0
2015	30	57.7	8	26.7	18.1	2.2	40.0	96.7
2016	16	50.0	9	56.3	18.5	0.0	62.5	100.0 ##
1998-2016	551	54.2	158	28.7	18.5	9.6	58.1	82.0

551 cases diagnosed 1998-2016 are related to a total of 551 patients. Currently, in 148 (26.9 %) of these 551 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 111 / 30 / 7 (20.1 % / 5.4 % / 1.3 %) 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 39 cases has been diagnosed, of which 18.0 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 4.8 % 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 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	10	55.6	1	10.0	0.0	9.2	70.0	100.0
1999	16	45.7	3	18.8	3.8	9.4	81.3	100.0
2000	18	48.6	6	33.3	6.8	9.3	61.1	100.0
2001	22	53.7	12	54.5	9.1	9.2	77.3	100.0
2002	34	57.6	15	44.1	8.0	8.9	70.6	91.2 #
2003	38	52.8	16	42.1	8.7	8.9	68.4	100.0
2004	24	40.7	10	41.7	9.9	9.3	79.2	91.7
2005	30	57.7	12	40.0	10.9	9.0	53.3	93.3
2006	24	42.9	10	41.7	12.0	8.6	62.5	79.2
2007	27	44.3	10	37.0	12.8	7.3	63.0	85.2 #
2008	29	42.0	7	24.1	13.6	6.0	58.6	79.3
2009	29	48.3	6	20.7	14.6	5.8	44.8	72.4
2010	35	50.0	6	17.1	15.8	5.6	40.0	60.0
2011	22	38.6	6	27.3	16.5	5.6	72.7	95.5
2012	26	39.4	7	26.9	17.7	4.7	42.3	61.5
2013	24	38.7	7	29.2	18.1	4.9	37.5	62.5
2014	20	33.9	6	30.0	18.9	5.3	40.0	70.0
2015	22	42.3	5	22.7	19.6	7.9	40.9	100.0
2016	16	50.0	5	31.3	19.3	12.5	31.3	87.5 ##
1998-2016	466	45.8	150	32.2	19.3	9.2	57.3	84.5

466 cases diagnosed 1998-2016 are related to a total of 466 patients. Currently, in 131 (28.1 %) of these 466 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 105 / 22 / 4 (22.5 % / 4.7 % / 0.9 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2014, a subgroup of 20 cases has been diagnosed, of which 18.9 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 5.3 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 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	8	10	0.7	0.9	0.5	0.5	0.7	0.6	0.8	0.7
1999	19	16	1.7	1.3	1.2	0.7	1.5	1.0	1.7	1.2
2000	19	18	1.7	1.5	1.2	0.7	1.5	1.0	1.8	1.2
2001	19	22	1.6	1.8	1.2	0.8	1.5	1.1	1.8	1.5
2002	25	34	1.3	1.7	0.8	0.9	1.1	1.3	1.5	1.5
2003	34	38	1.8	1.9	1.1	0.9	1.6	1.3	1.9	1.6
2004	35	24	1.9	1.2	1.1	0.6	1.5	0.9	1.9	1.1
2005	22	30	1.2	1.5	0.6	0.7	0.9	1.0	1.2	1.3
2006	32	24	1.7	1.2	0.9	0.5	1.3	0.8	1.7	1.0
2007	34	27	1.5	1.2	0.9	0.5	1.2	0.7	1.5	0.9
2008	40	29	1.8	1.2	0.9	0.5	1.3	0.7	1.8	1.0
2009	31	29	1.4	1.2	0.8	0.6	1.1	0.9	1.3	1.0
2010	35	35	1.6	1.5	0.9	0.7	1.2	1.0	1.6	1.2
2011	35	22	1.6	0.9	0.9	0.4	1.2	0.6	1.5	0.8
2012	40	26	1.8	1.1	1.0	0.5	1.3	0.7	1.7	0.8
2013	38	24	1.7	1.0	0.8	0.5	1.2	0.6	1.5	0.8
2014	39	20	1.7	0.8	0.9	0.4	1.2	0.5	1.5	0.6
2015	30	22	1.3	0.9	0.6	0.4	0.9	0.5	1.2	0.7
2016	16	16	0.7	0.7	0.3	0.3	0.4	0.4	0.6	0.5
1998-2016	551	466	1.5	1.2	0.9	0.6	1.2	0.8	1.5	1.0

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

Table 3

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

Year of diagnosis	Cases n	Std.		Min.	Max.	10%	25%	Median		
		Mean	dev.					50%	75%	90%
1998	18	58.8	22.7	27.0	87.4	27.0	36.6	64.7	81.5	86.5
1999	35	61.5	18.0	1.5	88.5	35.3	54.9	68.2	72.5	79.7
2000	37	63.5	19.9	16.5	97.6	34.7	49.8	66.7	78.1	88.0
2001	41	62.7	21.6	9.8	96.4	32.9	51.2	65.3	79.8	85.9
2002	59	65.2	16.1	27.4	96.1	38.8	54.3	67.3	76.1	83.8
2003	72	64.3	18.7	21.0	98.9	38.1	49.8	68.1	80.4	85.1
2004	59	65.2	15.5	19.4	93.3	44.6	55.2	66.1	76.2	84.7
2005	52	65.9	16.7	25.2	92.9	41.6	56.1	69.4	78.5	84.3
2006	56	68.1	16.3	28.0	92.5	40.9	60.3	71.5	79.0	86.5
2007	61	65.1	19.0	18.0	94.2	37.6	47.2	69.7	81.9	86.0
2008	69	69.9	17.2	11.3	98.1	41.7	62.5	74.3	81.5	87.2
2009	60	64.6	16.6	28.3	100	42.2	52.9	65.8	76.0	85.9
2010	70	67.4	17.6	15.7	91.4	47.6	54.9	72.8	79.9	87.4
2011	57	66.1	16.1	16.6	91.4	43.6	55.2	69.5	78.5	84.1
2012	66	66.4	20.8	5.4	98.7	35.7	57.0	72.4	80.9	88.4
2013	62	67.2	17.1	21.7	92.6	48.0	52.8	71.8	78.3	84.5
2014	59	67.7	17.9	20.5	92.7	38.0	59.0	72.5	81.8	86.7
2015	52	70.3	17.1	24.5	92.1	46.9	58.8	75.0	82.7	88.5
2016	32	71.1	19.1	26.2	96.0	41.9	62.7	78.4	83.8	88.4
1998-2016	1017	66.2	17.9	1.5	100	39.5	54.5	70.3	79.8	86.2

