Munich Cancer Registry

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- *Deutsch*

ICD-10 C73: Thyroid cancer

Incidence and Mortality

Year of diagnosis	1998-2020
Patients	9,142
Diseases	9,206
Creation date	12/21/2021
Database export	12/20/2021
Population	4.95 m

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

https://www.tumorregister-muenchen.de/en/facts/base/bC73__E-ICD-10-C73-Thyroid-cancer-incidence-and-mortality.pdf

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Global Statements about the statistics on the Internet −
Baseline Statistics (grey button), **Survival** (red button)

In these analyses, the clinics and physicians of Upper Bavaria and the city and county of Landshut[#], with a total of 4.69 million inhabitants, account for the frequency of cancer diseases[##] and the achieved long term results. Additionally, the long term survival evaluated by the Munich Cancer Registry (MCR) is compared with the results of the population-based registry in the USA (SEER), which is useful for checking the consistency of the data on an international level.

In comparing several tables, inconsistent figures may be detected. This is based on the fact that different patient cohorts are included in the base calculation, for example when proportions of multiple tumors or DCO-cases[###] are concerned. In other cases the individual tumor diagnosis is the basis for calculation, for example with incidence.

The foot notes describe the currentness of the data. The baseline statistics and survival data are updated annually. This yearly analysis comprises the Annual Report of the MCR.

Clinics and physicians have access to essentially more detailed data, with which they can check, compare and in the best case optimize their own data and results.

We would be pleased to receive corrections, critique and useful suggestions. Just send an e-mail to tumor@ibe.med.uni-muenchen.de.

Munich Cancer Registry, 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 2015) used for specifying cancer site

Code	Description
C73	Malignant neoplasm of thyroid gland

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	213	9	4.2	8.5	11.0	39.4	92.0
1999	205	4	2.0	7.2	10.7	27.8	89.3
2000	240	6	2.5	9.1	10.3	30.8	91.7
2001	200	6	3.0	9.2	10.1	30.0	91.0
2002	314	14	4.5	9.5	9.9	38.2	93.0 #
2003	303	8	2.6	9.6	9.5	27.7	93.1
2004	356	9	2.5	9.0	9.3	22.5	89.9
2005	373	8	2.1	9.3	9.0	26.0	88.5
2006	425	9	2.1	9.2	8.5	21.6	84.2
2007	585	8	1.4	9.2	7.9	21.4	82.1 #
2008	664	13	2.0	9.0	7.4	17.5	95.9
2009	630	4	0.6	9.4	6.8	15.6	96.3
2010	525	17	3.2	9.6	6.1	17.3	95.6
2011	473	8	1.7	9.9	5.3	17.5	95.8
2012	465	2	0.4	9.9	4.7	16.1	94.2
2013	479	13	2.7	10.0	4.1	15.4	96.7
2014	433	9	2.1	10.0	3.5	12.5	90.3
2015	445	8	1.8	10.3	3.1	12.1	89.7
2016	475	9	1.9	10.3	2.7	8.8	97.7
2017	445	2	0.4	10.4	2.4	7.6	99.3
2018	451	1	0.2	10.4	2.0	4.2	99.6
2019	327			10.2	1.4	6.1	99.4
2020	180			10.2	0.0	2.8	100.0 ##
1998-2020	9206	167	1.8	10.2	11.0	17.8	93.3

9,206 cases diagnosed 1998-2020 are related to a total of 9,142 patients. Currently, in 1,821 (19.9 %) of these 9,142 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 1,441 / 281 / 99 (15.8 % / 3.1 % / 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 451 cases has been diagnosed, of which 10.4 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 2.0 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1a

Cases with invasive cancer by year of diagnosis, proportions of 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	43	20.2	2	4.7	9.3	11.8	44.2	93.0
1999	53	25.9	3	5.7	6.3	11.5	50.9	90.6
2000	63	26.3	2	3.2	10.7	11.2	39.7	92.1
2001	55	27.5	2	3.6	11.2	11.0	41.8	92.7
2002	80	25.5	4	5.0	10.9	10.7	42.5	95.0 #
2003	84	27.7	5	6.0	10.8	10.4	39.3	95.2
2004	107	30.1	3	2.8	10.3	10.3	30.8	92.5
2005	82	22.0			10.6	10.0	37.8	95.1
2006	118	27.8	3	2.5	10.2	9.7	26.3	87.3
2007	174	29.7	3	1.7	10.4	9.1	30.5	83.3 #
2008	173	26.1	5	2.9	10.8	8.1	22.5	98.3
2009	180	28.6			11.5	7.1	17.8	96.7
2010	120	22.9	4	3.3	11.7	6.6	30.0	95.0
2011	141	29.8	3	2.1	12.0	5.6	24.8	95.7
2012	146	31.4	1	0.7	12.2	5.2	29.5	95.2
2013	185	38.6	5	2.7	12.4	4.3	17.8	95.7
2014	134	30.9	2	1.5	12.6	4.2	20.1	93.3
2015	143	32.1	5	3.5	12.9	3.5	21.0	92.3
2016	148	31.2	4	2.7	13.0	2.6	10.1	98.6
2017	121	27.2			13.1	2.7	12.4	100.0
2018	127	28.2	1	0.8	13.0	1.8	5.5	100.0
2019	96	29.4			12.9	1.3	9.4	97.9
2020	62	34.4			12.8	0.0	4.8	100.0 ##
1998-2020	2635	28.6	57	2.2	12.8	11.8	24.0	94.6

2,635 cases diagnosed 1998-2020 are related to a total of 2,609 patients. Currently, in 608 (23.3 %) of these 2,609 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 476 / 93 / 39 (18.2 % / 3.6 % / 1.5 %) 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 127 cases has been diagnosed, of which 13.0 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 1.8 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1b

Cases with invasive cancer by year of diagnosis, proportions of 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	170	79.8	7	4.1	8.2	10.7	38.2	91.8	
1999	152	74.1	1	0.7	7.5	10.4	19.7	88.8	
2000	177	73.8	4	2.3	8.6	10.0	27.7	91.5	
2001	145	72.5	4	2.8	8.5	9.8	25.5	90.3	
2002	234	74.5	10	4.3	9.0	9.6	36.8	92.3	#
2003	219	72.3	3	1.4	9.2	9.1	23.3	92.2	
2004	249	69.9	6	2.4	8.5	8.9	18.9	88.8	
2005	291	78.0	8	2.7	8.8	8.5	22.7	86.6	
2006	307	72.2	6	2.0	8.8	8.0	19.9	83.1	
2007	411	70.3	5	1.2	8.8	7.4	17.5	81.5	#
2008	491	73.9	8	1.6	8.4	7.1	15.7	95.1	
2009	450	71.4	4	0.9	8.7	6.6	14.7	96.2	
2010	405	77.1	13	3.2	8.9	5.9	13.6	95.8	
2011	332	70.2	5	1.5	9.1	5.2	14.5	95.8	
2012	319	68.6	1	0.3	9.0	4.5	10.0	93.7	
2013	294	61.4	8	2.7	9.0	4.0	13.9	97.3	
2014	299	69.1	7	2.3	9.0	3.3	9.0	89.0	
2015	302	67.9	3	1.0	9.2	3.0	7.9	88.4	
2016	327	68.8	5	1.5	9.2	2.7	8.3	97.2	
2017	324	72.8	2	0.6	9.3	2.3	5.9	99.1	
2018	324	71.8			9.3	2.1	3.7	99.4	
2019	231	70.6			9.2	1.4	4.8	100.0	
2020	118	65.6			9.2	0.0	1.7	100.0	##
1998-2020	6571	71.4	110	1.7	9.2	10.7	15.3	92.8	

6,571 cases diagnosed 1998-2020 are related to a total of 6,533 patients. Currently, in 1,213 (18.6 %) of these 6,533 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 965 / 188 / 60 (14.8 % / 2.9 % / 0.9 %) 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 2018, a subgroup of 324 cases has been diagnosed, of which 9.3 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 2.1 % 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 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	43	170	3.9	14.5	2.7	9.9	3.5	12.4	4.0	13.7
1999	53	152	4.7	12.8	3.2	9.5	4.3	11.5	5.2	12.3
2000	63	177	5.5	14.7	3.7	10.7	5.0	13.1	5.8	13.7
2001	55	145	4.7	11.9	3.2	8.1	4.3	10.2	4.6	10.9
2002	80	234	4.3	12.0	3.0	8.5	3.8	10.5	4.2	11.4
2003	84	219	4.5	11.1	2.9	8.1	3.9	9.9	4.4	10.5
2004	107	249	5.7	12.6	3.9	9.0	5.0	11.1	5.7	11.9
2005	82	291	4.3	14.6	2.8	10.1	3.7	12.7	4.2	13.5
2006	118	307	6.2	15.3	4.1	10.6	5.3	13.5	5.8	14.3
2007	174	411	7.9	17.8	5.3	12.6	6.8	15.7	7.4	16.6
2008	173	491	7.8	21.2	5.4	14.6	6.9	18.3	7.5	19.6
2009	180	450	8.1	19.3	5.6	14.1	7.1	17.3	7.6	18.5
2010	120	405	5.3	17.3	3.3	12.2	4.4	15.0	5.0	16.1
2011	141	332	6.3	14.2	4.2	10.1	5.3	12.2	5.8	13.2
2012	146	319	6.4	13.5	4.3	10.2	5.4	12.2	6.0	12.8
2013	185	294	8.0	12.3	5.5	8.4	7.0	10.5	7.5	11.4
2014	134	299	5.7	12.4	3.8	9.5	4.9	11.2	5.4	11.7
2015	143	302	6.0	12.4	4.1	9.5	5.2	11.2	5.6	11.9
2016	148	327	6.2	13.3	4.2	10.2	5.3	12.1	5.7	12.8
2017	121	324	5.0	13.1	3.5	10.0	4.4	11.9	4.7	12.6
2018	127	324	5.2	13.1	3.8	9.8	4.6	11.7	5.0	12.4
2019	96	231	3.9	9.3	2.8	7.2	3.4	8.6	3.7	8.9
2020	62	118	2.5	4.8	1.8	3.6	2.2	4.3	2.4	4.5
1998-2020	2635	6571	5.7	13.6	3.8	9.8	4.9	12.0	5.3	12.7

