

Munich Cancer Registry



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

ICD-10 C88,C90: Immunoprolif. disease

Incidence and Mortality

Year of diagnosis	1998-2016
Patients	5,478
Diseases	5,487
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/bC8890E-ICD-10-C88-C90-Immunoprolif.-disease-incidence-and-mortality.pdf>

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

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

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

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

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

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

Munich Cancer Registry, August 2018

- [#] Base data has been collected since 1998. An increase in new diseases is apparent, which is an effect of two extensions in the MCR catchment area (from a base population of 2.65 million to 4.10 in 2002, and to 4.69 million in 2007).
- ^{##} Due to the high frequency and good prognosis of non-malignant skin cancer (C44), no systematic ascertainment is performed for this diagnosis. C44 is not designated as a primary, but rather as a secondary tumor.
- ^{###} DCO (death certificate only) identifies a cancer case that first becomes available to the MCR through the death certificate.

Some remarks regarding this cancer type

The results for 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	143	31	21.7	9.1	9.7	86.7	96.5
1999	154	29	18.8	12.8	9.6	89.6	98.7
2000	157	44	28.0	12.1	9.7	92.4	98.7
2001	154	34	22.1	12.3	9.7	83.1	96.8
2002	289	76	26.3	12.9	9.4	81.0	97.2 #
2003	286	58	20.3	12.8	9.4	80.8	95.5
2004	285	65	22.8	13.1	9.1	81.8	97.2
2005	292	45	15.4	14.0	9.0	76.4	95.5
2006	319	44	13.8	14.5	8.8	73.7	93.4
2007	391	66	16.9	14.9	8.3	75.4	86.4 #
2008	406	57	14.0	14.8	8.0	69.2	78.3
2009	350	43	12.3	15.1	7.4	66.6	83.7
2010	381	53	13.9	15.7	6.8	62.7	79.5
2011	410	65	15.9	16.3	6.2	59.3	78.3
2012	352	45	12.8	17.2	5.8	51.7	72.2
2013	357	49	13.7	17.6	5.1	47.6	75.6
2014	334	37	11.1	18.0	3.9	40.7	74.6
2015	245	53	21.6	18.2	3.6	50.2	98.0
2016	182	58	31.9	18.2	4.0	44.5	82.4 ##
1998-2016	5487	952	17.4	18.2	9.7	67.0	86.3

5,487 cases diagnosed 1998-2016 are related to a total of 5,478 patients. Currently, in 1,498 (27.3 %) of these 5,478 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 1,189 / 238 / 71 (21.7 % / 4.3 % / 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 334 cases has been diagnosed, of which 18.0 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 3.9 % 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	58.7	14	16.7	10.7	11.5	85.7	98.8
1999	79	51.3	13	16.5	13.5	11.4	88.6	98.7
2000	91	58.0	29	31.9	12.6	11.4	94.5	98.9
2001	73	47.4	14	19.2	13.8	11.4	80.8	98.6
2002	150	51.9	34	22.7	14.9	11.0	79.3	98.0 #
2003	168	58.7	33	19.6	14.0	11.0	79.2	94.6
2004	142	49.8	30	21.1	14.0	10.6	83.1	97.2
2005	151	51.7	21	13.9	14.4	10.5	76.8	95.4
2006	158	49.5	19	12.0	14.9	10.2	69.6	93.0
2007	204	52.2	38	18.6	15.5	9.5	76.5	86.3 #
2008	222	54.7	33	14.9	15.2	9.3	70.7	79.7
2009	175	50.0	21	12.0	15.5	8.6	64.6	83.4
2010	220	57.7	23	10.5	16.3	7.8	63.6	78.6
2011	214	52.2	24	11.2	17.2	6.7	59.3	78.0
2012	194	55.1	23	11.9	18.0	6.8	51.0	74.2
2013	189	52.9	27	14.3	18.4	6.1	48.7	75.7
2014	178	53.3	19	10.7	18.8	5.0	40.4	76.4
2015	131	53.5	29	22.1	18.7	4.4	52.7	96.9
2016	106	58.2	31	29.2	18.9	6.0	44.3	79.2 ##
1998-2016	2929	53.4	475	16.2	18.9	11.5	66.7	86.4

2,929 cases diagnosed 1998-2016 are related to a total of 2,926 patients. Currently, in 869 (29.7 %) of these 2,926 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 678 / 138 / 53 (23.2 % / 4.7 % / 1.8 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2014, a subgroup of 178 cases has been diagnosed, of which 18.8 % 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 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	59	41.3	17	28.8	6.8	7.7	88.1	93.2
1999	75	48.7	16	21.3	11.9	7.6	90.7	98.7
2000	66	42.0	15	22.7	11.5	7.7	89.4	98.5
2001	81	52.6	20	24.7	10.7	7.8	85.2	95.1
2002	139	48.1	42	30.2	10.7	7.5	82.7	96.4 #
2003	118	41.3	25	21.2	11.3	7.5	83.1	96.6
2004	143	50.2	35	24.5	12.0	7.4	80.4	97.2
2005	141	48.3	24	17.0	13.5	7.2	75.9	95.7
2006	161	50.5	25	15.5	14.1	7.1	77.6	93.8
2007	187	47.8	28	15.0	14.3	6.9	74.3	86.6 #
2008	184	45.3	24	13.0	14.3	6.6	67.4	76.6
2009	175	50.0	22	12.6	14.6	6.1	68.6	84.0
2010	161	42.3	30	18.6	15.0	5.6	61.5	80.7
2011	196	47.8	41	20.9	15.2	5.5	59.2	78.6
2012	158	44.9	22	13.9	16.2	4.5	52.5	69.6
2013	168	47.1	22	13.1	16.7	4.0	46.4	75.6
2014	156	46.7	18	11.5	17.0	2.7	41.0	72.4
2015	114	46.5	24	21.1	17.5	2.7	47.4	99.1
2016	76	41.8	27	35.5	17.4	1.3	44.7	86.8 ##
1998-2016	2558	46.6	477	18.6	17.4	7.7	67.2	86.3

2,558 cases diagnosed 1998-2016 are related to a total of 2,552 patients. Currently, in 629 (24.6 %) of these 2,552 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 511 / 100 / 18 (20.0 % / 3.9 % / 0.7 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2014, a subgroup of 156 cases has been diagnosed, of which 17.0 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 2.7 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 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	84	59	7.6	5.0	4.7	2.3	6.8	3.4	8.4	4.2
1999	79	75	7.1	6.3	4.3	2.6	6.4	4.0	8.8	5.3
2000	91	66	8.0	5.5	4.5	2.3	7.1	3.6	10.0	4.7
2001	73	81	6.3	6.7	3.7	3.2	5.6	4.6	7.5	5.8
2002	150	139	8.1	7.1	4.6	3.0	6.8	4.6	8.7	5.8
2003	168	118	9.0	6.0	5.0	2.6	7.3	3.9	9.3	5.0
2004	142	143	7.5	7.2	4.2	3.1	6.3	4.5	8.0	6.0
2005	151	141	8.0	7.1	4.2	3.0	6.3	4.4	8.2	5.9
2006	158	161	8.3	8.0	4.4	3.3	6.5	4.9	8.3	6.4
2007	204	187	9.2	8.1	4.7	3.4	7.1	5.0	9.5	6.4
2008	222	184	10.0	7.9	5.1	3.4	7.5	5.0	9.6	6.5
2009	175	175	7.8	7.5	3.8	3.1	5.7	4.6	7.3	5.9
2010	220	161	9.8	6.9	5.0	2.9	7.3	4.3	9.3	5.4
2011	214	196	9.6	8.4	4.5	3.6	6.7	5.3	8.9	6.7
2012	194	158	8.5	6.7	4.0	2.6	6.0	3.9	7.8	5.2
2013	189	168	8.2	7.0	3.7	3.0	5.7	4.4	7.6	5.6
2014	178	156	7.6	6.5	3.6	2.7	5.4	4.0	6.9	5.1
2015	131	114	5.5	4.7	2.4	1.7	3.7	2.6	5.0	3.5
2016	106	76	4.4	3.1	1.7	1.0	2.8	1.6	3.9	2.2
1998-2016	2929	2558	8.0	6.7	4.1	2.8	6.1	4.1	7.9	5.3

