Munich Cancer Registry

- Survival
- Selection Matrix
- Homepage
- *Deutsch*

ICD-10 C00-C14: HN cancer

Incidence and Mortality

Year of diagnosis	1998-2020
Patients	11,617
Diseases	12,084
Creation date	12/20/2021
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/bC0014E-ICD-10-C00-C14-HN-cancer-incidence-and-mortality.pdf

Index of figures and tables

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

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

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

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

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

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

Munich Cancer Registry, 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.

Some remarks regarding this cancer type

As a general rule, these few results from the TRM form the basis of sophisticated analyses. For head and neck tumors this is not the case. Therefore the results for head and neck tumors should be interpreted with caution. In part this is due to problems of classification because of limited specific details of locality. Additionally, with advanced tumors in a close topographic location it is often not possible to determine the exact ICD localization of a tumor.

ICD-10 codes (ICD-10 2016) used for specifying cancer site

Code	Description
C00.-	Malignant neoplasm of lip
C01	Malignant neoplasm of base of tongue
C02.-	Malignant neoplasm of other and unspecified parts of tongue
C03.-	Malignant neoplasm of gum
C04.-	Malignant neoplasm of floor of mouth
C05.-	Malignant neoplasm of palate
C06.-	Malignant neoplasm of other and unspecified parts of mouth
C07	Malignant neoplasm of parotid gland
C08.-	Malignant neoplasm of other and unspecified major salivary glands
C09.-	Malignant neoplasm of tonsil
C10.-	Malignant neoplasm of oropharynx
C11.-	Malignant neoplasm of nasopharynx
C12	Malignant neoplasm of piriform sinus
C13.-	Malignant neoplasm of hypopharynx
C14.-	Malignant neoplasm of other and ill-defined sites in the lip, oral cavity and pharynx

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	355	20	5.6	10.7	17.0	85.6	99.2
1999	386	18	4.7	12.4	16.8	83.9	96.9
2000	346	18	5.2	12.0	16.7	85.3	97.7
2001	360	26	7.2	12.5	16.5	83.3	96.9
2002	558	39	7.0	13.5	16.3	82.4	98.0 #
2003	570	25	4.4	14.1	16.0	81.8	98.8
2004	546	26	4.8	14.2	15.5	80.2	98.5
2005	574	27	4.7	14.6	15.2	76.5	97.4
2006	555	13	2.3	14.7	14.7	77.5	95.5
2007	674	41	6.1	14.7	14.4	74.2	95.3 #
2008	706	25	3.5	15.0	13.9	74.2	98.7
2009	696	14	2.0	15.6	13.3	72.3	98.1
2010	741	35	4.7	15.9	12.7	67.3	97.8
2011	660	29	4.4	16.4	11.8	63.8	98.2
2012	666	31	4.7	16.7	11.2	62.6	98.2
2013	707	24	3.4	16.9	10.7	61.5	98.2
2014	615	25	4.1	17.3	10.2	62.3	96.7
2015	625	20	3.2	17.5	9.6	54.9	97.9
2016	552	19	3.4	17.9	9.9	52.2	99.5
2017	448	17	3.8	18.4	8.6	44.9	99.1
2018	338	15	4.4	18.7	7.1	39.1	99.1
2019	219	1	0.5	18.9	6.3	33.8	99.5
2020	187	1	0.5	19.2	5.2	30.5	99.5 ##
1998-2020	12084	509	4.2	19.2	17.0	68.1	97.9

12,084 cases diagnosed 1998-2020 are related to a total of 11,617 patients. Currently, in 3,827 (32.9 %) of these 11,617 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 2,854 / 689 / 284 (24.6 % / 5.9 % / 2.4 %) 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 338 cases has been diagnosed, of which 18.7 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 7.1 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1a

Cases with invasive cancer by year of diagnosis, proportions of 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	268	75.5	13	4.9	10.4	17.1	88.1	98.9
1999	278	72.0	10	3.6	12.1	17.0	86.7	97.5
2000	263	76.0	12	4.6	11.7	16.8	86.3	98.5
2001	267	74.2	17	6.4	12.4	16.7	85.0	97.4
2002	409	73.3	29	7.1	13.3	16.5	84.1	98.3 #
2003	421	73.9	17	4.0	14.3	16.1	84.1	99.5
2004	415	76.0	17	4.1	14.6	15.6	79.8	98.3
2005	423	73.7	18	4.3	14.9	15.3	78.0	97.6
2006	394	71.0	10	2.5	14.9	14.8	83.2	95.9
2007	498	73.9	27	5.4	14.9	14.5	77.5	96.0 #
2008	513	72.7	18	3.5	15.3	13.9	74.3	99.2
2009	499	71.7	9	1.8	15.8	13.4	75.8	98.0
2010	545	73.5	24	4.4	16.2	12.6	69.5	98.3
2011	470	71.2	19	4.0	16.6	11.7	67.4	98.3
2012	466	70.0	19	4.1	16.9	10.8	65.9	98.9
2013	493	69.7	14	2.8	16.9	10.1	64.5	98.2
2014	454	73.8	18	4.0	17.4	9.4	66.3	97.6
2015	421	67.4	14	3.3	17.6	8.6	56.8	98.1
2016	396	71.7	14	3.5	18.1	8.9	53.5	99.5
2017	318	71.0	11	3.5	18.5	7.7	48.7	98.7
2018	229	67.8	9	3.9	18.8	5.6	41.9	99.1
2019	144	65.8			19.0	5.0	39.6	100.0
2020	133	71.1	1	0.8	19.2	4.8	33.8	100.0 ##
1998-2020	8717	72.1	340	3.9	19.2	17.1	71.0	98.2

8,717 cases diagnosed 1998-2020 are related to a total of 8,373 patients. Currently, in 2,783 (33.2 %) of these 8,373 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 2,062 / 501 / 220 (24.6 % / 6.0 % / 2.6 %) 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 229 cases has been diagnosed, of which 18.8 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 5.6 % 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	87	24.5	7	8.0	11.5	16.5	78.2	100.0	
1999	108	28.0	8	7.4	13.3	16.4	76.9	95.4	
2000	83	24.0	6	7.2	12.6	16.4	81.9	95.2	
2001	93	25.8	9	9.7	12.9	16.1	78.5	95.7	
2002	149	26.7	10	6.7	14.0	15.8	77.9	97.3	#
2003	149	26.1	8	5.4	13.5	15.7	75.2	96.6	
2004	131	24.0	9	6.9	13.0	15.2	81.7	99.2	
2005	151	26.3	9	6.0	14.0	14.9	72.2	96.7	
2006	161	29.0	3	1.9	14.4	14.4	63.4	94.4	
2007	176	26.1	14	8.0	14.1	14.1	64.8	93.2	#
2008	193	27.3	7	3.6	14.2	13.8	74.1	97.4	
2009	197	28.3	5	2.5	15.3	13.3	63.5	98.5	
2010	196	26.5	11	5.6	15.1	13.0	61.2	96.4	
2011	190	28.8	10	5.3	15.7	12.2	54.7	97.9	
2012	200	30.0	12	6.0	16.2	12.0	55.0	96.5	
2013	214	30.3	10	4.7	16.6	12.1	54.7	98.1	
2014	161	26.2	7	4.3	17.0	12.1	50.9	94.4	
2015	204	32.6	6	2.9	17.1	11.9	51.0	97.5	
2016	156	28.3	5	3.2	17.6	12.2	48.7	99.4	
2017	130	29.0	6	4.6	18.3	10.6	35.4	100.0	
2018	109	32.2	6	5.5	18.7	10.3	33.0	99.1	
2019	75	34.2	1	1.3	18.8	9.2	22.7	98.7	
2020	54	28.9			19.2	6.3	22.2	98.1	##
1998-2020	3367	27.9	169	5.0	19.2	16.5	60.7	97.1	

3,367 cases diagnosed 1998-2020 are related to a total of 3,244 patients. Currently, in 1,044 (32.2 %) of these 3,244 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 792 / 188 / 64 (24.4 % / 5.8 % / 2.0 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:
In 2018, a subgroup of 109 cases has been diagnosed, of which 18.7 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 10.3 % 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	268	87	24.2	7.4	16.3	4.0	21.9	5.6	24.2	6.6
1999	278	108	24.8	9.1	16.1	5.2	22.4	7.1	24.8	8.0
2000	263	83	23.1	6.9	15.3	4.0	21.1	5.5	23.5	6.3
2001	267	93	23.0	7.6	15.1	4.3	20.7	6.0	23.2	6.7
2002	409	149	22.0	7.6	14.2	4.0	19.4	5.7	21.3	6.6
2003	421	149	22.5	7.6	14.7	4.2	20.3	5.8	22.0	6.7
2004	415	131	22.1	6.6	14.1	3.4	19.3	4.7	21.7	5.7
2005	423	151	22.3	7.6	14.2	4.3	19.2	5.9	21.4	6.7
2006	394	161	20.6	8.0	12.9	4.8	18.0	6.4	20.4	7.2
2007	498	176	22.5	7.6	13.8	4.2	19.1	5.8	21.5	6.6
2008	513	193	23.0	8.3	14.2	4.4	19.6	6.1	22.1	7.0
2009	499	197	22.4	8.5	13.4	4.6	18.5	6.3	21.0	7.3
2010	545	196	24.2	8.4	14.6	4.5	20.1	6.1	22.6	7.0
2011	470	190	21.0	8.1	12.1	4.4	16.9	6.1	19.3	6.9
2012	466	200	20.5	8.5	11.9	4.5	16.5	6.1	18.8	7.1
2013	493	214	21.4	9.0	12.5	4.5	17.3	6.3	19.6	7.2
2014	454	161	19.5	6.7	11.3	3.5	15.6	4.8	17.7	5.6
2015	421	204	17.7	8.4	10.1	4.5	14.0	6.1	16.1	7.0
2016	396	156	16.5	6.4	9.4	3.1	13.0	4.3	15.0	5.1
2017	318	130	13.2	5.3	7.0	2.7	9.9	3.7	11.8	4.3
2018	229	109	9.4	4.4	5.1	2.6	7.2	3.4	8.5	3.7
2019	144	75	5.9	3.0	3.2	1.5	4.5	2.1	5.3	2.4
2020	133	54	5.5	2.2	2.9	1.0	4.1	1.4	4.8	1.7
1998-2020	8717	3367	18.7	7.0	11.2	3.7	15.5	5.1	17.5	5.9

