Munich Cancer Registry

- Survival
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ICD-10 C01: Base of tongue cancer

Incidence and Mortality

Year of diagnosis	1998-2020
Patients	946
Diseases	948
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/bC01__E-ICD-10-C01-Base-of-tongue-cancer-incidence-and-mortality.pdf

Index of figures and tables

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

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

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

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

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

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

Munich Cancer Registry, December 2021

[#] Base data has been collected since 1998. An increase in new diseases is apparent, which is an effect of two extensions in the MCR catchment area (from a base population of 2.65 million to 4.10 in 2002, and to 4.69 million in 2007).

[##] Due to the high frequency and good prognosis of non-malignant skin cancer (C44), no systematic ascertainment is performed for this diagnosis. C44 is not designated as a primary, but rather as a secondary tumor.

[###] DCO (death certificate only) identifies a cancer case that first becomes available to the MCR through the death certificate.

Some remarks regarding this cancer type

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

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

Code	Description
C01	Malignant neoplasm of base of tongue

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	15	1	6.7	20.0	15.9	80.0	100.0
1999	22	1	4.5	16.2	16.1	90.9	95.5
2000	12	1	8.3	18.4	15.8	83.3	100.0
2001	18	2	11.1	19.4	15.8	100.0	100.0
2002	33			15.0	15.7	87.9	97.0 #
2003	40	5	12.5	17.1	15.3	92.5	100.0
2004	47	4	8.5	14.4	14.2	78.7	93.6
2005	50	3	6.0	16.0	14.3	72.0	92.0
2006	50	2	4.0	17.1	13.6	74.0	94.0
2007	54	1	1.9	17.0	13.5	74.1	92.6 #
2008	55	4	7.3	17.2	13.1	81.8	100.0
2009	48			17.8	13.3	62.5	97.9
2010	55	1	1.8	18.0	12.4	72.7	98.2
2011	66	2	3.0	18.2	12.5	63.6	98.5
2012	55	2	3.6	19.2	11.6	61.8	96.4
2013	59	1	1.7	18.9	12.2	61.0	98.3
2014	55	1	1.8	19.5	12.5	52.7	100.0
2015	57	2	3.5	19.1	10.5	57.9	96.5
2016	39			19.4	12.7	56.4	100.0
2017	44			19.9	8.5	40.9	100.0
2018	25	3	12.0	20.6	5.4	40.0	100.0
2019	23			20.6	6.1	39.1	100.0
2020	26			20.9	7.7	15.4	100.0 ##
1998-2020	948	36	3.8	20.9	15.9	66.2	97.5

948 cases diagnosed 1998-2020 are related to a total of 946 patients. Currently, in 338 (35.7 %) of these 946 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 250 / 64 / 24 (26.4 % / 6.8 % / 2.5 %) 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 25 cases has been diagnosed, of which 20.6 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 5.4 % 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	11	73.3	1	9.1	27.3	16.8	90.9	100.0
1999	18	81.8			17.2	16.9	88.9	94.4
2000	8	66.7	1	12.5	18.9	16.4	87.5	100.0
2001	11	61.1	1	9.1	18.8	16.5	100.0	100.0
2002	26	78.8			14.9	16.5	84.6	96.2 #
2003	36	90.0	3	8.3	18.2	16.2	91.7	100.0
2004	33	70.2	3	9.1	16.1	15.0	75.8	90.9
2005	39	78.0	3	7.7	16.5	15.2	69.2	92.3
2006	37	74.0	2	5.4	17.4	14.2	81.1	94.6
2007	45	83.3			17.8	14.3	75.6	93.3 #
2008	43	78.2	3	7.0	18.6	13.8	86.0	100.0
2009	33	68.8			19.4	14.1	69.7	100.0
2010	39	70.9	1	2.6	19.5	13.1	74.4	97.4
2011	50	75.8	1	2.0	19.3	13.1	70.0	100.0
2012	43	78.2	2	4.7	20.3	11.7	62.8	95.3
2013	47	79.7	1	2.1	19.5	12.9	59.6	97.9
2014	41	74.5	1	2.4	20.2	12.9	51.2	100.0
2015	38	66.7	2	5.3	19.7	10.3	50.0	94.7
2016	31	79.5			20.2	11.7	51.6	100.0
2017	34	77.3			20.7	6.3	44.1	100.0
2018	17	68.0	1	5.9	21.0	2.2	35.3	100.0
2019	15	65.2			21.3	3.4	46.7	100.0
2020	14	53.8			21.4	7.1	14.3	100.0 ##
1998-2020	709	74.8	26	3.7	21.4	16.8	67.7	97.3

709 cases diagnosed 1998-2020 are related to a total of 707 patients. Currently, in 258 (36.5 %) of these 707 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 191 / 46 / 21 (27.0 % / 6.5 % / 3.0 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:
In 2018, a subgroup of 17 cases has been diagnosed, of which 21.0 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 2.2 % 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	4	26.7			0.0	13.3	50.0	100.0	
1999	4	18.2	1	25.0	12.5	13.5	100.0	100.0	
2000	4	33.3			16.7	13.8	75.0	100.0	
2001	7	38.9	1	14.3	21.1	13.6	100.0	100.0	
2002	7	21.2			15.4	13.5	100.0	100.0	#
2003	4	10.0	2	50.0	13.3	12.5	100.0	100.0	
2004	14	29.8	1	7.1	9.1	11.7	85.7	100.0	
2005	11	22.0			14.5	11.5	81.8	90.9	
2006	13	26.0			16.2	11.6	53.8	92.3	
2007	9	16.7	1	11.1	14.3	11.3	66.7	88.9	#
2008	12	21.8	1	8.3	12.4	11.2	66.7	100.0	
2009	15	31.3			12.5	11.3	46.7	93.3	
2010	16	29.1			13.3	10.2	68.8	100.0	
2011	16	24.2	1	6.3	14.7	10.7	43.8	93.8	
2012	12	21.8			15.5	11.2	58.3	100.0	
2013	12	20.3			16.9	10.3	66.7	100.0	
2014	14	25.5			17.2	11.7	57.1	100.0	
2015	19	33.3			17.1	11.1	73.7	100.0	
2016	8	20.5			16.9	15.2	75.0	100.0	
2017	10	22.7			17.5	13.2	30.0	100.0	
2018	8	32.0	2	25.0	19.2	10.7	50.0	100.0	
2019	8	34.8			18.5	10.0	25.0	100.0	
2020	12	46.2			19.2	8.3	16.7	100.0	##
1998-2020	239	25.2	10	4.2	19.2	13.3	61.9	97.9	

