Munich Cancer Registry

- Survival
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- *Deutsch*

ICD-10 C77-C80: Secondary and unknown sites

Incidence and Mortality

Year of diagnosis	1998-2020
Patients	8,361
Diseases	8,369
Creation date	12/21/2021
Database export	12/20/2021
Population	4.95 m

Munich Cancer Registry
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https://www.tumorregister-muenchen.de/en

https://www.tumorregister-muenchen.de/en/facts/base/bC7780E-ICD-10-C77-C80-Secondary-and-unknown-sites-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, December 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 2016) used for specifying cancer site

Code	Description
C77.-	Secondary and unspecified malignant neoplasm of lymph nodes
C78.-	Secondary malignant neoplasm of respiratory and digestive organs
C79.-	Secondary malignant neoplasm of other and unspecified sites
C80.-	Malignant neoplasm, without specification of site

INCIDENCE

Table 1

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

Year of diagnosis	All cases n	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	352	145	41.2	6.0	6.5	98.3	99.4
1999	268	115	42.9	6.3	6.6	98.9	99.6
2000	256	116	45.3	6.4	6.6	97.7	99.6
2001	229	102	44.5	6.3	6.7	96.1	99.1
2002	443	209	47.2	7.2	6.6	98.2	100.0 #
2003	429	184	42.9	7.6	6.7	96.7	100.0
2004	434	141	32.5	8.2	6.8	93.1	98.2
2005	388	133	34.3	8.9	6.8	96.1	98.2
2006	368	121	32.9	9.5	6.6	92.4	98.9
2007	422	131	31.0	10.1	6.5	94.1	98.6 #
2008	436	134	30.7	10.6	6.4	92.4	99.8
2009	390	109	27.9	10.9	6.2	93.3	99.0
2010	407	131	32.2	11.1	5.7	90.4	99.0
2011	467	115	24.6	11.4	5.3	90.1	99.1
2012	447	114	25.5	11.8	5.0	88.6	99.1
2013	429	111	25.9	12.4	4.9	91.6	98.6
2014	407	106	26.0	12.8	4.9	88.7	98.3
2015	434	123	28.3	12.9	4.7	84.3	98.4
2016	396	128	32.3	13.3	4.3	90.9	99.5
2017	381	101	26.5	13.6	4.3	87.1	100.0
2018	276	59	21.4	14.0	3.7	79.3	100.0
2019	183	6	3.3	14.2	3.3	72.7	100.0
2020	127			14.4	2.4	67.7	100.0 ##
1998-2020	8369	2634	31.5	14.4	6.5	91.4	99.2

8,369 cases diagnosed 1998-2020 are related to a total of 8,361 patients. Currently, in 1,748 (20.9 %) of these 8,361 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 1,378 / 278 / 92 (16.5 % / 3.3 % / 1.1 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:
In 2018, a subgroup of 276 cases has been diagnosed, of which 14.0 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 3.7 % 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 1a

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

Year of diagnosis	Males n	Males %	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %	
1998	164	46.6	60	36.6	4.9	7.2	98.8	100.0	
1999	125	46.6	47	37.6	5.2	7.3	99.2	99.2	
2000	121	47.3	56	46.3	5.4	7.3	98.3	100.0	
2001	111	48.5	40	36.0	5.8	7.4	97.3	98.2	
2002	215	48.5	92	42.8	7.3	7.4	97.2	100.0	#
2003	217	50.6	78	35.9	8.1	7.3	97.2	100.0	
2004	216	49.8	53	24.5	9.2	7.4	92.6	99.1	
2005	180	46.4	57	31.7	10.0	7.2	96.7	97.2	
2006	198	53.8	61	30.8	11.0	7.2	91.9	99.0	
2007	226	53.6	60	26.5	12.0	7.0	94.7	99.1	#
2008	246	56.4	59	24.0	12.6	6.8	90.7	99.6	
2009	190	48.7	51	26.8	13.0	6.5	94.7	100.0	
2010	201	49.4	48	23.9	13.4	5.6	89.6	99.0	
2011	239	51.2	40	16.7	13.6	5.2	90.4	99.6	
2012	227	50.8	39	17.2	13.7	4.8	83.3	98.2	
2013	218	50.8	51	23.4	14.3	4.8	93.6	99.1	
2014	198	48.6	43	21.7	14.7	4.7	87.9	98.5	
2015	218	50.2	54	24.8	14.7	4.5	81.2	99.1	
2016	202	51.0	62	30.7	15.2	4.0	90.1	99.0	
2017	187	49.1	40	21.4	15.4	4.7	85.0	100.0	
2018	144	52.2	26	18.1	15.9	4.6	77.1	100.0	
2019	105	57.4	3	2.9	16.1	4.9	71.4	100.0	
2020	65	51.2			16.5	3.2	69.2	100.0	##
1998-2020	4213	50.3	1120	26.6	16.5	7.2	90.6	99.3	

4,213 cases diagnosed 1998-2020 are related to a total of 4,208 patients. Currently, in 991 (23.6 %) of these 4,208 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 756 / 169 / 66 (18.0 % / 4.0 % / 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 2018, a subgroup of 144 cases has been diagnosed, of which 15.9 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 4.6 % 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 1b

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

Year of diagnosis	Females n	Females %	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %	
1998	188	53.4	85	45.2	6.9	5.7	97.9	98.9	
1999	143	53.4	68	47.6	7.3	5.9	98.6	100.0	
2000	135	52.7	60	44.4	7.3	5.9	97.0	99.3	
2001	118	51.5	62	52.5	6.8	5.9	94.9	100.0	
2002	228	51.5	117	51.3	7.0	5.9	99.1	100.0	#
2003	212	49.4	106	50.0	7.2	6.2	96.2	100.0	
2004	218	50.2	88	40.4	7.2	6.2	93.6	97.2	
2005	208	53.6	76	36.5	7.9	6.3	95.7	99.0	
2006	170	46.2	60	35.3	8.1	6.0	92.9	98.8	
2007	196	46.4	71	36.2	8.3	6.0	93.4	98.0	#
2008	190	43.6	75	39.5	8.5	6.0	94.7	100.0	
2009	200	51.3	58	29.0	8.8	6.0	92.0	98.0	
2010	206	50.6	83	40.3	8.9	5.7	91.3	99.0	
2011	228	48.8	75	32.9	9.1	5.4	89.9	98.7	
2012	220	49.2	75	34.1	9.8	5.3	94.1	100.0	
2013	211	49.2	60	28.4	10.5	5.1	89.6	98.1	
2014	209	51.4	63	30.1	10.8	5.0	89.5	98.1	
2015	216	49.8	69	31.9	11.0	5.0	87.5	97.7	
2016	194	49.0	66	34.0	11.3	4.6	91.8	100.0	
2017	194	50.9	61	31.4	11.7	3.9	89.2	100.0	
2018	132	47.8	33	25.0	12.0	2.6	81.8	100.0	
2019	78	42.6	3	3.8	12.2	1.4	74.4	100.0	
2020	62	48.8			12.4	1.6	66.1	100.0	##
1998-2020	4156	49.7	1514	36.4	12.4	5.7	92.1	99.1	

4,156 cases diagnosed 1998-2020 are related to a total of 4,153 patients. Currently, in 757 (18.2 %) of these 4,153 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 622 / 109 / 26 (15.0 % / 2.6 % / 0.6 %) 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 2018, a subgroup of 132 cases has been diagnosed, of which 12.0 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 2.6 % 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 including DCO cases
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.94 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	164	188	14.8	16.0	9.1	5.4	13.7	8.8	17.7	12.6
1999	125	143	11.2	12.1	6.5	4.7	10.1	7.2	13.3	9.6
2000	121	135	10.6	11.2	6.3	4.3	9.7	6.6	12.7	8.5
2001	111	118	9.6	9.7	5.5	3.8	8.6	5.7	11.6	7.5
2002	215	228	11.5	11.6	6.4	3.8	9.9	6.1	13.2	8.6
2003	217	212	11.6	10.8	6.2	3.8	9.8	6.0	13.2	8.2
2004	216	218	11.5	11.0	6.2	4.1	9.4	6.3	12.5	8.4
2005	180	208	9.5	10.5	5.2	3.7	7.7	6.0	9.9	7.9
2006	198	170	10.3	8.5	5.4	3.0	8.3	4.6	11.0	6.2
2007	226	196	10.2	8.5	5.4	3.0	8.1	4.7	10.4	6.5
2008	246	190	11.1	8.2	5.5	3.0	8.4	4.6	10.8	6.2
2009	190	200	8.5	8.6	4.1	3.3	6.4	5.1	8.5	6.4
2010	201	206	8.9	8.8	4.3	3.0	6.6	4.7	8.6	6.3
2011	239	228	10.7	9.8	5.1	3.3	7.7	5.1	10.0	6.8
2012	227	220	10.0	9.3	5.1	3.0	7.3	4.8	9.3	6.5
2013	218	211	9.5	8.9	4.4	3.2	6.7	4.8	8.9	6.4
2014	198	209	8.5	8.7	3.8	3.1	5.8	4.8	7.7	6.2
2015	218	216	9.2	8.9	4.3	2.9	6.5	4.5	8.3	6.0
2016	202	194	8.4	7.9	3.8	2.8	5.7	4.3	7.5	5.6
2017	187	194	7.7	7.9	3.3	2.6	5.2	4.0	6.8	5.3
2018	144	132	5.9	5.3	2.6	1.9	4.0	2.9	5.2	3.8
2019	105	78	4.3	3.1	2.0	1.3	2.9	1.9	3.8	2.4
2020	65	62	2.7	2.5	1.2	1.1	1.7	1.5	2.3	1.9
1998-2020	4213	4156	9.1	8.6	4.5	3.0	6.7	4.7	8.8	6.2