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

Table 3

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	355	59.1	12.6	0.9	97.4	46.2	51.8	58.1	66.0	76.0
1999	386	60.4	12.5	13.9	95.7	47.9	52.0	58.8	66.8	78.6
2000	346	59.9	11.6	31.0	91.9	46.0	51.6	58.6	67.5	76.4
2001	360	61.1	12.4	16.4	96.4	47.4	53.0	60.1	68.0	77.2
2002	558	61.4	11.9	26.4	99.0	47.0	53.6	60.8	68.2	78.6
2003	570	60.6	11.8	10.7	98.2	46.6	53.1	59.5	67.9	76.8
2004	546	61.7	12.4	24.7	97.9	45.8	53.8	61.4	69.4	78.9
2005	574	61.3	12.1	4.1	103	46.6	53.5	61.1	67.6	77.7
2006	555	61.4	12.4	17.6	101	46.8	53.4	60.1	69.2	77.8
2007	674	62.3	12.3	7.7	101	47.2	53.7	62.4	70.4	77.6
2008	706	63.4	11.6	19.8	100	49.4	55.4	62.8	69.6	79.3
2009	696	63.1	12.2	16.6	98.4	48.1	55.0	62.9	70.9	79.9
2010	741	62.5	12.9	18.2	95.3	47.0	53.6	62.7	70.7	78.7
2011	660	63.7	12.7	14.4	96.9	48.6	55.0	63.9	71.9	79.6
2012	666	63.7	11.9	21.5	100	48.9	55.3	63.8	72.3	78.5
2013	707	64.4	12.5	10.0	95.5	50.0	55.9	64.1	72.5	80.0
2014	615	63.8	12.1	16.8	93.7	48.5	56.2	63.8	72.0	79.1
2015	625	64.2	12.1	0.9	96.0	50.2	55.9	63.9	72.9	80.4
2016	552	65.2	12.6	15.0	93.0	50.7	57.1	65.6	74.2	80.4
2017	448	66.3	12.8	14.0	96.5	51.1	58.0	66.8	75.6	81.7
2018	338	65.0	12.5	12.5	95.3	49.4	57.7	65.4	74.0	80.1
2019	219	66.5	12.3	19.5	99.0	52.1	59.1	66.6	74.4	81.7
2020	187	67.4	12.3	23.7	94.2	53.3	59.6	67.3	77.1	82.8
1998–2020	12084	62.9	12.4	0.9	103	48.1	54.6	62.4	71.0	79.2

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	268	57.6	11.2	0.9	87.6	46.0	51.3	57.3	63.8	71.0
1999	278	59.1	11.3	32.0	90.8	47.9	51.4	57.6	64.3	75.2
2000	263	59.4	10.5	35.6	89.7	47.5	51.7	58.4	66.5	73.6
2001	267	59.6	11.3	28.7	94.9	46.4	51.9	59.5	65.4	74.5
2002	409	59.8	10.4	26.4	96.8	46.6	53.0	59.9	65.3	73.0
2003	421	59.5	10.0	28.1	94.5	47.3	53.1	58.9	65.6	72.7
2004	415	60.3	11.4	26.7	92.4	45.5	53.1	60.2	66.3	75.5
2005	423	60.4	11.4	4.1	99.0	46.6	53.4	61.0	67.0	74.3
2006	394	61.1	11.3	17.6	92.0	47.2	53.8	59.8	67.7	76.9
2007	498	61.5	11.3	15.7	101	47.2	53.2	61.5	69.5	75.7
2008	513	62.4	10.8	19.8	100	49.3	54.8	62.1	68.8	76.8
2009	499	62.6	11.0	16.6	90.7	48.2	55.0	62.8	70.2	76.5
2010	545	61.8	12.4	18.2	95.3	46.9	53.1	61.4	70.0	76.6
2011	470	63.2	12.1	14.4	95.5	48.3	54.2	63.1	71.3	78.4
2012	466	62.9	11.0	21.6	94.3	49.2	54.8	62.5	70.8	77.3
2013	493	63.3	11.4	10.0	93.9	50.3	55.9	63.4	70.9	77.7
2014	454	63.5	11.1	25.6	93.5	48.7	56.3	63.0	71.0	77.5
2015	421	63.8	11.6	0.9	94.6	50.2	55.8	63.5	71.9	78.9
2016	396	64.4	11.6	15.0	91.6	51.3	56.9	64.7	72.2	77.6
2017	318	66.5	12.1	17.1	96.1	52.5	58.2	67.0	75.4	81.0
2018	229	66.2	11.6	27.8	95.3	51.2	58.5	66.4	74.5	80.4
2019	144	65.8	12.2	26.1	95.5	51.6	59.1	65.9	74.4	80.9
2020	133	66.4	11.8	23.7	91.4	52.8	58.7	66.4	75.3	81.3
1998–2020	8717	62.1	11.5	0.9	101	48.1	54.2	61.8	69.7	77.2

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	87	63.9	15.2	9.5	97.4	49.6	54.5	61.8	75.9	83.1
1999	108	63.7	14.7	13.9	95.7	47.8	54.7	64.2	74.1	82.4
2000	83	61.5	14.5	31.0	91.9	44.4	51.1	59.6	74.0	80.7
2001	93	65.3	14.5	16.4	96.4	50.2	56.4	63.3	72.9	87.8
2002	149	65.8	14.2	31.4	99.0	48.1	55.5	63.5	77.3	84.2
2003	149	63.7	15.3	10.7	98.2	44.8	53.7	63.1	76.1	83.8
2004	131	66.4	14.1	24.7	97.9	48.9	57.0	67.4	76.8	83.1
2005	151	63.6	13.7	22.8	103	48.0	54.2	62.2	72.1	81.4
2006	161	62.2	14.9	19.0	101	45.9	52.7	61.7	71.2	83.2
2007	176	64.3	14.6	7.7	98.2	46.5	55.2	63.6	74.6	84.3
2008	193	66.0	13.4	25.6	98.4	50.7	57.5	65.7	74.1	83.6
2009	197	64.4	14.8	16.8	98.4	47.4	54.8	63.6	75.1	83.6
2010	196	64.5	14.1	21.9	91.8	47.4	54.0	65.9	72.7	85.0
2011	190	64.7	14.0	17.2	96.9	48.9	56.5	64.7	73.1	84.0
2012	200	65.5	13.7	21.5	100	48.0	57.3	65.1	73.6	82.6
2013	214	66.8	14.6	12.1	95.5	47.8	56.5	67.4	77.1	87.7
2014	161	64.7	14.7	16.8	93.7	47.5	56.2	66.0	74.4	83.7
2015	204	65.0	12.9	19.0	96.0	50.1	56.0	64.4	74.3	82.9
2016	156	67.1	14.7	22.6	93.0	46.4	57.7	68.9	77.8	86.6
2017	130	65.8	14.5	14.0	96.5	49.1	55.4	66.1	75.7	84.0
2018	109	62.6	14.0	12.5	92.0	44.6	56.0	64.2	70.8	78.2
2019	75	67.7	12.4	19.5	99.0	54.6	59.3	68.2	74.3	82.7
2020	54	69.7	13.3	30.8	94.2	55.6	61.5	70.8	80.2	83.1
1998–2020	3367	64.9	14.3	7.7	103	47.8	55.7	64.9	74.9	83.6

