Munich Cancer Registry

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ICD-10 C02: Tongue excl. base of tongue

Incidence and Mortality

Year of diagnosis	1998-2020
Patients	1,273
Diseases	1,279
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/bC02__E-ICD-10-C02-Tongue-excl.-base-of-tongue-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 2015) used for specifying cancer site

Code	Description
C02.-	Malignant neoplasm of other and unspecified parts of tongue
C02.0	Dorsal surface of tongue
C02.1	Border of tongue
C02.2	Ventral surface of tongue
C02.3	Anterior two-thirds of tongue, part unspecified
C02.4	Lingual tonsil
C02.8	Overlapping lesion of tongue
C02.9	Tongue, 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	43	3	7.0	18.6	17.5	81.4	97.7
1999	33			17.1	17.3	84.8	100.0
2000	32	2	6.3	14.8	17.0	75.0	100.0
2001	35			14.0	16.9	82.9	100.0
2002	64			14.5	16.7	70.3	98.4 #
2003	54	2	3.7	14.2	16.6	79.6	100.0
2004	48			12.9	15.9	75.0	100.0
2005	49			13.1	15.5	77.6	95.9
2006	58	2	3.4	12.0	15.5	75.9	94.8
2007	75	5	6.7	12.0	15.1	64.0	90.7 #
2008	80			12.3	14.8	68.8	97.5
2009	70	1	1.4	13.3	13.5	65.7	100.0
2010	80	2	2.5	13.0	13.5	67.5	100.0
2011	63	1	1.6	13.4	12.0	50.8	96.8
2012	81	1	1.2	13.3	10.9	44.4	98.8
2013	75			13.8	10.4	61.3	97.3
2014	73	1	1.4	14.5	11.6	65.8	97.3
2015	68			14.8	10.8	51.5	100.0
2016	64	1	1.6	15.5	10.9	45.3	98.4
2017	55			15.8	9.2	29.1	100.0
2018	40			16.2	7.9	22.5	100.0
2019	22			16.4	5.3	50.0	100.0
2020	17			16.8	0.0	29.4	100.0 ##
1998-2020	1279	21	1.6	16.8	17.5	61.9	98.1

1,279 cases diagnosed 1998-2020 are related to a total of 1,273 patients. Currently, in 425 (33.4 %) of these 1,273 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 309 / 86 / 30 (24.3 % / 6.8 % / 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 40 cases has been diagnosed, of which 16.2 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 7.9 % 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	29	67.4	1	3.4	20.7	17.6	82.8	96.6
1999	16	48.5			22.2	17.3	93.8	100.0
2000	22	68.8	2	9.1	17.9	17.0	81.8	100.0
2001	26	74.3			16.1	17.1	88.5	100.0
2002	38	59.4			16.0	16.9	68.4	97.4 #
2003	35	64.8	1	2.9	16.3	16.8	80.0	100.0
2004	31	64.6			14.7	16.6	77.4	100.0
2005	31	63.3			14.9	16.2	80.6	100.0
2006	35	60.3	1	2.9	13.3	16.0	85.7	94.3
2007	52	69.3	5	9.6	13.3	15.3	65.4	88.5 #
2008	46	57.5			13.0	15.3	73.9	100.0
2009	39	55.7			13.5	14.0	71.8	100.0
2010	50	62.5	2	4.0	13.6	13.3	76.0	100.0
2011	41	65.1	1	2.4	14.1	12.2	58.5	97.6
2012	52	64.2	1	1.9	14.4	10.2	46.2	100.0
2013	45	60.0			14.6	9.0	57.8	97.8
2014	46	63.0			15.8	10.8	65.2	97.8
2015	43	63.2			16.1	10.1	53.5	100.0
2016	48	75.0	1	2.1	16.8	9.5	43.8	97.9
2017	36	65.5			17.1	7.6	33.3	100.0
2018	23	57.5			17.7	4.7	21.7	100.0
2019	10	45.5			18.0	4.8	70.0	100.0
2020	11	64.7			18.3	0.0	27.3	100.0 ##
1998-2020	805	62.9	15	1.9	18.3	17.6	64.8	98.3

805 cases diagnosed 1998-2020 are related to a total of 801 patients. Currently, in 282 (35.2 %) of these 801 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 203 / 56 / 23 (25.3 % / 7.0 % / 2.9 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:
In 2018, a subgroup of 23 cases has been diagnosed, of which 17.7 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 4.7 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1b

Cases with invasive cancer by year of diagnosis, proportions of 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	14	32.6	2	14.3	14.3	17.2	78.6	100.0	
1999	17	51.5			9.7	17.1	76.5	100.0	
2000	10	31.3			9.8	16.9	60.0	100.0	
2001	9	25.7			10.0	16.5	66.7	100.0	
2002	26	40.6			11.8	16.4	73.1	100.0	#
2003	19	35.2	1	5.3	10.5	16.2	78.9	100.0	
2004	17	35.4			9.8	14.9	70.6	100.0	
2005	18	36.7			10.0	14.2	72.2	88.9	
2006	23	39.7	1	4.3	9.8	14.7	60.9	95.7	
2007	23	30.7			9.7	14.8	60.9	95.7	#
2008	34	42.5			11.0	13.9	61.8	94.1	
2009	31	44.3	1	3.2	12.9	12.5	58.1	100.0	
2010	30	37.5			12.2	13.8	53.3	100.0	
2011	22	34.9			12.3	11.7	36.4	95.5	
2012	29	35.8			11.5	12.0	41.4	96.6	
2013	30	40.0			12.5	12.9	66.7	96.7	
2014	27	37.0	1	3.7	12.4	12.8	66.7	96.3	
2015	25	36.8			12.6	12.1	48.0	100.0	
2016	16	25.0			13.1	13.6	50.0	100.0	
2017	19	34.5			13.4	11.5	21.1	100.0	
2018	17	42.5			13.6	12.1	23.5	100.0	
2019	12	54.5			13.7	5.9	33.3	100.0	
2020	6	35.3			14.3	0.0	33.3	100.0	##
1998-2020	474	37.1	6	1.3	14.3	17.2	57.0	97.9	

474 cases diagnosed 1998-2020 are related to a total of 472 patients. Currently, in 143 (30.3 %) of these 472 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 106 / 30 / 7 (22.5 % / 6.4 % / 1.5 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:
In 2018, a subgroup of 17 cases has been diagnosed, of which 13.6 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 12.1 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 2

Incidence measures by year of diagnosis including DCO cases
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.94 m as of 2007, respectively)