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	143	66.9	13.1	26.1	94.0	50.2	58.4	67.5	76.4	84.8
1999	154	69.6	12.7	23.9	92.8	53.5	60.1	71.1	79.1	84.1
2000	157	71.3	12.1	23.0	94.4	55.7	64.3	72.5	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	289	69.9	12.4	30.3	93.5	54.9	61.4	70.8	79.4	86.2
2003	286	68.5	11.4	27.3	99.0	54.7	61.8	68.5	77.0	82.8
2004	285	69.6	12.1	29.1	93.4	53.1	62.2	70.4	78.5	84.0
2005	292	70.0	12.3	24.4	102	53.4	63.6	70.8	78.6	84.2
2006	319	70.2	12.7	22.7	95.3	54.2	63.8	71.0	78.9	85.1
2007	391	70.4	11.6	16.4	95.2	56.1	64.1	70.9	79.3	83.8
2008	406	70.3	12.2	19.0	97.9	53.6	63.4	70.5	79.1	85.2
2009	350	70.7	11.4	34.7	94.6	54.5	63.8	71.1	79.0	85.5
2010	381	69.4	13.4	5.0	97.2	50.9	62.1	71.3	78.8	85.1
2011	410	70.1	13.1	9.2	97.5	51.1	62.4	72.5	78.9	85.0
2012	352	70.6	12.6	8.5	97.5	52.3	64.2	72.3	79.1	84.7
2013	357	70.6	12.1	29.8	93.1	52.7	62.8	72.8	79.7	84.7
2014	334	70.7	11.8	37.9	99.6	54.7	63.0	72.0	79.5	85.3
2015	245	72.9	11.7	40.9	95.2	55.6	66.3	74.3	81.1	86.6
2016	182	74.2	12.1	26.1	99.9	56.7	67.9	76.8	82.1	87.2
1998–2016	5487	70.3	12.3	5.0	102	53.7	62.8	71.6	79.2	84.9

Table 3a

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

Year of diagnosis	Cases n	Std.		Median						
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	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	70.7	12.2	23.0	92.3	56.5	61.6	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	150	68.2	11.9	32.7	93.5	53.7	61.4	68.0	76.5	82.5
2003	168	66.9	10.8	27.3	99.0	54.1	60.3	67.1	74.9	80.8
2004	142	67.9	12.5	35.0	93.4	50.0	60.7	68.3	75.9	82.4
2005	151	68.8	12.3	25.2	102	53.0	63.1	68.2	77.3	83.0
2006	158	68.3	12.1	27.5	94.8	52.9	62.3	68.7	76.5	83.3
2007	204	69.5	12.3	16.4	93.2	52.5	63.2	70.5	78.9	83.5
2008	222	69.3	12.1	33.8	97.9	51.6	63.4	69.8	77.2	84.9
2009	175	69.5	11.1	34.7	94.1	53.5	63.6	70.8	76.9	83.8
2010	220	68.2	13.9	5.0	93.0	48.5	61.6	70.8	77.1	84.6
2011	214	69.7	13.3	9.2	97.4	49.7	64.1	72.4	78.1	84.2
2012	194	69.7	12.1	25.3	93.0	51.9	63.9	71.5	77.6	84.1
2013	189	71.0	11.7	38.5	93.1	52.2	63.5	73.6	79.2	84.7
2014	178	70.6	11.9	37.9	99.6	55.2	62.6	71.9	79.0	85.6
2015	131	73.4	10.5	48.2	95.1	58.4	66.7	73.8	80.3	86.5
2016	106	74.2	11.3	34.9	99.9	57.1	67.2	76.4	81.5	87.6
1998–2016	2929	69.3	12.3	5.0	102	52.3	62.3	70.7	77.8	84.1

Table 3b

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min. Max.		10% 25%		Median		
				Min.	Max.	10%	25%	50%	75%	90%
1998	59	70.3	11.8	37.6	94.0	57.5	61.5	69.3	78.6	88.1
1999	75	72.1	11.9	47.5	92.8	56.1	60.8	74.6	80.1	87.9
2000	66	72.2	12.1	40.6	94.4	55.7	65.3	75.6	80.0	85.8
2001	81	69.2	11.2	36.1	93.7	57.3	62.2	70.1	77.0	81.2
2002	139	71.7	12.6	30.3	93.2	55.6	61.4	72.4	82.0	87.8
2003	118	70.9	11.9	31.4	94.2	55.8	63.7	71.8	79.6	84.6
2004	143	71.2	11.5	29.1	92.1	56.1	64.6	70.9	80.7	84.2
2005	141	71.3	12.1	24.4	96.8	54.4	64.4	73.9	80.0	84.5
2006	161	72.1	13.0	22.7	95.3	55.2	65.8	74.4	81.1	86.0
2007	187	71.4	10.8	34.8	95.2	58.6	65.2	71.5	79.7	85.2
2008	184	71.5	12.4	19.0	94.3	56.3	63.9	73.1	79.8	86.0
2009	175	72.0	11.6	36.3	94.6	55.4	64.2	72.4	82.0	86.4
2010	161	71.0	12.7	29.1	97.2	53.7	62.9	72.4	80.5	86.2
2011	196	70.6	12.9	29.8	97.5	53.1	60.3	72.5	79.7	87.0
2012	158	71.6	13.1	8.5	97.5	53.8	65.1	73.6	81.2	85.0
2013	168	70.3	12.5	29.8	92.2	53.8	62.2	71.9	80.3	84.7
2014	156	70.8	11.7	41.4	98.4	53.9	63.0	72.0	79.8	84.9
2015	114	72.4	12.9	40.9	95.2	50.9	65.0	75.6	81.3	87.2
2016	76	74.2	13.2	26.1	95.8	55.7	69.0	77.6	82.9	87.2
1998-2016	2558	71.4	12.2	8.5	98.4	54.8	63.4	72.8	80.5	85.6