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)
(incl. DCO)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	352	73.0	13.1	30.2	107	54.6	63.8	74.0	83.4	88.9
1999	268	72.9	12.7	23.4	95.8	56.2	64.1	73.1	84.4	89.1
2000	256	71.9	15.5	28.6	99.5	50.5	59.9	74.7	85.4	90.1
2001	229	72.1	14.2	0.5	97.6	53.9	61.8	74.6	82.4	88.5
2002	443	73.9	13.3	13.1	97.2	55.6	64.4	76.6	83.0	89.3
2003	429	73.5	13.6	21.5	101	55.5	64.6	75.3	83.4	89.8
2004	434	71.8	13.9	32.9	103	52.8	62.7	73.5	82.5	89.6
2005	388	72.2	13.4	22.5	101	55.4	63.5	74.0	82.3	88.9
2006	368	72.9	14.2	0.2	97.9	53.9	64.4	75.8	83.8	88.6
2007	422	72.5	13.3	16.5	99.2	54.3	63.5	74.1	83.2	87.5
2008	436	72.3	12.6	0.6	99.5	56.1	65.2	73.3	81.5	87.2
2009	390	72.6	13.1	31.6	98.0	53.8	63.8	74.4	83.3	88.3
2010	407	73.8	12.8	27.1	99.2	56.7	65.1	75.4	84.5	89.0
2011	467	73.6	13.0	8.1	99.9	57.3	66.0	74.2	83.4	88.7
2012	447	72.8	14.0	0.7	98.1	54.8	65.5	73.9	83.1	88.6
2013	429	72.8	12.7	13.4	96.9	55.7	65.3	74.2	82.3	88.4
2014	407	73.3	12.7	26.0	102	55.3	65.8	74.8	82.8	88.6
2015	434	73.8	13.3	27.0	102	55.6	64.7	75.5	83.4	90.3
2016	396	73.1	12.8	21.1	95.6	54.6	64.5	75.4	82.6	88.4
2017	381	74.8	12.4	22.5	99.3	58.1	67.2	76.6	83.0	90.1
2018	276	73.1	12.7	26.0	99.8	56.5	64.9	75.4	82.4	88.0
2019	183	70.8	11.6	31.5	95.5	56.9	63.3	72.6	79.3	84.2
2020	127	71.2	12.5	29.9	96.8	54.8	63.1	73.7	81.0	84.1
1998–2020	8369	72.9	13.2	0.2	107	55.2	64.3	74.7	82.9	88.7

Table 3a

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	Median 10%	25%	50%	75%	90%
1998	164	67.7	12.5	30.2	93.3	50.7	59.6	68.8	75.5	84.7
1999	125	70.0	12.7	23.4	94.9	54.4	60.3	69.7	77.9	87.3
2000	121	68.7	14.0	39.6	96.8	50.5	56.9	68.9	78.5	87.2
2001	111	69.4	12.1	36.8	97.6	53.9	59.8	69.6	78.9	83.7
2002	215	69.8	13.6	13.1	95.9	51.8	61.1	70.1	79.9	87.6
2003	217	70.9	13.5	27.7	97.9	54.7	62.0	71.9	81.1	88.9
2004	216	69.1	12.8	34.4	95.3	51.4	60.0	69.1	79.8	84.6
2005	180	67.8	13.3	22.5	97.0	50.3	60.0	68.4	76.9	84.1
2006	198	70.5	14.3	0.2	97.1	53.4	62.2	71.4	81.3	86.5
2007	226	69.7	12.9	16.5	95.2	52.8	62.2	69.1	79.8	85.9
2008	246	70.4	10.7	31.9	95.7	56.1	63.5	69.7	78.8	84.8
2009	190	71.5	12.2	37.4	92.4	54.8	63.6	72.5	81.6	86.7
2010	201	71.2	12.3	31.5	95.4	55.9	63.4	71.9	81.3	86.3
2011	239	71.0	11.8	18.0	96.8	57.3	64.9	71.4	79.4	85.4
2012	227	69.4	14.2	0.7	96.5	53.4	63.2	70.8	78.3	84.3
2013	218	71.1	11.9	26.0	93.9	55.6	63.6	71.9	80.0	84.8
2014	198	71.7	13.1	26.0	102	54.3	63.5	74.0	80.5	86.7
2015	218	70.5	12.7	27.6	97.2	54.7	61.2	71.8	79.5	85.7
2016	202	72.1	12.1	21.1	95.6	56.0	64.4	74.5	80.0	86.5
2017	187	73.0	11.7	39.4	97.5	57.3	64.2	74.6	80.9	87.8
2018	144	71.9	11.9	26.0	95.7	56.5	65.3	73.3	80.8	86.0
2019	105	70.8	10.8	31.5	92.8	57.4	63.7	72.5	78.4	84.0
2020	65	72.3	10.7	46.4	96.8	59.6	65.4	73.7	80.2	83.9
1998–2020	4213	70.4	12.7	0.2	102	54.2	62.5	71.5	79.8	85.9

Table 3b

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	Median 10%	25%	50%	75%	90%
1998	188	77.6	11.9	43.7	107	59.4	70.8	78.8	85.9	91.3
1999	143	75.5	12.1	41.6	95.8	58.5	67.0	77.4	85.6	90.0
2000	135	74.9	16.2	28.6	99.5	52.1	63.9	78.4	87.8	92.5
2001	118	74.7	15.6	0.5	96.1	55.2	62.7	79.4	87.2	91.0
2002	228	77.8	11.7	38.9	97.2	61.2	71.3	80.7	86.5	90.3
2003	212	76.2	13.2	21.5	101	57.7	66.4	78.9	86.0	90.8
2004	218	74.5	14.4	32.9	103	53.8	65.7	78.4	84.4	90.9
2005	208	76.1	12.2	35.1	101	57.6	67.3	78.5	85.4	90.7
2006	170	75.7	13.6	23.8	97.9	55.1	67.6	79.7	85.7	90.7
2007	196	75.6	13.1	22.0	99.2	57.1	67.4	78.1	85.1	89.6
2008	190	74.8	14.4	0.6	99.5	55.9	68.7	77.5	85.2	88.2
2009	200	73.6	13.8	31.6	98.0	53.7	63.9	75.3	85.5	89.3
2010	206	76.3	12.7	27.1	99.2	57.6	67.0	80.1	86.8	89.9
2011	228	76.3	13.7	8.1	99.9	57.2	68.2	80.0	86.7	90.8
2012	220	76.3	12.9	37.3	98.1	56.3	69.9	78.7	86.2	90.8
2013	211	74.5	13.3	13.4	96.9	55.8	67.3	77.8	84.2	89.9
2014	209	74.9	12.2	34.2	95.1	56.7	68.0	76.4	83.8	89.5
2015	216	77.1	13.2	27.0	102	57.2	69.2	78.9	87.1	92.2
2016	194	74.1	13.4	33.4	95.1	53.4	64.7	76.1	84.7	89.9
2017	194	76.5	12.8	22.5	99.3	58.7	68.7	78.2	86.1	91.5
2018	132	74.4	13.4	33.3	99.8	58.0	64.9	76.9	84.2	90.1
2019	78	70.8	12.7	35.8	95.5	52.0	63.3	73.1	80.0	85.1
2020	62	70.1	14.1	29.9	94.2	50.7	61.6	73.6	81.2	85.1
1998–2020	4156	75.5	13.3	0.5	107	56.4	67.2	78.1	85.5	90.4

Table 4

Age distribution by 5-year age group and sex for period 2007-2020
(incl. DCO)

