

Munich Cancer Registry



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

ICD-10 C88.4: MALT lymphoma

Incidence and Mortality

Year of diagnosis	1998-2016
Patients	1,041
Diseases	1,046
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/bC884_E-ICD-10-C88.4-MALT-lymphoma-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.

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

Code	Description
C88.4	Extranodal marginal zone B-cell lymphoma of mucosa-associated lymphoid tissue [MALT-lymphoma]

... or ...

Morphology codes (ICD-O-3 2011) used for specifying cancer site

Code	Description
9699/3	Marginal zone B-cell lymphoma, NOS

INCIDENCE

Table 1

Cases with invasive cancer by year of diagnosis, proportions of further malignancies, deaths, and active follow-up (ALL PATIENTS)

Year of diagnosis	All cases n	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	16	6.3	16.7	43.8	87.5
1999	21	13.5	16.3	71.4	95.2
2000	18	14.5	16.4	66.7	94.4
2001	35	15.6	16.3	54.3	88.6
2002	54	13.9	16.0	51.9	92.6 #
2003	49	15.5	16.0	42.9	87.8
2004	36	15.3	15.7	38.9	97.2
2005	51	15.4	15.8	45.1	92.2
2006	67	14.1	15.4	38.8	86.6
2007	70	14.9	14.1	35.7	58.6 #
2008	68	14.0	13.9	38.2	63.2
2009	65	14.7	13.5	26.2	63.1
2010	90	14.2	11.8	28.9	61.1
2011	88	15.1	11.2	28.4	62.5
2012	83	16.4	9.2	27.7	63.9
2013	78	16.8	7.8	17.9	61.5
2014	66	17.3	7.2	10.6	63.6
2015	58	17.6	9.1	15.5	94.8
2016	33	18.1	6.7	3.0	78.8 ##
1998-2016	1046	18.1	16.7	32.3	74.0

1,046 cases diagnosed 1998-2016 are related to a total of 1,041 patients. Currently, in 341 (32.8 %) of these 1,041 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 253 / 67 / 21 (24.3 % / 6.4 % / 2.0 %) 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 66 cases has been diagnosed, of which 17.3 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 7.2 % 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 1a

Cases with invasive cancer by year of diagnosis, proportions of further malignancies, deaths, and active follow-up (MALES)

Year of diagnosis	Males n	Males %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	9	56.3	11.1	19.5	55.6	100.0
1999	12	57.1	14.3	19.0	75.0	100.0
2000	9	50.0	13.3	18.8	77.8	100.0
2001	12	34.3	16.7	18.7	58.3	100.0
2002	26	48.1	11.8	18.3	57.7	96.2 #
2003	23	46.9	15.4	18.2	43.5	82.6
2004	13	36.1	15.4	17.4	38.5	92.3
2005	24	47.1	14.8	17.7	45.8	87.5
2006	35	52.2	13.5	17.2	34.3	88.6
2007	31	44.3	15.5	14.6	35.5	58.1 #
2008	30	44.1	14.3	14.4	43.3	70.0
2009	29	44.6	14.6	12.7	24.1	72.4
2010	43	47.8	13.9	11.7	32.6	60.5
2011	40	45.5	15.5	10.7	40.0	70.0
2012	42	50.6	17.5	10.2	26.2	69.0
2013	28	35.9	17.5	9.5	28.6	64.3
2014	35	53.0	18.1	7.8	11.4	60.0
2015	26	44.8	18.4	9.5	11.5	88.5
2016	18	54.5	19.2	6.3	5.6	72.2 ##
1998-2016	485	46.4	19.2	19.5	34.8	75.9

485 cases diagnosed 1998-2016 are related to a total of 483 patients. Currently, in 178 (36.9 %) of these 483 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 129 / 38 / 11 (26.7 % / 7.9 % / 2.3 %) 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 35 cases has been diagnosed, of which 18.1 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 7.8 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1b

Cases with invasive cancer by year of diagnosis, proportions of further malignancies, deaths, and active follow-up (FEMALES)

Year of diagnosis	Females n	Females %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	7	43.8	0.0	14.3	28.6	71.4
1999	9	42.9	12.5	14.1	66.7	88.9
2000	9	50.0	16.0	14.3	55.6	88.9
2001	23	65.7	14.6	14.2	52.2	82.6
2002	28	51.9	15.8	14.1	46.4	89.3 #
2003	26	53.1	15.7	14.2	42.3	92.3
2004	23	63.9	15.2	14.2	39.1	100.0
2005	27	52.9	15.8	14.2	44.4	96.3
2006	32	47.8	14.7	13.9	43.8	84.4
2007	39	55.7	14.3	13.7	35.9	59.0 #
2008	38	55.9	13.8	13.5	34.2	57.9
2009	36	55.4	14.8	14.2	27.8	55.6
2010	47	52.2	14.5	11.9	25.5	61.7
2011	48	54.5	14.8	11.7	18.8	56.3
2012	41	49.4	15.5	8.4	29.3	58.5
2013	50	64.1	16.1	6.3	12.0	60.0
2014	31	47.0	16.5	6.6	9.7	67.7
2015	32	55.2	16.8	8.7	18.8	100.0
2016	15	45.5	17.1	7.1		86.7 ##
1998-2016	561	53.6	17.1	14.3	30.1	72.4

561 cases diagnosed 1998-2016 are related to a total of 558 patients. Currently, in 163 (29.2 %) of these 558 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 124 / 29 / 10 (22.2 % / 5.2 % / 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 31 cases has been diagnosed, of which 16.5 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 6.6 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 2

Incidence measures by year of diagnosis
(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	9	7	0.8	0.6	0.5	0.4	0.7	0.5	1.0	0.5
1999	12	9	1.1	0.8	0.6	0.3	1.0	0.5	1.5	0.7
2000	9	9	0.8	0.7	0.5	0.4	0.7	0.6	1.0	0.7
2001	12	23	1.0	1.9	0.6	1.0	0.9	1.4	1.1	1.7
2002	26	28	1.4	1.4	0.8	0.7	1.2	1.1	1.4	1.2
2003	23	26	1.2	1.3	0.8	0.7	1.0	1.0	1.2	1.2
2004	13	23	0.7	1.2	0.4	0.6	0.6	0.8	0.7	1.0
2005	24	27	1.3	1.4	0.8	0.7	1.1	1.0	1.3	1.2
2006	35	32	1.8	1.6	1.0	0.7	1.5	1.1	1.8	1.3
2007	31	39	1.4	1.7	0.8	0.8	1.1	1.2	1.4	1.4
2008	30	38	1.3	1.6	0.7	0.8	1.0	1.1	1.3	1.4
2009	29	36	1.3	1.5	0.7	0.8	1.0	1.2	1.3	1.4
2010	43	47	1.9	2.0	1.2	1.0	1.6	1.4	1.8	1.7
2011	40	48	1.8	2.1	1.1	1.1	1.4	1.5	1.6	1.8
2012	42	41	1.9	1.7	1.0	0.8	1.4	1.1	1.7	1.4
2013	28	50	1.2	2.1	0.6	1.0	0.9	1.5	1.1	1.8
2014	35	31	1.5	1.3	0.9	0.7	1.2	1.0	1.4	1.1
2015	26	32	1.1	1.3	0.5	0.6	0.8	0.9	1.0	1.1
2016	18	15	0.7	0.6	0.3	0.3	0.4	0.4	0.7	0.5
1998-2016	485	561	1.3	1.5	0.7	0.7	1.0	1.0	1.3	1.2

