Munich Cancer Registry

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- *Deutsch*

ICD-10 C18.1: Appendix cancer

Incidence and Mortality

Year of diagnosis	1998-2019
Patients	902
Diseases	902
Creation date	01/25/2021
Database export	01/07/2021
Population	4.92 m

Munich Cancer Registry
Cancer Registry Bavaria - Upper Bavaria Regional Center
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Marchioninistr. 15
Munich, 81377
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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, January 2021

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

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

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

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	8.2	58.3	100.0
1999	15	14.8	7.8	33.3	93.3
2000	17	13.6	7.6	35.3	94.1
2001	13	15.8	7.4	76.9	100.0
2002	35	17.4	7.4	48.6	97.1 #
2003	21	20.4	6.9	57.1	95.2
2004	20	20.3	7.0	45.0	100.0
2005	31	20.7	7.0	71.0	93.5
2006	25	20.6	6.5	48.0	88.0
2007	35	19.2	6.0	51.4	85.7 #
2008	32	19.1	5.4	46.9	100.0
2009	39	18.3	5.3	48.7	100.0
2010	44	17.4	4.9	50.0	95.5
2011	55	16.2	5.0	27.3	96.4
2012	77	15.1	3.9	24.7	94.8
2013	67	14.9	4.3	22.4	95.5
2014	72	15.6	4.5	25.0	95.8
2015	67	15.5	2.8	17.9	86.6
2016	57	16.3	3.2	19.3	98.2
2017	69	16.4	3.1	11.6	98.6
2018	53	17.2	2.1	22.6	100.0
2019	46	17.4	0.0	2.2	65.2 ##
1998–2019	902	17.4	8.2	31.6	93.9

902 cases diagnosed 1998-2019 are related to a total of 902 patients. Currently, in 236 (26.2 %) of these 902 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 177 / 42 / 17 (19.6 % / 4.7 % / 1.9 %) 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 2017, a subgroup of 69 cases has been diagnosed, of which 16.4 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 3.1 % 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	9.9	42.9	100.0
1999	8	53.3	20.0	9.1	25.0	100.0
2000	7	41.2	22.7	9.0	57.1	100.0
2001	8	61.5	20.0	8.9	87.5	100.0
2002	15	42.9	15.6	8.8	33.3	100.0 #
2003	9	42.9	14.8	8.1	44.4	88.9
2004	9	45.0	12.7	8.0	44.4	100.0
2005	12	38.7	14.7	8.2	66.7	100.0
2006	13	52.0	15.9	7.8	53.8	100.0
2007	22	62.9	15.5	6.9	63.6	95.5 #
2008	16	50.0	16.7	6.7	37.5	100.0
2009	18	46.2	16.0	6.7	61.1	100.0
2010	22	50.0	16.3	6.4	45.5	90.9
2011	28	50.9	16.5	6.6	25.0	96.4
2012	32	41.6	15.9	6.0	31.3	93.8
2013	36	53.7	16.4	6.9	30.6	97.2
2014	37	51.4	17.7	7.1	32.4	94.6
2015	32	47.8	17.2	5.0	15.6	84.4
2016	28	49.1	18.4	5.7	21.4	100.0
2017	21	30.4	18.7	6.7	14.3	100.0
2018	19	35.8	19.3	2.5	21.1	100.0
2019	22	47.8	20.0	0.0		72.7 ##
1998-2019	421	46.7	20.0	9.9	34.0	95.0

421 cases diagnosed 1998-2019 are related to a total of 421 patients. Currently, in 125 (29.7 %) of these 421 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 87 / 25 / 13 (20.7 % / 5.9 % / 3.1 %) 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 retreived from the respective headings.

How to interpret:
In 2017, a subgroup of 21 cases has been diagnosed, of which 18.7 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 6.7 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 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	6.7	80.0	100.0
1999	7	46.7	8.3	6.7	42.9	85.7
2000	10	58.8	4.5	6.4	20.0	90.0
2001	5	38.5	11.1	6.1	60.0	100.0
2002	20	57.1	19.1	6.1	60.0	95.0 #
2003	12	57.1	25.4	5.9	66.7	100.0
2004	11	55.0	27.1	6.1	45.5	100.0
2005	19	61.3	25.8	6.0	73.7	89.5
2006	12	48.0	24.8	5.3	41.7	75.0
2007	13	37.1	22.8	5.2	30.8	69.2 #
2008	16	50.0	21.5	4.2	56.3	100.0
2009	21	53.8	20.5	4.1	38.1	100.0
2010	22	50.0	18.5	3.8	54.5	100.0
2011	27	49.1	16.0	3.7	29.6	96.3
2012	45	58.4	14.3	2.2	20.0	95.6
2013	31	46.3	13.4	2.2	12.9	93.5
2014	35	48.6	13.5	2.5	17.1	97.1
2015	35	52.2	13.9	1.2	20.0	88.6
2016	29	50.9	14.4	1.5	17.2	96.6
2017	48	69.6	14.4	1.0	10.4	97.9
2018	34	64.2	15.3	1.8	23.5	100.0
2019	24	52.2	15.2	0.0	4.2	58.3 ##
1998-2019	481	53.3	15.2	6.7	29.5	92.9

481 cases diagnosed 1998-2019 are related to a total of 481 patients. Currently, in 111 (23.1 %) of these 481 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 90 / 17 / 4 (18.7 % / 3.5 % / 0.8 %) 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 retreived from the respective headings.

How to interpret:
In 2017, a subgroup of 48 cases has been diagnosed, of which 14.4 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 1.0 % 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 4.92 m as of 2007, respectively)

Year of diagnosis	Males n	Females n	Males Inc. raw	Fem. Inc. raw	Males Inc. WS	Fem. Inc. WS	Males Inc. ES	Fem. Inc. ES	Males Inc. BRD-S	Fem. Inc. BRD-S
1998	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	22	13	1.0	0.6	0.7	0.5	0.8	0.5	1.1	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	28	27	1.3	1.2	0.8	0.8	1.0	1.0	1.2	1.1
2012	32	45	1.4	1.9	1.0	1.9	1.2	1.9	1.3	2.0
2013	36	31	1.6	1.3	0.9	1.1	1.2	1.2	1.5	1.4
2014	37	35	1.6	1.5	1.1	1.1	1.4	1.2	1.6	1.4
2015	32	35	1.3	1.4	0.9	1.1	1.2	1.3	1.3	1.4
2016	28	29	1.2	1.2	0.8	0.9	1.0	1.0	1.1	1.1
2017	21	48	0.9	1.9	0.6	1.6	0.7	1.8	0.9	2.0
2018	19	34	0.8	1.4	0.4	1.0	0.6	1.1	0.7	1.3
2019	22	24	0.9	1.0	0.6	0.7	0.7	0.8	0.8	0.9
1998-2019	421	481	1.0	1.1	0.6	0.8	0.8	0.9	0.9	1.0