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	1	0.0	0.0	1	0.0	0.0			0.0
5-9	2	0.0	0.0	1	0.0	0.0	1	0.0	0.0
10-14	5	0.1	0.1	2	0.0	0.1	3	0.1	0.2
15-19	13	0.2	0.3	6	0.1	0.2	7	0.3	0.5
20-24	16	0.2	0.5	10	0.2	0.4	6	0.3	0.8
25-29	39	0.5	1.0	21	0.4	0.7	18	0.8	1.6
30-34	52	0.7	1.6	26	0.5	1.2	26	1.2	2.7
35-39	69	0.9	2.5	40	0.7	1.9	29	1.3	4.0
40-44	205	2.6	5.1	140	2.5	4.4	65	2.9	6.9
45-49	506	6.5	11.6	383	6.9	11.3	123	5.5	12.3
50-54	898	11.5	23.1	688	12.3	23.6	210	9.3	21.6
55-59	1131	14.4	37.5	843	15.1	38.7	288	12.8	34.4
60-64	1245	15.9	53.4	934	16.7	55.5	311	13.8	48.2
65-69	1231	15.7	69.1	896	16.1	71.5	335	14.9	63.1
70-74	969	12.4	81.5	688	12.3	83.9	281	12.5	75.5
75-79	699	8.9	90.4	496	8.9	92.8	203	9.0	84.5
80-84	403	5.1	95.5	241	4.3	97.1	162	7.2	91.7
85+	350	4.5	100.0	163	2.9	100.0	187	8.3	100.0
All ages	7834	100.0		5579	100.0		2255	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=193 %	Females DCO rate n=97 %	Males Prop.all cancers n=153686 %	Females Prop.all cancers n=155051 %
0- 4	1		0.1				0.5	
5- 9	1	1	0.1	0.1			0.9	1.0
10-14	2	3	0.1	0.2			1.5	2.3
15-19	6	7	0.3	0.4			1.9	2.6
20-24	10	6	0.5	0.3			1.6	1.2
25-29	21	18	0.9	0.8			2.2	1.5
30-34	26	26	1.1	1.1			2.0	1.2
35-39	39	29	1.7	1.3		3.4	2.1	0.8
40-44	137	65	5.5	2.7	1.5	1.5	4.9	1.1
45-49	371	121	13.8	4.6	0.8		7.3	1.3
50-54	677	204	26.6	8.1	1.6	1.5	8.0	1.6
55-59	828	282	39.0	12.9	2.3	2.8	6.5	2.1
60-64	916	305	51.8	16.1	2.4	2.3	5.2	2.0
65-69	880	328	53.9	18.1	3.3	1.5	3.6	1.7
70-74	680	279	45.4	16.2	5.1	2.9	2.5	1.4
75-79	493	201	40.7	13.4	4.7	3.0	2.1	1.0
80-84	237	157	32.7	14.7	6.8	8.3	1.5	1.0
85+	163	186	34.9	17.8	20.2	24.2	1.6	1.1
All ages	5488	2218			3.5	4.4	3.6	1.4
Incidence								
Raw			16.9	6.6				
WS			9.7	3.5				
ES			13.5	4.8				
BRD-S			15.4	5.5				

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).

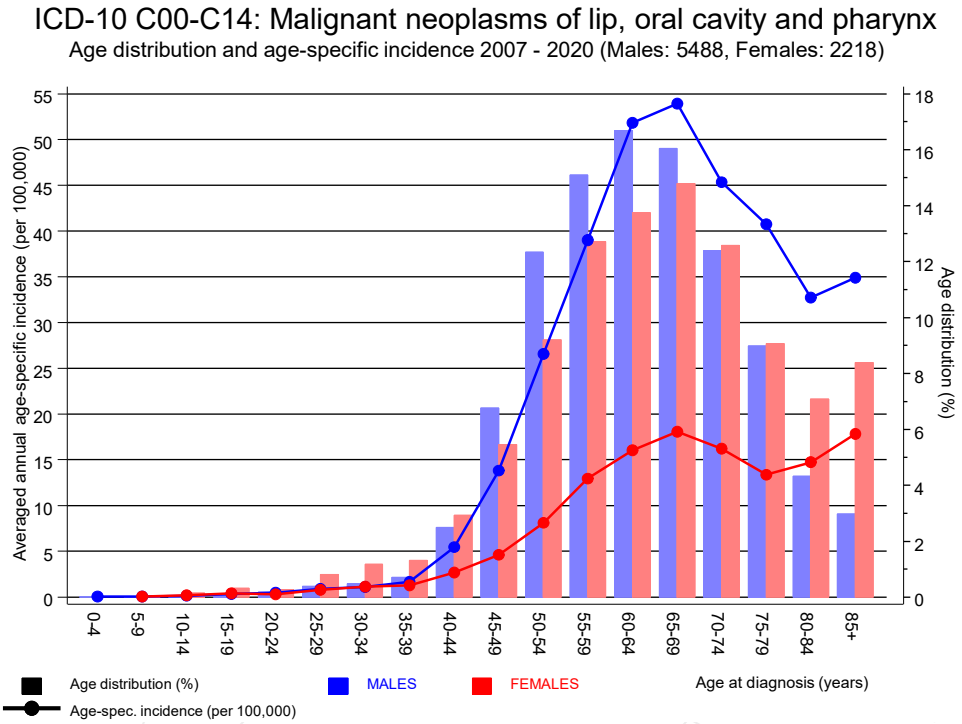


Figure 6. Age distribution (males: mean=63.4 yrs, median=63.4 yrs; females: mean=65.4 yrs, median=65.8 yrs) and age-specific incidence.

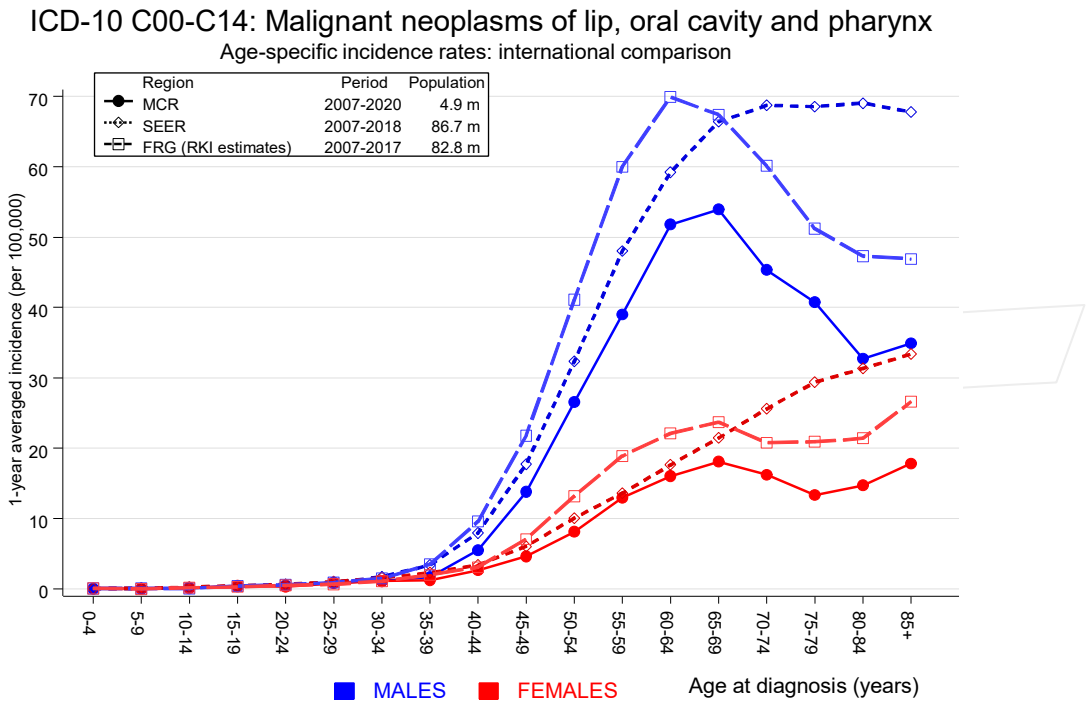


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, RKI estimates) and SEER (Surveillance, Epidemiology, and End Results, USA).

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 %
C00	Lip	6	0.4	16.6	6.1	36.2	#	1.9	
C03-C06	Oral cavity	114	4.0	28.2	23.3	33.9	#	37.8	5.3
C07-C08	Salivary gland	5	0.8	6.2	2.0	14.4	#	1.4	
C09-C10	Oropharynx	112	5.2	21.6	17.8	26.0	#	36.7	0.9
C11	Nasopharynx	8	0.3	23.4	10.1	46.0	#	2.6	12.5
C12-C13	Hypopharynx	91	2.8	33.0	26.6	40.6	#	30.3	9.9
C14	ENT cancer	4	0.1	45.1	12.3	115.5	#	1.3	100.0
C15	Oesophagus	188	8.3	22.7	19.6	26.2	#	61.8	11.2
C16	Stomach	35	13.3	2.6	1.8	3.7	#	7.5	11.4
C17	Small intestine	4	2.3	1.7	0.5	4.4		0.6	50.0
C18	Colon	84	32.7	2.6	2.0	3.2	#	17.6	4.8
C19-C20	Rectum	44	20.3	2.2	1.6	2.9	#	8.1	
C21	Anus/canal	8	1.0	8.0	3.5	15.9	#	2.4	
C22	Liver	49	10.8	4.5	3.4	6.0	#	13.1	12.2
C23-C24	Bile	5	3.6	1.4	0.4	3.2		0.5	40.0
C25	Pancreas	38	13.7	2.8	2.0	3.8	#	8.3	18.4
C30-C31	Sinuses	6	0.7	8.3	3.0	18.0	#	1.8	16.7
C32	Larynx	102	4.3	24.0	19.5	29.1	#	33.6	23.5
C33-C34	Lung	416	44.2	9.4	8.5	10.4	#	127.9	10.8
C43	Malign. melanoma	36	17.5	2.1	1.4	2.8	#	6.3	8.3
C46,C49	Soft tissue	10	2.1	4.7	2.3	8.7	#	2.7	10.0
C60	Penis	3	0.9	3.3	0.7	9.6		0.7	
C61	Prostate	127	103.2	1.2	1.0	1.5	#	8.2	6.3
C64	Kidney	39	13.4	2.9	2.1	4.0	#	8.8	5.1
C65	Renal pelvis	4	1.5	2.7	0.7	6.9		0.9	
C67	Bladder	44	15.1	2.9	2.1	3.9	#	9.9	6.8
C68	Urethra	4	0.3	11.7	3.2	30.1	#	1.3	
C70-C72	CNS cancer	5	5.1	1.0	0.3	2.3		-0.0	
C73	Thyroid	13	3.1	4.2	2.3	7.2	#	3.4	7.7
C76-C79	CUP	27	5.9	4.5	3.0	6.6	#	7.2	
C81	Hodgkin lymphoma	5	1.0	5.2	1.7	12.2	#	1.4	40.0
C82-C85	NHL	36	15.0	2.4	1.7	3.3	#	7.2	8.3
C90	Mult. myeloma	4	4.5	0.9	0.2	2.3		-0.2	
C91-C96	Leukaemia	12	5.0	2.4	1.2	4.2	#	2.4	33.3
Others, specified		13	6.7	1.9	1.0	3.3	#	2.2	
Not observed		0	2.0	0.0	0.0	1.9		-0.7	
All further malignancies		1701	371.2	4.6	4.4	4.8	#	457.3	9.6