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	1	0.0	0.0	1	0.1	0.1			0.0
5-9	2	0.1	0.1	1	0.1	0.1	1	0.1	0.1
10-14	1	0.0	0.1	1	0.1	0.2			0.1
15-19	2	0.1	0.2	1	0.1	0.2	1	0.1	0.1
20-24	1	0.0	0.2	1	0.1	0.3			0.1
25-29	6	0.2	0.4	2	0.1	0.4	4	0.3	0.4
30-34	11	0.3	0.7	6	0.3	0.7	5	0.3	0.7
35-39	20	0.6	1.3	15	0.8	1.5	5	0.3	1.0
40-44	59	1.7	3.0	37	2.0	3.5	22	1.4	2.4
45-49	128	3.8	6.8	77	4.2	7.7	51	3.2	5.7
50-54	169	5.0	11.7	86	4.7	12.4	83	5.3	10.9
55-59	226	6.6	18.4	106	5.8	18.2	120	7.6	18.5
60-64	316	9.3	27.6	181	9.9	28.1	135	8.6	27.1
65-69	476	14.0	41.6	263	14.3	42.4	213	13.5	40.6
70-74	627	18.4	60.0	377	20.6	63.0	250	15.9	56.5
75-79	566	16.6	76.6	301	16.4	79.4	265	16.8	73.3
80-84	438	12.9	89.5	206	11.2	90.7	232	14.7	88.1
85+	359	10.5	100.0	171	9.3	100.0	188	11.9	100.0
All ages	3408	100.0		1833	100.0		1575	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=267 %	Females DCO rate n=257 %	Males	Females
							Prop.all cancers n=113978 %	Prop.all cancers n=112253 %
0- 4	1		0.1				0.5	
5- 9	1	1	0.1	0.1			1.0	1.2
10-14	1		0.1				0.9	
15-19	1	1	0.1	0.1			0.4	0.5
20-24	1		0.1				0.2	
25-29	2	4	0.1	0.3			0.3	0.5
30-34	6	5	0.4	0.3			0.6	0.3
35-39	15	5	0.9	0.3			1.1	0.2
40-44	37	22	2.0	1.2			1.7	0.5
45-49	77	51	3.9	2.7			2.0	0.7
50-54	86	83	5.0	4.9	7.0	3.6	1.4	1.0
55-59	106	120	7.5	8.2	3.8	2.5	1.1	1.3
60-64	181	135	14.8	10.2	5.5	4.4	1.4	1.2
65-69	263	213	22.2	16.4	8.0	6.1	1.4	1.5
70-74	377	250	34.1	19.8	11.1	8.8	1.8	1.7
75-79	300	265	37.7	26.5	17.3	14.7	1.8	2.0
80-84	206	231	44.8	32.6	27.2	27.3	1.9	2.1
85+	171	187	55.8	25.5	44.4	57.8	2.2	1.5
All ages	1832	1573			14.6	16.3	1.6	1.4
Incidence								
Raw			8.0	6.6				
WS			3.8	2.7				
ES			5.7	4.0				
BRD-S			7.5	5.2				

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 - 2016 (Males: 1832, Females: 1573)

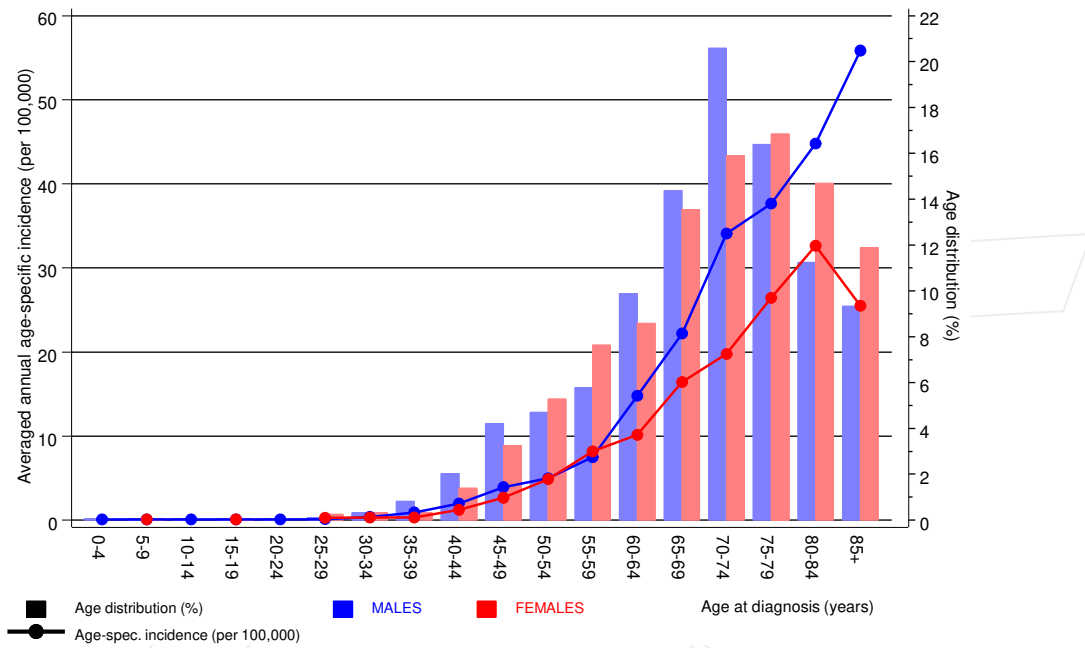


Figure 6. Age distribution (males: mean=70.2 yrs, median=71.7 yrs; females: mean=71.4 yrs, median=72.9 yrs) and age-specific incidence.

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

Age-specific incidence rates: international comparison

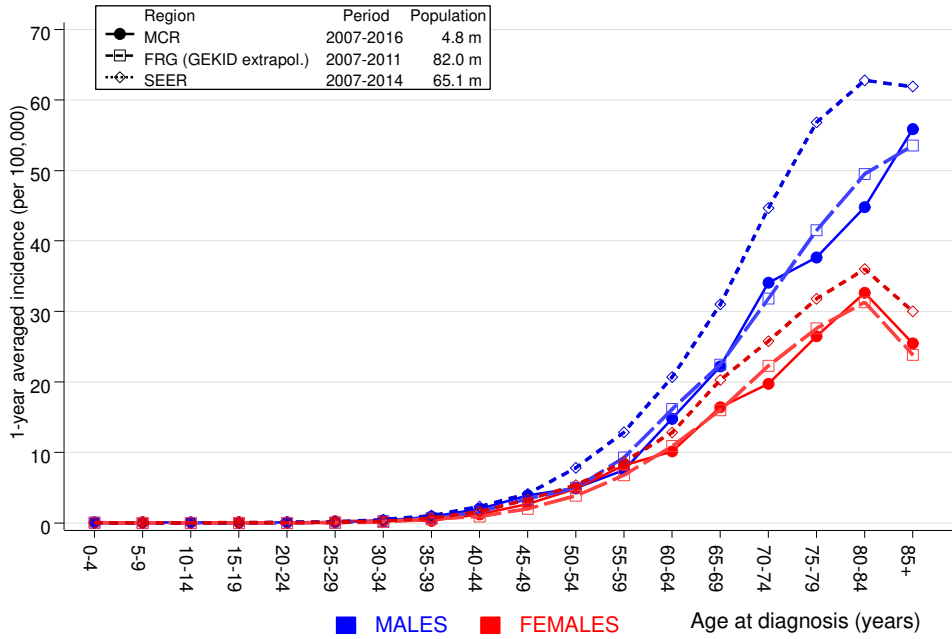


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).