239 cases diagnosed 1998-2020 are related to a total of 239 patients. Currently, in 80 (33.5 %) of these 239 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 59 / 18 / 3 (24.7 % / 7.5 % / 1.3 %) 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 8 cases has been diagnosed, of which 19.2 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 10.7 % 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	11	4	1.0	0.3	0.7	0.2	0.9	0.2	1.0	0.3
1999	18	4	1.6	0.3	1.1	0.2	1.4	0.3	1.5	0.3
2000	8	4	0.7	0.3	0.5	0.2	0.6	0.3	0.7	0.3
2001	11	7	0.9	0.6	0.7	0.3	0.9	0.4	1.1	0.5
2002	26	7	1.4	0.4	0.9	0.2	1.3	0.3	1.4	0.3
2003	36	4	1.9	0.2	1.2	0.1	1.7	0.1	1.9	0.2
2004	33	14	1.8	0.7	1.0	0.4	1.4	0.6	1.6	0.6
2005	39	11	2.1	0.6	1.4	0.3	1.9	0.4	2.0	0.5
2006	37	13	1.9	0.6	1.2	0.4	1.7	0.5	1.9	0.6
2007	45	9	2.0	0.4	1.3	0.3	1.8	0.4	1.9	0.4
2008	43	12	1.9	0.5	1.2	0.3	1.7	0.4	1.9	0.5
2009	33	15	1.5	0.6	0.9	0.3	1.2	0.5	1.4	0.5
2010	39	16	1.7	0.7	1.0	0.3	1.4	0.5	1.6	0.6
2011	50	16	2.2	0.7	1.3	0.3	1.8	0.5	2.0	0.6
2012	43	12	1.9	0.5	1.1	0.3	1.5	0.4	1.7	0.4
2013	47	12	2.0	0.5	1.2	0.3	1.7	0.4	1.9	0.4
2014	41	14	1.8	0.6	1.1	0.3	1.5	0.4	1.6	0.5
2015	38	19	1.6	0.8	0.8	0.4	1.2	0.6	1.5	0.6
2016	31	8	1.3	0.3	0.8	0.2	1.1	0.2	1.2	0.3
2017	34	10	1.4	0.4	0.8	0.2	1.1	0.3	1.3	0.3
2018	17	8	0.7	0.3	0.4	0.1	0.6	0.2	0.6	0.3
2019	15	8	0.6	0.3	0.3	0.2	0.5	0.2	0.6	0.2
2020	14	12	0.6	0.5	0.3	0.3	0.4	0.4	0.5	0.4
1998–2020	709	239	1.5	0.5	0.9	0.3	1.3	0.4	1.4	0.4

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	15	56.9	13.1	31.1	78.2	44.9	47.3	57.2	67.5	77.8
1999	22	58.9	9.3	40.4	74.9	48.5	52.2	59.7	64.7	70.5
2000	12	58.8	13.5	35.9	78.2	42.5	46.8	62.4	68.5	73.3
2001	18	63.2	14.0	48.6	92.5	49.0	50.6	59.3	71.2	85.1
2002	33	60.5	9.0	43.8	81.5	50.3	54.8	58.2	65.1	72.1
2003	40	63.2	9.2	45.1	83.3	51.3	56.4	62.7	69.4	77.0
2004	47	62.8	9.0	38.6	81.4	52.0	57.3	62.3	68.9	74.7
2005	50	60.6	13.5	4.1	87.2	49.0	53.4	61.0	65.4	78.9
2006	50	60.6	11.9	19.0	84.8	45.9	53.4	60.7	68.0	76.3
2007	54	57.7	9.5	35.2	76.9	45.6	52.6	57.9	63.3	69.5
2008	55	63.4	10.2	38.3	87.7	50.1	56.0	62.4	71.1	77.4
2009	48	63.5	10.7	36.7	87.3	48.0	57.1	62.9	72.3	76.2
2010	55	64.8	10.7	42.4	92.1	50.9	57.6	65.9	72.6	77.9
2011	66	64.3	10.9	40.0	93.8	49.9	56.5	64.1	71.8	77.5
2012	55	62.6	10.8	39.8	87.9	49.7	53.6	62.1	70.6	76.3
2013	59	63.7	10.1	48.9	91.0	50.6	55.3	63.0	69.5	78.8
2014	55	62.6	9.2	47.4	93.5	50.1	56.2	61.4	69.7	74.4
2015	57	66.9	12.1	28.5	93.2	53.3	57.6	67.6	73.6	84.2
2016	39	64.3	10.7	42.9	89.1	47.8	57.1	64.5	71.1	77.6
2017	44	66.3	12.3	34.7	91.4	51.1	57.8	65.5	74.3	82.0
2018	25	65.5	9.5	37.6	82.3	53.8	61.1	67.3	70.0	75.4
2019	23	68.4	10.5	51.3	90.8	55.6	59.6	68.8	74.8	81.7
2020	26	65.5	11.6	40.1	93.8	49.7	58.9	64.5	72.8	78.3
1998–2020	948	63.1	11.0	4.1	93.8	49.8	56.0	62.7	70.1	77.3

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	11	56.2	10.8	44.9	78.2	45.7	47.3	52.5	60.4	72.2
1999	18	56.9	8.8	40.4	72.5	43.1	50.5	58.4	63.4	70.5
2000	8	57.3	15.2	35.9	78.2	35.9	45.1	56.2	71.0	78.2
2001	11	61.0	12.7	48.6	85.1	49.0	49.1	57.2	71.2	78.7
2002	26	59.7	8.4	43.8	80.2	48.0	54.6	58.2	64.2	70.8
2003	36	62.5	9.0	45.1	83.3	50.6	56.4	62.5	68.0	76.9
2004	33	62.9	8.8	38.6	80.3	54.8	58.9	62.5	68.3	72.5
2005	39	59.2	14.2	4.1	87.1	44.8	52.9	59.5	65.4	78.5
2006	37	61.8	10.4	38.7	84.8	47.5	55.3	61.3	67.0	77.4
2007	45	58.3	9.4	37.1	76.9	45.6	54.7	58.0	64.0	69.5
2008	43	63.5	9.6	38.3	85.9	52.5	56.5	62.4	71.1	76.3
2009	33	62.3	10.7	36.7	81.1	48.0	56.6	61.9	70.7	76.2
2010	39	64.1	11.4	42.4	92.1	50.0	56.5	64.8	70.7	81.3
2011	50	63.6	10.5	40.0	86.5	49.8	55.0	64.4	70.9	76.4
2012	43	62.9	10.8	39.8	87.9	49.7	53.6	62.1	70.6	76.3
2013	47	63.6	10.1	48.9	91.0	50.6	55.3	61.8	69.7	77.4
2014	41	61.3	8.7	47.4	93.5	50.1	56.2	60.4	64.3	71.0
2015	38	67.0	12.9	28.5	93.2	52.6	57.6	67.7	76.3	84.2
2016	31	64.0	10.9	42.9	89.1	50.7	57.1	64.3	71.1	76.4
2017	34	66.2	10.7	47.2	91.4	53.5	57.6	65.4	72.0	78.7
2018	17	63.8	9.8	37.6	77.6	51.2	60.6	65.7	70.0	73.4
2019	15	69.1	8.3	56.8	82.4	59.2	61.9	69.3	74.8	81.7
2020	14	65.5	11.1	44.9	81.0	49.7	58.0	67.2	75.1	78.3
1998-2020	709	62.6	10.7	4.1	93.5	49.7	55.8	62.1	69.7	76.7

