Munich Cancer Registry

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ICD-10 C18.1: Appendix cancer

Incidence and Mortality

Year of diagnosis	1998-2016
Patients	696
Diseases	696
Creation date	08/21/2018
Export date	08/09/2018
Population	4.81 m

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

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

https://www.tumorregister-muenchen.de/en/facts/base/bC181_E-ICD-10-C18.1-Appendix-cancer-incidence-and-mortality.pdf

Index of figures and tables

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
C18.1	Malignant neoplasm: Appendix

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	12	8.3	7.9	50.0	100.0
1999	15	14.8	7.4	33.3	93.3
2000	17	13.6	7.2	23.5	94.1
2001	13	15.8	7.0	76.9	100.0
2002	35	17.4	7.0	45.7	94.3 #
2003	21	20.4	6.5	57.1	95.2
2004	20	20.3	6.6	40.0	100.0
2005	31	20.7	6.7	61.3	93.5
2006	25	20.6	5.9	40.0	88.0
2007	34	19.3	5.1	44.1	79.4 #
2008	32	19.2	4.2	37.5	65.6
2009	39	18.4	4.0	43.6	66.7
2010	44	17.5	3.4	40.9	70.5
2011	54	16.3	3.2	27.8	53.7
2012	72	15.3	2.4	22.2	52.8
2013	63	15.2	3.2	19.0	41.3
2014	66	15.9	3.0	16.7	50.0
2015	55	15.9	1.0	7.3	96.4
2016	48	16.5	0.0	2.1	66.7 ##
1998-2016	696	16.5	7.9	30.3	71.1

696 cases diagnosed 1998-2016 are related to a total of 696 patients. Currently, in 175 (25.1 %) of these 696 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 132 / 32 / 11 (19.0 % / 4.6 % / 1.6 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:
In 2014, a subgroup of 66 cases has been diagnosed, of which 15.9 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 3.0 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1a

Cases 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	7	58.3	14.3	9.6	28.6	100.0
1999	8	53.3	20.0	8.5	25.0	100.0
2000	7	41.2	22.7	8.4	28.6	100.0
2001	8	61.5	20.0	8.6	87.5	100.0
2002	15	42.9	15.6	8.5	33.3	100.0 #
2003	9	42.9	14.8	7.9	44.4	88.9
2004	9	45.0	12.7	7.7	44.4	100.0
2005	12	38.7	14.7	8.0	50.0	100.0
2006	13	52.0	15.9	7.5	38.5	100.0
2007	21	61.8	15.6	6.3	52.4	90.5 #
2008	16	50.0	16.8	5.9	18.8	50.0
2009	18	46.2	16.1	5.9	50.0	66.7
2010	22	50.0	16.4	5.3	40.9	77.3
2011	27	50.0	16.7	5.5	25.9	51.9
2012	30	41.7	16.2	5.0	26.7	63.3
2013	34	54.0	16.8	6.3	23.5	44.1
2014	34	51.5	17.9	6.2	17.6	47.1
2015	25	45.5	17.8	2.0	4.0	96.0
2016	24	50.0	18.9	0.0		58.3 ##
1998-2016	339	48.7	18.9	9.6	29.2	72.3

339 cases diagnosed 1998-2016 are related to a total of 339 patients. Currently, in 96 (28.3 %) of these 339 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 65 / 21 / 10 (19.2 % / 6.2 % / 2.9 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:
In 2014, a subgroup of 34 cases has been diagnosed, of which 17.9 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 6.2 % 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 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	5	41.7	0.0	6.4	80.0	100.0
1999	7	46.7	8.3	6.5	42.9	85.7
2000	10	58.8	4.5	6.0	20.0	90.0
2001	5	38.5	11.1	5.5	60.0	100.0
2002	20	57.1	19.1	5.6	55.0	90.0 #
2003	12	57.1	25.4	5.3	66.7	100.0
2004	11	55.0	27.1	5.5	36.4	100.0
2005	19	61.3	25.8	5.4	68.4	89.5
2006	12	48.0	24.8	4.2	41.7	75.0
2007	13	38.2	22.8	4.0	30.8	61.5 #
2008	16	50.0	21.5	2.5	56.3	81.3
2009	21	53.8	20.5	2.3	38.1	66.7
2010	22	50.0	18.5	1.5	40.9	63.6
2011	27	50.0	16.0	1.1	29.6	55.6
2012	42	58.3	14.5	0.0	19.0	45.2
2013	29	46.0	13.7	0.0	13.8	37.9
2014	32	48.5	13.9	0.0	15.6	53.1
2015	30	54.5	14.1	0.0	10.0	96.7
2016	24	50.0	14.3	0.0	4.2	75.0 ##
1998-2016	357	51.3	14.3	6.4	31.4	70.0

357 cases diagnosed 1998-2016 are related to a total of 357 patients. Currently, in 79 (22.1 %) of these 357 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 67 / 11 / 1 (18.8 % / 3.1 % / 0.3 %) 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 retreived from the respective headings.

How to interpret:
In 2014, a subgroup of 32 cases has been diagnosed, of which 13.9 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 0.0 % 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 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	7	5	0.6	0.4	0.4	0.3	0.5	0.4	0.5	0.3
1999	8	7	0.7	0.6	0.6	0.5	0.6	0.6	0.9	0.6
2000	7	10	0.6	0.8	0.4	0.6	0.5	0.7	0.6	0.9
2001	8	5	0.7	0.4	0.4	0.2	0.6	0.3	0.6	0.3
2002	15	20	0.8	1.0	0.5	0.7	0.7	0.9	0.8	1.0
2003	9	12	0.5	0.6	0.3	0.3	0.4	0.4	0.5	0.5
2004	9	11	0.5	0.6	0.3	0.4	0.4	0.5	0.5	0.5
2005	12	19	0.6	1.0	0.4	0.6	0.5	0.8	0.6	0.9
2006	13	12	0.7	0.6	0.4	0.4	0.6	0.5	0.7	0.5
2007	21	13	0.9	0.6	0.7	0.5	0.8	0.5	1.0	0.5
2008	16	16	0.7	0.7	0.5	0.5	0.6	0.5	0.7	0.6
2009	18	21	0.8	0.9	0.5	0.7	0.7	0.8	0.8	0.9
2010	22	22	1.0	0.9	0.6	0.7	0.8	0.8	0.9	0.8
2011	27	27	1.2	1.2	0.8	0.8	1.0	1.0	1.1	1.1
2012	30	42	1.3	1.8	0.9	1.7	1.1	1.7	1.3	1.9
2013	34	29	1.5	1.2	0.9	1.0	1.1	1.1	1.4	1.3
2014	34	32	1.5	1.3	1.0	1.0	1.3	1.1	1.5	1.3
2015	25	30	1.1	1.2	0.7	1.0	0.9	1.1	1.0	1.2
2016	24	24	1.0	1.0	0.7	0.8	0.8	0.8	1.0	0.9
1998-2016	339	357	0.9	0.9	0.6	0.7	0.8	0.8	0.9	0.9