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 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	6	2.5	2.4	0.9	5.2	4.3	16.7
C16 Stomach	15	5.3	2.8	1.6	4.7 #	12.2	
C18 Colon	20	12.7	1.6	1.0	2.4	9.1	
C19–C20 Rectum	10	7.2	1.4	0.7	2.6	3.5	
C22 Liver	10	3.9	2.6	1.2	4.8 #	7.7	30.0
C25 Pancreas	10	5.0	2.0	1.0	3.7	6.2	20.0
C32 Larynx	2	1.4	1.4	0.2	5.2	0.8	
C33–C34 Lung	25	15.9	1.6	1.0	2.3 #	11.4	4.0
C38,C45 Mesothelioma	3	0.9	3.2	0.7	9.4	2.6	
C40–C41 Bone	3	0.1	26.7	5.5	77.9 #	3.6	
C43 Malign. melanoma	17	5.9	2.9	1.7	4.6 #	13.9	
C46,C49 Soft tissue	3	0.7	4.1	0.8	11.9	2.8	
C61 Prostate	79	39.0	2.0	1.6	2.5 #	50.2	5.1
C64 Kidney	16	4.7	3.4	1.9	5.5 #	14.2	6.3
C65 Renal pelvis	2	0.6	3.5	0.4	12.5	1.8	
C67 Bladder	12	6.0	2.0	1.0	3.5 #	7.6	8.3
C70–C72 CNS cancer	5	1.7	2.9	0.9	6.7	4.1	20.0
C73 Thyroid	5	0.9	5.7	1.9	13.3 #	5.2	
C76–C79 CUP	7	2.2	3.1	1.3	6.4 #	6.0	
C82–C85 NHL	35	5.4	6.4	4.5	8.9 #	37.1	2.9
C91–C96 Leukaemia	12	2.2	5.5	2.9	9.6 #	12.3	8.3
Others, specified	13	8.8	1.5	0.8	2.5	5.3	7.7
Not observed	0	2.1	0.0	0.0	1.7	-2.7	
All further malignancies	310	135.3	2.3	2.0	2.6 #	219.2	5.5

Patients	2449
Median age at next malignancy (years)	72.4
Person-years	7973
Mean observation time (years)	3.3
Median observation time (years)	2.1

The occurrence of further malignancy listed is statistically significant.

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

Table 7b

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

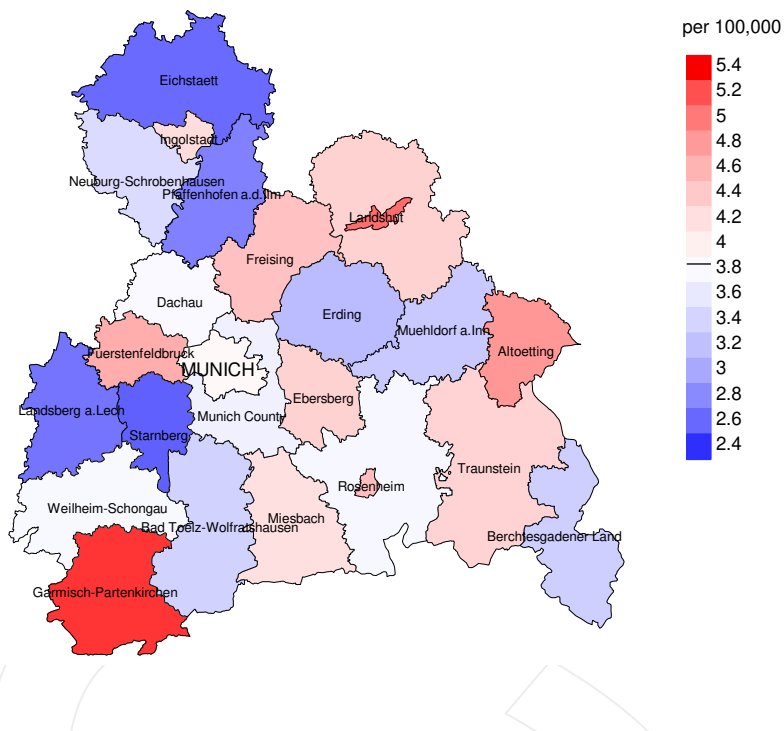
FEMALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C09–C10 Oropharynx	2	0.3	6.2	0.8	22.6	2.5	
C16 Stomach	10	2.7	3.7	1.8	6.9 #	10.9	
C18 Colon	11	7.6	1.4	0.7	2.6	5.1	
C19–C20 Rectum	4	3.2	1.2	0.3	3.2	1.1	
C22 Liver	2	1.0	2.0	0.2	7.4	1.5	
C23–C24 Bile	2	1.1	1.8	0.2	6.5	1.3	
C25 Pancreas	7	3.6	1.9	0.8	4.0	5.0	42.9
C33–C34 Lung	14	6.1	2.3	1.3	3.9 #	11.8	
C43 Malign. melanoma	11	2.9	3.7	1.9	6.7 #	12.0	
C48 Peritoneal	4	0.3	12.3	3.4	31.6 #	5.5	
C50 Breast	36	23.7	1.5	1.1	2.1 #	18.3	5.6
C53 Cervix uteri	2	0.9	2.1	0.3	7.6	1.6	
C54 Corpus uteri	4	4.5	0.9	0.2	2.3	-0.7	
C56 Ovary	7	3.2	2.2	0.9	4.5	5.6	28.6
C64 Kidney	4	2.0	2.0	0.5	5.1	3.0	
C67 Bladder	2	1.5	1.4	0.2	4.9	0.8	
C69 Eye lymphoma	2	0.0	78.1	9.5	282.3 #	2.9	
C73 Thyroid	2	1.3	1.6	0.2	5.6	1.1	
C76–C79 CUP	3	1.4	2.1	0.4	6.2	2.4	
C82–C85 NHL	33	3.1	10.6	7.3	14.9 #	44.5	6.1
C90 Mult. myeloma	5	1.0	4.9	1.6	11.4 #	5.9	20.0
C91–C96 Leukaemia	10	1.3	7.8	3.7	14.4 #	13.0	10.0
Others, specified	11	3.8	2.9	1.4	5.1 #	10.7	18.2
Not observed	0	2.6	0.0	0.0	1.4	-3.8	
All further malignancies	188	79.3	2.4	2.0	2.7 #	161.9	6.9
Patients		2096					
Median age at next malignancy (years)		72.9					
Person-years		6714					
Mean observation time (years)		3.2					
Median observation time (years)		2.1					

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

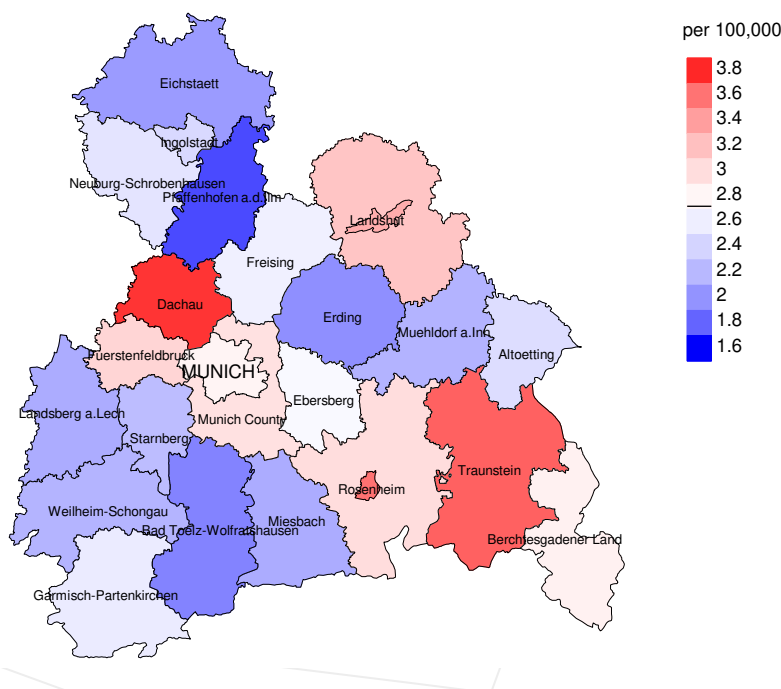
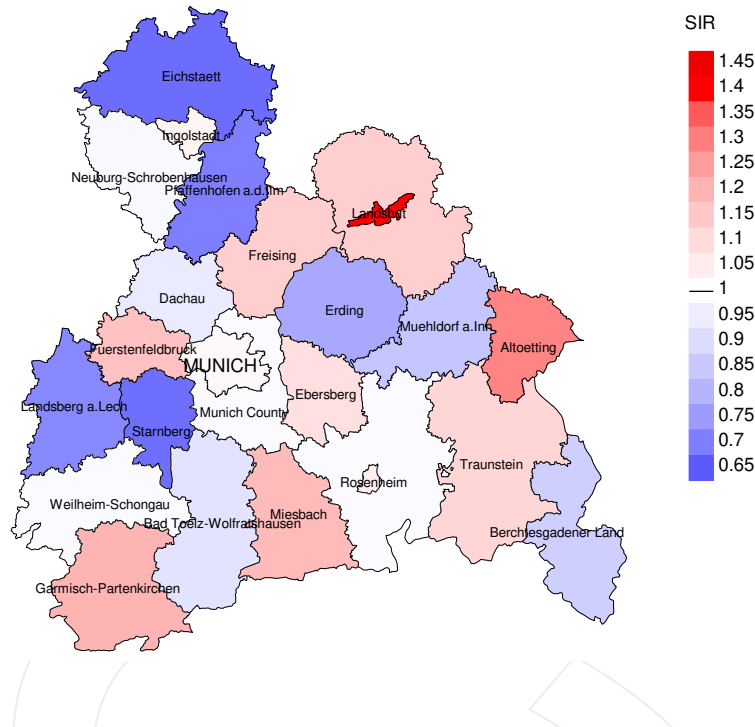