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)

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	35	52.6	22.0	13.4	84.4	19.1	38.6	60.0	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	55	56.2	20.8	15.5	88.8	23.3	40.5	57.0	73.0	83.8
2012	77	48.8	21.7	9.7	89.9	18.5	28.7	49.0	66.4	77.3
2013	67	53.5	19.7	15.7	83.5	23.6	35.1	56.5	72.0	76.6
2014	72	54.1	20.0	15.8	88.6	24.4	38.6	55.9	71.5	78.1
2015	67	51.6	19.1	11.4	82.6	24.7	40.1	53.1	67.7	76.3
2016	57	54.2	20.5	15.8	93.8	21.2	42.6	53.9	65.7	80.9
2017	69	51.1	20.0	14.5	81.6	23.3	34.1	54.9	68.8	79.0
2018	53	60.0	17.5	17.8	90.4	34.2	51.5	61.5	74.1	78.1
2019	46	58.3	20.5	17.7	93.2	29.1	44.6	62.7	76.6	84.8
1998–2019	902	54.9	19.8	9.7	94.1	24.9	40.4	57.4	70.7	79.2

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	22	56.4	21.3	15.8	84.4	24.8	39.2	62.5	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	28	57.0	17.6	15.5	85.6	34.7	41.8	59.7	68.7	82.1
2012	32	54.8	17.2	9.7	79.8	28.8	45.0	57.7	67.6	75.3
2013	36	60.7	16.7	19.4	83.4	35.6	48.1	64.4	74.6	79.3
2014	37	55.2	19.5	20.3	88.6	24.1	39.3	58.2	69.1	82.2
2015	32	51.4	16.3	24.7	82.6	29.0	40.9	51.1	63.9	72.3
2016	28	54.0	19.1	15.8	90.7	21.4	44.4	53.0	69.0	80.9
2017	21	56.2	21.9	19.1	81.6	23.8	35.9	59.3	72.4	79.0
2018	19	66.3	15.6	17.8	90.4	53.2	57.1	70.5	76.6	78.1
2019	22	59.1	20.4	22.6	89.3	29.1	44.6	60.0	78.0	83.2
1998–2019	421	57.1	17.7	9.7	90.7	29.4	45.3	58.9	70.9	78.4

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	45	44.6	23.7	13.7	89.9	16.4	21.9	40.8	62.4	78.1
2013	31	45.1	19.7	15.7	83.5	22.7	28.6	39.3	62.8	72.7
2014	35	52.9	20.8	15.8	86.7	24.4	32.7	51.1	72.7	76.6
2015	35	51.9	21.7	11.4	81.3	18.9	36.8	55.9	72.5	78.6
2016	29	54.5	22.1	16.1	93.8	20.3	40.6	55.6	65.7	87.1
2017	48	48.8	18.9	14.5	81.3	23.3	32.0	51.9	61.5	78.1
2018	34	56.5	17.8	19.3	85.2	28.9	48.6	58.3	71.7	78.5
2019	24	57.5	20.9	17.7	93.2	29.8	39.1	63.0	71.0	84.8
1998–2019	481	53.0	21.3	11.4	94.1	21.2	34.7	55.5	69.9	79.5

Table 4

Age distribution by 5-year age group and sex for period 2007–2019

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0–4									
5–9	1	0.1	0.1	1	0.3	0.3			0.0
10–14	6	0.8	1.0	1	0.3	0.6	5	1.3	1.3
15–19	38	5.3	6.3	7	2.1	2.7	31	8.2	9.5
20–24	37	5.2	11.5	14	4.2	6.9	23	6.1	15.5
25–29	42	5.9	17.4	15	4.5	11.4	27	7.1	22.6
30–34	28	3.9	21.3	10	3.0	14.4	18	4.7	27.4
35–39	30	4.2	25.5	14	4.2	18.6	16	4.2	31.6
40–44	41	5.8	31.3	21	6.3	24.9	20	5.3	36.8
45–49	58	8.1	39.4	27	8.1	33.0	31	8.2	45.0
50–54	52	7.3	46.7	27	8.1	41.1	25	6.6	51.6
55–59	67	9.4	56.1	35	10.5	51.7	32	8.4	60.0
60–64	63	8.8	64.9	32	9.6	61.3	31	8.2	68.2
65–69	62	8.7	73.6	32	9.6	70.9	30	7.9	76.1
70–74	56	7.9	81.5	32	9.6	80.5	24	6.3	82.4
75–79	70	9.8	91.3	36	10.8	91.3	34	8.9	91.3
80–84	34	4.8	96.1	22	6.6	97.9	12	3.2	94.5
85+	28	3.9	100.0	7	2.1	100.0	21	5.5	100.0
All ages	713	100.0		333	100.0		380	100.0	

Table 5

Age-specific incidence and proportion of all cancers
for period 2007-2019

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males Prop.all cancers n=143063 %	Females Prop.all cancers n=144724 %
0- 4						
5- 9	1		0.1		0.9	
10-14	1	5	0.1	0.4	0.8	4.3
15-19	7	31	0.4	2.1	2.3	12.6
20-24	14	23	0.8	1.3	2.4	4.9
25-29	15	27	0.7	1.3	1.7	2.4
30-34	10	18	0.5	0.9	0.8	0.9
35-39	14	16	0.7	0.8	0.8	0.5
40-44	21	20	0.9	0.9	0.8	0.3
45-49	27	31	1.1	1.3	0.6	0.4
50-54	27	25	1.2	1.1	0.3	0.2
55-59	35	32	1.8	1.6	0.3	0.3
60-64	32	31	2.0	1.8	0.2	0.2
65-69	32	30	2.1	1.8	0.1	0.2
70-74	32	24	2.3	1.5	0.1	0.1
75-79	36	34	3.3	2.5	0.2	0.2
80-84	22	12	3.4	1.2	0.2	0.1
85+	7	21	1.6	2.2	0.1	0.1
All ages	333	380			0.2	0.3
Incidence						
Raw			1.1	1.2		
WS			0.7	1.0		
ES			0.9	1.1		
BRD-S			1.1	1.2		

