Munich Cancer Registry

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- *Deutsch*

ICD-10 C09: Tonsil cancer

Incidence and Mortality

Year of diagnosis	1998-2020
Patients	1,779
Diseases	1,794
Creation date	12/20/2021
Database export	12/20/2021
Population	4.95 m

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

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

https://www.tumorregister-muenchen.de/en/facts/base/bC09__E-ICD-10-C09-Tonsil-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.

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 2015) used for specifying cancer site

Code	Description
C09.-	Malignant neoplasm of tonsil
C09.0	Tonsillar fossa
C09.1	Tonsillar pillar (anterior)(posterior)
C09.8	Overlapping lesion of tonsil
C09.9	Tonsil, unspecified

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	48	3	6.3	8.3	15.4	91.7	100.0
1999	48			7.3	15.3	85.4	100.0
2000	44	1	2.3	8.6	15.1	86.4	100.0
2001	47	1	2.1	9.6	14.9	78.7	91.5
2002	79			11.7	14.6	73.4	97.5 #
2003	99	2	2.0	12.1	14.0	78.8	97.0
2004	87	1	1.1	12.6	13.7	75.9	100.0
2005	91	3	3.3	13.3	13.6	70.3	97.8
2006	93			13.5	13.1	67.7	92.5
2007	98	9	9.2	12.7	12.9	61.2	95.9 #
2008	108	1	0.9	13.4	12.3	61.1	99.1
2009	101	1	1.0	14.1	11.8	61.4	98.0
2010	110	1	0.9	13.7	10.6	60.9	97.3
2011	93			14.2	9.8	54.8	98.9
2012	118	4	3.4	14.5	10.0	62.7	97.5
2013	109	2	1.8	14.9	9.2	54.1	98.2
2014	80	2	2.5	15.1	8.3	68.8	98.8
2015	97	3	3.1	15.4	8.2	45.4	99.0
2016	64	1	1.6	15.7	8.0	29.7	100.0
2017	71	1	1.4	16.3	9.7	35.2	100.0
2018	41	2	4.9	16.3	5.7	31.7	100.0
2019	38			16.5	4.6	28.9	97.4
2020	30			16.6	3.6	20.0	100.0 ##
1998-2020	1794	38	2.1	16.6	15.4	61.4	97.9

1,794 cases diagnosed 1998-2020 are related to a total of 1,779 patients. Currently, in 568 (31.9 %) of these 1,779 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 421 / 109 / 38 (23.7 % / 6.1 % / 2.1 %) 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 41 cases has been diagnosed, of which 16.3 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 5.7 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1a

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

Year of diagnosis	Males n	Males %	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	36	75.0	2	5.6	8.3	15.2	97.2	100.0
1999	36	75.0			6.9	15.0	83.3	100.0
2000	33	75.0	1	3.0	7.6	14.8	81.8	100.0
2001	38	80.9			8.4	14.8	81.6	92.1
2002	64	81.0			11.6	14.3	81.3	100.0 #
2003	68	68.7	1	1.5	11.6	13.6	79.4	97.1
2004	74	85.1	1	1.4	12.6	13.4	77.0	100.0
2005	65	71.4	2	3.1	13.0	13.2	72.3	100.0
2006	67	72.0			13.5	12.9	70.1	92.5
2007	77	78.6	7	9.1	12.7	12.8	64.9	96.1 #
2008	73	67.6			13.6	12.1	56.2	98.6
2009	75	74.3	1	1.3	14.2	11.4	64.0	97.3
2010	83	75.5	1	1.2	13.9	10.3	62.7	97.6
2011	70	75.3			14.3	9.7	52.9	100.0
2012	91	77.1	3	3.3	14.4	9.9	65.9	98.9
2013	78	71.6	2	2.6	14.9	10.0	60.3	98.7
2014	63	78.8	1	1.6	14.9	8.3	68.3	98.4
2015	60	61.9	2	3.3	15.4	8.3	56.7	100.0
2016	50	78.1	1	2.0	15.7	8.2	34.0	100.0
2017	52	73.2	1	1.9	16.1	9.9	42.3	100.0
2018	32	78.0	2	6.3	16.1	5.6	37.5	100.0
2019	21	55.3			16.2	5.1	42.9	100.0
2020	21	70.0			16.2	5.3	28.6	100.0 ##
1998-2020	1327	74.0	28	2.1	16.2	15.2	64.7	98.4

1,327 cases diagnosed 1998-2020 are related to a total of 1,317 patients. Currently, in 419 (31.8 %) of these 1,317 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 312 / 79 / 28 (23.7 % / 6.0 % / 2.1 %) 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 32 cases has been diagnosed, of which 16.1 % 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	12	25.0	1	8.3	8.3	16.0	75.0	100.0	
1999	12	25.0			8.3	16.0	91.7	100.0	
2000	11	25.0			11.4	15.8	100.0	100.0	
2001	9	19.1	1	11.1	13.6	15.2	66.7	88.9	
2002	15	19.0			11.9	15.6	40.0	86.7	#
2003	31	31.3	1	3.2	13.3	15.2	77.4	96.8	
2004	13	14.9			12.6	14.5	69.2	100.0	
2005	26	28.6	1	3.8	14.0	14.7	65.4	92.3	
2006	26	28.0			13.5	13.7	61.5	92.3	
2007	21	21.4	2	9.5	12.5	13.2	47.6	95.2	#
2008	35	32.4	1	2.9	12.8	12.7	71.4	100.0	
2009	26	25.7			13.9	12.9	53.8	100.0	
2010	27	24.5			12.9	11.7	55.6	96.3	
2011	23	24.7			13.9	10.0	60.9	95.7	
2012	27	22.9	1	3.7	14.6	10.1	51.9	92.6	
2013	31	28.4			14.8	7.3	38.7	96.8	
2014	17	21.3	1	5.9	15.5	8.3	70.6	100.0	
2015	37	38.1	1	2.7	15.3	7.8	27.0	97.3	
2016	14	21.9			15.7	7.5	14.3	100.0	
2017	19	26.8			16.7	9.3	15.8	100.0	
2018	9	22.0			17.0	5.7	11.1	100.0	
2019	17	44.7			17.2	3.8	11.8	94.1	
2020	9	30.0			17.8	0.0		100.0	##
1998-2020	467	26.0	10	2.1	17.8	16.0	52.0	96.6	

467 cases diagnosed 1998-2020 are related to a total of 462 patients. Currently, in 149 (32.3 %) of these 462 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 109 / 30 / 10 (23.6 % / 6.5 % / 2.2 %) 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 9 cases has been diagnosed, of which 17.0 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 5.7 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 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	36	12	3.2	1.0	2.3	0.6	2.9	0.9	3.1	0.9
1999	36	12	3.2	1.0	2.2	0.5	3.0	0.7	3.2	0.9
2000	33	11	2.9	0.9	1.8	0.5	2.6	0.8	3.0	0.8
2001	38	9	3.3	0.7	2.1	0.5	3.0	0.7	3.2	0.7
2002	64	15	3.4	0.8	2.2	0.5	3.1	0.6	3.2	0.7
2003	68	31	3.6	1.6	2.4	0.9	3.3	1.3	3.6	1.4
2004	74	13	3.9	0.7	2.6	0.3	3.5	0.5	3.8	0.6
2005	65	26	3.4	1.3	2.2	0.8	3.0	1.1	3.2	1.2
2006	67	26	3.5	1.3	2.2	0.9	3.1	1.1	3.4	1.2
2007	77	21	3.5	0.9	2.2	0.5	3.0	0.7	3.3	0.8
2008	73	35	3.3	1.5	2.0	0.8	2.8	1.1	3.2	1.3
2009	75	26	3.4	1.1	2.1	0.6	2.9	0.9	3.2	1.0
2010	83	27	3.7	1.2	2.2	0.7	3.1	1.0	3.4	1.0
2011	70	23	3.1	1.0	1.9	0.6	2.6	0.8	2.8	0.9
2012	91	27	4.0	1.1	2.4	0.7	3.3	0.9	3.7	1.0
2013	78	31	3.4	1.3	2.1	0.8	2.8	1.0	3.1	1.1
2014	63	17	2.7	0.7	1.6	0.4	2.2	0.5	2.4	0.6
2015	60	37	2.5	1.5	1.5	0.9	2.0	1.2	2.3	1.4
2016	50	14	2.1	0.6	1.1	0.3	1.6	0.4	1.9	0.5
2017	52	19	2.2	0.8	1.2	0.4	1.7	0.6	1.9	0.7
2018	32	9	1.3	0.4	0.7	0.2	1.0	0.3	1.2	0.3
2019	21	17	0.9	0.7	0.5	0.4	0.7	0.5	0.8	0.6
2020	21	9	0.9	0.4	0.5	0.2	0.7	0.2	0.8	0.3
1998–2020	1327	467	2.9	1.0	1.7	0.6	2.4	0.8	2.6	0.8