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

Table 3

Age distribution parameters by year of diagnosis (ALL PATIENTS)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	12	54.8	20.9	13.2	87.9	32.1	43.3	55.8	63.8	86.0
1999	15	46.2	18.7	24.9	80.5	26.2	27.4	43.0	59.8	75.1
2000	17	50.6	13.7	24.7	81.6	32.7	41.6	49.5	60.1	64.1
2001	13	60.9	17.1	34.3	88.5	35.2	54.0	62.6	68.9	84.4
2002	35	56.4	19.1	17.7	90.9	29.9	37.0	60.3	72.8	78.6
2003	21	60.1	18.3	23.5	88.5	32.4	56.3	60.0	77.1	79.4
2004	20	51.9	21.3	13.8	81.0	22.4	33.8	57.8	71.9	75.9
2005	31	63.5	14.5	16.1	89.9	46.9	56.7	67.2	71.8	76.7
2006	25	61.2	11.9	40.8	81.2	44.8	50.6	63.7	70.9	76.0
2007	34	53.0	22.2	13.4	84.4	19.1	38.6	60.5	70.7	78.7
2008	32	54.3	19.7	18.9	86.2	27.5	41.7	52.5	72.0	80.6
2009	39	58.7	21.3	12.4	91.8	24.1	49.6	59.1	76.4	84.7
2010	44	59.6	19.6	14.9	94.1	31.8	46.3	64.6	70.8	81.9
2011	54	55.7	20.7	15.5	88.8	23.3	40.5	56.8	69.9	83.8
2012	72	49.6	21.9	9.7	89.9	18.5	28.2	50.6	67.5	77.3
2013	63	53.8	19.8	15.7	83.5	24.6	35.1	56.5	72.7	76.6
2014	66	53.8	20.3	15.8	86.7	24.1	36.7	56.3	71.7	78.1
2015	55	51.0	18.8	15.0	82.6	24.7	36.8	52.2	66.0	75.9
2016	48	54.3	20.2	16.1	91.0	21.4	41.6	53.4	66.1	81.9
1998-2016	696	54.8	19.8	9.7	94.1	25.0	40.3	57.4	70.7	79.4

Table 3a

Age distribution parameters by year of diagnosis (MALES)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	7	52.6	12.2	32.1	64.1	32.1	40.0	56.0	63.6	64.1
1999	8	45.5	22.5	24.9	80.5	24.9	26.8	36.1	66.3	80.5
2000	7	50.1	9.9	37.4	64.0	37.4	39.0	49.5	59.2	64.0
2001	8	59.2	16.7	34.3	88.5	34.3	48.0	60.0	67.5	88.5
2002	15	56.9	14.9	27.1	79.8	35.0	53.4	59.7	65.9	74.9
2003	9	58.5	13.8	32.4	78.0	32.4	56.3	58.1	60.0	78.0
2004	9	53.4	19.8	27.8	76.4	27.8	32.9	58.2	74.3	76.4
2005	12	64.7	11.9	34.1	77.0	53.3	59.5	69.5	71.5	74.8
2006	13	62.0	11.2	44.8	78.3	49.4	51.7	64.2	70.9	76.0
2007	21	57.3	21.5	15.8	84.4	24.8	39.5	63.3	70.7	81.3
2008	16	51.8	16.7	19.3	80.6	27.5	38.6	55.1	63.4	71.9
2009	18	62.1	17.5	12.4	84.7	40.8	53.2	63.8	75.4	83.8
2010	22	63.0	15.0	27.9	86.5	43.5	57.4	64.9	70.8	81.4
2011	27	56.1	17.2	15.5	85.6	34.7	41.0	56.6	68.7	79.4
2012	30	56.0	17.1	9.7	79.8	27.6	48.5	59.0	68.0	75.4
2013	34	61.3	17.0	19.4	83.4	35.6	48.7	66.1	75.1	79.3
2014	34	54.6	19.4	20.3	82.7	24.1	39.3	58.4	69.1	81.8
2015	25	51.2	16.6	24.7	82.6	29.0	40.1	52.0	59.2	73.4
2016	24	54.1	18.3	20.9	90.7	32.0	44.4	51.2	69.0	80.9
1998-2016	339	56.8	17.2	9.7	90.7	30.7	45.3	58.7	70.0	78.0

Table 3b

Age distribution parameters by year of diagnosis (FEMALES)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	5	57.9	30.9	13.2	87.9	13.2	46.7	55.5	86.0	87.9
1999	7	47.0	14.8	26.9	64.7	26.9	28.4	52.7	59.8	64.7
2000	10	51.0	16.4	24.7	81.6	28.7	41.6	49.3	60.8	72.8
2001	5	63.5	19.4	35.2	84.4	35.2	56.7	62.6	78.5	84.4
2002	20	56.1	22.2	17.7	90.9	26.3	35.0	62.6	74.0	83.3
2003	12	61.3	21.6	23.5	88.5	30.6	46.3	64.0	79.1	84.0
2004	11	50.6	23.4	13.8	81.0	17.0	34.6	57.4	70.4	73.4
2005	19	62.8	16.2	16.1	89.9	45.7	54.2	63.8	72.2	83.1
2006	12	60.3	13.0	40.8	81.2	43.1	49.0	62.3	70.7	72.3
2007	13	46.2	22.4	13.4	76.0	17.8	27.1	42.9	68.5	74.4
2008	16	56.7	22.5	18.9	86.2	22.8	43.9	49.2	77.1	85.5
2009	21	55.8	24.1	15.9	91.8	24.1	35.1	58.0	76.5	86.7
2010	22	56.3	23.2	14.9	94.1	26.0	35.1	64.2	70.7	85.4
2011	27	55.3	23.9	16.5	88.8	18.7	33.0	57.0	79.8	87.0
2012	42	45.1	24.0	13.7	89.9	16.4	21.9	42.6	63.4	78.1
2013	29	45.1	19.5	15.7	83.5	22.7	32.3	39.3	61.0	75.1
2014	32	53.1	21.5	15.8	86.7	24.4	31.2	51.3	73.3	76.6
2015	30	50.8	20.8	15.0	80.2	19.2	36.8	54.1	67.6	78.2
2016	24	54.5	22.4	16.1	91.0	21.2	37.6	58.5	66.1	87.0
1998-2016	357	53.0	21.9	13.2	94.1	21.1	34.6	55.5	71.5	81.0