Figure 8a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 3.8/100,000 WS N=1,832, females 2.7/100,000 WS N=1,573).

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 43 women were identified with newly diagnosed immunoprolif. disease. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 2.7/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 1.6 and 4.3/100,000.

Standardized incidence ratio (SIR) 2007 - 2016: Males



Standardized incidence ratio (SIR) 2007 - 2016: Females

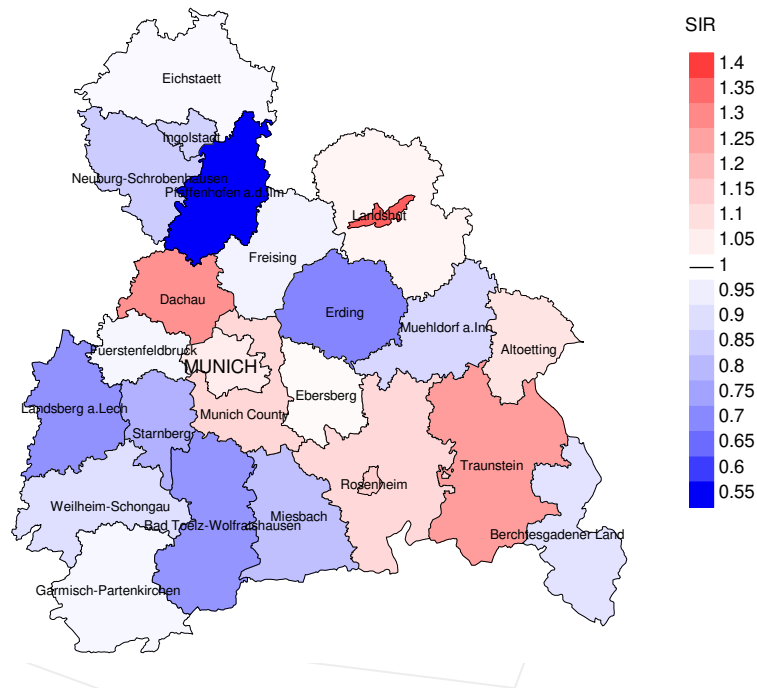


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=1,832, females N=1,573).

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 43 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 1.01. Though, the value of this parameter may vary with an underlying probability of 99% between 0.66 and 1.48, 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	143	96.5	21.7	124	86.7	93.5
1999	154	98.7	18.8	138	89.6	94.9
2000	157	98.7	28.0	145	92.4	95.9
2001	154	96.8	22.1	128	83.1	96.1
2002	289	97.2	26.3	234	81.0	97.4
2003	286	95.5	20.3	231	80.8	97.8
2004	285	97.2	22.8	233	81.8	97.9
2005	292	95.5	15.4	223	76.4	97.8
2006	319	93.4	13.8	235	73.7	99.1
2007	391	86.4	16.9	295	75.4	97.6
2008	406	78.3	14.0	281	69.2	97.9
2009	350	83.7	12.3	233	66.6	97.4
2010	381	79.5	13.9	239	62.7	99.2
2011	410	78.3	15.9	243	59.3	98.4
2012	352	72.2	12.8	182	51.7	98.4
2013	357	75.6	13.7	170	47.6	96.5
2014	334	74.6	11.1	136	40.7	96.3
2015	245	98.0	21.6	123	50.2	95.9
2016	182	82.4	31.9	81	44.5	91.4
1998-2016	5487	86.3	17.4	3674	67.0	97.3

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	143	86	93.0	36	25.2
1999	154	103	96.1	45	29.2
2000	157	116	92.2	51	32.5
2001	154	108	95.4	38	24.7
2002	289	163	96.3	91	31.5
2003	286	179	98.3	82	28.7
2004	285	203	98.5	92	32.3
2005	292	157	98.1	68	23.3
2006	319	177	96.6	72	22.6
2007	391	217	99.1	95	24.3
2008	406	248	97.6	88	21.7
2009	350	238	97.5	73	20.9
2010	381	256	99.2	84	22.0
2011	410	276	97.8	90	22.0
2012	352	249	97.6	69	19.6
2013	357	264	98.9	79	22.1
2014	334	291	97.6	78	23.4
2015	245	294	99.7	90	36.7
2016	182	229	97.8	74	40.7
1998-2016	5487	3854	97.7	1395	25.4

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	86	54.7	45.3	95.0
1999	103	72.8	27.2	97.0
2000	116	66.4	33.6	96.3
2001	108	61.1	38.9	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	157	82.2	17.8	94.8
2006	177	81.4	18.6	94.2
2007	217	83.9	16.1	93.5
2008	248	83.5	16.5	90.9
2009	238	80.3	19.7	94.8
2010	256	78.5	21.5	87.8
2011	276	77.9	22.1	90.7
2012	249	83.1	16.9	93.4
2013	264	79.5	20.5	90.0
2014	291	81.1	18.9	90.1
2015	294	76.5	23.5	86.3
2016	229	70.7	29.3	90.2
1998-2016	3854	78.3	21.7	92.4

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	37	68.9	66.1	78.5	70.3
1999	54	72.4	71.9	75.0	72.1
2000	65	75.5	73.8	77.0	77.8
2001	53	75.5	74.2	76.6	75.5
2002	80	71.3	71.8	70.1	71.5
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	93	74.1	73.5	79.7	73.3
2007	109	74.3	74.2	78.7	74.5
2008	139	72.7	70.6	81.3	71.9
2009	127	72.6	72.6	74.1	73.0
2010	132	74.7	74.1	76.7	74.0
2011	152	75.3	75.0	76.8	75.3
2012	134	75.2	75.0	77.1	76.1
2013	161	76.6	75.8	81.1	76.5
2014	158	76.9	76.1	77.9	76.2
2015	157	76.9	76.4	80.1	76.9
2016	124	76.9	76.6	77.7	77.2
1998-2016	2054	74.7	74.2	77.8	74.6

