

Munich Cancer Registry



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

ICD-10 C88,C90: Immunoprolif. disease

Incidence and Mortality

Year of diagnosis	1998-2019
Patients	6,174
Diseases	6,194
Creation date	01/26/2021
Database export	01/07/2021
Population	4.92 m





Munich Cancer Registry
Cancer Registry Bavaria - Upper Bavaria Regional Center
at Klinikum Grosshadern/IBE
Marchioninstr. 15
Munich, 81377
Germany

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

<https://www.tumorregister-muenchen.de/en/facts/base/bC8890E-ICD-10-C88-C90-Immunoprolif.-disease-incidence-and-mortality.pdf>

Index of figures and tables

Fig./Tbl.		Page
1	Annual cases, DCO, mult. malignancies, follow-up / yr	5
2	Incidence by year of diagnosis	8
3	Age distribution parameters by year of diagnosis	9
4	Age distribution by 5-year age group and sex	12
5	Age-specific incidence, DCO rate, proportion malignancies	13
6	Age distribution and age-specific incidence (chart)	14
6a	Age-specific incidence internationally (chart)	15
7	Standardized incidence ratio of further malignancies	16
8a	Map of cancer incidence (BRD-S) by county (chart)	18
8b	Standardized incidence ratio (SIR) by county (chart)	19
9a	Pts incident cohorts and mortality / yr	20
9b	Incidence and mortality by year of diagnosis	21
9c	Cancer-related deaths, death certification available / yr	22
10	Medians of age at death / yr	23
11	Mortality by year of death	25
12	Distribution of age at death	27
13	Age-specific mortality	28
14	Further malignancies in deaths	29
15	Age-specific mortality (first primaries)	31
16	Age-specific mortality (single primaries)	32
17	Age distribution and age-specific mortality (chart)	33
18a	Map of cancer mortality (BRD-S) by county (chart)	34
18b	Standardized mortality ratio (SMR) by county (chart)	35

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

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

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

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

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

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

Munich Cancer Registry, January 2021

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

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

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

Some remarks regarding this cancer type

The results for immunoproliferative and plasma cell neoplasms 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
C88.-	Malignant immunoproliferative diseases
C88.0	Waldenström macroglobulinaemia
C88.2	Other heavy chain disease
C88.3	Immunoproliferative small intestinal disease
C88.4	Extranodal marginal zone B-cell lymphoma of mucosa-associated lymphoid tissue [MALT-lyphoma]
C88.7	Other malignant immunoproliferative diseases
C88.9	Malignant immunoproliferative disease, unspecified
C90.-	Multiple myeloma and malignant plasma cell neoplasms
C90.0	Multiple myeloma
C90.1	Plasma cell leukaemia
C90.2	Extramedullary plasmacytoma
C90.3	Solitary plasmacytoma

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	145	32	22.1	9.0	10.6	87.6	97.2
1999	154	30	19.5	12.7	10.5	91.6	98.1
2000	156	48	30.8	12.1	10.6	92.9	98.7
2001	154	34	22.1	12.3	10.6	85.7	97.4
2002	285	79	27.7	13.0	10.4	86.3	98.2 #
2003	291	59	20.3	13.0	10.4	83.2	97.9
2004	286	66	23.1	13.3	10.1	83.6	98.3
2005	286	46	16.1	14.1	9.9	83.6	97.2
2006	311	47	15.1	14.6	9.7	79.1	96.1
2007	386	68	17.6	14.9	9.4	80.6	96.9 #
2008	390	59	15.1	14.8	9.3	77.7	98.7
2009	338	45	13.3	15.1	8.8	74.6	98.5
2010	370	54	14.6	15.6	8.6	71.1	97.8
2011	405	65	16.0	16.1	8.1	65.4	96.0
2012	349	49	14.0	17.0	7.8	63.3	97.4
2013	361	52	14.4	17.3	7.4	63.7	97.0
2014	346	38	11.0	17.9	6.7	55.2	96.5
2015	358	54	15.1	18.1	6.6	60.3	95.3
2016	309	61	19.7	18.3	6.6	52.8	99.4
2017	247	43	17.4	18.5	6.6	42.9	99.6
2018	174	16	9.2	18.8	5.4	39.1	97.7
2019	93	5	5.4	19.0	3.3	22.6	74.2 ##
1998-2019	6194	1050	17.0	19.0	10.6	70.5	97.2

6,194 cases diagnosed 1998-2019 are related to a total of 6,174 patients. Currently, in 1,760 (28.5 %) of these 6,174 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 1,366 / 306 / 88 (22.1 % / 5.0 % / 1.4 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2017, a subgroup of 247 cases has been diagnosed, of which 18.5 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 6.6 % 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	84	57.9	14	16.7	10.7	12.4	86.9	98.8
1999	79	51.3	14	17.7	13.5	12.2	91.1	98.7
2000	91	58.3	32	35.2	13.0	12.2	94.5	98.9
2001	73	47.4	14	19.2	14.1	12.2	86.3	98.6
2002	149	52.3	36	24.2	15.1	11.9	83.9	98.0 #
2003	170	58.4	34	20.0	14.6	12.0	81.8	97.1
2004	141	49.3	30	21.3	14.5	11.6	83.7	99.3
2005	148	51.7	21	14.2	14.9	11.5	85.1	97.3
2006	156	50.2	21	13.5	15.2	11.3	76.9	96.8
2007	202	52.3	40	19.8	15.7	10.7	81.2	96.0 #
2008	218	55.9	35	16.1	15.5	10.5	78.4	98.6
2009	170	50.3	22	12.9	15.6	10.0	74.1	98.2
2010	220	59.5	24	10.9	16.4	9.6	72.3	98.6
2011	210	51.9	24	11.4	17.1	8.9	67.1	97.6
2012	194	55.6	24	12.4	17.8	8.7	62.4	96.4
2013	202	56.0	30	14.9	18.3	8.4	63.9	97.0
2014	184	53.2	19	10.3	18.8	7.7	56.5	97.3
2015	192	53.6	29	15.1	18.6	7.3	57.8	93.2
2016	186	60.2	30	16.1	19.1	7.6	55.9	98.9
2017	135	54.7	20	14.8	19.6	6.4	41.5	100.0
2018	102	58.6	8	7.8	19.8	6.0	44.1	96.1
2019	54	58.1	3	5.6	19.9	3.8	25.9	75.9 ##
1998-2019	3360	54.2	524	15.6	19.9	12.4	70.4	97.2

3,360 cases diagnosed 1998-2019 are related to a total of 3,354 patients. Currently, in 1,042 (31.1 %) of these 3,354 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 786 / 186 / 70 (23.4 % / 5.5 % / 2.1 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2017, a subgroup of 135 cases has been diagnosed, of which 19.6 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 6.4 % 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	61	42.1	18	29.5	6.6	8.6	88.5	95.1
1999	75	48.7	16	21.3	11.8	8.5	92.0	97.3
2000	65	41.7	16	24.6	10.9	8.6	90.8	98.5
2001	81	52.6	20	24.7	10.3	8.7	85.2	96.3
2002	136	47.7	43	31.6	10.5	8.5	89.0	98.5 #
2003	121	41.6	25	20.7	11.1	8.5	85.1	99.2
2004	145	50.7	36	24.8	11.8	8.2	83.4	97.2
2005	138	48.3	25	18.1	13.3	8.0	81.9	97.1
2006	155	49.8	26	16.8	13.8	7.9	81.3	95.5
2007	184	47.7	28	15.2	14.0	7.9	79.9	97.8 #
2008	172	44.1	24	14.0	14.1	7.7	76.7	98.8
2009	168	49.7	23	13.7	14.5	7.4	75.0	98.8
2010	150	40.5	30	20.0	14.7	7.2	69.3	96.7
2011	195	48.1	41	21.0	14.9	7.1	63.6	94.4
2012	155	44.4	25	16.1	15.9	6.6	64.5	98.7
2013	159	44.0	22	13.8	16.3	6.2	63.5	96.9
2014	162	46.8	19	11.7	16.9	5.4	53.7	95.7
2015	166	46.4	25	15.1	17.5	5.7	63.3	97.6
2016	123	39.8	31	25.2	17.3	5.3	48.0	100.0
2017	112	45.3	23	20.5	17.3	6.8	44.6	99.1
2018	72	41.4	8	11.1	17.5	4.5	31.9	100.0
2019	39	41.9	2	5.1	17.8	2.6	17.9	71.8 ##
1998–2019	2834	45.8	526	18.6	17.8	8.6	70.6	97.1

2,834 cases diagnosed 1998-2019 are related to a total of 2,820 patients. Currently, in 718 (25.5 %) of these 2,820 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 580 / 120 / 18 (20.6 % / 4.3 % / 0.6 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2017, a subgroup of 112 cases has been diagnosed, of which 17.3 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 6.8 % 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 2

Incidence measures by year of diagnosis including DCO cases
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.92 m as of 2007, respectively)