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	48	54.5	12.8	0.9	83.1	41.1	49.3	55.2	59.5	69.2
1999	48	60.6	11.3	37.1	91.7	47.1	52.5	60.2	66.4	75.2
2000	44	62.0	10.0	45.0	89.6	51.1	54.3	59.5	69.4	75.5
2001	47	59.0	10.0	41.3	88.3	46.7	52.3	57.7	64.8	74.5
2002	79	59.6	10.0	37.3	96.8	47.4	53.3	59.7	63.0	74.5
2003	99	61.1	9.9	41.4	87.5	49.7	53.8	58.9	67.2	75.1
2004	87	59.5	10.4	38.3	85.1	45.4	51.9	58.4	65.0	74.9
2005	91	61.1	9.6	41.9	103	51.4	54.0	60.9	65.7	71.2
2006	93	60.3	10.5	41.2	90.3	47.2	52.5	59.1	66.0	72.7
2007	98	61.4	11.6	39.1	91.6	47.7	52.4	61.1	68.7	77.6
2008	108	63.7	10.0	45.2	91.8	49.9	57.7	62.4	69.2	77.1
2009	101	62.7	11.2	40.8	95.5	50.6	54.5	61.7	68.5	79.1
2010	110	62.1	8.9	37.1	85.1	50.0	55.1	62.1	68.5	72.8
2011	93	61.4	10.1	44.9	91.7	49.8	53.6	59.7	67.6	74.4
2012	118	61.8	9.6	42.3	91.1	49.3	54.8	61.6	68.0	75.8
2013	109	62.0	10.4	33.2	92.9	50.0	54.7	61.4	67.7	75.9
2014	80	61.8	10.2	40.2	89.6	48.2	55.4	60.4	70.2	74.9
2015	97	62.1	9.9	43.2	87.2	49.7	54.5	62.3	66.8	76.2
2016	64	65.6	9.4	43.2	86.7	52.5	57.4	66.5	73.4	76.5
2017	71	65.2	9.7	39.2	86.7	52.5	58.1	64.4	72.9	77.2
2018	41	65.9	9.9	43.6	85.3	58.3	60.2	63.3	74.1	81.0
2019	38	63.9	8.8	48.8	88.3	53.4	57.8	64.7	69.4	73.8
2020	30	67.2	9.5	49.4	92.3	56.1	60.6	65.9	71.1	79.9
1998–2020	1794	61.8	10.3	0.9	103	49.5	54.3	61.2	68.2	75.9

Table 3a

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	Median 10%	25%	50%	75%	90%
1998	36	53.3	13.6	0.9	81.1	40.2	47.8	55.2	60.2	68.6
1999	36	57.6	9.9	37.1	80.9	46.4	50.8	55.6	64.2	68.2
2000	33	62.5	10.5	45.0	89.6	50.0	55.3	61.9	69.6	75.5
2001	38	58.7	8.5	42.0	81.2	46.7	53.7	57.8	64.6	67.1
2002	64	59.7	9.1	41.7	96.8	47.5	54.8	59.8	63.0	69.5
2003	68	59.9	9.3	41.4	87.5	49.3	53.6	58.8	65.2	73.8
2004	74	58.7	10.1	38.3	85.1	45.4	51.8	57.9	64.3	73.0
2005	65	60.8	7.5	41.9	79.5	52.5	56.0	61.0	64.8	70.4
2006	67	60.6	10.2	42.5	86.7	47.6	52.5	59.1	68.2	74.7
2007	77	61.1	11.2	39.1	91.6	47.2	52.4	61.2	68.7	76.8
2008	73	62.7	9.8	45.2	87.0	49.9	57.3	61.1	68.8	76.3
2009	75	62.4	10.0	40.8	90.7	50.6	54.5	62.2	68.5	75.4
2010	83	62.7	8.7	43.5	81.9	51.4	56.0	62.6	68.6	73.4
2011	70	61.4	10.3	44.9	89.2	49.4	52.9	60.8	68.8	74.5
2012	91	61.0	9.2	42.3	81.5	49.3	54.3	61.1	66.0	72.8
2013	78	61.9	9.8	33.2	92.9	50.0	55.6	61.7	67.4	74.0
2014	63	61.1	10.5	40.2	89.6	48.0	54.3	59.6	70.5	75.0
2015	60	62.4	10.3	43.2	84.4	49.5	53.7	62.2	68.8	78.5
2016	50	64.9	9.7	43.2	79.3	52.1	55.8	66.1	73.4	76.9
2017	52	65.9	9.9	39.2	86.7	52.6	58.4	65.9	73.0	79.6
2018	32	66.0	10.5	43.6	85.3	53.5	60.6	63.2	75.9	81.0
2019	21	61.9	7.3	48.8	77.8	53.4	57.8	60.2	66.3	70.1
2020	21	65.8	8.1	53.3	80.2	57.4	60.6	64.8	69.8	78.8
1998–2020	1327	61.4	10.0	0.9	96.8	49.1	54.3	61.1	67.6	75.1

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	12	58.0	9.4	50.7	83.1	50.8	52.3	55.0	58.3	69.2
1999	12	69.4	11.2	52.1	91.7	57.2	60.1	69.9	74.9	82.4
2000	11	60.4	8.7	51.1	77.0	51.6	53.4	58.0	65.0	74.9
2001	9	59.9	15.3	41.3	88.3	41.3	49.6	53.6	73.0	88.3
2002	15	59.5	13.7	37.3	80.8	46.8	48.1	56.1	77.7	78.9
2003	31	63.6	10.9	43.7	84.2	52.6	55.8	61.6	72.2	81.3
2004	13	63.9	11.4	44.7	82.5	50.9	56.0	60.9	69.3	80.5
2005	26	61.9	13.7	44.9	103	48.0	52.6	59.3	67.0	81.2
2006	26	59.3	11.5	41.2	90.3	45.4	51.8	59.1	62.6	72.5
2007	21	62.6	12.9	44.2	89.4	48.7	53.6	58.8	68.6	83.5
2008	35	65.7	10.3	45.9	91.8	52.6	60.7	65.3	70.3	80.7
2009	26	63.5	14.1	43.2	95.5	49.6	53.9	59.5	71.1	85.9
2010	27	60.3	9.6	37.1	85.1	49.5	53.4	59.6	67.4	69.6
2011	23	61.4	9.6	49.9	91.7	51.9	54.7	58.6	64.9	70.9
2012	27	64.6	10.6	44.0	91.1	51.5	56.6	64.7	69.5	75.9
2013	31	62.3	11.8	43.0	90.5	50.5	53.5	60.7	69.5	78.4
2014	17	64.5	8.7	52.4	86.9	53.1	58.6	64.1	70.1	73.9
2015	37	61.6	9.2	46.1	87.2	49.7	55.9	62.3	66.7	75.1
2016	14	68.3	7.9	56.3	86.7	58.4	63.8	68.3	73.5	74.5
2017	19	63.6	9.3	46.3	76.6	50.3	53.9	64.3	72.9	75.8
2018	9	65.6	8.2	58.6	81.4	58.6	59.0	65.4	65.5	81.4
2019	17	66.4	10.1	49.8	88.3	53.5	59.1	68.0	72.0	80.5
2020	9	70.2	12.1	49.4	92.3	49.4	66.6	70.6	71.1	92.3
1998-2020	467	63.1	11.1	37.1	103	49.9	54.8	61.9	69.7	78.4