Patients	8128
Median age at next malignancy (years)	65.8
Person-years	29079
Mean observation time (years)	3.6
Median observation time (years)	1.9

The occurrence of further specified malignancy is statistically significant.

Further observed malignancies with count 1 to 2 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 %
C00	Lip	2	0.1	24.7	3.0	89.1	#	1.5	
C03-C06	Oral cavity	38	0.8	48.0	34.0	65.9	#	29.5	
C07-C08	Salivary gland	2	0.2	9.8	1.2	35.5	#	1.4	
C09-C10	Oropharynx	47	0.6	77.3	56.8	102.7	#	36.8	
C11	Nasopharynx	5	0.0	108.7	35.3	253.6	#	3.9	
C12-C13	Hypopharynx	22	0.2	141.7	88.8	214.5	#	17.3	18.2
C14	ENT cancer	5	0.0	265.7	86.3	620.1	#	4.0	80.0
C15	Oesophagus	45	0.9	50.9	37.1	68.1	#	35.0	8.9
C16	Stomach	10	4.1	2.4	1.2	4.5	#	4.7	10.0
C18	Colon	26	11.8	2.2	1.4	3.2	#	11.2	
C19-C20	Rectum	11	5.0	2.2	1.1	4.0	#	4.8	
C21	Anus/canal	2	0.7	2.7	0.3	9.7		1.0	
C22	Liver	13	1.6	8.4	4.5	14.3	#	9.1	7.7
C23-C24	Bile	4	1.7	2.4	0.6	6.0		1.8	
C25	Pancreas	13	5.7	2.3	1.2	3.9	#	5.8	23.1
C30-C31	Sinuses	8	0.2	45.2	19.5	89.0	#	6.2	25.0
C32	Larynx	24	0.3	95.3	61.0	141.8	#	18.9	12.5
C33-C34	Lung	115	10.1	11.4	9.4	13.7	#	83.3	16.5
C40-C41	Bone	3	0.1	24.2	5.0	70.8	#	2.3	66.7
C43	Malign. melanoma	11	5.1	2.2	1.1	3.9	#	4.7	9.1
C50	Breast	73	41.0	1.8	1.4	2.2	#	25.4	4.1
C51	Vulva	8	1.3	6.1	2.6	12.0	#	5.3	
C52	Vagina	2	0.2	8.7	1.0	31.3	#	1.4	
C53	Cervix uteri	12	1.8	6.7	3.5	11.7	#	8.1	16.7
C54	Corpus uteri	8	7.2	1.1	0.5	2.2		0.6	
C56	Ovary	11	5.1	2.1	1.1	3.8	#	4.7	9.1
C64	Kidney	6	2.9	2.1	0.8	4.5		2.5	16.7
C65	Renal pelvis	2	0.4	5.2	0.6	18.9		1.3	
C67	Bladder	5	2.4	2.1	0.7	4.9		2.1	40.0
C70-C72	CNS cancer	5	1.7	3.0	1.0	7.0		2.7	40.0
C73	Thyroid	10	2.3	4.4	2.1	8.0	#	6.1	20.0
C76-C79	CUP	8	2.2	3.6	1.5	7.1	#	4.6	
C82-C85	NHL	18	4.9	3.7	2.2	5.8	#	10.4	
C90	Mult. myeloma	3	1.5	2.0	0.4	5.8		1.2	33.3
C91-C96	Leukaemia	7	1.8	3.9	1.6	8.0	#	4.1	14.3
Others, specified		7	1.9	3.6	1.5	7.4	#	4.0	
Not observed		0	2.0	0.0	0.0	1.8		-1.6	
All further malignancies		591	129.9	4.5	4.2	4.9	#	366.1	10.0

Patients	3105
Median age at next malignancy (years)	67.8
Person-years	12595
Mean observation time (years)	4.1
Median observation time (years)	2.5

The occurrence of further specified malignancy is statistically significant.

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

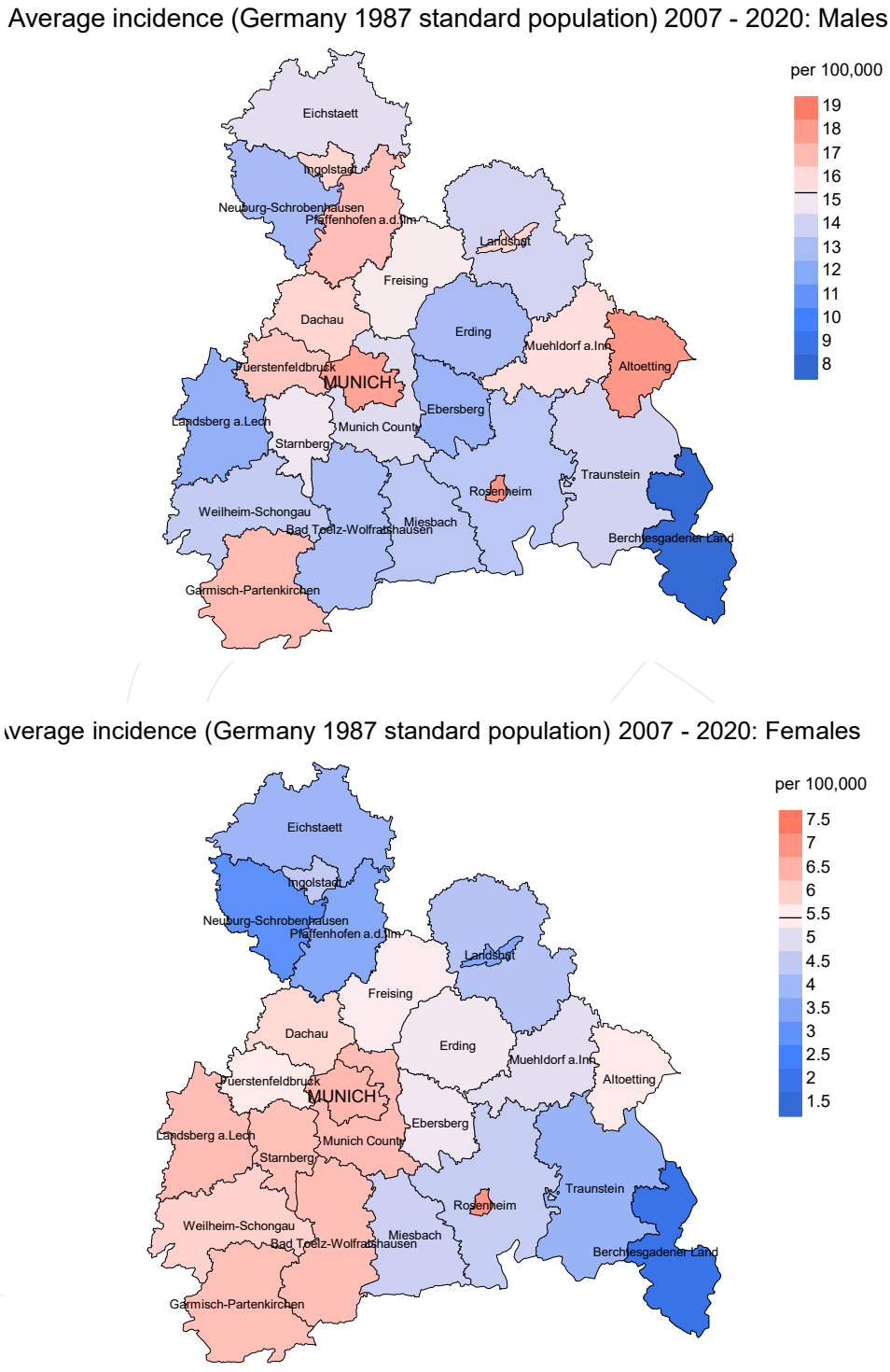
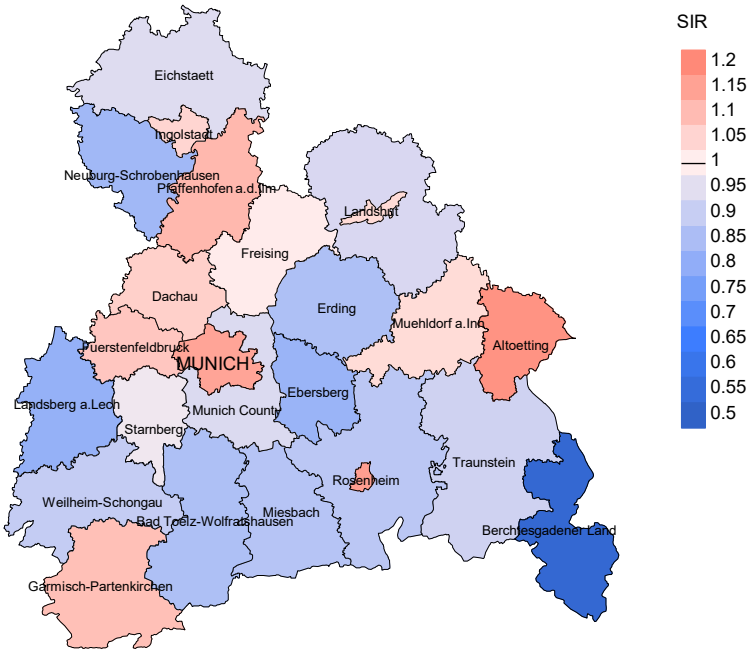


Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 15.4/100,000 WS N=5,488, females 5.5/100,000 WS N=2,218).

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 HN cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 5.2/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 3.6 and 7.3/100,000.

Standardized incidence ratio (SIR) 2007 - 2020: Males



Standardized incidence ratio (SIR) 2007 - 2020: Females

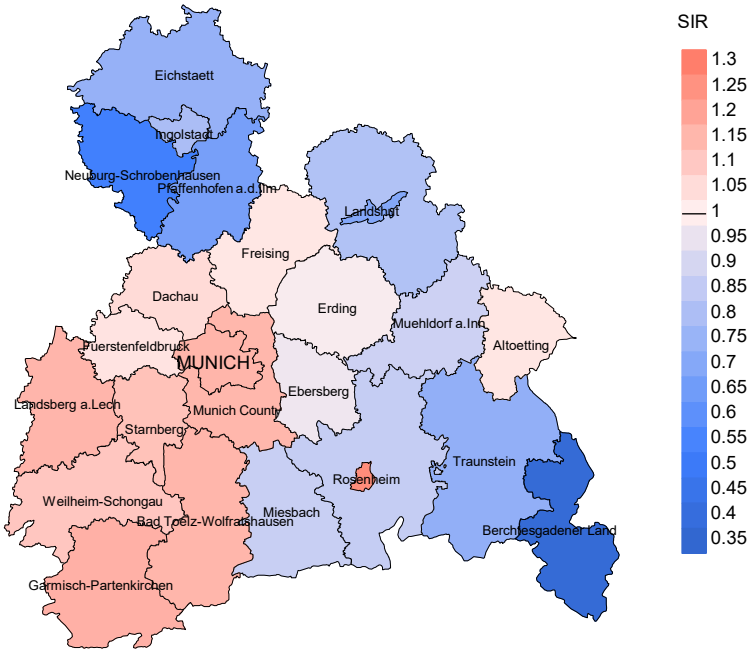


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=5,488, females N=2,218).

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 HN cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.96. Though, the value of this parameter may vary with an underlying probability of 99% between 0.67 and 1.34, 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	355	99.2	5.6	304	85.6	95.4
1999	386	96.9	4.7	324	83.9	90.1
2000	346	97.7	5.2	295	85.3	95.3
2001	360	96.9	7.2	300	83.3	94.7
2002	558	98.0	7.0	460	82.4	95.2
2003	570	98.8	4.4	466	81.8	96.4
2004	546	98.5	4.8	438	80.2	94.1
2005	574	97.4	4.7	439	76.5	96.8
2006	555	95.5	2.3	430	77.5	94.4
2007	674	95.3	6.1	500	74.2	96.0
2008	706	98.7	3.5	524	74.2	95.2
2009	696	98.1	2.0	503	72.3	95.0
2010	741	97.8	4.7	499	67.3	94.8
2011	660	98.2	4.4	421	63.8	93.1
2012	666	98.2	4.7	417	62.6	91.6
2013	707	98.2	3.4	435	61.5	93.8
2014	615	96.7	4.1	383	62.3	94.0
2015	625	97.9	3.2	343	54.9	91.0
2016	552	99.5	3.4	288	52.2	87.2
2017	448	99.1	3.8	201	44.9	72.6
2018	338	99.1	4.4	132	39.1	70.5
2019	219	99.5	0.5	74	33.8	89.2
2020	187	99.5	0.5	57	30.5	98.2
1998-2020	12084	97.9	4.2	8233	68.1	93.2

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	355	236	91.5	56	15.8
1999	386	243	89.3	58	15.0
2000	346	252	93.7	50	14.5
2001	360	277	91.0	64	17.8
2002	558	376	97.6	87	15.6
2003	570	396	96.2	86	15.1
2004	546	408	96.6	95	17.4
2005	574	377	97.3	84	14.6
2006	555	426	96.7	85	15.3
2007	674	468	97.4	103	15.3
2008	706	438	98.6	97	13.7
2009	696	483	98.6	88	12.6
2010	741	486	99.0	103	13.9
2011	660	479	97.7	93	14.1
2012	666	509	97.2	94	14.1
2013	707	501	98.4	108	15.3
2014	615	485	97.7	105	17.1
2015	625	501	98.8	90	14.4
2016	552	476	98.5	99	17.9
2017	448	453	95.8	60	13.4
2018	338	347	64.6	44	13.0
2019	219	344	43.9	33	15.1
2020	187	329	92.7	18	9.6
1998–2020	12084	9290	93.6	1800	14.9

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	236	73.3	26.7	90.3
1999	243	67.9	32.1	86.2
2000	252	77.0	23.0	89.4
2001	277	75.8	24.2	89.3
2002	376	77.9	22.1	90.5
2003	396	77.0	23.0	87.1
2004	408	80.4	19.6	91.9
2005	377	82.2	17.8	91.0
2006	426	77.7	22.3	87.1
2007	468	78.8	21.2	88.8
2008	438	79.0	21.0	87.3
2009	483	79.3	20.7	89.7
2010	486	79.8	20.2	89.8
2011	479	74.3	25.7	84.8
2012	509	77.6	22.4	87.7
2013	501	76.8	23.2	87.6
2014	485	75.9	24.1	87.1
2015	501	73.7	26.3	85.7
2016	476	73.1	26.9	81.9
2017	453	71.3	28.7	81.3
2018	347	52.4	47.6	72.3
2019	344	36.0	64.0	84.8
2020	329	47.1	52.9	74.4
1998-2020	9290	73.2	26.8	86.6

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	172	60.5	59.0	63.7	60.6
1999	186	58.9	58.1	62.6	57.9
2000	193	61.6	61.2	65.7	61.7
2001	216	60.5	60.2	63.8	60.5
2002	293	61.7	61.3	66.5	61.4
2003	306	63.2	62.6	67.8	62.9
2004	314	62.4	61.2	66.0	62.0
2005	269	64.2	63.7	71.8	64.0
2006	324	64.0	62.9	67.1	63.8
2007	370	64.8	63.4	69.9	63.9
2008	327	66.1	65.0	68.8	65.7
2009	355	66.2	65.2	70.8	65.3
2010	374	66.0	64.3	70.8	64.7
2011	371	68.4	66.2	71.6	66.7
2012	376	68.9	68.8	71.1	68.6
2013	353	67.8	66.1	71.6	66.6
2014	367	69.7	68.2	74.9	69.1
2015	362	68.4	67.4	72.1	67.7
2016	334	69.8	67.1	75.3	67.8
2017	335	70.8	69.6	74.2	70.4
2018	258	72.0	68.9	73.8	71.6
2019	248	72.3	69.8	73.3	69.7
2020	251	72.2	69.9	73.9	70.2
1998–2020	6954	66.2	64.7	71.2	65.1

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

Table 10b

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

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	64	72.2	68.3	77.7	71.7
1999	57	72.7	63.9	79.2	64.9
2000	59	64.0	61.0	77.4	65.8
2001	61	70.4	68.0	72.5	68.0
2002	83	71.9	71.0	77.5	71.9
2003	90	69.7	64.7	77.2	66.2
2004	94	73.7	73.7	74.5	73.7
2005	108	68.8	64.6	84.6	66.4
2006	102	72.0	68.4	81.7	68.9
2007	98	72.8	69.3	84.4	69.4
2008	111	69.2	67.8	78.1	68.0
2009	128	70.3	68.5	81.7	69.6
2010	112	70.8	67.5	82.0	68.2
2011	108	72.3	69.8	82.3	70.1
2012	133	72.5	69.7	82.9	71.4
2013	148	74.0	70.8	83.2	71.8
2014	118	75.8	71.7	79.5	73.0
2015	139	71.7	71.0	73.5	71.1
2016	142	75.4	72.8	84.2	72.8
2017	118	76.3	72.4	81.8	72.9
2018	89	73.3	70.8	76.0	71.3
2019	96	74.8	74.1	76.4	75.0
2020	78	75.2	72.3	78.3	73.6
1998–2020	2336	72.7	69.8	79.4	70.7