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	213	54.9	16.2	13.0	89.6	33.4	43.0	54.4	67.3	76.9
1999	205	52.9	15.9	16.7	88.4	30.0	42.2	53.6	62.2	75.7
2000	240	53.5	16.8	11.3	93.7	32.1	41.7	54.7	65.2	75.6
2001	200	54.2	14.8	17.6	95.4	35.4	42.7	54.8	65.0	73.2
2002	314	55.3	16.2	7.8	91.2	34.6	44.9	55.9	66.6	75.0
2003	303	54.2	16.0	7.6	100	33.6	43.1	55.1	64.7	73.5
2004	356	53.5	15.9	14.8	91.6	31.8	41.8	53.2	64.7	75.1
2005	373	55.0	15.6	13.5	98.2	36.2	43.3	54.8	66.0	74.2
2006	425	54.2	14.6	15.1	94.9	34.9	43.4	55.0	64.9	73.1
2007	585	52.8	14.8	9.3	92.0	34.2	42.0	52.4	63.9	72.3
2008	664	54.3	15.1	12.7	97.7	34.5	43.0	54.9	65.0	73.6
2009	630	52.7	15.7	12.7	93.1	31.9	41.9	52.9	63.6	72.3
2010	525	54.3	16.0	14.3	94.5	34.6	42.9	54.1	65.8	76.2
2011	473	53.7	16.6	10.1	91.5	32.3	41.0	53.1	67.1	75.1
2012	465	52.1	15.7	5.7	91.7	31.8	41.0	51.3	64.0	72.9
2013	479	54.0	16.3	11.6	93.9	32.8	41.6	53.6	66.0	75.9
2014	433	52.4	16.7	6.4	93.1	30.9	41.3	51.1	63.9	73.7
2015	445	51.8	17.0	6.4	97.7	29.5	39.1	50.8	64.3	74.1
2016	475	51.3	16.3	12.6	97.7	30.8	39.0	50.6	63.6	73.7
2017	445	51.0	15.6	13.1	91.2	30.9	39.6	50.4	61.8	73.1
2018	451	51.2	16.0	10.3	97.4	30.4	39.2	50.0	62.8	73.7
2019	327	50.0	15.3	10.1	93.7	30.1	38.9	49.6	57.8	73.3
2020	180	50.6	16.3	13.1	87.2	30.4	37.6	50.5	62.2	74.5
1998-2020	9206	53.0	15.9	5.7	100	32.5	41.5	52.9	64.4	74.1

Table 3a

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	43	54.7	13.9	27.2	81.5	37.2	46.2	55.2	66.2	76.2
1999	53	58.1	15.9	17.5	88.4	34.1	50.1	58.3	71.0	78.0
2000	63	57.6	17.9	15.9	93.7	32.7	45.9	56.7	69.9	79.8
2001	55	54.8	12.3	29.9	78.5	39.7	44.4	55.4	65.0	71.3
2002	80	54.9	16.8	7.8	88.6	34.8	43.0	56.5	65.8	75.4
2003	84	58.7	14.1	24.0	87.9	36.2	50.6	59.7	67.5	77.0
2004	107	55.9	15.4	16.1	88.1	36.4	45.2	57.4	66.5	75.8
2005	82	58.6	14.2	20.1	91.3	41.7	48.3	58.2	68.7	78.2
2006	118	56.2	13.9	19.6	93.4	37.4	46.6	57.8	65.4	72.3
2007	174	53.9	14.0	23.1	84.6	36.5	43.3	53.5	65.0	72.6
2008	173	55.2	14.5	12.7	89.5	35.0	46.6	57.0	64.7	72.7
2009	180	54.6	15.0	13.4	84.7	33.5	46.2	57.6	66.0	71.2
2010	120	58.1	14.9	20.5	88.5	37.9	47.4	57.4	70.4	76.3
2011	141	54.5	15.5	17.3	86.7	35.7	42.8	54.0	67.8	74.5
2012	146	55.8	15.3	19.6	91.7	36.8	44.3	57.3	66.8	74.3
2013	185	54.5	15.2	11.6	89.9	34.2	44.2	55.2	64.9	73.5
2014	134	56.3	16.5	14.3	92.3	35.7	45.0	57.3	67.7	77.6
2015	143	55.4	16.7	10.5	90.8	32.4	44.4	54.7	68.7	76.3
2016	148	54.0	15.7	13.0	85.9	34.1	42.1	52.5	65.9	76.7
2017	121	53.3	14.3	20.6	86.9	35.4	42.9	53.8	63.8	71.9
2018	127	53.1	15.4	13.8	86.5	32.7	43.0	53.5	64.9	73.7
2019	96	53.4	15.7	17.8	86.0	33.2	43.9	53.3	64.6	74.9
2020	62	50.7	17.2	25.3	86.0	30.1	37.3	46.5	62.4	76.3
1998-2020	2635	55.2	15.3	7.8	93.7	35.0	44.5	55.6	66.2	74.8

Table 3b

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	170	54.9	16.7	13.0	89.6	32.9	42.2	54.4	67.7	77.1
1999	152	51.1	15.6	16.7	86.8	28.5	40.2	52.3	61.5	72.7
2000	177	52.0	16.2	11.3	91.0	31.9	40.7	53.2	63.6	72.4
2001	145	54.0	15.7	17.6	95.4	34.4	40.7	54.7	65.0	74.3
2002	234	55.5	16.0	10.0	91.2	34.5	46.5	55.8	66.8	75.0
2003	219	52.4	16.4	7.6	100	32.8	40.2	53.4	63.2	73.5
2004	249	52.4	16.0	14.8	91.6	31.5	40.0	52.6	63.6	74.3
2005	291	54.0	15.8	13.5	98.2	34.2	42.3	54.0	65.3	73.4
2006	307	53.4	14.8	15.1	94.9	34.7	42.1	54.5	63.7	73.2
2007	411	52.3	15.1	9.3	92.0	33.2	41.4	51.8	63.9	72.2
2008	491	54.0	15.3	16.2	97.7	34.3	42.3	54.2	65.2	73.8
2009	450	51.9	15.9	12.7	93.1	31.6	39.9	51.5	62.7	72.7
2010	405	53.2	16.2	14.3	94.5	33.9	41.3	52.5	63.9	76.1
2011	332	53.3	17.1	10.1	91.5	30.4	40.8	52.8	67.0	75.3
2012	319	50.4	15.6	5.7	90.3	30.3	39.0	50.3	61.8	70.4
2013	294	53.6	17.0	16.4	93.9	32.0	40.8	53.0	67.4	77.7
2014	299	50.6	16.5	6.4	93.1	30.0	39.4	49.3	61.9	71.8
2015	302	50.2	17.0	6.4	97.7	28.5	37.5	48.8	61.7	72.4
2016	327	50.0	16.4	12.6	97.7	28.6	37.2	49.9	62.3	72.1
2017	324	50.2	16.0	13.1	91.2	30.0	37.4	49.8	61.5	73.1
2018	324	50.5	16.1	10.3	97.4	29.8	38.1	48.6	61.6	73.7
2019	231	48.6	14.9	10.1	93.7	30.0	37.6	47.7	56.4	69.6
2020	118	50.6	15.9	13.1	87.2	31.1	37.7	51.2	61.9	72.6
1998–2020	6571	52.1	16.1	5.7	100	31.7	40.3	51.8	63.6	73.6