Year of diagnosis	Males n	Females n	Males Inc. raw	Fem. Inc. raw	Males Inc. WS	Fem. Inc. WS	Males Inc. ES	Fem. Inc. ES	Males Inc. BRD-S	Fem. Inc. BRD-S
1998	29	14	2.6	1.2	1.8	0.6	2.4	0.9	2.8	1.1
1999	16	17	1.4	1.4	1.0	0.9	1.3	1.2	1.3	1.3
2000	22	10	1.9	0.8	1.3	0.6	1.8	0.7	1.9	0.8
2001	26	9	2.2	0.7	1.4	0.4	1.9	0.6	2.3	0.7
2002	38	26	2.0	1.3	1.4	0.8	1.8	1.1	2.0	1.2
2003	35	19	1.9	1.0	1.3	0.5	1.8	0.7	1.9	0.8
2004	31	17	1.6	0.9	1.1	0.4	1.5	0.6	1.6	0.8
2005	31	18	1.6	0.9	1.0	0.6	1.3	0.8	1.5	0.8
2006	35	23	1.8	1.1	1.1	0.6	1.6	0.8	1.9	1.0
2007	52	23	2.3	1.0	1.5	0.6	2.0	0.8	2.2	0.9
2008	46	34	2.1	1.5	1.3	0.9	1.8	1.2	1.9	1.3
2009	39	31	1.7	1.3	1.1	0.7	1.5	0.9	1.7	1.2
2010	50	30	2.2	1.3	1.4	0.7	1.8	1.0	2.1	1.1
2011	41	22	1.8	0.9	1.1	0.5	1.6	0.7	1.7	0.8
2012	52	29	2.3	1.2	1.4	0.7	1.8	0.9	2.1	1.1
2013	45	30	2.0	1.3	1.1	0.6	1.6	0.8	1.8	1.0
2014	46	27	2.0	1.1	1.2	0.5	1.6	0.8	1.8	0.9
2015	43	25	1.8	1.0	1.1	0.5	1.5	0.7	1.7	0.9
2016	48	16	2.0	0.7	1.2	0.3	1.6	0.4	1.8	0.5
2017	36	19	1.5	0.8	0.9	0.4	1.2	0.5	1.3	0.6
2018	23	17	0.9	0.7	0.6	0.4	0.8	0.5	0.9	0.6
2019	10	12	0.4	0.5	0.2	0.2	0.3	0.3	0.4	0.4
2020	11	6	0.5	0.2	0.3	0.1	0.4	0.1	0.4	0.2
1998-2020	805	474	1.7	1.0	1.1	0.5	1.4	0.7	1.6	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	43	61.7	12.3	32.0	91.4	48.0	51.3	60.5	68.9	77.8
1999	33	59.6	14.0	25.6	90.8	43.4	51.8	58.5	68.2	77.1
2000	32	57.4	12.5	33.5	84.8	41.4	47.3	57.1	66.9	73.1
2001	35	61.9	12.7	33.7	90.0	44.5	52.0	60.5	71.6	79.9
2002	64	59.2	12.7	26.4	89.8	44.9	50.6	59.1	67.4	78.6
2003	54	60.6	14.3	28.1	98.2	45.6	53.1	58.1	69.5	81.2
2004	48	60.9	12.8	29.5	88.4	40.9	54.5	61.2	68.5	78.4
2005	49	60.1	11.6	33.0	92.0	43.3	53.9	61.1	66.1	74.8
2006	58	64.0	13.6	33.8	96.2	46.0	55.1	62.5	74.9	82.5
2007	75	61.4	13.0	26.0	101	45.4	52.8	61.2	69.6	78.1
2008	80	60.9	12.1	21.8	87.1	45.1	53.1	62.2	69.2	75.8
2009	70	62.0	13.4	30.2	88.9	45.6	53.6	62.2	71.9	80.0
2010	80	61.3	14.6	24.5	92.8	45.3	50.6	59.9	71.9	83.7
2011	63	61.3	15.1	29.2	92.8	40.8	52.9	62.4	72.5	80.0
2012	81	62.3	14.2	25.6	88.7	43.4	54.3	64.9	73.0	78.7
2013	75	64.2	14.6	28.1	95.5	45.3	53.6	64.4	75.2	81.8
2014	73	62.9	12.8	28.7	90.9	44.9	55.0	63.2	72.5	78.4
2015	68	62.7	13.0	28.5	86.3	46.6	53.8	63.5	71.4	79.3
2016	64	63.4	14.8	21.1	91.3	46.9	55.3	63.5	75.3	79.8
2017	55	63.7	13.7	30.1	93.2	45.0	54.0	63.9	72.5	82.4
2018	40	62.7	11.6	37.9	92.6	47.9	55.7	61.0	70.2	77.7
2019	22	69.4	9.3	56.0	91.8	59.0	62.0	69.8	76.2	79.0
2020	17	62.4	14.0	32.3	83.1	39.6	52.8	64.8	72.1	79.9
1998-2020	1279	61.9	13.4	21.1	101	45.1	53.3	61.9	71.6	79.4

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	29	60.2	10.0	44.0	81.3	47.8	51.8	60.1	67.4	76.4
1999	16	56.2	12.4	33.3	90.8	43.4	51.4	53.9	60.8	67.1
2000	22	58.6	11.2	35.8	75.4	45.7	50.2	59.1	68.9	73.1
2001	26	61.5	13.3	33.7	90.0	44.5	51.4	60.5	65.4	82.9
2002	38	56.3	11.9	26.4	79.9	39.5	48.2	57.0	65.6	70.7
2003	35	56.3	10.9	28.1	86.1	45.6	50.9	54.6	60.8	70.0
2004	31	58.3	11.1	38.4	88.4	44.3	49.8	58.8	64.9	70.3
2005	31	59.5	11.5	36.8	82.5	43.3	49.7	60.8	66.6	74.7
2006	35	63.0	13.2	33.8	92.0	46.0	55.1	61.8	74.9	77.0
2007	52	60.9	12.9	26.0	101	45.4	52.7	61.1	69.3	73.9
2008	46	60.7	11.5	21.8	87.1	45.1	53.7	62.2	69.2	74.5
2009	39	59.4	12.2	30.2	79.9	44.3	52.8	61.3	66.3	78.4
2010	50	60.7	15.5	24.5	92.8	44.3	49.0	59.6	69.6	84.2
2011	41	60.3	13.8	29.2	88.6	42.9	53.7	59.3	68.2	78.1
2012	52	62.0	12.6	25.6	85.9	45.1	54.0	63.4	72.2	75.3
2013	45	61.6	13.4	30.0	84.3	44.5	53.6	62.0	71.2	79.9
2014	46	60.5	11.8	28.7	83.4	44.8	51.1	61.8	68.9	75.8
2015	43	61.2	11.4	28.5	85.6	47.1	52.9	63.4	70.2	73.7
2016	48	61.0	14.3	21.1	80.9	38.7	53.7	62.0	73.1	77.0
2017	36	61.6	13.4	30.1	91.2	42.9	52.1	62.5	70.2	76.2
2018	23	63.0	10.8	44.5	92.6	52.2	57.6	60.8	68.6	76.1
2019	10	71.2	8.3	59.0	81.5	60.5	62.7	73.4	78.3	80.3
2020	11	56.8	13.2	32.3	75.2	39.6	50.2	59.5	67.9	70.7
1998-2020	805	60.4	12.6	21.1	101	44.9	52.4	60.7	69.1	76.3

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	14	64.7	16.0	32.0	91.4	49.5	50.2	64.7	75.8	84.4
1999	17	62.7	15.1	25.6	87.3	42.2	53.3	66.8	73.0	77.7
2000	10	54.8	15.3	33.5	84.8	36.7	43.3	53.6	66.3	76.1
2001	9	63.0	11.6	44.0	76.2	44.0	54.5	60.5	72.4	76.2
2002	26	63.4	12.8	44.9	89.8	47.0	53.5	60.9	69.6	82.9
2003	19	68.6	16.4	35.5	98.2	44.8	58.5	64.8	81.2	91.2
2004	17	65.5	14.5	29.5	82.9	39.8	58.2	67.5	75.4	80.3
2005	18	61.2	11.9	33.0	92.0	50.7	54.2	61.6	65.4	77.3
2006	23	65.5	14.2	37.9	96.2	47.5	54.9	63.3	77.0	82.5
2007	23	62.4	13.4	34.4	83.6	45.5	53.7	62.8	75.7	79.8
2008	34	61.1	13.2	26.7	86.9	43.9	52.1	61.8	70.9	78.1
2009	31	65.4	14.3	32.4	88.9	47.5	54.2	67.1	78.2	82.8
2010	30	62.2	13.1	43.2	88.5	46.1	50.9	61.0	72.7	80.2
2011	22	63.2	17.3	31.2	92.8	40.8	49.2	64.6	75.1	86.6
2012	29	62.8	16.8	28.5	88.7	31.8	54.3	65.1	73.5	82.3
2013	30	68.2	15.5	28.1	95.5	46.8	61.7	72.0	76.3	89.0
2014	27	67.0	13.7	34.3	90.9	50.0	56.2	68.6	77.3	84.7
2015	25	65.2	15.4	28.9	86.3	43.8	56.9	67.0	78.1	83.8
2016	16	70.8	14.1	37.2	91.3	55.7	58.9	74.5	80.4	87.5
2017	19	67.6	13.8	42.2	93.2	47.1	57.2	67.8	76.9	85.4
2018	17	62.3	13.1	37.9	84.6	42.8	54.3	62.8	71.9	83.1
2019	12	67.9	10.1	56.0	91.8	58.4	59.9	65.6	73.7	76.2
2020	6	72.8	8.7	58.1	83.1	58.1	71.2	72.3	79.9	83.1
1998-2020	474	64.5	14.3	25.6	98.2	46.1	54.5	64.8	75.2	82.9