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)

Year of diagnosis	Cases n	Std.		Median						
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	16	62.1	14.5	39.2	81.8	39.8	49.7	64.7	75.1	78.4
1999	21	71.2	11.5	47.5	88.2	58.2	61.0	75.6	80.8	82.3
2000	18	65.2	13.9	23.0	80.8	48.6	60.8	65.8	77.7	80.0
2001	35	66.2	11.4	40.7	93.0	49.0	60.3	66.5	73.8	77.7
2002	54	65.5	13.0	30.3	90.6	50.0	58.5	64.8	73.3	82.2
2003	49	63.7	12.0	27.3	83.5	43.9	58.0	65.5	71.8	78.5
2004	36	62.8	14.2	29.1	85.2	37.7	54.6	65.0	74.2	79.9
2005	51	62.9	16.3	24.4	88.7	42.5	54.4	64.1	76.9	80.5
2006	67	67.2	14.3	23.9	95.3	52.3	58.6	68.4	77.3	84.1
2007	70	66.2	14.7	16.4	95.2	48.4	56.5	67.8	75.9	83.5
2008	68	66.5	14.9	19.0	90.4	45.0	56.3	68.7	77.1	85.2
2009	65	67.0	11.4	37.3	88.8	51.4	60.5	66.1	75.1	81.8
2010	90	63.5	16.1	12.4	91.1	40.1	53.6	67.4	73.8	81.3
2011	88	64.0	14.6	9.2	90.2	46.0	54.5	66.6	74.3	83.0
2012	83	66.4	14.4	8.5	90.3	48.4	56.5	69.2	76.1	83.7
2013	78	66.2	12.9	29.8	93.0	50.7	57.4	68.3	75.8	81.1
2014	66	65.0	12.6	37.9	99.6	44.8	57.5	66.5	73.0	79.3
2015	58	68.0	14.1	40.9	98.5	49.3	55.6	71.6	77.6	84.2
2016	33	69.5	15.3	26.1	95.8	53.9	57.5	75.1	81.4	84.0
1998–2016	1046	65.7	14.0	8.5	99.6	47.5	57.4	67.1	75.6	82.0

Table 3a

Age distribution parameters by year of diagnosis (MALES)

Year of diagnosis	Cases n	Std.		Median						
		Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	9	64.0	16.1	39.2	81.8	39.2	54.0	68.7	76.4	81.8
1999	12	71.0	10.5	50.4	83.8	59.8	62.4	74.2	80.0	82.3
2000	9	65.2	17.5	23.0	80.8	23.0	61.3	67.6	77.7	80.8
2001	12	66.5	10.4	48.8	87.8	55.1	60.7	65.1	71.9	77.7
2002	26	64.7	10.9	38.3	89.3	54.7	59.0	64.7	72.4	75.7
2003	23	60.8	13.7	27.3	83.5	43.7	54.7	62.3	70.1	76.0
2004	13	59.8	14.0	35.0	75.1	35.6	49.3	64.8	72.4	74.9
2005	24	59.8	15.5	25.2	85.9	42.5	49.2	61.2	70.8	77.2
2006	35	65.0	12.5	28.7	84.1	52.3	58.6	67.0	73.3	80.3
2007	31	65.6	17.7	16.4	89.2	47.5	52.5	67.0	78.9	86.1
2008	30	66.9	12.3	40.0	85.4	47.5	60.6	68.7	75.5	84.1
2009	29	67.2	12.6	37.3	88.8	47.5	61.5	66.2	76.0	83.3
2010	43	61.6	17.8	12.4	91.1	39.2	50.2	62.6	73.8	85.9
2011	40	63.3	16.6	9.2	90.2	41.0	51.5	65.7	73.1	84.8
2012	42	64.3	12.9	25.3	87.8	47.3	54.8	65.9	72.8	79.2
2013	28	69.1	12.4	47.5	93.0	53.9	60.7	67.4	76.8	90.6
2014	35	66.8	12.9	37.9	99.6	46.7	60.2	67.5	73.0	83.3
2015	26	71.1	11.7	49.3	92.3	55.2	63.5	73.3	77.1	88.2
2016	18	74.9	13.2	34.9	95.8	57.5	70.4	76.9	82.2	87.6
1998–2016	485	65.4	14.3	9.2	99.6	47.3	57.5	66.8	75.1	82.9

Table 3b

Age distribution parameters by year of diagnosis (FEMALES)

Year of diagnosis	Cases n	Mean	Std. dev.	Min. Max.		10% 25%		Median		
				Min.	Max.	10%	25%	50%	75%	90%
1998	7	59.8	13.0	41.3	78.4	41.3	45.3	59.9	69.4	78.4
1999	9	71.4	13.4	47.5	88.2	47.5	60.1	77.0	80.8	88.2
2000	9	65.1	10.0	48.6	80.0	48.6	59.5	63.1	67.1	80.0
2001	23	66.1	12.1	40.7	93.0	49.0	60.0	69.1	74.1	77.3
2002	28	66.3	14.9	30.3	90.6	46.3	57.1	66.5	77.4	87.2
2003	26	66.3	9.9	42.7	82.5	52.2	61.8	66.5	73.0	79.1
2004	23	64.5	14.2	29.1	85.2	47.4	58.1	65.6	77.8	80.4
2005	27	65.7	16.7	24.4	88.7	37.8	58.0	70.4	78.1	84.5
2006	32	69.5	15.9	23.9	95.3	53.2	58.8	73.9	78.3	88.5
2007	39	66.6	12.1	34.8	95.2	51.1	58.9	68.0	74.3	80.1
2008	38	66.2	16.9	19.0	90.4	45.0	50.8	68.8	79.5	87.3
2009	36	66.8	10.4	48.7	87.7	53.7	59.7	65.3	73.5	79.6
2010	47	65.3	14.2	20.5	84.8	47.7	58.6	67.7	74.4	81.0
2011	48	64.7	12.9	29.8	89.2	48.1	55.0	66.6	74.8	82.0
2012	41	68.5	15.6	8.5	90.3	51.7	62.7	72.3	77.3	83.9
2013	50	64.6	13.1	29.8	83.7	47.3	55.2	68.3	75.6	81.0
2014	31	63.0	12.2	41.4	82.4	43.0	55.5	66.0	73.6	75.9
2015	32	65.5	15.5	40.9	98.5	46.1	51.1	66.5	77.7	84.1
2016	15	63.0	15.5	26.1	85.1	51.0	55.7	60.1	78.1	81.7
1998-2016	561	65.9	13.8	8.5	98.5	48.0	57.4	67.4	76.0	81.4