Table 3a

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

Year of diagnosis	Cases n	Std.		Min.	Max.	10%	25%	Median		
		Mean	dev.					50%	75%	90%
1998	8	57.9	20.7	32.4	86.5	32.4	38.6	58.9	74.4	86.5
1999	19	56.3	19.9	1.5	80.3	30.7	43.4	59.9	69.8	78.3
2000	19	59.6	19.0	16.5	97.6	34.7	48.2	60.5	72.4	79.6
2001	19	53.2	23.2	9.8	96.4	23.3	37.7	51.8	77.1	81.6
2002	25	61.5	16.2	32.7	83.8	38.0	49.7	62.4	75.5	78.7
2003	34	59.7	19.3	21.0	91.1	35.2	41.9	61.0	77.3	83.7
2004	35	63.7	16.1	19.4	90.1	41.8	51.0	65.7	75.5	84.6
2005	22	63.0	17.7	30.9	91.0	39.5	43.7	69.4	77.7	81.5
2006	32	68.6	14.7	37.3	92.5	48.2	60.3	70.7	77.0	86.5
2007	34	62.2	19.7	18.0	91.8	33.9	44.6	67.3	77.4	84.0
2008	40	68.4	17.2	11.3	98.1	44.7	61.5	72.6	80.5	84.0
2009	31	63.5	16.8	28.3	92.2	43.0	51.2	65.8	76.3	85.1
2010	35	66.0	18.6	15.7	89.2	38.5	59.9	72.9	78.2	80.2
2011	35	63.8	17.0	16.6	91.4	42.8	53.3	67.7	75.2	83.5
2012	40	64.9	21.3	10.4	94.0	30.6	54.4	72.2	80.9	84.9
2013	38	66.3	17.3	21.7	92.6	39.2	52.4	72.1	76.5	84.5
2014	39	67.3	16.8	20.5	92.7	38.0	59.1	71.2	79.7	85.9
2015	30	69.9	17.5	24.5	91.8	42.8	55.7	74.7	82.1	88.5
2016	16	71.5	18.5	28.9	96.0	31.1	66.2	76.5	81.9	88.4
1998-2016	551	64.2	18.3	1.5	98.1	38.0	51.4	68.4	77.9	84.3

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	10	59.5	25.3	27.0	87.4	27.0	33.6	65.8	81.7	86.5
1999	16	67.6	13.8	35.3	88.5	46.3	58.6	70.8	77.6	79.8
2000	18	67.6	20.5	27.4	93.9	32.2	54.5	73.4	86.2	89.0
2001	22	70.9	16.6	26.8	91.1	53.6	62.4	73.9	84.0	86.8
2002	34	67.9	15.8	27.4	96.1	51.9	55.4	68.6	78.6	88.4
2003	38	68.4	17.3	25.2	98.9	42.2	54.8	73.4	82.3	87.8
2004	24	67.4	14.6	28.0	93.3	49.3	57.4	68.9	78.3	84.7
2005	30	68.1	16.0	25.2	92.9	44.1	60.6	69.7	79.5	85.1
2006	24	67.6	18.6	28.0	92.2	33.3	60.9	73.5	79.8	84.1
2007	27	68.9	17.6	35.1	94.2	43.6	53.2	69.8	84.6	86.4
2008	29	71.9	17.3	26.6	94.9	41.4	62.6	74.9	84.5	88.6
2009	29	65.8	16.5	30.5	100	41.4	56.5	65.8	75.6	89.0
2010	35	68.7	16.6	29.0	91.4	47.6	53.9	72.7	83.6	89.3
2011	22	69.6	14.2	41.3	87.1	50.5	56.2	73.5	81.4	84.1
2012	26	68.6	20.0	5.4	98.7	44.8	57.0	73.1	80.9	90.1
2013	24	68.5	17.1	25.3	92.4	50.7	53.9	70.9	82.9	88.0
2014	20	68.3	20.2	27.9	92.3	36.0	48.7	74.9	84.3	87.7
2015	22	70.9	17.0	31.1	92.1	48.7	59.1	75.9	83.8	88.5
2016	16	70.7	20.4	26.2	94.8	41.9	50.8	79.5	86.2	90.0
1998-2016	466	68.5	17.2	5.4	100	43.5	55.6	72.6	82.3	87.8

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									
5-9	1	0.2	0.2		0.0		1	0.4	0.4
10-14	2	0.3	0.5	2	0.6	0.6			0.4
15-19	6	1.0	1.5	6	1.8	2.4			0.4
20-24	5	0.9	2.4	5	1.5	3.8			0.4
25-29	12	2.0	4.4	7	2.1	5.9	5	2.0	2.4
30-34	8	1.4	5.8	5	1.5	7.4	3	1.2	3.6
35-39	18	3.1	8.8	11	3.3	10.7	7	2.8	6.4
40-44	23	3.9	12.8	15	4.4	15.1	8	3.2	9.6
45-49	32	5.4	18.2	15	4.4	19.5	17	6.8	16.4
50-54	36	6.1	24.3	15	4.4	24.0	21	8.4	24.8
55-59	33	5.6	29.9	17	5.0	29.0	16	6.4	31.2
60-64	34	5.8	35.7	23	6.8	35.8	11	4.4	35.6
65-69	61	10.4	46.1	40	11.8	47.6	21	8.4	44.0
70-74	83	14.1	60.2	53	15.7	63.3	30	12.0	56.0
75-79	69	11.7	71.9	43	12.7	76.0	26	10.4	66.4
80-84	86	14.6	86.6	48	14.2	90.2	38	15.2	81.6
85+	79	13.4	100.0	33	9.8	100.0	46	18.4	100.0
All ages	588	100.0		338	100.0		250	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=102 %	Females DCO rate n=65 %	Males	Females
							Prop.all cancers n=113978 %	Prop.all cancers n=112253 %
0- 4								
5- 9		1		0.1				1.2
10-14	2		0.2				1.7	
15-19	6		0.5				2.4	
20-24	5		0.4				1.1	
25-29	7	5	0.4	0.3			1.0	0.6
30-34	5	3	0.3	0.2			0.5	0.2
35-39	11	7	0.7	0.4			0.8	0.3
40-44	15	8	0.8	0.4			0.7	0.2
45-49	15	17	0.8	0.9	6.7		0.4	0.2
50-54	15	21	0.9	1.2	6.7		0.2	0.2
55-59	17	16	1.2	1.1	17.6	6.3	0.2	0.2
60-64	23	11	1.9	0.8	17.4		0.2	0.1
65-69	40	21	3.4	1.6	20.0	14.3	0.2	0.1
70-74	53	30	4.8	2.4	35.8	16.7	0.3	0.2
75-79	43	26	5.4	2.6	37.2	34.6	0.3	0.2
80-84	48	38	10.4	5.4	56.3	36.8	0.4	0.3
85+	33	46	10.8	6.3	69.7	71.7	0.4	0.4
All ages	338	250			30.2	26.0	0.3	0.2
Incidence								
Raw			1.5	1.1				
WS			0.8	0.5				
ES			1.1	0.7				
BRD-S			1.4	0.8				

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).