Table 4

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

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4									
5-9	1	0.2	0.2	1	0.4	0.4			0.0
10-14	4	0.8	1.0	1	0.4	0.8	3	1.2	1.2
15-19	29	5.7	6.7	4	1.6	2.4	25	9.8	10.9
20-24	26	5.1	11.8	10	4.0	6.4	16	6.3	17.2
25-29	29	5.7	17.6	11	4.4	10.8	18	7.0	24.2
30-34	20	3.9	21.5	8	3.2	13.9	12	4.7	28.9
35-39	24	4.7	26.2	12	4.8	18.7	12	4.7	33.6
40-44	32	6.3	32.5	15	6.0	24.7	17	6.6	40.2
45-49	41	8.1	40.6	22	8.8	33.5	19	7.4	47.7
50-54	34	6.7	47.3	21	8.4	41.8	13	5.1	52.7
55-59	45	8.9	56.2	25	10.0	51.8	20	7.8	60.5
60-64	44	8.7	64.9	28	11.2	62.9	16	6.3	66.8
65-69	48	9.5	74.4	29	11.6	74.5	19	7.4	74.2
70-74	37	7.3	81.7	20	8.0	82.5	17	6.6	80.9
75-79	47	9.3	90.9	23	9.2	91.6	24	9.4	90.2
80-84	25	4.9	95.9	18	7.2	98.8	7	2.7	93.0
85+	21	4.1	100.0	3	1.2	100.0	18	7.0	100.0
All ages	507	100.0		251	100.0		256	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		0.1		1.0	
10-14	1	3	0.1	0.3	0.9	3.0
15-19	4	25	0.3	2.2	1.6	12.1
20-24	10	16	0.7	1.2	2.2	4.2
25-29	11	18	0.7	1.1	1.6	2.2
30-34	8	12	0.5	0.8	0.8	0.8
35-39	12	12	0.7	0.8	0.9	0.5
40-44	15	17	0.8	0.9	0.7	0.4
45-49	22	19	1.1	1.0	0.6	0.3
50-54	21	13	1.2	0.8	0.3	0.1
55-59	25	20	1.8	1.4	0.3	0.2
60-64	28	16	2.3	1.2	0.2	0.1
65-69	29	19	2.4	1.5	0.2	0.1
70-74	20	17	1.8	1.3	0.1	0.1
75-79	23	24	2.9	2.4	0.1	0.2
80-84	18	7	3.9	1.0	0.2	0.1
85+	3	18	1.0	2.5	0.0	0.1
All ages	251	256			0.2	0.2
Incidence						
Raw			1.1	1.1		
WS			0.7	0.9		
ES			0.9	1.0		
BRD-S			1.1	1.1		

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).

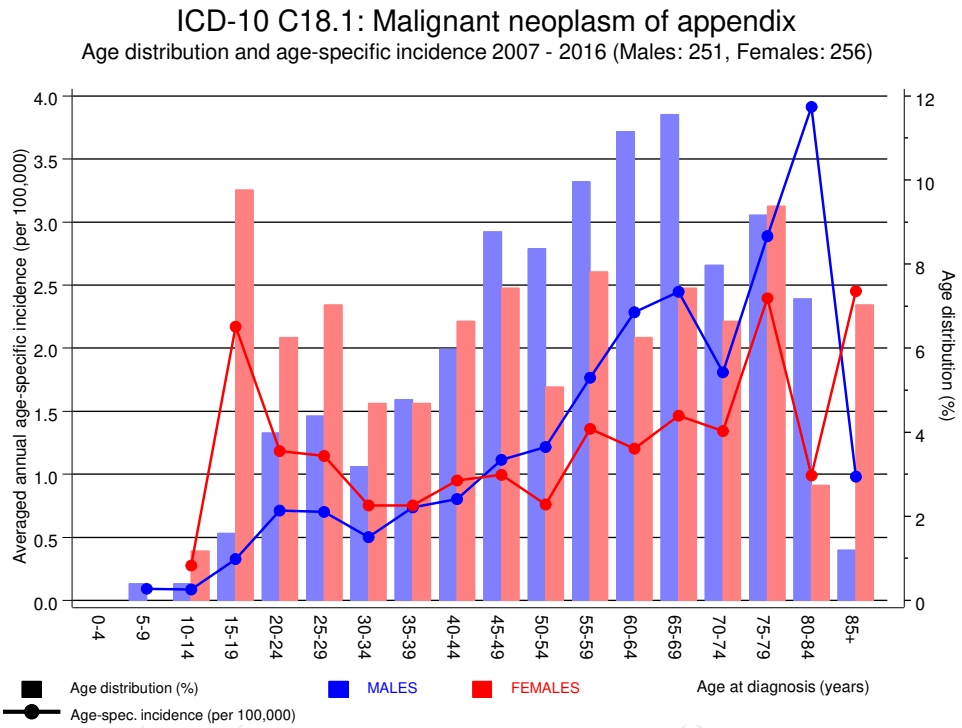


Figure 6. Age distribution (males: mean=56.7 yrs, median=59.0 yrs; females: mean=51.3 yrs, median=51.1 yrs) and age-specific incidence.

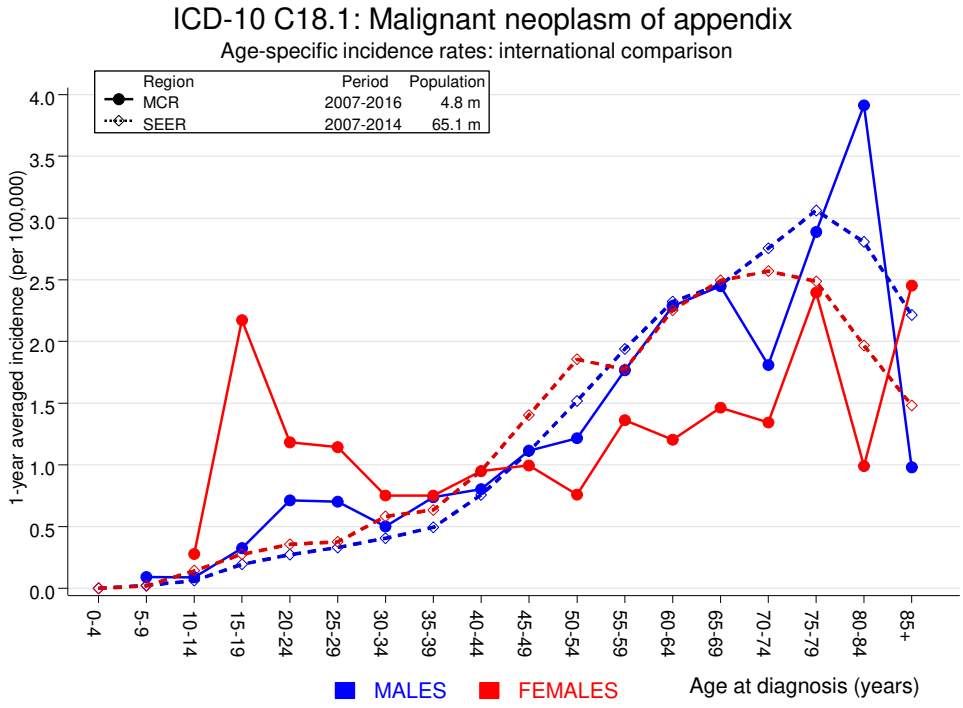


Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

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	4	0.3	15.3	4.2	39.3	#	35.5	
C17	Small intestine	4	0.1	52.8	14.4	135.1	#	37.3	
C18	Colon	10	1.2	8.6	4.1	15.9	#	84.1	
C19–C20	Rectum	7	0.7	10.2	4.1	21.0	#	60.0	
C33–C34	Lung	2	1.5	1.3	0.2	4.7		4.4	
C61	Prostate	12	3.6	3.4	1.7	5.9	#	80.2	
C64	Kidney	3	0.5	6.4	1.3	18.8	#	24.1	
C82–C85	NHL	3	0.5	5.8	1.2	17.1	#	23.6	
Others, specified		7	1.5	4.6	1.9	9.5	#	52.1	14.3
Not observed		0	3.1	0.0	0.0	1.2		-29.0	
All further malignancies		52	12.8	4.1	3.0	5.3	#	372.3	1.9