Table 4

Age distribution by 5-year age group and sex for period 2007-2016

Age at diagnosis Years	Cases n	Males			Females				
		%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4									
5-9	2	0.3	0.3	1	0.3	0.3	1	0.3	0.3
10-14	1	0.1	0.4	1	0.3	0.6			0.3
15-19	2	0.3	0.7	1	0.3	0.9	1	0.3	0.5
20-24	2	0.3	1.0	1	0.3	1.2	1	0.3	0.8
25-29	6	0.9	1.9	2	0.6	1.9	4	1.1	1.9
30-34	6	0.9	2.7	2	0.6	2.5	4	1.1	2.9
35-39	10	1.4	4.1	8	2.5	5.0	2	0.5	3.4
40-44	21	3.0	7.2	8	2.5	7.5	13	3.4	6.9
45-49	42	6.0	13.2	22	6.8	14.3	20	5.3	12.2
50-54	56	8.0	21.2	20	6.2	20.5	36	9.5	21.8
55-59	67	9.6	30.8	25	7.8	28.3	42	11.1	32.9
60-64	83	11.9	42.6	44	13.7	41.9	39	10.3	43.2
65-69	91	13.0	55.7	44	13.7	55.6	47	12.5	55.7
70-74	118	16.9	72.5	53	16.5	72.0	65	17.2	72.9
75-79	91	13.0	85.6	39	12.1	84.2	52	13.8	86.7
80-84	54	7.7	93.3	19	5.9	90.1	35	9.3	96.0
85+	47	6.7	100.0	32	9.9	100.0	15	4.0	100.0
All ages	699	100.0		322	100.0		377	100.0	

Table 5

Age-specific incidence 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 Prop.all cancers n=113978 %	Females Prop.all cancers n=112253 %
0- 4						
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	1	0.1	0.1	0.2	0.3
25-29	2	4	0.1	0.3	0.3	0.5
30-34	2	4	0.1	0.3	0.2	0.3
35-39	8	2	0.5	0.1	0.6	0.1
40-44	8	13	0.4	0.7	0.4	0.3
45-49	22	20	1.1	1.0	0.6	0.3
50-54	20	36	1.2	2.1	0.3	0.4
55-59	25	42	1.8	2.9	0.3	0.4
60-64	44	39	3.6	2.9	0.3	0.3
65-69	44	47	3.7	3.6	0.2	0.3
70-74	52	65	4.7	5.1	0.2	0.4
75-79	39	52	4.9	5.2	0.2	0.4
80-84	19	35	4.1	4.9	0.2	0.3
85+	32	15	10.5	2.0	0.4	0.1
All ages	321	377			0.3	0.3
Incidence						
Raw			1.4	1.6		
WS			0.8	0.8		
ES			1.1	1.1		
BRD-S			1.3	1.3		

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

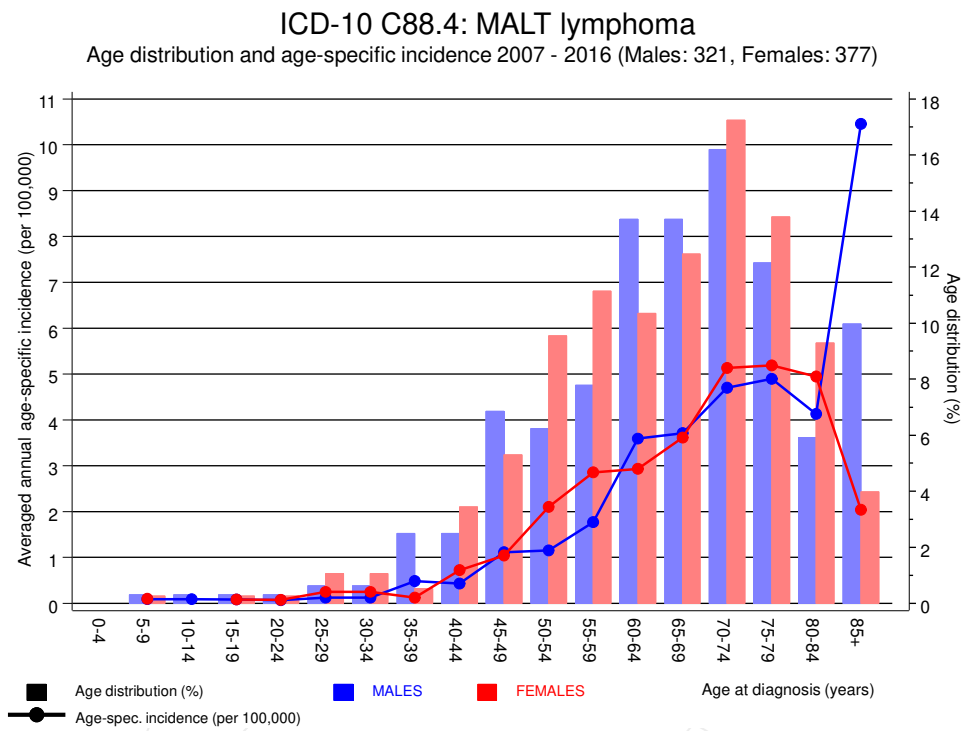


Figure 6. Age distribution (males: mean=66.3 yrs, median=68.1 yrs; females: mean=65.6 yrs, median=67.5 yrs) and age-specific incidence.

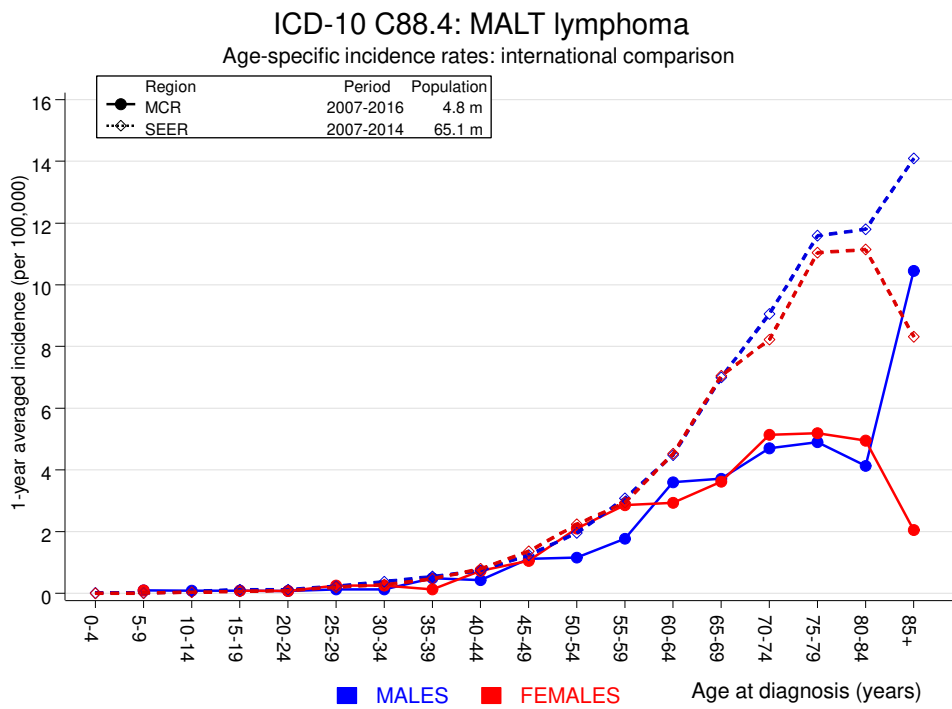


Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

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 %
C16 Stomach	6	1.3	4.7	1.7	10.2 #	24.6	
C18 Colon	8	3.0	2.6	1.1	5.2 #	25.8	
C22 Liver	4	0.9	4.5	1.2	11.5 #	16.2	50.0
C25 Pancreas	3	1.2	2.5	0.5	7.2	9.3	
C33-C34 Lung	6	3.7	1.6	0.6	3.5	12.0	
C43 Malign. melanoma	6	1.4	4.4	1.6	9.6 #	24.1	
C61 Prostate	17	8.9	1.9	1.1	3.0 #	41.9	11.8
C64 Kidney	8	1.1	7.4	3.2	14.5 #	36.0	
C67 Bladder	2	1.5	1.4	0.2	4.9	2.8	
C73 Thyroid	2	0.2	9.8	1.2	35.6 #	9.4	
C82-C85 NHL	11	1.3	8.5	4.2	15.2 #	50.5	
C91-C96 Leukaemia	2	0.5	3.7	0.5	13.5	7.6	
Others, specified	10	3.3	3.0	1.4	5.5 #	34.8	
Not observed	0	3.3	0.0	0.0	1.1	-17.2	
All further malignancies	85	31.6	2.7	2.1	3.3 #	277.8	4.7