ICD-10 C92.1: Chronic myeloid leukaemia (CML), BCR/ABL-positive

Age distribution and age-specific incidence 2007 - 2016 (Males: 338, Females: 250)

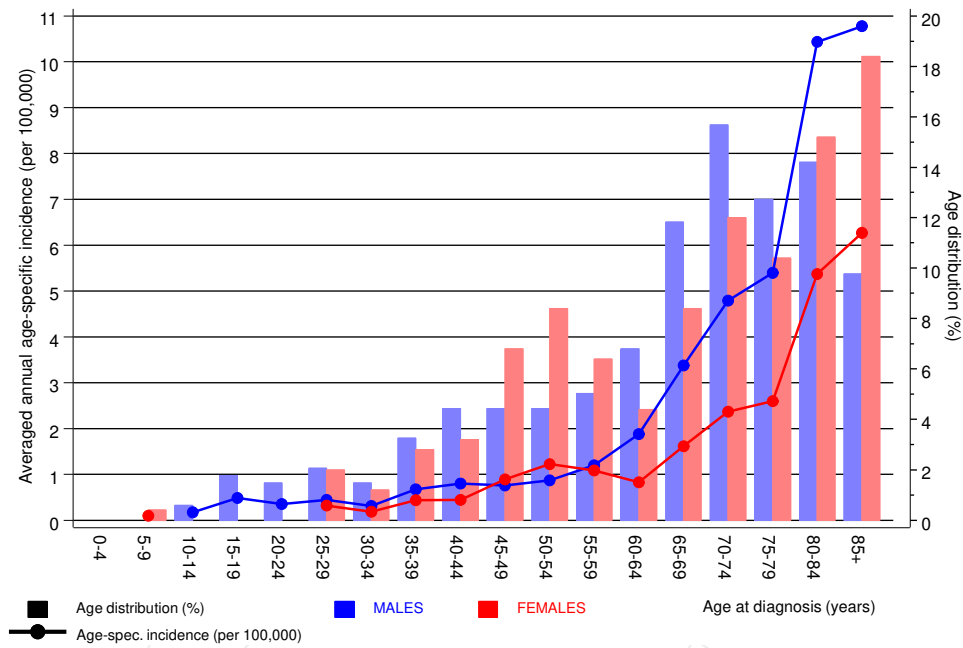


Figure 6. Age distribution (males: mean=66.1 yrs, median=70.9 yrs; females: mean=69.1 yrs, median=73.5 yrs) and age-specific incidence.

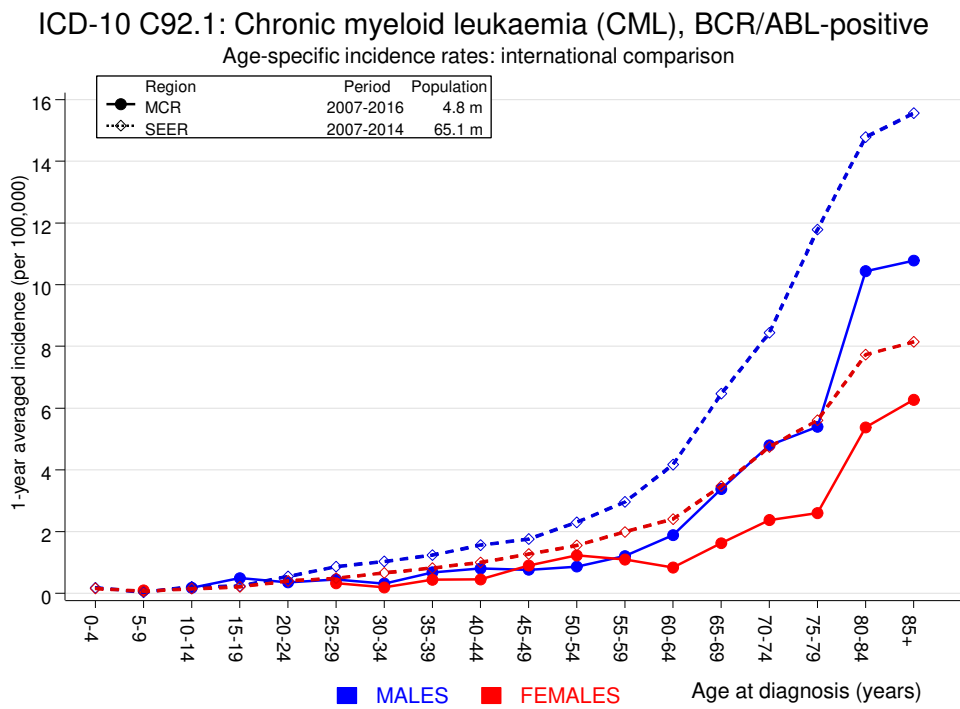


Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 18 Regs Research Data, released April 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 %
C15 Oesophagus	3	0.3	9.1	1.9	26.5 #	18.9	
C16 Stomach	2	0.7	3.0	0.4	10.8	9.4	
C18 Colon	6	1.6	3.7	1.4	8.1 #	31.1	
C22 Liver	3	0.5	6.1	1.3	17.9 #	17.8	
C25 Pancreas	3	0.6	4.8	1.0	14.0	16.8	
C33–C34 Lung	4	2.0	2.0	0.5	5.0	13.9	
C43 Malign. melanoma	6	0.8	7.5	2.8	16.4 #	36.9	
C61 Prostate	10	4.9	2.0	1.0	3.7	36.0	
C64 Kidney	3	0.6	4.8	1.0	14.2 #	16.9	
C67 Bladder	3	0.7	4.1	0.8	12.0	16.1	
C82–C85 NHL	3	0.7	4.2	0.9	12.4	16.3	
C91–C96 Leukaemia	4	0.3	14.2	3.9	36.5 #	26.4	50.0
Others, specified	7	1.9	3.8	1.5	7.7 #	36.4	
Not observed	0	1.7	0.0	0.0	2.1	-12.3	
All further malignancies	57	17.4	3.3	2.5	4.2 #	280.7	3.5

Patients 427
 Median age at next malignancy (years) 71.8
 Person-years 1409
 Mean observation time (years) 3.3
 Median observation time (years) 1.4