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	4	0.5	0.5	4	0.7	0.7			0.0
25-29	10	1.2	1.6	6	1.1	1.8	4	1.2	1.2
30-34	16	1.9	3.5	9	1.7	3.5	7	2.2	3.4
35-39	15	1.7	5.2	11	2.0	5.5	4	1.2	4.7
40-44	39	4.5	9.7	24	4.4	10.0	15	4.7	9.3
45-49	63	7.3	17.0	42	7.7	17.7	21	6.5	15.9
50-54	96	11.1	28.2	67	12.4	30.1	29	9.0	24.9
55-59	115	13.3	41.5	79	14.6	44.6	36	11.2	36.1
60-64	133	15.4	56.9	92	17.0	61.6	41	12.8	48.9
65-69	103	11.9	68.8	70	12.9	74.5	33	10.3	59.2
70-74	107	12.4	81.2	63	11.6	86.2	44	13.7	72.9
75-79	88	10.2	91.4	48	8.9	95.0	40	12.5	85.4
80-84	41	4.8	96.2	14	2.6	97.6	27	8.4	93.8
85+	33	3.8	100.0	13	2.4	100.0	20	6.2	100.0
All ages	863	100.0		542	100.0		321	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=10 %	Females DCO rate n=2 %	Males Prop.all cancers n=153686 %	Females Prop.all cancers n=155051 %
0- 4								
5- 9								
10-14								
15-19								
20-24	4		0.2				0.6	
25-29	6	4	0.3	0.2			0.6	0.3
30-34	9	7	0.4	0.3			0.7	0.3
35-39	11	4	0.5	0.2			0.6	0.1
40-44	24	15	1.0	0.6			0.9	0.2
45-49	42	21	1.6	0.8			0.8	0.2
50-54	67	29	2.6	1.2			0.8	0.2
55-59	79	36	3.7	1.7		2.8	0.6	0.3
60-64	92	41	5.2	2.2			0.5	0.3
65-69	70	33	4.3	1.8	4.3		0.3	0.2
70-74	63	44	4.2	2.6	3.2		0.2	0.2
75-79	48	40	4.0	2.7	2.1		0.2	0.2
80-84	14	27	1.9	2.5	7.1		0.1	0.2
85+	13	20	2.8	1.9	23.1	5.0	0.1	0.1
All ages	542	321			1.8	0.6	0.4	0.2
Incidence								
Raw			1.7	1.0				
WS			1.0	0.5				
ES			1.4	0.7				
BRD-S			1.5	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).

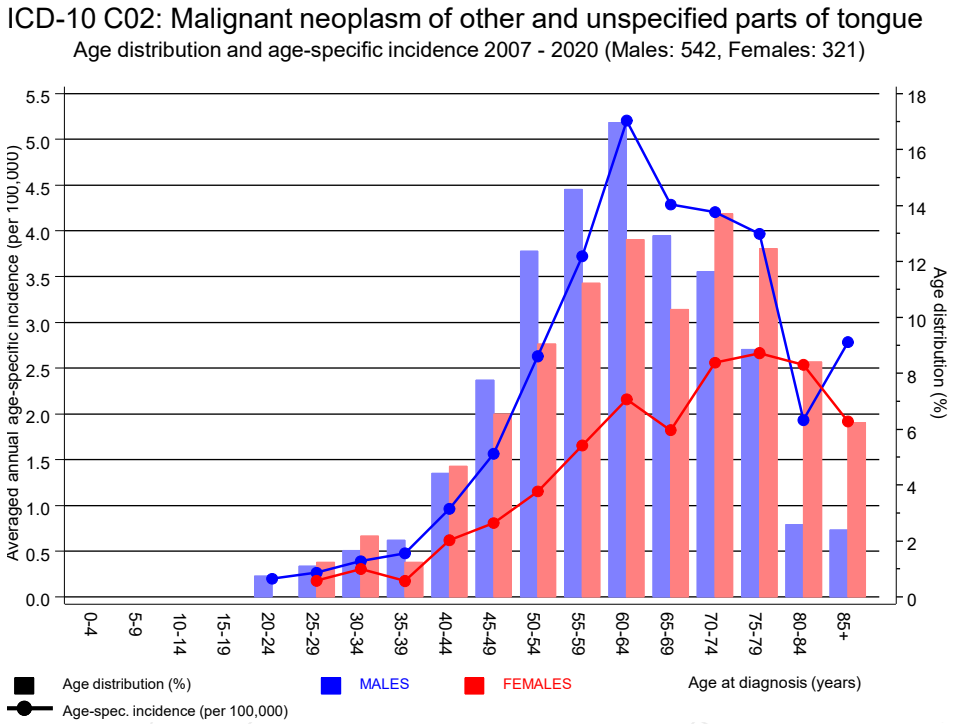


Figure 6. Age distribution (males: mean=61.1 yrs, median=61.9 yrs; females: mean=64.9 yrs, median=65.7 yrs) and age-specific incidence.

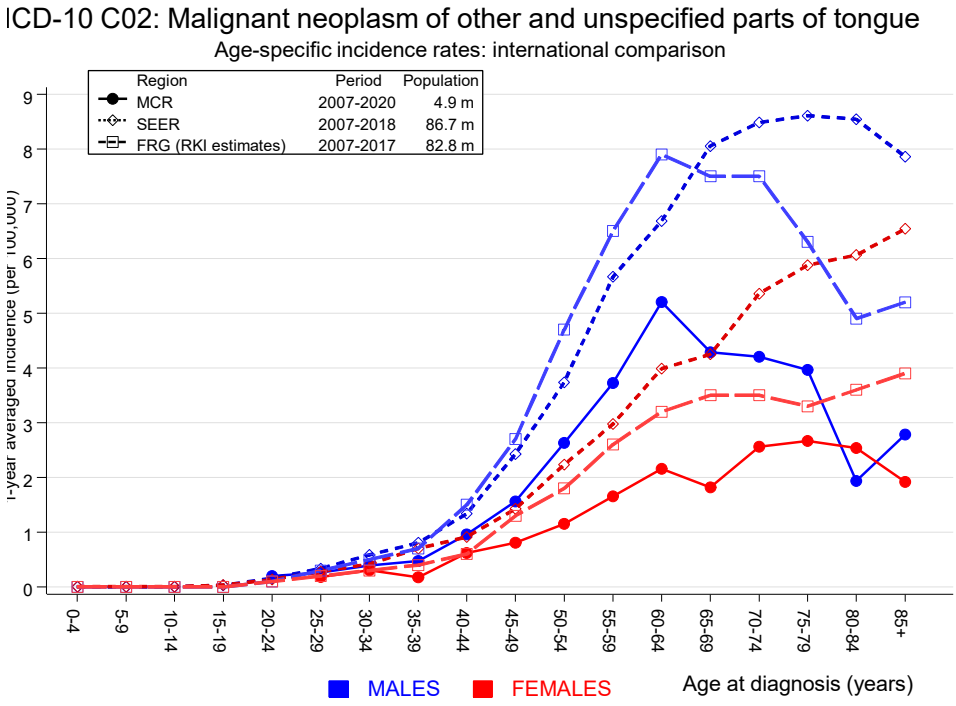


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, RKI estimates) and SEER (Surveillance, Epidemiology, and End Results, USA).