Patients 461
 Median age at next malignancy (years) 69.8
 Person-years 1920
 Mean observation time (years) 4.2
 Median observation time (years) 3.0

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

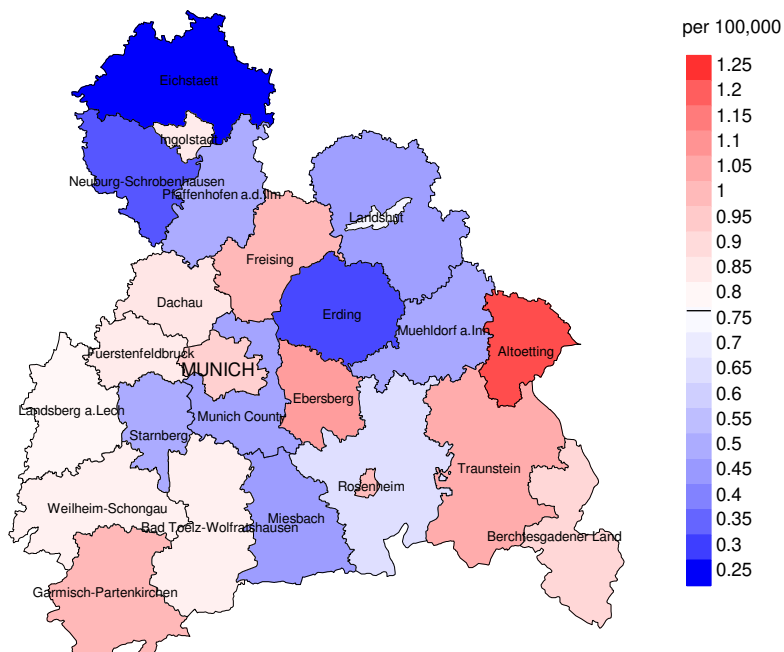
FEMALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C16 Stomach	3	0.9	3.4	0.7	10.0	9.5	
C25 Pancreas	3	1.2	2.5	0.5	7.4	8.1	66.7
C33–C34 Lung	9	1.9	4.7	2.1	8.9 #	31.7	
C43 Malign. melanoma	2	1.0	2.1	0.3	7.6	4.7	
C50 Breast	16	7.6	2.1	1.2	3.4 #	37.7	
C56 Ovary	3	1.0	2.9	0.6	8.5	8.8	33.3
C64 Kidney	3	0.6	4.8	1.0	13.9	10.6	
C69 Eye lymphoma	2	0.0	249.7	30.2	902.1 #	8.9	
C82–C85 NHL	17	1.0	17.1	9.9	27.3 #	71.7	
C90 Mult. myeloma	2	0.3	6.2	0.7	22.3	7.5	
C91–C96 Leukaemia	2	0.4	4.8	0.6	17.4	7.1	
Others, specified	9	4.6	2.0	0.9	3.7	19.9	
Not observed	0	5.0	0.0	0.0	0.7 #	-22.3	
All further malignancies	71	25.5	2.8	2.2	3.5 #	203.9	4.2
Patients		537					
Median age at next malignancy (years)		71.3					
Person-years		2232					
Mean observation time (years)		4.2					
Median observation time (years)		3.3					

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

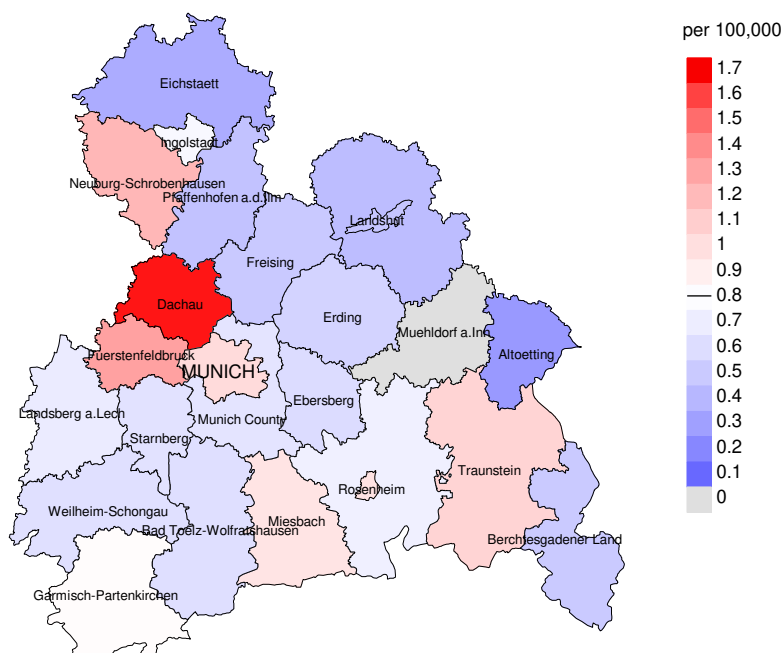
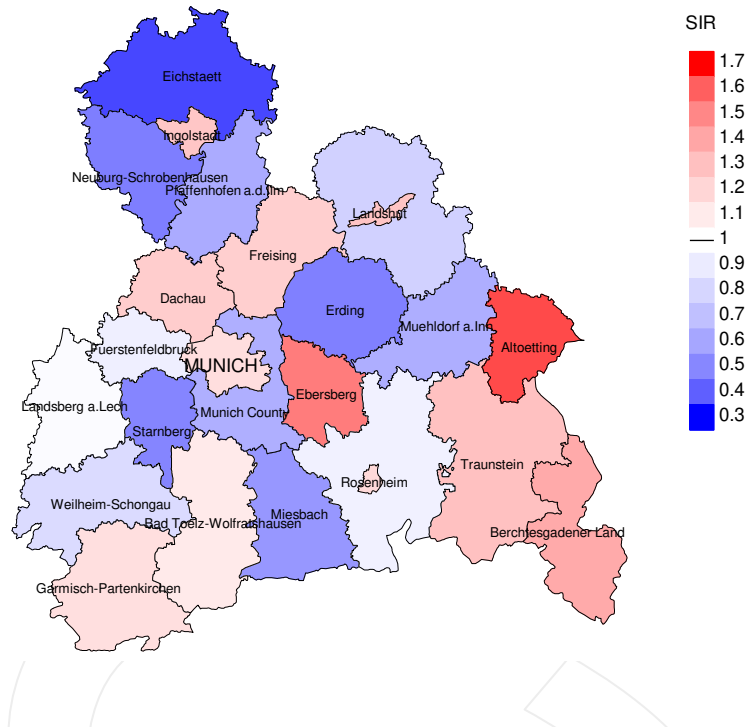


Figure 8a. Map of cancer incidence (world standard population) by county averaged for period 2007 to 2016. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.8/100,000 WS N=321, females 0.8/100,000 WS N=377).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 7 women were identified with newly diagnosed MALT lymphoma. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 0.6/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.2 and 1.7/100,000.