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

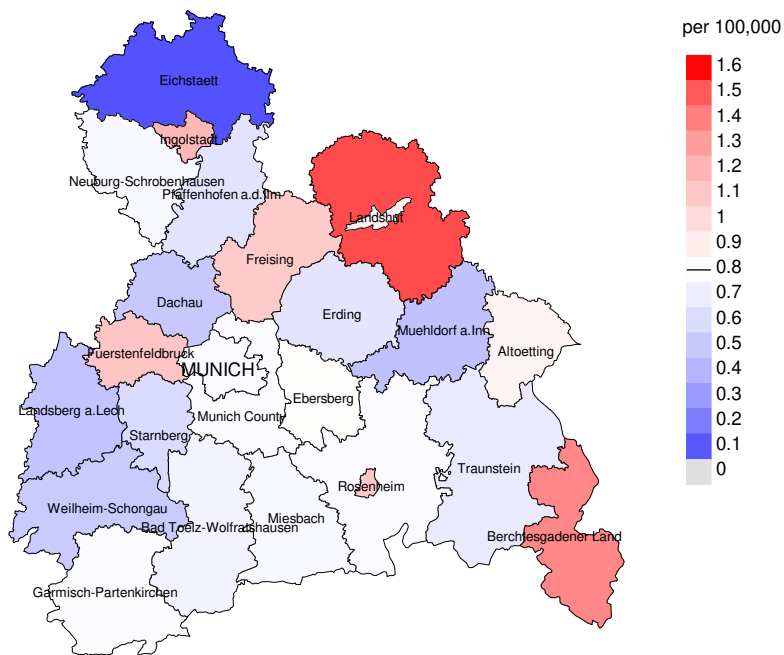
FEMALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C18 Colon	2	1.1	1.9	0.2	6.8	7.5	
C33–C34 Lung	2	0.9	2.3	0.3	8.4	9.2	
C50 Breast	10	3.6	2.8	1.3	5.1 #	51.4	
C53 Cervix uteri	2	0.2	11.0	1.3	39.7 #	14.6	
C54 Corpus uteri	3	0.6	4.7	1.0	13.8	18.9	
C82–C85 NHL	3	0.4	6.9	1.4	20.1 #	20.6	33.3
C91–C96 Leukaemia	3	0.2	16.4	3.4	48.1 #	22.6	33.3
Others, specified	6	1.5	3.9	1.4	8.4 #	35.7	16.7
Not observed	0	3.1	0.0	0.0	1.2	-24.8	
All further malignancies	31	11.6	2.7	1.8	3.8 #	155.7	9.7
Patients		343					
Median age at next malignancy (years)		69.0					
Person-years		1248					
Mean observation time (years)		3.6					
Median observation time (years)		2.5					

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

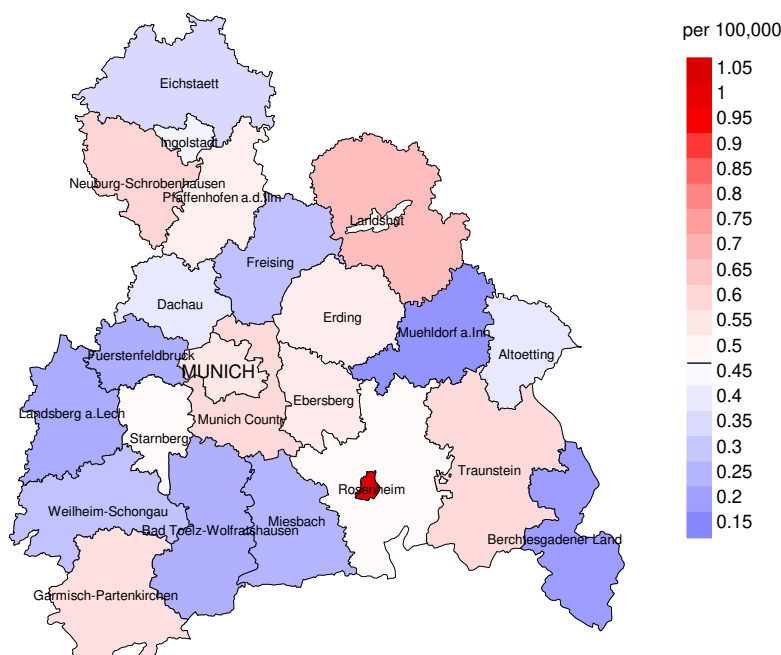
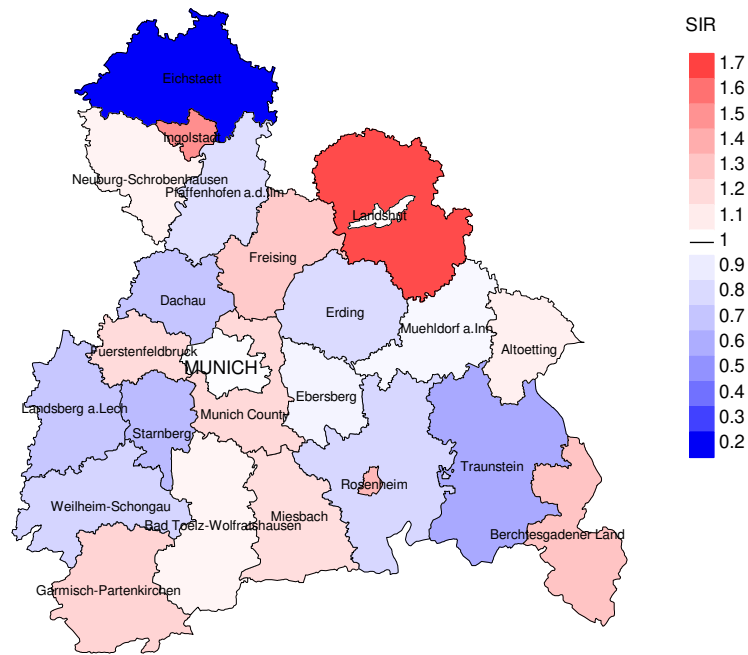


Figure 8a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.8/100,000 WS N=338, females 0.5/100,000 WS N=250).

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 7 women were identified with newly diagnosed chronic myel. leukaemia. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 0.5/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.1 and 1.6/100,000.

Standardized incidence ratio (SIR) 2007 - 2016: Males



Standardized incidence ratio (SIR) 2007 - 2016: Females

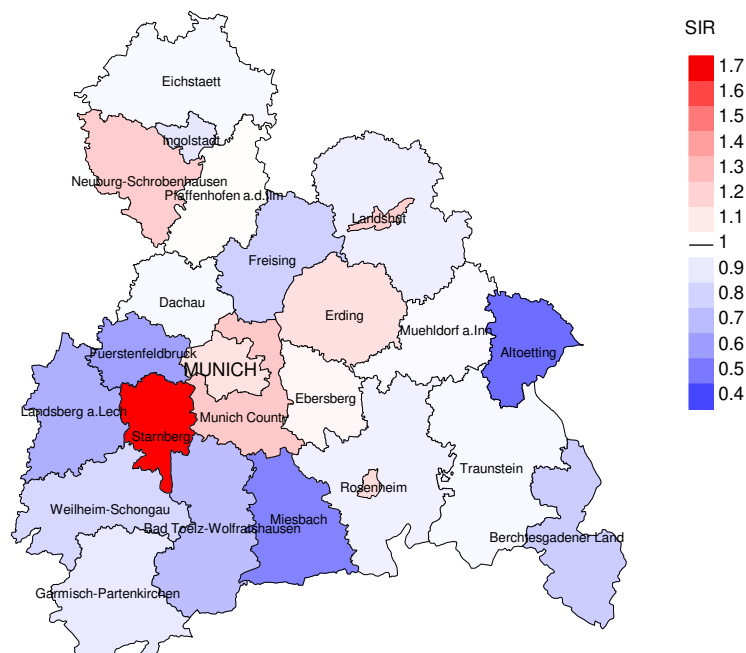


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=338, females N=250).