Table 4

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

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4									
5-9									
10-14									
15-19									
20-24									
25-29									
30-34	1	0.1	0.1	1	0.1	0.1			0.0
35-39	3	0.3	0.3	2	0.2	0.4	1	0.3	0.3
40-44	24	2.1	2.4	17	2.0	2.4	7	2.2	2.6
45-49	89	7.7	10.1	70	8.3	10.6	19	6.1	8.7
50-54	169	14.6	24.7	125	14.8	25.4	44	14.1	22.8
55-59	183	15.8	40.5	131	15.5	40.9	52	16.7	39.4
60-64	237	20.5	61.0	180	21.3	62.2	57	18.3	57.7
65-69	184	15.9	76.9	128	15.1	77.3	56	17.9	75.6
70-74	122	10.5	87.4	88	10.4	87.7	34	10.9	86.5
75-79	81	7.0	94.4	65	7.7	95.4	16	5.1	91.7
80-84	40	3.5	97.8	29	3.4	98.8	11	3.5	95.2
85+	25	2.2	100.0	10	1.2	100.0	15	4.8	100.0
All ages	1158	100.0		846	100.0		312	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=21 %	Females DCO rate n=6 %	Males Prop.all cancers n=153686 %	Females Prop.all cancers n=155051 %
0- 4								
5- 9								
10-14								
15-19								
20-24								
25-29								
30-34	1		0.0				0.1	
35-39	2	1	0.1	0.0			0.1	0.0
40-44	17	7	0.7	0.3		14.3	0.6	0.1
45-49	70	18	2.6	0.7			1.4	0.2
50-54	125	43	4.9	1.7	0.8		1.5	0.3
55-59	129	52	6.1	2.4	0.8		1.0	0.4
60-64	179	56	10.1	2.9	1.7	1.8	1.0	0.4
65-69	127	55	7.8	3.0	3.1		0.5	0.3
70-74	87	34	5.8	2.0	3.4		0.3	0.2
75-79	65	16	5.4	1.1	7.7		0.3	0.1
80-84	29	11	4.0	1.0	10.3	9.1	0.2	0.1
85+	10	15	2.1	1.4	10.0	20.0	0.1	0.1
All ages	841	308			2.5	1.9	0.5	0.2
Incidence								
Raw			2.6	0.9				
WS			1.5	0.5				
ES			2.1	0.7				
BRD-S			2.4	0.8				

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).

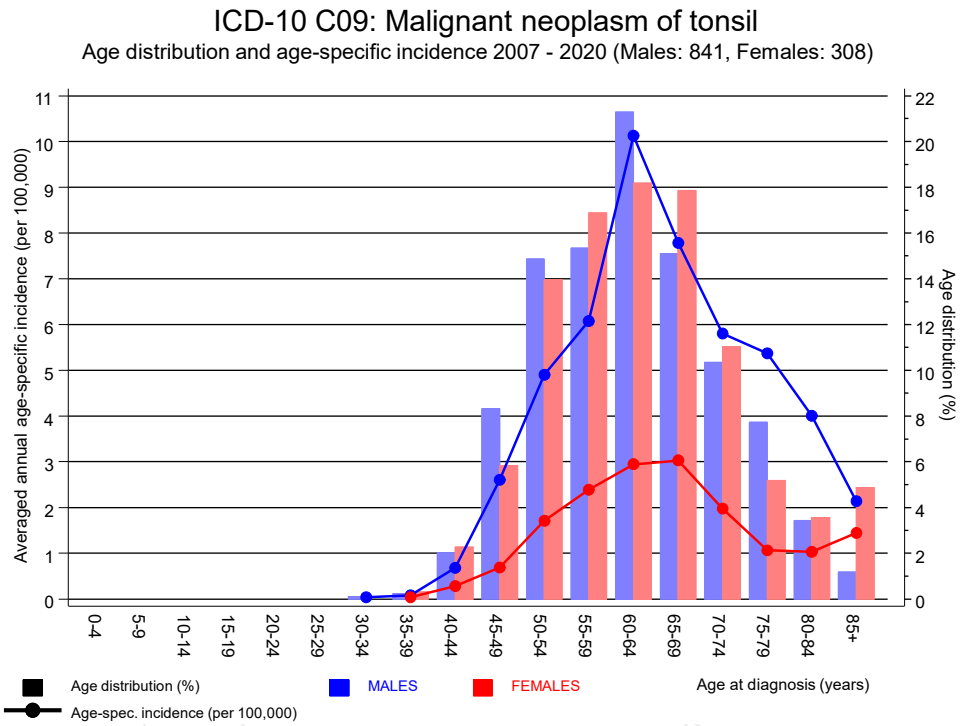


Figure 6. Age distribution (males: mean=62.5 yrs, median=62.1 yrs; females: mean=63.8 yrs, median=63.5 yrs) and age-specific incidence.

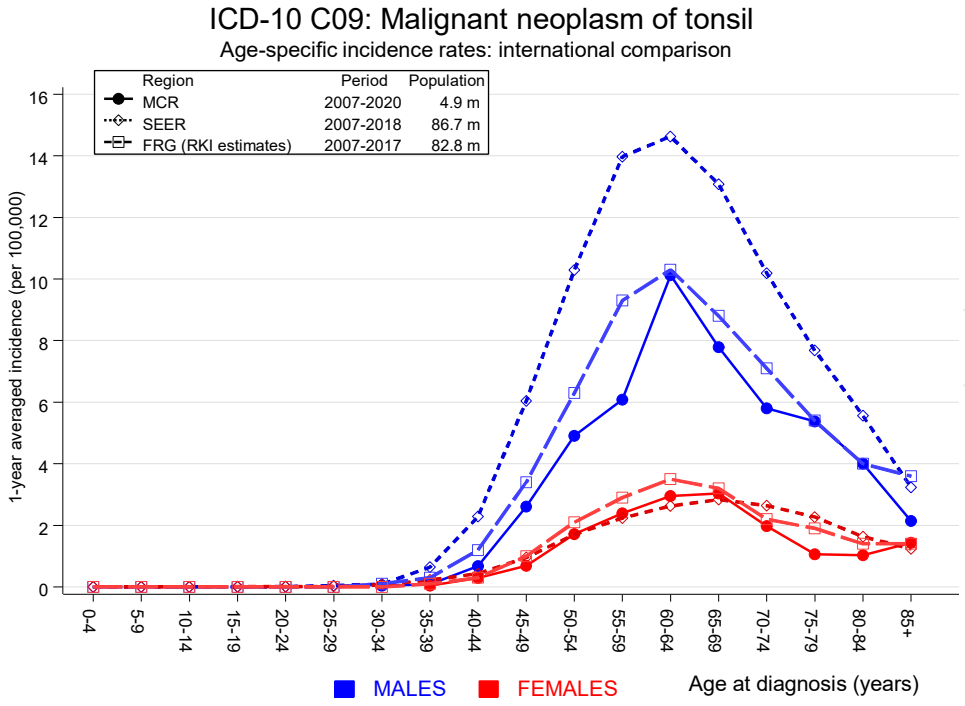


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, RKI estimates) and SEER (Surveillance, Epidemiology, and End Results, USA).