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

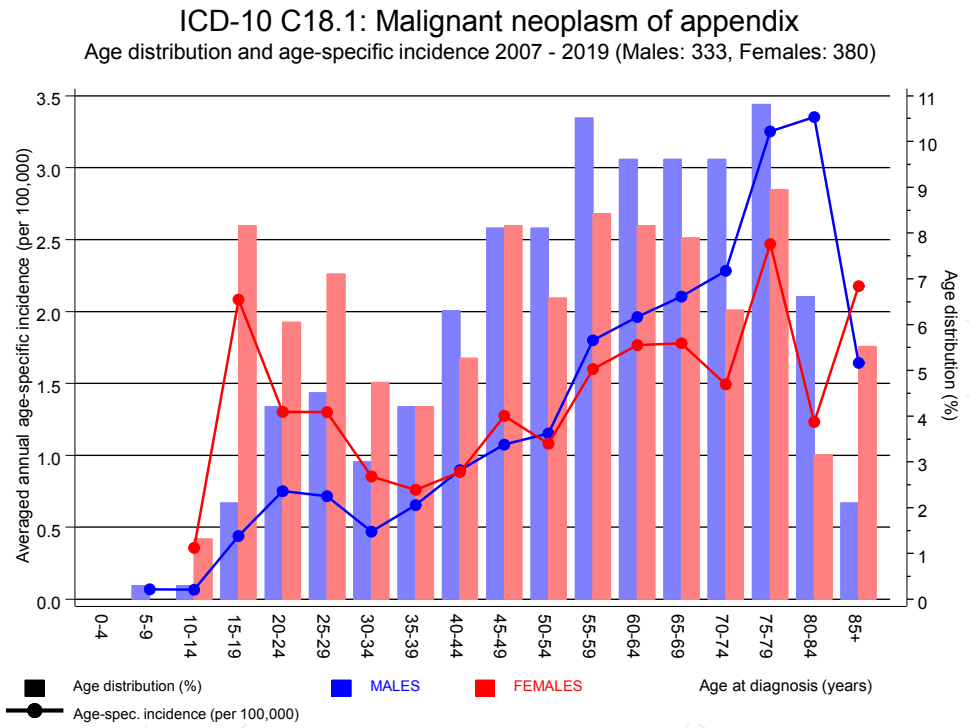


Figure 6. Age distribution (males: mean=57.2 yrs, median=59.2 yrs; females: mean=51.9 yrs, median=52.7 yrs) and age-specific incidence.

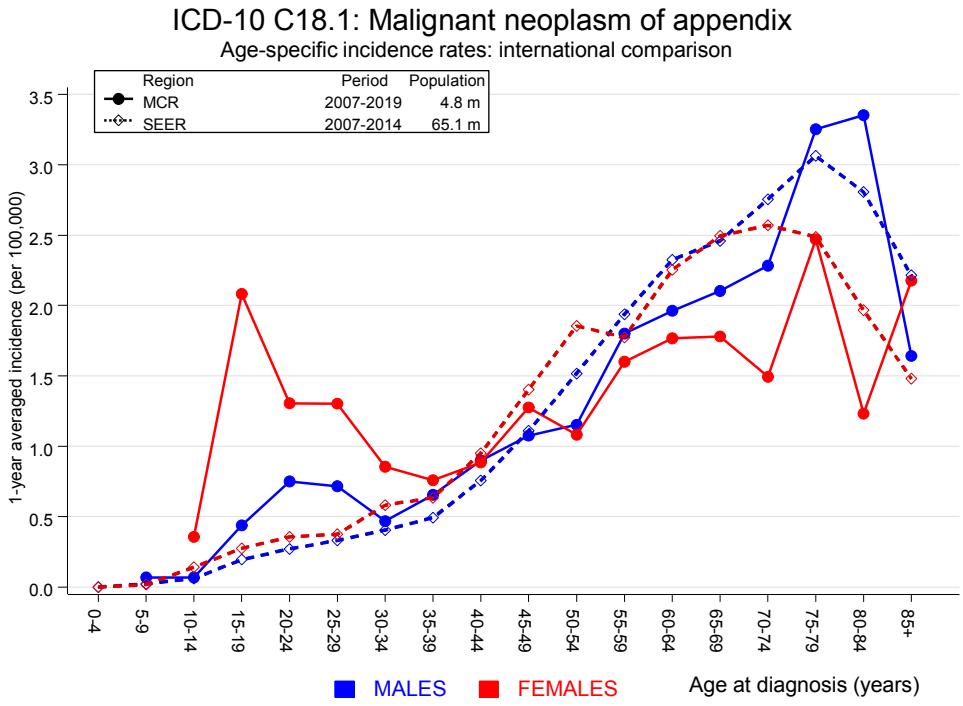


Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:
Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 18 Regs Research Data, released April 2019, based on the November 2018 submission. http://www.seer.cancer.gov.

Table 7a

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

MALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C07–C08	Salivary gland	1	0.0	27.7	0.7	154.1		6.8	
C12–C13	Hypopharynx	1	0.1	9.6	0.2	53.3		6.3	
C15	Oesophagus	5	0.3	14.6	4.7	34.0	#	32.6	
C17	Small intestine	4	0.1	38.1	10.4	97.6	#	27.3	
C18	Colon	15	1.5	10.0	5.6	16.5	#	94.6	
C19–C20	Rectum	7	0.9	8.0	3.2	16.5	#	42.9	
C25	Pancreas	1	0.6	1.6	0.0	8.9		2.6	
C33–C34	Lung	3	1.9	1.5	0.3	4.5		7.4	
C40–C41	Bone	1	0.0	65.7	1.7	366.1	#	6.9	
C61	Prostate	15	4.4	3.4	1.9	5.6	#	74.0	
C64	Kidney	4	0.6	6.8	1.9	17.5	#	23.9	
C66	Ureter	1	0.0	24.2	0.6	135.1		6.7	
C67	Bladder	1	0.7	1.4	0.0	7.8		2.0	100.0
C70–C72	CNS cancer	1	0.2	4.5	0.1	25.1		5.5	
C74–C80	Cancer others	1	0.0	31.5	0.8	175.7		6.8	
C82–C85	NHL	3	0.7	4.3	0.9	12.7		16.2	
C91–C96	Leukaemia	1	0.2	4.1	0.1	22.7		5.3	
Not observed		0	3.9	0.0	0.0	0.9	#	-27.4	
All further malignancies		65	16.4	4.0	3.1	5.0	#	340.5	1.5

Patients	408
Median age at next malignancy (years)	72.5
Person-years	1427
Mean observation time (years)	3.5
Median observation time (years)	1.9

The occurrence of further specified malignancy is statistically significant.