Year of diagnosis	Males n	Females n	Males Inc. raw	Fem. Inc. raw	Males Inc. WS	Fem. Inc. WS	Males Inc. ES	Fem. Inc. ES	Males Inc. BRD-S	Fem. Inc. BRD-S
1998	84	61	7.6	5.2	4.7	2.5	6.8	3.6	8.4	4.4
1999	79	75	7.1	6.3	4.3	2.6	6.4	4.0	8.8	5.3
2000	91	65	8.0	5.4	4.5	2.3	7.1	3.5	9.9	4.6
2001	73	81	6.3	6.7	3.7	3.2	5.6	4.6	7.5	5.8
2002	149	136	8.0	6.9	4.5	2.9	6.8	4.4	8.7	5.7
2003	170	121	9.1	6.1	5.1	2.8	7.4	4.1	9.5	5.2
2004	141	145	7.5	7.3	4.2	3.1	6.2	4.6	7.9	6.0
2005	148	138	7.8	6.9	4.1	2.8	6.2	4.3	8.1	5.7
2006	156	155	8.1	7.7	4.3	3.2	6.4	4.8	8.2	6.2
2007	202	184	9.1	8.0	4.7	3.4	7.1	4.9	9.4	6.4
2008	218	172	9.8	7.4	5.0	3.0	7.4	4.6	9.5	6.1
2009	170	168	7.6	7.2	3.7	3.0	5.5	4.4	7.1	5.6
2010	220	150	9.8	6.4	5.0	2.7	7.3	3.9	9.3	5.0
2011	210	195	9.4	8.3	4.5	3.6	6.6	5.3	8.7	6.7
2012	194	155	8.5	6.6	4.0	2.6	6.0	3.9	7.7	5.2
2013	202	159	8.8	6.7	4.0	2.8	6.0	4.2	8.1	5.4
2014	184	162	7.9	6.7	3.7	2.9	5.5	4.2	7.1	5.3
2015	192	166	8.1	6.8	3.7	2.7	5.6	4.0	7.3	5.2
2016	186	123	7.7	5.0	3.4	1.8	5.2	2.8	6.9	3.7
2017	135	112	5.6	4.5	2.6	1.9	3.9	2.7	5.0	3.5
2018	102	72	4.2	2.9	1.9	1.1	2.9	1.6	3.7	2.2
2019	54	39	2.2	1.6	1.0	0.6	1.6	0.9	1.9	1.2
1998-2019	3360	2834	7.6	6.2	3.8	2.6	5.7	3.8	7.4	4.9

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	145	66.7	13.2	26.1	94.0	50.1	58.4	67.1	75.7	84.8
1999	154	69.6	12.7	23.9	92.8	53.5	60.1	71.1	79.1	84.1
2000	156	71.2	12.2	23.0	94.4	55.7	63.6	72.3	79.5	85.8
2001	154	68.3	10.9	36.1	93.7	51.7	60.3	69.4	76.6	81.0
2002	285	70.0	12.5	30.3	93.5	54.9	61.4	70.9	79.5	86.2
2003	291	68.4	11.5	27.3	99.0	54.1	61.5	68.3	77.0	82.8
2004	286	69.4	12.3	29.1	93.4	52.5	62.2	70.2	78.5	84.0
2005	286	70.5	12.1	25.2	102	54.4	63.9	71.7	79.2	84.5
2006	311	70.3	12.2	22.7	95.3	54.8	63.5	71.0	79.0	85.1
2007	386	70.4	11.8	16.4	95.2	55.2	64.1	71.1	79.4	83.8
2008	390	70.6	11.8	33.8	97.9	55.1	64.0	70.8	79.3	85.1
2009	338	70.7	11.6	34.7	94.6	54.3	64.5	71.2	79.0	85.5
2010	370	69.5	13.2	5.0	97.2	51.0	62.6	71.1	78.8	85.2
2011	405	69.7	13.4	9.2	97.5	50.5	61.5	72.2	78.6	85.0
2012	349	70.5	12.5	8.5	97.5	52.0	63.6	72.3	78.9	84.8
2013	361	71.0	12.0	29.8	93.1	54.1	63.0	73.2	79.9	84.8
2014	346	70.5	11.9	34.2	99.6	53.9	62.7	72.2	79.3	84.9
2015	358	71.6	12.1	27.7	95.2	53.2	63.6	73.9	80.2	85.8
2016	309	71.7	12.3	22.4	99.9	54.5	65.1	74.9	79.8	85.1
2017	247	71.3	12.6	30.8	96.6	53.8	64.6	73.0	79.5	85.8
2018	174	71.3	11.6	38.2	92.7	53.4	63.5	74.1	79.4	84.3
2019	93	70.7	11.1	40.0	93.5	53.1	62.5	72.6	79.0	83.0
1998-2019	6194	70.3	12.3	5.0	102	53.7	62.8	71.7	79.2	84.8

Table 3a

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

Year of diagnosis	Cases n	Std.		Min.	Max.	Median				
		Mean	dev.			10%	25%	50%	75%	90%
1998	84	64.6	13.5	26.1	92.3	48.0	56.0	64.7	73.8	82.0
1999	79	67.3	13.1	23.9	91.7	48.5	59.4	68.4	77.3	83.7
2000	91	70.5	12.2	23.0	92.3	56.5	61.4	71.8	79.4	85.4
2001	73	67.4	10.6	44.4	87.8	50.9	59.4	68.4	76.0	79.5
2002	149	68.2	12.0	32.7	93.5	52.9	61.4	68.0	76.5	82.8
2003	170	67.1	10.8	27.3	99.0	54.1	60.3	67.1	75.0	80.9
2004	141	67.9	12.5	35.0	93.4	50.0	60.7	68.0	75.9	82.4
2005	148	69.2	12.1	25.2	102	53.4	63.6	68.8	77.4	83.4
2006	156	68.7	11.4	27.5	94.8	53.7	62.3	69.2	76.5	83.3
2007	202	69.3	12.4	16.4	93.2	53.7	63.1	70.5	78.9	83.3
2008	218	69.3	12.0	33.8	97.9	51.6	63.4	70.0	77.2	84.9
2009	170	69.6	11.2	34.7	94.1	53.9	63.6	70.7	77.3	83.8
2010	220	68.3	13.3	5.0	93.0	48.9	61.7	70.4	76.9	84.6
2011	210	69.2	13.4	9.2	97.4	48.8	63.1	71.8	77.8	84.0
2012	194	69.6	11.9	41.0	93.0	51.8	63.3	71.5	77.6	84.1
2013	202	71.4	11.6	38.5	93.1	54.1	64.0	73.8	79.3	84.8
2014	184	70.8	11.6	37.9	99.6	56.7	63.0	72.7	79.1	85.4
2015	192	71.9	11.4	31.2	95.1	55.7	64.0	73.3	80.0	85.8
2016	186	71.3	11.6	22.4	99.9	54.9	65.0	73.6	79.0	82.8
2017	135	70.8	12.8	34.9	94.1	53.8	64.0	72.8	80.4	85.5
2018	102	70.0	12.0	38.2	92.7	52.0	62.2	72.9	78.6	82.8
2019	54	69.0	11.4	40.0	88.1	52.2	59.9	70.9	77.9	82.5
1998-2019	3360	69.4	12.1	5.0	102	52.5	62.2	70.8	77.9	83.9

Table 3b

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

Year of diagnosis	Cases n	Std.		Median						
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	61	69.7	12.3	37.6	94.0	57.5	61.5	69.2	78.4	85.8
1999	75	72.1	11.9	47.5	92.8	56.1	60.8	74.6	80.1	87.9
2000	65	72.1	12.2	40.6	94.4	55.7	65.3	75.6	79.8	85.8
2001	81	69.2	11.2	36.1	93.7	57.3	62.2	70.1	77.0	81.2
2002	136	72.0	12.8	30.3	93.2	55.6	61.5	73.2	82.1	87.8
2003	121	70.2	12.2	31.4	94.2	52.9	63.3	71.3	79.5	84.3
2004	145	70.8	11.9	29.1	92.1	55.7	64.6	70.7	80.4	84.2
2005	138	71.9	11.9	32.2	96.8	54.4	64.5	74.6	80.6	84.7
2006	155	71.9	12.8	22.7	95.3	54.8	64.0	73.4	81.2	86.4
2007	184	71.6	11.0	34.8	95.2	58.6	65.2	71.9	80.1	85.2
2008	172	72.3	11.3	37.5	94.3	56.9	65.1	73.7	79.9	85.9
2009	168	72.0	11.9	35.0	94.6	55.4	64.7	72.4	81.9	86.3
2010	150	71.3	12.9	20.5	97.2	54.0	63.6	72.5	81.4	86.4
2011	195	70.3	13.5	29.8	97.5	51.8	59.7	72.5	79.6	87.1
2012	155	71.6	13.2	8.5	97.5	53.5	63.7	74.5	81.2	85.0
2013	159	70.5	12.6	29.8	92.2	53.9	62.1	72.3	80.5	85.0
2014	162	70.1	12.3	34.2	98.4	53.5	62.7	71.9	79.5	84.5
2015	166	71.4	12.8	27.7	95.2	51.6	63.2	74.4	80.2	85.3
2016	123	72.4	13.4	26.1	95.8	53.4	65.7	76.1	81.7	86.7
2017	112	71.9	12.3	30.8	96.6	56.8	64.7	73.1	78.8	87.6
2018	72	73.0	10.9	48.4	92.1	56.3	66.9	74.7	80.5	84.9
2019	39	73.1	10.4	50.1	93.5	55.5	68.8	74.4	81.0	85.0
1998-2019	2834	71.4	12.3	8.5	98.4	54.6	63.5	73.1	80.3	85.6