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									
5-9	6	0.1	0.1			0.0	6	0.1	0.1
10-14	36	0.5	0.6	10	0.5	0.5	26	0.6	0.7
15-19	47	0.7	1.4	13	0.7	1.2	34	0.7	1.4
20-24	158	2.4	3.8	34	1.7	2.9	124	2.7	4.1
25-29	256	3.9	7.6	59	3.0	5.9	197	4.3	8.4
30-34	428	6.5	14.2	92	4.7	10.7	336	7.3	15.6
35-39	597	9.1	23.2	139	7.1	17.8	458	9.9	25.5
40-44	697	10.6	33.8	190	9.7	27.5	507	11.0	36.5
45-49	744	11.3	45.1	203	10.4	37.9	541	11.7	48.2
50-54	774	11.8	56.9	246	12.6	50.6	528	11.4	59.6
55-59	675	10.3	67.2	217	11.1	61.7	458	9.9	69.5
60-64	631	9.6	76.8	216	11.1	72.8	415	9.0	78.5
65-69	518	7.9	84.6	187	9.6	82.4	331	7.2	85.6
70-74	447	6.8	91.4	163	8.4	90.7	284	6.1	91.7
75-79	274	4.2	95.6	100	5.1	95.8	174	3.8	95.5
80-84	165	2.5	98.1	54	2.8	98.6	111	2.4	97.9
85+	124	1.9	100.0	27	1.4	100.0	97	2.1	100.0
All ages	6577	100.0		1950	100.0		4627	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=33 %	Females DCO rate n=61 %	Males Prop.all cancers n=153686 %	Females Prop.all cancers n=155051 %
0- 4								
5- 9		6		0.4				6.0
10-14	10	26	0.6	1.7		3.8	7.3	20.3
15-19	13	34	0.8	2.1			4.1	12.8
20-24	34	124	1.7	6.5			5.4	23.9
25-29	59	197	2.6	8.8			6.2	16.6
30-34	92	334	4.0	14.6			7.1	15.6
35-39	137	454	5.9	20.0			7.5	12.9
40-44	187	506	7.5	20.9	0.5		6.7	8.2
45-49	200	536	7.4	20.6			4.0	5.7
50-54	245	528	9.6	21.0			2.9	4.2
55-59	215	454	10.1	20.8			1.7	3.4
60-64	214	410	12.1	21.6	0.9	1.0	1.2	2.6
65-69	183	329	11.2	18.1	2.2		0.8	1.7
70-74	161	282	10.7	16.4	4.3	0.4	0.6	1.4
75-79	100	172	8.3	11.5	8.0	4.1	0.4	0.9
80-84	52	111	7.2	10.4	11.5	15.3	0.3	0.7
85+	27	97	5.8	9.3	18.5	32.0	0.3	0.6
All ages	1929	4600			1.7	1.3	1.3	3.0
Incidence								
Raw			5.9	13.7				
WS			4.0	10.0				
ES			5.1	12.1				
BRD-S			5.5	12.9				

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).

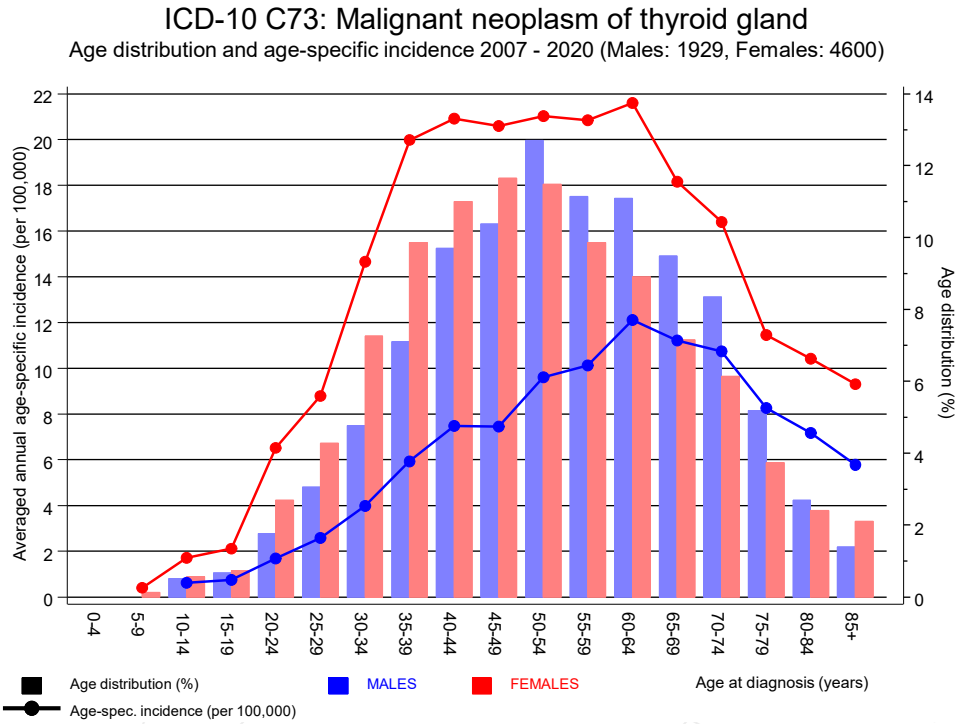


Figure 6. Age distribution (males: mean=54.6 yrs, median=54.6 yrs; females: mean=51.6 yrs, median=50.8 yrs) and age-specific incidence.

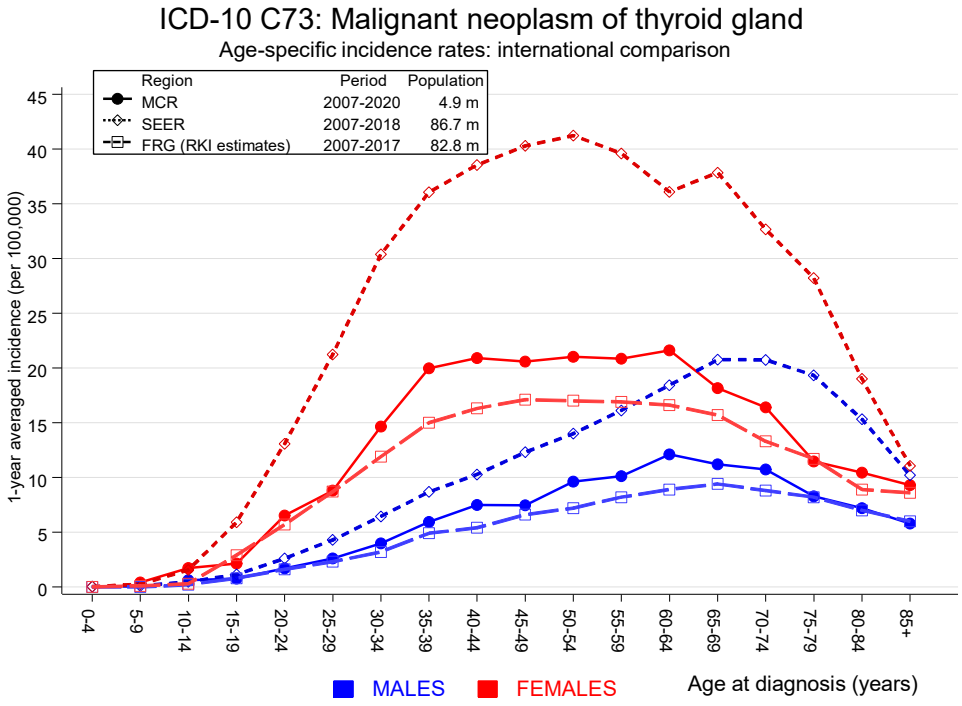


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, RKI estimates) and SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

Estimated age-specific patient population of Germany, latest update: 16 March 2021. German Centre for Cancer Registry Data, Robert Koch Institute (RKI), based on data of the population based cancer registries. http://www.krebsdaten.de. Last access: 08/17/2021
Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 21 Regs Research Data, released April 2021, based on the November 2020 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 1998-2020

MALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C03-C06	Oral cavity	3	1.2	2.5	0.5	7.3		1.7	
C07-C08	Salivary gland	1	0.2	4.1	0.1	22.6		0.7	
C09-C10	Oropharynx	2	1.5	1.3	0.2	4.8		0.5	
C12-C13	Hypopharynx	1	0.8	1.3	0.0	7.1		0.2	
C15	Oesophagus	12	2.5	4.9	2.5	8.5	#	8.8	
C16	Stomach	10	4.0	2.5	1.2	4.6	#	5.6	
C17	Small intestine	2	0.7	2.8	0.3	10.2		1.2	50.0
C18	Colon	18	9.8	1.8	1.1	2.9	#	7.6	
C19-C20	Rectum	21	6.0	3.5	2.2	5.3	#	13.8	
C21	Anus/canal	2	0.3	6.6	0.8	23.7		1.6	
C22	Liver	7	3.2	2.2	0.9	4.4		3.5	14.3
C23-C24	Bile	1	1.1	0.9	0.0	5.1		-0.1	
C25	Pancreas	13	4.2	3.1	1.7	5.4	#	8.2	7.7
C32	Larynx	7	1.2	5.7	2.3	11.7	#	5.3	
C33-C34	Lung	26	13.1	2.0	1.3	2.9	#	12.0	7.7
C37	Thymus	1	0.1	12.7	0.3	70.5		0.9	
C38,C45	Mesothelioma	2	0.7	2.8	0.3	10.2		1.2	
C40-C41	Bone	2	0.1	17.1	2.1	61.9	#	1.7	
C43	Malign. melanoma	16	5.5	2.9	1.7	4.7	#	9.7	
C46,C49	Soft tissue	8	0.7	12.1	5.2	23.9	#	6.8	
C50	Breast	2	0.3	6.5	0.8	23.5		1.6	
C61	Prostate	60	30.2	2.0	1.5	2.6	#	27.6	
C62	Testis	1	0.8	1.2	0.0	6.9		0.2	
C64	Kidney	17	4.0	4.2	2.5	6.8	#	12.0	
C65	Renal pelvis	2	0.5	4.4	0.5	16.0		1.4	
C66	Ureter	2	0.3	7.5	0.9	27.1		1.6	
C67	Bladder	12	4.5	2.6	1.4	4.6	#	6.9	8.3
C68	Urethra	1	0.1	9.4	0.2	52.3		0.8	
C69	Eye melanoma	1	0.1	7.8	0.2	43.6		0.8	
C70-C72	CNS cancer	6	1.6	3.8	1.4	8.3	#	4.1	
C73	Thyroid	25	1.0	24.5	15.8	36.1	#	22.2	
C74-C80	Cancer others	1	0.2	5.0	0.1	27.8		0.7	
C76-C79	CUP	8	1.8	4.6	2.0	9.0	#	5.8	
C82-C85	NHL	14	4.6	3.0	1.7	5.1	#	8.7	
C90	Mult. myeloma	6	1.4	4.3	1.6	9.5	#	4.3	
C91-C96	Leukaemia	5	1.6	3.2	1.0	7.4	#	3.2	
Not observed		0	1.5	0.0	0.0	2.5		-1.4	
All further malignancies		318	111.3	2.9	2.6	3.2	#	191.2	1.9

Patients	2530
Median age at next malignancy (years)	68.0
Person-years	10808
Mean observation time (years)	4.3
Median observation time (years)	2.3

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 1998–2020
FEMALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C03–C06	Oral cavity	2	1.3	1.5	0.2	5.5		0.2	
C07–C08	Salivary gland	6	0.3	18.0	6.6	39.2	#	2.0	
C09–C10	Oropharynx	3	1.1	2.7	0.6	8.0		0.7	33.3
C15	Oesophagus	6	1.4	4.4	1.6	9.5	#	1.6	
C16	Stomach	13	5.5	2.3	1.2	4.0	#	2.6	
C18	Colon	36	16.2	2.2	1.6	3.1	#	6.8	2.8
C19–C20	Rectum	19	7.3	2.6	1.6	4.0	#	4.0	
C21	Anus/canal	2	1.2	1.6	0.2	5.8		0.3	
C22	Liver	4	2.2	1.8	0.5	4.6		0.6	25.0
C23–C24	Bile	5	2.3	2.2	0.7	5.2		0.9	
C25	Pancreas	20	7.7	2.6	1.6	4.0	#	4.2	5.0
C32	Larynx	2	0.4	4.7	0.6	17.1		0.5	50.0
C33–C34	Lung	53	16.0	3.3	2.5	4.3	#	12.8	5.7
C37	Thymus	2	0.1	13.9	1.7	50.2	#	0.6	
C38,C45	Mesothelioma	5	0.3	15.1	4.9	35.1	#	1.6	
C40–C41	Bone	2	0.2	9.0	1.1	32.4	#	0.6	
C43	Malign. melanoma	28	9.6	2.9	1.9	4.2	#	6.4	3.6
C46,C49	Soft tissue	5	1.2	4.2	1.3	9.7	#	1.3	
C48	Peritoneal	4	0.9	4.6	1.2	11.7	#	1.1	25.0
C50	Breast	216	73.0	3.0	2.6	3.4	#	49.4	0.5
C51	Vulva	5	1.9	2.6	0.9	6.1		1.1	
C53	Cervix uteri	8	4.1	2.0	0.8	3.9		1.4	
C54	Corpus uteri	28	11.7	2.4	1.6	3.5	#	5.6	
C56	Ovary	20	8.3	2.4	1.5	3.7	#	4.0	
C64	Kidney	18	4.4	4.1	2.4	6.5	#	4.7	5.6
C66	Ureter	2	0.3	7.1	0.9	25.8		0.6	
C67	Bladder	12	3.1	3.8	2.0	6.7	#	3.1	
C70–C72	CNS cancer	8	2.8	2.8	1.2	5.6	#	1.8	
C73	Thyroid	38	5.4	7.0	4.9	9.6	#	11.2	
C74–C80	Cancer others	5	0.5	10.7	3.5	25.0	#	1.6	
C76–C79	CUP	14	3.0	4.7	2.6	8.0	#	3.8	7.1
C82–C85	NHL	25	7.4	3.4	2.2	5.0	#	6.1	
C90	Mult. myeloma	3	2.2	1.4	0.3	4.0		0.3	33.3
C91–C96	Leukaemia	23	2.7	8.4	5.3	12.6	#	7.0	13.0
Others, specified		7	3.1	2.3	0.9	4.6		1.3	
Not observed		0	1.3	0.0	0.0	2.8		-0.5	
All further malignancies		649	210.6	3.1	2.8	3.3	#	151.3	2.6

Patients	6348
Median age at next malignancy (years)	65.4
Person-years	28970
Mean observation time (years)	4.6
Median observation time (years)	2.6

The occurrence of further specified malignancy is statistically significant.

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

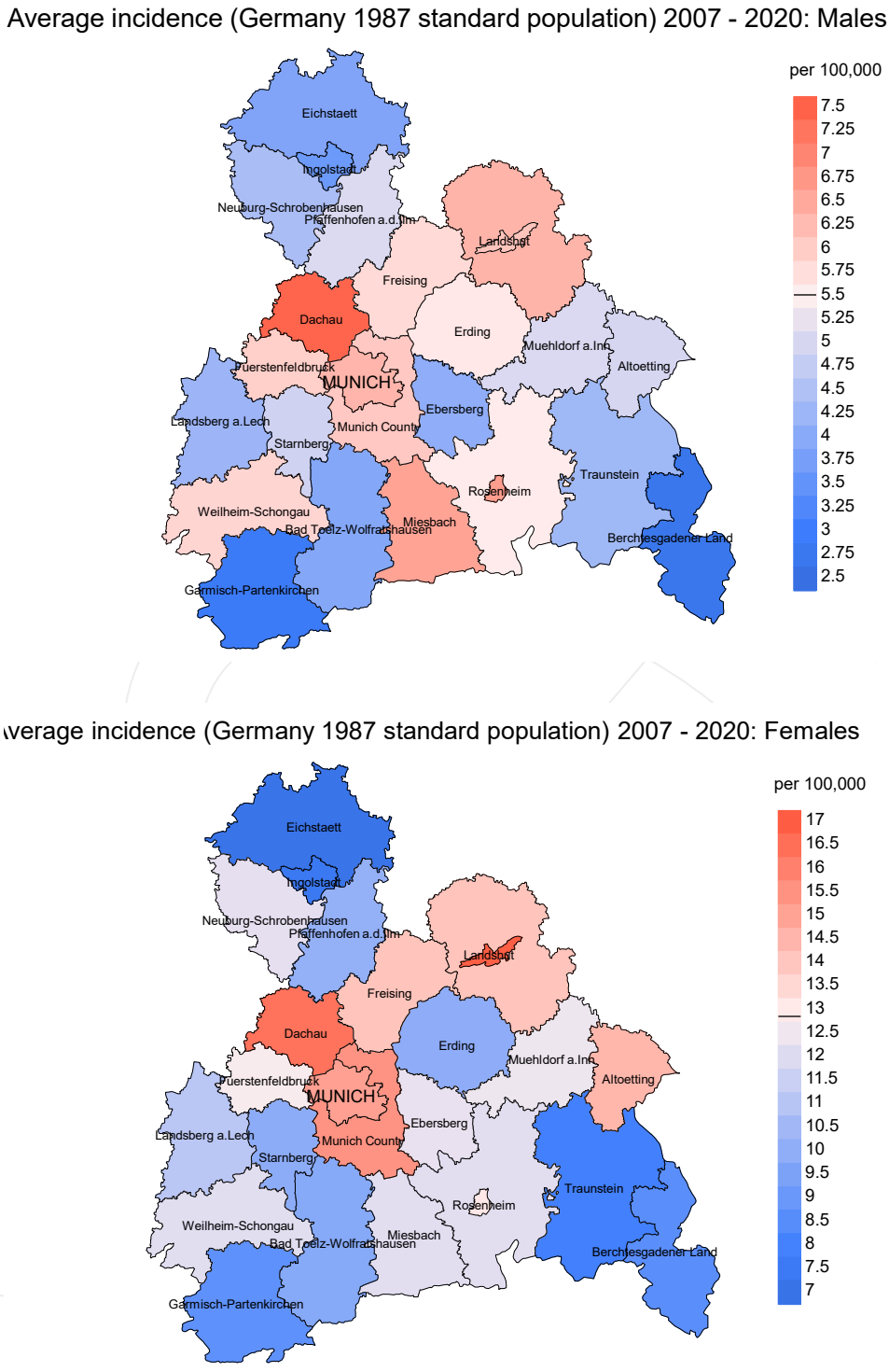


Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 5.5/100,000 WS N=1,929, females 12.9/100,000 WS N=4,600).

