

Munich Cancer Registry



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ICD-10 C90: Plasmacytoma

Incidence and Mortality

Year of diagnosis	1998-2016
Patients	4,325
Diseases	4,328
Creation date	08/21/2018
Export date	08/09/2018
Population	4.81 m



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

https://www.tumorregister-muenchen.de/en/facts/base/bC90__E-ICD-10-C90-Plasmacytoma-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 plasmacytomas 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
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	126	31	24.6	8.7	7.8	91.3	97.6
1999	131	29	22.1	12.5	7.7	93.1	99.2
2000	137	43	31.4	11.7	7.6	95.6	99.3
2001	115	34	29.6	11.4	7.7	92.2	99.1
2002	233	76	32.6	12.7	7.4	87.6	98.3 #
2003	236	58	24.6	12.5	7.4	89.0	96.6
2004	240	65	27.1	12.9	7.1	88.3	97.9
2005	233	45	19.3	13.7	6.9	84.5	97.0
2006	236	41	17.4	14.5	6.7	85.6	96.2
2007	317	66	20.8	14.7	6.6	84.9	92.4 #
2008	329	56	17.0	14.8	6.3	76.0	82.1
2009	280	42	15.0	15.1	5.8	76.1	88.9
2010	282	48	17.0	15.7	5.5	72.7	84.8
2011	318	61	19.2	16.2	5.0	67.0	83.0
2012	266	43	16.2	17.0	4.7	59.0	75.6
2013	268	46	17.2	17.4	4.1	56.3	79.1
2014	260	37	14.2	17.7	2.8	48.5	78.5
2015	177	48	27.1	17.8	1.9	62.1	99.4
2016	144	56	38.9	17.8	3.5	54.2	82.6 ##
1998-2016	4328	925	21.4	17.8	7.8	75.6	89.5

4,328 cases diagnosed 1998-2016 are related to a total of 4,325 patients. Currently, in 1,094 (25.3 %) of these 4,325 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 885 / 162 / 47 (20.5 % / 3.7 % / 1.1 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2014, a subgroup of 260 cases has been diagnosed, of which 17.7 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 2.8 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1a

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

Year of diagnosis	Males n	Males %	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	73	57.9	14	19.2	9.6	9.6	89.0	98.6
1999	66	50.4	13	19.7	12.9	9.5	92.4	98.5
2000	80	58.4	28	35.0	12.3	9.5	96.3	98.8
2001	57	49.6	14	24.6	12.7	9.5	86.0	98.2
2002	122	52.4	34	27.9	15.1	9.1	84.4	98.4 #
2003	142	60.2	33	23.2	14.1	9.2	86.6	95.8
2004	123	51.3	30	24.4	14.2	8.9	88.6	98.4
2005	121	51.9	21	17.4	14.5	8.7	84.3	97.5
2006	119	50.4	19	16.0	15.2	8.4	83.2	95.0
2007	172	54.3	38	22.1	15.3	8.2	84.3	90.7 #
2008	185	56.2	32	17.3	15.4	8.0	75.7	81.6
2009	142	50.7	20	14.1	15.7	7.6	73.2	85.9
2010	169	59.9	20	11.8	16.4	7.0	71.0	82.8
2011	169	53.1	22	13.0	17.2	6.2	65.1	82.2
2012	147	55.3	21	14.3	17.8	6.1	57.1	75.5
2013	156	58.2	25	16.0	18.3	5.4	52.6	76.9
2014	136	52.3	19	14.0	18.5	4.2	48.5	81.6
2015	100	56.5	26	26.0	18.3	3.4	63.0	99.0
2016	83	57.6	29	34.9	18.4	6.3	53.0	79.5 ##
1998-2016	2362	54.6	458	19.4	18.4	9.6	73.9	88.7

2,362 cases diagnosed 1998-2016 are related to a total of 2,361 patients. Currently, in 649 (27.5 %) of these 2,361 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 514 / 96 / 39 (21.8 % / 4.1 % / 1.7 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2014, a subgroup of 136 cases has been diagnosed, of which 18.5 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 4.2 % 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	53	42.1	17	32.1	7.5	5.6	94.3	96.2
1999	65	49.6	16	24.6	11.9	5.5	93.8	100.0
2000	57	41.6	15	26.3	10.9	5.4	94.7	100.0
2001	58	50.4	20	34.5	9.9	5.6	98.3	100.0
2002	111	47.6	42	37.8	9.9	5.3	91.0	98.2 #
2003	94	39.8	25	26.6	10.5	5.3	92.6	97.9
2004	117	48.8	35	29.9	11.4	5.1	88.0	97.4
2005	112	48.1	24	21.4	12.7	4.8	84.8	96.4
2006	117	49.6	22	18.8	13.6	4.7	88.0	97.4
2007	145	45.7	28	19.3	13.9	4.7	85.5	94.5 #
2008	144	43.8	24	16.7	14.1	4.3	76.4	82.6
2009	138	49.3	22	15.9	14.4	3.5	79.0	92.0
2010	113	40.1	28	24.8	14.8	3.6	75.2	87.6
2011	149	46.9	39	26.2	15.0	3.5	69.1	83.9
2012	119	44.7	22	18.5	16.0	2.9	61.3	75.6
2013	112	41.8	21	18.8	16.4	2.5	61.6	82.1
2014	124	47.7	18	14.5	16.7	1.2	48.4	75.0
2015	77	43.5	22	28.6	17.1	0.0	61.0	100.0
2016	61	42.4	27	44.3	17.0	0.0	55.7	86.9 ##
1998-2016	1966	45.4	467	23.8	17.0	5.6	77.6	90.5

1,966 cases diagnosed 1998-2016 are related to a total of 1,964 patients. Currently, in 445 (22.7 %) of these 1,964 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 371 / 66 / 8 (18.9 % / 3.4 % / 0.4 %) 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 2014, a subgroup of 124 cases has been diagnosed, of which 16.7 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 1.2 % 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	73	53	6.6	4.5	4.1	2.1	5.9	3.0	7.3	3.7
1999	66	65	5.9	5.5	3.7	2.2	5.4	3.5	7.2	4.6
2000	80	57	7.0	4.7	3.9	1.9	6.3	3.0	8.8	4.0
2001	57	58	4.9	4.8	2.9	2.2	4.4	3.2	6.0	4.2
2002	122	111	6.5	5.7	3.7	2.3	5.6	3.5	7.3	4.6
2003	142	94	7.6	4.8	4.1	2.0	6.1	3.0	8.0	3.9
2004	123	117	6.5	5.9	3.6	2.4	5.4	3.6	6.9	4.8
2005	121	112	6.4	5.6	3.2	2.2	4.9	3.4	6.6	4.6
2006	119	117	6.2	5.8	3.2	2.3	4.8	3.5	6.3	4.6
2007	172	145	7.8	6.3	3.9	2.5	6.0	3.8	8.0	4.9
2008	185	144	8.3	6.2	4.2	2.5	6.2	3.8	8.0	5.1
2009	142	138	6.4	5.9	3.0	2.3	4.5	3.4	5.9	4.5
2010	169	113	7.5	4.8	3.7	1.9	5.5	2.8	7.2	3.7
2011	169	149	7.6	6.4	3.4	2.6	5.2	3.9	7.1	5.0
2012	147	119	6.5	5.0	2.9	1.8	4.4	2.8	5.9	3.9
2013	156	112	6.8	4.7	3.0	1.8	4.6	2.7	6.2	3.7
2014	136	124	5.8	5.2	2.6	2.0	4.0	3.0	5.2	4.0
2015	100	77	4.2	3.2	1.8	1.0	2.8	1.6	3.8	2.3
2016	83	61	3.5	2.5	1.4	0.7	2.2	1.2	3.1	1.7
1998-2016	2362	1966	6.4	5.1	3.2	2.0	4.8	3.1	6.4	4.0