Table 4

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

Age at diagnosis Years	Cases			Males			Females		
	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4	1	0.0	0.0	1	0.0	0.0			
5-9	2	0.0	0.1	1	0.0	0.1	1	0.1	0.1
10-14	0	0.0	0.1			0.1			0.1
15-19	1	0.0	0.1	1	0.0	0.1			0.1
20-24	3	0.1	0.2	2	0.1	0.2	1	0.1	0.1
25-29	5	0.1	0.3	1	0.0	0.3	4	0.2	0.3
30-34	20	0.5	0.8	9	0.4	0.7	11	0.6	0.9
35-39	29	0.7	1.5	20	0.9	1.5	9	0.5	1.4
40-44	65	1.6	3.1	46	2.0	3.6	19	1.0	2.4
45-49	151	3.7	6.7	88	3.9	7.4	63	3.4	5.8
50-54	212	5.1	11.9	115	5.1	12.5	97	5.2	11.0
55-59	276	6.7	18.5	145	6.4	18.9	131	7.1	18.1
60-64	393	9.5	28.1	226	10.0	28.9	167	9.0	27.1
65-69	566	13.7	41.8	329	14.5	43.4	237	12.8	39.8
70-74	727	17.6	59.4	437	19.3	62.6	290	15.6	55.5
75-79	732	17.7	77.1	388	17.1	79.7	344	18.5	74.0
80-84	532	12.9	90.0	265	11.7	91.4	267	14.4	88.4
85+	411	10.0	100.0	195	8.6	100.0	216	11.6	100.0
All ages	4126	100.0		2269	100.0		1857	100.0	

Table 5

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

Age at diagnosis Years	Males n	Females n	Males Age- spec. incid.	Females Age- spec. incid.	Males DCO rate n=307 %	Females DCO rate n=300 %	Males	Females
							Prop.all cancers n=143063 %	Prop.all cancers n=144724 %
0- 4	1		0.1				0.5	
5- 9	1	1	0.1	0.1			0.9	1.1
10-14								
15-19	1		0.1				0.3	
20-24	2	1	0.1	0.1			0.3	0.2
25-29	1	4	0.0	0.2			0.1	0.4
30-34	9	11	0.4	0.5			0.8	0.6
35-39	20	9	0.9	0.4			1.2	0.3
40-44	46	19	2.0	0.8			1.8	0.3
45-49	88	63	3.5	2.6			1.8	0.7
50-54	115	96	4.9	4.2	5.2	4.2	1.5	0.8
55-59	145	131	7.5	6.6	3.4	3.1	1.2	1.1
60-64	226	167	13.9	9.5	4.9	3.6	1.4	1.1
65-69	329	237	21.6	14.1	7.0	5.5	1.4	1.3
70-74	436	290	31.1	18.1	9.9	9.0	1.7	1.6
75-79	387	344	35.0	25.0	15.5	14.8	1.8	1.9
80-84	265	266	40.4	27.3	24.9	27.4	1.9	1.9
85+	195	215	45.7	22.3	47.7	57.2	2.0	1.4
All ages	2267	1854			13.5	16.2	1.6	1.3
Incidence								
Raw			7.5	6.0				
WS			3.6	2.4				
ES			5.3	3.6				
BRD-S			6.9	4.6				

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

ICD-10 C88,C90: Malignant immunoproliferative and plasmacellular disease

Age distribution and age-specific incidence 2007 - 2019 (Males: 2267, Females: 1854)

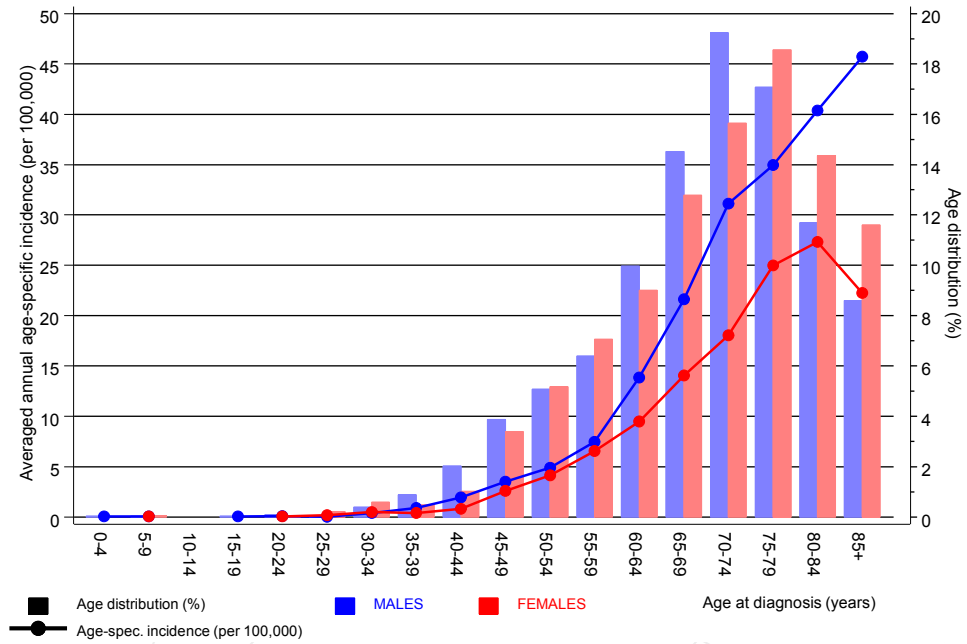


Figure 6. Age distribution (males: mean=70.0 yrs, median=71.6 yrs; females: mean=71.4 yrs, median=73.3 yrs) and age-specific incidence.

ICD-10 C88,C90: Malignant immunoproliferative and plasmacellular disease

Age-specific incidence rates: international comparison

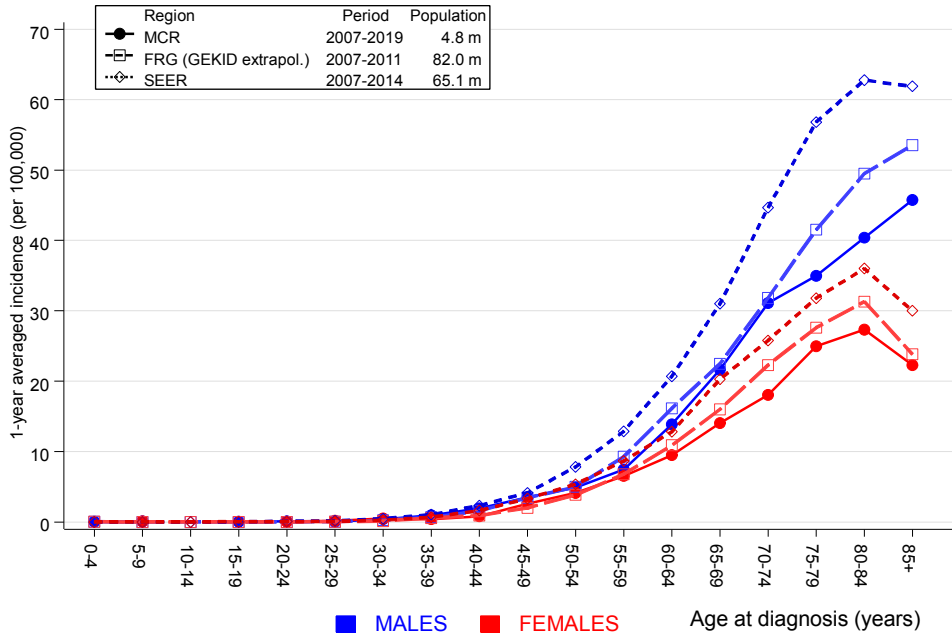


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).

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 2019, based on the November 2018 submission. <http://www.seer.cancer.gov>.