Table 7b

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

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C16	Stomach	3	0.3	9.6	2.0	28.2	#	18.6	33.3
C17	Small intestine	3	0.1	54.6	11.3	159.6	#	20.4	
C18	Colon	9	0.9	10.0	4.6	19.1	#	56.1	
C19–C20	Rectum	3	0.4	8.0	1.7	23.4	#	18.2	
C25	Pancreas	2	0.4	4.6	0.6	16.8		10.9	
C33–C34	Lung	5	0.7	6.7	2.2	15.6	#	29.5	
C43	Malign. melanoma	2	0.4	4.7	0.6	16.9		10.9	
C50	Breast	6	3.3	1.8	0.7	3.9		18.5	16.7
C56	Ovary	6	0.4	15.0	5.5	32.6	#	38.8	
C64	Kidney	3	0.2	13.8	2.8	40.3	#	19.3	
C67	Bladder	2	0.2	11.2	1.4	40.6	#	12.6	
C81	Hodgkin lymphoma	1	0.0	32.9	0.8	183.5		6.7	
C91–C96	Leukaemia	1	0.1	6.9	0.2	38.7		5.9	
Not observed		0	2.7	0.0	0.0	1.4		−18.5	
All further malignancies		46	10.2	4.5	3.3	6.0	#	247.7	4.3

Patients	463
Median age at next malignancy (years)	66.4
Person-years	1444
Mean observation time (years)	3.1
Median observation time (years)	1.7

The occurrence of further specified malignancy is statistically significant.

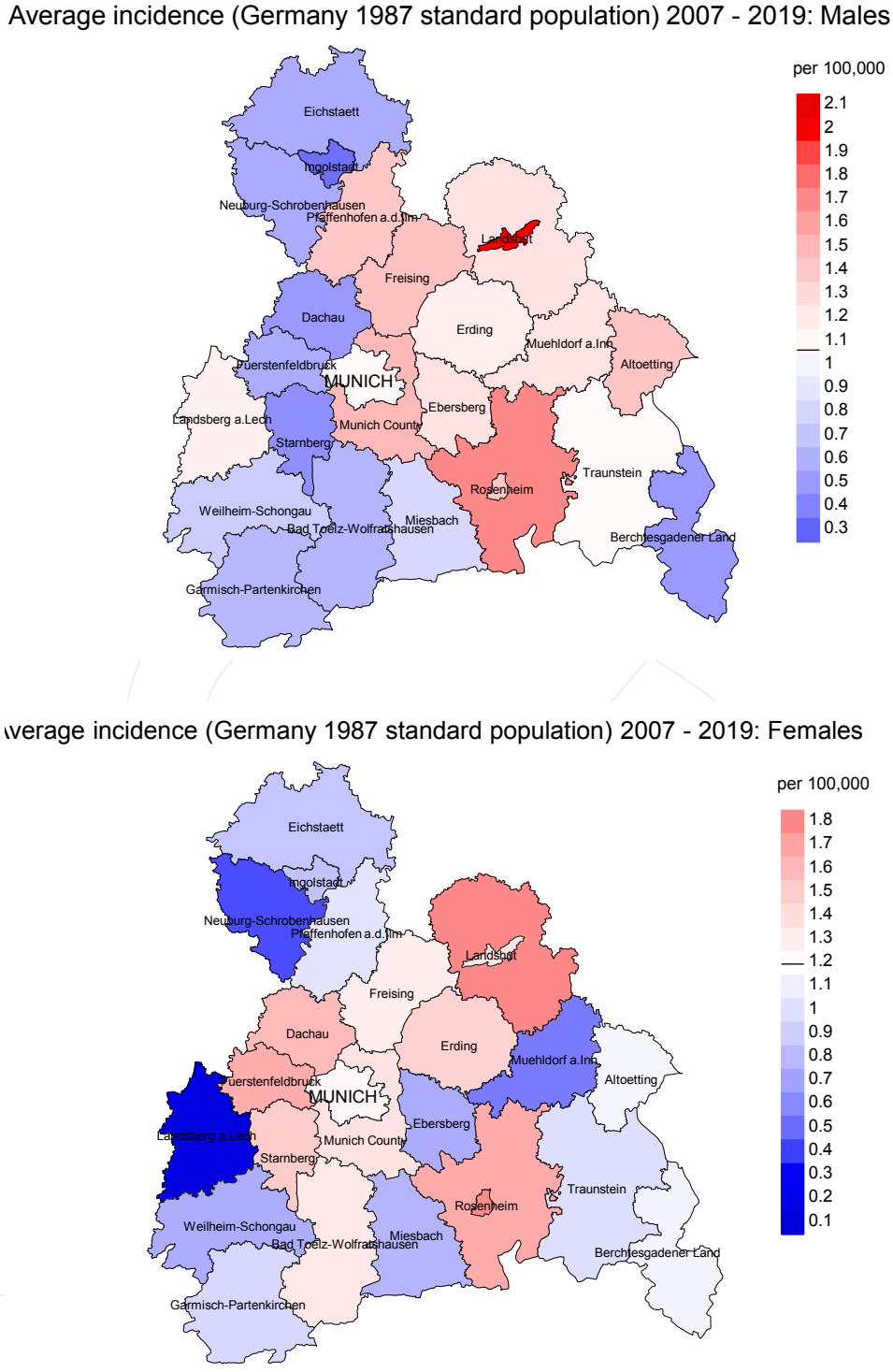
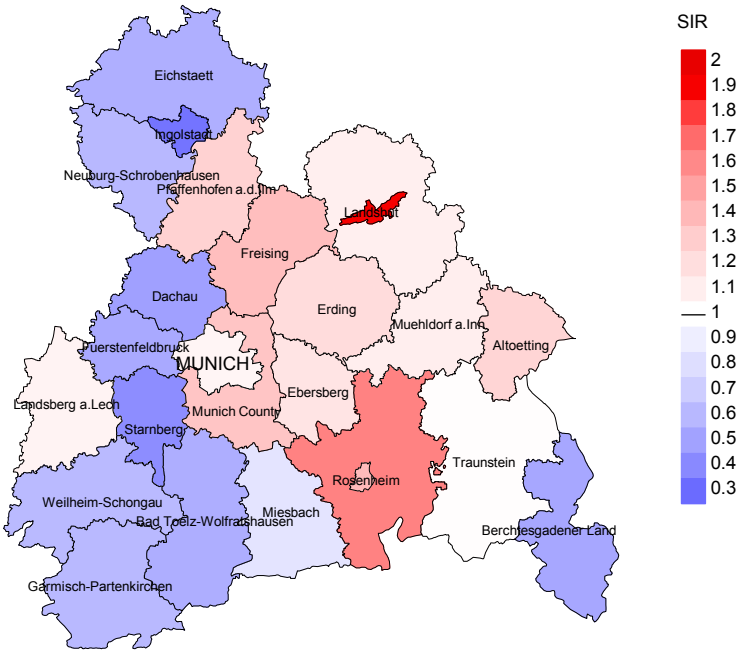