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

Table 3

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

Year of diagnosis	Cases n	Std.		Min.	Max.	10%	25%	Median		
		Mean	dev.					50%	75%	90%
1998	126	67.4	13.0	26.1	94.0	52.7	58.7	67.7	75.7	85.3
1999	131	69.5	13.0	23.9	92.8	53.5	60.0	71.0	79.0	84.3
2000	137	72.1	11.8	38.2	94.4	55.7	65.2	73.6	80.0	86.5
2001	115	68.9	11.1	36.1	93.7	50.9	60.8	70.5	77.5	81.4
2002	233	71.0	12.1	32.7	93.5	55.9	62.7	71.8	79.9	86.3
2003	236	69.6	11.2	31.4	99.0	55.4	62.3	69.1	78.2	83.7
2004	240	70.4	11.7	37.1	93.4	55.5	62.7	70.7	79.2	84.4
2005	233	71.7	11.0	38.9	102	56.7	65.2	72.7	79.4	84.7
2006	236	71.0	12.3	22.7	94.9	55.6	64.8	71.5	79.7	85.3
2007	317	71.2	11.0	30.9	93.2	58.1	64.6	71.5	79.8	84.5
2008	329	71.0	11.7	33.8	97.9	56.1	64.8	70.9	79.4	85.2
2009	280	71.9	11.2	34.7	94.6	56.7	66.0	72.0	79.7	85.7
2010	282	70.8	12.4	5.0	97.2	54.0	63.9	72.1	79.6	86.0
2011	318	71.5	12.1	31.0	97.4	53.6	66.3	73.0	79.6	85.4
2012	266	71.8	11.6	31.5	97.5	53.7	65.6	72.9	80.1	85.0
2013	268	71.9	11.7	38.5	93.1	54.1	64.2	74.4	80.6	85.2
2014	260	71.9	11.4	38.1	98.4	56.0	63.5	73.7	80.3	85.7
2015	177	74.4	10.5	47.5	95.2	58.4	68.1	75.5	81.6	87.0
2016	144	75.1	11.1	35.7	99.9	57.1	70.5	77.1	82.4	87.3
1998-2016	4328	71.3	11.7	5.0	102	55.3	64.2	72.5	79.8	85.3

Table 3a

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

Year of diagnosis	Cases n	Std.		Min.	Max.	10%	25%	Median		
		Mean	dev.					50%	75%	90%
1998	73	64.8	13.4	26.1	92.3	49.5	56.2	64.7	73.6	83.9
1999	66	66.7	13.5	23.9	91.7	48.5	58.5	68.3	77.0	83.7
2000	80	71.2	11.5	38.2	92.3	56.1	62.3	71.9	79.6	86.6
2001	57	67.7	10.8	44.4	85.3	49.1	59.2	69.7	76.3	80.3
2002	122	69.2	12.0	32.7	93.5	54.4	62.1	69.9	78.0	83.6
2003	142	68.2	10.2	36.7	99.0	55.2	61.8	67.4	75.6	81.4
2004	123	68.5	12.2	37.1	93.4	52.6	60.7	69.5	76.4	83.1
2005	121	70.7	10.9	38.9	102	57.6	65.2	69.8	77.8	83.8
2006	119	69.5	11.9	27.5	94.8	53.7	63.8	69.7	76.9	84.4
2007	172	69.9	11.4	30.9	93.2	55.9	63.4	70.5	79.1	82.7
2008	185	69.6	12.2	33.8	97.9	51.6	63.4	70.2	78.4	85.1
2009	142	70.2	10.8	34.7	94.1	54.9	65.5	71.2	77.7	83.8
2010	169	69.5	12.4	5.0	93.0	51.9	63.6	71.0	77.3	84.6
2011	169	71.1	11.9	31.0	97.4	51.6	67.3	73.0	78.4	84.2
2012	147	70.8	11.3	41.0	92.5	52.4	64.8	72.1	77.9	84.1
2013	156	71.4	11.9	38.5	93.1	52.0	64.3	74.3	79.4	84.8
2014	136	71.5	11.6	38.1	96.6	56.7	63.9	73.4	79.9	85.6
2015	100	73.5	10.1	48.2	92.1	58.8	67.2	73.7	80.6	86.3
2016	83	73.8	11.0	43.1	99.9	57.1	66.0	75.6	81.4	87.2
1998-2016	2362	70.0	11.7	5.0	102	53.9	63.2	71.3	78.3	84.3

Table 3b

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min. Max.		10% 25%		Median		
				Min.	Max.	10%	25%	50%	75%	90%
1998	53	70.9	11.6	37.6	94.0	57.6	62.4	70.7	78.6	88.1
1999	65	72.3	11.9	49.2	92.8	56.1	62.1	74.6	80.1	87.9
2000	57	73.4	12.1	40.6	94.4	55.7	67.0	76.1	80.4	86.2
2001	58	70.1	11.3	36.1	93.7	57.3	63.3	70.7	79.1	83.2
2002	111	73.0	11.9	38.9	93.2	56.3	63.7	74.3	82.6	87.8
2003	94	71.8	12.4	31.4	94.2	55.8	63.8	72.9	80.7	85.6
2004	117	72.4	10.9	38.8	92.1	56.9	65.6	73.4	81.3	84.5
2005	112	72.8	11.0	42.1	96.8	56.7	65.9	74.8	81.6	84.7
2006	117	72.6	12.4	22.7	94.9	55.6	66.2	74.5	81.9	85.7
2007	145	72.6	10.3	44.4	92.3	60.8	66.6	72.9	80.9	86.1
2008	144	72.7	10.7	37.5	94.3	59.1	66.3	73.9	79.9	85.5
2009	138	73.6	11.4	36.3	94.6	60.0	67.4	73.6	83.4	87.1
2010	113	72.8	12.1	40.5	97.2	55.9	66.5	73.1	82.1	87.1
2011	149	71.9	12.3	41.9	97.1	54.4	65.3	73.1	80.8	87.3
2012	119	73.0	12.0	31.5	97.5	54.8	66.7	75.4	82.4	86.1
2013	112	72.7	11.5	43.3	92.2	56.9	64.2	74.6	81.1	85.5
2014	124	72.4	11.2	42.1	98.4	55.5	63.2	74.6	81.7	85.7
2015	77	75.5	10.9	47.5	95.2	56.9	72.4	77.3	83.0	87.9
2016	61	76.9	11.1	35.7	95.8	65.7	71.5	79.0	83.7	87.3
1998-2016	1966	72.8	11.5	22.7	98.4	56.7	65.6	74.3	81.4	86.3