Standardized incidence ratio (SIR) 2007 - 2016: Males



Standardized incidence ratio (SIR) 2007 - 2016: Females

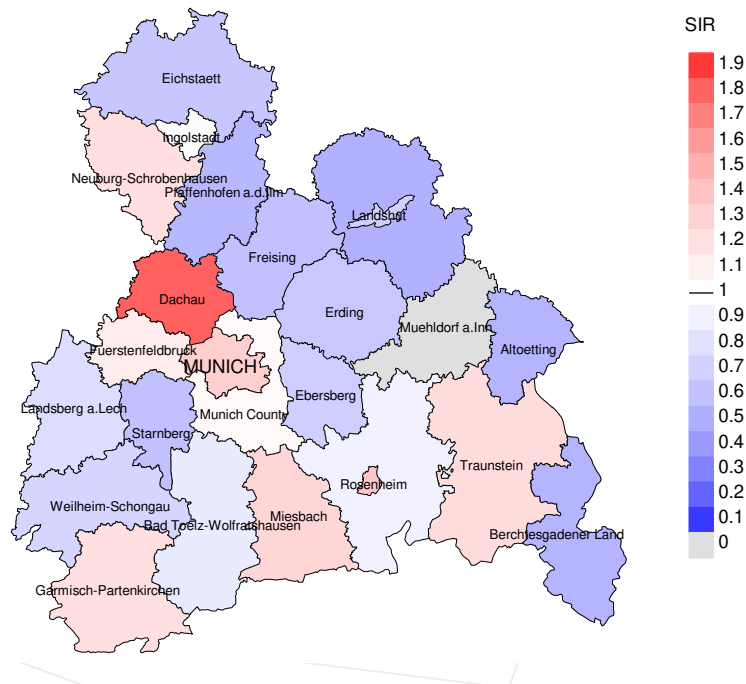


Figure 8b. Map of standardized incidence ratio (SIR) by county averaged for period 2007 to 2016. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=321, females N=377).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 7 women were identified with newly diagnosed MALT lymphoma. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.67. Though, the value of this parameter may vary with an underlying probability of 99% between 0.20 and 1.65, and is therefore not statistically striking.

MORTALITY

Table 9a

Annual cohorts: Incident cancers, follow-up status,
and deaths among the annual cohorts

(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 %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	16	87.5	7	43.8	85.7
1999	21	95.2	15	71.4	100.0
2000	18	94.4	12	66.7	100.0
2001	35	88.6	19	54.3	94.7
2002	54	92.6	28	51.9	92.9
2003	49	87.8	21	42.9	100.0
2004	36	97.2	14	38.9	92.9
2005	51	92.2	23	45.1	95.7
2006	67	86.6	26	38.8	100.0
2007	70	58.6	25	35.7	100.0
2008	68	63.2	26	38.2	92.3
2009	65	63.1	17	26.2	100.0
2010	90	61.1	26	28.9	100.0
2011	88	62.5	25	28.4	100.0
2012	83	63.9	23	27.7	95.7
2013	78	61.5	14	17.9	85.7
2014	66	63.6	7	10.6	100.0
2015	58	94.8	9	15.5	88.9
2016	33	78.8	1	3.0	100.0
1998-2016	1046	74.0	338	32.3	96.4

Table 9b

Annual cohorts of incident cancers and deaths,
and cases deceased within the same year of being diagnosed with cancer

(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	Deaths in same year n	Prop. deaths in same year %
1998	16	2		
1999	21	4	2	9.5
2000	18	4	2	11.1
2001	35	6	1	2.9
2002	54	15	4	7.4
2003	49	12	2	4.1
2004	36	7		
2005	51	7	2	3.9
2006	67	19	3	4.5
2007	70	26	4	5.7
2008	68	26	4	5.9
2009	65	21	1	1.5
2010	90	25	4	4.4
2011	88	35	4	4.5
2012	83	29	5	6.0
2013	78	35	6	7.7
2014	66	27		
2015	58	43	5	8.6
2016	33	41	1	3.0
1998-2016	1046	384	50	4.8

Table 9c

Annual cohorts of deaths, and proportion of cancer-related and non-cancer-related deaths

(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	2	100.0		100.0
1999	4	75.0	25.0	100.0
2000	4	100.0		100.0
2001	6	83.3	16.7	83.3
2002	15	86.7	13.3	93.3
2003	12	58.3	41.7	90.0
2004	7	71.4	28.6	85.7
2005	7	71.4	28.6	85.7
2006	19	57.9	42.1	72.2
2007	26	84.6	15.4	84.6
2008	26	76.9	23.1	76.9
2009	21	71.4	28.6	76.2
2010	25	48.0	52.0	72.0
2011	35	60.0	40.0	67.6
2012	29	75.9	24.1	89.7
2013	35	65.7	34.3	70.6
2014	27	66.7	33.3	70.4
2015	43	60.5	39.5	67.4
2016	41	46.3	53.7	69.2
1998-2016	384	65.9	34.1	76.1

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	2	65.1	65.1		65.1
1999	2	79.3	77.5	81.2	79.3
2000	3	81.4	81.4		81.4
2001	5	66.9	66.9		66.9
2002	6	66.7	59.0	89.5	59.0
2003	7	69.9	70.7	67.1	69.9
2004	1	73.7	73.7		73.7
2005	2	74.0	77.3	70.8	74.0
2006	12	78.9	77.9	80.1	73.8
2007	12	76.3	76.3	77.0	76.3
2008	14	77.4	78.4	76.5	73.4
2009	10	78.3	78.3	74.0	73.5
2010	11	77.5	75.2	79.8	77.5
2011	17	73.2	72.7	73.4	72.7
2012	18	76.9	76.1	77.6	76.1
2013	18	83.6	80.7	85.7	87.8
2014	13	71.0	71.0	74.2	69.5
2015	18	77.4	73.7	84.8	75.5
2016	22	77.9	77.6	78.2	76.5
1998–2016	193	76.5	74.4	81.2	74.1

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					
1999	2	81.0	81.0		81.0
2000	1	88.1	88.1		88.1
2001	1	72.5		72.5	
2002	9	81.3	80.4	93.0	81.3
2003	5	77.2	82.5	75.5	78.2
2004	6	75.0	74.9	76.1	76.0
2005	5	82.4	82.3	86.1	83.7
2006	7	86.1	86.1	82.8	86.1
2007	14	79.0	78.9	79.2	78.9
2008	12	76.1	72.1	90.2	75.6
2009	11	83.3	78.1	91.6	80.7
2010	14	84.2	73.4	87.3	80.7
2011	18	78.0	75.8	78.0	75.8
2012	11	71.9	71.5	73.2	71.9
2013	17	80.9	81.5	74.8	81.8
2014	14	79.9	81.1	78.1	81.1
2015	25	81.5	81.4	81.8	81.5
2016	19	83.6	78.4	85.4	78.4
1998-2016	191	80.5	80.5	81.0	80.7