Patients	313
Median age at next malignancy (years)	72.0
Person-years	1052
Mean observation time (years)	3.4
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

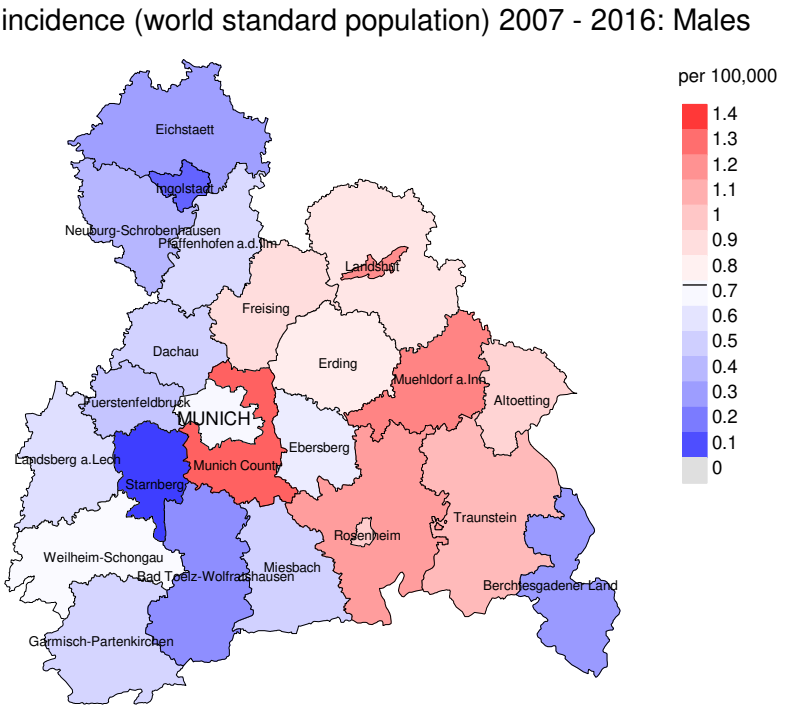
Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of further malignancies for period 1998–2016
FEMALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C16	Stomach	3	0.2	12.2	2.5	35.6	#	28.5	33.3
C17	Small intestine	3	0.0	77.4	16.0	226.3	#	30.7	
C18	Colon	7	0.7	10.1	4.0	20.7	#	65.3	
C19–C20	Rectum	3	0.3	10.2	2.1	29.7	#	28.0	
C25	Pancreas	2	0.3	6.2	0.7	22.3		17.4	
C33–C34	Lung	3	0.6	5.5	1.1	15.9	#	25.4	
C50	Breast	3	2.4	1.3	0.3	3.7		6.2	33.3
C56	Ovary	3	0.3	9.9	2.0	29.0	#	28.0	
C64	Kidney	2	0.2	11.5	1.4	41.6	#	18.9	
C67	Bladder	2	0.1	14.7	1.8	53.3	#	19.3	
Others, specified		1	0.0	47.0	1.2	262.1	#	10.1	
Not observed		0	2.4	0.0	0.0	1.5		-25.3	
All further malignancies		32	7.6	4.2	2.9	5.9	#	252.6	6.3

Patients	328
Median age at next malignancy (years)	67.1
Person-years	965
Mean observation time (years)	2.9
Median observation time (years)	1.6

The occurrence of further malignancy listed is statistically significant.

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



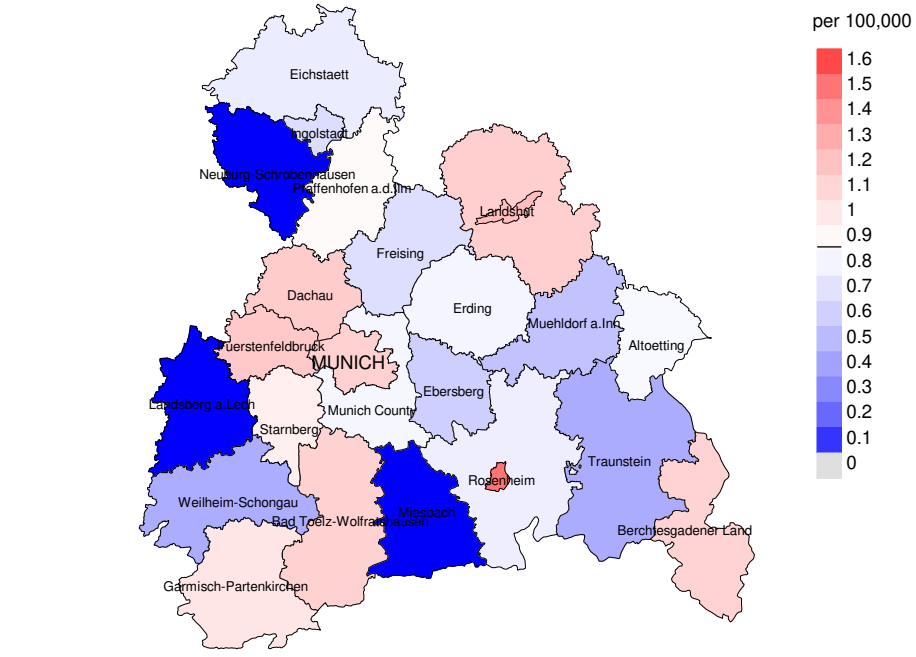
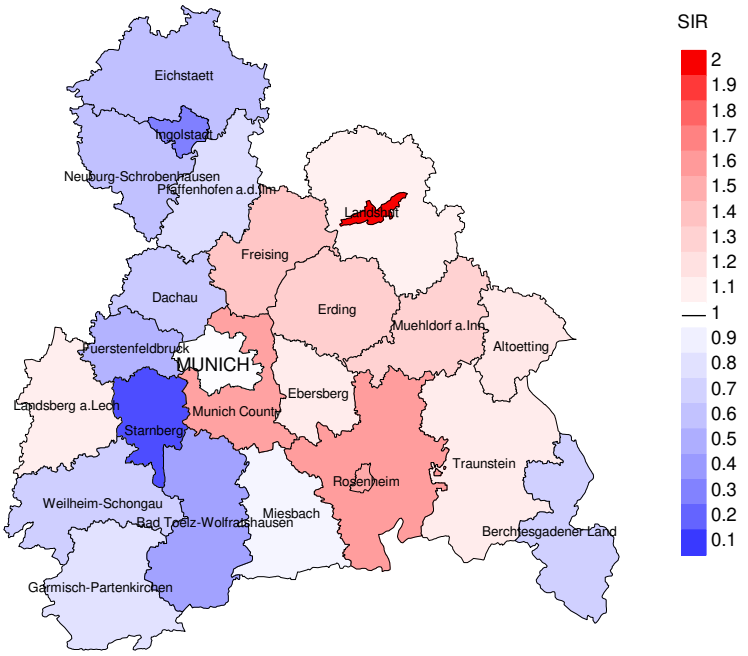


Figure 8a. Map of cancer incidence (world standard population) by county averaged for period 2007 to 2016. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.7/100,000 WS N=251, females 0.9/100,000 WS N=256).