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	29	0.7	40.2	26.9	57.8	#	56.0	3.4
C07–C08	Salivary gland	1	0.1	7.5	0.2	41.7		1.7	
C09–C10	Oropharynx	18	0.9	19.2	11.4	30.3	#	33.8	
C11	Nasopharynx	2	0.1	32.4	3.9	117.2	#	3.8	
C12–C13	Hypopharynx	15	0.5	30.5	17.1	50.3	#	28.7	
C14	ENT cancer	1	0.0	70.1	1.8	390.4	#	2.0	100.0
C15	Oesophagus	25	1.5	16.9	11.0	25.0	#	46.6	12.0
C16	Stomach	8	2.2	3.6	1.6	7.2	#	11.5	25.0
C18	Colon	12	5.4	2.2	1.1	3.9	#	13.0	
C19–C20	Rectum	2	3.5	0.6	0.1	2.1		−3.0	
C21	Anus/canal	1	0.2	5.7	0.1	31.7		1.6	
C22	Liver	12	1.9	6.4	3.3	11.2	#	20.0	16.7
C25	Pancreas	4	2.3	1.7	0.5	4.4		3.3	25.0
C30–C31	Sinuses	1	0.1	7.9	0.2	44.1		1.7	
C32	Larynx	20	0.7	26.8	16.3	41.3	#	38.1	25.0
C33–C34	Lung	62	7.6	8.1	6.2	10.4	#	107.7	8.1
C43	Malign. melanoma	6	3.0	2.0	0.7	4.3		5.9	
C46,C49	Soft tissue	1	0.4	2.8	0.1	15.6		1.3	
C61	Prostate	16	17.6	0.9	0.5	1.5		−3.2	
C62	Testis	1	0.2	4.1	0.1	23.1		1.5	
C64	Kidney	7	2.3	3.0	1.2	6.2	#	9.3	
C67	Bladder	2	2.5	0.8	0.1	2.9		−1.0	
C70–C72	CNS cancer	2	0.9	2.3	0.3	8.3		2.2	
C73	Thyroid	3	0.5	5.5	1.1	16.1	#	4.9	
C76–C79	CUP	5	1.0	5.0	1.6	11.7	#	7.9	
C82–C85	NHL	3	2.5	1.2	0.2	3.5		0.9	
C90	Mult. myeloma	1	0.8	1.3	0.0	7.3		0.5	
C91–C96	Leukaemia	2	0.8	2.4	0.3	8.7		2.3	50.0
Not observed		0	2.9	0.0	0.0	1.3		−5.8	
All further malignancies		262	63.3	4.1	3.7	4.7	#	393.3	8.0

Patients	1287
Median age at next malignancy (years)	63.5
Person-years	5052
Mean observation time (years)	3.9
Median observation time (years)	2.2

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	10	0.1	81.6	39.1	150.1	#	52.5	
C09–C10	Oropharynx	10	0.1	94.3	45.2	173.5	#	52.6	
C12–C13	Hypopharynx	5	0.0	185.1	60.1	431.9	#	26.5	
C14	ENT cancer	1	0.0	523.1	13.2	2915	#	5.3	100.0
C15	Oesophagus	7	0.1	52.5	21.1	108.2	#	36.5	14.3
C16	Stomach	1	0.5	2.0	0.1	11.0		2.6	
C18	Colon	6	1.5	4.1	1.5	8.8	#	24.1	
C19–C20	Rectum	1	0.7	1.5	0.0	8.4		1.8	
C22	Liver	1	0.2	4.8	0.1	27.0		4.2	
C32	Larynx	5	0.0	121.7	39.5	284.1	#	26.4	
C33–C34	Lung	17	1.5	11.2	6.5	17.9	#	82.3	11.8
C50	Breast	8	6.2	1.3	0.6	2.5		9.5	
C51	Vulva	1	0.2	6.0	0.2	33.5		4.4	
C53	Cervix uteri	2	0.3	7.3	0.9	26.5		9.2	
C54	Corpus uteri	3	1.1	2.8	0.6	8.2		10.3	
C56	Ovary	4	0.7	5.5	1.5	14.1	#	17.4	25.0
C64	Kidney	1	0.4	2.6	0.1	14.5		3.3	
C70–C72	CNS cancer	1	0.2	4.3	0.1	24.0		4.1	
C76–C79	CUP	1	0.3	3.7	0.1	20.4		3.9	
C82–C85	NHL	2	0.7	3.1	0.4	11.1		7.2	
C91–C96	Leukaemia	2	0.2	8.7	1.1	31.5	#	9.4	
Not observed		0	3.3	0.0	0.0	1.1		-17.7	
All further malignancies		89	18.3	4.9	3.9	6.0	#	375.8	5.6

Patients	451
Median age at next malignancy (years)	64.3
Person-years	1880
Mean observation time (years)	4.2
Median observation time (years)	2.8

The occurrence of further specified malignancy is statistically significant.

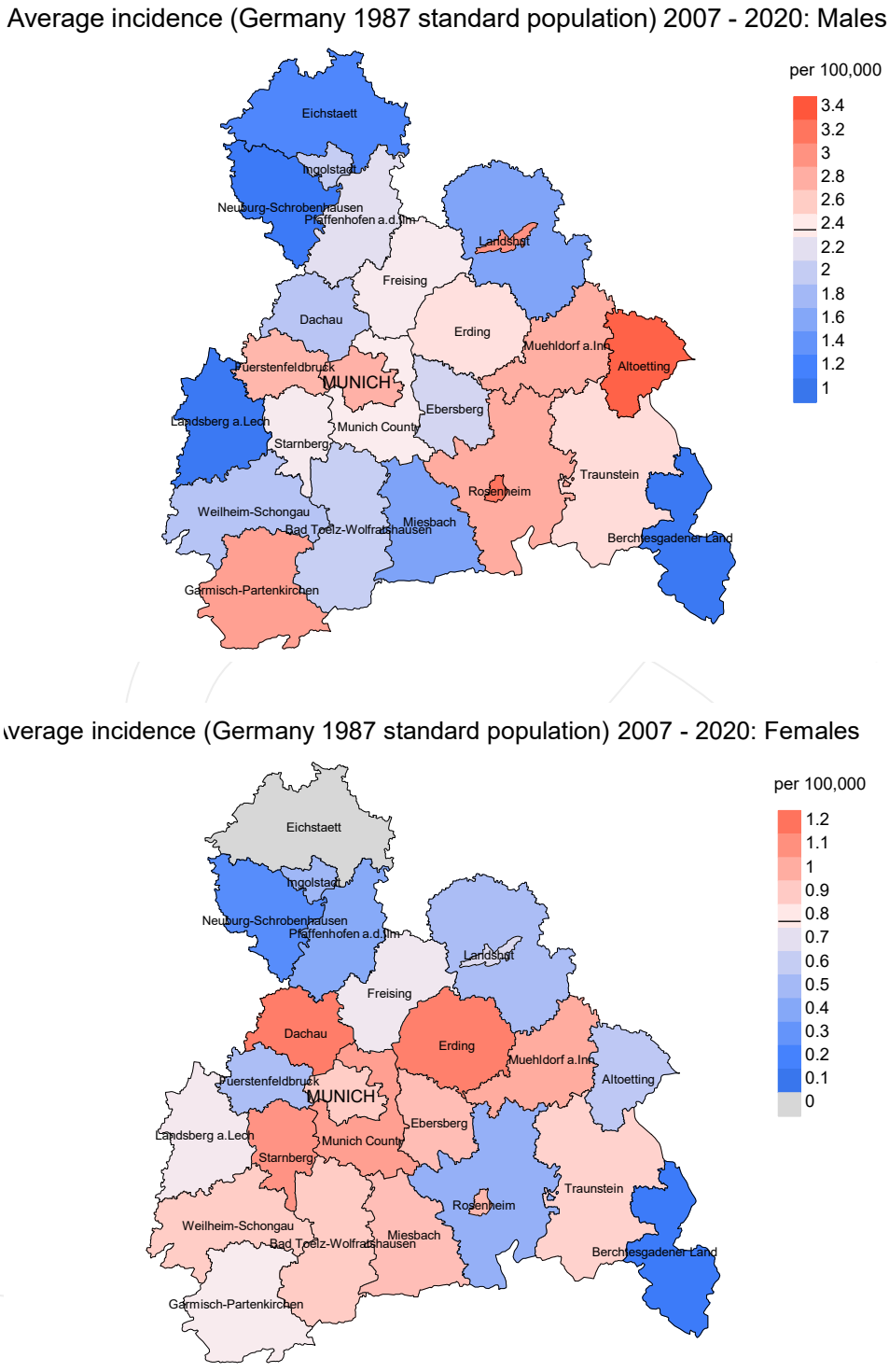
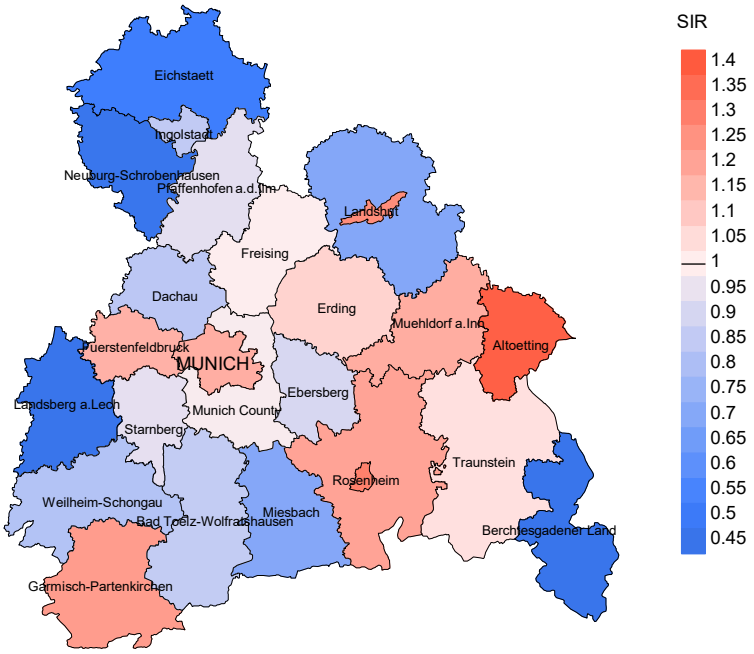


Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 2.4/100,000 WS N=841, females 0.8/100,000 WS N=308).