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	4	58.8	20.0	31.1	77.8	31.1	45.0	63.2	72.6	77.8
1999	4	67.5	6.7	59.0	74.9	59.0	62.6	68.2	72.5	74.9
2000	4	61.8	10.6	46.0	68.2	46.0	55.7	66.5	67.9	68.2
2001	7	66.8	16.2	50.2	92.5	50.2	50.6	63.0	83.0	92.5
2002	7	63.3	11.4	50.3	81.5	50.3	55.2	58.3	73.9	81.5
2003	4	68.8	11.1	53.1	77.3	53.1	61.2	72.5	76.5	77.3
2004	14	62.5	9.8	48.0	81.4	50.3	55.8	60.8	68.9	75.4
2005	11	65.5	9.4	57.1	87.2	57.2	58.4	63.2	65.9	79.3
2006	13	57.1	15.4	19.0	76.4	45.9	48.1	58.6	68.0	71.1
2007	9	54.7	10.0	35.2	70.5	35.2	49.8	57.9	60.2	70.5
2008	12	63.2	12.6	45.6	87.7	49.7	52.4	62.5	72.2	77.4
2009	15	66.2	10.6	45.8	87.3	54.2	57.8	66.8	73.7	75.6
2010	16	66.5	8.7	47.1	77.9	53.4	60.6	67.8	73.2	77.8
2011	16	66.3	12.2	48.6	93.8	54.5	56.7	62.3	72.9	84.0
2012	12	61.7	11.1	45.5	83.5	50.0	53.3	60.7	69.8	72.7
2013	12	64.1	10.5	50.0	85.2	51.2	57.0	63.6	68.7	78.9
2014	14	66.3	9.8	48.9	79.9	51.1	63.3	66.1	72.9	79.6
2015	19	66.7	10.5	46.1	89.4	53.3	57.6	67.6	72.2	86.3
2016	8	65.5	10.5	47.8	79.6	47.8	59.1	65.8	73.3	79.6
2017	10	66.8	17.5	34.7	89.9	41.5	58.1	69.3	77.0	89.1
2018	8	69.1	8.3	56.0	82.3	56.0	63.3	68.8	75.2	82.3
2019	8	67.1	14.4	51.3	90.8	51.3	53.8	65.6	77.8	90.8
2020	12	65.5	12.8	40.1	93.8	58.9	59.4	63.6	72.4	76.4
1998-2020	239	64.5	11.7	19.0	93.8	50.0	57.1	64.7	72.6	78.9

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									
25-29	1	0.2	0.2	1	0.2	0.2			0.0
30-34	1	0.2	0.3			0.2	1	0.6	0.6
35-39	8	1.2	1.5	7	1.4	1.6	1	0.6	1.2
40-44	10	1.5	3.0	9	1.8	3.5	1	0.6	1.8
45-49	40	6.1	9.1	27	5.5	9.0	13	7.6	9.4
50-54	68	10.3	19.4	53	10.8	19.8	15	8.8	18.1
55-59	121	18.3	37.7	93	19.0	38.8	28	16.4	34.5
60-64	120	18.2	55.8	93	19.0	57.8	27	15.8	50.3
65-69	103	15.6	71.4	75	15.3	73.1	28	16.4	66.7
70-74	89	13.5	84.9	63	12.9	85.9	26	15.2	81.9
75-79	56	8.5	93.3	39	8.0	93.9	17	9.9	91.8
80-84	21	3.2	96.5	17	3.5	97.3	4	2.3	94.2
85+	23	3.5	100.0	13	2.7	100.0	10	5.8	100.0
All ages	661	100.0		490	100.0		171	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=12 %	Females DCO rate n=5 %	Males Prop.all cancers n=153686 %	Females Prop.all cancers n=155051 %
0– 4								
5– 9								
10–14								
15–19								
20–24								
25–29	1		0.0				0.1	
30–34		1		0.0				0.0
35–39	7	1	0.3	0.0			0.4	0.0
40–44	9	1	0.4	0.0			0.3	0.0
45–49	27	13	1.0	0.5			0.5	0.1
50–54	53	15	2.1	0.6			0.6	0.1
55–59	93	28	4.4	1.3	1.1		0.7	0.2
60–64	93	27	5.3	1.4	2.2		0.5	0.2
65–69	75	28	4.6	1.5	2.7		0.3	0.1
70–74	63	26	4.2	1.5	3.2	7.7	0.2	0.1
75–79	39	17	3.2	1.1	5.1	5.9	0.2	0.1
80–84	17	4	2.3	0.4	5.9	25.0	0.1	0.0
85+	13	10	2.8	1.0	15.4	10.0	0.1	0.1
All ages	490	171			2.4	2.9	0.3	0.1
Incidence								
Raw			1.5	0.5				
WS			0.9	0.3				
ES			1.2	0.4				
BRD-S			1.4	0.4				

The age-specific incidence characterizes the disease risk in a particular age group. The age distribution depends on the patient population frequency in each age group and reflects the tangible clinical picture of everyday patients care (see following chart).

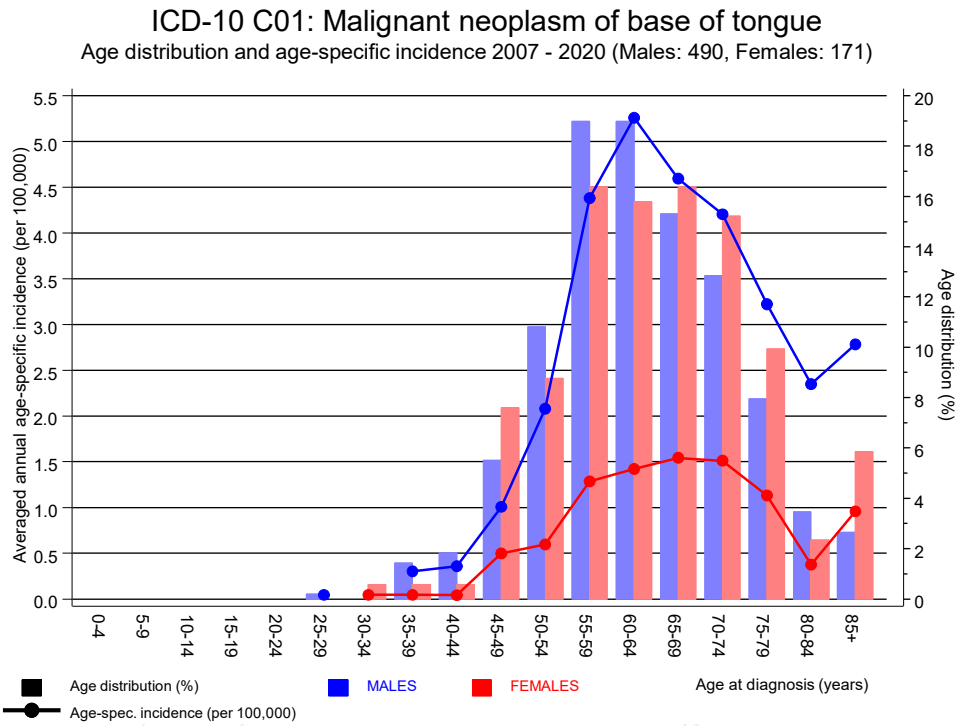


Figure 6. Age distribution (males: mean=63.5 yrs, median=63.0 yrs; females: mean=65.2 yrs, median=64.8 yrs) and age-specific incidence.