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	55	76.9	74.5	77.9	76.6
2002	83	77.6	74.2	84.2	77.6
2003	85	75.1	73.3	80.3	75.1
2004	97	75.4	74.0	79.2	75.4
2005	78	76.7	75.2	85.0	76.2
2006	84	78.1	77.7	79.3	78.2
2007	108	78.3	77.7	80.2	78.4
2008	109	77.4	75.6	82.2	76.7
2009	111	73.9	72.8	81.5	73.8
2010	124	76.7	75.9	82.6	76.1
2011	124	76.2	74.5	83.0	75.8
2012	115	77.1	76.5	81.0	76.3
2013	103	79.2	79.7	78.9	79.8
2014	133	78.1	76.3	83.2	78.3
2015	137	77.9	77.3	83.0	77.9
2016	105	79.2	79.0	79.7	78.7
1998-2016	1800	77.2	76.1	81.4	76.9

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	24	2.2	0.29	1.3	0.28	1.9	0.28	2.2	0.26
1999	38	3.4	0.48	2.1	0.48	3.2	0.49	4.4	0.50
2000	42	3.7	0.46	2.0	0.45	3.3	0.46	4.9	0.49
2001	36	3.1	0.49	1.6	0.45	2.7	0.49	4.0	0.54
2002	62	3.3	0.41	1.8	0.40	2.8	0.41	3.8	0.44
2003	76	4.1	0.45	2.1	0.42	3.2	0.44	4.5	0.48
2004	87	4.6	0.61	2.4	0.56	3.7	0.59	5.0	0.63
2005	65	3.4	0.43	1.7	0.40	2.7	0.43	3.8	0.46
2006	74	3.9	0.47	1.8	0.41	2.9	0.44	4.0	0.49
2007	95	4.3	0.47	2.0	0.43	3.2	0.45	4.5	0.48
2008	120	5.4	0.54	2.6	0.52	4.1	0.54	5.3	0.55
2009	101	4.5	0.58	2.1	0.54	3.2	0.57	4.3	0.59
2010	100	4.4	0.45	1.9	0.38	3.0	0.41	4.3	0.46
2011	126	5.6	0.59	2.4	0.53	3.9	0.57	5.4	0.61
2012	109	4.8	0.56	2.0	0.49	3.2	0.53	4.5	0.58
2013	121	5.3	0.64	2.0	0.55	3.3	0.59	4.8	0.64
2014	126	5.4	0.71	2.1	0.59	3.4	0.64	4.9	0.71
2015	119	5.0	0.91	1.9	0.79	3.1	0.84	4.5	0.90
2016	88	3.7	0.84	1.5	0.89	2.4	0.87	3.3	0.85
1998-2016	1609	4.4	0.55	2.0	0.50	3.2	0.53	4.4	0.56

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	0.39	0.9	0.39	1.3	0.39	1.7	0.40
1999	37	3.1	0.49	1.1	0.43	1.8	0.45	2.6	0.48
2000	35	2.9	0.53	1.1	0.45	1.7	0.47	2.4	0.50
2001	30	2.5	0.37	1.0	0.31	1.6	0.34	2.2	0.37
2002	70	3.6	0.50	1.4	0.46	2.1	0.46	2.8	0.48
2003	67	3.4	0.57	1.4	0.52	2.1	0.53	2.7	0.55
2004	81	4.1	0.57	1.6	0.51	2.4	0.53	3.3	0.56
2005	64	3.2	0.45	1.2	0.40	1.8	0.42	2.6	0.43
2006	70	3.5	0.43	1.2	0.35	1.9	0.38	2.7	0.42
2007	87	3.8	0.47	1.3	0.37	2.0	0.41	2.9	0.45
2008	87	3.7	0.47	1.4	0.41	2.1	0.43	3.0	0.45
2009	90	3.9	0.52	1.5	0.47	2.2	0.48	2.9	0.50
2010	101	4.3	0.63	1.5	0.51	2.3	0.53	3.2	0.58
2011	89	3.8	0.45	1.4	0.39	2.2	0.41	2.9	0.43
2012	98	4.2	0.62	1.4	0.54	2.3	0.57	3.0	0.57
2013	89	3.7	0.53	1.1	0.38	1.8	0.42	2.7	0.48
2014	110	4.6	0.71	1.5	0.56	2.4	0.60	3.4	0.66
2015	106	4.4	0.93	1.4	0.80	2.2	0.83	3.1	0.87
2016	74	3.0	0.97	0.8	0.81	1.4	0.86	2.0	0.92
1998-2016	1408	3.7	0.55	1.3	0.46	2.0	0.49	2.8	0.52

Table 12

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

Age at death Years	Cases			Males			Females		
	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4									
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	2	0.1	0.2	1	0.1	0.3	1	0.1	0.1
40-44	9	0.4	0.6	5	0.5	0.7	4	0.4	0.5
45-49	22	1.1	1.7	16	1.4	2.2	6	0.6	1.2
50-54	63	3.1	4.8	41	3.7	5.9	22	2.4	3.5
55-59	85	4.2	9.0	42	3.8	9.7	43	4.6	8.2
60-64	118	5.8	14.8	75	6.8	16.5	43	4.6	12.8
65-69	278	13.7	28.4	151	13.7	30.1	127	13.6	26.4
70-74	403	19.8	48.2	228	20.6	50.8	175	18.8	45.2
75-79	384	18.9	67.1	218	19.7	70.5	166	17.8	63.1
80-84	359	17.6	84.7	176	15.9	86.4	183	19.7	82.7
85+	311	15.3	100.0	150	13.6	100.0	161	17.3	100.0
All ages	2036	100.0		1105	100.0		931	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 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		0.1	0.50			1.4	
30-34	1		0.1	0.17			1.0	
35-39	1	1	0.1	0.07	0.1	0.20	0.5	0.4
40-44	5	4	0.3	0.14	0.2	0.18	1.0	0.6
45-49	16	6	0.8	0.21	0.3	0.12	1.4	0.5
50-54	41	22	2.4	0.48	1.3	0.27	2.0	1.1
55-59	42	43	3.0	0.40	2.9	0.36	1.2	1.5
60-64	75	43	6.1	0.41	3.2	0.32	1.5	1.1
65-69	151	127	12.7	0.57	9.8	0.60	2.1	2.4
70-74	228	175	20.6	0.60	13.8	0.70	2.4	2.6
75-79	218	166	27.4	0.73	16.6	0.63	2.4	2.4
80-84	176	183	38.3	0.85	25.9	0.79	2.3	2.7
85+	150	161	49.0	0.88	21.9	0.86	2.3	1.7
All ages	1105	931					2.1	2.0
Mortality								
Raw			4.8	0.60	3.9	0.59		
WS			2.1	0.54	1.3	0.48		
ES			3.3	0.57	2.1	0.52		
BRD-S			4.6	0.61	2.9	0.56		
PYLL-70								
per 100,000			13.8		9.2			
ES			11.8		7.6			
AYLL-70			8.4		7.5			

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 ←%
C15 Oesophagus	7	1.3	1	14.3	2	28.6	4	57.1
C16 Stomach	16	3.0	7	43.8	3	18.8	6	37.5
C18 Colon	34	6.3	21	61.8	4	11.8	9	26.5
C19–C20 Rectum	21	3.9	13	61.9	1	4.8	7	33.3
C22 Liver	13	2.4	3	23.1	1	7.7	9	69.2
C25 Pancreas	12	2.2			2	16.7	10	83.3
C33–C34 Lung	32	6.0	7	21.9	6	18.8	19	59.4
C43 Malign. melanoma	28	5.2	18	64.3	1	3.6	9	32.1
C44 Skin others	48	9.0	20	41.7			28	58.3
C61 Prostate	155	28.9	110	71.0	9	5.8	36	23.2
C64 Kidney	29	5.4	15	51.7	5	17.2	9	31.0
C67 Bladder	15	2.8	7	46.7			8	53.3
C70–C72 CNS cancer	9	1.7	1	11.1	2	22.2	6	66.7
C76–C79 CUP	8	1.5	1	12.5	1	12.5	6	75.0
C82–C85 NHL	37	6.9			7	18.9	30	81.1
C90 Mult. myeloma	14	2.6			3	21.4	11	78.6
C91–C96 Leukaemia	12	2.2	1	8.3	3	25.0	8	66.7
Others, specified	46	8.6	19	41.3	2	4.3	25	54.3
All further malignancies	536	100.0	244	45.5	52	9.7	240	44.8

Further malignancies with number of cases 1 to 5 are pooled in category "Others, specified".