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 123 women were identified with newly diagnosed thyroid cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 12.3/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 9.6 and 15.6/100,000.

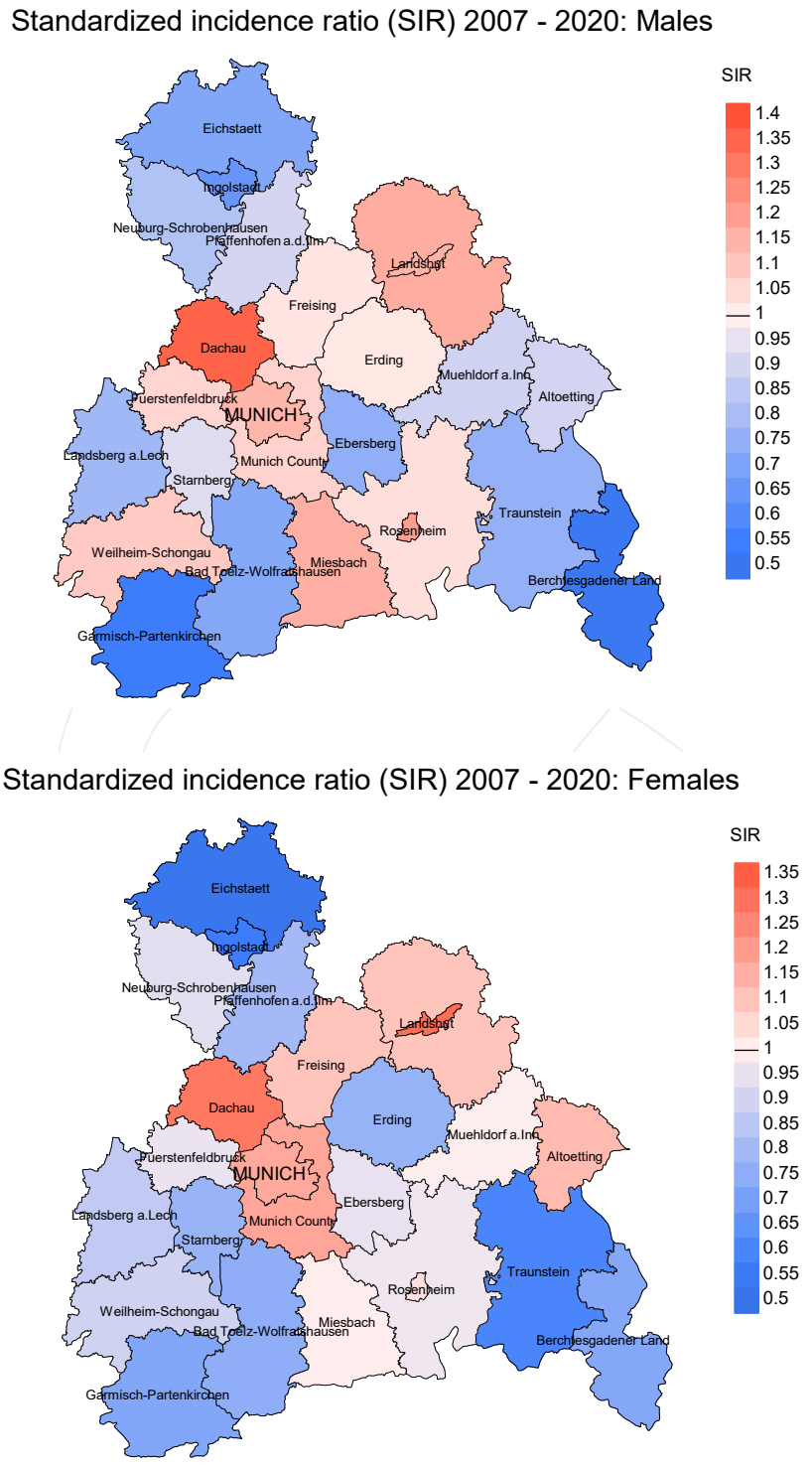


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=1,929, females N=4,600).

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 123 women were identified with newly diagnosed thyroid cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.95. Though, the value of this parameter may vary with an underlying probability of 99% between 0.75 and 1.20, 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	213	92.0	4.2	84	39.4	92.9
1999	205	89.3	2.0	57	27.8	89.5
2000	240	91.7	2.5	74	30.8	94.6
2001	200	91.0	3.0	60	30.0	95.0
2002	314	93.0	4.5	120	38.2	91.7
2003	303	93.1	2.6	84	27.7	94.0
2004	356	89.9	2.5	80	22.5	95.0
2005	373	88.5	2.1	97	26.0	90.7
2006	425	84.2	2.1	92	21.6	95.7
2007	585	82.1	1.4	125	21.4	93.6
2008	664	95.9	2.0	116	17.5	92.2
2009	630	96.3	0.6	98	15.6	92.9
2010	525	95.6	3.2	91	17.3	89.0
2011	473	95.8	1.7	83	17.5	90.4
2012	465	94.2	0.4	75	16.1	96.0
2013	479	96.7	2.7	74	15.4	94.6
2014	433	90.3	2.1	54	12.5	94.4
2015	445	89.7	1.8	54	12.1	83.3
2016	475	97.7	1.9	42	8.8	85.7
2017	445	99.3	0.4	34	7.6	82.4
2018	451	99.6	0.2	19	4.2	57.9
2019	327	99.4		20	6.1	70.0
2020	180	100.0		5	2.8	100.0
1998-2020	9206	93.3	1.8	1638	17.8	91.6

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	213	53	96.2	18	8.5
1999	205	45	88.9	11	5.4
2000	240	48	91.7	13	5.4
2001	200	38	86.8	13	6.5
2002	314	69	98.6	26	8.3
2003	303	79	96.2	18	5.9
2004	356	69	95.7	20	5.6
2005	373	84	100.0	20	5.4
2006	425	100	98.0	18	4.2
2007	585	92	93.5	24	4.1
2008	664	73	98.6	24	3.6
2009	630	88	96.6	19	3.0
2010	525	114	98.2	30	5.7
2011	473	134	100.0	32	6.8
2012	465	119	95.8	17	3.7
2013	479	123	99.2	28	5.8
2014	433	135	99.3	29	6.7
2015	445	121	98.3	17	3.8
2016	475	148	97.3	21	4.4
2017	445	122	96.7	13	2.9
2018	451	102	72.5	9	2.0
2019	327	113	33.6	9	2.8
2020	180	138	84.1	4	2.2
1998–2020	9206	2207	91.9	433	4.7

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	53	79.2	20.8	94.1
1999	45	71.1	28.9	87.5
2000	48	77.1	22.9	88.6
2001	38	68.4	31.6	87.9
2002	69	84.1	15.9	98.5
2003	79	68.4	31.6	84.2
2004	69	71.0	29.0	81.8
2005	84	76.2	23.8	77.4
2006	100	71.0	29.0	82.7
2007	92	73.9	26.1	83.7
2008	73	68.5	31.5	87.5
2009	88	73.9	26.1	87.1
2010	114	71.9	28.1	75.9
2011	134	67.2	32.8	80.6
2012	119	62.2	37.8	66.7
2013	123	61.8	38.2	70.5
2014	135	72.6	27.4	81.3
2015	121	58.7	41.3	68.9
2016	148	65.5	34.5	75.7
2017	122	63.9	36.1	63.6
2018	102	41.2	58.8	43.2
2019	113	33.6	66.4	44.7
2020	138	32.6	67.4	61.2
1998-2020	2207	63.8	36.2	76.0

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	18	73.3	73.3	59.1	73.3
1999	18	68.9	69.2	63.7	70.5
2000	22	76.8	78.0	74.0	76.8
2001	14	72.2	70.7	75.0	71.1
2002	21	74.8	74.7	87.0	75.5
2003	26	74.8	74.9	73.2	74.9
2004	28	71.8	72.3	71.3	70.7
2005	29	79.1	79.4	68.6	76.6
2006	36	72.2	71.1	80.1	71.5
2007	35	73.3	73.3	66.6	73.3
2008	19	77.1	77.7	70.8	77.7
2009	26	73.0	68.7	79.2	70.6
2010	41	72.3	71.5	81.1	71.6
2011	44	71.6	68.0	77.3	70.4
2012	46	75.3	75.1	75.6	75.0
2013	49	76.1	69.0	80.9	72.3
2014	57	70.3	70.3	75.4	70.3
2015	41	76.1	75.2	79.7	75.9
2016	58	75.2	75.5	74.9	75.5
2017	38	75.9	75.4	79.1	75.4
2018	36	74.8	74.6	74.8	70.9
2019	51	78.7	68.0	81.4	69.9
2020	49	77.0	69.1	80.1	69.1
1998–2020	802	74.7	72.9	77.3	73.3