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	8	0.4	20.9	9.0	41.1	#	26.0	
C09–C10	Oropharynx	23	0.5	47.4	30.0	71.1	#	76.9	
C12–C13	Hypopharynx	12	0.3	46.7	24.2	81.7	#	40.1	25.0
C15	Oesophagus	18	0.8	23.2	13.7	36.7	#	58.8	5.6
C16	Stomach	2	1.2	1.6	0.2	5.8		2.6	
C17	Small intestine	1	0.2	4.6	0.1	25.4		2.7	100.0
C18	Colon	9	3.0	3.0	1.4	5.6	#	20.3	11.1
C19–C20	Rectum	6	1.9	3.2	1.2	6.9	#	14.0	
C21	Anus/canal	1	0.1	10.5	0.3	58.6		3.1	
C22	Liver	2	1.0	2.0	0.2	7.1		3.4	50.0
C23–C24	Bile	2	0.3	5.9	0.7	21.4		5.7	50.0
C25	Pancreas	3	1.3	2.3	0.5	6.8		5.8	
C30–C31	Sinuses	1	0.1	14.5	0.4	80.6		3.2	
C32	Larynx	9	0.4	22.7	10.4	43.2	#	29.4	11.1
C33–C34	Lung	37	4.1	9.0	6.3	12.3	#	112.3	24.3
C43	Malign. melanoma	4	1.7	2.4	0.7	6.1		8.0	
C46,C49	Soft tissue	1	0.2	4.9	0.1	27.5		2.7	
C60	Penis	1	0.1	11.7	0.3	65.2		3.1	
C61	Prostate	12	9.5	1.3	0.6	2.2		8.4	
C64	Kidney	4	1.3	3.2	0.9	8.2		9.4	
C67	Bladder	6	1.4	4.2	1.6	9.2	#	15.7	16.7
C68	Urethra	1	0.0	30.9	0.8	172.4		3.3	
C73	Thyroid	3	0.3	10.1	2.1	29.6	#	9.2	
C76–C79	CUP	3	0.6	5.4	1.1	15.7	#	8.3	
C81	Hodgkin lymphoma	1	0.1	10.6	0.3	58.8		3.1	100.0
C82–C85	NHL	4	1.4	2.8	0.8	7.2		8.8	25.0
C91–C96	Leukaemia	1	0.5	2.1	0.1	11.7		1.8	
Not observed		0	2.0	0.0	0.0	1.8		-7.0	
All further malignancies		175	34.7	5.0	4.3	5.8	#	479.1	12.0

Patients	787
Median age at next malignancy (years)	65.5
Person-years	2928
Mean observation time (years)	3.7
Median observation time (years)	2.0

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	9	0.1	77.8	35.6	147.6	#	46.5	
C09–C10	Oropharynx	6	0.1	68.5	25.2	149.2	#	30.9	
C11	Nasopharynx	1	0.0	142.5	3.6	794.0	#	5.2	
C12–C13	Hypopharynx	4	0.0	178.1	48.5	456.0	#	20.8	50.0
C15	Oesophagus	2	0.1	15.5	1.9	56.0	#	9.8	
C16	Stomach	1	0.6	1.7	0.0	9.6		2.2	
C18	Colon	2	1.7	1.2	0.1	4.3		1.6	
C19–C20	Rectum	3	0.7	4.2	0.9	12.3		12.0	
C22	Liver	1	0.2	4.4	0.1	24.8		4.1	
C23–C24	Bile	3	0.2	12.4	2.5	36.1	#	14.4	
C25	Pancreas	1	0.8	1.2	0.0	6.8		0.9	100.0
C32	Larynx	4	0.0	107.6	29.3	275.6	#	20.7	25.0
C33–C34	Lung	19	1.5	12.8	7.7	20.0	#	91.6	21.1
C43	Malign. melanoma	1	0.8	1.3	0.0	7.3		1.2	
C50	Breast	6	6.1	1.0	0.4	2.1		−0.4	
C53	Cervix uteri	1	0.3	3.7	0.1	20.7		3.8	
C54	Corpus uteri	3	1.1	2.8	0.6	8.2		10.1	
C56	Ovary	1	0.8	1.3	0.0	7.3		1.3	
C65	Renal pelvis	1	0.1	17.6	0.4	98.3		4.9	
C67	Bladder	3	0.3	8.8	1.8	25.7	#	13.9	66.7
C70–C72	CNS cancer	1	0.2	4.0	0.1	22.3		3.9	
C73	Thyroid	2	0.3	5.7	0.7	20.6		8.6	
C76–C79	CUP	4	0.3	12.7	3.5	32.5	#	19.3	
C82–C85	NHL	4	0.7	5.6	1.5	14.3	#	17.2	
C90	Mult. myeloma	1	0.2	4.5	0.1	24.9		4.1	
Not observed		0	1.7	0.0	0.0	2.2		−8.9	
All further malignancies		84	19.0	4.4	3.5	5.5	#	339.8	11.9

Patients	462
Median age at next malignancy (years)	70.3
Person-years	1912
Mean observation time (years)	4.1
Median observation time (years)	2.6

The occurrence of further specified malignancy is statistically significant.

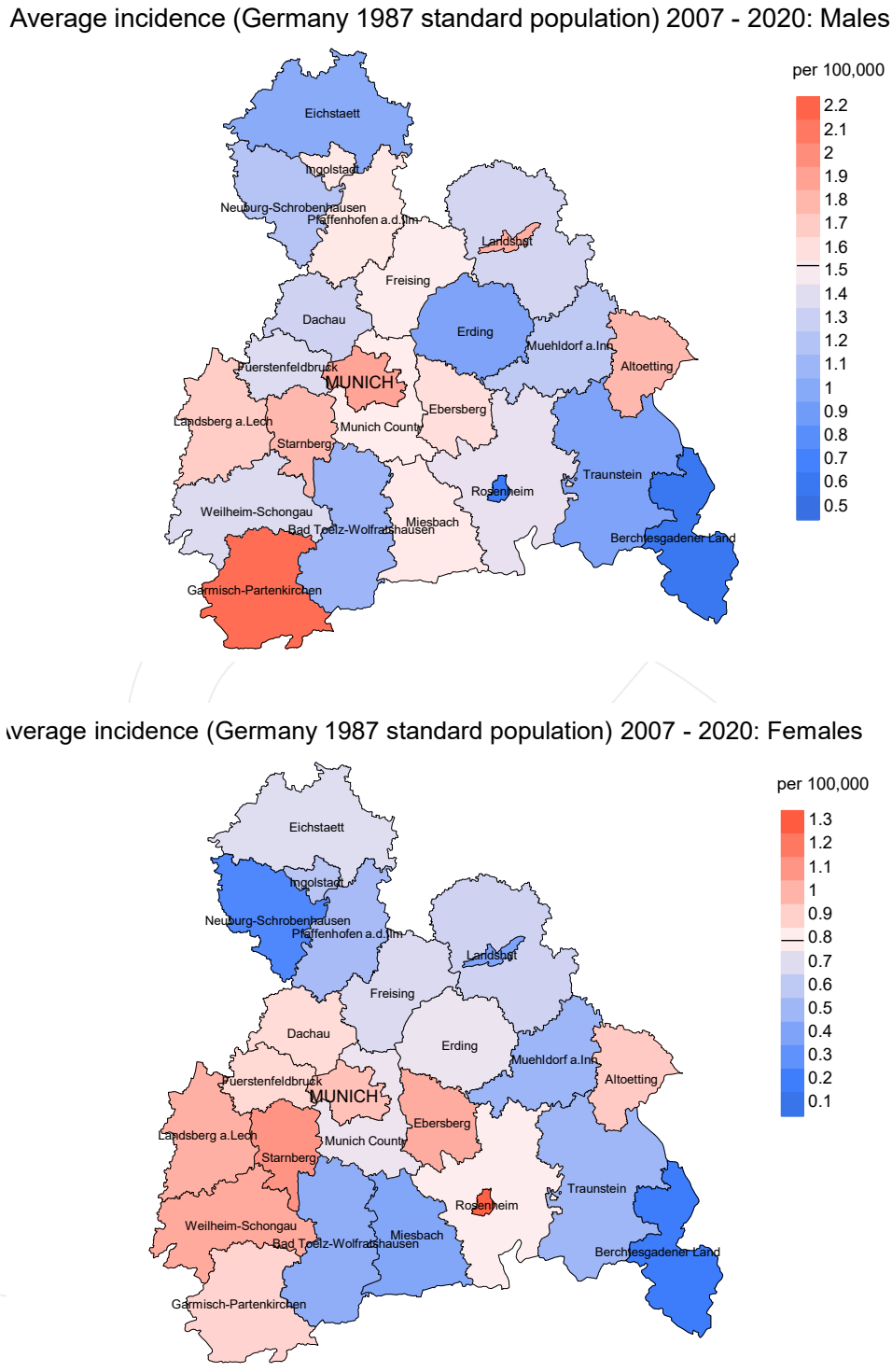
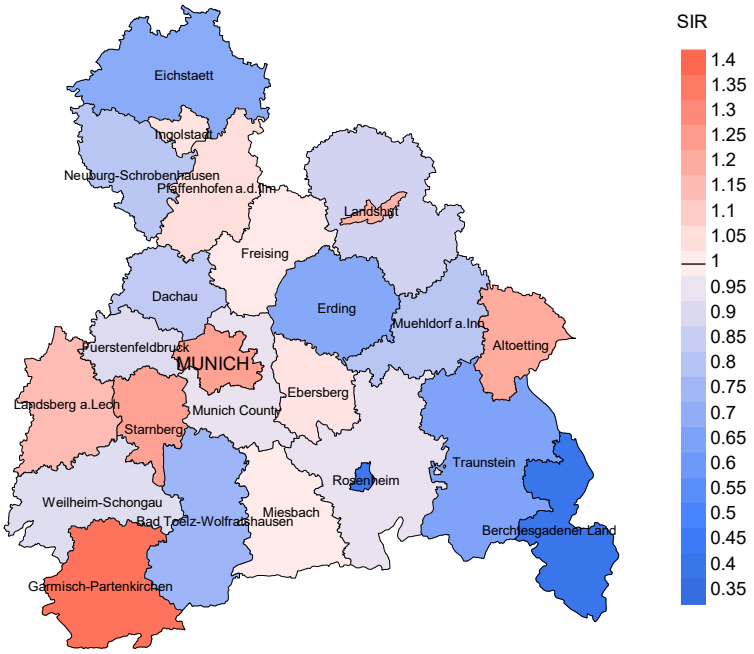


Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 1.5/100,000 WS N=542, females 0.8/100,000 WS N=321).

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 12 women were identified with newly diagnosed tongue excl. base of tongue. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 1.0/100,000 (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

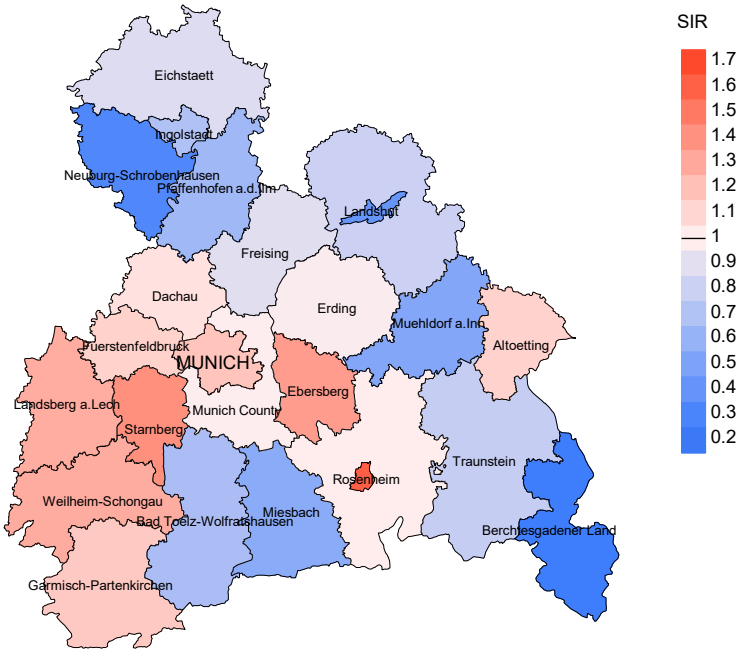


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=542, females N=321).

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 12 women were identified with newly diagnosed tongue excl. base of tongue. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.35. Though, the value of this parameter may vary with an underlying probability of 99% between 0.56 and 2.72, 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	43	97.7	7.0	35	81.4	91.4
1999	33	100.0		28	84.8	96.4
2000	32	100.0	6.3	24	75.0	100.0
2001	35	100.0		29	82.9	96.6
2002	64	98.4		45	70.3	95.6
2003	54	100.0	3.7	43	79.6	100.0
2004	48	100.0		36	75.0	94.4
2005	49	95.9		38	77.6	92.1
2006	58	94.8	3.4	44	75.9	97.7
2007	75	90.7	6.7	48	64.0	100.0
2008	80	97.5		55	68.8	96.4
2009	70	100.0	1.4	46	65.7	89.1
2010	80	100.0	2.5	54	67.5	90.7
2011	63	96.8	1.6	32	50.8	93.8
2012	81	98.8	1.2	36	44.4	88.9
2013	75	97.3		46	61.3	93.5
2014	73	97.3	1.4	48	65.8	93.8
2015	68	100.0		35	51.5	91.4
2016	64	98.4	1.6	29	45.3	96.6
2017	55	100.0		16	29.1	75.0
2018	40	100.0		9	22.5	77.8
2019	22	100.0		11	50.0	100.0
2020	17	100.0		5	29.4	100.0
1998-2020	1279	98.1	1.6	792	61.9	94.1

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	43	21	85.7	4	9.3
1999	33	18	88.9	2	6.1
2000	32	20	85.0	4	12.5
2001	35	31	90.3	9	25.7
2002	64	39	97.4	9	14.1
2003	54	38	100.0	5	9.3
2004	48	42	100.0	7	14.6
2005	49	40	100.0	6	12.2
2006	58	47	93.6	8	13.8
2007	75	48	100.0	10	13.3
2008	80	47	95.7	6	7.5
2009	70	53	98.1	3	4.3
2010	80	46	100.0	4	5.0
2011	63	47	95.7	5	7.9
2012	81	54	94.4	10	12.3
2013	75	49	100.0	11	14.7
2014	73	53	96.2	7	9.6
2015	68	53	100.0	1	1.5
2016	64	59	98.3	7	10.9
2017	55	54	94.4	2	3.6
2018	40	35	60.0	2	5.0
2019	22	31	58.1	3	13.6
2020	17	39	94.9		
1998–2020	1279	964	94.0	125	9.8

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	21	57.1	42.9	88.9
1999	18	55.6	44.4	75.0
2000	20	70.0	30.0	94.1
2001	31	87.1	12.9	96.4
2002	39	74.4	25.6	89.5
2003	38	68.4	31.6	76.3
2004	42	83.3	16.7	90.5
2005	40	87.5	12.5	97.5
2006	47	63.8	36.2	79.5
2007	48	87.5	12.5	93.8
2008	47	80.9	19.1	91.1
2009	53	75.5	24.5	84.6
2010	46	78.3	21.7	89.1
2011	47	83.0	17.0	82.2
2012	54	72.2	27.8	88.2
2013	49	69.4	30.6	87.8
2014	53	77.4	22.6	92.2
2015	53	69.8	30.2	79.2
2016	59	71.2	28.8	82.8
2017	54	72.2	27.8	84.3
2018	35	45.7	54.3	71.4
2019	31	25.8	74.2	72.2
2020	39	48.7	51.3	73.0
1998-2020	964	71.4	28.6	85.8

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	12	58.6	59.9	57.3	65.6
1999	13	58.7	58.7	59.0	64.7
2000	14	63.6	63.6	59.3	63.6
2001	21	60.7	60.3	75.9	60.1
2002	33	64.2	64.3	60.9	64.0
2003	23	67.4	64.9	74.3	65.0
2004	27	60.8	59.6	71.9	60.2
2005	20	60.7	60.7	60.9	60.7
2006	29	61.9	62.0	60.9	61.9
2007	34	62.2	61.7	62.8	61.7
2008	31	62.6	62.3	64.7	62.3
2009	30	68.2	65.2	68.4	67.5
2010	29	67.5	62.4	73.7	65.0
2011	36	68.8	66.9	79.5	66.2
2012	38	64.8	62.8	68.2	64.3
2013	29	62.8	59.6	76.1	60.6
2014	32	69.7	67.4	71.4	68.7
2015	39	70.1	70.1	71.9	70.2
2016	32	68.0	64.7	75.4	65.0
2017	39	70.8	70.8	71.6	70.5
2018	24	70.3	68.8	70.9	70.6
2019	18	72.0	71.9	72.1	67.6
2020	25	69.7	67.4	74.9	69.1
1998–2020	628	65.7	64.4	70.3	64.9