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 7 women were identified with newly diagnosed chronic myel. leukaemia. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.04. Though, the value of this parameter may vary with an underlying probability of 99% between 0.30 and 2.54, 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	18	100.0	5.6	14	77.8	92.9
1999	35	100.0	14.3	25	71.4	96.0
2000	37	100.0	27.0	25	67.6	100.0
2001	41	97.6	43.9	30	73.2	96.7
2002	59	91.5	37.3	41	69.5	100.0
2003	72	97.2	34.7	50	69.4	100.0
2004	59	94.9	33.9	40	67.8	97.5
2005	52	96.2	34.6	33	63.5	100.0
2006	56	83.9	39.3	39	69.6	100.0
2007	61	77.0	31.1	34	55.7	100.0
2008	69	76.8	36.2	42	60.9	100.0
2009	60	71.7	23.3	30	50.0	100.0
2010	70	68.6	24.3	35	50.0	100.0
2011	57	78.9	26.3	36	63.2	97.2
2012	66	62.1	24.2	29	43.9	100.0
2013	62	71.0	32.3	28	45.2	100.0
2014	59	62.7	23.7	20	33.9	100.0
2015	52	98.1	25.0	21	40.4	100.0
2016	32	93.8	43.8	15	46.9	100.0
1998-2016	1017	83.2	30.3	587	57.7	99.1

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	18	14	100.0	2	11.1
1999	35	14	92.9	1	2.9
2000	37	27	92.6	10	27.0
2001	41	31	96.8	15	36.6
2002	59	37	100.0	24	40.7
2003	72	30	100.0	25	34.7
2004	59	37	97.3	20	33.9
2005	52	36	100.0	20	38.5
2006	56	35	100.0	28	50.0
2007	61	27	100.0	21	34.4
2008	69	28	96.4	27	39.1
2009	60	26	100.0	18	30.0
2010	70	22	100.0	17	24.3
2011	57	37	100.0	20	35.1
2012	66	32	96.9	18	27.3
2013	62	45	97.8	22	35.5
2014	59	44	100.0	17	28.8
2015	52	38	100.0	18	34.6
2016	32	19	100.0	15	46.9
1998-2016	1017	579	98.6	338	33.2

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	14	57.1	42.9	85.7
1999	14	50.0	50.0	92.3
2000	27	77.8	22.2	100.0
2001	31	71.0	29.0	93.3
2002	37	81.1	18.9	97.3
2003	30	76.7	23.3	100.0
2004	37	81.1	18.9	94.4
2005	36	86.1	13.9	100.0
2006	35	94.3	5.7	100.0
2007	27	85.2	14.8	100.0
2008	28	53.6	46.4	88.9
2009	26	65.4	34.6	96.2
2010	22	77.3	22.7	90.9
2011	37	75.7	24.3	91.9
2012	32	62.5	37.5	93.5
2013	45	64.4	35.6	88.6
2014	44	68.2	31.8	88.6
2015	38	65.8	34.2	86.8
2016	19	68.4	31.6	100.0
1998-2016	579	72.9	27.1	94.0

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	8	61.3	62.9	57.1	66.4
1999	11	69.4	56.3	74.9	62.8
2000	15	74.7	70.2	76.7	77.7
2001	7	62.5	61.4	64.0	62.5
2002	13	65.2	65.2	61.3	66.4
2003	14	74.5	72.4	76.5	74.5
2004	20	75.4	75.8	68.6	75.4
2005	22	72.9	72.3	73.5	72.9
2006	22	75.1	75.0	75.9	75.1
2007	11	72.8	70.9	85.5	72.8
2008	15	72.0	77.1	53.5	72.5
2009	15	77.2	77.2	75.3	78.3
2010	16	78.9	78.4	80.0	78.9
2011	22	76.1	75.2	83.8	76.1
2012	23	75.8	73.4	81.4	75.4
2013	27	75.0	76.6	73.7	75.8
2014	27	74.1	73.2	75.6	74.1
2015	19	79.3	81.6	75.6	80.2
2016	12	76.2	77.5	74.4	76.2
1998-2016	319	74.8	74.2	75.3	74.8

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

Table 10b

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

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	6	43.3	43.3	52.3	46.9
1999	3	81.1	79.1	81.2	79.1
2000	12	83.4	78.2	86.9	83.4
2001	24	80.3	77.0	87.3	79.3
2002	24	73.4	72.3	82.8	73.4
2003	16	80.6	77.7	83.3	80.6
2004	17	74.6	74.8	74.6	74.2
2005	14	78.7	73.6	87.5	78.7
2006	13	73.4	74.7	67.0	73.4
2007	16	80.4	77.5	86.4	80.4
2008	13	81.3	72.8	85.7	79.9
2009	11	84.9	86.3	67.7	84.9
2010	6	85.6	85.6		85.6
2011	15	79.5	76.6	86.8	80.0
2012	9	77.6	79.5	77.4	78.5
2013	18	83.9	77.6	88.6	82.5
2014	17	78.8	77.2	79.4	78.8
2015	19	79.5	78.9	81.2	79.3
2016	7	85.5	82.4	85.5	85.5
1998–2016	260	79.3	76.6	83.7	79.2

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	4	0.4	0.50	0.2	0.43	0.3	0.45	0.4	0.48
1999	5	0.4	0.26	0.3	0.25	0.4	0.26	0.5	0.26
2000	13	1.1	0.68	0.7	0.60	1.0	0.68	1.4	0.78
2001	6	0.5	0.32	0.3	0.24	0.4	0.28	0.6	0.33
2002	9	0.5	0.36	0.3	0.37	0.4	0.35	0.5	0.33
2003	13	0.7	0.38	0.4	0.35	0.6	0.38	0.8	0.40
2004	16	0.9	0.46	0.4	0.39	0.7	0.46	1.0	0.51
2005	19	1.0	0.86	0.5	0.79	0.8	0.84	1.1	0.92
2006	21	1.1	0.66	0.5	0.61	0.9	0.64	1.2	0.70
2007	10	0.5	0.29	0.2	0.24	0.3	0.28	0.4	0.28
2008	9	0.4	0.23	0.2	0.20	0.3	0.24	0.4	0.24
2009	9	0.4	0.29	0.2	0.20	0.3	0.25	0.4	0.33
2010	11	0.5	0.31	0.2	0.22	0.3	0.28	0.5	0.31
2011	18	0.8	0.51	0.4	0.38	0.6	0.46	0.8	0.53
2012	15	0.7	0.38	0.3	0.27	0.4	0.32	0.6	0.37
2013	17	0.7	0.45	0.3	0.34	0.5	0.41	0.7	0.45
2014	20	0.9	0.51	0.4	0.46	0.6	0.49	0.8	0.50
2015	14	0.6	0.47	0.2	0.40	0.4	0.45	0.5	0.44
2016	9	0.4	0.56	0.2	0.49	0.2	0.54	0.3	0.55
1998-2016	238	0.6	0.43	0.3	0.36	0.5	0.41	0.7	0.44