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	35	78.1	77.4	79.8	79.3
1999	27	74.7	72.0	76.9	71.7
2000	26	77.0	71.2	89.6	76.5
2001	24	79.1	67.3	80.0	78.9
2002	48	76.6	76.7	75.2	76.6
2003	53	78.2	77.7	78.2	78.4
2004	41	79.4	78.4	80.3	76.5
2005	55	78.0	76.1	83.6	76.1
2006	64	76.6	75.3	83.5	75.4
2007	57	78.0	78.0	75.9	78.1
2008	54	76.6	73.0	81.2	76.2
2009	62	76.9	76.9	79.4	80.0
2010	73	77.0	72.3	82.8	73.4
2011	90	78.5	78.1	81.3	78.1
2012	73	79.3	78.7	80.0	77.7
2013	74	78.6	77.1	79.4	77.3
2014	78	77.0	76.2	78.7	75.9
2015	80	78.7	77.7	81.5	77.6
2016	90	77.2	76.3	80.6	75.4
2017	84	76.9	73.6	81.6	73.6
2018	66	78.7	75.1	80.5	76.9
2019	62	82.1	81.6	83.3	81.8
2020	89	81.2	80.2	82.4	79.6
1998–2020	1405	78.4	76.6	80.8	76.8

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	16	1.4	0.37	0.8	0.30	1.3	0.37	1.9	0.48
1999	13	1.2	0.25	0.7	0.21	1.0	0.24	1.4	0.27
2000	19	1.7	0.31	0.9	0.24	1.5	0.31	2.2	0.40
2001	10	0.9	0.18	0.5	0.15	0.8	0.18	1.0	0.22
2002	18	1.0	0.23	0.5	0.16	0.8	0.21	1.1	0.27
2003	20	1.1	0.24	0.5	0.19	0.9	0.22	1.2	0.28
2004	21	1.1	0.20	0.6	0.15	0.9	0.18	1.3	0.23
2005	22	1.2	0.27	0.6	0.20	0.9	0.24	1.3	0.31
2006	29	1.5	0.25	0.8	0.18	1.2	0.22	1.6	0.27
2007	26	1.2	0.15	0.6	0.11	0.9	0.13	1.2	0.17
2008	14	0.6	0.08	0.3	0.05	0.5	0.07	0.7	0.09
2009	19	0.9	0.11	0.4	0.08	0.6	0.09	0.8	0.11
2010	32	1.4	0.27	0.7	0.20	1.0	0.23	1.3	0.26
2011	31	1.4	0.22	0.7	0.17	1.0	0.20	1.3	0.22
2012	36	1.6	0.25	0.7	0.17	1.1	0.21	1.5	0.26
2013	29	1.3	0.16	0.6	0.12	0.9	0.14	1.2	0.16
2014	45	1.9	0.34	0.9	0.25	1.4	0.29	1.8	0.33
2015	28	1.2	0.20	0.5	0.14	0.8	0.16	1.1	0.19
2016	42	1.7	0.29	0.8	0.18	1.1	0.22	1.6	0.28
2017	25	1.0	0.21	0.4	0.12	0.7	0.15	0.9	0.20
2018	14	0.6	0.11	0.2	0.06	0.4	0.08	0.5	0.10
2019	16	0.7	0.17	0.3	0.12	0.5	0.14	0.6	0.16
2020	23	0.9	0.37	0.5	0.25	0.7	0.30	0.8	0.35
1998-2020	548	1.2	0.21	0.6	0.15	0.9	0.18	1.1	0.22

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	26	2.2	0.15	0.8	0.08	1.3	0.10	1.9	0.14
1999	19	1.6	0.13	0.7	0.08	1.1	0.09	1.4	0.12
2000	18	1.5	0.10	0.8	0.07	1.1	0.08	1.3	0.09
2001	16	1.3	0.11	0.6	0.07	0.8	0.08	1.0	0.10
2002	40	2.0	0.17	0.8	0.09	1.2	0.12	1.7	0.15
2003	34	1.7	0.16	0.7	0.08	1.0	0.10	1.3	0.13
2004	28	1.4	0.11	0.5	0.06	0.8	0.07	1.1	0.09
2005	42	2.1	0.14	0.8	0.08	1.2	0.10	1.6	0.12
2006	42	2.1	0.14	0.8	0.07	1.3	0.09	1.7	0.12
2007	42	1.8	0.10	0.7	0.05	1.0	0.07	1.4	0.09
2008	36	1.6	0.07	0.6	0.04	0.9	0.05	1.2	0.06
2009	46	2.0	0.10	0.7	0.05	1.1	0.06	1.3	0.07
2010	50	2.1	0.12	0.8	0.07	1.3	0.08	1.6	0.10
2011	59	2.5	0.18	0.8	0.08	1.3	0.11	1.8	0.14
2012	38	1.6	0.12	0.6	0.05	0.9	0.07	1.2	0.09
2013	47	2.0	0.16	0.7	0.09	1.1	0.10	1.5	0.13
2014	53	2.2	0.18	0.8	0.08	1.2	0.11	1.6	0.14
2015	43	1.8	0.14	0.6	0.06	0.9	0.08	1.3	0.11
2016	55	2.2	0.17	0.9	0.09	1.3	0.10	1.7	0.13
2017	53	2.2	0.16	0.9	0.09	1.3	0.11	1.6	0.13
2018	28	1.1	0.09	0.4	0.04	0.6	0.05	0.8	0.06
2019	22	0.9	0.10	0.2	0.03	0.4	0.04	0.6	0.07
2020	22	0.9	0.19	0.2	0.06	0.4	0.09	0.6	0.13
1998-2020	859	1.8	0.13	0.6	0.07	1.0	0.08	1.3	0.11

Table 12

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

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4									
5-9									
10-14	1	0.1	0.1			0.0	1	0.2	0.2
15-19	0	0.0	0.1			0.0			0.2
20-24	0	0.0	0.1			0.0			0.2
25-29	3	0.3	0.4	1	0.3	0.3	2	0.3	0.5
30-34	3	0.3	0.7	2	0.5	0.8	1	0.2	0.7
35-39	7	0.7	1.4	5	1.3	2.1	2	0.3	1.0
40-44	5	0.5	2.0	1	0.3	2.4	4	0.7	1.7
45-49	22	2.3	4.2	8	2.1	4.5	14	2.4	4.0
50-54	26	2.7	6.9	13	3.4	7.9	13	2.2	6.2
55-59	48	4.9	11.8	17	4.5	12.4	31	5.2	11.4
60-64	101	10.4	22.2	56	14.7	27.1	45	7.6	19.0
65-69	115	11.8	34.0	54	14.2	41.3	61	10.3	29.3
70-74	154	15.8	49.8	64	16.8	58.2	90	15.2	44.4
75-79	170	17.5	67.2	73	19.2	77.4	97	16.3	60.8
80-84	155	15.9	83.2	46	12.1	89.5	109	18.4	79.1
85+	164	16.8	100.0	40	10.5	100.0	124	20.9	100.0
All ages	974	100.0		380	100.0		594	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.	Males MI-index	Females Age-spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14		1			0.1	0.04		4.3
15-19								
20-24								
25-29	1	2	0.0	0.02	0.1	0.01	1.1	2.0
30-34	2	1	0.1	0.02	0.0	0.00	1.4	0.6
35-39	5	2	0.2	0.04	0.1	0.00	1.9	0.5
40-44	1	4	0.0	0.01	0.2	0.01	0.2	0.5
45-49	8	14	0.3	0.04	0.5	0.03	0.6	0.8
50-54	13	13	0.5	0.05	0.5	0.02	0.5	0.5
55-59	17	31	0.8	0.08	1.4	0.07	0.4	0.8
60-64	56	45	3.2	0.26	2.4	0.11	0.9	0.9
65-69	54	61	3.3	0.30	3.4	0.19	0.6	0.9
70-74	64	90	4.3	0.40	5.2	0.32	0.5	1.0
75-79	73	97	6.0	0.73	6.5	0.56	0.6	1.0
80-84	46	109	6.4	0.88	10.2	0.98	0.4	1.2
85+	40	124	8.6	1.48	11.9	1.28	0.4	1.0
All ages	380	594					0.5	1.0
Mortality								
Raw			1.2	0.20	1.8	0.13		
WS			0.5	0.14	0.6	0.06		
ES			0.8	0.16	1.0	0.08		
BRD-S			1.1	0.20	1.3	0.10		
PYLL-70								
per 100,000			5.2		6.3			
ES			4.5		5.3			
AYLL-70			9.4		10.2			