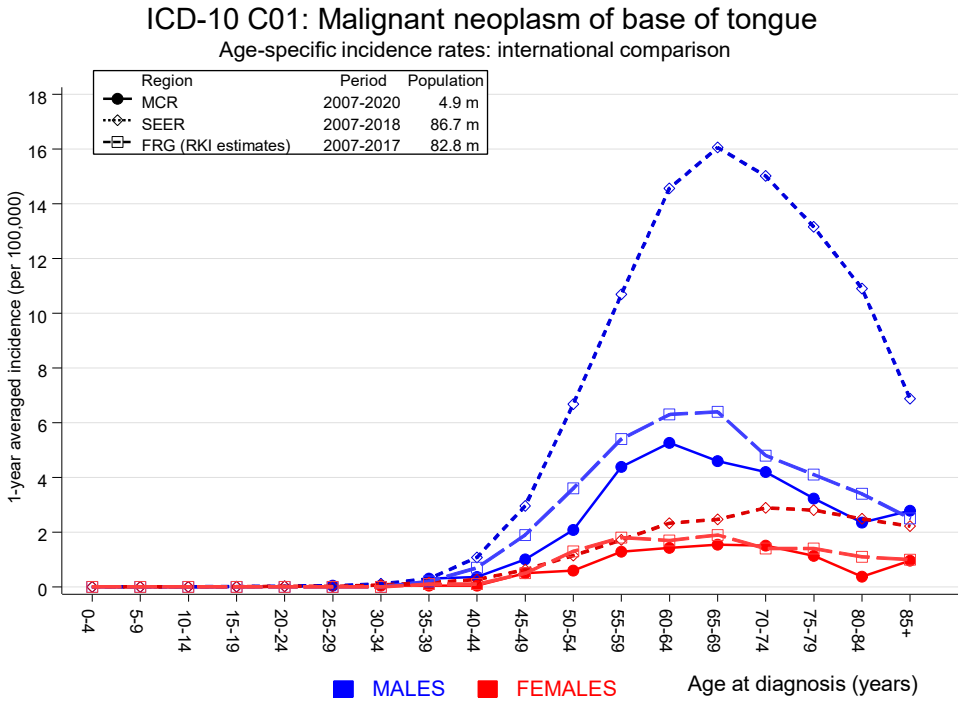


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, RKI estimates) and SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

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

Table 7a

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

MALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
		1	0.0	144.4	3.7	804.6	#	4.6	
C00	Lip	1	0.0	39.6	1.0	220.6	#	4.5	
C03–C06	Oral cavity	12	0.3	40.4	20.9	70.6	#	54.2	
C07–C08	Salivary gland	1	0.1	16.5	0.4	91.8		4.4	
C09–C10	Oropharynx	5	0.4	12.9	4.2	30.0	#	21.4	
C12–C13	Hypopharynx	11	0.2	55.0	27.4	98.4	#	50.1	9.1
C15	Oesophagus	12	0.6	19.1	9.9	33.4	#	52.7	16.7
C16	Stomach	1	1.0	1.0	0.0	5.7		0.1	
C17	Small intestine	1	0.2	5.7	0.1	31.7		3.8	100.0
C18	Colon	4	2.4	1.7	0.5	4.3		7.4	
C19–C20	Rectum	4	1.5	2.7	0.7	6.9		11.7	
C22	Liver	3	0.8	3.7	0.8	10.9		10.2	33.3
C25	Pancreas	3	1.0	2.9	0.6	8.4		9.1	
C32	Larynx	8	0.3	25.8	11.2	50.9	#	35.6	62.5
C33–C34	Lung	36	3.3	11.0	7.7	15.3	#	151.7	11.1
C38,C45	Mesothelioma	1	0.2	5.9	0.1	32.9		3.8	
C43	Malign. melanoma	2	1.3	1.5	0.2	5.5		3.2	
C46,C49	Soft tissue	2	0.2	12.7	1.5	45.7	#	8.5	
C61	Prostate	11	7.4	1.5	0.7	2.7		16.6	
C64	Kidney	6	1.0	6.2	2.3	13.4	#	23.3	
C65	Renal pelvis	1	0.1	9.2	0.2	51.3		4.1	
C67	Bladder	5	1.1	4.4	1.4	10.3	#	17.9	
C70–C72	CNS cancer	2	0.4	5.5	0.7	19.7		7.6	
C73	Thyroid	1	0.2	4.3	0.1	24.2		3.6	
C76–C79	CUP	2	0.4	4.6	0.6	16.5		7.2	
C82–C85	NHL	3	1.1	2.7	0.6	8.0		8.8	
C91–C96	Leukaemia	3	0.4	8.1	1.7	23.6	#	12.2	33.3
Not observed		0	1.4	0.0	0.0	2.7		-6.4	
All further malignancies		142	27.2	5.2	4.4	6.2	#	532.1	10.6

Patients	681
Median age at next malignancy (years)	65.7
Person-years	2158
Mean observation time (years)	3.2
Median observation time (years)	1.7

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	3	0.0	61.0	12.6	178.4	#	38.7	
C09–C10	Oropharynx	4	0.0	102.1	27.8	261.4	#	52.0	
C11	Nasopharynx	1	0.0	345.0	8.7	1922	#	13.1	
C12–C13	Hypopharynx	2	0.0	200.6	24.3	724.5	#	26.1	
C15	Oesophagus	4	0.1	73.4	20.0	187.9	#	51.8	25.0
C16	Stomach	2	0.2	8.3	1.0	30.1	#	23.1	
C18	Colon	1	0.7	1.4	0.0	8.1		4.1	
C19–C20	Rectum	2	0.3	6.7	0.8	24.4		22.4	
C25	Pancreas	1	0.3	3.0	0.1	16.5		8.7	
C32	Larynx	3	0.0	187.4	38.7	547.8	#	39.2	33.3
C33–C34	Lung	14	0.6	22.1	12.1	37.2	#	175.4	21.4
C50	Breast	4	2.5	1.6	0.4	4.0		19.2	25.0
C51	Vulva	1	0.1	12.7	0.3	70.7		12.1	
C53	Cervix uteri	2	0.1	18.7	2.3	67.4	#	24.8	
C82–C85	NHL	2	0.3	6.8	0.8	24.7		22.4	
C91–C96	Leukaemia	1	0.1	9.3	0.2	51.7		11.7	
Not observed		0	2.4	0.0	0.0	1.5		−31.7	
All further malignancies		47	7.9	5.9	4.4	7.9	#	512.9	12.8

Patients	230
Median age at next malignancy (years)	66.5
Person-years	762
Mean observation time (years)	3.3
Median observation time (years)	1.4

The occurrence of further specified malignancy is statistically significant.