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	4	0.1	0.1	3	0.1	0.1	1	0.0	0.0
5-9	1	0.0	0.1			0.1	1	0.0	0.1
10-14	2	0.0	0.1	1	0.0	0.2	1	0.0	0.1
15-19	2	0.0	0.2	2	0.1	0.2			0.1
20-24	4	0.1	0.2	1	0.0	0.3	3	0.1	0.2
25-29	11	0.2	0.5	8	0.3	0.6	3	0.1	0.4
30-34	12	0.2	0.7	6	0.2	0.8	6	0.2	0.6
35-39	27	0.5	1.2	18	0.7	1.5	9	0.4	0.9
40-44	60	1.2	2.4	22	0.8	2.3	38	1.5	2.4
45-49	133	2.6	4.9	71	2.7	5.0	62	2.4	4.9
50-54	220	4.2	9.2	119	4.5	9.4	101	4.0	8.9
55-59	358	6.9	16.0	221	8.3	17.7	137	5.4	14.3
60-64	468	9.0	25.0	283	10.6	28.3	185	7.3	21.6
65-69	615	11.8	36.9	394	14.8	43.1	221	8.7	30.3
70-74	723	13.9	50.7	427	16.0	59.1	296	11.7	42.0
75-79	835	16.1	66.8	430	16.1	75.2	405	16.0	57.9
80-84	764	14.7	81.5	353	13.2	88.5	411	16.2	74.1
85+	963	18.5	100.0	307	11.5	100.0	656	25.9	100.0
All ages	5202	100.0		2666	100.0		2536	100.0	

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 2007–2020

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males DCO rate n=574 %	Females DCO rate n=792 %	Males Prop.all cancers n=153686 %	Females Prop.all cancers n=155051 %
0- 4	3	1	0.2	0.1		100.0	1.4	0.6
5- 9		1		0.1				1.0
10-14	1	1	0.1	0.1			0.7	0.8
15-19	2		0.1				0.6	
20-24	1	3	0.0	0.2		33.3	0.2	0.6
25-29	8	3	0.4	0.1	12.5		0.8	0.3
30-34	6	6	0.3	0.3			0.5	0.3
35-39	18	9	0.8	0.4			1.0	0.3
40-44	22	38	0.9	1.6			0.8	0.6
45-49	71	62	2.6	2.4	4.2	6.5	1.4	0.7
50-54	119	101	4.7	4.0	6.7	3.0	1.4	0.8
55-59	221	137	10.4	6.3	5.0	6.6	1.7	1.0
60-64	283	185	16.0	9.7	9.2	9.7	1.6	1.2
65-69	394	221	24.1	12.2	14.7	12.7	1.6	1.2
70-74	427	296	28.5	17.2	19.0	18.9	1.6	1.5
75-79	430	405	35.5	27.0	22.1	26.2	1.8	2.1
80-84	353	411	48.7	38.6	32.9	41.1	2.3	2.7
85+	305	656	65.3	62.9	57.4	60.5	2.9	4.0
All ages	2664	2536			21.5	31.2	1.7	1.6
Incidence								
Raw			8.2	7.6				
WS			3.9	2.7				
ES			5.8	4.1				
BRD-S			7.5	5.4				

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).

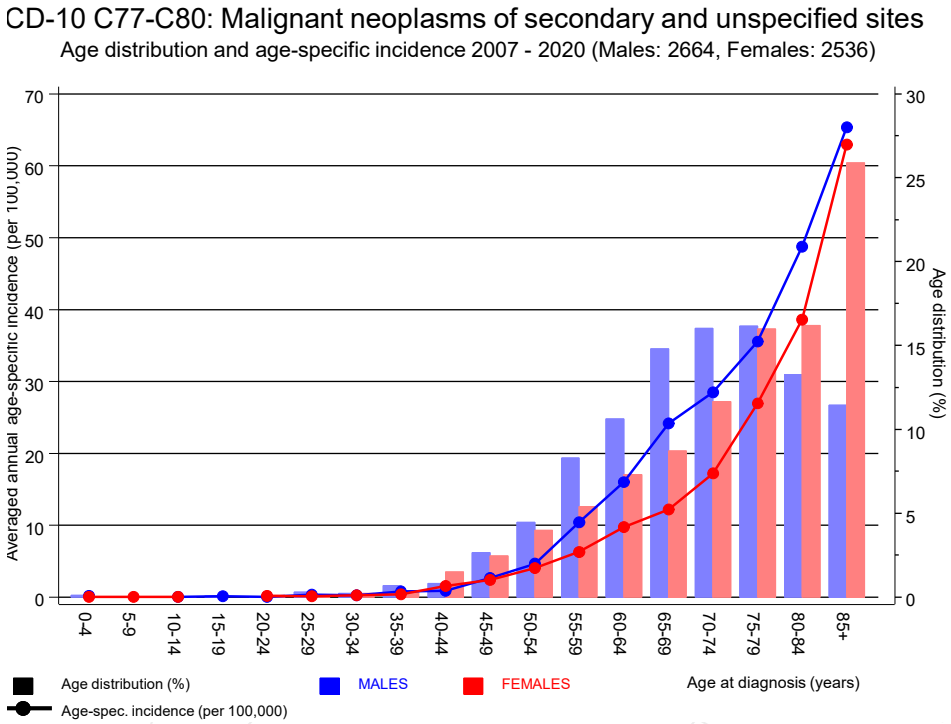

Figure 6. Age distribution (males: mean=71.0 yrs, median=72.2 yrs; females: mean=75.2 yrs, median=77.6 yrs) and age-specific incidence.

Table 7a

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of further malignancies for period 1998–2020
MALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C03–C06	Oral cavity	10	0.6	16.9	8.1	31.1	#	21.3	
C07–C08	Salivary gland	4	0.2	26.1	7.1	66.8	#	8.7	
C09–C10	Oropharynx	27	0.7	36.9	24.3	53.6	#	59.5	
C12–C13	Hypopharynx	12	0.4	30.6	15.8	53.4	#	26.3	16.7
C15	Oesophagus	15	1.4	11.0	6.2	18.1	#	30.9	
C16	Stomach	11	2.6	4.2	2.1	7.6	#	19.0	18.2
C17	Small intestine	4	0.4	9.9	2.7	25.3	#	8.1	
C18	Colon	19	6.4	3.0	1.8	4.7	#	28.6	15.8
C19–C20	Rectum	7	3.5	2.0	0.8	4.1		7.8	14.3
C21	Anus/canal	2	0.2	12.3	1.5	44.3	#	4.2	
C22	Liver	11	1.9	5.7	2.8	10.2	#	20.5	45.5
C23–C24	Bile	10	0.7	14.4	6.9	26.4	#	21.1	30.0
C25	Pancreas	11	2.6	4.3	2.1	7.6	#	19.1	27.3
C26	GI cancer	5	0.1	72.2	23.5	168.6	#	11.2	60.0
C30–C31	Sinuses	3	0.1	24.5	5.1	71.7	#	6.5	
C32	Larynx	9	0.7	13.2	6.0	25.1	#	18.8	
C33–C34	Lung	75	7.9	9.5	7.5	12.0	#	152.0	25.3
C38,C45	Mesothelioma	4	0.4	9.0	2.4	23.0	#	8.0	
C43	Malign. melanoma	7	3.0	2.3	0.9	4.8		9.0	14.3
C46,C49	Soft tissue	2	0.4	5.2	0.6	18.6		3.7	50.0
C48	Peritoneal	2	0.1	36.5	4.4	131.8	#	4.4	100.0
C50	Breast	2	0.2	11.1	1.3	40.3	#	4.1	
C61	Prostate	59	18.9	3.1	2.4	4.0	#	90.8	3.4
C64	Kidney	15	2.3	6.5	3.6	10.7	#	28.7	13.3
C65	Renal pelvis	3	0.3	10.3	2.1	30.0	#	6.1	33.3
C67	Bladder	11	3.1	3.6	1.8	6.4	#	18.0	
C70–C72	CNS cancer	5	0.9	5.9	1.9	13.7	#	9.4	20.0
C73	Thyroid	6	0.5	13.3	4.9	28.9	#	12.6	
C74–C80	Cancer others	3	0.2	19.7	4.1	57.6	#	6.4	66.7
C76–C79	CUP	3	1.1	2.7	0.5	7.8		4.2	33.3
C82–C85	NHL	9	2.8	3.2	1.5	6.1	#	14.1	11.1
C90	Mult. myeloma	2	0.9	2.3	0.3	8.4		2.6	50.0
C91–C96	Leukaemia	3	1.0	3.0	0.6	8.9		4.6	
	Others, specified	7	0.7	10.0	4.0	20.7	#	14.3	14.3
	Not observed	0	0.5	0.0	0.0	7.3		−1.1	
	All further malignancies	378	67.3	5.6	5.1	6.2	#	703.5	15.1

Patients	3232
Median age at next malignancy (years)	68.8
Person-years	4417
Mean observation time (years)	1.4
Median observation time (years)	0.4

The occurrence of further specified malignancy is statistically significant.