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	129	11.6	0.48	7.6	0.48	10.5	0.48	12.0	0.50
1999	135	12.1	0.49	7.7	0.49	10.8	0.49	12.3	0.50
2000	147	12.9	0.56	8.0	0.52	11.6	0.55	14.0	0.59
2001	166	14.3	0.64	9.3	0.63	13.0	0.64	14.7	0.65
2002	235	12.6	0.58	7.9	0.56	11.1	0.58	12.8	0.61
2003	243	13.0	0.59	7.9	0.55	11.2	0.57	12.9	0.60
2004	254	13.5	0.62	8.4	0.61	11.8	0.62	13.4	0.63
2005	226	11.9	0.54	7.0	0.50	9.9	0.52	11.6	0.55
2006	260	13.6	0.67	8.2	0.65	11.5	0.65	13.2	0.65
2007	296	13.4	0.60	7.9	0.58	11.2	0.60	13.0	0.61
2008	269	12.1	0.53	7.0	0.50	9.9	0.52	11.6	0.53
2009	291	13.0	0.60	7.4	0.57	10.5	0.58	12.3	0.60
2010	303	13.4	0.57	7.6	0.54	11.0	0.56	12.7	0.58
2011	283	12.6	0.62	6.9	0.59	10.0	0.60	11.7	0.62
2012	292	12.9	0.63	6.7	0.57	9.7	0.60	11.8	0.63
2013	275	11.9	0.56	6.4	0.52	9.2	0.54	10.9	0.56
2014	292	12.5	0.65	6.5	0.59	9.3	0.61	11.2	0.65
2015	268	11.3	0.65	5.9	0.59	8.5	0.61	10.2	0.65
2016	245	10.2	0.63	5.5	0.60	7.8	0.61	9.3	0.63
2017	243	10.1	0.77	4.9	0.72	7.3	0.74	9.0	0.76
2018	140	5.8	0.61	2.8	0.55	4.1	0.58	5.1	0.61
2019	89	3.7	0.62	1.8	0.56	2.6	0.58	3.3	0.62
2020	119	4.9	0.92	2.5	0.87	3.6	0.89	4.4	0.92
1998-2020	5200	11.2	0.61	6.3	0.57	8.9	0.59	10.5	0.61

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	44	3.7	0.51	1.7	0.44	2.6	0.46	3.3	0.50
1999	30	2.5	0.28	1.3	0.25	1.9	0.26	2.2	0.28
2000	47	3.9	0.57	2.1	0.53	3.0	0.55	3.4	0.55
2001	44	3.6	0.47	1.7	0.40	2.5	0.41	3.0	0.45
2002	59	3.0	0.40	1.5	0.37	2.1	0.38	2.6	0.39
2003	64	3.2	0.43	1.7	0.40	2.4	0.42	2.9	0.43
2004	74	3.7	0.57	1.6	0.48	2.4	0.51	3.0	0.53
2005	84	4.2	0.57	2.1	0.51	3.1	0.54	3.6	0.55
2006	72	3.6	0.46	1.6	0.34	2.3	0.37	2.8	0.40
2007	73	3.2	0.42	1.4	0.35	2.1	0.37	2.5	0.40
2008	77	3.3	0.40	1.6	0.38	2.3	0.39	2.7	0.39
2009	93	4.0	0.48	1.9	0.42	2.8	0.44	3.2	0.45
2010	85	3.6	0.45	1.8	0.41	2.6	0.43	3.0	0.45
2011	75	3.2	0.40	1.4	0.33	2.1	0.34	2.4	0.35
2012	103	4.4	0.52	2.0	0.45	2.8	0.47	3.4	0.48
2013	110	4.6	0.52	2.0	0.44	2.9	0.46	3.5	0.50
2014	78	3.2	0.48	1.4	0.39	2.0	0.41	2.4	0.44
2015	101	4.2	0.51	1.8	0.41	2.6	0.43	3.2	0.46
2016	103	4.2	0.66	1.6	0.52	2.5	0.56	3.1	0.61
2017	81	3.3	0.64	1.3	0.50	1.9	0.53	2.4	0.57
2018	42	1.7	0.39	0.8	0.30	1.1	0.33	1.3	0.36
2019	38	1.5	0.51	0.6	0.40	0.9	0.44	1.1	0.46
2020	38	1.5	0.76	0.6	0.67	0.9	0.70	1.2	0.73
1998-2020	1615	3.3	0.49	1.5	0.41	2.2	0.43	2.6	0.46

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	1	0.0	0.0	1	0.0	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	0	0.0	0.0			0.0			0.0
20-24	4	0.1	0.1	3	0.1	0.1	1	0.1	0.1
25-29	3	0.1	0.2	1	0.0	0.1	2	0.2	0.3
30-34	5	0.1	0.3	2	0.1	0.2	3	0.3	0.5
35-39	13	0.3	0.6	7	0.2	0.4	6	0.5	1.1
40-44	53	1.2	1.8	42	1.2	1.6	11	1.0	2.1
45-49	162	3.6	5.4	132	3.9	5.5	30	2.7	4.8
50-54	372	8.3	13.6	313	9.2	14.7	59	5.4	10.2
55-59	593	13.2	26.8	487	14.3	29.0	106	9.7	19.9
60-64	659	14.6	41.4	521	15.3	44.3	138	12.6	32.5
65-69	767	17.0	58.5	590	17.3	61.6	177	16.1	48.6
70-74	696	15.5	73.9	531	15.6	77.2	165	15.0	63.6
75-79	527	11.7	85.6	405	11.9	89.1	122	11.1	74.7
80-84	321	7.1	92.8	221	6.5	95.6	100	9.1	83.9
85+	326	7.2	100.0	149	4.4	100.0	177	16.1	100.0
All ages	4502	100.0		3405	100.0		1097	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			5.3	
5- 9								
10-14								
15-19								
20-24	3	1	0.1	0.30	0.1	0.17	4.1	2.3
25-29	1	2	0.0	0.05	0.1	0.11	1.1	2.0
30-34	2	3	0.1	0.08	0.1	0.12	1.4	1.7
35-39	7	6	0.3	0.18	0.3	0.21	2.6	1.5
40-44	42	11	1.7	0.31	0.5	0.17	6.9	1.3
45-49	132	30	4.9	0.36	1.2	0.25	9.3	1.8
50-54	313	59	12.3	0.46	2.3	0.29	11.8	2.2
55-59	487	106	22.9	0.59	4.9	0.38	11.0	2.8
60-64	521	138	29.5	0.57	7.3	0.45	8.1	2.8
65-69	590	177	36.1	0.67	9.8	0.54	6.4	2.5
70-74	531	165	35.4	0.78	9.6	0.59	4.5	1.9
75-79	405	122	33.5	0.82	8.1	0.61	3.2	1.2
80-84	221	100	30.5	0.93	9.4	0.64	2.1	1.1
85+	149	177	31.9	0.91	17.0	0.95	1.6	1.5
All ages	3405	1097					4.9	1.8
Mortality								
Raw			10.5	0.62	3.3	0.49		
WS			5.6	0.57	1.4	0.41		
ES			8.0	0.59	2.1	0.44		
BRD-S			9.5	0.62	2.5	0.46		
PYLL-70								
per 100,000			75.4		18.6			
ES			64.3		15.4			
AYLL-70			10.3		9.9			