Table 4

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

Age at diagnosis Years	Cases n	Males			Females				
		%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4	1	0.0	0.0	1	0.1	0.1			0.0
5-9	0	0.0	0.0			0.1			0.0
10-14	0	0.0	0.0			0.1			0.0
15-19	0	0.0	0.0			0.1			0.0
20-24	0	0.0	0.0			0.1			0.0
25-29	0	0.0	0.0			0.1			0.0
30-34	6	0.2	0.3	5	0.3	0.4	1	0.1	0.1
35-39	10	0.4	0.6	7	0.5	0.9	3	0.3	0.3
40-44	39	1.5	2.1	29	2.0	2.9	10	0.8	1.2
45-49	85	3.2	5.3	55	3.8	6.6	30	2.5	3.7
50-54	111	4.2	9.5	62	4.2	10.9	49	4.1	7.9
55-59	157	5.9	15.5	79	5.4	16.3	78	6.6	14.5
60-64	228	8.6	24.1	135	9.3	25.6	93	7.9	22.3
65-69	371	14.0	38.2	211	14.5	40.0	160	13.5	35.9
70-74	495	18.7	56.9	312	21.4	61.4	183	15.5	51.4
75-79	460	17.4	74.3	251	17.2	78.6	209	17.7	69.0
80-84	375	14.2	88.5	179	12.3	90.9	196	16.6	85.6
85+	303	11.5	100.0	133	9.1	100.0	170	14.4	100.0
All ages	2641	100.0		1459	100.0		1182	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=252 %	Females DCO rate n=250 %	Males	Females
							Prop.all cancers n=113978 %	Prop.all cancers n=112253 %
0- 4	1		0.1				0.5	
5- 9								
10-14								
15-19								
20-24								
25-29								
30-34	5	1	0.3	0.1			0.5	0.1
35-39	7	3	0.4	0.2			0.5	0.1
40-44	29	10	1.6	0.6			1.3	0.2
45-49	55	30	2.8	1.6			1.4	0.4
50-54	62	49	3.6	2.9	9.7	6.1	1.0	0.6
55-59	79	78	5.6	5.3	5.1	3.8	0.9	0.8
60-64	135	93	11.0	7.0	6.7	6.5	1.0	0.8
65-69	211	160	17.8	12.3	9.0	8.1	1.1	1.1
70-74	312	183	28.2	14.5	13.1	11.5	1.5	1.2
75-79	251	209	31.5	20.9	19.5	16.7	1.5	1.6
80-84	179	196	38.9	27.7	29.6	32.1	1.6	1.8
85+	133	169	43.4	23.0	53.4	62.7	1.7	1.3
All ages	1459	1181			17.3	21.2	1.3	1.1
Incidence								
Raw			6.4	5.0				
WS			3.0	1.9				
ES			4.5	2.9				
BRD-S			6.0	3.8				

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

ICD-10 C90: Multiple myeloma and malignant plasma cell neoplasms

Age distribution and age-specific incidence 2007 - 2016 (Males: 1459, Females: 1181)

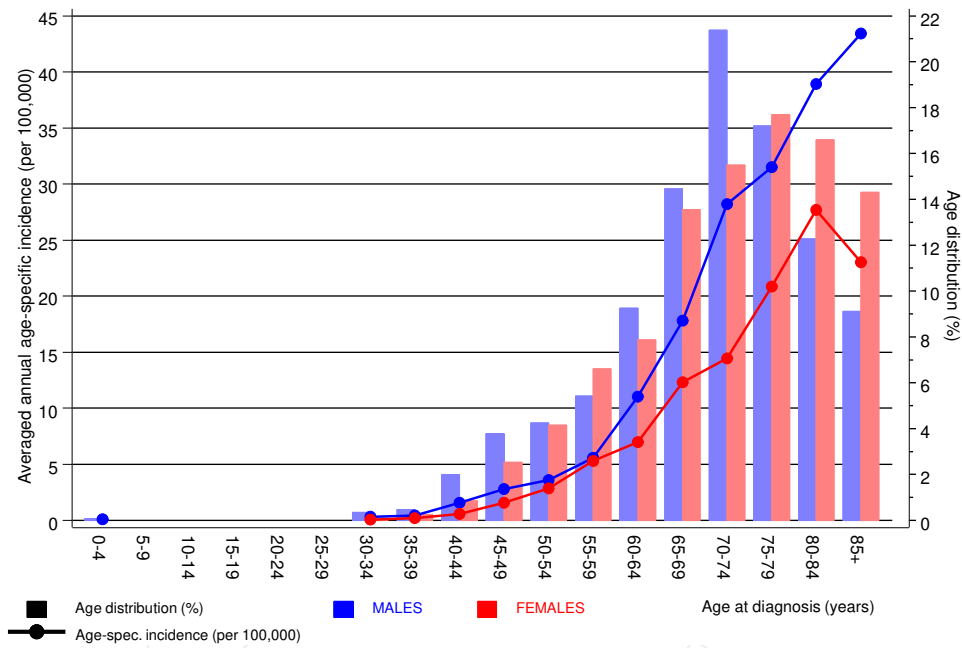


Figure 6. Age distribution (males: mean=70.9 yrs, median=72.2 yrs; females: mean=73.1 yrs, median=74.5 yrs) and age-specific incidence.

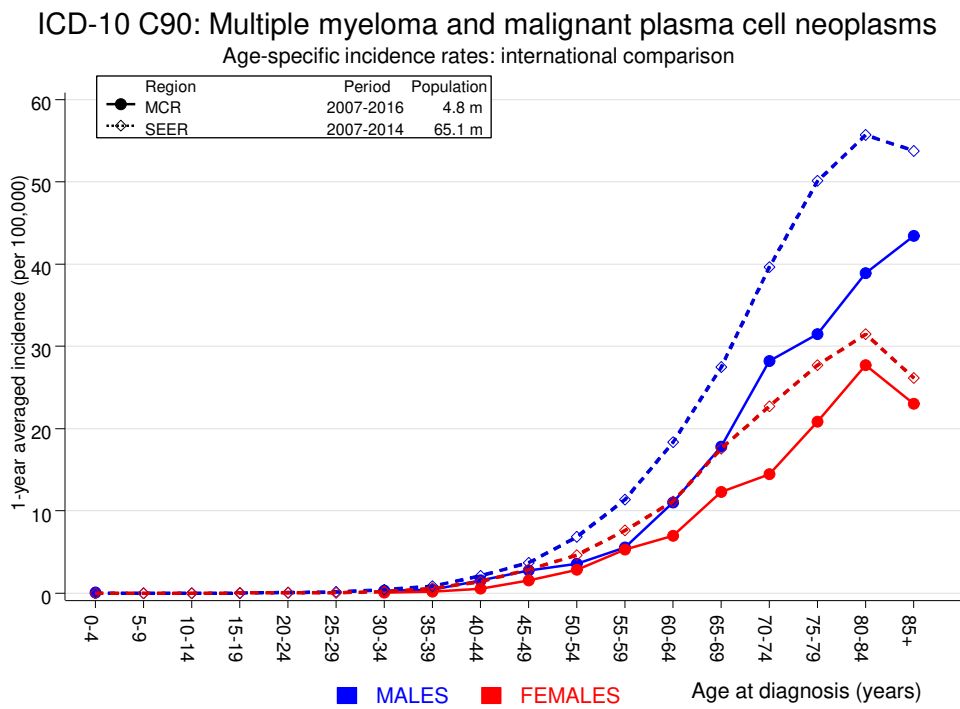


Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 18 Regs Research Data, released April 2014, based on the November 2013 submission. <http://www.seer.cancer.gov>.