Further observed 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 1998–2020
FEMALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C03–C06	Oral cavity	4	0.2	16.3	4.5	41.9	#	10.0	
C07–C08	Salivary gland	2	0.1	28.0	3.4	101.0	#	5.1	
C09–C10	Oropharynx	10	0.2	57.3	27.5	105.3	#	26.1	
C15	Oesophagus	2	0.3	7.2	0.9	25.9		4.6	
C16	Stomach	11	1.5	7.2	3.6	12.8	#	25.1	18.2
C17	Small intestine	5	0.2	22.3	7.2	52.1	#	12.7	
C18	Colon	17	4.3	3.9	2.3	6.3	#	33.6	35.3
C19–C20	Rectum	3	1.7	1.7	0.4	5.1		3.4	
C22	Liver	5	0.5	9.3	3.0	21.8	#	11.8	60.0
C23–C24	Bile	8	0.6	12.8	5.5	25.1	#	19.5	62.5
C25	Pancreas	14	2.0	7.0	3.8	11.7	#	31.8	50.0
C26	GI cancer	3	0.1	35.6	7.3	104.0	#	7.7	100.0
C33–C34	Lung	41	3.2	12.9	9.2	17.5	#	100.3	22.0
C43	Malign. melanoma	8	1.6	5.0	2.2	9.9	#	17.0	25.0
C48	Peritoneal	4	0.2	23.9	6.5	61.2	#	10.2	
C50	Breast	68	12.9	5.3	4.1	6.7	#	146.1	8.8
C51	Vulva	3	0.5	6.5	1.3	19.1	#	6.7	
C53	Cervix uteri	4	0.5	7.3	2.0	18.7	#	9.1	
C54	Corpus uteri	6	2.3	2.6	0.9	5.6		9.8	
C56	Ovary	23	1.7	13.5	8.6	20.3	#	56.5	30.4
C64	Kidney	4	1.0	4.1	1.1	10.4	#	8.0	25.0
C67	Bladder	4	0.9	4.6	1.2	11.7	#	8.3	25.0
C70–C72	CNS cancer	3	0.5	5.5	1.1	16.2	#	6.5	33.3
C73	Thyroid	3	0.7	4.6	0.9	13.5		6.2	
C74–C80	Cancer others	3	0.2	16.6	3.4	48.4	#	7.5	66.7
C82–C85	NHL	10	1.7	6.0	2.9	11.1	#	22.1	20.0
C90	Mult. myeloma	3	0.5	5.8	1.2	16.9	#	6.6	
Others, specified		10	2.4	4.1	2.0	7.6	#	20.1	10.0
Not observed		0	0.5	0.0	0.0	7.7		-1.3	
All further malignancies		281	43.0	6.5	5.8	7.3	#	631.1	20.6

Patients	2823
Median age at next malignancy (years)	69.9
Person-years	3772
Mean observation time (years)	1.3
Median observation time (years)	0.4

The occurrence of further specified malignancy is statistically significant.

Further observed malignancies with count 1 are pooled in category “Others, specified”.

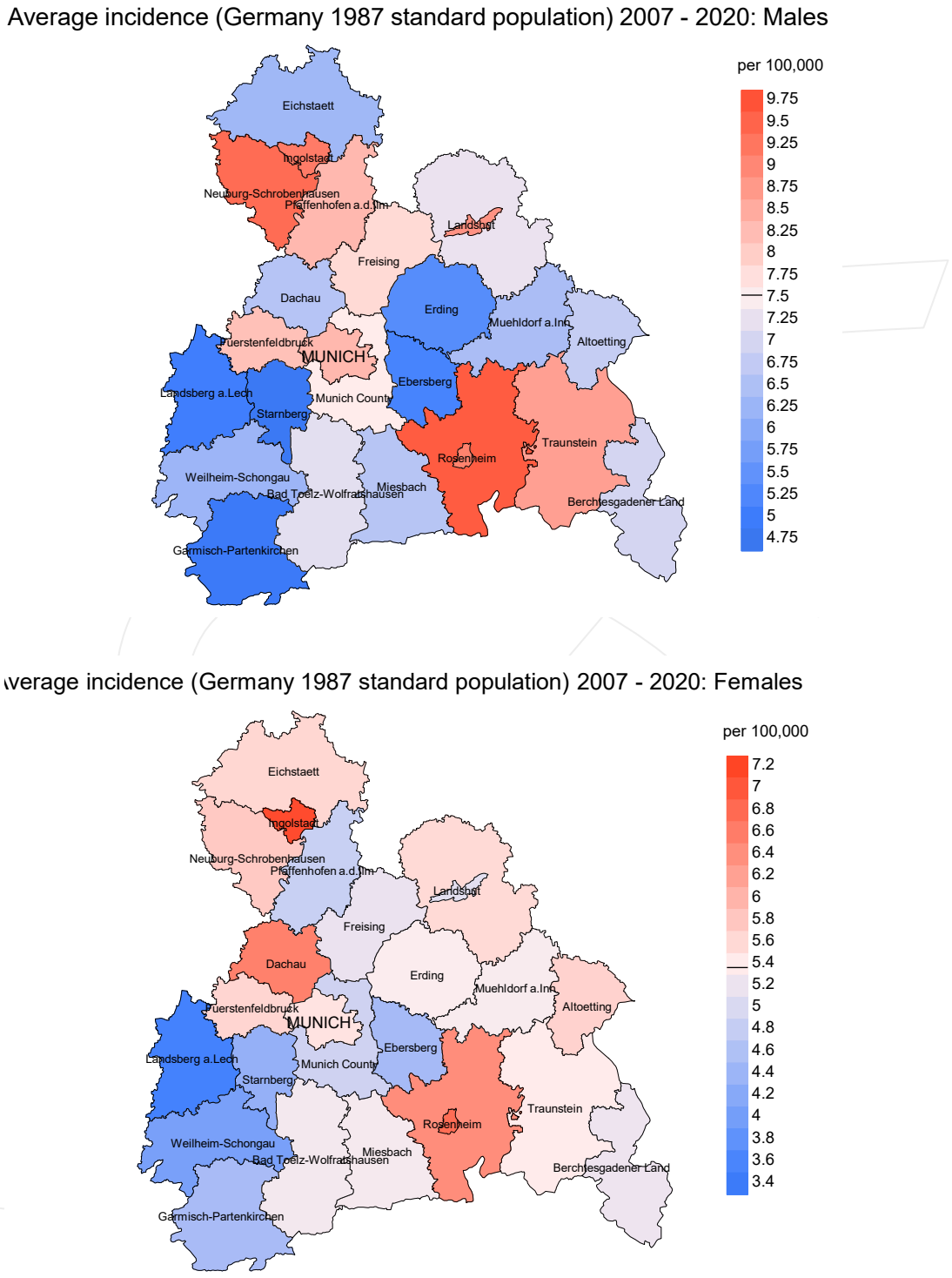

Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 7.5/100,000 WS N=2,664, females 5.4/100,000 WS N=2,536).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,727 female residents (averaged) in the period from 2007 to 2020 a total of 59 women were identified with newly diagnosed secondary and unknown sites. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 4.5/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 3.1 and 6.3/100,000.

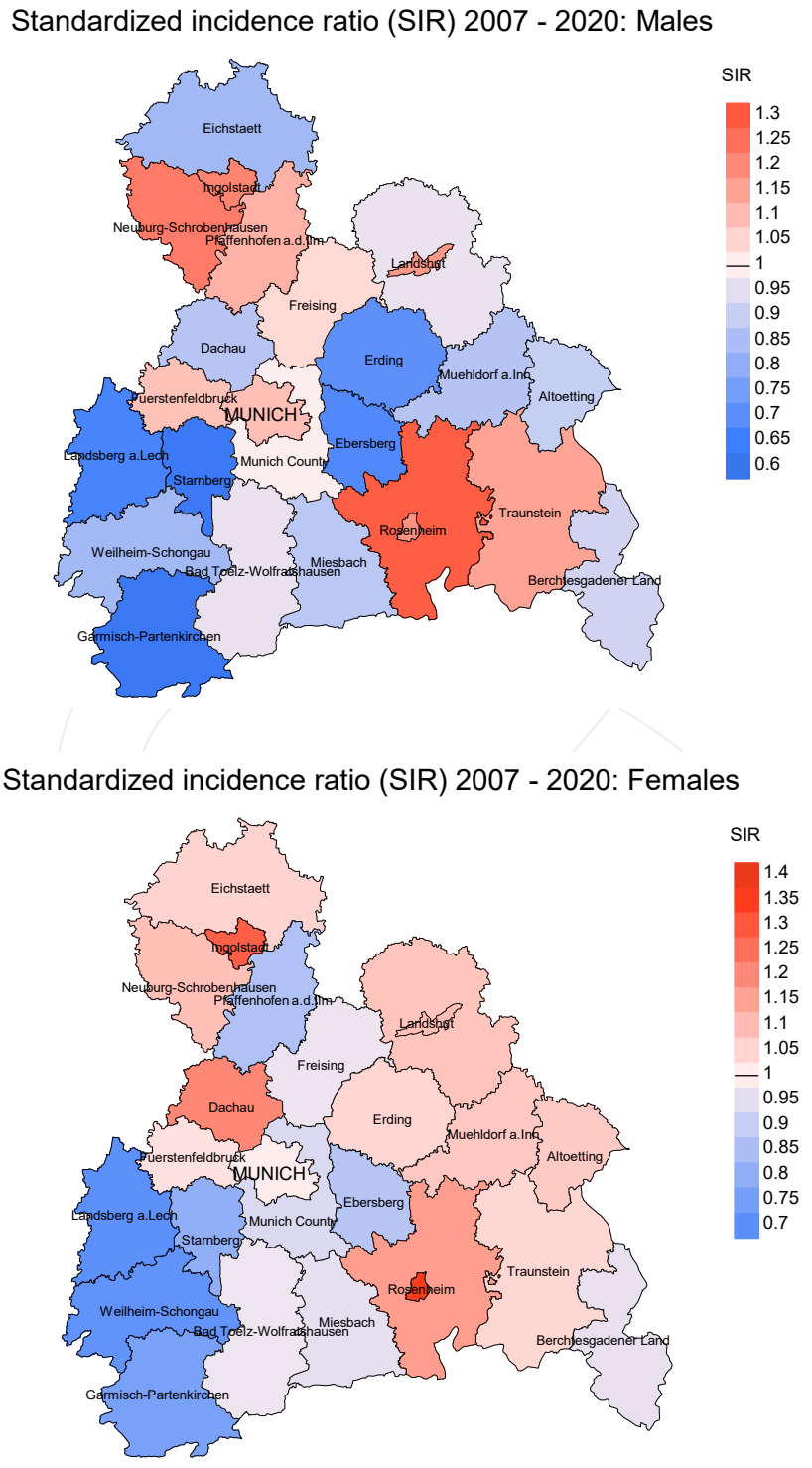

Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=2,664, females N=2,536).