Table 7a

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

MALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C00 Lip	1	0.2	5.4	0.1	30.2	0.8	
C03-C06 Oral cavity	3	1.4	2.1	0.4	6.3	1.6	
C07-C08 Salivary gland	1	0.4	2.6	0.1	14.6	0.6	
C09-C10 Oropharynx	2	1.7	1.2	0.1	4.2	0.3	
C12-C13 Hypopharynx	2	0.9	2.1	0.3	7.6	1.0	
C15 Oesophagus	6	3.3	1.8	0.7	3.9	2.6	16.7
C16 Stomach	17	6.6	2.6	1.5	4.1 #	10.1	
C17 Small intestine	3	1.0	3.0	0.6	8.7	1.9	
C18 Colon	25	16.1	1.5	1.0	2.3 #	8.6	
C19-C20 Rectum	10	9.0	1.1	0.5	2.0	1.0	
C22 Liver	12	5.0	2.4	1.2	4.2 #	6.8	25.0
C23-C24 Bile	2	1.8	1.1	0.1	4.1	0.2	
C25 Pancreas	14	6.6	2.1	1.2	3.6 #	7.2	14.3
C30-C31 Sinuses	1	0.3	3.2	0.1	17.9	0.7	
C32 Larynx	4	1.7	2.4	0.6	6.0	2.2	
C33-C34 Lung	37	20.1	1.8	1.3	2.5 #	16.3	2.7
C37 Thymus	2	0.1	20.7	2.5	74.9 #	1.8	
C38,C45 Mesothelioma	4	1.2	3.3	0.9	8.5	2.7	
C40-C41 Bone	3	0.1	22.3	4.6	65.3 #	2.8	
C43 Malign. melanoma	17	7.6	2.2	1.3	3.6 #	9.1	
C44 Skin others	1	0.0	22.6	0.6	126.0	0.9	
C46,C49 Soft tissue	4	0.9	4.3	1.2	11.0 #	3.0	
C50 Breast	1	0.5	2.2	0.1	12.1	0.5	
C60 Penis	1	0.4	2.3	0.1	13.0	0.6	
C61 Prostate	96	48.4	2.0	1.6	2.4 #	46.1	4.2
C64 Kidney	21	5.9	3.6	2.2	5.5 #	14.6	4.8
C65 Renal pelvis	2	0.8	2.6	0.3	9.6	1.2	
C67 Bladder	12	7.8	1.5	0.8	2.7	4.1	8.3
C69 Eye carcinoma	1	0.1	15.7	0.4	87.2	0.9	100.0
C70-C72 CNS cancer	6	2.1	2.8	1.0	6.1 #	3.7	16.7
C73 Thyroid	6	1.1	5.5	2.0	12.0 #	4.7	
C76-C79 CUP	9	2.8	3.2	1.5	6.0 #	6.0	
C81 Hodgkin lymphoma	1	0.4	2.6	0.1	14.4	0.6	
C82-C85 NHL	48	7.1	6.7	5.0	8.9 #	39.5	2.1
C90 Mult. myeloma	1	2.3	0.4	0.0	2.5	-1.2	100.0
C91-C96 Leukaemia	12	2.6	4.7	2.4	8.2 #	9.1	8.3
Not observed	0	2.7	0.0	0.0	1.4	-2.6	
All further malignancies	388	171.0	2.3	2.0	2.5 #	210.0	4.6

Patients	2889
Median age at next malignancy (years)	72.3
Person-years	10336
Mean observation time (years)	3.6
Median observation time (years)	2.3

The occurrence of further specified malignancy is statistically significant.

Table 7b

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

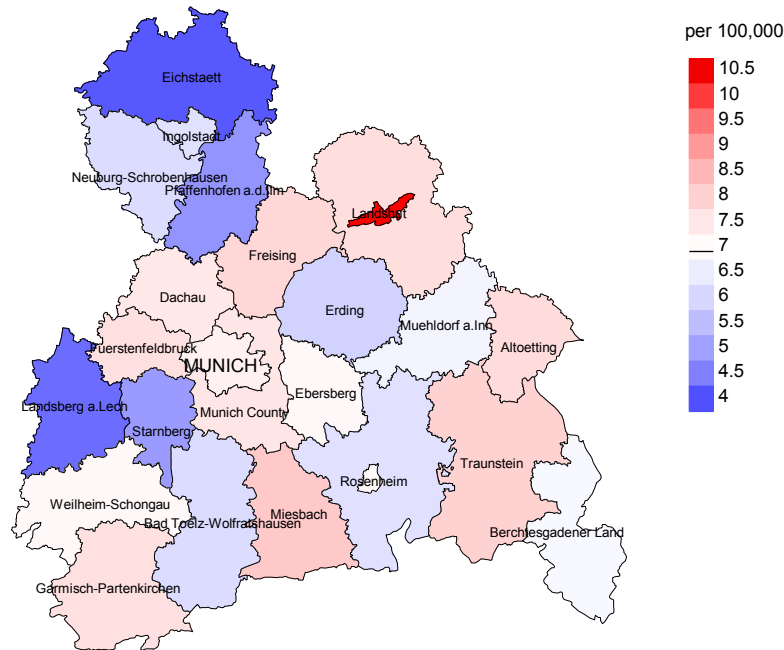
FEMALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C00 Lip	1	0.1	15.0	0.4	83.6	1.1	
C03-C06 Oral cavity	1	0.6	1.8	0.0	10.1	0.5	
C09-C10 Oropharynx	2	0.4	5.1	0.6	18.3	1.9	
C15 Oesophagus	1	0.6	1.6	0.0	8.8	0.4	
C16 Stomach	12	3.2	3.8	2.0	6.6 #	10.7	
C18 Colon	15	9.1	1.6	0.9	2.7	7.1	6.7
C19-C20 Rectum	4	3.8	1.1	0.3	2.7	0.3	
C21 Anus/canal	2	0.5	3.8	0.5	13.8	1.8	
C22 Liver	3	1.2	2.5	0.5	7.3	2.2	
C23-C24 Bile	2	1.3	1.5	0.2	5.4	0.8	
C25 Pancreas	11	4.5	2.5	1.2	4.4 #	7.9	36.4
C26 GI cancer	1	0.2	6.6	0.2	37.0	1.0	100.0
C33-C34 Lung	20	7.4	2.7	1.6	4.1 #	15.2	5.0
C38,C45 Mesothelioma	1	0.2	5.5	0.1	30.5	1.0	
C43 Malign. melanoma	12	3.6	3.4	1.7	5.9 #	10.2	
C46,C49 Soft tissue	1	0.5	1.9	0.0	10.3	0.6	
C48 Peritoneal	4	0.4	9.9	2.7	25.2 #	4.3	
C50 Breast	50	29.2	1.7	1.3	2.3 #	25.1	6.0
C51 Vulva	2	1.0	2.0	0.2	7.2	1.2	
C53 Cervix uteri	2	1.2	1.7	0.2	6.2	1.0	
C54 Corpus uteri	4	5.5	0.7	0.2	1.9	-1.8	
C56 Ovary	7	3.9	1.8	0.7	3.7	3.8	14.3
C64 Kidney	3	2.3	1.3	0.3	3.8	0.8	
C65 Renal pelvis	1	0.3	3.2	0.1	18.0	0.8	
C67 Bladder	2	1.8	1.1	0.1	3.9	0.2	
C69 Eye lymphoma	2	0.0	69.0	8.4	249.4 #	2.4	
C70-C72 CNS cancer	1	1.2	0.8	0.0	4.5	-0.3	100.0
C73 Thyroid	1	1.5	0.7	0.0	3.7	-0.6	
C74-C80 Cancer others	1	0.3	3.2	0.1	17.8	0.8	
C76-C79 CUP	2	1.7	1.2	0.1	4.2	0.3	
C81 Hodgkin lymphoma	1	0.2	6.0	0.2	33.4	1.0	
C82-C85 NHL	34	3.8	9.0	6.2	12.6 #	36.5	5.9
C90 Mult. myeloma	5	1.2	4.1	1.3	9.6 #	4.6	20.0
C91-C96 Leukaemia	12	1.4	8.6	4.4	14.9 #	12.8	16.7
C96 Systemic	1	0.0	44.8	1.1	249.5 #	1.2	100.0
Not observed	0	2.0	0.0	0.0	1.8	-2.5	
All further malignancies	224	96.2	2.3	2.0	2.7 #	154.5	8.0

Patients	2362
Median age at next malignancy (years)	73.4
Person-years	8275
Mean observation time (years)	3.5
Median observation time (years)	2.3

The occurrence of further specified malignancy is statistically significant.