Figure 8a. Map of cancer incidence (german standard population) by county averaged for period 2007 to 2019. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 1.1/100,000 WS N=333, females 1.2/100,000 WS N=380).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,462 female residents (averaged) in the period from 2007 to 2019 a total of 6 women were identified with newly diagnosed appendix cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 0.7/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.2 and 2.0/100,000.

Standardized incidence ratio (SIR) 2007 - 2019: Males



Standardized incidence ratio (SIR) 2007 - 2019: Females

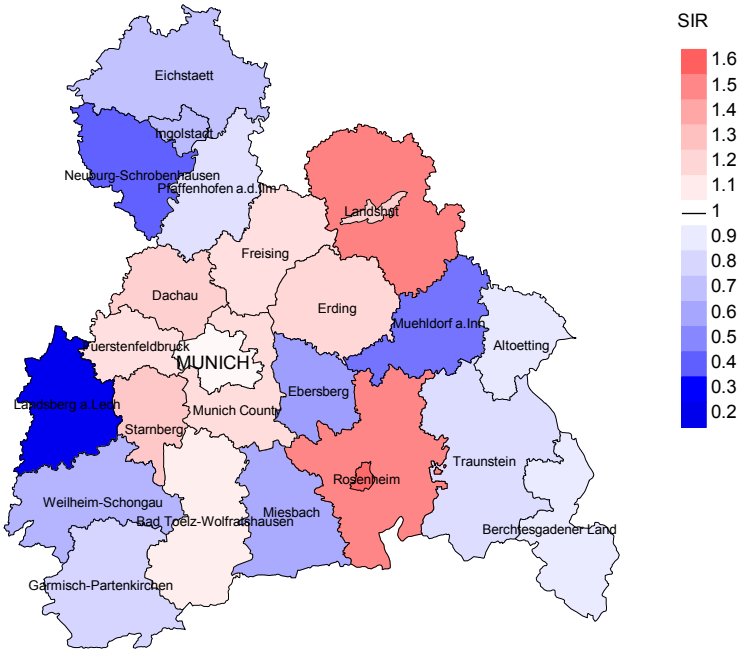


Figure 8b. Map of standardized incidence ratio (SIR) by county averaged for period 2007 to 2019. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=333, females N=380).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2019 a total of 6 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 0.15 and 1.49, 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 4.92 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	7	58.3	100.0
1999	15	93.3	5	33.3	80.0
2000	17	94.1	6	35.3	83.3
2001	13	100.0	10	76.9	100.0
2002	35	97.1	17	48.6	100.0
2003	21	95.2	12	57.1	100.0
2004	20	100.0	9	45.0	100.0
2005	31	93.5	22	71.0	95.5
2006	25	88.0	12	48.0	91.7
2007	35	85.7	18	51.4	88.9
2008	32	100.0	15	46.9	86.7
2009	39	100.0	19	48.7	94.7
2010	44	95.5	22	50.0	100.0
2011	55	96.4	15	27.3	86.7
2012	77	94.8	19	24.7	84.2
2013	67	95.5	15	22.4	86.7
2014	72	95.8	18	25.0	83.3
2015	67	86.6	12	17.9	66.7
2016	57	98.2	11	19.3	72.7
2017	69	98.6	8	11.6	37.5
2018	53	100.0	12	22.6	50.0
2019	46	65.2	1	2.2	100.0
1998–2019	902	93.9	285	31.6	87.0

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 4.92 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	35	4	1	2.9
2008	32	15	1	3.1
2009	39	14	4	10.3
2010	44	24	4	9.1
2011	55	15	2	3.6
2012	77	18	6	7.8
2013	67	21	2	3.0
2014	72	22	3	4.2
2015	67	26	1	1.5
2016	57	23	1	1.8
2017	69	22	1	1.4
2018	53	26	2	3.8
2019	46	21	1	2.2
1998–2019	902	308	45	5.0

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 4.92 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. non-cancer-related %	Prop. cancer recorded on death certificate %
1998	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	23	60.9	39.1	59.1
2017	22	86.4	13.6	76.2
2018	26	42.3	57.7	62.5
2019	21	57.1	42.9	70.0
1998-2019	308	73.1	26.9	79.3

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	15	71.1	71.2	71.1	71.2
2017	11	81.0	78.9	87.3	81.0
2018	18	66.5	61.3	67.3	79.4
2019	8	69.6	57.6	74.5	64.6
1998–2019	148	71.9	70.8	74.5	73.5

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	8	77.2	77.2	67.8	77.7
2017	11	78.8	78.8		68.1
2018	8	82.1	86.0	78.2	88.2
2019	13	74.9	64.4	81.7	64.4
1998–2019	160	77.4	74.8	81.4	75.4

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

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

Table 11a

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

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	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	0.29	0.2	0.23	0.3	0.25	0.3	0.27
2012	7	0.3	0.22	0.1	0.13	0.2	0.17	0.3	0.24
2013	10	0.4	0.28	0.2	0.24	0.3	0.27	0.4	0.27
2014	8	0.3	0.22	0.2	0.15	0.2	0.18	0.3	0.19
2015	10	0.4	0.31	0.2	0.23	0.3	0.28	0.4	0.30
2016	8	0.3	0.29	0.2	0.20	0.2	0.24	0.3	0.27
2017	8	0.3	0.38	0.1	0.21	0.2	0.29	0.3	0.33
2018	7	0.3	0.37	0.2	0.48	0.2	0.43	0.3	0.41
2019	5	0.2	0.23	0.1	0.18	0.2	0.21	0.2	0.20
1998-2019	111	0.3	0.26	0.1	0.20	0.2	0.24	0.2	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	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	0.13	0.1	0.06	0.2	0.09	0.2	0.11
2013	8	0.3	0.26	0.2	0.14	0.2	0.19	0.3	0.21
2014	7	0.3	0.20	0.1	0.14	0.2	0.16	0.2	0.17
2015	8	0.3	0.23	0.1	0.13	0.2	0.17	0.3	0.19
2016	6	0.2	0.21	0.1	0.08	0.1	0.12	0.2	0.15
2017	11	0.4	0.23	0.2	0.10	0.3	0.14	0.3	0.18
2018	4	0.2	0.12	0.0	0.04	0.1	0.06	0.1	0.07
2019	7	0.3	0.29	0.2	0.22	0.2	0.26	0.2	0.27
1998-2019	114	0.2	0.24	0.1	0.12	0.1	0.16	0.2	0.19