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 2020 a total of 59 women were identified with newly diagnosed secondary and unknown sites. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.87. Though, the value of this parameter may vary with an underlying probability of 99% between 0.61 and 1.21, and is therefore not statistically striking.

MORTALITY

Table 9a

Annual cohorts: Incident cancers, follow-up status, proportion of DCO, deaths among the annual cohorts and proportion of available death certificates (with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.94 m as of 2007, respectively)

Year of diagnosis	Incident cases n	Prop. actively followed %	Prop. DCO %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	352	99.4	41.2	346	98.3	95.7
1999	268	99.6	42.9	265	98.9	94.0
2000	256	99.6	45.3	250	97.7	96.4
2001	229	99.1	44.5	220	96.1	98.6
2002	443	100.0	47.2	435	98.2	98.2
2003	429	100.0	42.9	415	96.7	99.0
2004	434	98.2	32.5	404	93.1	98.8
2005	388	98.2	34.3	373	96.1	98.9
2006	368	98.9	32.9	340	92.4	98.2
2007	422	98.6	31.0	397	94.1	98.2
2008	436	99.8	30.7	403	92.4	98.8
2009	390	99.0	27.9	364	93.3	98.1
2010	407	99.0	32.2	368	90.4	97.8
2011	467	99.1	24.6	421	90.1	97.9
2012	447	99.1	25.5	396	88.6	98.0
2013	429	98.6	25.9	393	91.6	97.2
2014	407	98.3	26.0	361	88.7	97.0
2015	434	98.4	28.3	366	84.3	97.0
2016	396	99.5	32.3	360	90.9	97.8
2017	381	100.0	26.5	332	87.1	90.7
2018	276	100.0	21.4	219	79.3	64.8
2019	183	100.0	3.3	133	72.7	70.7
2020	127	100.0		86	67.7	96.5
1998-2020	8369	99.2	31.5	7647	91.4	96.0

Table 9b

Annual cohorts of incident cancers and deaths, proportion of death certificates and cases deceased within the same year of being diagnosed with cancer (incl. DCO)
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.94 m as of 2007, respectively)

Year of diagnosis/ death	Incident cases n	Deaths n	Prop. deaths with death certific. %	Deaths in same year n	Prop. deaths in same year %
1998	352	317	95.9	249	70.7
1999	268	263	94.3	183	68.3
2000	256	262	96.9	184	71.9
2001	229	206	97.1	151	65.9
2002	443	289	98.3	289	65.2
2003	429	321	97.8	275	64.1
2004	434	345	98.8	250	57.6
2005	388	306	98.0	226	58.2
2006	368	321	98.1	212	57.6
2007	422	319	99.1	245	58.1
2008	436	352	98.0	259	59.4
2009	390	311	99.4	216	55.4
2010	407	326	98.8	238	58.5
2011	467	355	98.6	281	60.2
2012	447	358	98.0	261	58.4
2013	429	318	98.7	251	58.5
2014	407	339	97.9	228	56.0
2015	434	358	99.2	246	56.7
2016	396	335	99.1	244	61.6
2017	381	341	99.4	224	58.8
2018	276	245	68.6	144	52.2
2019	183	204	45.1	77	42.1
2020	127	168	93.5	67	52.8
1998–2020	8369	6959	95.4	5000	59.7

Table 9c

Annual cohorts of deaths, proportion of cancer-related and non-cancer-related deaths, and cancer recorded on death certificates (incl. DCO)
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.94 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. non-cancer-related %	Prop. cancer recorded on death certificate %
1998	317	89.0	11.0	97.7
1999	263	95.4	4.6	97.6
2000	262	96.6	3.4	96.9
2001	206	97.1	2.9	96.5
2002	289	95.8	4.2	97.2
2003	321	98.4	1.6	96.8
2004	345	97.4	2.6	96.2
2005	306	98.4	1.6	96.0
2006	321	98.8	1.2	95.9
2007	319	99.4	0.6	96.2
2008	352	98.3	1.7	96.2
2009	311	98.7	1.3	96.8
2010	326	99.1	0.9	94.4
2011	355	99.2	0.8	94.6
2012	358	98.6	1.4	93.4
2013	318	99.1	0.9	93.6
2014	339	99.4	0.6	94.6
2015	358	99.7	0.3	95.5
2016	335	99.1	0.9	96.1
2017	341	99.1	0.9	93.5
2018	245	99.2	0.8	90.5
2019	204	98.5	1.5	96.7
2020	168	98.8	1.2	97.5
1998-2020	6959	98.0	2.0	95.6

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	151	69.2	68.8	73.3	69.5
1999	127	70.8	70.4	86.3	70.6
2000	128	70.5	69.9	78.1	69.7
2001	90	71.5	71.5		72.0
2002	147	71.7	71.7	79.4	71.8
2003	158	71.1	71.0	89.2	71.0
2004	180	72.3	71.8	82.6	71.3
2005	155	68.1	68.1	76.1	68.4
2006	158	70.9	71.0	54.7	70.9
2007	172	70.6	70.6	85.6	71.1
2008	191	70.4	70.4	76.3	70.3
2009	172	72.7	72.7	84.2	72.7
2010	158	72.3	72.2	94.0	72.0
2011	188	72.5	72.5		72.2
2012	193	72.8	72.8	74.9	72.7
2013	159	71.9	71.8	78.8	71.8
2014	173	74.1	74.1		74.1
2015	171	73.1	73.2	70.3	72.4
2016	173	74.6	74.7	65.8	74.6
2017	164	74.1	74.1	79.5	74.0
2018	126	75.3	75.3	90.3	75.2
2019	116	73.5	73.5		75.9
2020	87	73.3	73.8	63.5	73.2
1998-2020	3537	72.2	72.2	75.4	72.0

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	166	80.6	79.2	84.8	80.4
1999	136	79.0	78.7	85.1	79.1
2000	134	80.1	80.1	93.2	80.1
2001	116	80.4	80.4	81.0	81.0
2002	142	81.2	80.8	88.2	81.2
2003	163	78.5	78.5	81.7	78.8
2004	165	79.7	79.6	81.8	80.0
2005	151	79.2	78.8	91.0	79.2
2006	163	79.4	79.1	83.9	79.4
2007	147	77.4	77.3	101.7	77.2
2008	161	77.2	77.2	84.7	77.2
2009	139	76.5	76.9	73.6	76.5
2010	168	78.3	78.3	80.6	77.8
2011	167	79.6	79.2	86.1	79.3
2012	165	79.5	79.3	89.0	79.3
2013	159	78.3	78.3	85.1	78.1
2014	166	75.6	75.6	83.0	74.7
2015	187	78.8	78.8		78.7
2016	162	77.9	77.9	92.7	77.9
2017	177	78.5	78.5	94.0	77.8
2018	119	76.5	76.3	93.4	76.1
2019	88	75.0	74.3	86.5	73.2
2020	81	77.8	77.5	82.9	77.2
1998–2020	3422	78.5	78.4	85.6	78.5