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 4 women were identified with newly diagnosed appendix cancer. 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 0.1 and 2.0/100,000.

Standardized incidence ratio (SIR) 2007 - 2016: Males



Standardized incidence ratio (SIR) 2007 - 2016: Females

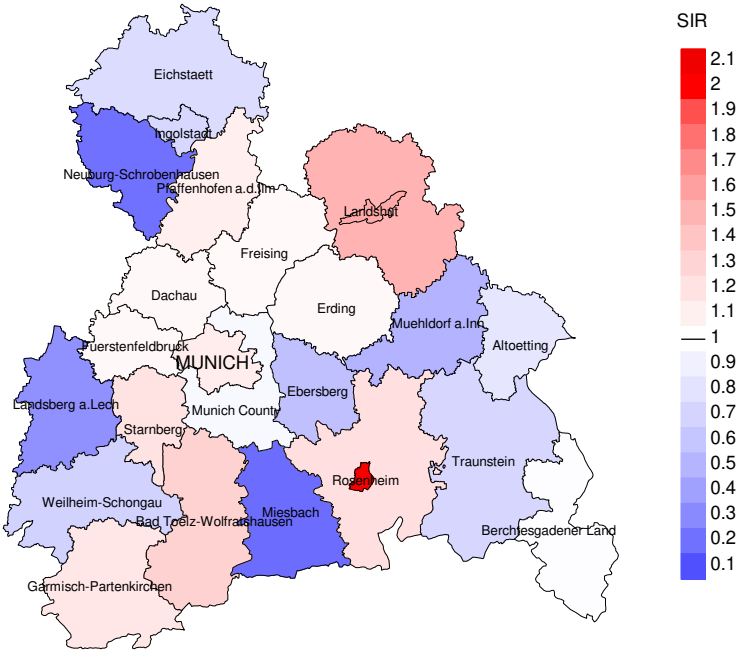


Figure 8b. Map of standardized incidence ratio (SIR) by county averaged for period 2007 to 2016. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=251, females N=256).

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 4 women were identified with newly diagnosed appendix cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.57. Though, the value of this parameter may vary with an underlying probability of 99% between 0.10 and 1.79, 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	12	100.0	6	50.0	100.0
1999	15	93.3	5	33.3	80.0
2000	17	94.1	4	23.5	100.0
2001	13	100.0	10	76.9	100.0
2002	35	94.3	16	45.7	100.0
2003	21	95.2	12	57.1	100.0
2004	20	100.0	8	40.0	100.0
2005	31	93.5	19	61.3	94.7
2006	25	88.0	10	40.0	90.0
2007	34	79.4	15	44.1	93.3
2008	32	65.6	12	37.5	100.0
2009	39	66.7	17	43.6	100.0
2010	44	70.5	18	40.9	100.0
2011	54	53.7	15	27.8	86.7
2012	72	52.8	16	22.2	93.8
2013	63	41.3	12	19.0	83.3
2014	66	50.0	11	16.7	100.0
2015	55	96.4	4	7.3	75.0
2016	48	66.7	1	2.1	100.0
1998-2016	696	71.1	211	30.3	95.3

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	12	5	2	16.7
1999	15	5	2	13.3
2000	17			
2001	13	5	2	15.4
2002	35	5	2	5.7
2003	21	9	2	9.5
2004	20	7		
2005	31	11	5	16.1
2006	25	10	1	4.0
2007	34	4	1	2.9
2008	32	15	1	3.1
2009	39	14	4	10.3
2010	44	24	4	9.1
2011	54	15	2	3.7
2012	72	18	6	8.3
2013	63	21	2	3.2
2014	66	22	3	4.5
2015	55	26	1	1.8
2016	48	19	1	2.1
1998–2016	696	235	41	5.9

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	5	80.0	20.0	80.0
1999	5	100.0		100.0
2000				
2001	5	100.0		100.0
2002	5	60.0	40.0	60.0
2003	9	66.7	33.3	88.9
2004	7	85.7	14.3	85.7
2005	11	72.7	27.3	80.0
2006	10	80.0	20.0	88.9
2007	4	100.0		100.0
2008	15	86.7	13.3	78.6
2009	14	78.6	21.4	100.0
2010	24	70.8	29.2	79.2
2011	15	100.0		93.3
2012	18	72.2	27.8	82.4
2013	21	85.7	14.3	85.7
2014	22	68.2	31.8	72.7
2015	26	69.2	30.8	70.8
2016	19	57.9	42.1	52.6
1998-2016	235	76.6	23.4	80.3

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	1	56.4	56.4		56.4
1999	2	71.5	71.5		71.5
2000					
2001	4	64.3	64.3		64.3
2002	2	71.0	71.0		63.2
2003	2	60.1	60.1		60.1
2004	4	69.6	69.6		82.0
2005	4	75.1	74.9	79.9	74.9
2006	5	76.4	58.5	76.8	58.5
2007					
2008	10	65.7	65.4	81.2	65.1
2009	5	78.9	78.9		78.9
2010	7	78.1	75.9	78.1	75.9
2011	8	67.7	67.7		67.8
2012	8	79.2	79.8	71.4	79.8
2013	13	71.9	66.8	71.9	66.8
2014	11	70.8	72.9	67.2	72.9
2015	10	67.1	67.1		66.3
2016	12	73.4	73.4	77.6	73.4
1998-2016	108	72.8	72.1	77.1	72.8

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

Table 10b

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

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	4	85.9	85.8	88.1	85.8
1999	3	72.9	72.9		76.9
2000					
2001	1	49.6	49.6		49.6
2002	3	91.0	95.7	76.9	79.2
2003	7	74.8	76.0	74.8	76.0
2004	3	79.7	79.9	79.7	79.7
2005	7	70.4	70.4	70.7	70.4
2006	5	66.8	66.8		66.8
2007	4	68.3	68.3		68.3
2008	5	72.2	72.2		73.8
2009	9	81.7	80.1	84.7	81.7
2010	17	87.4	80.8	89.4	87.4
2011	7	68.4	68.4		68.4
2012	10	79.1	71.8	83.8	78.1
2013	8	67.6	67.6		67.6
2014	11	77.4	49.8	79.2	65.2
2015	16	75.7	72.6	85.5	72.6
2016	7	77.7	77.7	67.8	77.9
1998-2016	127	77.4	74.8	82.6	75.8