Table 12

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

Age at death	Cases			Males			Females		
Years	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4									
5-9									
10-14									
15-19									
20-24									
25-29	1	0.6	0.6	1	1.1	1.1			0.0
30-34	1	0.6	1.1	1	1.1	2.2			0.0
35-39	4	2.2	3.3	1	1.1	3.3	3	3.3	3.3
40-44	3	1.7	5.0	2	2.2	5.6	1	1.1	4.4
45-49	8	4.4	9.4	3	3.3	8.9	5	5.6	10.0
50-54	8	4.4	13.9	6	6.7	15.6	2	2.2	12.2
55-59	12	6.7	20.6	8	8.9	24.4	4	4.4	16.7
60-64	18	10.0	30.6	8	8.9	33.3	10	11.1	27.8
65-69	25	13.9	44.4	13	14.4	47.8	12	13.3	41.1
70-74	20	11.1	55.6	13	14.4	62.2	7	7.8	48.9
75-79	36	20.0	75.6	16	17.8	80.0	20	22.2	71.1
80-84	23	12.8	88.3	10	11.1	91.1	13	14.4	85.6
85+	21	11.7	100.0	8	8.9	100.0	13	14.4	100.0
All ages	180	100.0		90	100.0		90	100.0	

Table 13

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

Age at death Years	Males n	Females n	Males Age-spec. mortal.	Males MI-index	Females Age-spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19								
20-24								
25-29	1		0.0	0.07			1.2	
30-34	1		0.0	0.10			0.8	
35-39	1	3	0.0	0.07	0.1	0.19	0.4	0.8
40-44	2	1	0.1	0.10	0.0	0.05	0.3	0.1
45-49	3	5	0.1	0.11	0.2	0.16	0.2	0.3
50-54	6	2	0.3	0.22	0.1	0.08	0.2	0.1
55-59	8	4	0.4	0.23	0.2	0.13	0.2	0.1
60-64	8	10	0.5	0.25	0.6	0.32	0.1	0.2
65-69	13	12	0.9	0.41	0.7	0.40	0.2	0.2
70-74	13	7	0.9	0.41	0.4	0.29	0.1	0.1
75-79	16	20	1.4	0.44	1.5	0.59	0.1	0.2
80-84	10	13	1.5	0.45	1.3	1.08	0.1	0.2
85+	8	13	1.9	1.14	1.3	0.62	0.1	0.1
All ages	90	90					0.1	0.2
Mortality								
Raw			0.3	0.27	0.3	0.24		
WS			0.1	0.20	0.1	0.12		
ES			0.2	0.24	0.2	0.16		
BRD-S			0.3	0.26	0.2	0.19		
PYLL-70								
per 100,000			2.0		1.6			
ES			1.7		1.4			
AYLL-70			12.4		11.6			

Table 14a

Further malignancies in deaths in period 1998–2019
MALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C12–C13 Hypopharynx	1	1.6					1	100.0
C15 Oesophagus	3	4.8					3	100.0
C16 Stomach	1	1.6					1	100.0
C17 Small intestine	3	4.8	1	33.3	1	33.3	1	33.3
C18 Colon	7	11.1			6	85.7	1	14.3
C19–C20 Rectum	9	14.3	5	55.6	3	33.3	1	11.1
C25 Pancreas	3	4.8	1	33.3			2	66.7
C33–C34 Lung	3	4.8					3	100.0
C44 Skin others	3	4.8	3	100.0				
C48 Peritoneal	1	1.6	1	100.0				
C61 Prostate	15	23.8	7	46.7	2	13.3	6	40.0
C64 Kidney	2	3.2	1	50.0			1	50.0
C65 Renal pelvis	2	3.2					2	100.0
C67 Bladder	4	6.3	3	75.0			1	25.0
C70–C72 CNS cancer	1	1.6					1	100.0
C73 Thyroid	1	1.6	1	100.0				
C76–C79 CUP	1	1.6					1	100.0
C82–C85 NHL	1	1.6			1	100.0		
C91–C96 Leukaemia	2	3.2	1	50.0			1	50.0
All further malignancies	63	100.0	24	38.1	13	20.6	26	41.3

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

Table 14b

Further malignancies in deaths in period 1998–2019
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03–C06	Oral cavity	1	1.6					1	100.0
C16	Stomach	3	4.8	1	33.3			2	66.7
C17	Small intestine	1	1.6			1	100.0		
C18	Colon	11	17.7			6	54.5	5	45.5
C19–C20	Rectum	5	8.1	2	40.0	2	40.0	1	20.0
C25	Pancreas	3	4.8			1	33.3	2	66.7
C33–C34	Lung	4	6.5	1	25.0			3	75.0
C44	Skin others	2	3.2	1	50.0			1	50.0
C46,C49	Soft tissue	2	3.2	2	100.0				
C48	Peritoneal	1	1.6	1	100.0				
C50	Breast	9	14.5	7	77.8			2	22.2
C51	Vulva	1	1.6	1	100.0				
C53	Cervix uteri	2	3.2	1	50.0	1	50.0		
C54	Corpus uteri	2	3.2			1	50.0	1	50.0
C55,C57	Fem. genitals un	1	1.6	1	100.0				
C56	Ovary	8	12.9	3	37.5	4	50.0	1	12.5
C64	Kidney	4	6.5	2	50.0	1	25.0	1	25.0
C67	Bladder	2	3.2	1	50.0			1	50.0
All further malignancies		62	100.0	24	38.7	17	27.4	21	33.9