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	2	0.2	0.22	0.1	0.21	0.2	0.21	0.2	0.17
1999	1	0.1	0.08	0.0	0.07	0.1	0.08	0.1	0.10
2000	3	0.3	0.33	0.1	0.25	0.2	0.32	0.4	0.42
2001	5	0.4	0.42	0.2	0.38	0.4	0.41	0.5	0.49
2002	5	0.3	0.19	0.2	0.21	0.3	0.22	0.3	0.20
2003	4	0.2	0.17	0.1	0.15	0.2	0.16	0.2	0.18
2004	1	0.1	0.08	0.0	0.07	0.0	0.08	0.1	0.08
2005	1	0.1	0.04	0.0	0.02	0.0	0.03	0.1	0.05
2006	6	0.3	0.17	0.1	0.13	0.2	0.15	0.4	0.20
2007	10	0.5	0.32	0.2	0.26	0.3	0.31	0.5	0.32
2008	11	0.5	0.37	0.2	0.33	0.4	0.37	0.5	0.40
2009	6	0.3	0.21	0.1	0.14	0.2	0.17	0.3	0.21
2010	5	0.2	0.12	0.1	0.09	0.2	0.11	0.2	0.13
2011	10	0.4	0.26	0.2	0.18	0.3	0.21	0.4	0.24
2012	13	0.6	0.31	0.2	0.23	0.4	0.27	0.5	0.32
2013	9	0.4	0.32	0.2	0.24	0.3	0.27	0.4	0.34
2014	9	0.4	0.26	0.2	0.23	0.3	0.24	0.3	0.24
2015	8	0.3	0.31	0.1	0.29	0.2	0.29	0.3	0.30
2016	11	0.5	0.61	0.2	0.68	0.3	0.64	0.4	0.63
1998-2016	120	0.3	0.25	0.1	0.20	0.2	0.23	0.3	0.26

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									
1999	2	0.2	0.22	0.0	0.12	0.1	0.16	0.2	0.25
2000	1	0.1	0.11	0.0	0.04	0.0	0.05	0.0	0.06
2001									
2002	8	0.4	0.29	0.1	0.19	0.2	0.20	0.3	0.25
2003	3	0.2	0.12	0.0	0.06	0.1	0.07	0.1	0.09
2004	4	0.2	0.17	0.1	0.11	0.1	0.14	0.2	0.17
2005	4	0.2	0.15	0.0	0.06	0.1	0.08	0.1	0.12
2006	5	0.2	0.16	0.0	0.07	0.1	0.09	0.2	0.11
2007	12	0.5	0.31	0.2	0.19	0.3	0.22	0.4	0.27
2008	9	0.4	0.24	0.2	0.19	0.2	0.21	0.3	0.23
2009	9	0.4	0.25	0.1	0.15	0.2	0.17	0.3	0.21
2010	7	0.3	0.15	0.1	0.09	0.1	0.10	0.2	0.11
2011	11	0.5	0.23	0.2	0.16	0.3	0.18	0.3	0.19
2012	9	0.4	0.22	0.1	0.19	0.2	0.20	0.3	0.22
2013	14	0.6	0.28	0.2	0.16	0.3	0.19	0.4	0.23
2014	9	0.4	0.29	0.1	0.18	0.2	0.20	0.3	0.25
2015	18	0.7	0.56	0.2	0.30	0.3	0.35	0.5	0.43
2016	8	0.3	0.53	0.1	0.33	0.2	0.37	0.2	0.42
1998-2016	133	0.3	0.24	0.1	0.15	0.2	0.17	0.2	0.20

Table 12

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

Age at death Years	Cases			Males			Females		
	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4									
5-9									
10-14									
15-19									
20-24									
25-29									
30-34									
35-39									
40-44	2	1.0	1.0			0.0	2	1.9	1.9
45-49	1	0.5	1.5			0.0	1	0.9	2.8
50-54	10	5.1	6.6	7	7.6	7.6	3	2.8	5.7
55-59	6	3.0	9.6	3	3.3	10.9	3	2.8	8.5
60-64	9	4.5	14.1	5	5.4	16.3	4	3.8	12.3
65-69	28	14.1	28.3	13	14.1	30.4	15	14.2	26.4
70-74	32	16.2	44.4	19	20.7	51.1	13	12.3	38.7
75-79	28	14.1	58.6	14	15.2	66.3	14	13.2	51.9
80-84	37	18.7	77.3	15	16.3	82.6	22	20.8	72.6
85+	45	22.7	100.0	16	17.4	100.0	29	27.4	100.0
All ages	198	100.0		92	100.0		106	100.0	

Table 13

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

Age at death Years	Males		Females		Males		Females	
	n	n	Age- spec. mortal.	MI-index	Age- spec. mortal.	MI-index	Prop.all cancers %	Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19								
20-24								
25-29								
30-34								
35-39								
40-44		2			0.1	0.15		0.3
45-49		1			0.1	0.05		0.1
50-54	7	3	0.4	0.35	0.2	0.08	0.3	0.2
55-59	3	3	0.2	0.12	0.2	0.07	0.1	0.1
60-64	5	4	0.4	0.11	0.3	0.10	0.1	0.1
65-69	13	15	1.1	0.30	1.2	0.32	0.2	0.3
70-74	19	13	1.7	0.37	1.0	0.20	0.2	0.2
75-79	14	14	1.8	0.36	1.4	0.27	0.2	0.2
80-84	15	22	3.3	0.79	3.1	0.63	0.2	0.3
85+	16	29	5.2	0.50	4.0	1.93	0.2	0.3
All ages	92	106					0.2	0.2
Mortality								
Raw			0.4	0.29	0.4	0.28		
WS			0.2	0.22	0.1	0.18		
ES			0.3	0.26	0.2	0.20		
BRD-S			0.4	0.29	0.3	0.23		
PYLL-70								
per 100,000			1.1		1.2			
ES			1.0		1.0			
AYLL-70			8.2		8.4			

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	1	1.2					1	100.0
C16 Stomach	3	3.5			2	66.7	1	33.3
C18 Colon	8	9.3	5	62.5	2	25.0	1	12.5
C19–C20 Rectum	3	3.5	1	33.3	1	33.3	1	33.3
C22 Liver	5	5.8	2	40.0			3	60.0
C23–C24 Bile	1	1.2	1	100.0				
C25 Pancreas	4	4.7			1	25.0	3	75.0
C32 Larynx	1	1.2	1	100.0				
C33–C34 Lung	7	8.1	3	42.9	1	14.3	3	42.9
C38,C45 Mesothelioma	1	1.2					1	100.0
C43 Malign. melanoma	2	2.3	1	50.0			1	50.0
C44 Skin others	9	10.5	2	22.2			7	77.8
C46,C49 Soft tissue	1	1.2	1	100.0				
C50 Breast	1	1.2					1	100.0
C61 Prostate	14	16.3	7	50.0			7	50.0
C62 Testis	1	1.2	1	100.0				
C64 Kidney	6	7.0	3	50.0	1	16.7	2	33.3
C65 Renal pelvis	1	1.2					1	100.0
C67 Bladder	2	2.3					2	100.0
C70–C72 CNS cancer	1	1.2					1	100.0
C76–C79 CUP	2	2.3	1	50.0	1	50.0		
C82–C85 NHL	11	12.8					11	100.0
C91–C96 Leukaemia	1	1.2					1	100.0
All further malignancies	86	100.0	29	33.7	9	10.5	48	55.8