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 10 women were identified with newly diagnosed tonsil cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 0.9/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.4 and 2.1/100,000.

Standardized incidence ratio (SIR) 2007 - 2020: Males



Standardized incidence ratio (SIR) 2007 - 2020: Females

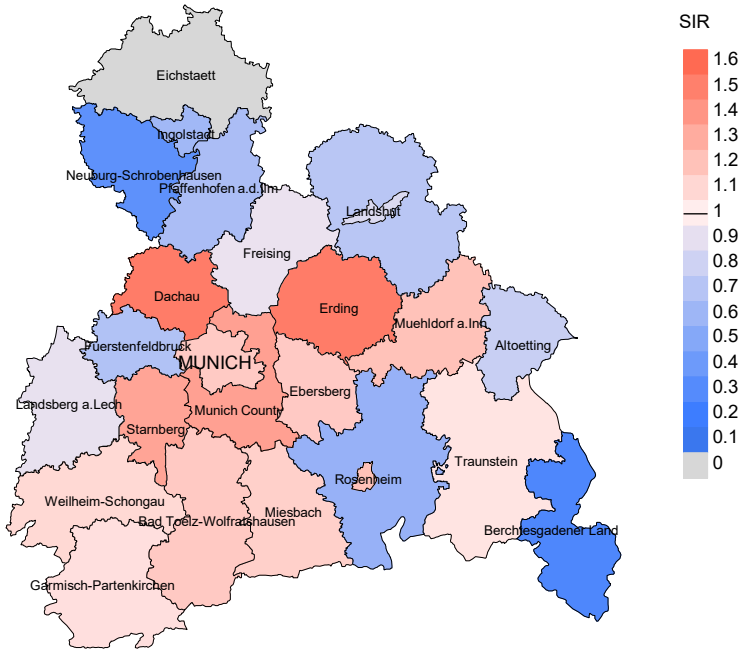


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=841, females N=308).

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 10 women were identified with newly diagnosed tonsil cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.16. Though, the value of this parameter may vary with an underlying probability of 99% between 0.43 and 2.49, 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	48	100.0	6.3	44	91.7	100.0
1999	48	100.0		41	85.4	82.9
2000	44	100.0	2.3	38	86.4	100.0
2001	47	91.5	2.1	37	78.7	94.6
2002	79	97.5		58	73.4	98.3
2003	99	97.0	2.0	78	78.8	97.4
2004	87	100.0	1.1	66	75.9	97.0
2005	91	97.8	3.3	64	70.3	96.9
2006	93	92.5		63	67.7	98.4
2007	98	95.9	9.2	60	61.2	95.0
2008	108	99.1	0.9	66	61.1	92.4
2009	101	98.0	1.0	62	61.4	96.8
2010	110	97.3	0.9	67	60.9	94.0
2011	93	98.9		51	54.8	90.2
2012	118	97.5	3.4	74	62.7	90.5
2013	109	98.2	1.8	59	54.1	91.5
2014	80	98.8	2.5	55	68.8	96.4
2015	97	99.0	3.1	44	45.4	90.9
2016	64	100.0	1.6	19	29.7	84.2
2017	71	100.0	1.4	25	35.2	60.0
2018	41	100.0	4.9	13	31.7	76.9
2019	38	97.4		11	28.9	81.8
2020	30	100.0		6	20.0	100.0
1998-2020	1794	97.9	2.1	1101	61.4	93.5

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	48	41	92.7	10	20.8
1999	48	36	77.8	10	20.8
2000	44	28	92.9	4	9.1
2001	47	32	96.9	11	23.4
2002	79	48	97.9	8	10.1
2003	99	59	96.6	16	16.2
2004	87	63	98.4	7	8.0
2005	91	63	96.8	15	16.5
2006	93	53	98.1	10	10.8
2007	98	64	98.4	16	16.3
2008	108	64	100.0	10	9.3
2009	101	62	98.4	14	13.9
2010	110	63	98.4	10	9.1
2011	93	63	98.4	11	11.8
2012	118	69	98.6	12	10.2
2013	109	82	97.6	11	10.1
2014	80	70	97.1	11	13.8
2015	97	82	100.0	15	15.5
2016	64	67	98.5	7	10.9
2017	71	55	90.9	6	8.5
2018	41	44	65.9	3	7.3
2019	38	55	52.7	5	13.2
2020	30	41	97.6	1	3.3
1998–2020	1794	1304	94.0	223	12.4

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	41	75.6	24.4	89.5
1999	36	52.8	47.2	82.1
2000	28	82.1	17.9	92.3
2001	32	78.1	21.9	93.5
2002	48	68.8	31.3	78.7
2003	59	76.3	23.7	93.0
2004	63	84.1	15.9	91.9
2005	63	90.5	9.5	95.1
2006	53	79.2	20.8	86.5
2007	64	82.8	17.2	90.5
2008	64	68.8	31.3	78.1
2009	62	80.6	19.4	98.4
2010	63	74.6	25.4	88.7
2011	63	71.4	28.6	82.3
2012	69	84.1	15.9	88.2
2013	82	72.0	28.0	82.5
2014	70	70.0	30.0	91.2
2015	82	87.8	12.2	95.1
2016	67	77.6	22.4	83.3
2017	55	69.1	30.9	90.0
2018	44	50.0	50.0	69.0
2019	55	27.3	72.7	79.3
2020	41	34.1	65.9	50.0
1998-2020	1304	72.5	27.5	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	32	61.1	57.7	80.5	57.9
1999	26	62.5	57.8	70.6	57.8
2000	19	61.6	61.6	60.9	61.6
2001	25	62.2	62.1	67.6	63.2
2002	40	63.0	62.0	71.8	61.8
2003	47	62.3	61.9	62.3	61.5
2004	48	60.7	60.5	62.5	60.8
2005	51	62.9	62.4	65.0	62.8
2006	41	64.8	64.8	65.5	64.8
2007	56	65.5	62.5	74.3	63.2
2008	45	68.0	67.6	69.2	67.6
2009	48	61.7	60.9	67.2	61.8
2010	46	64.1	63.8	70.8	63.8
2011	50	67.6	62.4	73.3	64.1
2012	49	68.5	68.5	67.1	67.6
2013	61	65.5	62.9	67.6	63.7
2014	53	70.2	67.9	75.1	69.7
2015	61	63.7	63.0	68.4	63.0
2016	51	67.5	66.3	75.4	66.6
2017	40	69.8	63.6	72.4	67.9
2018	35	77.1	77.4	76.3	77.7
2019	41	73.2	65.5	73.8	66.0
2020	38	72.5	71.8	73.5	69.0
1998-2020	1003	65.3	63.5	72.1	63.9