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	1	0.1	0.14	0.0	0.11	0.1	0.13	0.1	0.13
1999	2	0.2	0.25	0.1	0.18	0.2	0.24	0.3	0.31
2000									
2001	4	0.3	0.50	0.2	0.50	0.3	0.50	0.3	0.52
2002	2	0.1	0.13	0.1	0.10	0.1	0.12	0.1	0.16
2003	2	0.1	0.22	0.1	0.19	0.1	0.20	0.1	0.22
2004	4	0.2	0.44	0.1	0.44	0.2	0.46	0.3	0.50
2005	3	0.2	0.25	0.1	0.24	0.1	0.25	0.2	0.30
2006	3	0.2	0.23	0.1	0.24	0.1	0.26	0.2	0.26
2007									
2008	8	0.4	0.50	0.2	0.42	0.3	0.44	0.3	0.49
2009	5	0.2	0.28	0.1	0.15	0.1	0.21	0.3	0.32
2010	6	0.3	0.27	0.1	0.18	0.2	0.22	0.2	0.26
2011	8	0.4	0.30	0.2	0.23	0.3	0.26	0.3	0.28
2012	7	0.3	0.23	0.1	0.14	0.2	0.19	0.3	0.25
2013	10	0.4	0.29	0.2	0.25	0.3	0.29	0.4	0.28
2014	8	0.3	0.24	0.2	0.16	0.2	0.19	0.3	0.20
2015	10	0.4	0.40	0.2	0.30	0.3	0.36	0.4	0.39
2016	6	0.2	0.25	0.1	0.16	0.2	0.20	0.2	0.23
1998-2016	89	0.2	0.26	0.1	0.20	0.2	0.24	0.2	0.27

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	3	0.3	0.60	0.0	0.15	0.1	0.28	0.2	0.47
1999	3	0.3	0.43	0.1	0.25	0.2	0.33	0.2	0.43
2000									
2001	1	0.1	0.20	0.1	0.40	0.1	0.33	0.1	0.29
2002	1	0.1	0.05	0.0	0.01	0.0	0.02	0.0	0.02
2003	4	0.2	0.33	0.1	0.23	0.1	0.27	0.2	0.30
2004	2	0.1	0.18	0.0	0.08	0.1	0.11	0.1	0.12
2005	5	0.3	0.26	0.1	0.15	0.1	0.18	0.2	0.19
2006	5	0.2	0.42	0.1	0.38	0.2	0.39	0.2	0.39
2007	4	0.2	0.31	0.1	0.17	0.1	0.23	0.2	0.28
2008	5	0.2	0.31	0.1	0.21	0.1	0.25	0.2	0.27
2009	6	0.3	0.29	0.1	0.09	0.1	0.15	0.2	0.23
2010	11	0.5	0.50	0.1	0.22	0.2	0.30	0.3	0.39
2011	7	0.3	0.26	0.1	0.15	0.2	0.18	0.2	0.21
2012	6	0.3	0.14	0.1	0.06	0.2	0.10	0.2	0.12
2013	8	0.3	0.28	0.2	0.15	0.2	0.21	0.3	0.23
2014	7	0.3	0.22	0.1	0.15	0.2	0.18	0.2	0.18
2015	8	0.3	0.27	0.1	0.15	0.2	0.20	0.3	0.22
2016	5	0.2	0.21	0.1	0.09	0.1	0.12	0.1	0.15
1998-2016	91	0.2	0.25	0.1	0.13	0.1	0.18	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 n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4									
5-9									
10-14									
15-19									
20-24									
25-29	1	0.7	0.7	1	1.5	1.5			0.0
30-34	1	0.7	1.5	1	1.5	2.9			0.0
35-39	3	2.2	3.7			2.9	3	4.5	4.5
40-44	3	2.2	5.9	2	2.9	5.9	1	1.5	6.0
45-49	5	3.7	9.6			5.9	5	7.5	13.4
50-54	7	5.2	14.8	5	7.4	13.2	2	3.0	16.4
55-59	9	6.7	21.5	5	7.4	20.6	4	6.0	22.4
60-64	9	6.7	28.1	5	7.4	27.9	4	6.0	28.4
65-69	19	14.1	42.2	12	17.6	45.6	7	10.4	38.8
70-74	18	13.3	55.6	11	16.2	61.8	7	10.4	49.3
75-79	26	19.3	74.8	13	19.1	80.9	13	19.4	68.7
80-84	18	13.3	88.1	8	11.8	92.6	10	14.9	83.6
85+	16	11.9	100.0	5	7.4	100.0	11	16.4	100.0
All ages	135	100.0		68	100.0		67	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	0.09			1.4	
30-34	1		0.1	0.13			1.0	
35-39		3			0.2	0.25		1.1
40-44	2	1	0.1	0.13	0.1	0.06	0.4	0.1
45-49		5			0.3	0.26		0.4
50-54	5	2	0.3	0.24	0.1	0.15	0.2	0.1
55-59	5	4	0.4	0.20	0.3	0.20	0.1	0.1
60-64	5	4	0.4	0.18	0.3	0.25	0.1	0.1
65-69	12	7	1.0	0.41	0.5	0.37	0.2	0.1
70-74	11	7	1.0	0.55	0.6	0.41	0.1	0.1
75-79	13	13	1.6	0.57	1.3	0.54	0.1	0.2
80-84	8	10	1.7	0.44	1.4	1.43	0.1	0.1
85+	5	11	1.6	1.67	1.5	0.61	0.1	0.1
All ages	68	67					0.1	0.1
Mortality								
Raw			0.3	0.27	0.3	0.26		
WS			0.1	0.20	0.1	0.13		
ES			0.2	0.23	0.2	0.18		
BRD-S			0.3	0.26	0.2	0.21		
PYLL-70								
per 100,000			1.7		1.9			
ES			1.5		1.6			
AYLL-70			11.4		14.2			

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 ←%
C12-C13 Hypopharynx	1	2.0					1	100.0
C15 Oesophagus	3	5.9					3	100.0
C16 Stomach	1	2.0					1	100.0
C17 Small intestine	3	5.9	1	33.3	1	33.3	1	33.3
C18 Colon	6	11.8			5	83.3	1	16.7
C19-C20 Rectum	7	13.7	4	57.1	2	28.6	1	14.3
C25 Pancreas	2	3.9					2	100.0
C33-C34 Lung	3	5.9					3	100.0
C44 Skin others	2	3.9	2	100.0				
C48 Peritoneal	1	2.0	1	100.0				
C61 Prostate	10	19.6	3	30.0	2	20.0	5	50.0
C64 Kidney	1	2.0					1	100.0
C65 Renal pelvis	2	3.9					2	100.0
C67 Bladder	4	7.8	3	75.0			1	25.0
C73 Thyroid	1	2.0	1	100.0				
C76-C79 CUP	1	2.0					1	100.0
C82-C85 NHL	1	2.0			1	100.0		
C91-C96 Leukaemia	2	3.9	1	50.0			1	50.0
All further malignancies	51	100.0	16	31.4	11	21.6	24	47.1