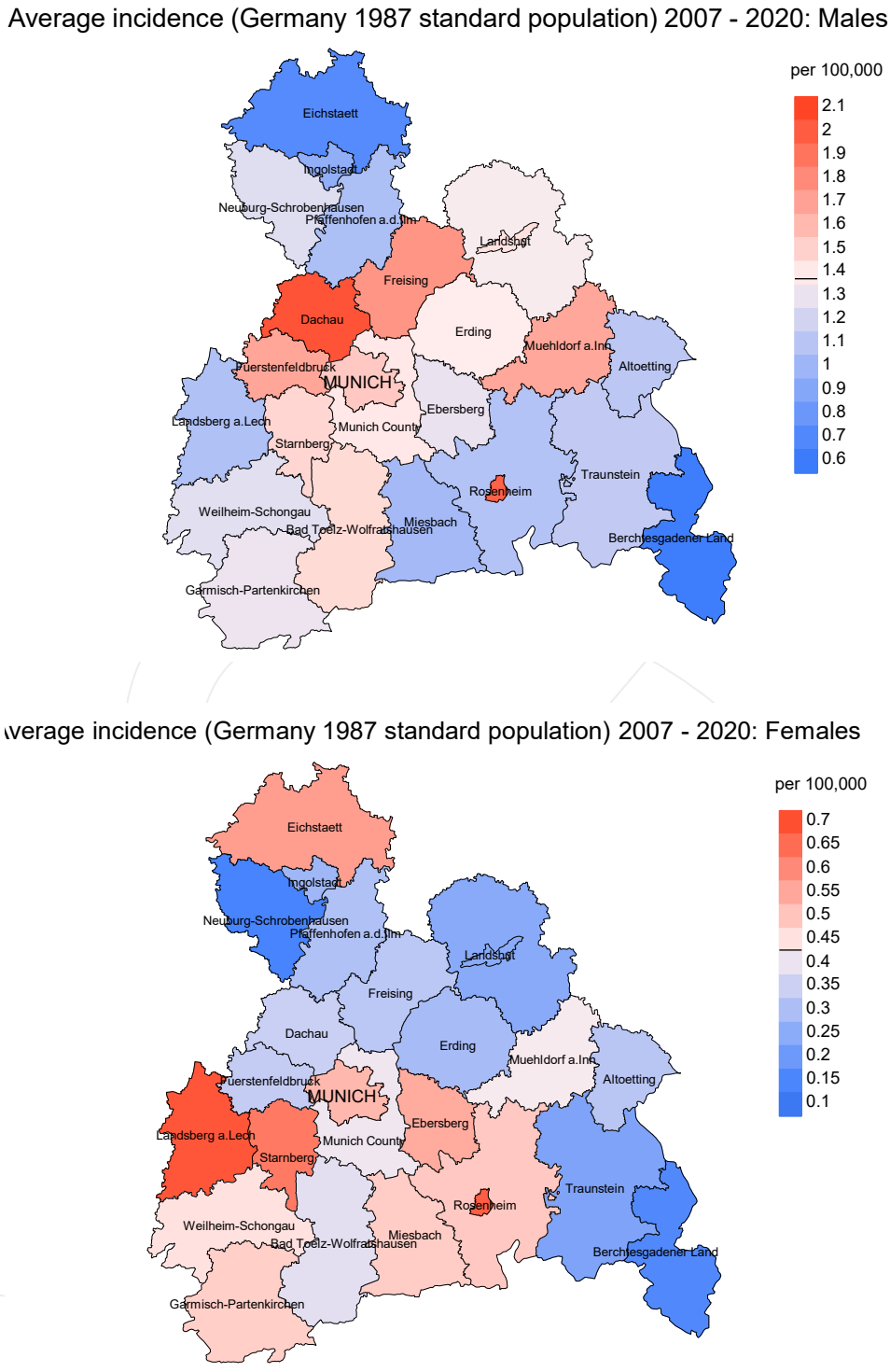
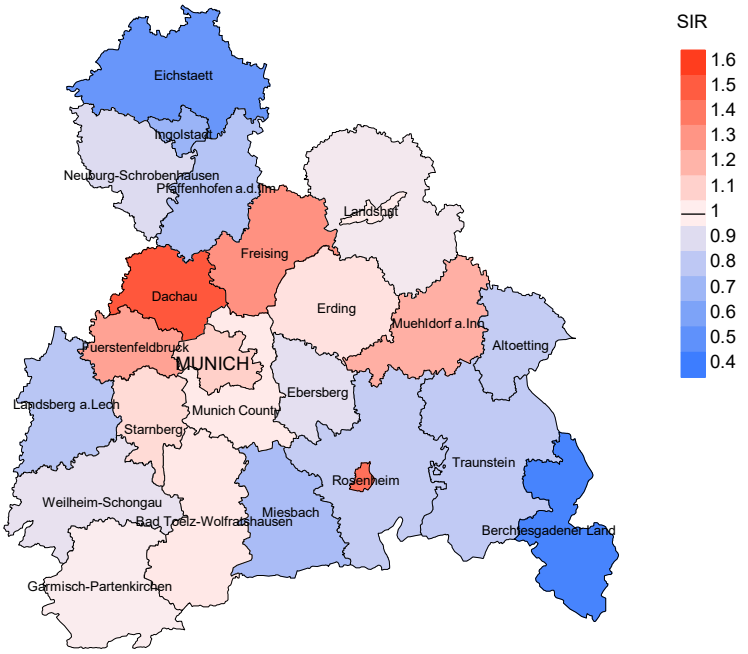


Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 1.4/100,000 WS N=490, females 0.4/100,000 WS N=171).

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 6 women were identified with newly diagnosed base of tongue cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 0.5/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.1 and 1.5/100,000.

Standardized incidence ratio (SIR) 2007 - 2020: Males



Standardized incidence ratio (SIR) 2007 - 2020: Females

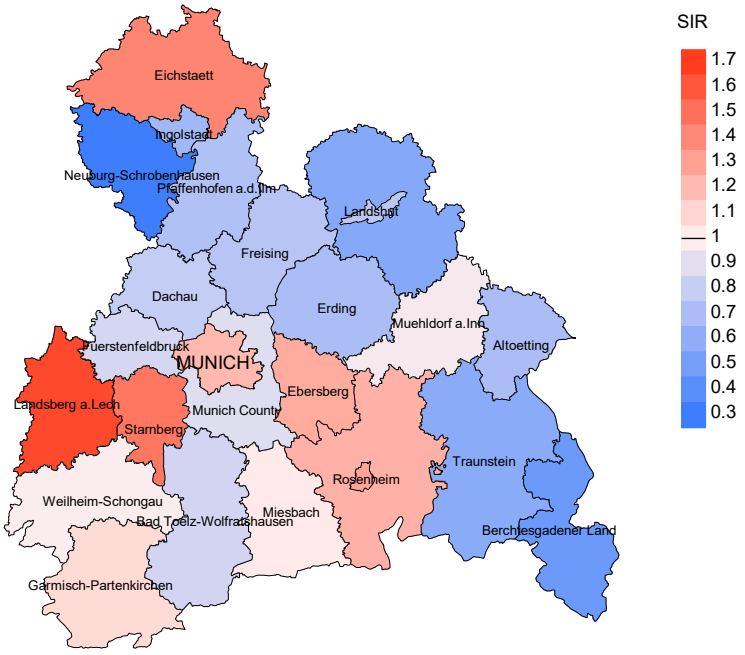


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=490, females N=171).