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	4	0.3	0.40	0.2	0.50	0.3	0.50	0.3	0.43
1999	2	0.2	0.13	0.0	0.06	0.1	0.08	0.2	0.13
2000	8	0.7	0.44	0.2	0.29	0.4	0.36	0.5	0.44
2001	16	1.3	0.73	0.5	0.62	0.8	0.68	1.1	0.76
2002	21	1.1	0.62	0.5	0.53	0.7	0.55	0.9	0.61
2003	10	0.5	0.26	0.2	0.18	0.3	0.21	0.4	0.26
2004	14	0.7	0.58	0.3	0.47	0.5	0.53	0.6	0.59
2005	12	0.6	0.40	0.2	0.34	0.4	0.36	0.5	0.37
2006	12	0.6	0.50	0.2	0.44	0.4	0.49	0.5	0.50
2007	13	0.6	0.48	0.2	0.40	0.3	0.43	0.4	0.46
2008	6	0.3	0.21	0.1	0.22	0.2	0.23	0.2	0.24
2009	8	0.3	0.28	0.1	0.11	0.1	0.15	0.2	0.19
2010	6	0.3	0.17	0.1	0.10	0.1	0.12	0.2	0.14
2011	10	0.4	0.45	0.2	0.39	0.2	0.40	0.3	0.46
2012	5	0.2	0.19	0.1	0.12	0.1	0.15	0.2	0.20
2013	12	0.5	0.50	0.2	0.35	0.3	0.40	0.3	0.41
2014	10	0.4	0.50	0.1	0.35	0.2	0.42	0.3	0.45
2015	11	0.5	0.50	0.1	0.38	0.2	0.41	0.3	0.49
2016	4	0.2	0.25	0.1	0.20	0.1	0.22	0.1	0.21
1998-2016	184	0.5	0.39	0.2	0.31	0.3	0.34	0.4	0.38

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									
5-9									
10-14									
15-19									
20-24									
25-29									
30-34									
35-39	1	0.5	0.5	1	0.8	0.8			0.0
40-44	2	0.9	1.4	2	1.5	2.3			0.0
45-49	3	1.4	2.8			2.3	3	3.5	3.5
50-54	7	3.2	6.0	5	3.8	6.1	2	2.4	5.9
55-59	14	6.5	12.4	9	6.8	12.9	5	5.9	11.8
60-64	7	3.2	15.7	5	3.8	16.7	2	2.4	14.1
65-69	25	11.5	27.2	17	12.9	29.5	8	9.4	23.5
70-74	36	16.6	43.8	24	18.2	47.7	12	14.1	37.6
75-79	41	18.9	62.7	25	18.9	66.7	16	18.8	56.5
80-84	36	16.6	79.3	22	16.7	83.3	14	16.5	72.9
85+	45	20.7	100.0	22	16.7	100.0	23	27.1	100.0
All ages	217	100.0		132	100.0		85	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		Females		Males		Females	
	n	n	Age- spec. mortal.	MI-index	Age- spec. mortal.	MI-index	Prop.all cancers %	Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19								
20-24								
25-29								
30-34								
35-39	1		0.1	0.09			0.5	
40-44	2		0.1	0.13			0.4	
45-49		3			0.2	0.18		0.2
50-54	5	2	0.3	0.33	0.1	0.10	0.2	0.1
55-59	9	5	0.6	0.53	0.3	0.31	0.3	0.2
60-64	5	2	0.4	0.22	0.2	0.18	0.1	0.1
65-69	17	8	1.4	0.43	0.6	0.38	0.2	0.2
70-74	24	12	2.2	0.45	0.9	0.40	0.3	0.2
75-79	25	16	3.1	0.58	1.6	0.62	0.3	0.2
80-84	22	14	4.8	0.46	2.0	0.37	0.3	0.2
85+	22	23	7.2	0.67	3.1	0.50	0.3	0.2
All ages	132	85					0.3	0.2
Mortality								
Raw			0.6	0.39	0.4	0.34		
WS			0.2	0.30	0.1	0.24		
ES			0.4	0.36	0.2	0.28		
BRD-S			0.5	0.39	0.3	0.31		
PYLL-70								
per 100,000			1.8		1.0			
ES			1.6		0.8			
AYLL-70			9.4		10.0			

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	1	1.3					1	100.0
C09-C10 Oropharynx	2	2.5	1	50.0			1	50.0
C15 Oesophagus	2	2.5					2	100.0
C16 Stomach	4	5.0	3	75.0			1	25.0
C18 Colon	5	6.3	2	40.0			3	60.0
C19-C20 Rectum	4	5.0	2	50.0	2	50.0		
C22 Liver	6	7.5	2	33.3	1	16.7	3	50.0
C25 Pancreas	4	5.0	1	25.0			3	75.0
C33-C34 Lung	8	10.0	4	50.0	1	12.5	3	37.5
C40-C41 Bone	1	1.3					1	100.0
C43 Malign. melanoma	1	1.3					1	100.0
C44 Skin others	4	5.0	1	25.0			3	75.0
C61 Prostate	13	16.3	12	92.3			1	7.7
C62 Testis	1	1.3	1	100.0				
C64 Kidney	3	3.8	3	100.0				
C65 Renal pelvis	1	1.3	1	100.0				
C67 Bladder	3	3.8	2	66.7			1	33.3
C73 Thyroid	1	1.3	1	100.0				
C76-C79 CUP	2	2.5	1	50.0	1	50.0		
C82-C85 NHL	4	5.0	2	50.0			2	50.0
C90 Mult. myeloma	1	1.3	1	100.0				
C91-C96 Leukaemia	9	11.3			2	22.2	7	77.8
All further malignancies	80	100.0	40	50.0	7	8.8	33	41.3