Table 7a

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

MALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C15 Oesophagus	5	1.8	2.7	0.9	6.3	5.5	20.0
C16 Stomach	9	3.8	2.4	1.1	4.5 #	9.1	
C18 Colon	12	9.2	1.3	0.7	2.3	4.9	
C19–C20 Rectum	9	5.2	1.7	0.8	3.3	6.5	
C22 Liver	5	2.8	1.8	0.6	4.2	3.8	20.0
C25 Pancreas	6	3.6	1.7	0.6	3.6	4.2	33.3
C32 Larynx	2	1.0	2.0	0.2	7.1	1.7	
C33–C34 Lung	18	11.6	1.6	0.9	2.5	11.2	5.6
C38,C45 Mesothelioma	2	0.7	2.9	0.4	10.6	2.3	
C40–C41 Bone	3	0.1	36.9	7.6	107.8 #	5.1	
C43 Malign. melanoma	9	4.3	2.1	1.0	4.0	8.2	
C46,C49 Soft tissue	3	0.5	5.7	1.2	16.6 #	4.3	
C61 Prostate	62	28.5	2.2	1.7	2.8 #	58.4	3.2
C64 Kidney	9	3.4	2.6	1.2	5.0 #	9.7	11.1
C67 Bladder	10	4.2	2.4	1.1	4.3 #	10.0	10.0
C70–C72 CNS cancer	5	1.3	4.0	1.3	9.2 #	6.5	20.0
C73 Thyroid	3	0.6	4.7	1.0	13.7	4.1	
C76–C79 CUP	6	1.6	3.7	1.4	8.1 #	7.7	
C82–C85 NHL	22	3.9	5.6	3.5	8.5 #	31.5	4.5
C91–C96 Leukaemia	10	1.5	6.5	3.1	11.9 #	14.7	10.0
Others, specified	9	4.9	1.8	0.8	3.5	7.1	11.1
Not observed	0	3.4	0.0	0.0	1.1	-5.9	
All further malignancies	219	98.0	2.2	1.9	2.6 #	210.6	5.9
Patients		1921					
Median age at next malignancy (years)		73.4					
Person-years		5748					
Mean observation time (years)		3.0					
Median observation time (years)		1.9					

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

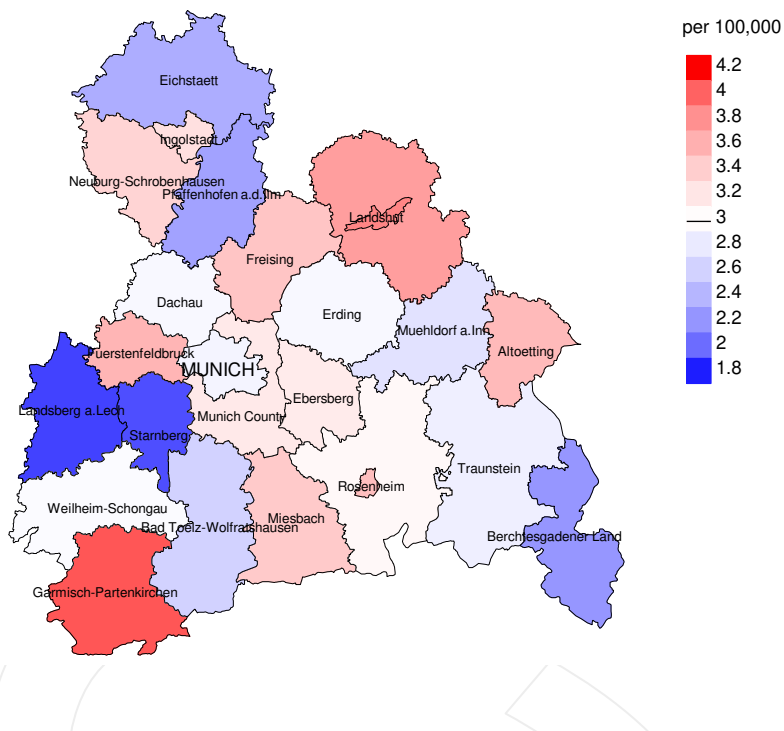
Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C09–C10 Oropharynx	2	0.2	9.3	1.1	33.7 #	4.0	
C16 Stomach	7	1.8	3.9	1.6	8.1 #	11.7	
C18 Colon	11	5.1	2.2	1.1	3.9 #	13.3	
C19–C20 Rectum	3	2.2	1.4	0.3	4.0	1.9	
C25 Pancreas	3	2.4	1.2	0.3	3.6	1.3	66.7
C33–C34 Lung	5	4.1	1.2	0.4	2.9	2.1	
C43 Malign. melanoma	8	2.0	4.1	1.8	8.0 #	13.6	
C48 Peritoneal	3	0.2	13.9	2.9	40.5 #	6.3	
C50 Breast	17	15.9	1.1	0.6	1.7	2.5	11.8
C54 Corpus uteri	2	3.0	0.7	0.1	2.4	-2.3	
C56 Ovary	3	2.2	1.4	0.3	4.0	1.9	33.3
C67 Bladder	2	1.0	2.0	0.2	7.3	2.3	
C73 Thyroid	2	0.9	2.3	0.3	8.4	2.6	
C76–C79 CUP	2	0.9	2.1	0.3	7.8	2.4	
C82–C85 NHL	14	2.1	6.7	3.7	11.3 #	26.8	14.3
C90 Mult. myeloma	2	0.7	2.9	0.4	10.6	3.0	50.0
C91–C96 Leukaemia	8	0.9	9.4	4.0	18.5 #	16.1	12.5
Others, specified	14	5.7	2.5	1.4	4.2 #	18.8	14.3
Not observed	0	2.0	0.0	0.0	1.9	-4.5	
All further malignancies	108	53.0	2.0	1.7	2.5 #	123.7	10.2

Patients	1537
Median age at next malignancy (years)	73.5
Person-years	4445
Mean observation time (years)	2.9
Median observation time (years)	1.8

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

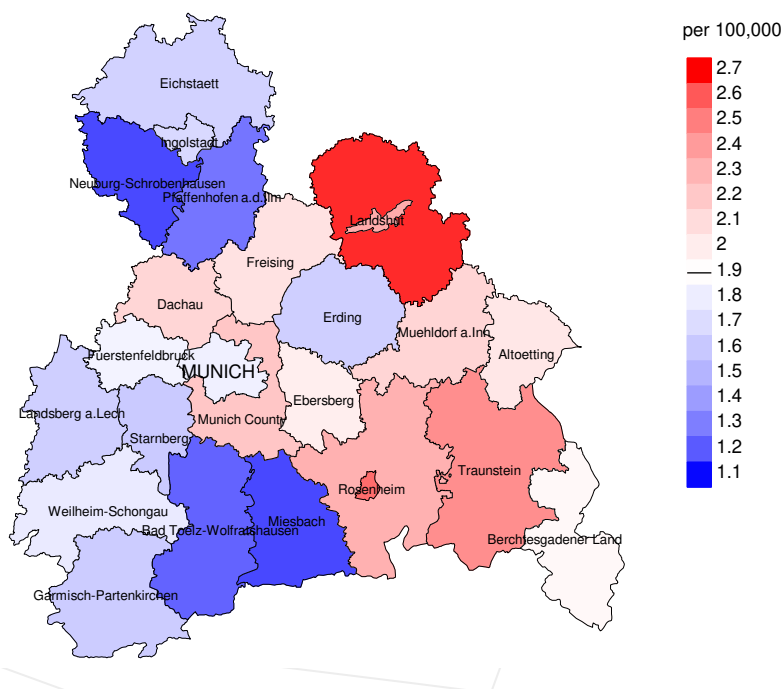
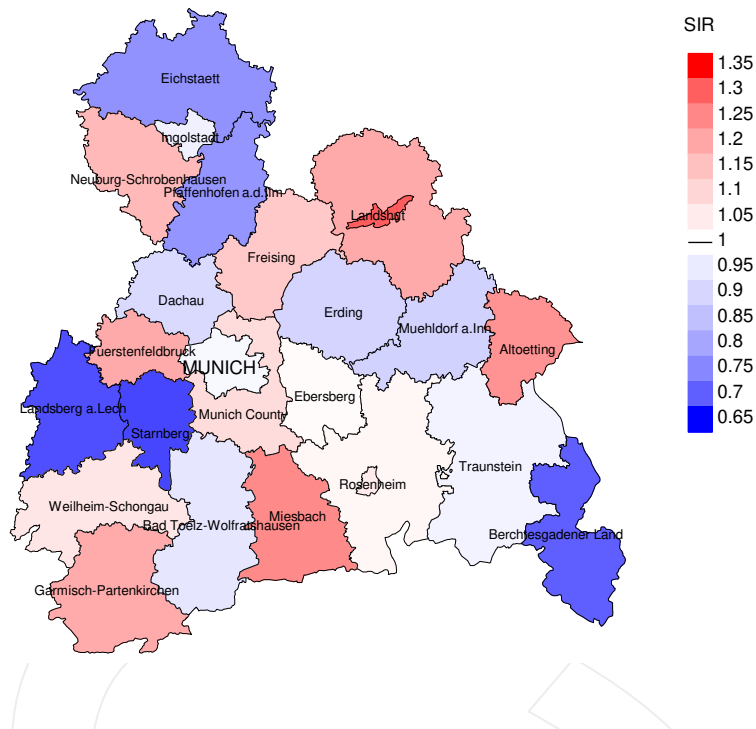


Figure 8a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 3.0/100,000 WS N=1,459, females 1.9/100,000 WS N=1,181).