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 6 women were identified with newly diagnosed base of tongue cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.26. Though, the value of this parameter may vary with an underlying probability of 99% between 0.32 and 3.30, 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	15	100.0	6.7	12	80.0	100.0
1999	22	95.5	4.5	20	90.9	90.0
2000	12	100.0	8.3	10	83.3	100.0
2001	18	100.0	11.1	18	100.0	94.4
2002	33	97.0		29	87.9	96.6
2003	40	100.0	12.5	37	92.5	94.6
2004	47	93.6	8.5	37	78.7	97.3
2005	50	92.0	6.0	36	72.0	94.4
2006	50	94.0	4.0	37	74.0	94.6
2007	54	92.6	1.9	40	74.1	97.5
2008	55	100.0	7.3	45	81.8	95.6
2009	48	97.9		30	62.5	96.7
2010	55	98.2	1.8	40	72.7	95.0
2011	66	98.5	3.0	42	63.6	92.9
2012	55	96.4	3.6	34	61.8	94.1
2013	59	98.3	1.7	36	61.0	94.4
2014	55	100.0	1.8	29	52.7	93.1
2015	57	96.5	3.5	33	57.9	90.9
2016	39	100.0		22	56.4	100.0
2017	44	100.0		18	40.9	66.7
2018	25	100.0	12.0	10	40.0	90.0
2019	23	100.0		9	39.1	77.8
2020	26	100.0		4	15.4	100.0
1998-2020	948	97.5	3.8	628	66.2	93.9

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	15	12	91.7	1	6.7
1999	22	10	90.0	2	9.1
2000	12	17	100.0	2	16.7
2001	18	15	100.0	4	22.2
2002	33	19	100.0		
2003	40	24	91.7	10	25.0
2004	47	28	100.0	9	19.1
2005	50	25	100.0	7	14.0
2006	50	47	97.9	12	24.0
2007	54	32	96.9	7	13.0
2008	55	29	100.0	12	21.8
2009	48	34	100.0	4	8.3
2010	55	38	100.0	10	18.2
2011	66	46	100.0	6	9.1
2012	55	39	97.4	4	7.3
2013	59	37	100.0	8	13.6
2014	55	44	100.0	8	14.5
2015	57	44	97.7	11	19.3
2016	39	35	97.1	7	17.9
2017	44	44	93.2	3	6.8
2018	25	33	66.7	6	24.0
2019	23	24	29.2	3	13.0
2020	26	30	93.3	1	3.8
1998–2020	948	706	94.1	137	14.5

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	12	75.0	25.0	90.9
1999	10	80.0	20.0	88.9
2000	17	64.7	35.3	70.6
2001	15	80.0	20.0	93.3
2002	19	94.7	5.3	100.0
2003	24	62.5	37.5	90.9
2004	28	92.9	7.1	96.4
2005	25	100.0		100.0
2006	47	89.4	10.6	95.7
2007	32	78.1	21.9	90.3
2008	29	82.8	17.2	96.6
2009	34	85.3	14.7	91.2
2010	38	89.5	10.5	97.4
2011	46	84.8	15.2	89.1
2012	39	79.5	20.5	92.1
2013	37	86.5	13.5	91.9
2014	44	86.4	13.6	88.6
2015	44	77.3	22.7	88.4
2016	35	80.0	20.0	91.2
2017	44	86.4	13.6	92.7
2018	33	60.6	39.4	95.5
2019	24	37.5	62.5	85.7
2020	30	46.7	53.3	75.0
1998-2020	706	79.5	20.5	91.4

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	8	63.2	61.8	65.7	62.1
1999	7	61.8	59.6	65.1	57.4
2000	15	62.0	61.5	70.4	61.3
2001	11	60.1	58.6	74.0	60.1
2002	15	60.5	56.3	67.3	60.5
2003	21	62.6	63.2	56.5	63.2
2004	23	63.1	62.7	86.1	62.7
2005	18	63.5	63.5		63.5
2006	33	66.2	66.1	72.2	66.1
2007	25	62.2	62.2	62.7	64.2
2008	24	60.7	61.0	59.2	60.7
2009	28	63.8	62.5	66.4	63.8
2010	28	65.0	65.6	61.8	65.0
2011	38	66.5	64.4	75.8	65.0
2012	31	70.1	68.2	70.7	66.3
2013	24	67.6	65.7	69.4	66.2
2014	32	66.9	64.0	77.6	65.3
2015	32	69.2	66.7	75.6	69.0
2016	24	75.0	74.1	78.7	74.3
2017	35	68.0	68.4	64.9	67.3
2018	25	69.7	64.8	70.9	63.5
2019	19	74.6	64.1	75.0	66.6
2020	22	73.4	70.0	76.1	70.2
1998–2020	538	66.0	64.8	70.7	65.1

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

Table 10b

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

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	4	63.2	52.8	85.2	63.2
1999	3	58.4	55.9	70.0	58.4
2000	2	71.4	71.4		71.4
2001	4	74.4	59.3	84.7	71.9
2002	4	72.9	72.9		72.9
2003	3	52.1	85.4	51.8	68.4
2004	5	61.3	57.2	81.6	61.3
2005	7	62.1	62.1		62.1
2006	14	65.0	65.0		65.0
2007	7	74.2	72.1	74.2	69.3
2008	5	66.7	58.3	71.9	62.5
2009	6	60.7	61.4	60.0	61.4
2010	10	71.7	67.7	75.0	70.6
2011	8	72.4	70.7	85.4	70.7
2012	8	67.0	65.0	72.3	65.3
2013	13	76.9	73.0	92.1	73.0
2014	12	69.3	68.0	79.1	68.0
2015	12	65.1	64.8	71.3	65.5
2016	11	71.3	69.3	87.9	69.3
2017	9	71.3	71.3		71.3
2018	8	70.5	69.4	76.0	71.7
2019	5	85.3	82.4	89.0	81.8
2020	8	67.5	67.5	61.1	67.5
1998-2020	168	69.1	66.6	76.0	67.3