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	8	2.4	2	25.0	3	37.5	3	37.5
C09–C10	Oropharynx	7	2.1	3	42.9			4	57.1
C11	Nasopharynx	1	0.3					1	100.0
C12–C13	Hypopharynx	2	0.6	1	50.0	1	50.0		
C15	Oesophagus	14	4.3	4	28.6	3	21.4	7	50.0
C16	Stomach	9	2.8	1	11.1			8	88.9
C17	Small intestine	2	0.6	1	50.0			1	50.0
C18	Colon	18	5.5	8	44.4	2	11.1	8	44.4
C19–C20	Rectum	9	2.8	2	22.2			7	77.8
C21	Anus/canal	2	0.6	1	50.0			1	50.0
C22	Liver	10	3.1	2	20.0			8	80.0
C23–C24	Bile	1	0.3					1	100.0
C25	Pancreas	10	3.1	1	10.0			9	90.0
C32	Larynx	8	2.4	5	62.5	1	12.5	2	25.0
C33–C34	Lung	41	12.5	5	12.2	3	7.3	33	80.5
C37	Thymus	1	0.3	1	100.0				
C38,C45	Mesothelioma	1	0.3					1	100.0
C43	Malign. melanoma	14	4.3	10	71.4			4	28.6
C44	Skin others	14	4.3	6	42.9	2	14.3	6	42.9
C46,C49	Soft tissue	7	2.1	1	14.3	1	14.3	5	71.4
C48	Peritoneal	1	0.3					1	100.0
C60	Penis	1	0.3					1	100.0
C61	Prostate	53	16.2	37	69.8			16	30.2
C62	Testis	3	0.9	3	100.0				
C64	Kidney	19	5.8	10	52.6			9	47.4
C65	Renal pelvis	1	0.3					1	100.0
C66	Ureter	1	0.3					1	100.0
C67	Bladder	16	4.9	4	25.0			12	75.0
C69	Eye melanoma	2	0.6	2	100.0				
C70–C72	CNS cancer	8	2.4	1	12.5			7	87.5
C73	Thyroid	4	1.2			3	75.0	1	25.0
C74–C80	Cancer others	1	0.3	1	100.0				
C76–C79	CUP	13	4.0	2	15.4	1	7.7	10	76.9
C81	Hodgkin lymphoma	1	0.3	1	100.0				
C82–C85	NHL	11	3.4	3	27.3			8	72.7
C90	Mult. myeloma	5	1.5	2	40.0			3	60.0
C91–C96	Leukaemia	8	2.4	1	12.5			7	87.5
All further malignancies		327	100.0	121	37.0	20	6.1	186	56.9

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 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 ←%
C07–C08	Salivary gland	2	0.4	1	50.0			1	50.0
C09–C10	Oropharynx	4	0.7			1	25.0	3	75.0
C12–C13	Hypopharynx	2	0.4	1	50.0			1	50.0
C15	Oesophagus	5	0.9					5	100.0
C16	Stomach	14	2.6	4	28.6			10	71.4
C18	Colon	32	5.9	14	43.8	2	6.3	16	50.0
C19–C20	Rectum	16	2.9	3	18.8	1	6.3	12	75.0
C21	Anus/canal	3	0.5	2	66.7			1	33.3
C22	Liver	8	1.5	2	25.0	1	12.5	5	62.5
C23–C24	Bile	4	0.7					4	100.0
C25	Pancreas	24	4.4	1	4.2			23	95.8
C32	Larynx	2	0.4			1	50.0	1	50.0
C33–C34	Lung	60	11.0	7	11.7	8	13.3	45	75.0
C38,C45	Mesothelioma	4	0.7					4	100.0
C40–C41	Bone	2	0.4					2	100.0
C43	Malign. melanoma	16	2.9	12	75.0			4	25.0
C44	Skin others	17	3.1	8	47.1	1	5.9	8	47.1
C46,C49	Soft tissue	7	1.3	3	42.9			4	57.1
C48	Peritoneal	2	0.4					2	100.0
C50	Breast	142	26.0	64	45.1	3	2.1	75	52.8
C53	Cervix uteri	11	2.0	8	72.7			3	27.3
C54	Corpus uteri	14	2.6	7	50.0			7	50.0
C56	Ovary	27	4.9	5	18.5			22	81.5
C64	Kidney	31	5.7	18	58.1	2	6.5	11	35.5
C66	Ureter	2	0.4					2	100.0
C67	Bladder	11	2.0	2	18.2	1	9.1	8	72.7
C69	Eye melanoma	2	0.4	1	50.0			1	50.0
C70–C72	CNS cancer	11	2.0					11	100.0
C73	Thyroid	6	1.1			5	83.3	1	16.7
C74–C80	Cancer others	2	0.4			2	100.0		
C76–C79	CUP	17	3.1	2	11.8			15	88.2
C81	Hodgkin lymphoma	2	0.4	2	100.0				
C82–C85	NHL	16	2.9	5	31.3			11	68.8
C90	Mult. myeloma	5	0.9	1	20.0			4	80.0
C91–C96	Leukaemia	19	3.5			1	5.3	18	94.7
Others, specified		5	0.9	1	20.0			4	80.0
All further malignancies		547	100.0	174	31.8	29	5.3	344	62.9

Further malignancies with number of cases 1 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								
5- 9								
10-14								
15-19								
20-24								
25-29		2			0.1	0.01		2.2
30-34	2	1	0.1	0.02	0.0	0.00	1.4	0.6
35-39	4	1	0.2	0.03	0.0	0.00	1.6	0.3
40-44	1	3	0.0	0.01	0.1	0.01	0.2	0.4
45-49	6	12	0.2	0.03	0.5	0.02	0.5	0.8
50-54	9	10	0.4	0.04	0.4	0.02	0.4	0.4
55-59	15	23	0.7	0.08	1.1	0.06	0.4	0.7
60-64	46	35	2.6	0.26	1.8	0.10	0.9	0.9
65-69	37	51	2.3	0.27	2.8	0.19	0.5	0.9
70-74	47	72	3.1	0.41	4.2	0.33	0.5	1.1
75-79	50	70	4.1	0.76	4.7	0.53	0.5	0.9
80-84	32	89	4.4	0.97	8.4	1.14	0.4	1.2
85+	26	90	5.6	1.73	8.6	1.38	0.4	1.0
All ages	275	459					0.5	0.9
Mortality								
Raw			0.8	0.17	1.4	0.11		
WS			0.4	0.11	0.5	0.05		
ES			0.6	0.14	0.7	0.07		
BRD-S			0.8	0.17	1.0	0.08		
PYLL-70								
per 100,000			4.0		4.8			
ES			3.5		4.0			
AYLL-70			9.6		9.9			

* 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.	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		2			0.1	0.01		2.3
30-34	2	1	0.1	0.02	0.0	0.00	1.5	0.6
35-39	3		0.1	0.02			1.2	
40-44	1	1	0.0	0.01	0.0	0.00	0.2	0.1
45-49	5	5	0.2	0.03	0.2	0.01	0.4	0.4
50-54	7	5	0.3	0.03	0.2	0.01	0.3	0.2
55-59	12	11	0.6	0.07	0.5	0.03	0.3	0.4
60-64	28	15	1.6	0.19	0.8	0.05	0.5	0.4
65-69	21	27	1.3	0.18	1.5	0.11	0.3	0.5
70-74	33	34	2.2	0.33	2.0	0.18	0.4	0.5
75-79	35	36	2.9	0.60	2.4	0.31	0.4	0.5
80-84	18	60	2.5	0.58	5.6	0.85	0.3	0.9
85+	17	70	3.6	1.31	6.7	1.15	0.3	0.8
All ages	182	267					0.4	0.6
Mortality								
Raw			0.6	0.12	0.8	0.07		
WS			0.3	0.08	0.3	0.03		
ES			0.4	0.10	0.4	0.04		
BRD-S			0.5	0.12	0.6	0.05		
PYLL-70								
per 100,000			3.0		2.4			
ES			2.6		2.0			
AYLL-70			10.7		10.0			

* See corresponding tables with multiple malignancies.