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 35 women were identified with newly diagnosed plasmacytoma. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 2.0/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 1.1 and 3.4/100,000.

Standardized incidence ratio (SIR) 2007 - 2016: Males



Standardized incidence ratio (SIR) 2007 - 2016: Females

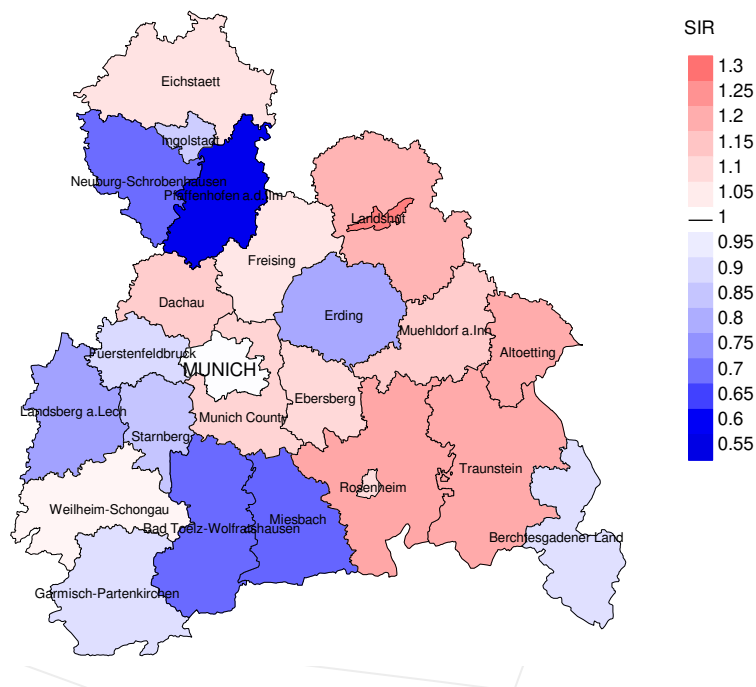


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=1,459, females N=1,181).

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 35 women were identified with newly diagnosed plasmacytoma. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.10. Though, the value of this parameter may vary with an underlying probability of 99% between 0.68 and 1.68, 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	126	97.6	24.6	115	91.3	93.9
1999	131	99.2	22.1	122	93.1	94.3
2000	137	99.3	31.4	131	95.6	95.4
2001	115	99.1	29.6	106	92.2	96.2
2002	233	98.3	32.6	204	87.6	98.0
2003	236	96.6	24.6	210	89.0	97.6
2004	240	97.9	27.1	212	88.3	98.1
2005	233	97.0	19.3	197	84.5	98.0
2006	236	96.2	17.4	202	85.6	99.0
2007	317	92.4	20.8	269	84.9	97.4
2008	329	82.1	17.0	250	76.0	98.4
2009	280	88.9	15.0	213	76.1	97.2
2010	282	84.8	17.0	205	72.7	99.0
2011	318	83.0	19.2	213	67.0	98.1
2012	266	75.6	16.2	157	59.0	98.7
2013	268	79.1	17.2	151	56.3	96.7
2014	260	78.5	14.2	126	48.5	96.8
2015	177	99.4	27.1	110	62.1	95.5
2016	144	82.6	38.9	78	54.2	91.0
1998-2016	4328	89.5	21.4	3271	75.6	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	126	84	92.9	36	28.6
1999	131	98	95.9	43	32.8
2000	137	111	91.9	49	35.8
2001	115	102	95.1	37	32.2
2002	233	144	95.8	87	37.3
2003	236	163	99.4	80	33.9
2004	240	193	98.4	91	37.9
2005	233	149	98.0	66	28.3
2006	236	154	96.8	66	28.0
2007	317	183	98.9	90	28.4
2008	329	215	97.2	83	25.2
2009	280	214	97.2	71	25.4
2010	282	224	99.1	75	26.6
2011	318	235	97.9	81	25.5
2012	266	211	97.2	62	23.3
2013	268	226	99.1	71	26.5
2014	260	256	97.7	77	29.6
2015	177	239	99.6	81	45.8
2016	144	182	98.4	71	49.3
1998-2016	4328	3383	97.6	1317	30.4

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	84	53.6	46.4	94.9
1999	98	72.4	27.6	96.8
2000	111	64.9	35.1	96.1
2001	102	58.8	41.2	99.0
2002	144	81.3	18.8	97.1
2003	163	81.0	19.0	96.9
2004	193	82.9	17.1	96.8
2005	149	83.2	16.8	95.2
2006	154	84.4	15.6	96.6
2007	183	85.2	14.8	95.6
2008	215	83.3	16.7	92.3
2009	214	81.3	18.7	96.6
2010	224	81.7	18.3	90.5
2011	235	79.6	20.4	93.0
2012	211	82.9	17.1	93.2
2013	226	81.4	18.6	92.9
2014	256	83.2	16.8	92.0
2015	239	79.9	20.1	89.5
2016	182	75.3	24.7	93.9
1998-2016	3383	79.5	20.5	94.2

Table 10a

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

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	35	68.9	66.1	78.5	71.7
1999	51	71.9	71.5	74.0	71.8
2000	62	75.4	72.1	77.0	77.8
2001	47	75.5	74.2	76.6	75.5
2002	73	71.3	71.9	68.1	71.5
2003	83	72.4	71.5	74.9	72.4
2004	103	73.4	73.1	77.2	73.5
2005	76	74.0	74.0	73.7	73.8
2006	80	73.7	73.4	79.7	73.4
2007	94	74.3	74.1	79.9	74.6
2008	124	72.3	70.4	81.3	71.5
2009	114	72.6	72.6	72.6	73.1
2010	117	74.1	73.7	76.6	73.6
2011	130	75.8	75.8	78.1	75.8
2012	108	75.2	74.9	77.1	76.4
2013	141	76.3	75.5	79.0	75.8
2014	140	77.3	76.4	78.3	76.7
2015	130	76.9	76.8	78.6	77.0
2016	99	75.8	75.4	76.5	76.9
1998-2016	1807	74.6	74.1	77.2	74.7

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	47	78.4	76.8	82.5	78.4
2000	49	77.2	76.7	78.8	76.5
2001	55	76.9	74.5	77.9	76.6
2002	71	76.5	74.0	82.1	77.0
2003	80	75.1	73.3	82.1	75.1
2004	90	75.5	74.3	81.4	75.4
2005	73	76.3	74.7	84.7	75.5
2006	74	76.3	76.1	78.8	77.2
2007	89	78.1	77.3	84.1	78.2
2008	91	77.4	77.1	80.8	77.4
2009	100	73.4	71.9	80.7	73.0
2010	107	76.1	74.9	81.8	75.9
2011	105	76.0	74.2	83.9	75.5
2012	103	77.8	76.6	81.4	76.4
2013	85	79.2	79.0	79.8	79.2
2014	116	77.9	76.2	83.2	78.0
2015	109	77.4	77.3	83.2	77.6
2016	83	78.5	78.7	77.8	78.5
1998-2016	1576	76.9	75.9	81.4	76.7