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	0.55	0.4	0.53	0.4	0.49	0.5	0.48
1999	6	0.5	0.33	0.3	0.32	0.5	0.33	0.5	0.33
2000	9	0.8	1.13	0.5	1.03	0.7	1.09	1.0	1.33
2001	10	0.9	0.91	0.6	0.89	0.8	0.85	0.8	0.76
2002	14	0.8	0.54	0.5	0.55	0.7	0.56	0.9	0.65
2003	14	0.7	0.40	0.5	0.40	0.6	0.39	0.7	0.38
2004	22	1.2	0.67	0.7	0.68	1.0	0.69	1.2	0.76
2005	18	1.0	0.46	0.6	0.40	0.8	0.43	0.9	0.46
2006	28	1.5	0.76	0.8	0.70	1.2	0.70	1.4	0.73
2007	21	0.9	0.47	0.6	0.43	0.8	0.45	0.9	0.47
2008	21	0.9	0.49	0.6	0.48	0.8	0.47	0.9	0.45
2009	24	1.1	0.73	0.6	0.71	0.9	0.71	1.0	0.70
2010	26	1.2	0.67	0.6	0.65	0.9	0.66	1.1	0.69
2011	32	1.4	0.64	0.8	0.64	1.2	0.66	1.4	0.68
2012	26	1.1	0.60	0.6	0.53	0.9	0.57	1.0	0.59
2013	21	0.9	0.45	0.5	0.42	0.7	0.42	0.9	0.46
2014	27	1.2	0.66	0.6	0.57	0.9	0.59	1.0	0.62
2015	25	1.1	0.66	0.5	0.65	0.8	0.66	1.0	0.66
2016	18	0.7	0.58	0.3	0.44	0.5	0.49	0.7	0.56
2017	29	1.2	0.85	0.6	0.80	0.9	0.82	1.1	0.84
2018	15	0.6	0.88	0.3	0.79	0.5	0.81	0.6	0.86
2019	5	0.2	0.33	0.1	0.29	0.1	0.30	0.2	0.31
2020	8	0.3	0.57	0.2	0.55	0.2	0.58	0.3	0.57
1998-2020	425	0.9	0.60	0.5	0.57	0.7	0.58	0.9	0.61

Table 11b

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

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	3	0.3	0.75	0.2	1.00	0.2	0.94	0.3	0.90
1999	2	0.2	0.50	0.1	0.60	0.2	0.59	0.2	0.50
2000	2	0.2	0.50	0.1	0.27	0.1	0.31	0.1	0.42
2001	2	0.2	0.29	0.1	0.40	0.2	0.35	0.2	0.37
2002	4	0.2	0.57	0.1	0.45	0.1	0.46	0.2	0.55
2003	1	0.1	0.25	0.0	0.11	0.0	0.14	0.0	0.14
2004	4	0.2	0.29	0.1	0.34	0.2	0.31	0.2	0.30
2005	7	0.4	0.64	0.2	0.72	0.3	0.73	0.3	0.73
2006	14	0.7	1.08	0.4	0.81	0.5	0.92	0.6	0.94
2007	4	0.2	0.44	0.1	0.29	0.1	0.31	0.1	0.34
2008	3	0.1	0.25	0.1	0.26	0.1	0.26	0.1	0.26
2009	5	0.2	0.33	0.1	0.39	0.2	0.36	0.2	0.37
2010	8	0.3	0.50	0.2	0.51	0.3	0.51	0.3	0.50
2011	7	0.3	0.44	0.1	0.37	0.2	0.37	0.2	0.36
2012	5	0.2	0.42	0.1	0.42	0.2	0.40	0.2	0.39
2013	11	0.5	0.92	0.2	0.68	0.3	0.73	0.4	0.91
2014	11	0.5	0.79	0.2	0.73	0.3	0.76	0.3	0.72
2015	9	0.4	0.47	0.2	0.46	0.3	0.47	0.3	0.47
2016	10	0.4	1.25	0.2	1.09	0.3	1.13	0.3	1.19
2017	9	0.4	0.90	0.2	0.79	0.2	0.83	0.3	0.81
2018	5	0.2	0.63	0.1	0.67	0.1	0.67	0.2	0.60
2019	4	0.2	0.50	0.0	0.19	0.1	0.26	0.1	0.37
2020	6	0.2	0.50	0.1	0.52	0.2	0.50	0.2	0.52
1998-2020	136	0.3	0.57	0.1	0.52	0.2	0.53	0.2	0.55

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	1	0.3	0.3	1	0.3	0.3			0.0
35-39	2	0.5	0.8	2	0.7	1.0			0.0
40-44	6	1.5	2.3	6	2.0	3.0			0.0
45-49	10	2.5	4.8	6	2.0	5.0	4	4.1	4.1
50-54	40	10.1	14.9	31	10.4	15.4	9	9.3	13.4
55-59	56	14.2	29.1	47	15.8	31.2	9	9.3	22.7
60-64	60	15.2	44.3	44	14.8	46.0	16	16.5	39.2
65-69	66	16.7	61.0	52	17.4	63.4	14	14.4	53.6
70-74	61	15.4	76.5	42	14.1	77.5	19	19.6	73.2
75-79	44	11.1	87.6	33	11.1	88.6	11	11.3	84.5
80-84	20	5.1	92.7	17	5.7	94.3	3	3.1	87.6
85+	29	7.3	100.0	17	5.7	100.0	12	12.4	100.0
All ages	395	100.0		298	100.0		97	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	1		0.0	1.00			0.7	
35-39	2		0.1	0.29			0.7	
40-44	6		0.2	0.67			1.0	
45-49	6	4	0.2	0.22	0.2	0.31	0.4	0.2
50-54	31	9	1.2	0.58	0.4	0.60	1.2	0.3
55-59	47	9	2.2	0.51	0.4	0.32	1.1	0.2
60-64	44	16	2.5	0.47	0.8	0.59	0.7	0.3
65-69	52	14	3.2	0.69	0.8	0.50	0.6	0.2
70-74	42	19	2.8	0.67	1.1	0.73	0.4	0.2
75-79	33	11	2.7	0.85	0.7	0.65	0.3	0.1
80-84	17	3	2.3	1.00	0.3	0.75	0.2	0.0
85+	17	12	3.6	1.31	1.2	1.20	0.2	0.1
All ages	298	97					0.4	0.2
Mortality								
Raw			0.9	0.61	0.3	0.57		
WS			0.5	0.57	0.1	0.51		
ES			0.7	0.58	0.2	0.52		
BRD-S			0.8	0.60	0.2	0.54		
PYLL-70								
per 100,000			7.0		1.8			
ES			5.9		1.5			
AYLL-70			10.5		9.9			

Table 14a

Further malignancies in deaths in period 1998–2020
MALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C00	Lip	1	0.4					1	100.0
C03–C06	Oral cavity	22	9.0	13	59.1	4	18.2	5	22.7
C07–C08	Salivary gland	1	0.4	1	100.0				
C09–C10	Oropharynx	8	3.3			1	12.5	7	87.5
C12–C13	Hypopharynx	15	6.1	6	40.0	4	26.7	5	33.3
C15	Oesophagus	21	8.6	5	23.8	4	19.0	12	57.1
C16	Stomach	4	1.6	2	50.0			2	50.0
C18	Colon	8	3.3	3	37.5	1	12.5	4	50.0
C19–C20	Rectum	1	0.4					1	100.0
C21	Anus/canal	1	0.4	1	100.0				
C22	Liver	2	0.8					2	100.0
C23–C24	Bile	1	0.4	1	100.0				
C25	Pancreas	6	2.4	2	33.3			4	66.7
C30–C31	Sinuses	1	0.4	1	100.0				
C32	Larynx	15	6.1	9	60.0	1	6.7	5	33.3
C33–C34	Lung	41	16.7	5	12.2	6	14.6	30	73.2
C38,C45	Mesothelioma	1	0.4					1	100.0
C43	Malign. melanoma	3	1.2	3	100.0				
C44	Skin others	30	12.2	10	33.3	2	6.7	18	60.0
C46,C49	Soft tissue	4	1.6	2	50.0			2	50.0
C50	Breast	1	0.4	1	100.0				
C61	Prostate	12	4.9	6	50.0	1	8.3	5	41.7
C62	Testis	4	1.6	4	100.0				
C63	Male urogen.	1	0.4	1	100.0				
C64	Kidney	7	2.9	2	28.6	1	14.3	4	57.1
C65	Renal pelvis	1	0.4					1	100.0
C67	Bladder	9	3.7	4	44.4			5	55.6
C70–C72	CNS cancer	2	0.8					2	100.0
C73	Thyroid	3	1.2	1	33.3	1	33.3	1	33.3
C76–C79	CUP	12	4.9	9	75.0	2	16.7	1	8.3
C82–C85	NHL	4	1.6	2	50.0	1	25.0	1	25.0
C90	Mult. myeloma	1	0.4	1	100.0				
C91–C96	Leukaemia	2	0.8					2	100.0
All further malignancies		245	100.0	95	38.8	29	11.8	121	49.4