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	9	72.7	71.3	77.9	72.7
1999	10	58.9	58.4	78.0	55.9
2000	9	70.7	65.1	74.0	70.7
2001	7	66.2	63.4	69.4	64.8
2002	8	66.0	66.0	65.6	73.4
2003	12	61.2	59.9	75.6	61.7
2004	15	73.8	73.8	67.3	71.5
2005	12	61.8	60.3	65.9	60.3
2006	12	73.9	72.8	75.1	73.9
2007	8	63.6	65.9	58.2	63.6
2008	19	67.4	67.4	71.9	67.4
2009	14	69.5	69.5	72.0	69.0
2010	17	64.5	61.9	71.1	64.1
2011	13	67.4	65.3	82.4	65.3
2012	20	70.6	65.9	77.6	65.9
2013	21	71.1	68.2	74.1	69.2
2014	17	77.6	71.6	86.5	71.8
2015	21	67.3	66.9	67.9	66.9
2016	16	67.4	68.6	59.2	68.6
2017	15	69.2	66.3	79.7	67.8
2018	9	73.4	71.0	73.4	73.9
2019	14	73.1	67.9	76.7	70.1
2020	3	80.9	81.8	79.1	80.9
1998–2020	301	69.2	67.3	75.0	67.7

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	26	2.3	0.72	1.7	0.74	2.2	0.74	2.3	0.74
1999	16	1.4	0.44	0.9	0.41	1.2	0.42	1.5	0.47
2000	15	1.3	0.45	0.8	0.45	1.1	0.43	1.3	0.43
2001	20	1.7	0.53	1.1	0.53	1.5	0.52	1.8	0.57
2002	29	1.6	0.45	1.0	0.43	1.4	0.45	1.6	0.50
2003	38	2.0	0.56	1.3	0.53	1.8	0.53	2.0	0.56
2004	40	2.1	0.55	1.3	0.53	1.9	0.54	2.0	0.54
2005	46	2.4	0.72	1.5	0.68	2.1	0.69	2.3	0.73
2006	35	1.8	0.52	1.1	0.49	1.5	0.49	1.7	0.51
2007	46	2.1	0.60	1.3	0.58	1.8	0.60	2.0	0.59
2008	31	1.4	0.42	0.8	0.40	1.1	0.41	1.3	0.41
2009	41	1.8	0.55	1.1	0.55	1.6	0.55	1.8	0.55
2010	37	1.6	0.45	0.9	0.42	1.3	0.44	1.6	0.47
2011	37	1.7	0.54	0.9	0.50	1.3	0.53	1.6	0.57
2012	41	1.8	0.46	0.9	0.39	1.4	0.43	1.7	0.47
2013	45	2.0	0.58	1.1	0.52	1.5	0.55	1.7	0.57
2014	39	1.7	0.62	0.9	0.56	1.3	0.58	1.5	0.60
2015	54	2.3	0.92	1.3	0.87	1.8	0.90	2.1	0.91
2016	39	1.6	0.78	0.9	0.78	1.2	0.78	1.5	0.79
2017	25	1.0	0.48	0.6	0.47	0.8	0.47	0.9	0.47
2018	18	0.7	0.56	0.3	0.37	0.4	0.44	0.6	0.53
2019	11	0.5	0.52	0.2	0.44	0.3	0.44	0.4	0.53
2020	12	0.5	0.57	0.2	0.49	0.3	0.52	0.4	0.56
1998-2020	741	1.6	0.56	0.9	0.53	1.3	0.54	1.5	0.57

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	5	0.4	0.42	0.2	0.29	0.3	0.31	0.4	0.41
1999	3	0.3	0.25	0.2	0.33	0.2	0.30	0.2	0.27
2000	8	0.7	0.73	0.4	0.67	0.5	0.67	0.6	0.77
2001	5	0.4	0.56	0.2	0.47	0.3	0.47	0.3	0.45
2002	4	0.2	0.27	0.1	0.22	0.2	0.25	0.2	0.23
2003	7	0.4	0.23	0.2	0.22	0.3	0.23	0.3	0.22
2004	13	0.7	1.00	0.3	0.83	0.4	0.85	0.6	0.99
2005	11	0.6	0.42	0.3	0.44	0.5	0.44	0.5	0.43
2006	7	0.3	0.27	0.2	0.18	0.2	0.20	0.3	0.24
2007	7	0.3	0.35	0.1	0.28	0.2	0.30	0.3	0.33
2008	13	0.6	0.37	0.3	0.33	0.4	0.35	0.4	0.33
2009	10	0.4	0.38	0.2	0.33	0.3	0.33	0.3	0.33
2010	10	0.4	0.38	0.2	0.35	0.3	0.37	0.4	0.39
2011	8	0.3	0.36	0.2	0.30	0.2	0.31	0.3	0.33
2012	17	0.7	0.63	0.4	0.55	0.5	0.57	0.6	0.58
2013	14	0.6	0.45	0.3	0.36	0.4	0.38	0.5	0.43
2014	10	0.4	0.59	0.2	0.46	0.3	0.49	0.3	0.51
2015	18	0.7	0.50	0.4	0.43	0.5	0.45	0.6	0.46
2016	13	0.5	0.93	0.3	0.90	0.4	0.88	0.5	0.96
2017	13	0.5	0.68	0.3	0.63	0.4	0.63	0.4	0.67
2018	4	0.2	0.44	0.1	0.44	0.1	0.43	0.1	0.47
2019	4	0.2	0.24	0.1	0.24	0.1	0.25	0.1	0.24
2020	2	0.1	0.22	0.0	0.07	0.0	0.09	0.0	0.17
1998-2020	206	0.4	0.44	0.2	0.39	0.3	0.40	0.4	0.42

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									
15-19									
20-24									
25-29									
30-34									
35-39									
40-44	3	0.5	0.5	3	0.6	0.6			0.0
45-49	17	2.7	3.2	14	2.9	3.6	3	2.1	2.1
50-54	75	12.1	15.3	64	13.4	17.0	11	7.7	9.8
55-59	103	16.6	32.0	81	17.0	34.0	22	15.4	25.2
60-64	103	16.6	48.6	81	17.0	51.1	22	15.4	40.6
65-69	100	16.2	64.8	72	15.1	66.2	28	19.6	60.1
70-74	94	15.2	80.0	67	14.1	80.3	27	18.9	79.0
75-79	55	8.9	88.9	49	10.3	90.5	6	4.2	83.2
80-84	45	7.3	96.1	33	6.9	97.5	12	8.4	91.6
85+	24	3.9	100.0	12	2.5	100.0	12	8.4	100.0
All ages	619	100.0		476	100.0		143	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								
15-19								
20-24								
25-29								
30-34								
35-39								
40-44	3		0.1	0.18			0.5	
45-49	14	3	0.5	0.20	0.1	0.17	1.0	0.2
50-54	64	11	2.5	0.51	0.4	0.26	2.4	0.4
55-59	81	22	3.8	0.63	1.0	0.42	1.8	0.6
60-64	81	22	4.6	0.45	1.2	0.39	1.3	0.4
65-69	72	28	4.4	0.57	1.5	0.51	0.8	0.4
70-74	67	27	4.5	0.77	1.6	0.79	0.6	0.3
75-79	49	6	4.0	0.75	0.4	0.38	0.4	0.1
80-84	33	12	4.6	1.14	1.1	1.09	0.3	0.1
85+	12	12	2.6	1.20	1.2	0.80	0.1	0.1
All ages	476	143					0.7	0.2
Mortality								
Raw			1.5	0.57	0.4	0.46		
WS			0.8	0.52	0.2	0.41		
ES			1.1	0.54	0.3	0.42		
BRD-S			1.3	0.56	0.3	0.44		
PYLL-70								
per 100,000			11.6		2.7			
ES			9.8		2.2			
AYLL-70			10.5		9.0			