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

Table 14b

Further malignancies in deaths in period 1998-2016
FEMALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C03-C06 Oral cavity	4	1.1	3	75.0			1	25.0
C16 Stomach	12	3.2	3	25.0	3	25.0	6	50.0
C18 Colon	28	7.4	15	53.6	3	10.7	10	35.7
C19-C20 Rectum	17	4.5	12	70.6	1	5.9	4	23.5
C21 Anus/canal	5	1.3	3	60.0			2	40.0
C25 Pancreas	12	3.2			4	33.3	8	66.7
C33-C34 Lung	19	5.0	3	15.8	4	21.1	12	63.2
C43 Malign. melanoma	21	5.6	12	57.1			9	42.9
C44 Skin others	20	5.3	11	55.0	2	10.0	7	35.0
C48 Peritoneal	5	1.3	1	20.0	1	20.0	3	60.0
C50 Breast	108	28.6	85	78.7	6	5.6	17	15.7
C53 Cervix uteri	8	2.1	8	100.0				
C54 Corpus uteri	13	3.4	11	84.6			2	15.4
C56 Ovary	8	2.1	3	37.5	1	12.5	4	50.0
C64 Kidney	10	2.6	7	70.0	2	20.0	1	10.0
C73 Thyroid	5	1.3	3	60.0			2	40.0
C76-C79 CUP	7	1.9	1	14.3	2	28.6	4	57.1
C81 Hodgkin lymphoma	4	1.1	4	100.0				
C82-C85 NHL	26	6.9			5	19.2	21	80.8
C90 Mult. myeloma	10	2.6			2	20.0	8	80.0
C91-C96 Leukaemia	13	3.4	3	23.1	1	7.7	9	69.2
Others, specified	23	6.1	8	34.8	1	4.3	14	60.9
All further malignancies	378	100.0	196	51.9	38	10.1	144	38.1

Further malignancies with number of cases 1 to 3 are pooled in category "Others, specified".

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

Table 15

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

Age at death Years	Males		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		0.1	0.50			1.5	
30-34	1		0.1	0.17			1.0	
35-39	1	1	0.1	0.07	0.1	0.20	0.5	0.4
40-44	4	4	0.2	0.11	0.2	0.20	0.9	0.7
45-49	14	4	0.7	0.21	0.2	0.09	1.3	0.4
50-54	38	19	2.2	0.54	1.1	0.26	2.1	1.1
55-59	42	38	3.0	0.45	2.6	0.37	1.4	1.6
60-64	67	36	5.5	0.44	2.7	0.33	1.6	1.2
65-69	128	92	10.8	0.60	7.1	0.56	2.2	2.2
70-74	181	136	16.4	0.61	10.7	0.70	2.5	2.6
75-79	164	132	20.6	0.80	13.2	0.68	2.5	2.4
80-84	122	147	26.5	0.95	20.8	0.81	2.2	2.8
85+	98	120	32.0	0.80	16.4	0.81	2.1	1.6
All ages	861	729					2.1	2.0
Mortality								
Raw			3.8	0.61	3.1	0.58		
WS			1.7	0.54	1.0	0.47		
ES			2.6	0.57	1.6	0.50		
BRD-S			3.5	0.62	2.3	0.55		
PYLL-70								
per 100,000			12.6		7.7			
ES			10.8		6.4			
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 2007-2016
(**Single 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		0.1	0.50			1.5	
30-34	1		0.1	0.17			1.0	
35-39	1	1	0.1	0.08	0.1	0.20	0.5	0.4
40-44	4	3	0.2	0.11	0.2	0.15	0.9	0.5
45-49	14	3	0.7	0.22	0.2	0.07	1.4	0.3
50-54	31	16	1.8	0.51	0.9	0.24	1.7	1.0
55-59	32	35	2.3	0.36	2.4	0.36	1.1	1.5
60-64	58	31	4.7	0.43	2.3	0.32	1.4	1.0
65-69	108	81	9.1	0.58	6.2	0.55	1.9	2.0
70-74	159	125	14.4	0.59	9.9	0.71	2.3	2.4
75-79	134	115	16.8	0.73	11.5	0.63	2.1	2.2
80-84	103	130	22.4	0.87	18.4	0.75	2.0	2.5
85+	81	112	26.5	0.69	15.3	0.78	1.8	1.6
All ages	727	652					1.8	1.8
Mortality								
Raw			3.2	0.57	2.8	0.56		
WS			1.4	0.50	0.9	0.45		
ES			2.2	0.53	1.5	0.48		
BRD-S			3.0	0.57	2.0	0.52		
PYLL-70								
per 100,000			10.8		6.7			
ES			9.3		5.5			
AYLL-70			8.7		7.9			

* See corresponding tables with multiple malignancies.

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

Age distribution and age-specific mortality 2007 - 2016 (Males: 1105, Females: 931)

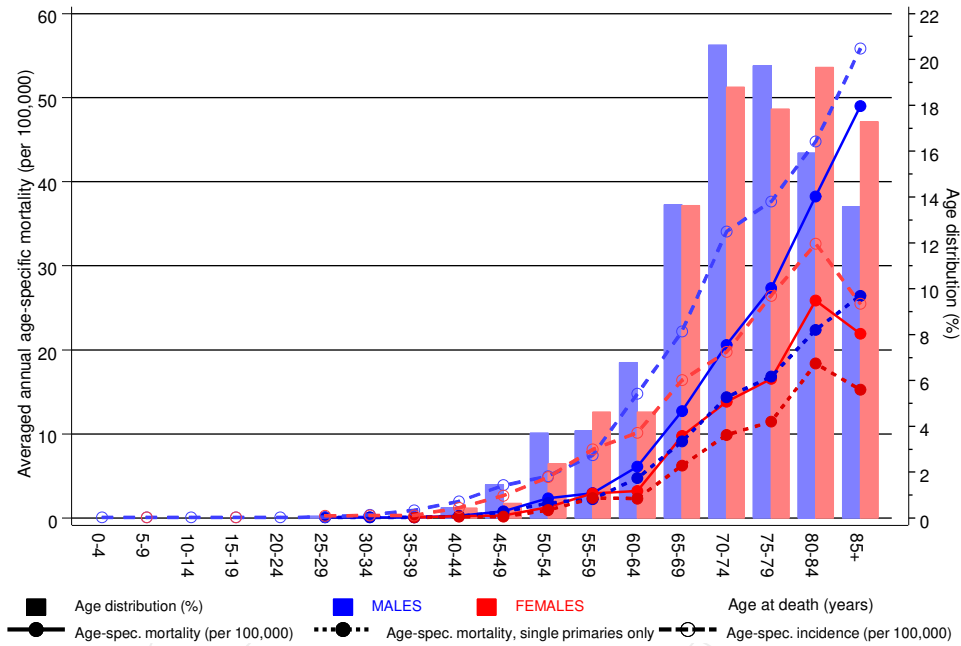
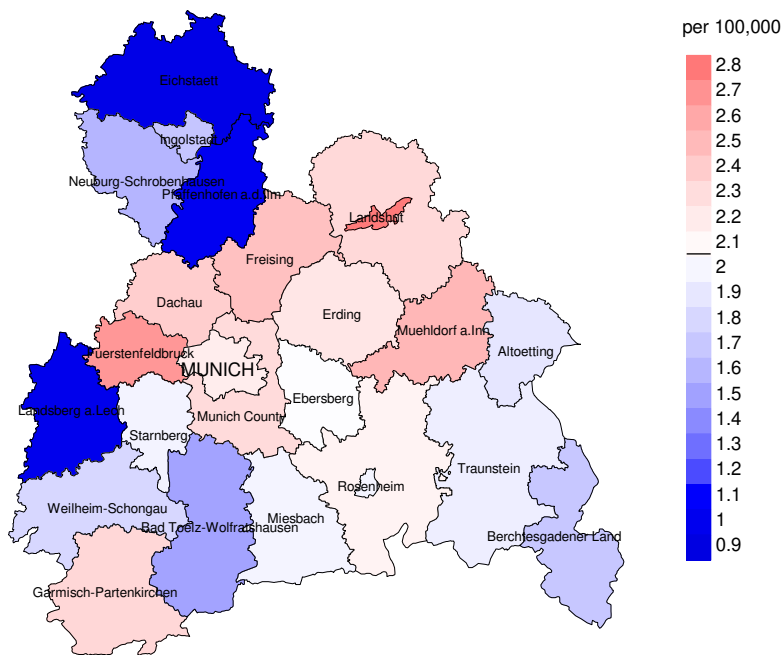