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



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

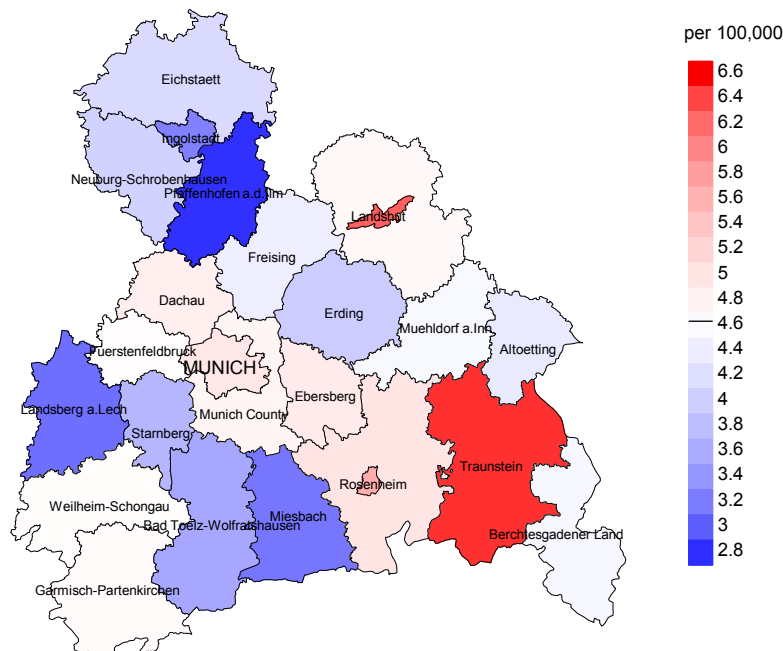
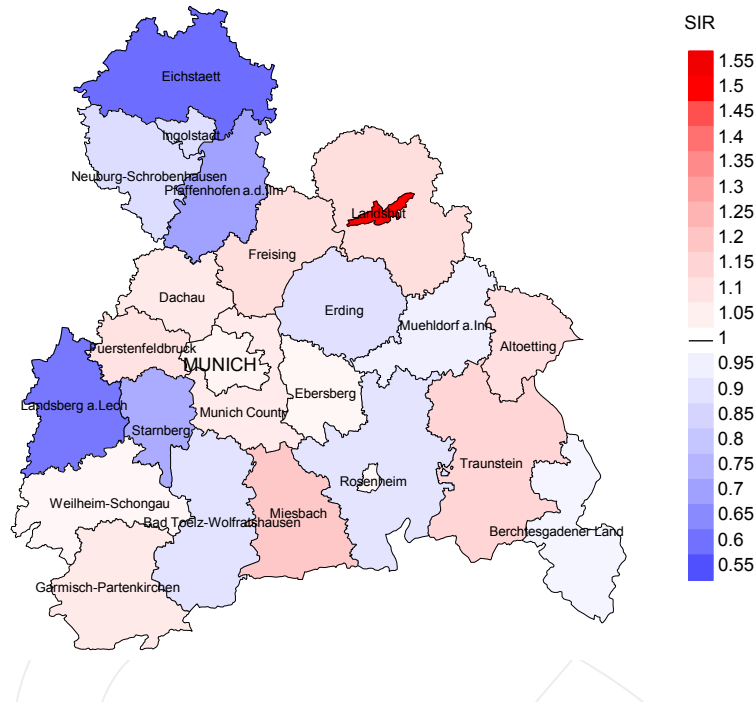


Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 6.9/100,000 WS N=2,267, females 4.6/100,000 WS N=1,854).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,462 female residents (averaged) in the period from 2007 to 2019 a total of 54 women were identified with newly diagnosed immunoprolif. disease. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 4.9/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 3.3 and 7.0/100,000.

Standardized incidence ratio (SIR) 2007 - 2019: Males



Standardized incidence ratio (SIR) 2007 - 2019: Females

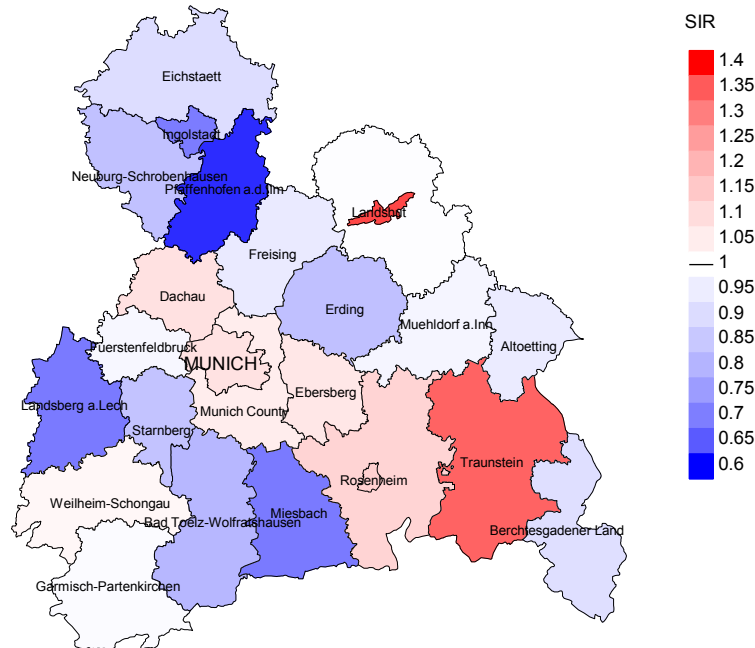


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=2,267, females N=1,854).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2019 a total of 54 women were identified with newly diagnosed immunoprolif. disease. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.07. Though, the value of this parameter may vary with an underlying probability of 99% between 0.73 and 1.51, and is therefore not statistically striking.

MORTALITY

Table 9a

Annual cohorts: Incident cancers, follow-up status, proportion of DCO, deaths among the annual cohorts and proportion of available death certificates (with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.92 m as of 2007, respectively)

Year of diagnosis	Incident cases n	Prop. actively followed %	Prop. DCO %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	145	97.2	22.1	127	87.6	92.9
1999	154	98.1	19.5	141	91.6	95.0
2000	156	98.7	30.8	145	92.9	95.2
2001	154	97.4	22.1	132	85.7	96.2
2002	285	98.2	27.7	246	86.3	95.5
2003	291	97.9	20.3	242	83.2	97.9
2004	286	98.3	23.1	239	83.6	97.5
2005	286	97.2	16.1	239	83.6	96.7
2006	311	96.1	15.1	246	79.1	96.7
2007	386	96.9	17.6	311	80.6	96.5
2008	390	98.7	15.1	303	77.7	96.0
2009	338	98.5	13.3	252	74.6	94.4
2010	370	97.8	14.6	263	71.1	96.6
2011	405	96.0	16.0	265	65.4	93.6
2012	349	97.4	14.0	221	63.3	93.7
2013	361	97.0	14.4	230	63.7	88.3
2014	346	96.5	11.0	191	55.2	87.4
2015	358	95.3	15.1	216	60.3	88.0
2016	309	99.4	19.7	163	52.8	93.9
2017	247	99.6	17.4	106	42.9	79.2
2018	174	97.7	9.2	68	39.1	60.3
2019	93	74.2	5.4	21	22.6	76.2
1998-2019	6194	97.2	17.0	4367	70.5	93.5

Table 9b

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

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.92 m as of 2007, respectively)

Year of diagnosis/ death	Incident cases n	Deaths n	Prop. deaths with death certific. %	Deaths in same year n	Prop. deaths in same year %
1998	145	87	93.1	36	24.8
1999	154	103	96.1	45	29.2
2000	156	117	91.5	51	32.7
2001	154	108	94.4	38	24.7
2002	285	163	96.3	91	31.9
2003	291	179	98.3	82	28.2
2004	286	203	98.5	92	32.2
2005	286	158	98.1	68	23.8
2006	311	175	96.6	72	23.2
2007	386	215	99.1	95	24.6
2008	390	245	97.6	87	22.3
2009	338	234	97.4	72	21.3
2010	370	252	99.2	82	22.2
2011	405	274	98.2	88	21.7
2012	349	244	97.5	69	19.8
2013	361	256	98.8	79	21.9
2014	346	283	97.9	77	22.3
2015	358	286	99.3	92	25.7
2016	309	266	98.5	89	28.8
2017	247	278	97.8	61	24.7
2018	174	187	34.2	37	21.3
2019	93	169	46.7	14	15.1
1998–2019	6194	4482	93.1	1517	24.5

Table 9c

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

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.92 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer- related %	Prop. non-cancer- related %	Prop. cancer recorded on death certificate %
1998	87	55.2	44.8	95.1
1999	103	72.8	27.2	97.0
2000	117	66.7	33.3	96.3
2001	108	60.2	39.8	99.0
2002	163	81.0	19.0	96.2
2003	179	79.9	20.1	96.6
2004	203	82.8	17.2	96.5
2005	158	82.3	17.7	94.8
2006	175	81.1	18.9	94.1
2007	215	83.7	16.3	93.4
2008	245	82.9	17.1	90.4
2009	234	81.2	18.8	95.6
2010	252	78.6	21.4	88.4
2011	274	77.7	22.3	89.6
2012	244	82.8	17.2	93.3
2013	256	80.9	19.1	90.5
2014	283	80.9	19.1	90.3
2015	286	76.9	23.1	86.6
2016	266	75.9	24.1	90.8
2017	278	73.4	26.6	86.0
2018	187	42.8	57.2	79.7
2019	169	49.7	50.3	75.9
1998–2019	4482	75.7	24.3	91.6