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	22	2.0	0.30	1.2	0.30	1.7	0.29	2.0	0.28
1999	36	3.2	0.55	2.0	0.54	3.0	0.56	4.2	0.58
2000	39	3.4	0.49	1.9	0.48	3.0	0.48	4.5	0.51
2001	30	2.6	0.53	1.4	0.48	2.3	0.52	3.4	0.56
2002	57	3.1	0.47	1.7	0.45	2.6	0.46	3.5	0.49
2003	68	3.6	0.48	1.9	0.45	2.9	0.48	4.0	0.51
2004	84	4.5	0.68	2.3	0.63	3.6	0.65	4.8	0.70
2005	64	3.4	0.53	1.7	0.52	2.7	0.54	3.7	0.56
2006	67	3.5	0.56	1.7	0.51	2.6	0.54	3.6	0.58
2007	84	3.8	0.49	1.8	0.46	2.9	0.48	4.0	0.50
2008	107	4.8	0.58	2.4	0.57	3.6	0.58	4.7	0.59
2009	93	4.2	0.65	1.9	0.63	3.0	0.66	4.0	0.68
2010	92	4.1	0.54	1.7	0.47	2.8	0.50	3.9	0.54
2011	109	4.9	0.64	2.0	0.60	3.3	0.64	4.7	0.67
2012	87	3.8	0.59	1.6	0.55	2.5	0.57	3.6	0.61
2013	110	4.8	0.71	1.9	0.62	3.0	0.66	4.4	0.71
2014	114	4.9	0.84	1.9	0.72	3.1	0.76	4.4	0.84
2015	104	4.4	1.04	1.7	0.91	2.7	0.97	3.9	1.03
2016	75	3.1	0.90	1.3	0.96	2.1	0.94	2.8	0.91
1998-2016	1442	3.9	0.61	1.8	0.56	2.9	0.59	4.0	0.63

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	0.43	0.9	0.44	1.3	0.44	1.7	0.45
1999	35	2.9	0.54	1.1	0.48	1.7	0.50	2.4	0.53
2000	33	2.7	0.58	1.0	0.54	1.6	0.54	2.2	0.56
2001	30	2.5	0.52	1.0	0.45	1.6	0.49	2.2	0.52
2002	60	3.1	0.54	1.2	0.53	1.8	0.52	2.4	0.53
2003	64	3.2	0.68	1.3	0.65	2.0	0.66	2.6	0.67
2004	76	3.8	0.65	1.5	0.61	2.3	0.63	3.1	0.65
2005	60	3.0	0.54	1.1	0.51	1.8	0.52	2.4	0.52
2006	63	3.1	0.54	1.1	0.47	1.7	0.50	2.5	0.54
2007	72	3.1	0.50	1.1	0.42	1.7	0.45	2.4	0.49
2008	72	3.1	0.50	1.1	0.44	1.7	0.46	2.4	0.48
2009	81	3.5	0.59	1.3	0.59	2.0	0.59	2.6	0.58
2010	91	3.9	0.81	1.3	0.71	2.1	0.73	2.9	0.78
2011	78	3.3	0.52	1.2	0.48	1.9	0.49	2.6	0.52
2012	88	3.7	0.74	1.3	0.70	2.0	0.71	2.7	0.68
2013	74	3.1	0.66	1.0	0.52	1.5	0.56	2.3	0.62
2014	99	4.1	0.80	1.3	0.67	2.1	0.71	3.0	0.77
2015	87	3.6	1.13	1.1	1.12	1.8	1.12	2.5	1.11
2016	62	2.5	1.02	0.7	0.98	1.2	0.99	1.7	1.01
1998-2016	1248	3.3	0.64	1.2	0.57	1.8	0.59	2.5	0.62

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	0.1	0.1	1	0.1	0.1			0.0
30-34	1	0.1	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	7	0.4	0.6	5	0.5	0.8	2	0.2	0.4
45-49	21	1.2	1.8	16	1.6	2.5	5	0.6	1.0
50-54	50	2.8	4.6	33	3.4	5.8	17	2.1	3.1
55-59	77	4.3	8.9	37	3.8	9.6	40	5.0	8.1
60-64	107	6.0	15.0	69	7.1	16.7	38	4.7	12.8
65-69	240	13.5	28.4	132	13.5	30.3	108	13.4	26.2
70-74	359	20.2	48.6	202	20.7	51.0	157	19.5	45.8
75-79	347	19.5	68.1	198	20.3	71.3	149	18.5	64.3
80-84	313	17.6	85.7	156	16.0	87.3	157	19.5	83.8
85+	254	14.3	100.0	124	12.7	100.0	130	16.2	100.0
All ages	1779	100.0		975	100.0		804	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	1.00			1.4	
30-34	1		0.1	0.20			1.0	
35-39	1	1	0.1	0.14	0.1	0.33	0.5	0.4
40-44	5	2	0.3	0.17	0.1	0.20	1.0	0.3
45-49	16	5	0.8	0.29	0.3	0.17	1.4	0.4
50-54	33	17	1.9	0.53	1.0	0.35	1.6	0.9
55-59	37	40	2.6	0.47	2.7	0.51	1.1	1.4
60-64	69	38	5.6	0.51	2.9	0.41	1.4	1.0
65-69	132	108	11.1	0.63	8.3	0.68	1.8	2.0
70-74	202	157	18.3	0.65	12.4	0.86	2.2	2.3
75-79	198	149	24.9	0.79	14.9	0.71	2.2	2.1
80-84	156	157	33.9	0.87	22.2	0.80	2.1	2.3
85+	124	130	40.5	0.93	17.7	0.77	1.9	1.4
All ages	975	804					1.9	1.7
Mortality								
Raw			4.3	0.67	3.4	0.68		
WS			1.8	0.61	1.1	0.60		
ES			2.9	0.64	1.8	0.63		
BRD-S			4.0	0.68	2.5	0.66		
PYLL-70								
per 100,000			12.4		7.8			
ES			10.6		6.4			
AYLL-70			8.5		7.4			

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	5	1.2	1	20.0	2	40.0	2	40.0
C16 Stomach	13	3.1	7	53.8	1	7.7	5	38.5
C18 Colon	25	5.9	15	60.0	3	12.0	7	28.0
C19–C20 Rectum	18	4.3	12	66.7			6	33.3
C22 Liver	7	1.7	1	14.3	1	14.3	5	71.4
C25 Pancreas	6	1.4			1	16.7	5	83.3
C33–C34 Lung	23	5.5	4	17.4	5	21.7	14	60.9
C40–C41 Bone	5	1.2			1	20.0	4	80.0
C43 Malign. melanoma	24	5.7	17	70.8	1	4.2	6	25.0
C44 Skin others	33	7.8	17	51.5			16	48.5
C61 Prostate	134	31.8	100	74.6	8	6.0	26	19.4
C64 Kidney	22	5.2	11	50.0	4	18.2	7	31.8
C67 Bladder	13	3.1	7	53.8			6	46.2
C70–C72 CNS cancer	7	1.7	1	14.3	1	14.3	5	71.4
C73 Thyroid	5	1.2	3	60.0			2	40.0
C76–C79 CUP	5	1.2					5	100.0
C82–C85 NHL	37	8.8	10	27.0	10	27.0	17	45.9
C91–C96 Leukaemia	11	2.6	1	9.1	3	27.3	7	63.6
Others, specified	28	6.7	12	42.9	1	3.6	15	53.6
All further malignancies	421	100.0	219	52.0	42	10.0	160	38.0