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	136	12.3	0.83	7.3	0.80	11.2	0.82	14.6	0.83
1999	123	11.0	0.98	6.6	1.01	10.2	1.01	13.3	1.00
2000	124	10.9	1.02	6.3	1.00	9.9	1.02	12.9	1.01
2001	90	7.8	0.81	4.5	0.81	7.0	0.82	9.6	0.83
2002	143	7.7	0.67	4.2	0.66	6.6	0.67	8.9	0.68
2003	156	8.3	0.72	4.4	0.70	6.9	0.70	9.4	0.71
2004	176	9.4	0.81	5.0	0.80	7.8	0.82	10.4	0.83
2005	153	8.1	0.85	4.4	0.85	6.5	0.85	8.3	0.85
2006	157	8.2	0.79	4.4	0.82	6.6	0.80	8.7	0.79
2007	171	7.7	0.76	4.0	0.73	6.0	0.74	8.0	0.76
2008	189	8.5	0.77	4.2	0.76	6.3	0.75	8.3	0.77
2009	170	7.6	0.89	3.7	0.90	5.8	0.90	7.6	0.90
2010	157	7.0	0.78	3.2	0.76	5.0	0.77	6.7	0.77
2011	188	8.4	0.79	3.8	0.75	5.9	0.78	8.0	0.80
2012	191	8.4	0.84	3.8	0.74	5.8	0.80	7.9	0.85
2013	157	6.8	0.72	3.3	0.73	4.9	0.73	6.3	0.71
2014	173	7.4	0.88	3.1	0.83	4.8	0.84	6.7	0.87
2015	170	7.1	0.78	3.3	0.77	5.0	0.78	6.5	0.78
2016	172	7.2	0.85	3.1	0.83	4.8	0.84	6.4	0.85
2017	162	6.7	0.87	2.9	0.87	4.5	0.87	5.9	0.87
2018	125	5.1	0.87	2.1	0.79	3.3	0.83	4.4	0.86
2019	116	4.8	1.10	2.1	1.05	3.2	1.08	4.2	1.09
2020	86	3.5	1.32	1.5	1.32	2.3	1.33	3.1	1.32
1998-2020	3485	7.5	0.83	3.6	0.81	5.5	0.82	7.3	0.83

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	146	12.4	0.78	4.2	0.78	6.8	0.77	9.6	0.76
1999	128	10.8	0.90	3.9	0.83	6.2	0.85	8.5	0.88
2000	130	10.8	0.97	4.0	0.93	6.2	0.94	8.1	0.96
2001	110	9.0	0.93	3.0	0.80	4.9	0.87	6.9	0.92
2002	134	6.8	0.59	2.4	0.64	3.8	0.62	5.1	0.60
2003	160	8.1	0.75	3.0	0.77	4.7	0.77	6.3	0.77
2004	160	8.1	0.74	2.7	0.66	4.3	0.68	5.9	0.71
2005	148	7.4	0.71	2.6	0.70	4.1	0.69	5.5	0.70
2006	160	8.0	0.94	2.9	0.96	4.5	0.97	5.9	0.95
2007	146	6.3	0.74	2.2	0.73	3.5	0.73	4.7	0.72
2008	157	6.8	0.83	2.6	0.84	3.8	0.83	5.0	0.80
2009	137	5.9	0.68	2.2	0.65	3.4	0.66	4.5	0.71
2010	166	7.1	0.81	2.4	0.81	3.8	0.81	5.2	0.82
2011	164	7.0	0.72	2.3	0.69	3.6	0.71	5.0	0.74
2012	162	6.9	0.74	2.3	0.76	3.6	0.76	4.9	0.75
2013	158	6.6	0.75	2.2	0.68	3.4	0.70	4.7	0.73
2014	164	6.8	0.78	2.4	0.78	3.7	0.78	4.9	0.79
2015	187	7.7	0.87	2.5	0.87	3.9	0.87	5.2	0.87
2016	160	6.5	0.82	2.1	0.75	3.3	0.77	4.4	0.79
2017	176	7.1	0.91	2.3	0.90	3.6	0.90	4.8	0.90
2018	118	4.8	0.89	1.7	0.90	2.6	0.90	3.3	0.89
2019	85	3.4	1.09	1.4	1.06	2.0	1.06	2.6	1.09
2020	80	3.2	1.29	1.2	1.07	1.8	1.14	2.3	1.18
1998-2020	3336	6.9	0.80	2.4	0.78	3.7	0.79	5.0	0.80

Table 12

Age distribution of age at death (cancer-related) for period 2007-2020
(**incl. multiple malignancies**)

Age at death	Cases			Males			Females		
Years	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4	1	0.0	0.0			0.0	1	0.0	0.0
5-9	0	0.0	0.0			0.0			0.0
10-14	0	0.0	0.0			0.0			0.0
15-19	1	0.0	0.0	1	0.0	0.0			0.0
20-24	2	0.0	0.1	1	0.0	0.1	1	0.0	0.1
25-29	4	0.1	0.2	2	0.1	0.2	2	0.1	0.2
30-34	10	0.2	0.4	7	0.3	0.5	3	0.1	0.3
35-39	16	0.4	0.8	8	0.4	0.9	8	0.4	0.7
40-44	37	0.9	1.7	18	0.8	1.7	19	0.9	1.7
45-49	84	2.0	3.6	35	1.6	3.2	49	2.4	4.0
50-54	137	3.2	6.8	78	3.5	6.7	59	2.9	6.9
55-59	273	6.4	13.2	168	7.5	14.3	105	5.1	12.0
60-64	371	8.7	21.8	226	10.1	24.4	145	7.0	19.0
65-69	531	12.4	34.2	326	14.6	39.1	205	10.0	29.0
70-74	642	15.0	49.2	388	17.4	56.5	254	12.3	41.3
75-79	726	16.9	66.1	383	17.2	73.7	343	16.7	58.0
80-84	633	14.8	80.9	305	13.7	87.4	328	15.9	73.9
85+	819	19.1	100.0	281	12.6	100.0	538	26.1	100.0
All ages	4287	100.0		2227	100.0		2060	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**incl. multiple malignancies**)

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		1			0.1	1.00		6.3
5- 9								
10-14								
15-19	1		0.1	0.50			2.1	
20-24	1	1	0.0	1.00	0.1	0.33	1.4	2.3
25-29	2	2	0.1	0.25	0.1	0.67	2.2	2.0
30-34	7	3	0.3	1.17	0.1	0.50	4.9	1.7
35-39	8	8	0.3	0.44	0.4	0.89	3.0	2.0
40-44	18	19	0.7	0.82	0.8	0.50	3.0	2.2
45-49	35	49	1.3	0.49	1.9	0.79	2.5	2.9
50-54	78	59	3.1	0.66	2.3	0.58	2.9	2.2
55-59	168	105	7.9	0.76	4.8	0.77	3.8	2.8
60-64	226	145	12.8	0.80	7.6	0.78	3.5	2.9
65-69	326	205	20.0	0.83	11.3	0.93	3.5	2.9
70-74	388	254	25.9	0.91	14.8	0.86	3.3	2.9
75-79	383	343	31.7	0.89	22.8	0.85	3.1	3.5
80-84	305	328	42.1	0.86	30.8	0.80	2.9	3.5
85+	281	538	60.2	0.92	51.6	0.82	3.1	4.5
All ages	2227	2060					3.2	3.3
Mortality								
Raw			6.8	0.84	6.1	0.81		
WS			3.1	0.80	2.1	0.79		
ES			4.8	0.82	3.2	0.80		
BRD-S			6.3	0.83	4.3	0.81		
PYLL-70								
per 100,000			27.8		21.7			
ES			23.8		18.2			
AYLL-70			9.2		10.3			

Table 14a

Further malignancies in deaths in period 1998–2020
MALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03–C06	Oral cavity	27	2.5	15	55.6	1	3.7	11	40.7
C07–C08	Salivary gland	4	0.4			2	50.0	2	50.0
C09–C10	Oropharynx	34	3.2	5	14.7	6	17.6	23	67.6
C12–C13	Hypopharynx	21	2.0	4	19.0	2	9.5	15	71.4
C15	Oesophagus	26	2.4	7	26.9	8	30.8	11	42.3
C16	Stomach	22	2.1	9	40.9	2	9.1	11	50.0
C17	Small intestine	7	0.7	2	28.6	1	14.3	4	57.1
C18	Colon	63	5.9	40	63.5	11	17.5	12	19.0
C19–C20	Rectum	33	3.1	24	72.7	3	9.1	6	18.2
C21	Anus/canal	3	0.3	2	66.7			1	33.3
C22	Liver	20	1.9	7	35.0	2	10.0	11	55.0
C23–C24	Bile	9	0.8			2	22.2	7	77.8
C25	Pancreas	11	1.0	2	18.2	1	9.1	8	72.7
C26	GI cancer	6	0.6			3	50.0	3	50.0
C30–C31	Sinuses	6	0.6	4	66.7	1	16.7	1	16.7
C32	Larynx	26	2.4	17	65.4	1	3.8	8	30.8
C33–C34	Lung	97	9.1	16	16.5	26	26.8	55	56.7
C38,C45	Mesothelioma	5	0.5	1	20.0			4	80.0
C43	Malign. melanoma	45	4.2	36	80.0	1	2.2	8	17.8
C44	Skin others	142	13.3	88	62.0	13	9.2	41	28.9
C46,C49	Soft tissue	5	0.5	3	60.0	2	40.0		
C61	Prostate	240	22.5	183	76.3	26	10.8	31	12.9
C62	Testis	10	0.9	10	100.0				
C64	Kidney	34	3.2	18	52.9	4	11.8	12	35.3
C65	Renal pelvis	8	0.7	2	25.0	1	12.5	5	62.5
C67	Bladder	54	5.1	38	70.4	5	9.3	11	20.4
C70–C72	CNS cancer	8	0.7	3	37.5			5	62.5
C73	Thyroid	17	1.6	13	76.5	1	5.9	3	17.6
C74–C80	Cancer others	4	0.4			3	75.0	1	25.0
C76–C79	CUP	3	0.3			1	33.3	2	66.7
C81	Hodgkin lymphoma	4	0.4	4	100.0				
C82–C85	NHL	46	4.3	33	71.7	7	15.2	6	13.0
C90	Mult. myeloma	8	0.7	6	75.0	1	12.5	1	12.5
C91–C96	Leukaemia	6	0.6	2	33.3	2	33.3	2	33.3
Others, specified		15	1.4	7	46.7	1	6.7	7	46.7
All further malignancies		1069	100.0	601	56.2	140	13.1	328	30.7

Further malignancies with number of cases 1 to 2 are pooled in category “Others, specified”.