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 1998-2016
FEMALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C09-C10 Oropharynx	1	1.9					1	100.0
C12-C13 Hypopharynx	1	1.9	1	100.0				
C18 Colon	1	1.9					1	100.0
C19-C20 Rectum	3	5.8	2	66.7	1	33.3		
C23-C24 Bile	2	3.8	2	100.0				
C25 Pancreas	2	3.8			2	100.0		
C33-C34 Lung	3	5.8	1	33.3	1	33.3	1	33.3
C43 Malign. melanoma	1	1.9	1	100.0				
C44 Skin others	4	7.7	1	25.0			3	75.0
C50 Breast	13	25.0	9	69.2	1	7.7	3	23.1
C51 Vulva	2	3.8	1	50.0			1	50.0
C52 Vagina	1	1.9	1	100.0				
C53 Cervix uteri	3	5.8	2	66.7	1	33.3		
C54 Corpus uteri	4	7.7	3	75.0			1	25.0
C56 Ovary	1	1.9					1	100.0
C61 Prostate	1	1.9	1	100.0				
C64 Kidney	1	1.9	1	100.0				
C67 Bladder	1	1.9	1	100.0				
C70-C72 CNS cancer	2	3.8	1	50.0			1	50.0
C82-C85 NHL	2	3.8	1	50.0			1	50.0
C90 Mult. myeloma	1	1.9					1	100.0
C91-C96 Leukaemia	2	3.8					2	100.0
All further malignancies	52	100.0	29	55.8	6	11.5	17	32.7

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 n	Females n	Males Age- spec. mortal.	Males MI-index	Females Age- spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19								
20-24								
25-29								
30-34								
35-39								
40-44	2		0.1	0.15			0.4	
45-49		3			0.2	0.21		0.3
50-54	4	1	0.2	0.33	0.1	0.06	0.2	0.1
55-59	7	5	0.5	0.47	0.3	0.50	0.2	0.2
60-64	5	1	0.4	0.28	0.1	0.13	0.1	0.0
65-69	13	6	1.1	0.43	0.5	0.33	0.2	0.1
70-74	20	8	1.8	0.57	0.6	0.40	0.3	0.2
75-79	17	12	2.1	0.57	1.2	0.67	0.3	0.2
80-84	15	7	3.3	0.52	1.0	0.32	0.3	0.1
85+	16	20	5.2	0.76	2.7	0.65	0.3	0.3
All ages	99	63					0.2	0.2
Mortality								
Raw			0.4	0.39	0.3	0.34		
WS			0.2	0.29	0.1	0.23		
ES			0.3	0.35	0.1	0.27		
BRD-S			0.4	0.38	0.2	0.30		
PYLL-70								
per 100,000			1.4		0.9			
ES			1.2		0.7			
AYLL-70			9.1		10.6			

* 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 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						
20-24						
25-29						
30-34						
35-39						
40-44						
45-49		3		0.2	0.27	0.3
50-54	3		0.2	0.25	0.2	
55-59	6	4	0.4	0.43	0.3	0.2
60-64	3	1	0.2	0.20	0.1	0.0
65-69	12	4	1.0	0.46	0.3	0.2
70-74	15	5	1.4	0.50	0.4	0.2
75-79	14	10	1.8	0.48	1.0	0.67
80-84	13	6	2.8	0.45	0.8	0.38
85+	15	19	4.9	0.71	2.6	0.61
All ages	81	52			0.2	0.1
Mortality						
Raw			0.4	0.34	0.2	0.31
WS			0.1	0.25	0.1	0.19
ES			0.2	0.30	0.1	0.23
BRD-S			0.3	0.34	0.1	0.27
PYLL-70						
per 100,000			0.9		0.7	
ES			0.8		0.5	
AYLL-70			7.5		11.3	

* See corresponding tables with multiple malignancies.

ICD-10 C92.1: Chronic myeloid leukaemia (CML), BCR/ABL-positive
 Age distribution and age-specific mortality 2007 - 2016 (Males: 132, Females: 85)

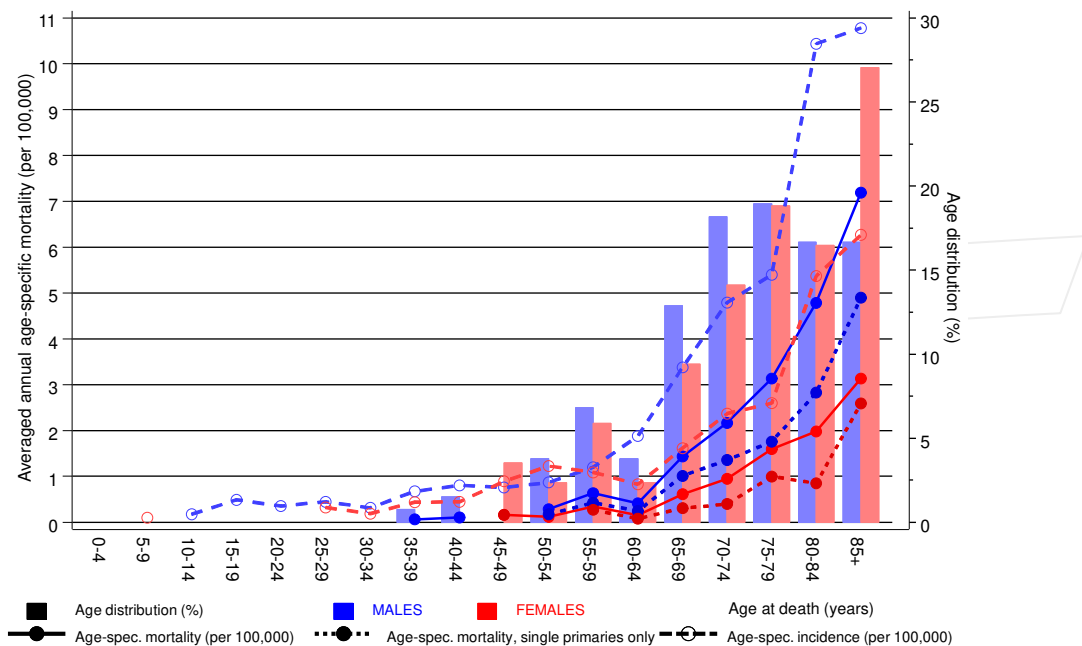
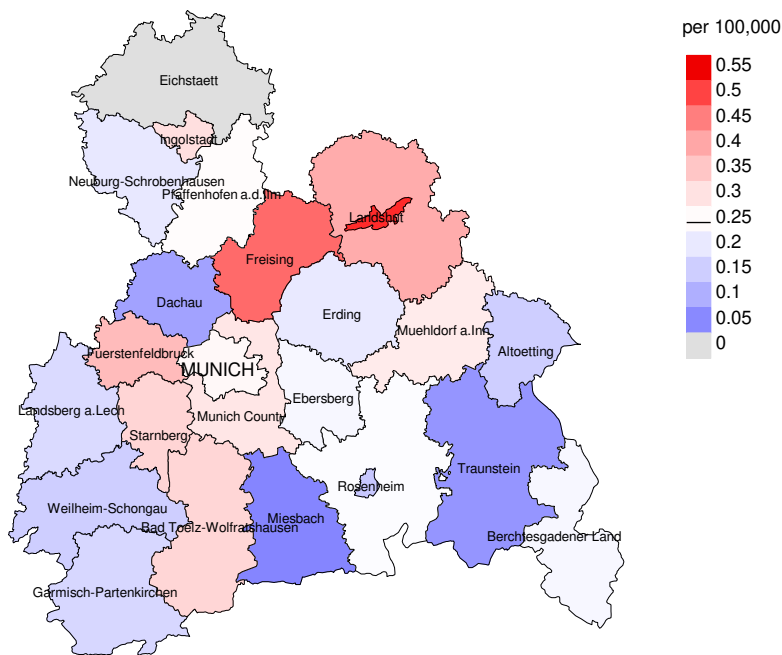