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

Table 15

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

Age at death Years	Males n	Females n	Males Age-spec. mortal.	Males MI-index	Females Age-spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19								
20-24								
25-29	1		0.0	0.07			1.3	
30-34	1		0.0	0.10			0.8	
35-39	1	1	0.0	0.07	0.0	0.08	0.4	0.3
40-44	2	1	0.1	0.10	0.0	0.06	0.4	0.1
45-49	3	4	0.1	0.14	0.2	0.15	0.2	0.3
50-54	6	1	0.3	0.26	0.0	0.05	0.3	0.0
55-59	6	3	0.3	0.21	0.2	0.12	0.2	0.1
60-64	4	5	0.2	0.16	0.3	0.22	0.1	0.1
65-69	10	10	0.7	0.53	0.6	0.40	0.1	0.2
70-74	9	6	0.6	0.50	0.4	0.29	0.1	0.1
75-79	10	16	0.9	0.45	1.2	0.67	0.1	0.2
80-84	7	7	1.1	0.58	0.7	0.78	0.1	0.1
85+	4	10	0.9	1.33	1.0	0.56	0.1	0.1
All ages	64	64					0.1	0.1
Mortality								
Raw			0.2	0.25	0.2	0.20		
WS			0.1	0.18	0.1	0.09		
ES			0.2	0.21	0.1	0.13		
BRD-S			0.2	0.24	0.2	0.15		
PYLL-70								
per 100,000			1.8		1.0			
ES			1.5		0.8			
AYLL-70			13.8		10.7			

* See corresponding tables with multiple malignancies.

Table 16

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

Age at death Years	Males n	Females n	Males Age-spec. mortal.	Males MI-index	Females Age-spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19								
20-24								
25-29	1		0.0	0.07			1.3	
30-34	1		0.0	0.10			0.8	
35-39	1	1	0.0	0.07	0.0	0.08	0.4	0.3
40-44	2	1	0.1	0.10	0.0	0.06	0.4	0.1
45-49	3	4	0.1	0.14	0.2	0.16	0.2	0.3
50-54	6	1	0.3	0.26	0.0	0.05	0.3	0.0
55-59	6	3	0.3	0.23	0.2	0.12	0.2	0.1
60-64	3	3	0.2	0.14	0.2	0.15	0.1	0.1
65-69	8	7	0.5	0.47	0.4	0.32	0.1	0.1
70-74	8	4	0.6	0.50	0.2	0.20	0.1	0.1
75-79	8	13	0.7	0.38	0.9	0.62	0.1	0.2
80-84	5	5	0.8	0.56	0.5	0.63	0.1	0.1
85+	2	7	0.5	0.67	0.7	0.44	0.0	0.1
All ages	54	49					0.1	0.1
Mortality								
Raw			0.2	0.22	0.2	0.16		
WS			0.1	0.16	0.1	0.08		
ES			0.1	0.19	0.1	0.10		
BRD-S			0.2	0.21	0.1	0.12		
PYLL-70								
per 100,000			1.7		0.9			
ES			1.5		0.8			
AYLL-70			14.8		12.3			

* See corresponding tables with multiple malignancies.

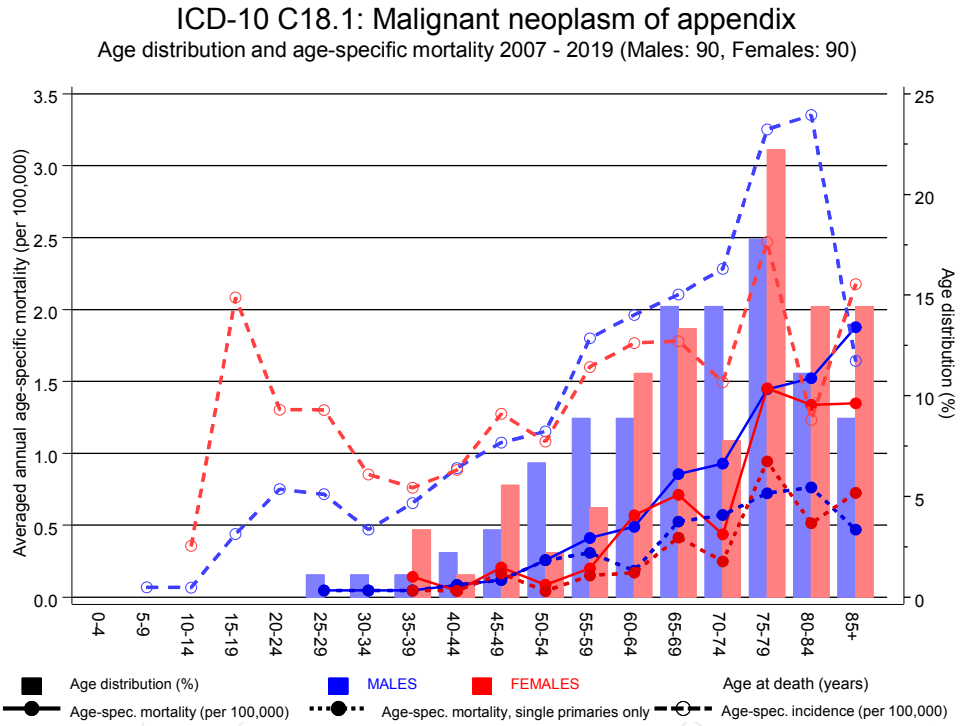


Figure 17. Distribution of age at death (bars; males: mean=64.2 yrs, median=65.9 yrs; females: mean=67.9 yrs, median=70.3 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