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 ←%
C00	Lip	8	0.3	5	62.5	2	25.0	1	12.5
C03–C06	Oral cavity	142	5.3	91	64.1	24	16.9	27	19.0
C09–C10	Oropharynx	142	5.3	78	54.9	36	25.4	28	19.7
C11	Nasopharynx	6	0.2	5	83.3			1	16.7
C12–C13	Hypopharynx	73	2.7	50	68.5	16	21.9	7	9.6
C15	Oesophagus	251	9.4	48	19.1	45	17.9	158	62.9
C16	Stomach	54	2.0	16	29.6	3	5.6	35	64.8
C17	Small intestine	9	0.3	7	77.8			2	22.2
C18	Colon	90	3.4	37	41.1	5	5.6	48	53.3
C19–C20	Rectum	76	2.8	24	31.6	5	6.6	47	61.8
C21	Anus/canal	8	0.3	5	62.5	1	12.5	2	25.0
C22	Liver	71	2.6	9	12.7	8	11.3	54	76.1
C23–C24	Bile	7	0.3	3	42.9			4	57.1
C25	Pancreas	51	1.9	6	11.8	1	2.0	44	86.3
C30–C31	Sinuses	18	0.7	7	38.9	2	11.1	9	50.0
C32	Larynx	181	6.8	89	49.2	36	19.9	56	30.9
C33–C34	Lung	568	21.2	79	13.9	68	12.0	421	74.1
C38,C45	Mesothelioma	6	0.2	1	16.7			5	83.3
C43	Malign. melanoma	44	1.6	20	45.5	4	9.1	20	45.5
C44	Skin others	290	10.8	113	39.0	38	13.1	139	47.9
C46,C49	Soft tissue	14	0.5	7	50.0			7	50.0
C50	Breast	4	0.1	3	75.0			1	25.0
C61	Prostate	195	7.3	116	59.5	10	5.1	69	35.4
C62	Testis	13	0.5	12	92.3			1	7.7
C64	Kidney	54	2.0	26	48.1	5	9.3	23	42.6
C65	Renal pelvis	11	0.4	3	27.3			8	72.7
C66	Ureter	4	0.1	2	50.0			2	50.0
C67	Bladder	74	2.8	32	43.2	1	1.4	41	55.4
C70–C72	CNS cancer	10	0.4	1	10.0			9	90.0
C73	Thyroid	16	0.6	7	43.8	3	18.8	6	37.5
C76–C79	CUP	70	2.6	39	55.7	8	11.4	23	32.9
C81	Hodgkin lymphoma	12	0.4	6	50.0			6	50.0
C82–C85	NHL	65	2.4	35	53.8	12	18.5	18	27.7
C90	Mult. myeloma	5	0.2	4	80.0			1	20.0
C91–C96	Leukaemia	20	0.7	8	40.0	1	5.0	11	55.0
Others, specified		19	0.7	12	63.2	1	5.3	6	31.6
All further malignancies		2681	100.0	1006	37.5	335	12.5	1340	50.0

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 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 ←%
C00	Lip	1	0.1			1	100.0		
C03-C06	Oral cavity	66	8.0	41	62.1	9	13.6	16	24.2
C07-C08	Salivary gland	2	0.2	2	100.0				
C09-C10	Oropharynx	34	4.1	16	47.1	11	32.4	7	20.6
C11	Nasopharynx	1	0.1	1	100.0				
C12-C13	Hypopharynx	6	0.7	2	33.3	2	33.3	2	33.3
C14	ENT cancer	1	0.1					1	100.0
C15	Oesophagus	57	6.9	6	10.5	9	15.8	42	73.7
C16	Stomach	19	2.3	5	26.3	4	21.1	10	52.6
C18	Colon	36	4.3	15	41.7	2	5.6	19	52.8
C19-C20	Rectum	14	1.7	5	35.7			9	64.3
C21	Anus/canal	6	0.7	2	33.3			4	66.7
C22	Liver	11	1.3	1	9.1	3	27.3	7	63.6
C23-C24	Bile	4	0.5					4	100.0
C25	Pancreas	16	1.9	1	6.3	1	6.3	14	87.5
C26	GI cancer	3	0.4			1	33.3	2	66.7
C30	Middle/inner ear	1	0.1					1	100.0
C30-C31	Sinuses	11	1.3	4	36.4			7	63.6
C32	Larynx	32	3.9	13	40.6	7	21.9	12	37.5
C33-C34	Lung	134	16.2	12	9.0	11	8.2	111	82.8
C40-C41	Bone	3	0.4					3	100.0
C43	Malign. melanoma	12	1.4	5	41.7	1	8.3	6	50.0
C44	Skin others	54	6.5	19	35.2	4	7.4	31	57.4
C46,C49	Soft tissue	1	0.1					1	100.0
C50	Breast	138	16.6	89	64.5	10	7.2	39	28.3
C51	Vulva	6	0.7	1	16.7			5	83.3
C52	Vagina	2	0.2	1	50.0			1	50.0
C53	Cervix uteri	25	3.0	16	64.0			9	36.0
C54	Corpus uteri	17	2.1	13	76.5	1	5.9	3	17.6
C55,C57	Fem. genitals un	1	0.1	1	100.0				
C56	Ovary	14	1.7	7	50.0			7	50.0
C64	Kidney	9	1.1	3	33.3	1	11.1	5	55.6
C65	Renal pelvis	1	0.1					1	100.0
C67	Bladder	9	1.1	5	55.6			4	44.4
C68	Urethra	1	0.1	1	100.0				
C69	Eye carcinoma	1	0.1	1	100.0				
C70-C72	CNS cancer	4	0.5			1	25.0	3	75.0
C73	Thyroid	11	1.3	7	63.6	1	9.1	3	27.3
C76-C79	CUP	25	3.0	13	52.0	1	4.0	11	44.0
C81	Hodgkin lymphoma	1	0.1					1	100.0
C82-C85	NHL	27	3.3	11	40.7	2	7.4	14	51.9

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 ←%
C90 Mult. myeloma	5	0.6	2	40.0			3	60.0
C91–C96 Leukaemia	7	0.8	2	28.6			5	71.4
All further malignancies	829	100.0	323	39.0	83	10.0	423	51.0

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.	MI-index	Females Age-spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4	1		0.1	1.00			5.3	
5- 9								
10-14								
15-19								
20-24	3	1	0.1	0.33	0.1	0.17	4.5	2.4
25-29	1	2	0.0	0.05	0.1	0.13	1.2	2.2
30-34	2	3	0.1	0.08	0.1	0.14	1.4	1.9
35-39	5	2	0.2	0.14	0.1	0.10	2.0	0.5
40-44	38	11	1.5	0.29	0.5	0.18	6.8	1.5
45-49	109	26	4.1	0.33	1.0	0.25	8.4	1.8
50-54	261	46	10.2	0.45	1.8	0.26	11.1	2.0
55-59	396	86	18.7	0.60	3.9	0.39	10.3	2.7
60-64	406	102	23.0	0.57	5.4	0.43	7.6	2.5
65-69	447	141	27.4	0.68	7.8	0.57	6.1	2.5
70-74	393	122	26.2	0.84	7.1	0.62	4.3	1.8
75-79	285	85	23.6	0.92	5.7	0.65	3.1	1.1
80-84	138	71	19.1	1.06	6.7	0.63	1.9	1.0
85+	97	135	20.8	1.09	12.9	0.92	1.5	1.4
All ages	2582	833					4.8	1.7
Mortality								
Raw			7.9	0.62	2.5	0.49		
WS			4.3	0.57	1.1	0.40		
ES			6.2	0.59	1.6	0.43		
BRD-S			7.2	0.62	1.9	0.45		
PYLL-70								
per 100,000			61.6		14.8			
ES			52.6		12.3			
AYLL-70			10.6		10.0			

* 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			5.3	
5- 9								
10-14								
15-19								
20-24	3	1	0.1	0.38	0.1	0.17	4.5	2.5
25-29	1	2	0.0	0.06	0.1	0.13	1.2	2.3
30-34	1	2	0.0	0.04	0.1	0.10	0.7	1.3
35-39	5	2	0.2	0.15	0.1	0.10	2.0	0.5
40-44	35	11	1.4	0.32	0.5	0.20	6.3	1.5
45-49	99	23	3.7	0.34	0.9	0.24	7.7	1.6
50-54	226	41	8.9	0.44	1.6	0.27	9.8	1.9
55-59	324	74	15.3	0.56	3.4	0.41	8.5	2.4
60-64	317	73	17.9	0.52	3.8	0.35	6.0	1.8
65-69	325	106	19.9	0.60	5.8	0.50	4.5	2.0
70-74	266	84	17.7	0.70	4.9	0.51	3.0	1.3
75-79	183	57	15.1	0.68	3.8	0.53	2.1	0.8
80-84	95	51	13.1	0.83	4.8	0.52	1.4	0.7
85+	77	109	16.5	0.97	10.5	0.80	1.3	1.2
All ages	1958	636					3.8	1.3
Mortality								
Raw			6.0	0.55	1.9	0.43		
WS			3.4	0.51	0.9	0.36		
ES			4.8	0.53	1.2	0.38		
BRD-S			5.5	0.55	1.5	0.40		
PYLL-70								
per 100,000			51.8		12.6			
ES			44.2		10.4			
AYLL-70			11.1		10.6			

* See corresponding tables with multiple malignancies.