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

Table 14b

Further malignancies in deaths in period 1998–2016
FEMALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03–C06 Oral cavity	1	2.6					1	100.0
C16 Stomach	2	5.1					2	100.0
C18 Colon	8	20.5			4	50.0	4	50.0
C19–C20 Rectum	4	10.3	2	50.0	1	25.0	1	25.0
C25 Pancreas	1	2.6					1	100.0
C33–C34 Lung	3	7.7	1	33.3			2	66.7
C46,C49 Soft tissue	1	2.6	1	100.0				
C48 Peritoneal	1	2.6	1	100.0				
C50 Breast	4	10.3	2	50.0			2	50.0
C51 Vulva	1	2.6	1	100.0				
C53 Cervix uteri	1	2.6			1	100.0		
C54 Corpus uteri	1	2.6			1	100.0		
C55,C57 Fem. genitals un	1	2.6	1	100.0				
C56 Ovary	7	17.9	2	28.6	4	57.1	1	14.3
C64 Kidney	1	2.6	1	100.0				
C67 Bladder	2	5.1	1	50.0			1	50.0
All further malignancies	39	100.0	13	33.3	11	28.2	15	38.5

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	0.09			1.5	
30-34	1		0.1	0.13			1.0	
35-39		1			0.1	0.11		0.4
40-44	2	1	0.1	0.13	0.1	0.06	0.4	0.2
45-49		4			0.2	0.27		0.4
50-54	5	1	0.3	0.28	0.1	0.11	0.3	0.1
55-59	3	3	0.2	0.15	0.2	0.18	0.1	0.1
60-64	4	3	0.3	0.19	0.2	0.25	0.1	0.1
65-69	9	7	0.8	0.50	0.5	0.44	0.2	0.2
70-74	7	6	0.6	0.64	0.5	0.38	0.1	0.1
75-79	9	11	1.1	0.64	1.1	0.61	0.1	0.2
80-84	6	6	1.3	0.55	0.8	1.00	0.1	0.1
85+	4	10	1.3	4.00	1.4	0.63	0.1	0.1
All ages	51	53					0.1	0.1
Mortality								
Raw			0.2	0.26	0.2	0.24		
WS			0.1	0.18	0.1	0.11		
ES			0.2	0.22	0.1	0.15		
BRD-S			0.2	0.25	0.2	0.18		
PYLL-70								
per 100,000			1.5		1.2			
ES			1.4		1.0			
AYLL-70			12.5		12.3			

* 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	0.09			1.5	
30-34	1		0.1	0.13			1.0	
35-39		1			0.1	0.11		0.4
40-44	2	1	0.1	0.13	0.1	0.06	0.4	0.2
45-49		4			0.2	0.27		0.4
50-54	5	1	0.3	0.28	0.1	0.11	0.3	0.1
55-59	3	3	0.2	0.17	0.2	0.19	0.1	0.1
60-64	3	1	0.2	0.17	0.1	0.09	0.1	0.0
65-69	7	7	0.6	0.44	0.5	0.47	0.1	0.2
70-74	6	4	0.5	0.55	0.3	0.27	0.1	0.1
75-79	8	9	1.0	0.57	0.9	0.56	0.1	0.2
80-84	4	4	0.9	0.40	0.6	0.67	0.1	0.1
85+	2	7	0.7	2.00	1.0	0.50	0.0	0.1
All ages	42	42					0.1	0.1
Mortality								
Raw			0.2	0.23	0.2	0.20		
WS			0.1	0.16	0.1	0.10		
ES			0.1	0.19	0.1	0.13		
BRD-S			0.2	0.22	0.1	0.15		
PYLL-70								
per 100,000			1.5		1.2			
ES			1.3		1.0			
AYLL-70			13.6		12.8			

* See corresponding tables with multiple malignancies.

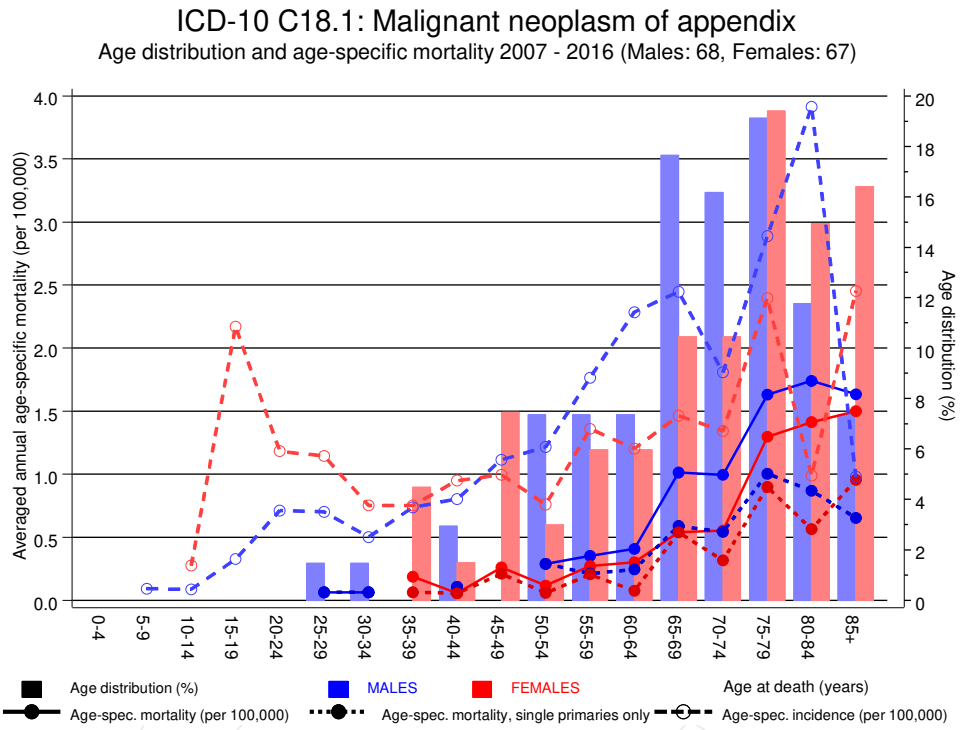


Figure 17. Distribution of age at death (bars; males: mean=65.3 yrs, median=67.0 yrs; females: mean=67.7 yrs, median=72.0 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