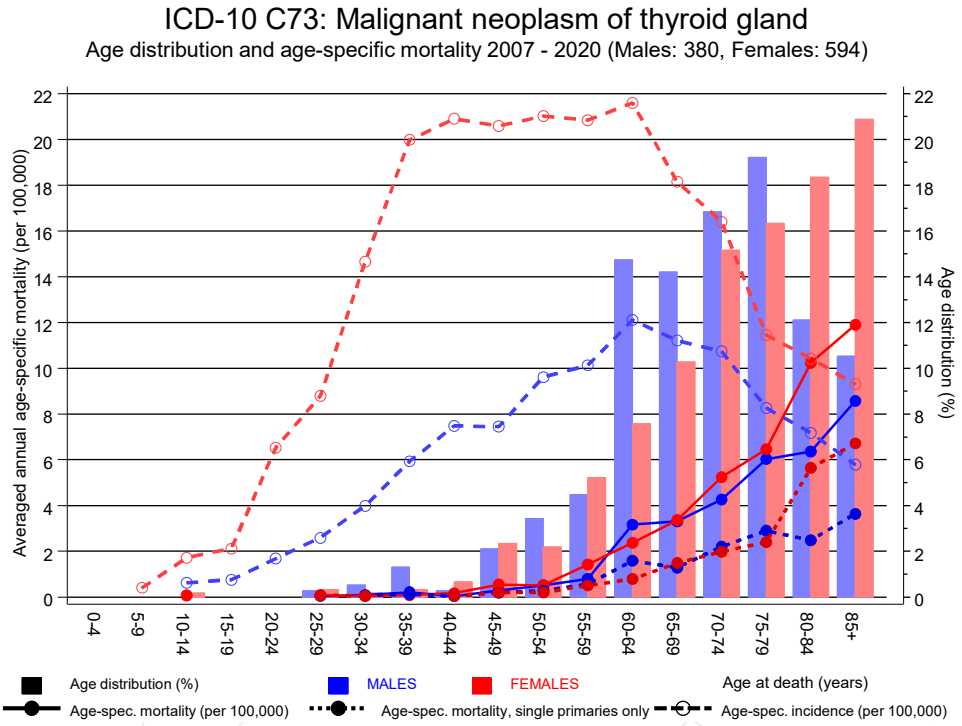


Figure 17. Distribution of age at death (bars; males: mean=64.7 yrs, median=65.7 yrs; females: mean=66.4 yrs, median=68.4 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

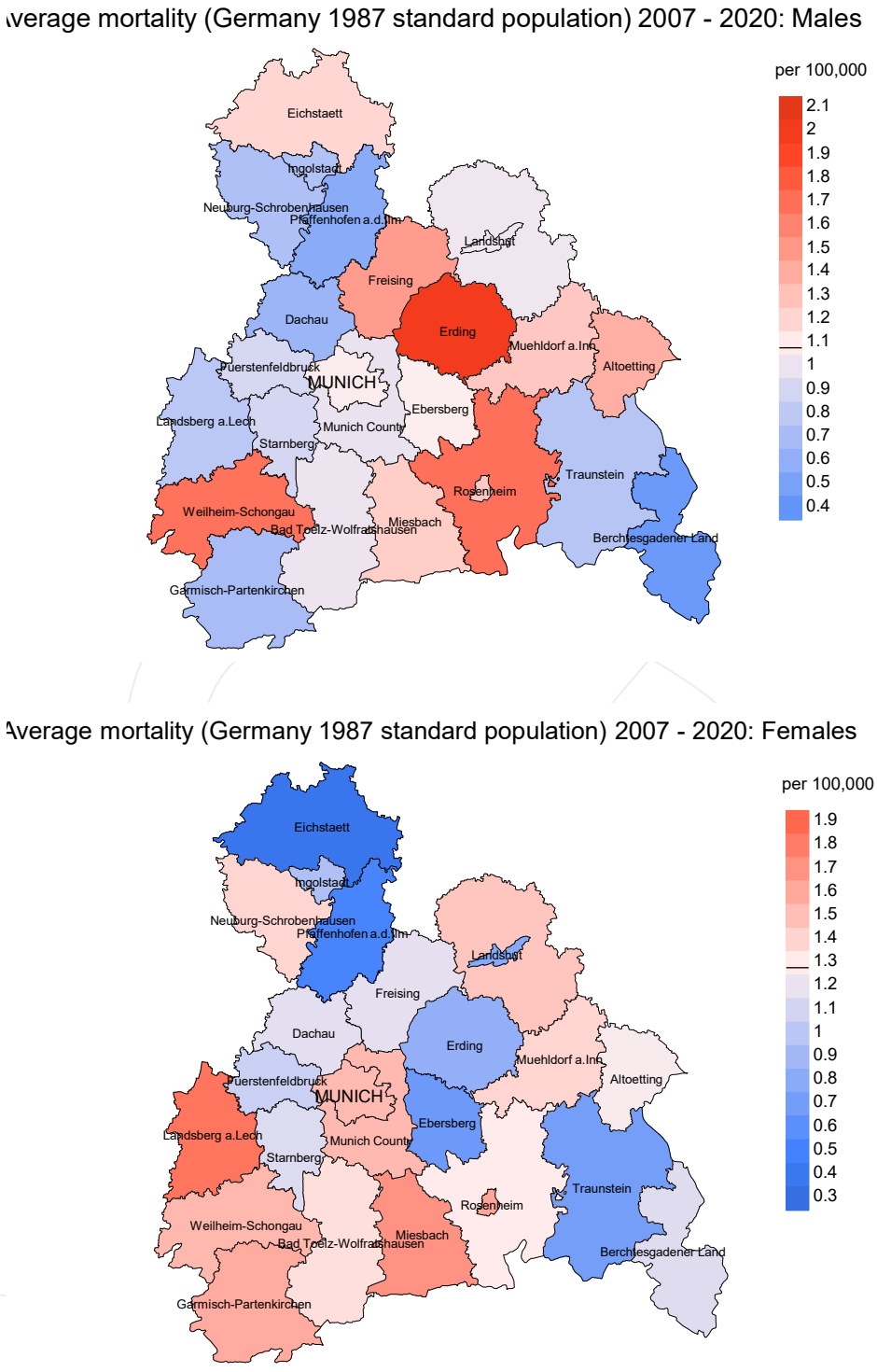
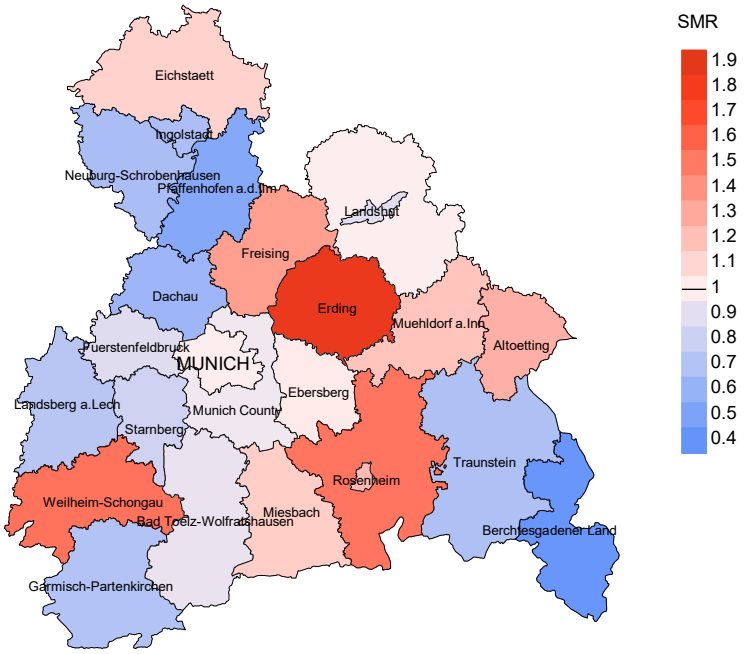


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2020. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 1.1/100,000 WS N=380, females 1.3/100,000 WS N=594).

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 9 women died from thyroid cancer. Therefore, the mean mortality 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 1.6/100,000.

Standardized mortality ratio (SMR) 2007 - 2020: Males



Standardized mortality ratio (SMR) 2007 - 2020: Females

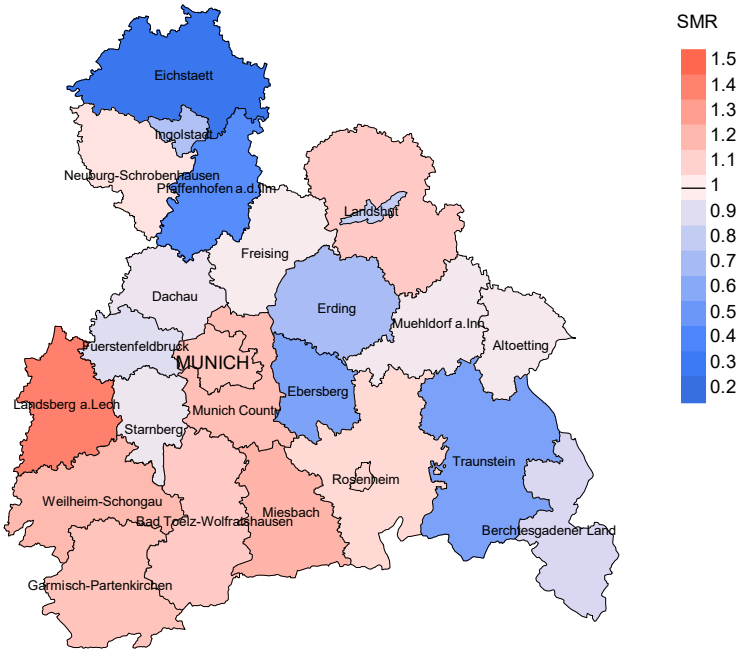


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=380, females N=594).

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 9 women died from thyroid cancer. Therefore, the mean standardized mortality ratio (SMR) 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 0.20 and 1.26, 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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