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	67.8	65.1	73.4	65.1
1999	5	81.0	81.0	78.2	81.0
2000	6	72.2	70.4	85.7	72.2
2001	10	65.6	67.9	47.3	65.6
2002	6	70.0	66.6	90.2	70.0
2003	15	70.8	67.2	74.2	68.3
2004	15	79.8	80.4	73.2	80.4
2005	20	68.0	66.8	89.3	67.5
2006	18	80.8	69.5	84.4	68.1
2007	14	80.2	77.9	102.6	80.2
2008	16	70.4	70.3	70.8	69.2
2009	23	77.7	63.2	81.8	66.8
2010	17	67.7	67.0	82.0	67.0
2011	11	73.3	69.8	77.8	69.8
2012	16	65.7	64.2	75.5	65.7
2013	20	78.7	76.3	83.4	77.5
2014	21	70.4	70.3	75.9	70.4
2015	14	81.1	79.8	87.7	79.6
2016	27	77.2	74.3	85.1	76.0
2017	15	78.4	78.3	82.9	78.1
2018	11	76.2	60.0	78.6	60.0
2019	13	76.5	71.6	83.1	76.2
2020	14	73.3	70.4	80.6	71.7
1998–2020	336	73.3	69.9	81.5	70.5

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

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

Table 11a

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

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	6	0.5	0.21	0.3	0.16	0.4	0.18	0.6	0.22
1999	7	0.6	0.44	0.4	0.43	0.6	0.46	0.7	0.54
2000	10	0.9	0.45	0.6	0.44	0.8	0.46	1.0	0.52
2001	18	1.6	0.72	1.0	0.74	1.4	0.73	1.6	0.76
2002	24	1.3	0.63	0.8	0.55	1.1	0.61	1.3	0.65
2003	18	1.0	0.51	0.6	0.45	0.8	0.46	0.9	0.50
2004	22	1.2	0.71	0.8	0.73	1.1	0.74	1.1	0.71
2005	18	1.0	0.58	0.6	0.59	0.8	0.62	0.9	0.62
2006	19	1.0	0.54	0.6	0.54	0.8	0.51	0.9	0.51
2007	29	1.3	0.56	0.8	0.54	1.1	0.56	1.3	0.58
2008	28	1.3	0.61	0.7	0.55	1.1	0.59	1.3	0.65
2009	23	1.0	0.59	0.6	0.50	0.8	0.53	1.0	0.57
2010	20	0.9	0.40	0.5	0.37	0.7	0.40	0.8	0.40
2011	30	1.3	0.73	0.8	0.66	1.1	0.68	1.3	0.74
2012	27	1.2	0.52	0.7	0.54	1.0	0.52	1.1	0.51
2013	21	0.9	0.47	0.5	0.48	0.8	0.48	0.8	0.46
2014	24	1.0	0.52	0.6	0.47	0.8	0.49	1.0	0.53
2015	29	1.2	0.67	0.6	0.52	0.9	0.57	1.1	0.68
2016	22	0.9	0.46	0.6	0.48	0.7	0.48	0.8	0.46
2017	27	1.1	0.75	0.6	0.62	0.8	0.66	1.0	0.74
2018	13	0.5	0.57	0.3	0.45	0.4	0.50	0.5	0.55
2019	3	0.1	0.30	0.1	0.32	0.1	0.31	0.1	0.31
2020	12	0.5	1.09	0.3	0.94	0.4	0.99	0.4	1.09
1998-2020	450	1.0	0.56	0.5	0.52	0.8	0.54	0.9	0.56

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	6	0.5	0.43	0.3	0.46	0.4	0.46	0.5	0.43
1999	3	0.3	0.18	0.1	0.11	0.2	0.13	0.2	0.16
2000	4	0.3	0.40	0.2	0.33	0.3	0.35	0.3	0.39
2001	9	0.7	1.00	0.4	0.93	0.5	0.93	0.7	1.02
2002	5	0.3	0.19	0.2	0.20	0.2	0.20	0.2	0.20
2003	8	0.4	0.42	0.2	0.43	0.3	0.42	0.3	0.45
2004	13	0.7	0.76	0.3	0.58	0.4	0.64	0.5	0.67
2005	17	0.9	0.94	0.4	0.73	0.6	0.80	0.7	0.87
2006	11	0.5	0.48	0.2	0.36	0.3	0.40	0.4	0.41
2007	13	0.6	0.57	0.2	0.34	0.3	0.39	0.4	0.47
2008	10	0.4	0.29	0.2	0.26	0.3	0.26	0.4	0.30
2009	17	0.7	0.55	0.4	0.52	0.5	0.56	0.6	0.56
2010	16	0.7	0.53	0.4	0.53	0.5	0.54	0.6	0.54
2011	9	0.4	0.41	0.2	0.33	0.2	0.36	0.3	0.38
2012	12	0.5	0.41	0.3	0.45	0.4	0.45	0.4	0.41
2013	13	0.5	0.43	0.2	0.33	0.3	0.36	0.4	0.38
2014	17	0.7	0.63	0.3	0.61	0.5	0.60	0.6	0.63
2015	8	0.3	0.32	0.1	0.22	0.2	0.25	0.2	0.29
2016	20	0.8	1.25	0.3	1.08	0.4	1.12	0.6	1.15
2017	12	0.5	0.63	0.2	0.49	0.3	0.51	0.4	0.58
2018	3	0.1	0.18	0.1	0.15	0.1	0.16	0.1	0.17
2019	5	0.2	0.42	0.1	0.35	0.1	0.35	0.2	0.38
2020	7	0.3	1.17	0.1	1.46	0.2	1.37	0.2	1.23
1998-2020	238	0.5	0.50	0.2	0.42	0.3	0.44	0.4	0.47

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	2	0.4	0.4	1	0.3	0.3	1	0.6	0.6
30-34	2	0.4	0.9	1	0.3	0.6	1	0.6	1.2
35-39	6	1.3	2.1	3	1.0	1.6	3	1.9	3.1
40-44	9	1.9	4.0	8	2.6	4.2	1	0.6	3.7
45-49	20	4.3	8.3	17	5.5	9.7	3	1.9	5.6
50-54	36	7.7	16.0	29	9.4	19.2	7	4.3	9.9
55-59	57	12.1	28.1	41	13.3	32.5	16	9.9	19.8
60-64	65	13.8	41.9	45	14.6	47.1	20	12.3	32.1
65-69	74	15.7	57.7	49	15.9	63.0	25	15.4	47.5
70-74	67	14.3	71.9	48	15.6	78.6	19	11.7	59.3
75-79	63	13.4	85.3	37	12.0	90.6	26	16.0	75.3
80-84	35	7.4	92.8	17	5.5	96.1	18	11.1	86.4
85+	34	7.2	100.0	12	3.9	100.0	22	13.6	100.0
All ages	470	100.0		308	100.0		162	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	1	1	0.0	0.17	0.0	0.25	1.1	1.0
30-34	1	1	0.0	0.11	0.0	0.14	0.7	0.6
35-39	3	3	0.1	0.27	0.1	0.75	1.1	0.7
40-44	8	1	0.3	0.33	0.0	0.07	1.3	0.1
45-49	17	3	0.6	0.40	0.1	0.14	1.2	0.2
50-54	29	7	1.1	0.43	0.3	0.24	1.1	0.3
55-59	41	16	1.9	0.52	0.7	0.44	0.9	0.4
60-64	45	20	2.5	0.49	1.1	0.49	0.7	0.4
65-69	49	25	3.0	0.70	1.4	0.76	0.5	0.4
70-74	48	19	3.2	0.76	1.1	0.43	0.4	0.2
75-79	37	26	3.1	0.77	1.7	0.65	0.3	0.3
80-84	17	18	2.3	1.21	1.7	0.67	0.2	0.2
85+	12	22	2.6	0.92	2.1	1.10	0.1	0.2
All ages	308	162					0.4	0.3
Mortality								
Raw			0.9	0.57	0.5	0.50		
WS			0.5	0.51	0.2	0.42		
ES			0.7	0.54	0.3	0.45		
BRD-S			0.9	0.56	0.4	0.47		
PYLL-70								
per 100,000			7.9		2.9			
ES			6.7		2.4			
AYLL-70			11.6		10.5			