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 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	3	1.0	2	66.7			1	33.3
C16 Stomach	10	3.5	3	30.0	3	30.0	4	40.0
C18 Colon	25	8.7	14	56.0	2	8.0	9	36.0
C19-C20 Rectum	16	5.6	12	75.0	1	6.3	3	18.8
C21 Anus/canal	4	1.4	3	75.0			1	25.0
C25 Pancreas	8	2.8			4	50.0	4	50.0
C33-C34 Lung	9	3.1	3	33.3	3	33.3	3	33.3
C43 Malign. melanoma	15	5.2	9	60.0			6	40.0
C44 Skin others	15	5.2	9	60.0	1	6.7	5	33.3
C48 Peritoneal	3	1.0	1	33.3	1	33.3	1	33.3
C50 Breast	91	31.8	72	79.1	5	5.5	14	15.4
C53 Cervix uteri	6	2.1	6	100.0				
C54 Corpus uteri	11	3.8	10	90.9			1	9.1
C56 Ovary	5	1.7	3	60.0	1	20.0	1	20.0
C64 Kidney	8	2.8	6	75.0	1	12.5	1	12.5
C70-C72 CNS cancer	3	1.0	1	33.3			2	66.7
C73 Thyroid	5	1.7	3	60.0			2	40.0
C76-C79 CUP	4	1.4	1	25.0	1	25.0	2	50.0
C82-C85 NHL	21	7.3	6	28.6	7	33.3	8	38.1
C91-C96 Leukaemia	9	3.1	2	22.2	1	11.1	6	66.7
Others, specified	15	5.2	5	33.3			10	66.7
All further malignancies	286	100.0	171	59.8	31	10.8	84	29.4

Further malignancies with number of cases 1 to 2 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 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	1.00			1.5	
30-34	1		0.1	0.20			1.0	
35-39	1	1	0.1	0.17	0.1	0.33	0.5	0.4
40-44	4	2	0.2	0.14	0.1	0.20	0.9	0.3
45-49	14	3	0.7	0.29	0.2	0.11	1.3	0.3
50-54	31	14	1.8	0.58	0.8	0.31	1.7	0.8
55-59	37	35	2.6	0.55	2.4	0.52	1.3	1.5
60-64	65	33	5.3	0.55	2.5	0.45	1.6	1.1
65-69	112	82	9.5	0.64	6.3	0.65	1.9	1.9
70-74	164	122	14.8	0.64	9.6	0.87	2.3	2.3
75-79	148	118	18.6	0.87	11.8	0.75	2.2	2.2
80-84	110	128	23.9	0.98	18.1	0.82	2.0	2.4
85+	82	98	26.8	0.84	13.4	0.73	1.7	1.3
All ages	770	636					1.9	1.7
Mortality								
Raw			3.4	0.67	2.7	0.68		
WS			1.5	0.62	0.9	0.59		
ES			2.3	0.65	1.4	0.62		
BRD-S			3.2	0.69	2.0	0.65		
PYLL-70								
per 100,000			11.4		6.5			
ES			9.8		5.3			
AYLL-70			8.7		7.6			

* See corresponding tables with multiple malignancies.

Table 16

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

Age at death Years	Males n	Females n	Males Age- spec. mortal.	MI-index	Females Age- spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19								
20-24								
25-29	1		0.1	1.00			1.5	
30-34	1		0.1	0.20			1.0	
35-39	1	1	0.1	0.20	0.1	0.33	0.5	0.4
40-44	4	2	0.2	0.14	0.1	0.20	0.9	0.3
45-49	14	3	0.7	0.30	0.2	0.11	1.4	0.3
50-54	30	13	1.7	0.63	0.8	0.30	1.7	0.8
55-59	31	34	2.2	0.48	2.3	0.53	1.1	1.4
60-64	57	30	4.7	0.54	2.3	0.42	1.4	1.0
65-69	100	77	8.4	0.63	5.9	0.66	1.8	1.9
70-74	148	115	13.4	0.64	9.1	0.86	2.1	2.2
75-79	126	106	15.8	0.81	10.6	0.71	2.0	2.0
80-84	94	119	20.4	0.90	16.8	0.78	1.8	2.3
85+	71	93	23.2	0.75	12.7	0.70	1.6	1.3
All ages	678	593					1.7	1.6
Mortality								
Raw			3.0	0.65	2.5	0.66		
WS			1.3	0.59	0.9	0.58		
ES			2.1	0.62	1.3	0.60		
BRD-S			2.8	0.66	1.9	0.64		
PYLL-70								
per 100,000			10.5		6.1			
ES			9.0		5.1			
AYLL-70			8.9		7.7			

* See corresponding tables with multiple malignancies.

ICD-10 C90: Multiple myeloma and malignant plasma cell neoplasms

Age distribution and age-specific mortality 2007 - 2016 (Males: 975, Females: 804)

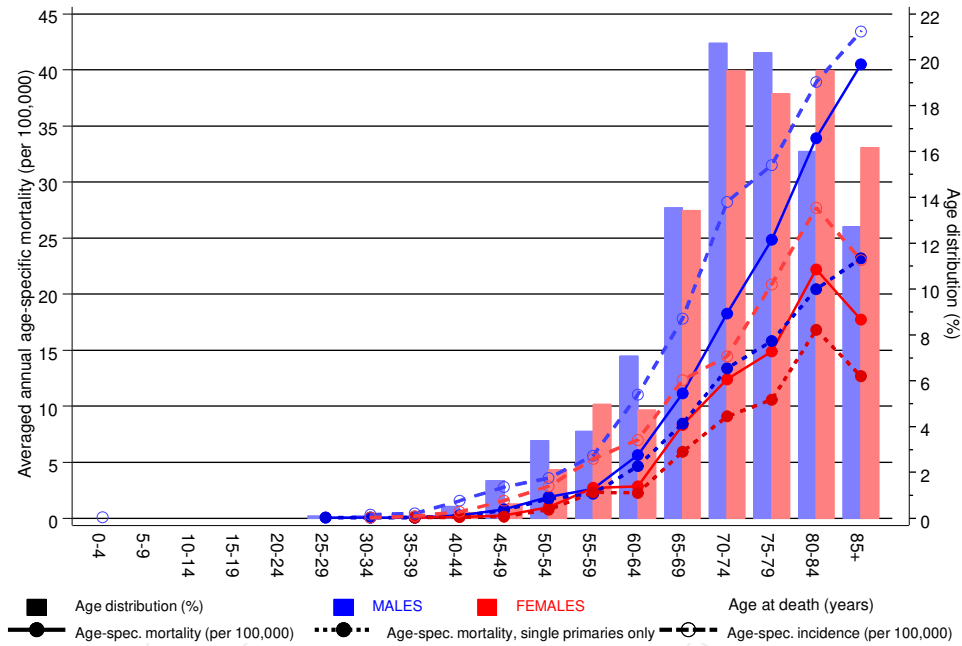
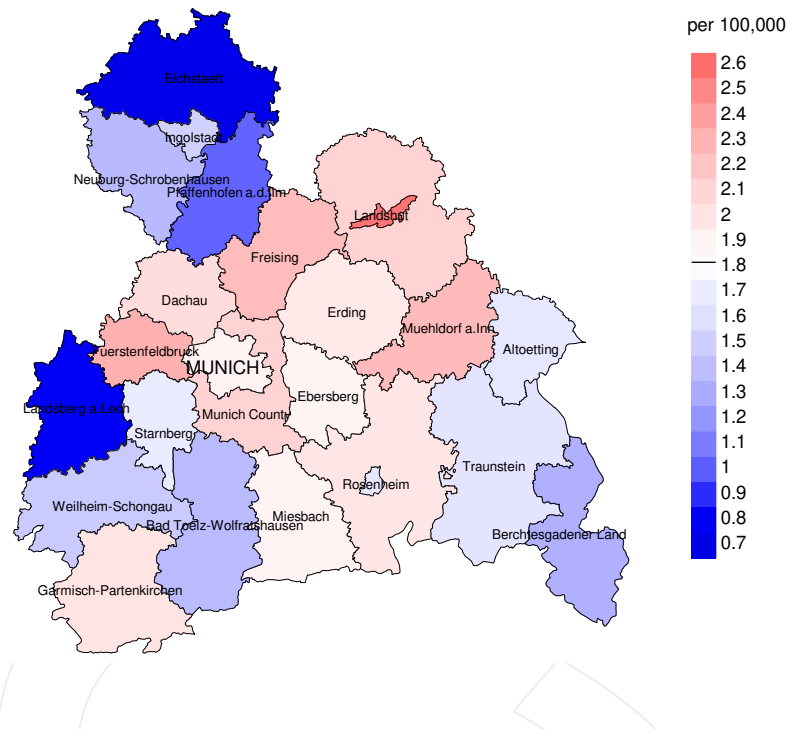