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	38	68.5	64.6	78.5	70.0
1999	54	72.4	71.9	75.0	72.1
2000	66	75.4	72.1	77.0	77.8
2001	52	75.5	73.0	76.6	75.5
2002	81	71.4	71.9	70.1	71.7
2003	94	72.4	71.6	74.3	72.4
2004	106	73.5	73.3	77.2	73.6
2005	79	74.2	74.2	73.7	74.0
2006	91	74.1	73.5	79.7	73.3
2007	109	74.3	74.2	78.7	74.5
2008	139	72.7	70.6	81.0	71.7
2009	124	73.1	73.0	75.5	73.2
2010	130	74.7	74.1	76.7	74.0
2011	151	75.5	75.0	78.1	75.5
2012	134	75.4	75.2	77.4	76.1
2013	156	76.6	75.6	81.2	76.3
2014	154	77.4	76.4	77.9	77.2
2015	153	77.0	76.8	79.9	77.0
2016	144	77.3	77.5	75.9	77.5
2017	157	77.4	76.8	78.5	76.7
2018	114	77.6	78.8	77.2	76.8
2019	94	78.3	78.1	78.5	78.2
1998-2019	2420	75.5	74.6	77.8	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	49	78.3	70.4	80.6	78.2
1999	49	78.8	76.9	82.5	78.8
2000	51	77.3	77.2	78.8	76.7
2001	56	76.9	74.5	77.5	76.6
2002	82	77.5	74.1	84.2	77.5
2003	85	75.1	73.3	80.3	75.1
2004	97	75.4	74.0	79.2	75.4
2005	79	76.9	75.3	85.0	76.3
2006	84	78.1	77.7	79.3	78.2
2007	106	78.3	77.7	80.2	78.8
2008	106	77.4	74.8	82.2	76.9
2009	110	73.8	72.6	81.5	73.4
2010	122	76.7	75.9	82.2	76.7
2011	123	76.6	74.9	83.5	75.8
2012	110	77.2	76.5	81.2	76.4
2013	100	78.9	79.0	78.9	79.5
2014	129	77.8	76.2	83.4	78.0
2015	133	78.0	77.6	83.4	77.9
2016	122	79.1	78.6	81.0	78.9
2017	121	78.4	77.8	81.5	77.9
2018	73	79.7	77.1	80.8	78.0
2019	75	80.2	79.0	81.1	78.0
1998-2019	2062	77.5	76.4	81.4	77.0

By 2018, Bavarians' life expectancy at birth is estimated at 79.3 years for boys and 83.8 years for girls.

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

Table 11a

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

MALES

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	25	2.3	0.30	1.4	0.29	2.0	0.29	2.3	0.27
1999	38	3.4	0.48	2.1	0.48	3.2	0.49	4.4	0.50
2000	43	3.8	0.47	2.1	0.46	3.3	0.47	5.0	0.50
2001	35	3.0	0.48	1.6	0.44	2.7	0.47	3.9	0.52
2002	63	3.4	0.42	1.8	0.41	2.9	0.42	3.9	0.45
2003	76	4.1	0.45	2.1	0.41	3.2	0.44	4.5	0.47
2004	87	4.6	0.62	2.4	0.57	3.7	0.59	5.0	0.64
2005	65	3.4	0.44	1.7	0.41	2.7	0.44	3.8	0.46
2006	72	3.8	0.46	1.8	0.41	2.8	0.44	3.9	0.48
2007	95	4.3	0.47	2.0	0.43	3.2	0.46	4.5	0.48
2008	119	5.3	0.55	2.6	0.53	4.0	0.54	5.3	0.56
2009	101	4.5	0.59	2.1	0.55	3.2	0.58	4.3	0.61
2010	98	4.3	0.45	1.8	0.37	2.9	0.40	4.2	0.45
2011	124	5.5	0.59	2.4	0.53	3.8	0.58	5.3	0.62
2012	108	4.8	0.56	2.0	0.49	3.1	0.52	4.4	0.57
2013	121	5.3	0.60	2.1	0.52	3.3	0.55	4.8	0.59
2014	122	5.2	0.66	2.0	0.55	3.3	0.60	4.7	0.67
2015	116	4.9	0.60	1.8	0.50	3.0	0.55	4.4	0.60
2016	107	4.5	0.58	1.8	0.53	2.9	0.56	4.0	0.57
2017	117	4.8	0.87	1.9	0.71	3.0	0.77	4.2	0.85
2018	47	1.9	0.46	0.7	0.38	1.2	0.41	1.6	0.44
2019	45	1.8	0.83	0.7	0.67	1.1	0.71	1.6	0.82
1998-2019	1824	4.1	0.54	1.9	0.48	2.9	0.52	4.1	0.55

Table 11b

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

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	23	2.0	0.38	0.9	0.37	1.3	0.37	1.7	0.38
1999	37	3.1	0.49	1.1	0.43	1.8	0.45	2.6	0.48
2000	35	2.9	0.54	1.1	0.46	1.7	0.48	2.4	0.51
2001	30	2.5	0.37	1.0	0.31	1.6	0.34	2.2	0.37
2002	69	3.5	0.51	1.4	0.47	2.1	0.47	2.8	0.49
2003	67	3.4	0.55	1.4	0.49	2.1	0.51	2.7	0.53
2004	81	4.1	0.56	1.6	0.49	2.4	0.52	3.3	0.55
2005	65	3.3	0.47	1.2	0.42	1.9	0.44	2.6	0.45
2006	70	3.5	0.45	1.2	0.36	1.9	0.39	2.7	0.44
2007	85	3.7	0.46	1.2	0.37	2.0	0.41	2.8	0.45
2008	84	3.6	0.49	1.3	0.44	2.1	0.45	2.8	0.46
2009	89	3.8	0.53	1.5	0.49	2.2	0.50	2.9	0.52
2010	100	4.3	0.67	1.4	0.54	2.3	0.58	3.1	0.62
2011	89	3.8	0.46	1.4	0.39	2.2	0.41	2.9	0.44
2012	94	4.0	0.61	1.4	0.53	2.2	0.56	2.9	0.55
2013	86	3.6	0.54	1.1	0.40	1.8	0.43	2.6	0.49
2014	107	4.4	0.66	1.5	0.52	2.4	0.56	3.3	0.62
2015	104	4.3	0.63	1.3	0.50	2.1	0.54	3.0	0.58
2016	95	3.9	0.77	1.1	0.60	1.8	0.66	2.6	0.70
2017	87	3.5	0.78	1.0	0.54	1.7	0.61	2.4	0.69
2018	33	1.3	0.46	0.4	0.41	0.7	0.42	1.0	0.44
2019	40	1.6	1.03	0.5	0.78	0.7	0.83	1.1	0.93
1998-2019	1570	3.4	0.55	1.2	0.46	1.9	0.49	2.6	0.52

Table 12

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

Age at death Years	Cases			Males			Females		
	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4									
5-9									
10-14									
15-19									
20-24									
25-29	1	0.0	0.0	1	0.1	0.1			0.0
30-34	1	0.0	0.1	1	0.1	0.2			0.0
35-39	3	0.1	0.2	2	0.2	0.3	1	0.1	0.1
40-44	10	0.4	0.6	6	0.5	0.8	4	0.4	0.5
45-49	26	1.1	1.7	19	1.4	2.2	7	0.6	1.1
50-54	67	2.8	4.5	43	3.3	5.5	24	2.2	3.3
55-59	100	4.1	8.6	51	3.9	9.3	49	4.5	7.8
60-64	143	5.9	14.5	90	6.8	16.1	53	4.8	12.6
65-69	307	12.7	27.3	170	12.9	29.0	137	12.5	25.2
70-74	454	18.8	46.1	252	19.1	48.1	202	18.5	43.6
75-79	490	20.3	66.4	279	21.1	69.2	211	19.3	62.9
80-84	430	17.8	84.2	217	16.4	85.7	213	19.5	82.4
85+	381	15.8	100.0	189	14.3	100.0	192	17.6	100.0
All ages	2413	100.0		1320	100.0		1093	100.0	

Table 13

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

Age at death Years	Males 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	1		0.0	1.00			1.2	
30-34	1		0.0	0.11			0.8	
35-39	2	1	0.1	0.10	0.0	0.11	0.8	0.3
40-44	6	4	0.3	0.13	0.2	0.21	1.0	0.5
45-49	19	7	0.8	0.22	0.3	0.11	1.4	0.4
50-54	43	24	1.8	0.37	1.0	0.25	1.7	1.0
55-59	51	49	2.6	0.35	2.5	0.37	1.2	1.4
60-64	90	53	5.5	0.40	3.0	0.32	1.5	1.1
65-69	170	137	11.2	0.52	8.1	0.58	2.0	2.1
70-74	252	202	18.0	0.58	12.6	0.70	2.3	2.5
75-79	279	211	25.2	0.72	15.3	0.61	2.4	2.3
80-84	217	213	33.1	0.82	21.9	0.80	2.3	2.5
85+	189	192	44.3	0.97	19.9	0.89	2.3	1.7
All ages	1320	1093					2.1	1.9
Mortality								
Raw			4.4	0.58	3.5	0.59		
WS			1.8	0.51	1.2	0.48		
ES			2.9	0.54	1.8	0.51		
BRD-S			4.1	0.59	2.6	0.55		
PYLL-70								
per 100,000			12.2		7.9			
ES			10.3		6.4			
AYLL-70			8.4		7.5			