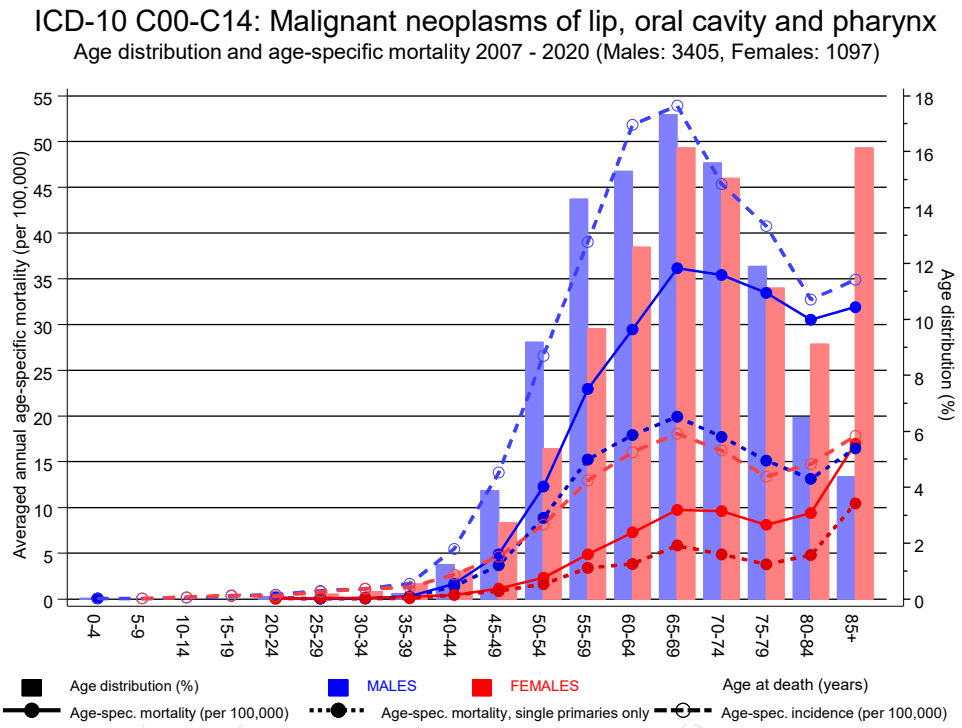
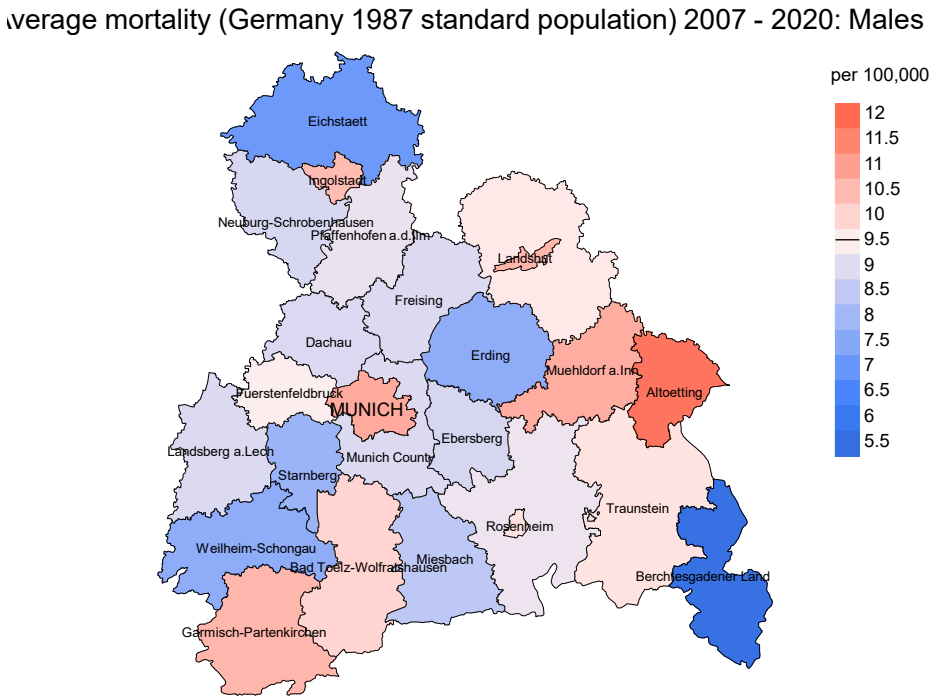


Figure 17. Distribution of age at death (bars; males: mean=62.7 yrs, median=62.3 yrs; females: mean=66.4 yrs, median=66.5 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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



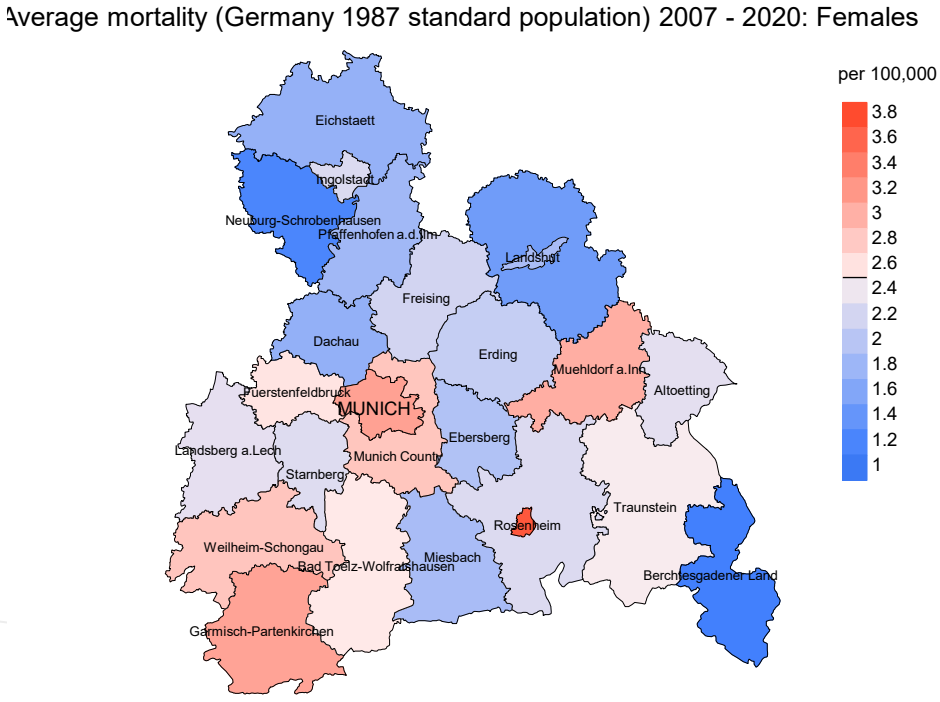
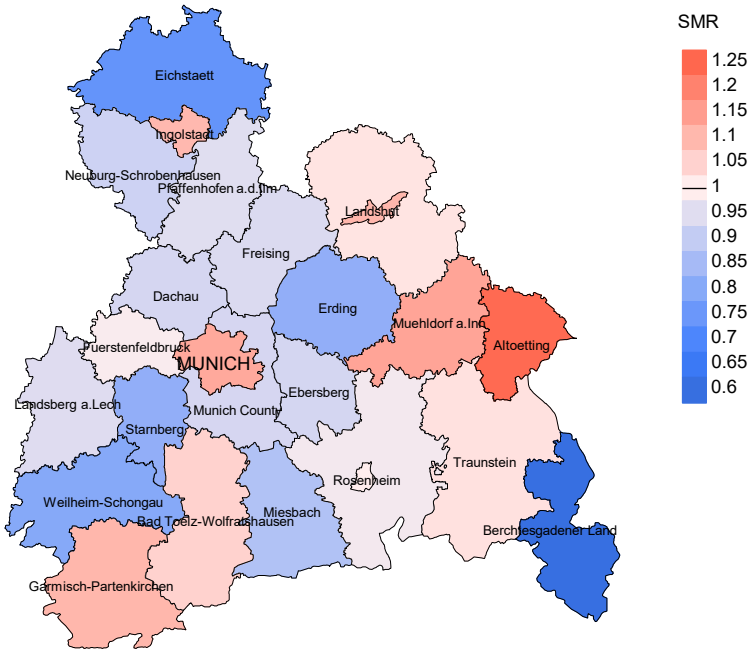


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2020. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 9.5/100,000 WS N=3,405, females 2.5/100,000 WS N=1,097).

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 24 women died from HN cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 1.9/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 1.1 and 3.3/100,000.

Standardized mortality ratio (SMR) 2007 - 2020: Males



Standardized mortality ratio (SMR) 2007 - 2020: Females

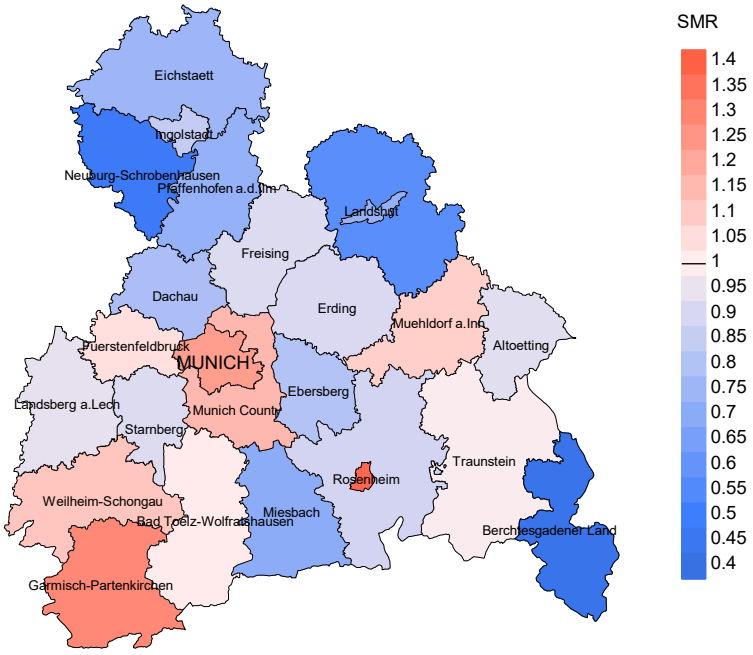


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=3,405, females N=1,097).

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 24 women died from HN cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.81. Though, the value of this parameter may vary with an underlying probability of 99% between 0.45 and 1.34, 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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