Figure 17. Distribution of age at death (bars; males: mean=70.2 yrs, median=71.4 yrs; females: mean=71.8 yrs, median=73.1 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

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



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

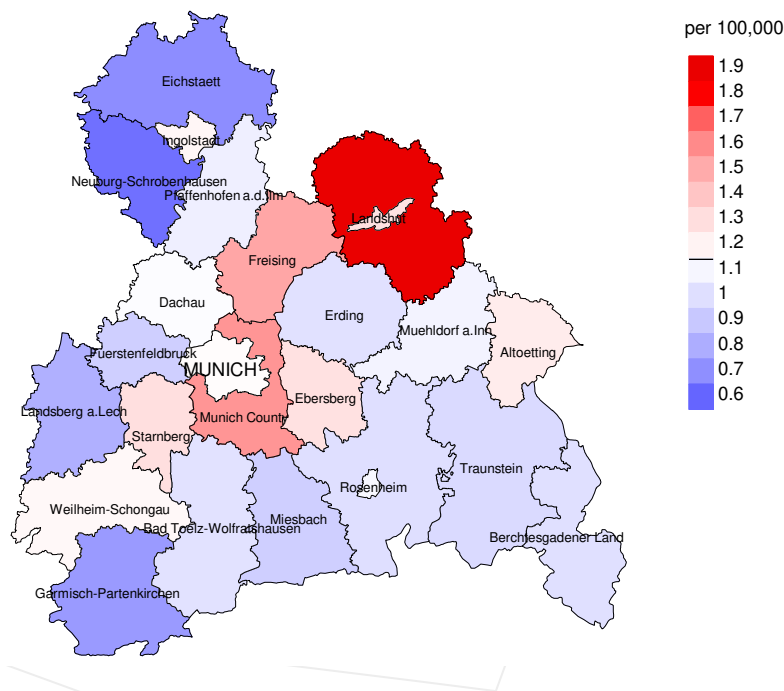
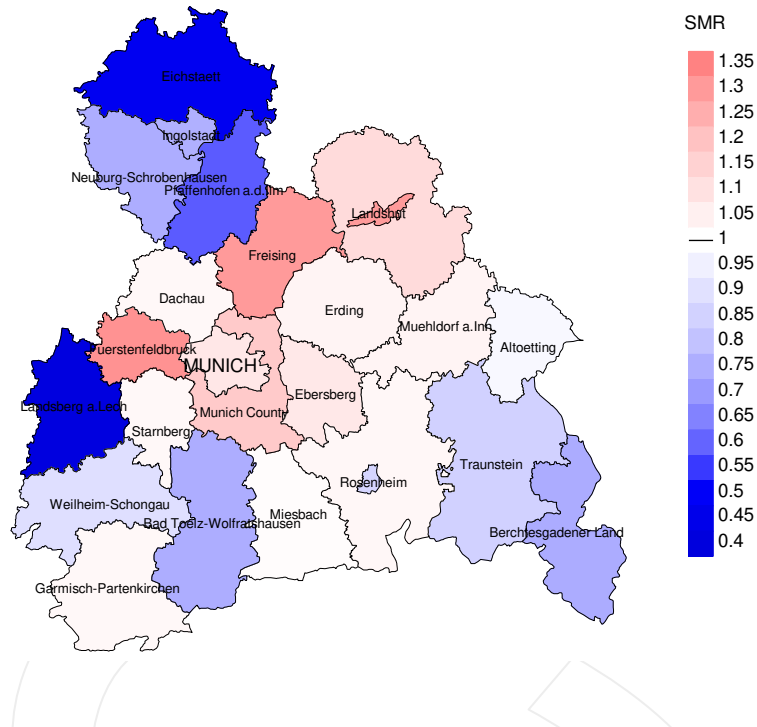


Figure 18a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2016. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 1.8/100,000 WS N=975, females 1.1/100,000 WS N=804).

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 26 women died from plasmacytoma. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 1.3/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.7 and 2.4/100,000.

Standardized mortality ratio (SMR) 2007 - 2016: Males



Standardized mortality ratio (SMR) 2007 - 2016: Females

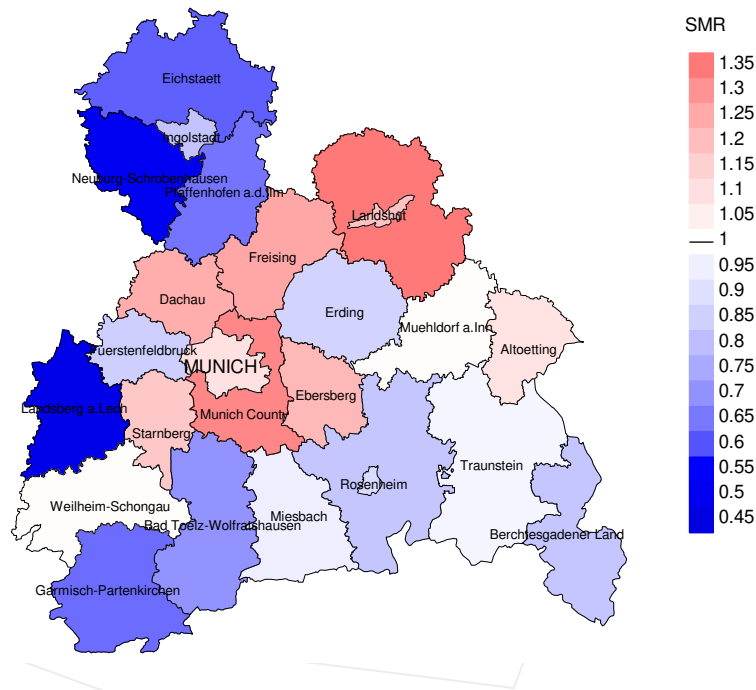


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=975, females N=804).

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 26 women died from plasmacytoma. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.21. Though, the value of this parameter may vary with an underlying probability of 99% between 0.69 and 1.97, 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

Recommended Citation

Munich Cancer Registry. ICD-10 C90: Plasmacytoma - Incidence and Mortality [Internet]. 2018 [updated 2018 Aug 21; cited 2018 Oct 1]. Available from: https://www.tumorregister-muenchen.de/en/facts/base/bC90__E-ICD-10-C90-Plasmacytoma-incidence-and-mortality.pdf

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