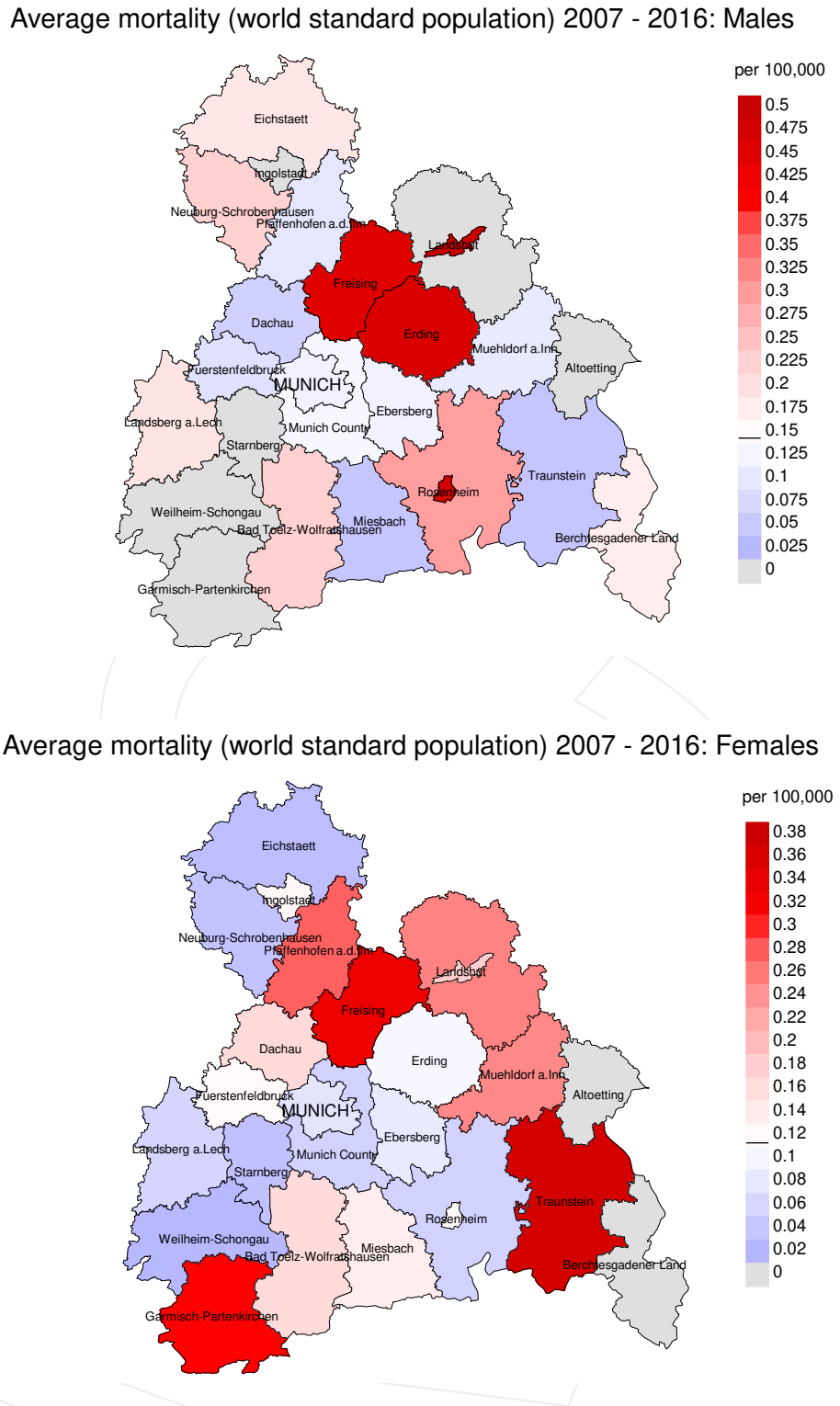
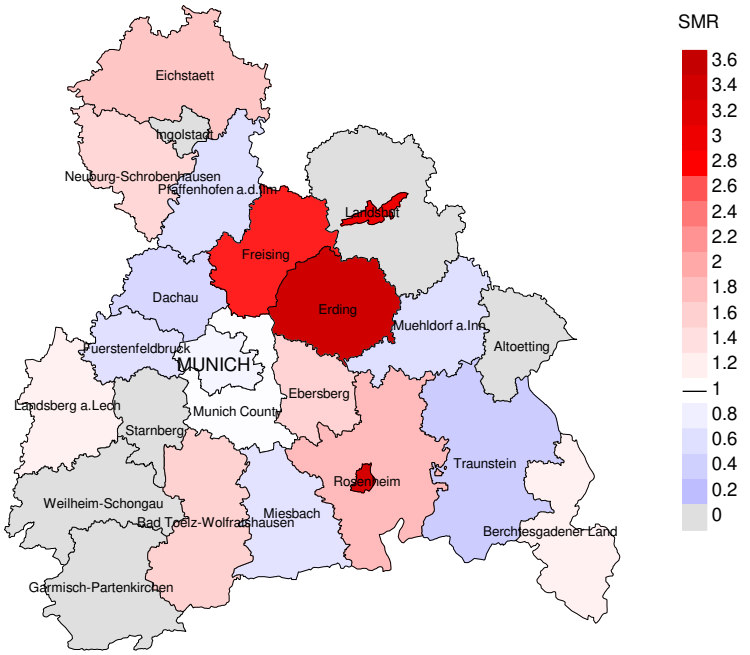


Figure 18a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2016. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.1/100,000 WS N=68, females 0.1/100,000 WS N=67).

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 1 women died from appendix cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.1/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.0 and 1.0/100,000.

Standardized mortality ratio (SMR) 2007 - 2016: Males



Standardized mortality ratio (SMR) 2007 - 2016: Females

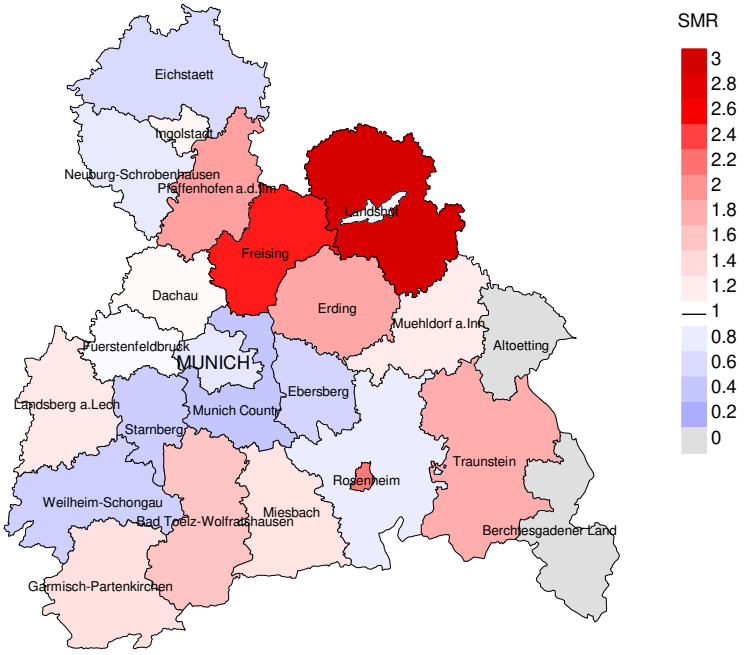


Figure 18b. Map of standardized mortality ratio (SMR) by county averaged for period 2007 to 2016. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=68, females N=67).

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 1 women died from appendix cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.55. Though, the value of this parameter may vary with an underlying probability of 99% between 0.00 and 4.10, 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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