Figure 17. Distribution of age at death (bars; males: mean=71.0 yrs, median=73.9 yrs; females: mean=73.0 yrs, median=78.3 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

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



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

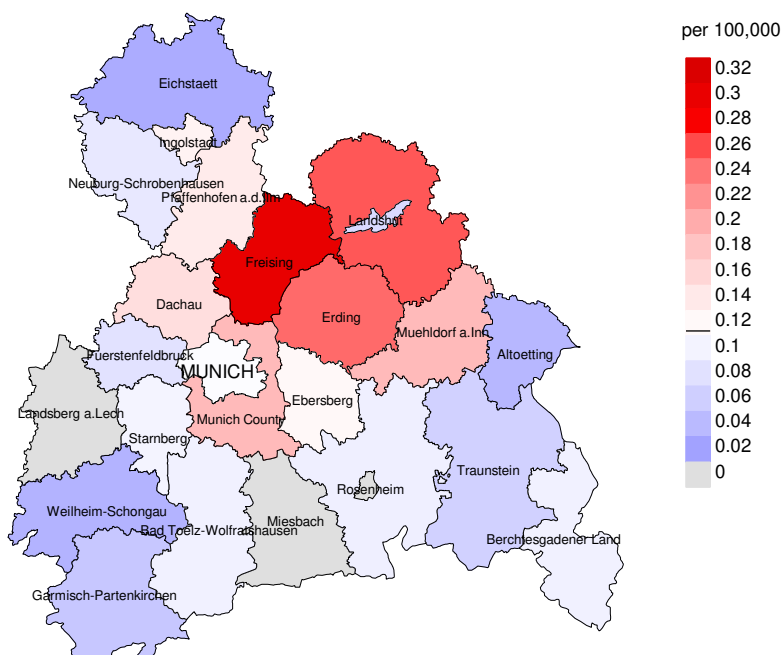
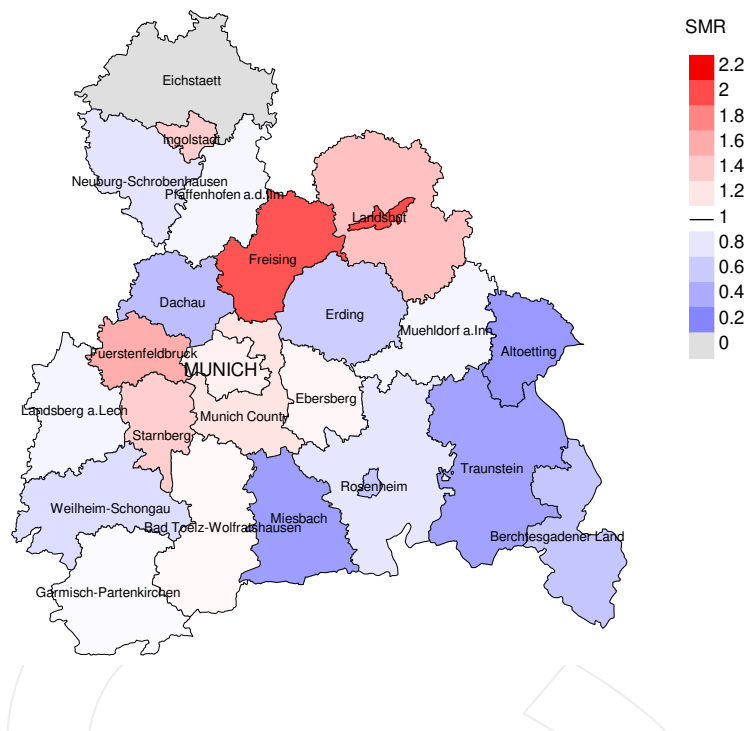


Figure 18a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2016. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.2/100,000 WS N=132, females 0.1/100,000 WS N=85).

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 2 women died from chronic myel. leukaemia. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.1/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.0 and 1.1/100,000.

Standardized mortality ratio (SMR) 2007 - 2016: Males



Standardized mortality ratio (SMR) 2007 - 2016: Females

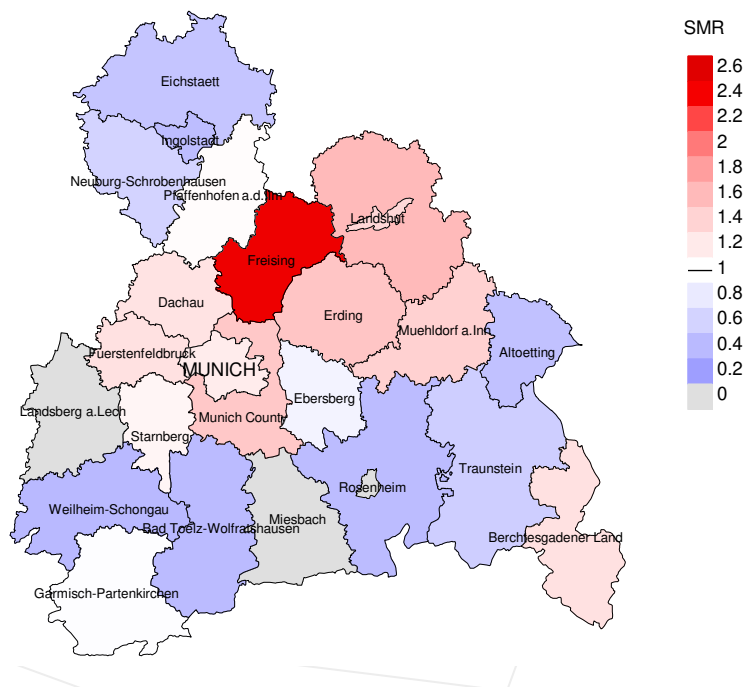


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=132, females N=85).

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 2 women died from chronic myel. leukaemia. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.89. Though, the value of this parameter may vary with an underlying probability of 99% between 0.05 and 4.13, 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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