Figure 17. Distribution of age at death (bars; males: mean=70.1 yrs, median=71.1 yrs; females: mean=71.6 yrs, median=73.0 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

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



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

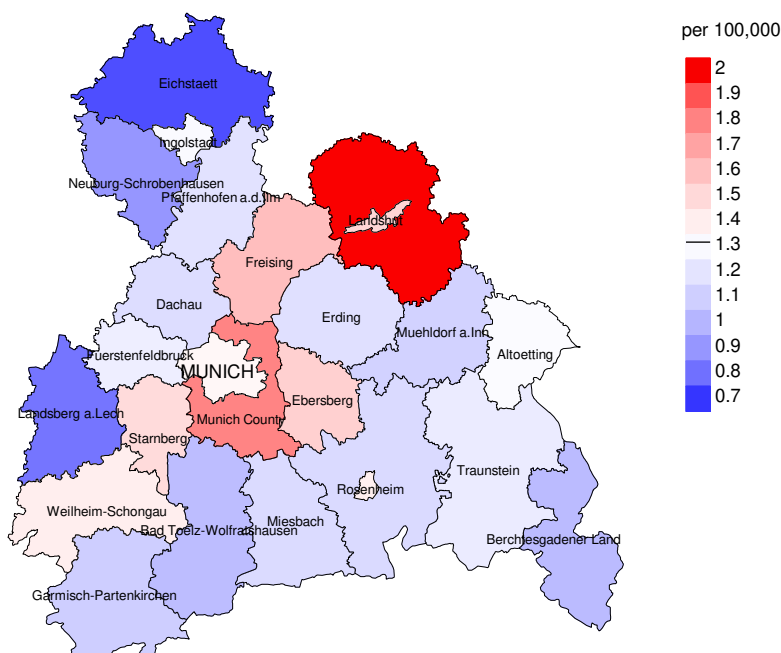
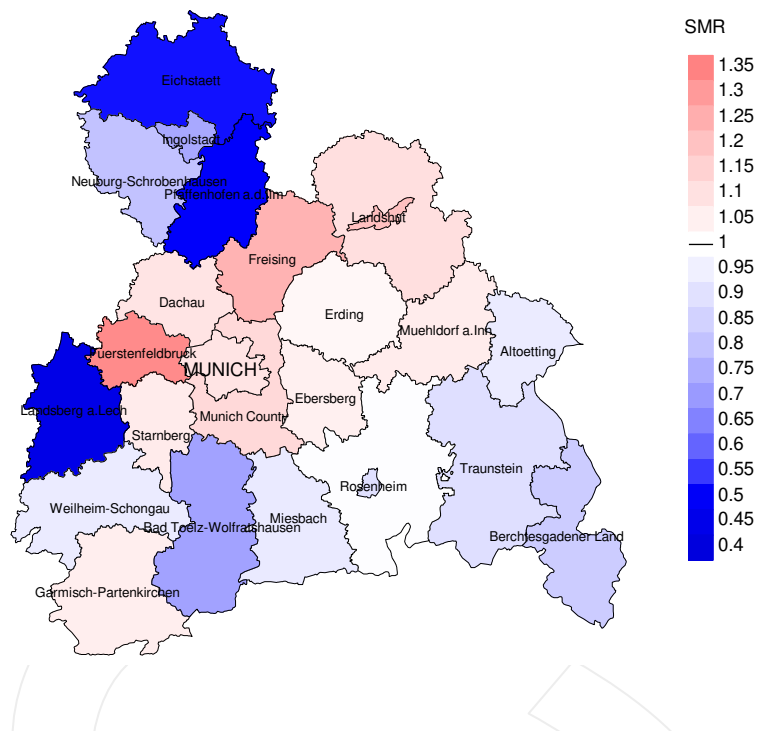


Figure 18a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2016. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 2.1/100,000 WS N=1,105, females 1.3/100,000 WS N=931).

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 29 women died from immunoprolif. disease. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 1.5/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.8 and 2.8/100,000.

Standardized mortality ratio (SMR) 2007 - 2016: Males



Standardized mortality ratio (SMR) 2007 - 2016: Females

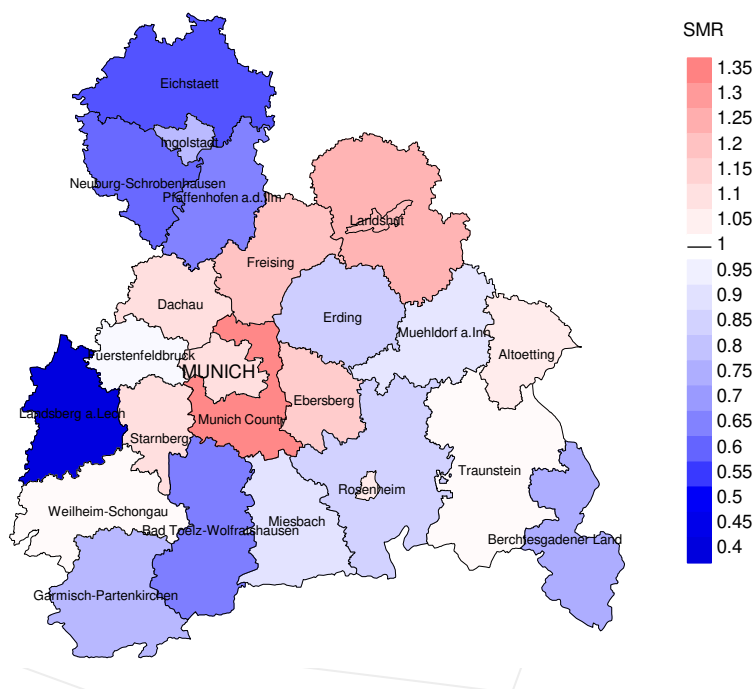


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=1,105, females N=931).

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 29 women died from immunoprolif. disease. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.17. Though, the value of this parameter may vary with an underlying probability of 99% between 0.69 and 1.85, 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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