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	48	12.1	18	37.5	7	14.6	23	47.9
C07–C08	Salivary gland	1	0.3					1	100.0
C09–C10	Oropharynx	26	6.5			8	30.8	18	69.2
C11	Nasopharynx	3	0.8	1	33.3	1	33.3	1	33.3
C12–C13	Hypopharynx	32	8.0	14	43.8	13	40.6	5	15.6
C14	ENT cancer	2	0.5			1	50.0	1	50.0
C15	Oesophagus	37	9.3	8	21.6	6	16.2	23	62.2
C16	Stomach	9	2.3	2	22.2	3	33.3	4	44.4
C18	Colon	11	2.8	3	27.3	1	9.1	7	63.6
C21	Anus/canal	1	0.3					1	100.0
C22	Liver	15	3.8			2	13.3	13	86.7
C23–C24	Bile	1	0.3	1	100.0				
C25	Pancreas	7	1.8					7	100.0
C30–C31	Sinuses	1	0.3					1	100.0
C32	Larynx	32	8.0	10	31.3	9	28.1	13	40.6
C33–C34	Lung	75	18.8	12	16.0	12	16.0	51	68.0
C38,C45	Mesothelioma	1	0.3					1	100.0
C43	Malign. melanoma	5	1.3	1	20.0			4	80.0
C44	Skin others	20	5.0	4	20.0	4	20.0	12	60.0
C46,C49	Soft tissue	2	0.5	1	50.0			1	50.0
C50	Breast	1	0.3	1	100.0				
C61	Prostate	24	6.0	13	54.2	1	4.2	10	41.7
C62	Testis	2	0.5	1	50.0			1	50.0
C64	Kidney	13	3.3	6	46.2	1	7.7	6	46.2
C65	Renal pelvis	1	0.3					1	100.0
C67	Bladder	6	1.5	4	66.7			2	33.3
C69	Eye melanoma	2	0.5	2	100.0				
C70–C72	CNS cancer	1	0.3					1	100.0
C73	Thyroid	3	0.8	1	33.3			2	66.7
C76–C79	CUP	7	1.8	2	28.6	2	28.6	3	42.9
C82–C85	NHL	5	1.3	3	60.0			2	40.0
C91–C96	Leukaemia	4	1.0	3	75.0			1	25.0
All further malignancies		398	100.0	111	27.9	71	17.8	216	54.3

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

Table 14b

Further malignancies in deaths in period 1998–2020
FEMALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03–C06 Oral cavity	18	14.3	8	44.4	2	11.1	8	44.4
C09–C10 Oropharynx	6	4.8			4	66.7	2	33.3
C12–C13 Hypopharynx	2	1.6					2	100.0
C14 ENT cancer	1	0.8					1	100.0
C15 Oesophagus	5	4.0	1	20.0	1	20.0	3	60.0
C16 Stomach	1	0.8					1	100.0
C18 Colon	6	4.8	3	50.0	1	16.7	2	33.3
C21 Anus/canal	2	1.6	1	50.0			1	50.0
C22 Liver	1	0.8					1	100.0
C25 Pancreas	1	0.8					1	100.0
C26 GI cancer	1	0.8					1	100.0
C30–C31 Sinuses	3	2.4					3	100.0
C32 Larynx	9	7.1	2	22.2	3	33.3	4	44.4
C33–C34 Lung	22	17.5	5	22.7			17	77.3
C43 Malign. melanoma	2	1.6	2	100.0				
C44 Skin others	4	3.2	2	50.0			2	50.0
C50 Breast	20	15.9	15	75.0			5	25.0
C53 Cervix uteri	6	4.8	4	66.7			2	33.3
C54 Corpus uteri	1	0.8	1	100.0				
C56 Ovary	1	0.8					1	100.0
C67 Bladder	1	0.8					1	100.0
C68 Urethra	1	0.8	1	100.0				
C70–C72 CNS cancer	1	0.8					1	100.0
C73 Thyroid	1	0.8	1	100.0				
C76–C79 CUP	7	5.6	4	57.1			3	42.9
C82–C85 NHL	2	1.6	1	50.0			1	50.0
C91–C96 Leukaemia	1	0.8					1	100.0
All further malignancies	126	100.0	51	40.5	11	8.7	64	50.8

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								
5- 9								
10-14								
15-19								
20-24								
25-29								
30-34								
35-39								
40-44	1		0.0	0.07			0.2	
45-49	10	3	0.4	0.16	0.1	0.20	0.8	0.2
50-54	50	9	2.0	0.46	0.4	0.26	2.1	0.4
55-59	61	15	2.9	0.59	0.7	0.38	1.6	0.5
60-64	57	18	3.2	0.43	0.9	0.38	1.1	0.4
65-69	53	23	3.2	0.52	1.3	0.52	0.7	0.4
70-74	55	18	3.7	0.93	1.0	0.90	0.6	0.3
75-79	29	3	2.4	0.76	0.2	0.25	0.3	0.0
80-84	25	8	3.5	1.19	0.8	0.80	0.3	0.1
85+	10	8	2.1	1.25	0.8	0.67	0.2	0.1
All ages	351	105					0.7	0.2
Mortality								
Raw			1.1	0.54	0.3	0.43		
WS			0.6	0.49	0.2	0.39		
ES			0.8	0.51	0.2	0.40		
BRD-S			1.0	0.54	0.3	0.41		
PYLL-70								
per 100,000			8.5		2.1			
ES			7.3		1.7			
AYLL-70			10.6		8.9			

* 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								
30-34								
35-39								
40-44	1		0.0	0.07			0.2	
45-49	8	2	0.3	0.14	0.1	0.13	0.6	0.1
50-54	39	9	1.5	0.41	0.4	0.29	1.7	0.4
55-59	47	11	2.2	0.50	0.5	0.33	1.2	0.4
60-64	43	12	2.4	0.39	0.6	0.32	0.8	0.3
65-69	41	18	2.5	0.46	1.0	0.47	0.6	0.3
70-74	35	9	2.3	0.67	0.5	0.56	0.4	0.1
75-79	21	3	1.7	0.64	0.2	0.27	0.2	0.0
80-84	17	7	2.3	0.94	0.7	0.78	0.2	0.1
85+	5	6	1.1	0.83	0.6	0.55	0.1	0.1
All ages	257	77					0.5	0.2
Mortality								
Raw			0.8	0.45	0.2	0.37		
WS			0.4	0.41	0.1	0.33		
ES			0.6	0.43	0.2	0.34		
BRD-S			0.7	0.45	0.2	0.35		
PYLL-70								
per 100,000			6.6		1.7			
ES			5.6		1.4			
AYLL-70			10.6		9.1			

* See corresponding tables with multiple malignancies.

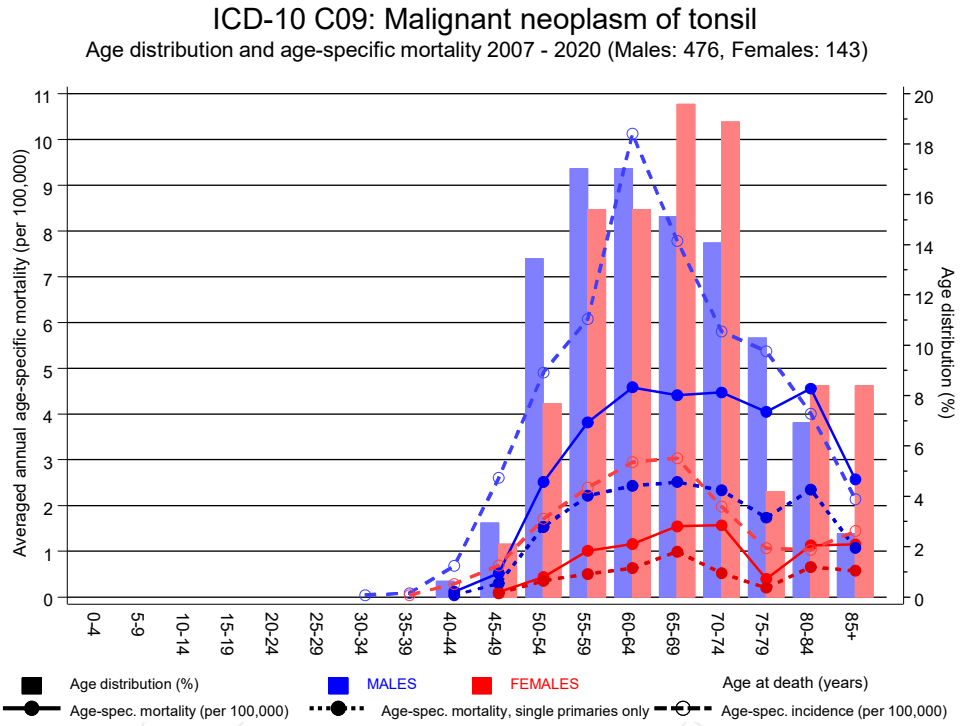


Figure 17. Distribution of age at death (bars; males: mean=61.6 yrs, median=60.7 yrs; females: mean=63.0 yrs, median=61.9 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