Table 14a

Further malignancies in deaths in period 1998-2019
MALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C03-C06 Oral cavity	1	0.2					1	100.0
C07-C08 Salivary gland	1	0.2					1	100.0
C09-C10 Oropharynx	2	0.3	2	100.0				
C12-C13 Hypopharynx	2	0.3			1	50.0	1	50.0
C15 Oesophagus	11	1.7	4	36.4	2	18.2	5	45.5
C16 Stomach	18	2.7	8	44.4	3	16.7	7	38.9
C17 Small intestine	2	0.3	2	100.0				
C18 Colon	37	5.6	21	56.8	5	13.5	11	29.7
C19-C20 Rectum	24	3.6	15	62.5	1	4.2	8	33.3
C22 Liver	14	2.1	3	21.4	1	7.1	10	71.4
C23-C24 Bile	2	0.3	1	50.0			1	50.0
C25 Pancreas	16	2.4	1	6.3	2	12.5	13	81.3
C30-C31 Sinuses	4	0.6	2	50.0			2	50.0
C32 Larynx	6	0.9	3	50.0			3	50.0
C33-C34 Lung	43	6.5	11	25.6	8	18.6	24	55.8
C38,C45 Mesothelioma	5	0.8			1	20.0	4	80.0
C40-C41 Bone	5	0.8			1	20.0	4	80.0
C43 Malign. melanoma	30	4.5	21	70.0	1	3.3	8	26.7
C44 Skin others	61	9.2	19	31.1	2	3.3	40	65.6
C46,C49 Soft tissue	4	0.6	1	25.0			3	75.0
C50 Breast	1	0.2					1	100.0
C60 Penis	2	0.3			1	50.0	1	50.0
C61 Prostate	175	26.4	122	69.7	10	5.7	43	24.6
C62 Testis	4	0.6	3	75.0	1	25.0		
C64 Kidney	33	5.0	15	45.5	5	15.2	13	39.4
C65 Renal pelvis	2	0.3					2	100.0
C66 Ureter	1	0.2	1	100.0				
C67 Bladder	18	2.7	10	55.6			8	44.4
C69 Eye carcinoma	1	0.2					1	100.0
C69 Eye melanoma	1	0.2					1	100.0
C70-C72 CNS cancer	9	1.4	1	11.1	2	22.2	6	66.7
C73 Thyroid	5	0.8	3	60.0			2	40.0
C76-C79 CUP	8	1.2	1	12.5	1	12.5	6	75.0
C81 Hodgkin lymphoma	3	0.5	1	33.3			2	66.7
C82-C85 NHL	54	8.1	10	18.5	12	22.2	32	59.3
C90 Mult. myeloma	47	7.1			1	2.1	46	97.9
C91-C96 Leukaemia	11	1.7	1	9.1	1	9.1	9	81.8
All further malignancies	663	100.0	282	42.5	62	9.4	319	48.1

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

Table 14b

Further malignancies in deaths in period 1998-2019
FEMALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C03-C06 Oral cavity	4	0.9	2	50.0			2	50.0
C07-C08 Salivary gland	1	0.2	1	100.0				
C09-C10 Oropharynx	1	0.2					1	100.0
C16 Stomach	15	3.2	4	26.7	3	20.0	8	53.3
C18 Colon	30	6.5	17	56.7	3	10.0	10	33.3
C19-C20 Rectum	20	4.3	14	70.0	1	5.0	5	25.0
C21 Anus/canal	5	1.1	3	60.0			2	40.0
C22 Liver	2	0.4					2	100.0
C23-C24 Bile	1	0.2					1	100.0
C25 Pancreas	14	3.0			4	28.6	10	71.4
C30-C31 Sinuses	1	0.2	1	100.0				
C33-C34 Lung	22	4.7	3	13.6	4	18.2	15	68.2
C38,C45 Mesothelioma	1	0.2					1	100.0
C43 Malign. melanoma	28	6.0	15	53.6			13	46.4
C44 Skin others	26	5.6	14	53.8	2	7.7	10	38.5
C46,C49 Soft tissue	2	0.4					2	100.0
C48 Peritoneal	5	1.1	1	20.0	1	20.0	3	60.0
C50 Breast	118	25.4	91	77.1	6	5.1	21	17.8
C51 Vulva	4	0.9	2	50.0			2	50.0
C53 Cervix uteri	9	1.9	9	100.0				
C54 Corpus uteri	14	3.0	12	85.7			2	14.3
C55,C57 Fem. genitals un	1	0.2	1	100.0				
C56 Ovary	9	1.9	5	55.6	2	22.2	2	22.2
C64 Kidney	12	2.6	9	75.0	2	16.7	1	8.3
C65 Renal pelvis	2	0.4	1	50.0			1	50.0
C66 Ureter	1	0.2	1	100.0				
C67 Bladder	4	0.9			1	25.0	3	75.0
C69 Eye melanoma	1	0.2					1	100.0
C70-C72 CNS cancer	3	0.6	1	33.3			2	66.7
C73 Thyroid	4	0.9	3	75.0			1	25.0
C76-C79 CUP	9	1.9	3	33.3	2	22.2	4	44.4
C81 Hodgkin lymphoma	4	0.9	4	100.0				
C82-C85 NHL	36	7.7	9	25.0	7	19.4	20	55.6
C90 Mult. myeloma	43	9.2			2	4.7	41	95.3
C91-C96 Leukaemia	13	2.8	2	15.4	1	7.7	10	76.9
All further malignancies	465	100.0	228	49.0	41	8.8	196	42.2

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

Table 15

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

Age at death Years	Males 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	1		0.0	1.00			1.3	
30-34	1		0.0	0.11			0.8	
35-39	2	1	0.1	0.12	0.0	0.11	0.9	0.3
40-44	4	4	0.2	0.09	0.2	0.22	0.8	0.6
45-49	16	4	0.6	0.20	0.2	0.07	1.3	0.3
50-54	41	21	1.8	0.41	0.9	0.26	1.9	1.0
55-59	51	43	2.6	0.41	2.2	0.38	1.4	1.5
60-64	79	43	4.8	0.40	2.4	0.33	1.6	1.1
65-69	144	102	9.5	0.55	6.1	0.55	2.1	2.0
70-74	197	159	14.1	0.58	9.9	0.72	2.3	2.5
75-79	209	164	18.9	0.81	11.9	0.64	2.5	2.4
80-84	152	165	23.2	0.96	17.0	0.79	2.2	2.5
85+	125	142	29.3	0.91	14.7	0.84	2.1	1.6
All ages	1022	848					2.1	1.9
Mortality								
Raw			3.4	0.59	2.7	0.58		
WS			1.5	0.51	0.9	0.47		
ES			2.3	0.55	1.4	0.50		
BRD-S			3.1	0.60	2.0	0.54		
PYLL-70								
per 100,000			11.0		6.6			
ES			9.3		5.3			
AYLL-70			8.6		7.9			

* See corresponding tables with multiple malignancies.

Table 16

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

Age at death Years	Males		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	1		0.0	1.00			1.3	
30-34	1		0.0	0.13			0.8	
35-39	2	1	0.1	0.13	0.0	0.11	0.9	0.3
40-44	4	3	0.2	0.09	0.1	0.17	0.8	0.4
45-49	16	3	0.6	0.22	0.1	0.06	1.3	0.2
50-54	36	18	1.5	0.42	0.8	0.24	1.6	0.9
55-59	40	42	2.1	0.35	2.1	0.40	1.1	1.4
60-64	69	39	4.2	0.41	2.2	0.33	1.4	1.1
65-69	122	91	8.0	0.53	5.4	0.55	1.8	1.8
70-74	170	143	12.1	0.56	8.9	0.72	2.1	2.3
75-79	167	139	15.1	0.73	10.1	0.58	2.1	2.1
80-84	129	149	19.6	0.88	15.3	0.75	2.0	2.4
85+	104	132	24.4	0.79	13.7	0.80	1.9	1.6
All ages	861	760					1.8	1.7
Mortality								
Raw			2.9	0.55	2.4	0.56		
WS			1.2	0.48	0.8	0.46		
ES			1.9	0.52	1.3	0.49		
BRD-S			2.6	0.56	1.8	0.52		
PYLL-70								
per 100,000			9.7		5.9			
ES			8.2		4.8			
AYLL-70			8.8		7.8			

* See corresponding tables with multiple malignancies.

ICD-10 C88,C90: Malignant immunoproliferative and plasmacellular disease

Age distribution and age-specific mortality 2007 - 2019 (Males: 1320, Females: 1093)