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	1	0.4	1	100.0				
C03–C06	Oral cavity	13	4.7			2	15.4	11	84.6
C09–C10	Oropharynx	44	16.0	17	38.6	5	11.4	22	50.0
C12–C13	Hypopharynx	22	8.0	8	36.4	2	9.1	12	54.5
C15	Oesophagus	24	8.7	4	16.7	1	4.2	19	79.2
C16	Stomach	4	1.5					4	100.0
C17	Small intestine	1	0.4	1	100.0				
C18	Colon	3	1.1	1	33.3			2	66.7
C19–C20	Rectum	10	3.6	2	20.0			8	80.0
C21	Anus/canal	1	0.4					1	100.0
C22	Liver	4	1.5	1	25.0			3	75.0
C23–C24	Bile	1	0.4					1	100.0
C25	Pancreas	4	1.5					4	100.0
C30–C31	Sinuses	1	0.4					1	100.0
C32	Larynx	23	8.4	15	65.2	2	8.7	6	26.1
C33–C34	Lung	49	17.8	4	8.2	7	14.3	38	77.6
C43	Malign. melanoma	5	1.8	2	40.0			3	60.0
C44	Skin others	15	5.5	5	33.3			10	66.7
C46,C49	Soft tissue	1	0.4					1	100.0
C61	Prostate	17	6.2	8	47.1			9	52.9
C64	Kidney	3	1.1	2	66.7			1	33.3
C65	Renal pelvis	1	0.4	1	100.0				
C67	Bladder	8	2.9	2	25.0	1	12.5	5	62.5
C73	Thyroid	3	1.1	1	33.3			2	66.7
C76–C79	CUP	8	2.9	3	37.5			5	62.5
C81	Hodgkin lymphoma	2	0.7	1	50.0			1	50.0
C82–C85	NHL	5	1.8	3	60.0			2	40.0
C91–C96	Leukaemia	2	0.7	1	50.0			1	50.0
All further malignancies		275	100.0	83	30.2	20	7.3	172	62.5

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

Table 14b

Further malignancies in deaths in period 1998–2020
FEMALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03–C06 Oral cavity	10	7.8					10	100.0
C09–C10 Oropharynx	15	11.7	5	33.3	1	6.7	9	60.0
C11 Nasopharynx	1	0.8					1	100.0
C12–C13 Hypopharynx	3	2.3					3	100.0
C15 Oesophagus	6	4.7					6	100.0
C16 Stomach	1	0.8					1	100.0
C18 Colon	6	4.7	3	50.0			3	50.0
C19–C20 Rectum	2	1.6					2	100.0
C22 Liver	1	0.8					1	100.0
C23–C24 Bile	2	1.6					2	100.0
C25 Pancreas	2	1.6	1	50.0			1	50.0
C30–C31 Sinuses	1	0.8	1	100.0				
C32 Larynx	4	3.1	1	25.0			3	75.0
C33–C34 Lung	21	16.4	1	4.8	1	4.8	19	90.5
C43 Malign. melanoma	4	3.1	2	50.0			2	50.0
C44 Skin others	6	4.7					6	100.0
C50 Breast	18	14.1	11	61.1	1	5.6	6	33.3
C53 Cervix uteri	2	1.6	2	100.0				
C54 Corpus uteri	2	1.6	2	100.0				
C55,C57 Fem. genitals un	1	0.8	1	100.0				
C56 Ovary	3	2.3	2	66.7			1	33.3
C64 Kidney	1	0.8	1	100.0				
C67 Bladder	3	2.3	1	33.3			2	66.7
C70–C72 CNS cancer	1	0.8					1	100.0
C76–C79 CUP	7	5.5	1	14.3	1	14.3	5	71.4
C81 Hodgkin lymphoma	1	0.8					1	100.0
C82–C85 NHL	2	1.6					2	100.0
C90 Mult. myeloma	1	0.8					1	100.0
C91–C96 Leukaemia	1	0.8	1	100.0				
All further malignancies	128	100.0	36	28.1	4	3.1	88	68.8

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.	Males MI-index	Females Age-spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19								
20-24								
25-29	1	1	0.0	0.20	0.0	0.25	1.2	1.1
30-34	1	1	0.0	0.11	0.0	0.17	0.7	0.6
35-39	3	2	0.1	0.30	0.1	0.67	1.2	0.5
40-44	7	1	0.3	0.30	0.0	0.07	1.3	0.1
45-49	16	3	0.6	0.42	0.1	0.15	1.2	0.2
50-54	22	5	0.9	0.42	0.2	0.21	0.9	0.2
55-59	30	14	1.4	0.47	0.6	0.58	0.8	0.4
60-64	37	16	2.1	0.55	0.8	0.46	0.7	0.4
65-69	38	19	2.3	0.79	1.0	0.68	0.5	0.3
70-74	32	17	2.1	0.71	1.0	0.49	0.4	0.3
75-79	29	22	2.4	0.97	1.5	0.69	0.3	0.3
80-84	10	15	1.4	1.25	1.4	0.75	0.1	0.2
85+	11	19	2.4	1.00	1.8	1.19	0.2	0.2
All ages	237	135					0.4	0.3
Mortality								
Raw			0.7	0.57	0.4	0.52		
WS			0.4	0.52	0.2	0.42		
ES			0.6	0.54	0.3	0.45		
BRD-S			0.7	0.57	0.3	0.48		
PYLL-70								
per 100,000			6.5		2.4			
ES			5.5		2.0			
AYLL-70			12.0		10.8			

* 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	1	1	0.0	0.20	0.0	0.25	1.2	1.1
30-34	1	1	0.0	0.13	0.0	0.20	0.7	0.6
35-39	3		0.1	0.30			1.2	
40-44	6	1	0.2	0.27	0.0	0.07	1.1	0.1
45-49	15	3	0.6	0.48	0.1	0.17	1.2	0.2
50-54	18	4	0.7	0.39	0.2	0.21	0.8	0.2
55-59	16	10	0.8	0.31	0.5	0.48	0.4	0.3
60-64	23	11	1.3	0.41	0.6	0.35	0.4	0.3
65-69	21	13	1.3	0.58	0.7	0.57	0.3	0.2
70-74	21	11	1.4	0.60	0.6	0.35	0.2	0.2
75-79	16	13	1.3	0.62	0.9	0.54	0.2	0.2
80-84	8	8	1.1	1.00	0.8	0.50	0.1	0.1
85+	10	13	2.1	0.91	1.2	0.93	0.2	0.1
All ages	159	89					0.3	0.2
Mortality								
Raw			0.5	0.46	0.3	0.40		
WS			0.3	0.42	0.1	0.33		
ES			0.4	0.43	0.2	0.35		
BRD-S			0.4	0.45	0.2	0.37		
PYLL-70								
per 100,000			5.0		1.7			
ES			4.2		1.4			
AYLL-70			13.7		11.0			

* See corresponding tables with multiple malignancies.

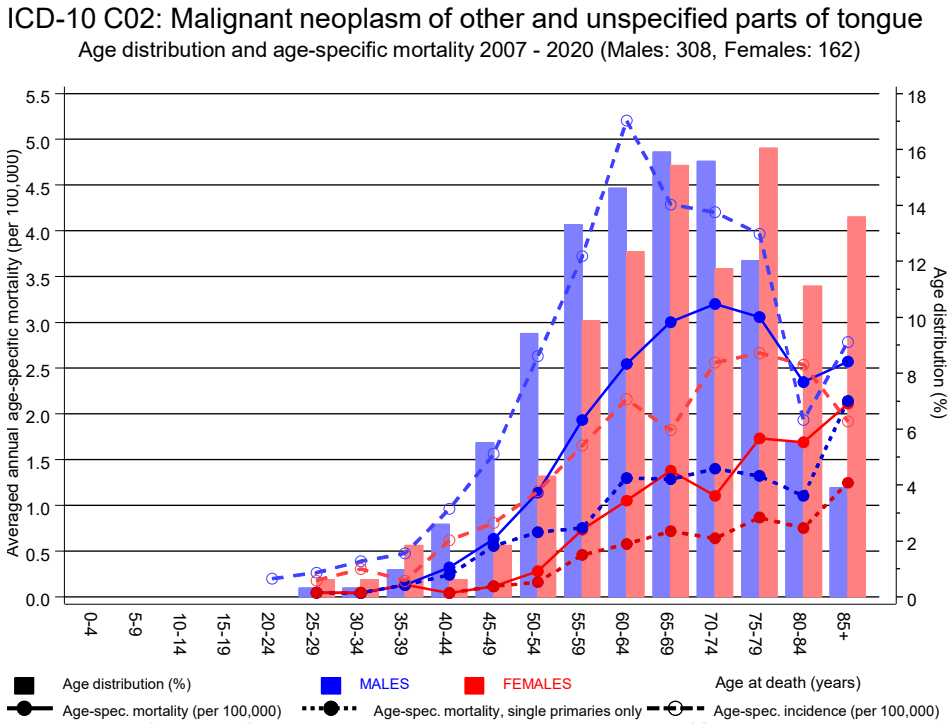


Figure 17. Distribution of age at death (bars; males: mean=60.7 yrs, median=60.4 yrs; females: mean=66.0 yrs, median=67.1 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

The difference between age at diagnosis (Table 3) and age at tongue excl. base of tongue-related death (see Table 10) should be considered.