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

Table 14b

Further malignancies in deaths in period 1998-2020
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03-C06	Oral cavity	10	1.3	6	60.0	1	10.0	3	30.0
C07-C08	Salivary gland	3	0.4	1	33.3			2	66.7
C09-C10	Oropharynx	17	2.3	6	35.3			11	64.7
C15	Oesophagus	6	0.8	4	66.7	1	16.7	1	16.7
C16	Stomach	13	1.7	3	23.1	5	38.5	5	38.5
C17	Small intestine	5	0.7	1	20.0	1	20.0	3	60.0
C18	Colon	37	5.0	17	45.9	5	13.5	15	40.5
C19-C20	Rectum	13	1.7	6	46.2	6	46.2	1	7.7
C21	Anus/canal	3	0.4	2	66.7			1	33.3
C22	Liver	9	1.2	1	11.1	4	44.4	4	44.4
C23-C24	Bile	12	1.6	2	16.7	3	25.0	7	58.3
C25	Pancreas	20	2.7	3	15.0	6	30.0	11	55.0
C26	GI cancer	6	0.8	2	33.3	2	33.3	2	33.3
C32	Larynx	4	0.5	4	100.0				
C33-C34	Lung	57	7.7	16	28.1	11	19.3	30	52.6
C43	Malign. melanoma	26	3.5	18	69.2	5	19.2	3	11.5
C44	Skin others	43	5.8	31	72.1	7	16.3	5	11.6
C48	Peritoneal	3	0.4					3	100.0
C50	Breast	198	26.6	126	63.6	14	7.1	58	29.3
C51	Vulva	8	1.1	3	37.5	2	25.0	3	37.5
C53	Cervix uteri	22	3.0	16	72.7	3	13.6	3	13.6
C54	Corpus uteri	39	5.2	33	84.6	2	5.1	4	10.3
C55,C57	Fem. genitals un	9	1.2	7	77.8	2	22.2		
C56	Ovary	43	5.8	16	37.2	6	14.0	21	48.8
C64	Kidney	25	3.4	19	76.0	2	8.0	4	16.0
C67	Bladder	22	3.0	17	77.3	2	9.1	3	13.6
C69	Eye melanoma	3	0.4	2	66.7	1	33.3		
C70-C72	CNS cancer	3	0.4			1	33.3	2	66.7
C73	Thyroid	20	2.7	18	90.0			2	10.0
C74-C80	Cancer others	3	0.4			1	33.3	2	66.7
C76-C79	CUP	3	0.4			2	66.7	1	33.3
C81	Hodgkin lymphoma	6	0.8	5	83.3	1	16.7		
C82-C85	NHL	30	4.0	18	60.0	4	13.3	8	26.7
C90	Mult. myeloma	6	0.8	2	33.3	1	16.7	3	50.0
C91-C96	Leukaemia	6	0.8	2	33.3	1	16.7	3	50.0
Others, specified		10	1.3	2	20.0	2	20.0	6	60.0
All further malignancies		743	100.0	409	55.0	104	14.0	230	31.0

Further malignancies with number of cases 1 to 2 are pooled in category “Others, specified”.

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

Table 15

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**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		1			0.1	1.00		6.7
5- 9								
10-14								
15-19	1		0.1	0.50			2.2	
20-24	1	1	0.0	1.00	0.1	0.33	1.5	2.4
25-29	2	2	0.1	0.25	0.1	0.67	2.4	2.2
30-34	6	2	0.3	1.00	0.1	0.40	4.3	1.3
35-39	7	8	0.3	0.47	0.4	0.89	2.8	2.2
40-44	14	19	0.6	0.67	0.8	0.58	2.5	2.5
45-49	25	35	0.9	0.46	1.3	0.74	1.9	2.4
50-54	68	48	2.7	0.64	1.9	0.59	2.9	2.1
55-59	144	88	6.8	0.79	4.0	0.78	3.7	2.8
60-64	185	115	10.5	0.83	6.1	0.82	3.5	2.8
65-69	250	161	15.3	0.81	8.9	0.92	3.4	2.9
70-74	292	206	19.5	0.89	12.0	0.86	3.2	3.0
75-79	284	259	23.5	0.87	17.2	0.83	3.1	3.4
80-84	206	279	28.4	0.82	26.2	0.78	2.8	3.9
85+	217	475	46.5	0.87	45.6	0.79	3.3	5.0
All ages	1702	1699					3.2	3.5
Mortality								
Raw			5.2	0.82	5.1	0.80		
WS			2.4	0.79	1.7	0.79		
ES			3.7	0.80	2.7	0.79		
BRD-S			4.8	0.81	3.5	0.80		
PYLL-70								
per 100,000			23.0		17.9			
ES			19.8		15.0			
AYLL-70			9.4		10.5			

* See corresponding tables with multiple malignancies.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**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		1			0.1	1.00		6.7
5- 9								
10-14								
15-19	1		0.1	0.50			2.2	
20-24	1	1	0.0	1.00	0.1	0.33	1.5	2.5
25-29	2	2	0.1	0.25	0.1	0.67	2.4	2.3
30-34	6	2	0.3	1.00	0.1	0.50	4.4	1.3
35-39	7	8	0.3	0.47	0.4	1.00	2.8	2.2
40-44	13	18	0.5	0.72	0.7	0.60	2.3	2.4
45-49	25	30	0.9	0.50	1.2	0.71	2.0	2.1
50-54	62	41	2.4	0.63	1.6	0.58	2.7	1.9
55-59	137	78	6.5	0.82	3.6	0.76	3.6	2.5
60-64	160	103	9.0	0.78	5.4	0.82	3.0	2.6
65-69	229	134	14.0	0.81	7.4	0.88	3.2	2.5
70-74	255	190	17.0	0.83	11.1	0.83	2.9	2.9
75-79	254	242	21.0	0.82	16.1	0.82	2.9	3.3
80-84	195	261	26.9	0.80	24.5	0.75	2.8	3.8
85+	203	450	43.5	0.83	43.2	0.77	3.4	5.0
All ages	1550	1561					3.0	3.3
Mortality								
Raw			4.8	0.79	4.6	0.78		
WS			2.2	0.77	1.5	0.77		
ES			3.4	0.78	2.4	0.78		
BRD-S			4.4	0.79	3.2	0.78		
PYLL-70								
per 100,000			21.4		15.9			
ES			18.4		13.5			
AYLL-70			9.5		10.8			

* See corresponding tables with multiple malignancies.

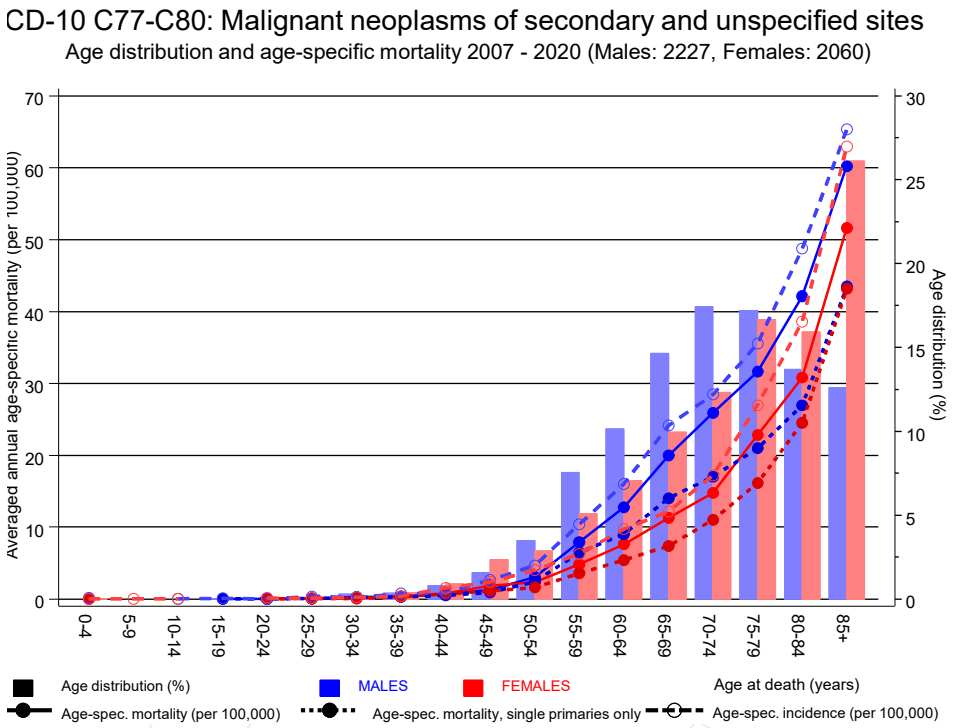

Figure 17. Distribution of age at death (bars; males: mean=70.8 yrs, median=71.6 yrs; females: mean=74.5 yrs, median=76.4 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