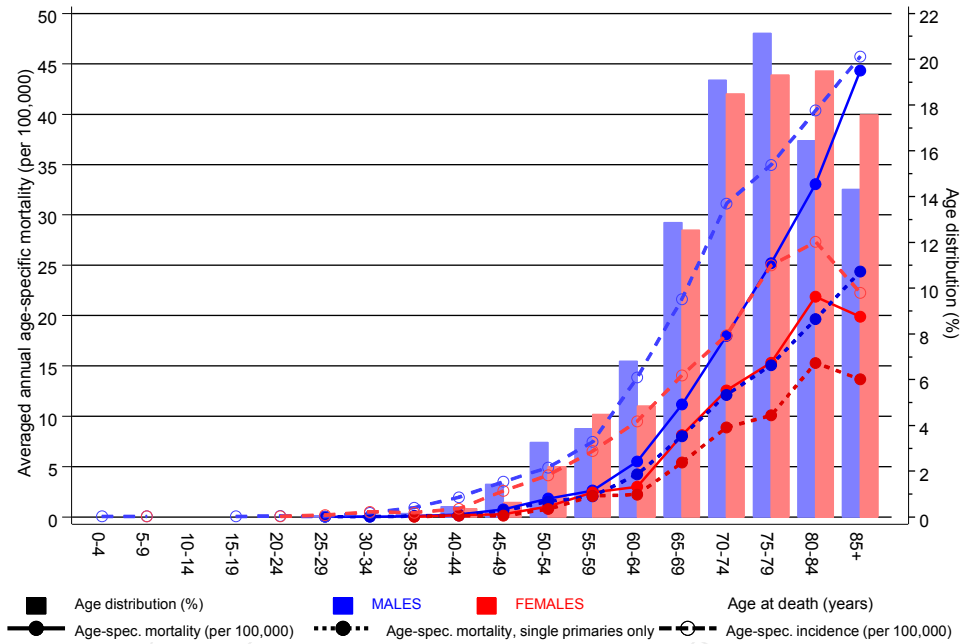
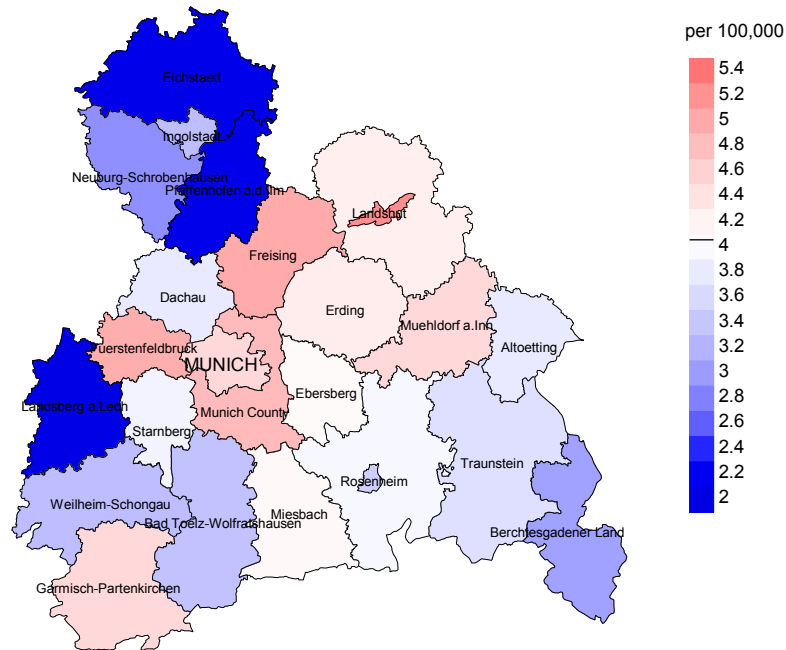


Figure 17. Distribution of age at death (bars; males: mean=70.2 yrs, median=71.3 yrs; females: mean=71.6 yrs, median=72.9 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

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



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

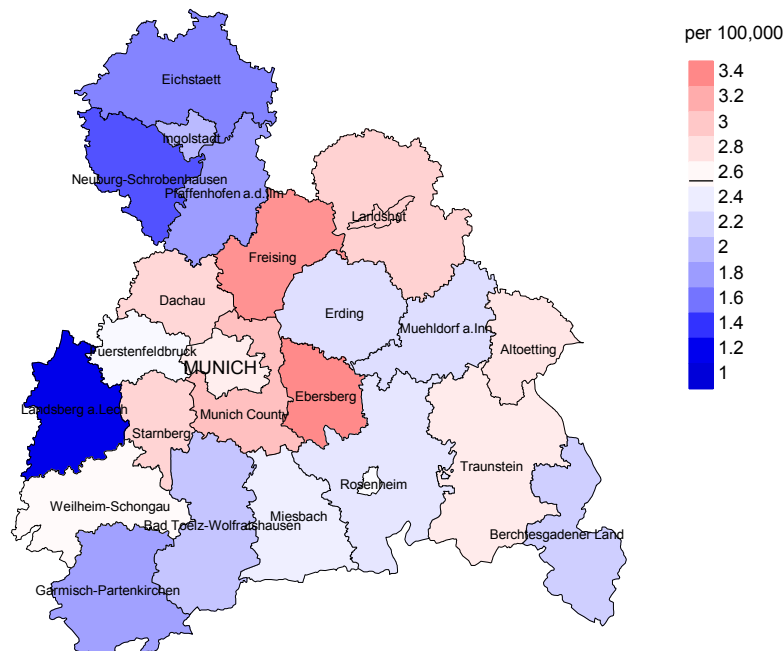
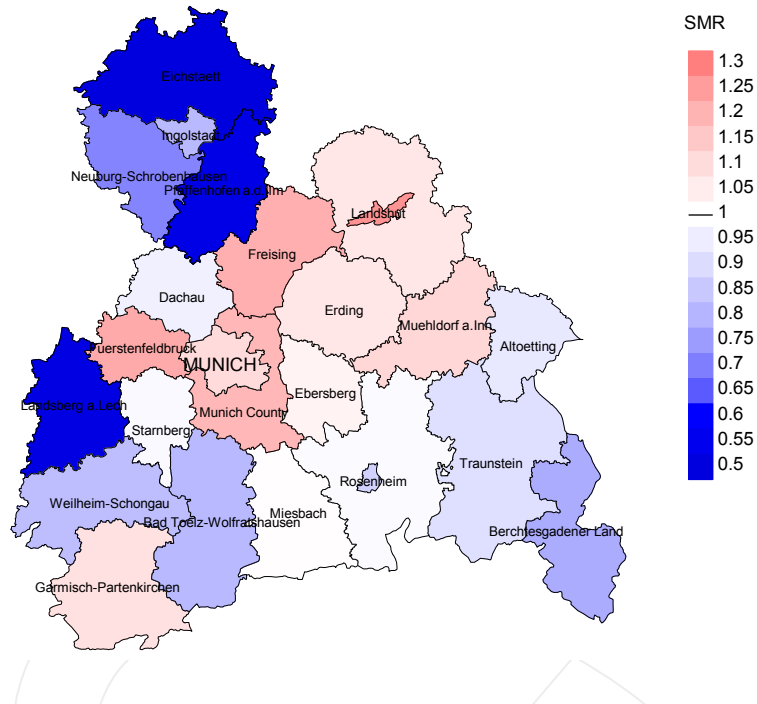


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2019. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 4.1/100,000 WS N=1,320, females 2.6/100,000 WS N=1,093).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,462 female residents (averaged) in the period from 2007 to 2019 a total of 39 women died from immunoprolif. disease. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 3.4/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 2.1 and 5.1/100,000.

Standardized mortality ratio (SMR) 2007 - 2019: Males



Standardized mortality ratio (SMR) 2007 - 2019: Females

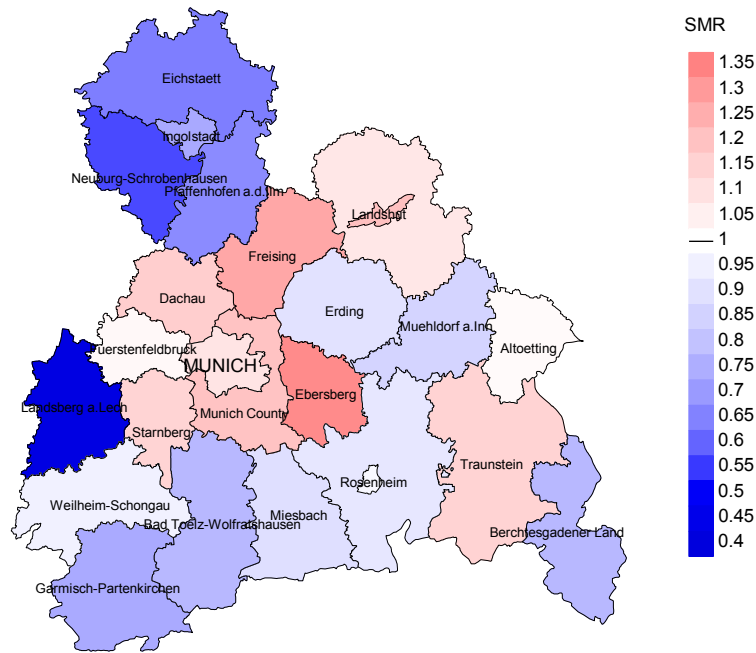


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=1,320, females N=1,093).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2019 a total of 39 women died from immunoprolif. disease. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.33. Though, the value of this parameter may vary with an underlying probability of 99% between 0.85 and 1.98, and is therefore not statistically striking.

Statistical Notes

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

1. All multiple primaries included

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

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

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

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

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

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

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

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

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

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

Shortcuts

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

Recommended Citation

Munich Cancer Registry. ICD-10 C88,C90: Immunoprolif. disease - Incidence and Mortality [Internet]. 2021 [updated 2021 Jan 26; cited 2021 Mar 1]. Available from: <https://www.tumorregister-muenchen.de/en/facts/base/bC8890E-ICD-10-C88-C90-Immunoprolif.-disease-incidence-and-mortality.pdf>

Copyright

The content of the public web site provided by the Munich Cancer Registry is available worldwide and free of charge. All documents are free to download, utilize, copy, print-out and distribute, providing that the MCR is referenced.

Disclaimer

The Munich Cancer Registry reserves the right to not be responsible for the topicality, correctness, completeness or quality of the information provided. Liability claims regarding damage caused by the use of any information provided, including any kind of information which is incomplete or incorrect, will therefore be rejected.