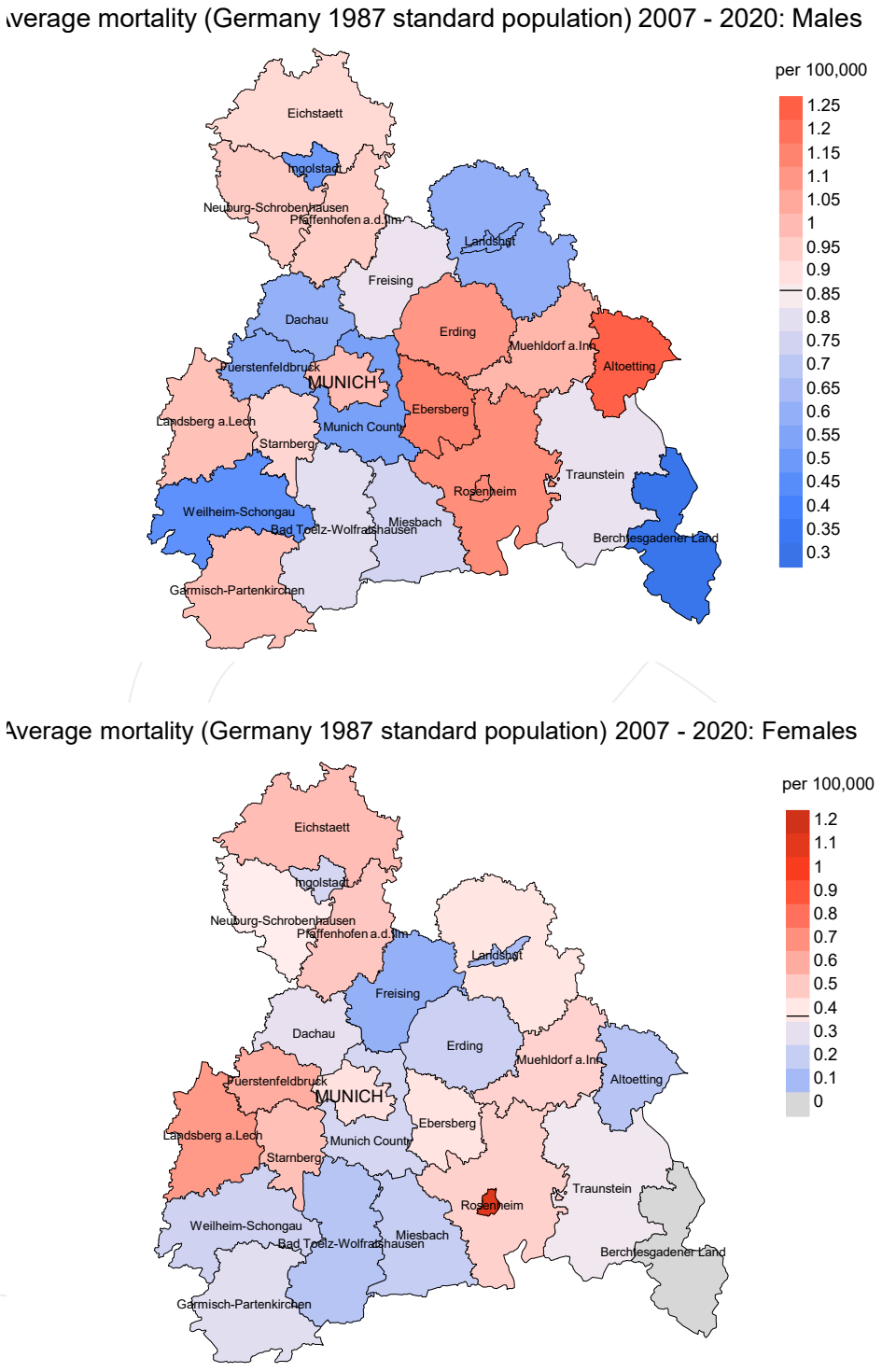
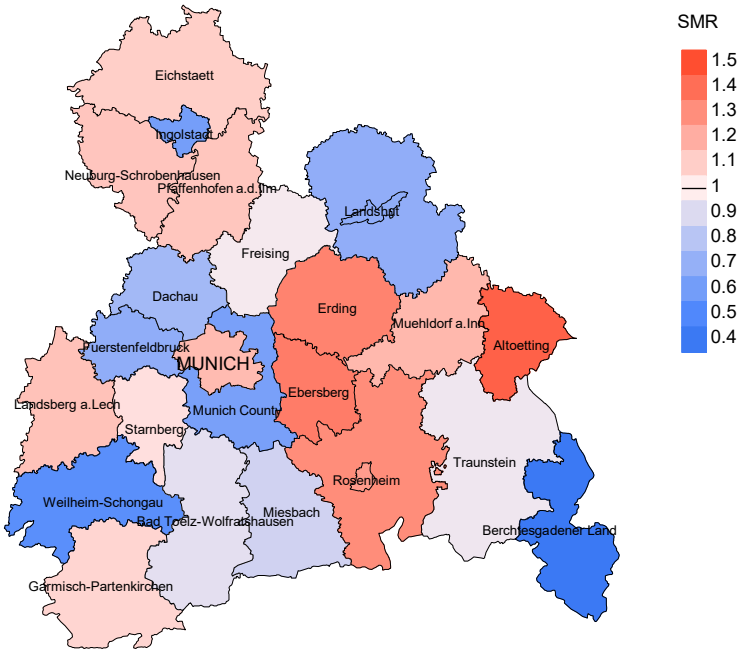


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2020. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.9/100,000 WS N=308, females 0.4/100,000 WS N=162).

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 5 women died from tongue excl. base of tongue. 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

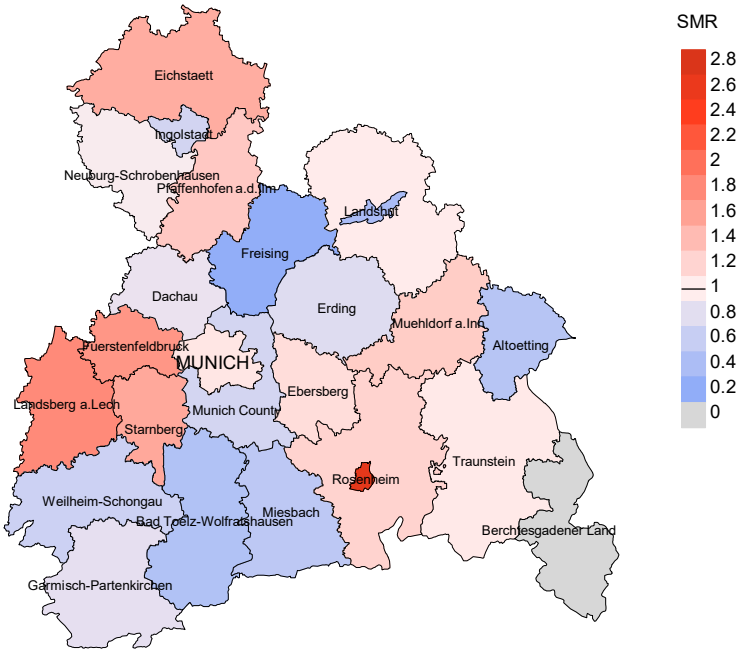


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=308, females N=162).

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 5 women died from tongue excl. base of tongue. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.14. Though, the value of this parameter may vary with an underlying probability of 99% between 0.25 and 3.23, 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

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