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	1	1.3	1	100.0				
C09-C10 Oropharynx	1	1.3	1	100.0				
C16 Stomach	2	2.6					2	100.0
C18 Colon	3	3.9	1	33.3	1	33.3	1	33.3
C19-C20 Rectum	1	1.3					1	100.0
C21 Anus/canal	1	1.3					1	100.0
C23-C24 Bile	1	1.3					1	100.0
C25 Pancreas	3	3.9					3	100.0
C32 Larynx	1	1.3	1	100.0				
C33-C34 Lung	9	11.7			1	11.1	8	88.9
C43 Malign. melanoma	4	5.2	1	25.0			3	75.0
C44 Skin others	6	7.8	3	50.0	1	16.7	2	33.3
C48 Peritoneal	2	2.6					2	100.0
C50 Breast	13	16.9	10	76.9	1	7.7	2	15.4
C51 Vulva	1	1.3					1	100.0
C53 Cervix uteri	2	2.6	2	100.0				
C54 Corpus uteri	2	2.6	1	50.0			1	50.0
C55,C57 Fem. genitals un	1	1.3	1	100.0				
C56 Ovary	3	3.9	1	33.3			2	66.7
C64 Kidney	1	1.3			1	100.0		
C69 Eye lymphoma	2	2.6					2	100.0
C76-C79 CUP	2	2.6					2	100.0
C81 Hodgkin lymphoma	3	3.9	3	100.0				
C82-C85 NHL	8	10.4					8	100.0
C91-C96 Leukaemia	4	5.2	1	25.0			3	75.0
All further malignancies	77	100.0	27	35.1	5	6.5	45	58.4

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

Table 15

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

Age at death Years	Males n	Females n	Males Age- spec. mortal.	Males MI-index	Females Age- spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19								
20-24								
25-29								
30-34								
35-39								
40-44		2			0.1	0.18		0.3
45-49		1			0.1	0.06		0.1
50-54	6	3	0.3	0.40	0.2	0.10	0.3	0.2
55-59	3	3	0.2	0.13	0.2	0.08	0.1	0.1
60-64	2	3	0.2	0.06	0.2	0.09	0.0	0.1
65-69	12	8	1.0	0.38	0.6	0.22	0.2	0.2
70-74	11	10	1.0	0.31	0.8	0.19	0.2	0.2
75-79	11	14	1.4	0.39	1.4	0.39	0.2	0.3
80-84	6	15	1.3	0.50	2.1	0.63	0.1	0.3
85+	10	19	3.3	0.45	2.6	1.58	0.2	0.3
All ages	61	78					0.1	0.2
Mortality								
Raw			0.3	0.25	0.3	0.26		
WS			0.1	0.20	0.1	0.16		
ES			0.2	0.22	0.2	0.18		
BRD-S			0.2	0.25	0.2	0.22		
PYLL-70								
per 100,000			0.9		1.1			
ES			0.8		0.9			
AYLL-70			8.2		10.5			

* See corresponding tables with multiple malignancies.

Table 16

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

Age at death Years	Males n	Females n	Males Age- spec. mortal. MI-index	Females Age- spec. mortal. MI-index	Males Prop.all cancers %	Females Prop.all cancers %		
0- 4								
5- 9								
10-14								
15-19								
20-24								
25-29								
30-34								
35-39								
40-44		1		0.1	0.09	0.2		
45-49								
50-54		3		0.2	0.12	0.2		
55-59	1	1	0.1	0.05	0.1	0.03	0.0	0.0
60-64	1	1	0.1	0.03	0.1	0.04	0.0	0.0
65-69	7	4	0.6	0.29	0.3	0.14	0.1	0.1
70-74	9	8	0.8	0.31	0.6	0.18	0.1	0.2
75-79	5	10	0.6	0.22	1.0	0.29	0.1	0.2
80-84	6	9	1.3	0.55	1.3	0.45	0.1	0.2
85+	6	16	2.0	0.30	2.2	1.60	0.1	0.2
All ages	35	53					0.1	0.1
Mortality								
Raw			0.2	0.17	0.2	0.20		
WS			0.1	0.12	0.1	0.11		
ES			0.1	0.14	0.1	0.14		
BRD-S			0.1	0.17	0.2	0.16		
PYLL-70								
per 100,000			0.2		0.6			
ES			0.2		0.5			
AYLL-70			4.2		11.0			

* See corresponding tables with multiple malignancies.

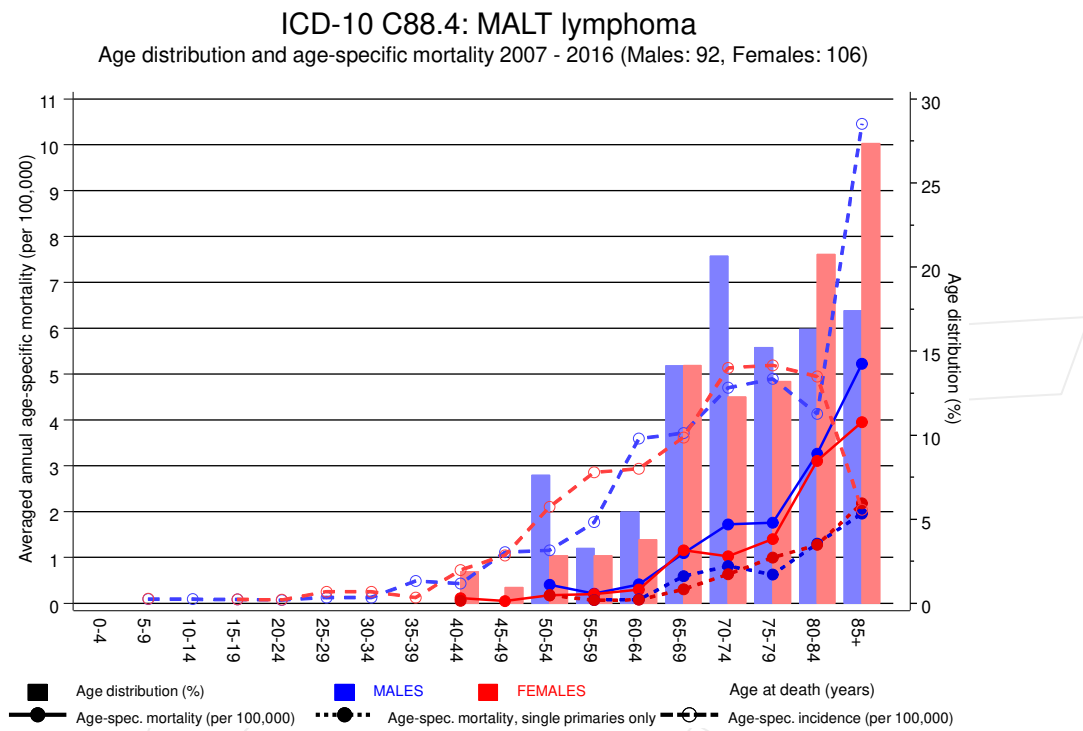
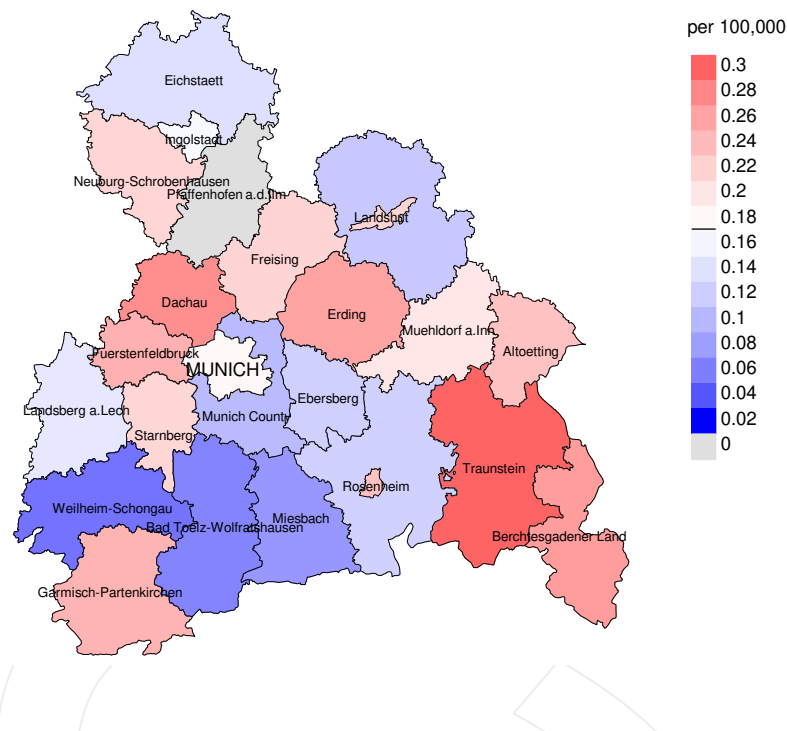