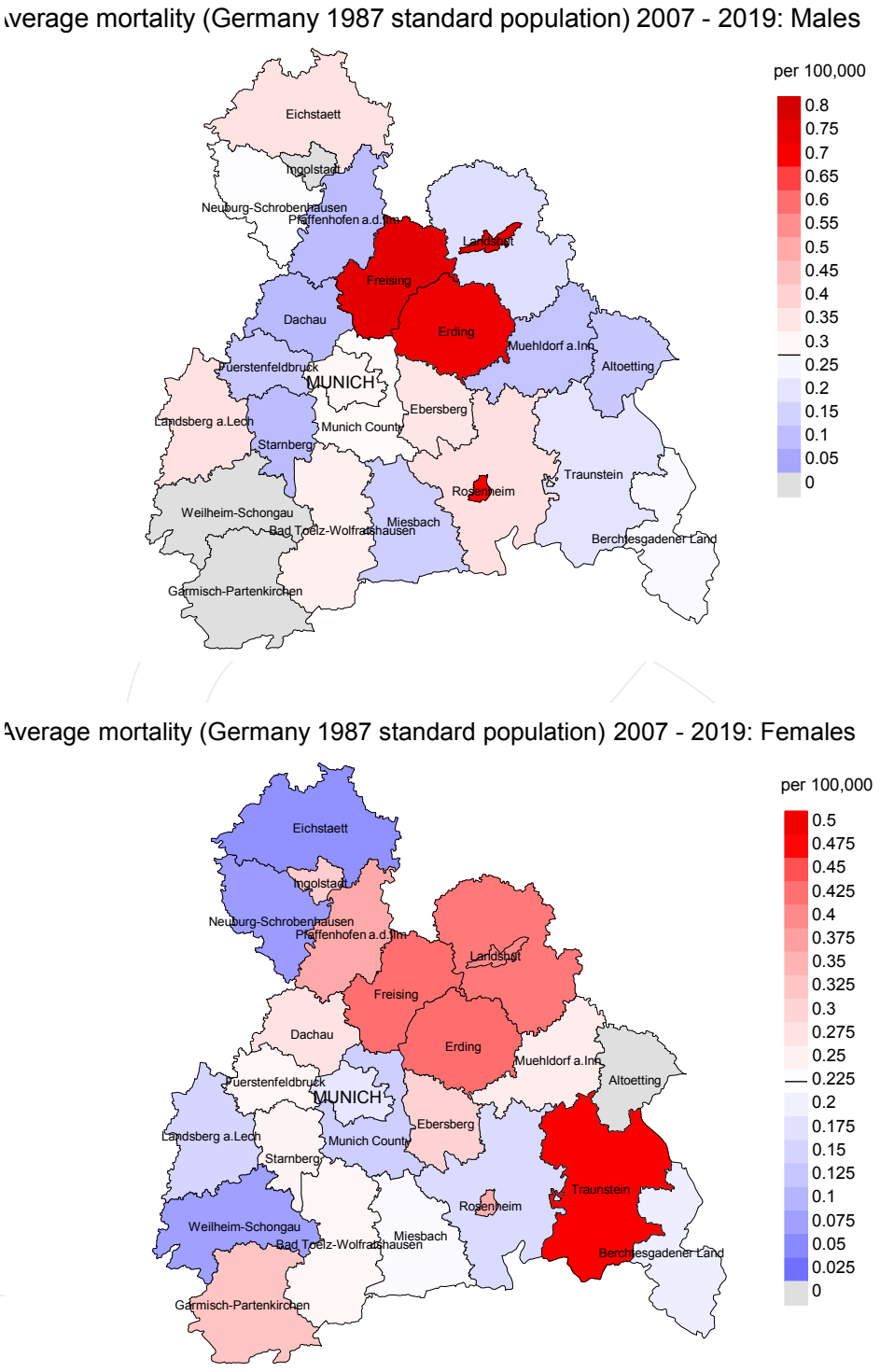
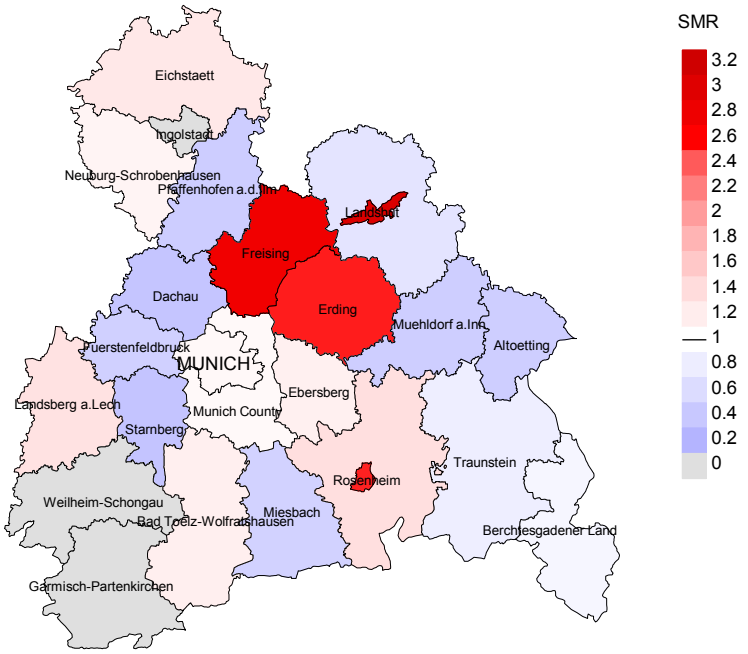


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2019. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.3/100,000 WS N=90, females 0.2/100,000 WS N=90).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,462 female residents (averaged) in the period from 2007 to 2019 a total of 3 women died from appendix cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.3/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.0 and 1.2/100,000.

Standardized mortality ratio (SMR) 2007 - 2019: Males



Standardized mortality ratio (SMR) 2007 - 2019: Females

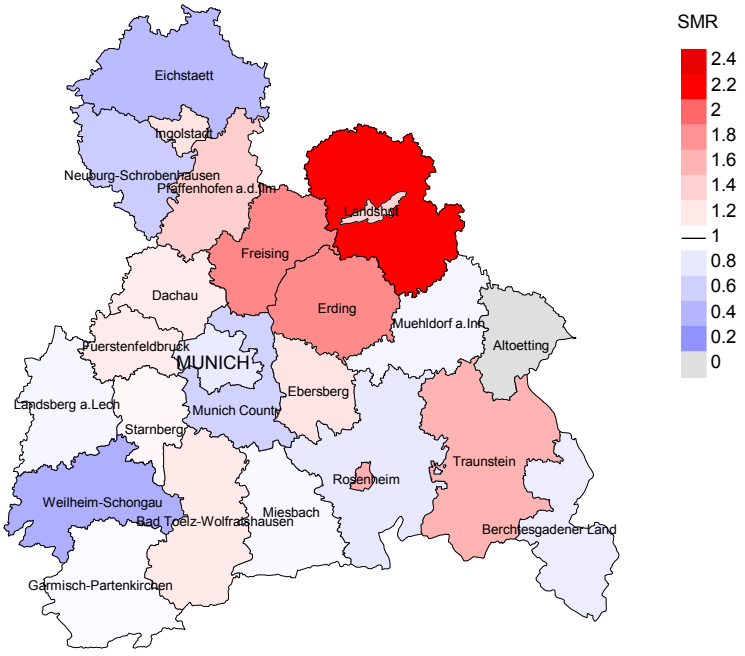


Figure 18b. Map of standardized mortality ratio (SMR) by county averaged for period 2007 to 2019. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=90, females N=90).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2019 a total of 3 women died from appendix cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.23. Though, the value of this parameter may vary with an underlying probability of 99% between 0.14 and 4.49, and is therefore not statistically striking.

Statistical Notes

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

1. **All multiple primaries included**

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

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

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

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

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

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

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

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

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

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

Shortcuts

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

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