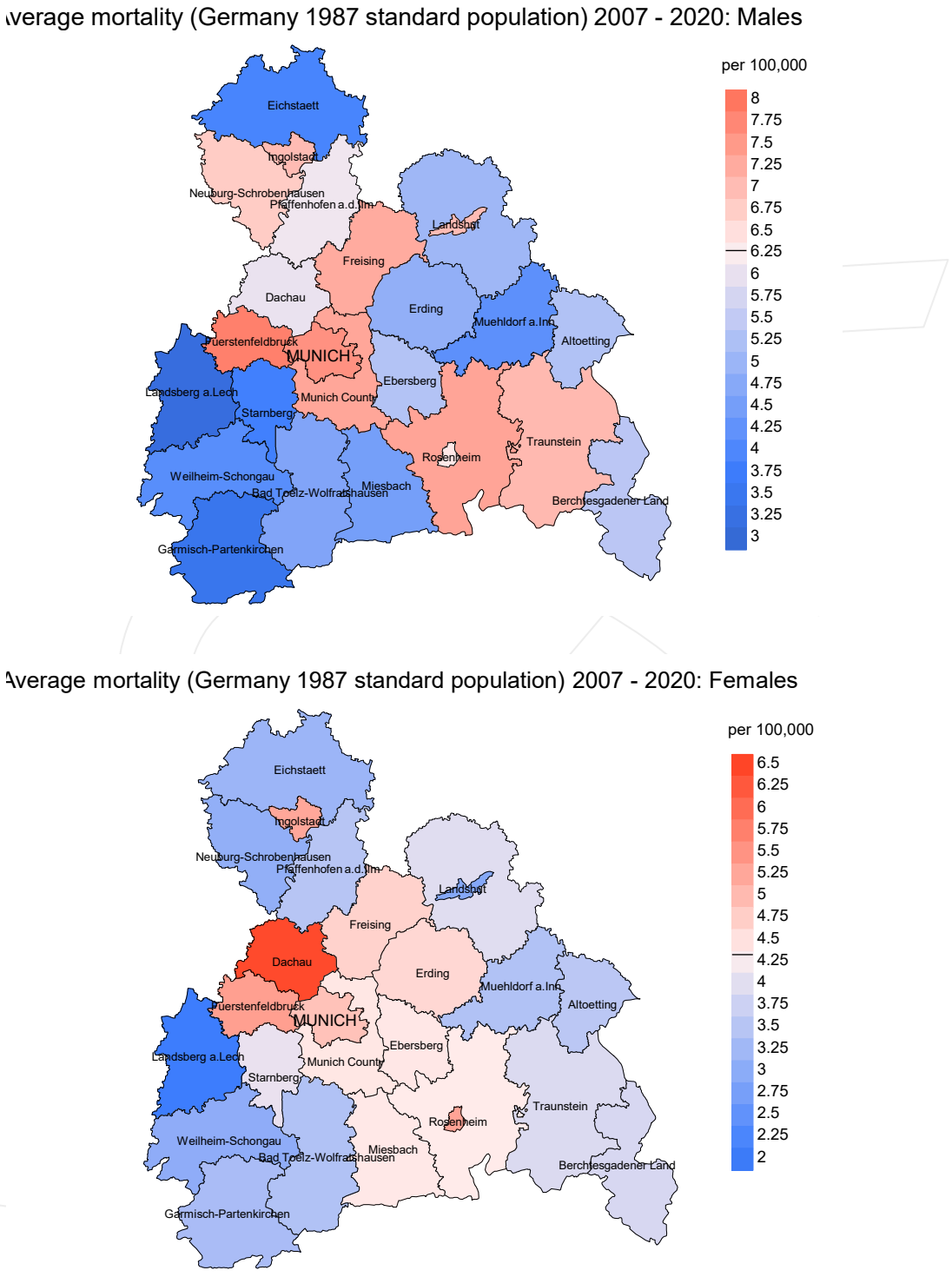

Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2020. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 6.3/100,000 WS N=2,227, females 4.3/100,000 WS N=2,060).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,727 female residents (averaged) in the period from 2007 to 2020 a total of 59 women died from secondary and unknown sites. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 4.4/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 3.1 and 6.2/100,000.

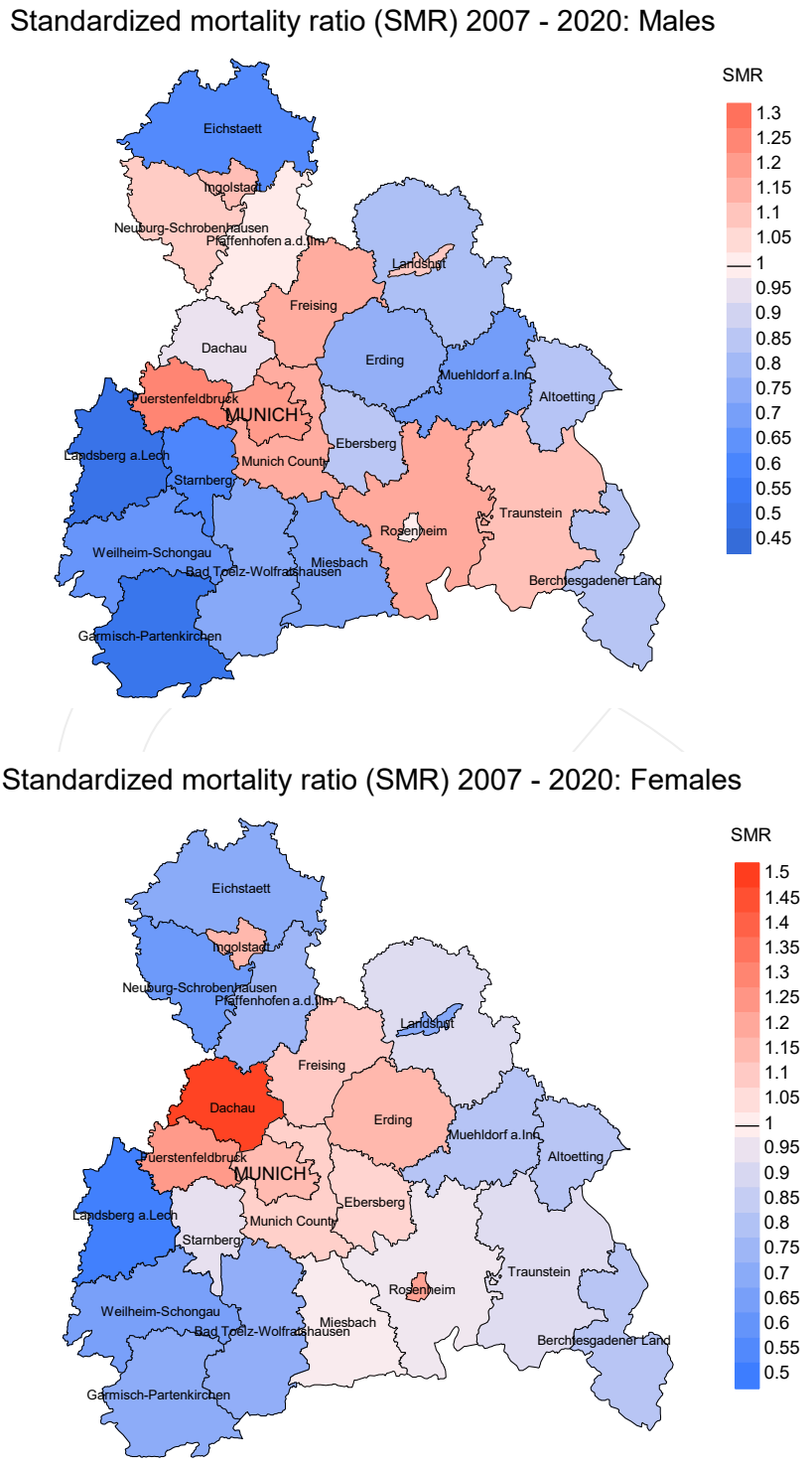

Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=2,227, females N=2,060).

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 2020 a total of 59 women died from secondary and unknown sites. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.07. Though, the value of this parameter may vary with an underlying probability of 99% between 0.75 and 1.49, 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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