Figure 17. Distribution of age at death (bars; males: mean=69.4 yrs, median=70.0 yrs; females: mean=71.5 yrs, median=74.1 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

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



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

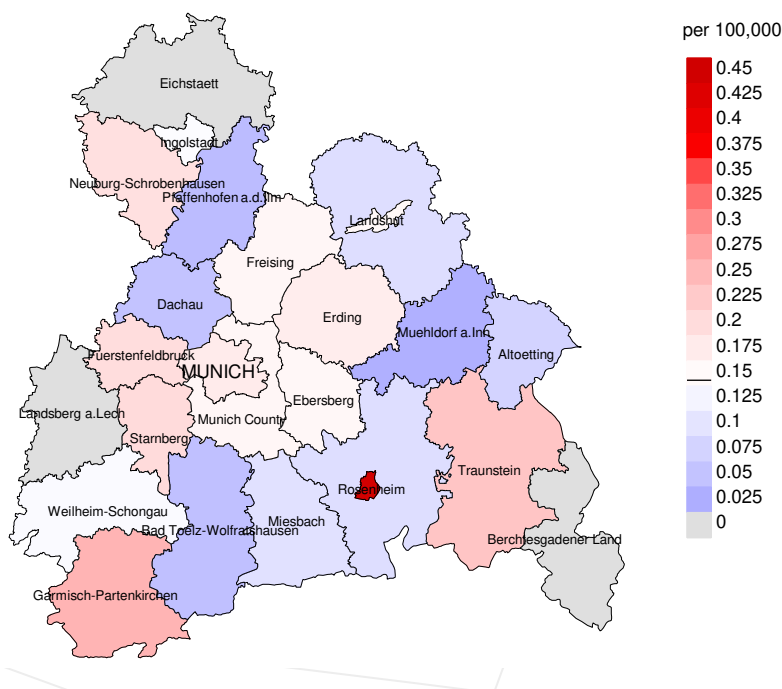
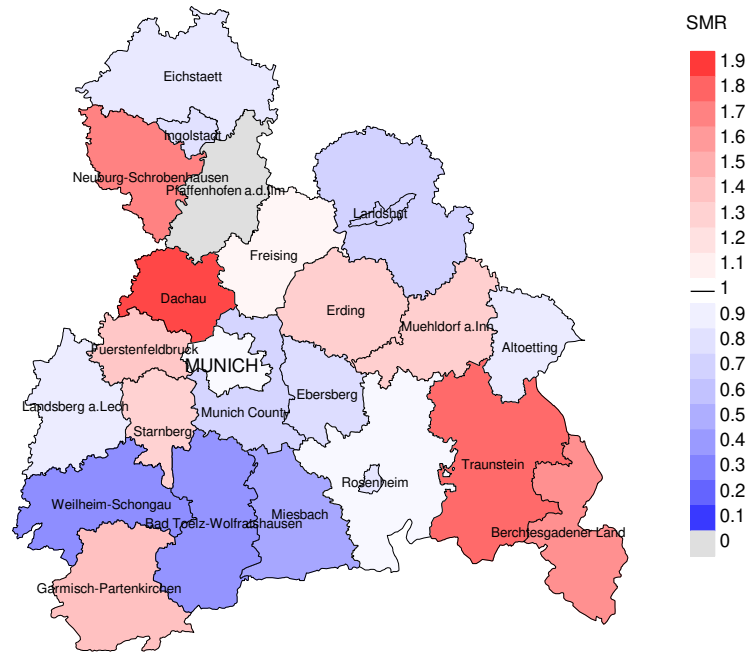


Figure 18a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2016. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.2/100,000 WS N=92, females 0.1/100,000 WS N=106).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 2 women died from MALT lymphoma. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.2/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.0 and 1.1/100,000.

Standardized mortality ratio (SMR) 2007 - 2016: Males



Standardized mortality ratio (SMR) 2007 - 2016: Females

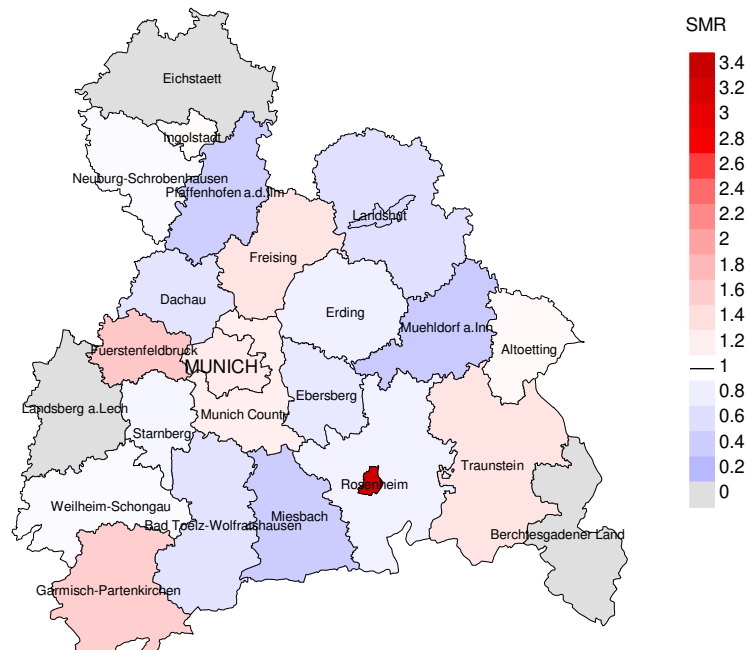


Figure 18b. Map of standardized mortality ratio (SMR) by county averaged for period 2007 to 2016. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=92, females N=106).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 2 women died from MALT lymphoma. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.72. Though, the value of this parameter may vary with an underlying probability of 99% between 0.04 and 3.32, 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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