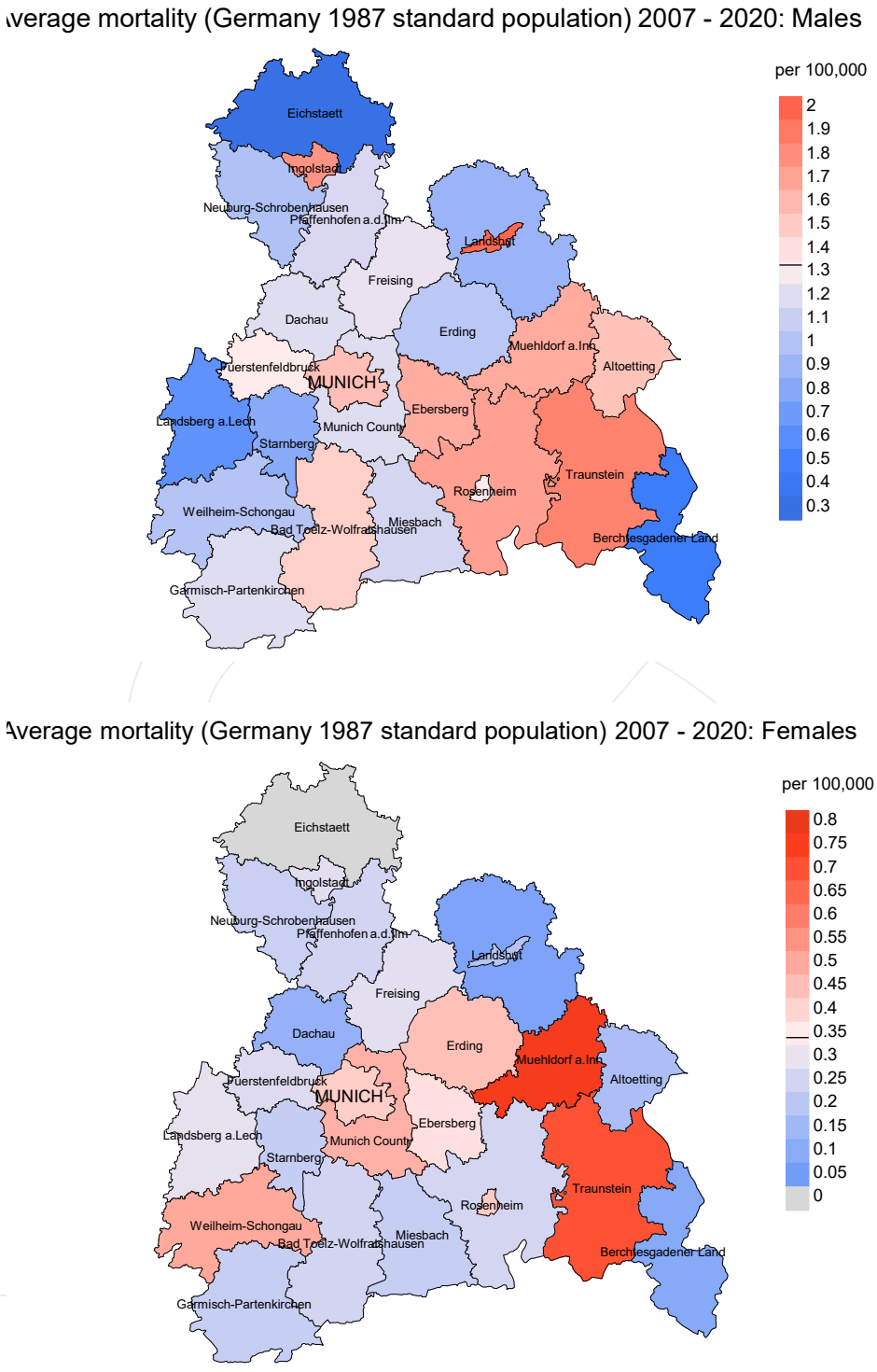
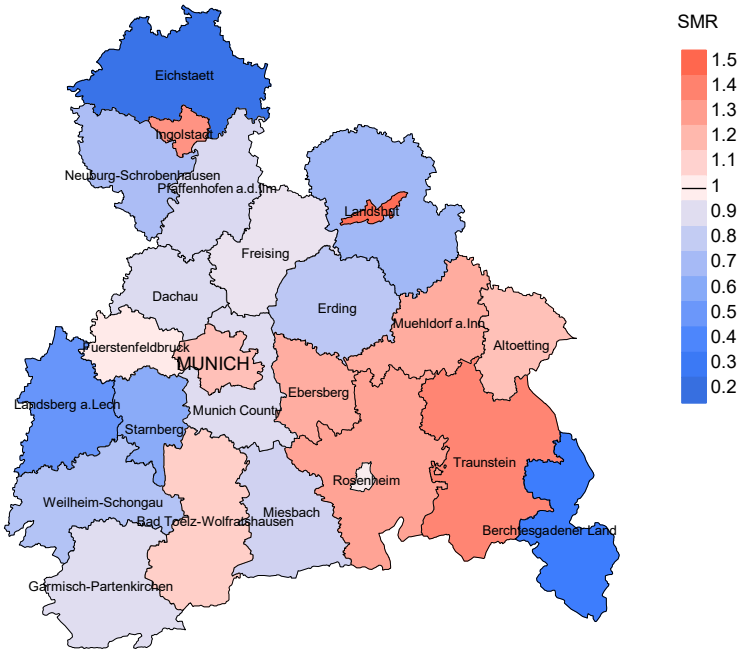


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2020. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 1.3/100,000 WS N=476, females 0.3/100,000 WS N=143).

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 4 women died from tonsil cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.4/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.1 and 1.2/100,000.

Standardized mortality ratio (SMR) 2007 - 2020: Males



Standardized mortality ratio (SMR) 2007 - 2020: Females

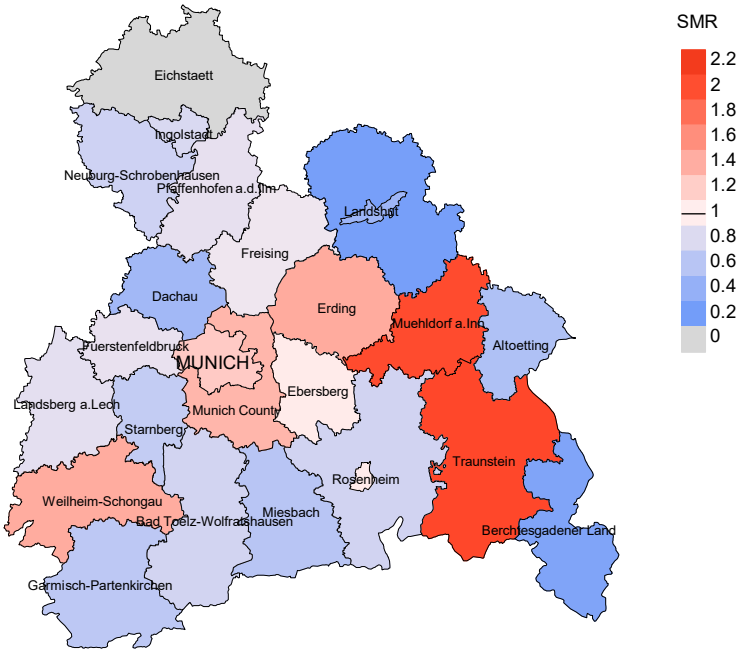


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=476, females N=143).

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 4 women died from tonsil cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.02. Though, the value of this parameter may vary with an underlying probability of 99% between 0.17 and 3.22, 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

Recommended Citation

Munich Cancer Registry. ICD-10 C09: Tonsil cancer - Incidence and Mortality [Internet]. 2021 [updated 2021 Dec 20; cited 2022 Feb 1]. Available from: https://www.tumorregister-muenchen.de/en/facts/base/bC09__E-ICD-10-C09-Tonsil-cancer-incidence-and-mortality.pdf

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