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	9	12.3	4	44.4	3	33.3	2	22.2
C09–C10 Oropharynx	5	6.8			2	40.0	3	60.0
C12–C13 Hypopharynx	4	5.5	1	25.0	2	50.0	1	25.0
C15 Oesophagus	8	11.0	2	25.0	1	12.5	5	62.5
C16 Stomach	1	1.4			1	100.0		
C18 Colon	1	1.4					1	100.0
C19–C20 Rectum	3	4.1	1	33.3			2	66.7
C25 Pancreas	1	1.4					1	100.0
C32 Larynx	5	6.8	2	40.0	2	40.0	1	20.0
C33–C34 Lung	14	19.2	1	7.1	3	21.4	10	71.4
C40–C41 Bone	1	1.4					1	100.0
C44 Skin others	3	4.1	2	66.7			1	33.3
C50 Breast	8	11.0	5	62.5			3	37.5
C53 Cervix uteri	3	4.1	1	33.3			2	66.7
C54 Corpus uteri	1	1.4	1	100.0				
C64 Kidney	1	1.4					1	100.0
C76–C79 CUP	4	5.5	4	100.0				
C82–C85 NHL	1	1.4					1	100.0
All further malignancies	73	100.0	24	32.9	14	19.2	35	47.9

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

Table 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								
30-34	1		0.0	1.00			0.7	
35-39	1		0.0	0.20			0.4	
40-44	5		0.2	0.71			0.9	
45-49	3	4	0.1	0.13	0.2	0.40	0.2	0.3
50-54	26	6	1.0	0.54	0.2	0.50	1.1	0.3
55-59	34	8	1.6	0.46	0.4	0.38	0.9	0.3
60-64	34	11	1.9	0.50	0.6	0.55	0.6	0.3
65-69	39	8	2.4	0.70	0.4	0.38	0.5	0.1
70-74	30	15	2.0	0.68	0.9	0.71	0.3	0.2
75-79	19	7	1.6	0.90	0.5	0.64	0.2	0.1
80-84	9	3	1.2	1.13	0.3	1.50	0.1	0.0
85+	11	8	2.4	1.22	0.8	1.14	0.2	0.1
All ages	212	70					0.4	0.1
Mortality								
Raw			0.7	0.58	0.2	0.56		
WS			0.4	0.54	0.1	0.50		
ES			0.5	0.56	0.1	0.51		
BRD-S			0.6	0.58	0.2	0.53		
PYLL-70								
per 100,000			5.3		1.4			
ES			4.5		1.2			
AYLL-70			10.5		10.7			

* 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	1		0.0	0.20			0.4	
40-44	4		0.2	0.67			0.7	
45-49	2	4	0.1	0.10	0.2	0.44	0.2	0.3
50-54	24	5	0.9	0.59	0.2	0.42	1.0	0.2
55-59	28	7	1.3	0.40	0.3	0.41	0.7	0.2
60-64	30	7	1.7	0.52	0.4	0.37	0.6	0.2
65-69	26	6	1.6	0.63	0.3	0.30	0.4	0.1
70-74	20	10	1.3	0.54	0.6	0.59	0.2	0.2
75-79	11	5	0.9	0.58	0.3	0.45	0.1	0.1
80-84	6	3	0.8	0.86	0.3	1.50	0.1	0.0
85+	9	7	1.9	1.29	0.7	1.17	0.2	0.1
All ages	161	54					0.3	0.1
Mortality								
Raw			0.5	0.52	0.2	0.47		
WS			0.3	0.50	0.1	0.42		
ES			0.4	0.51	0.1	0.43		
BRD-S			0.4	0.51	0.1	0.45		
PYLL-70								
per 100,000			4.4		1.2			
ES			3.7		1.0			
AYLL-70			10.8		11.5			

* See corresponding tables with multiple malignancies.

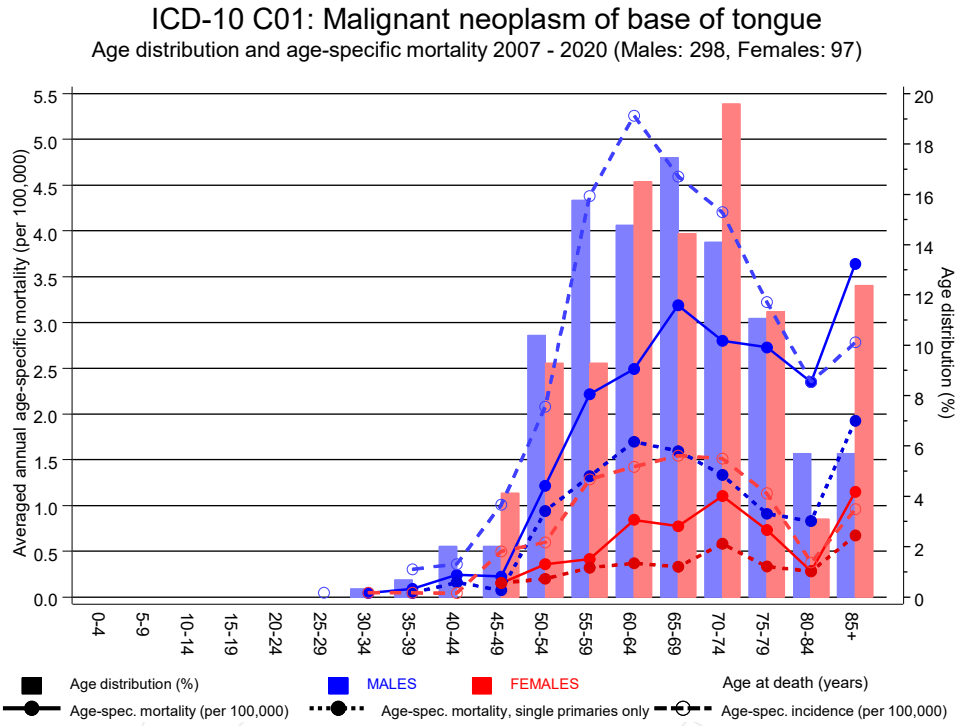


Figure 17. Distribution of age at death (bars; males: mean=62.4 yrs, median=61.8 yrs; females: mean=65.2 yrs, median=65.9 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

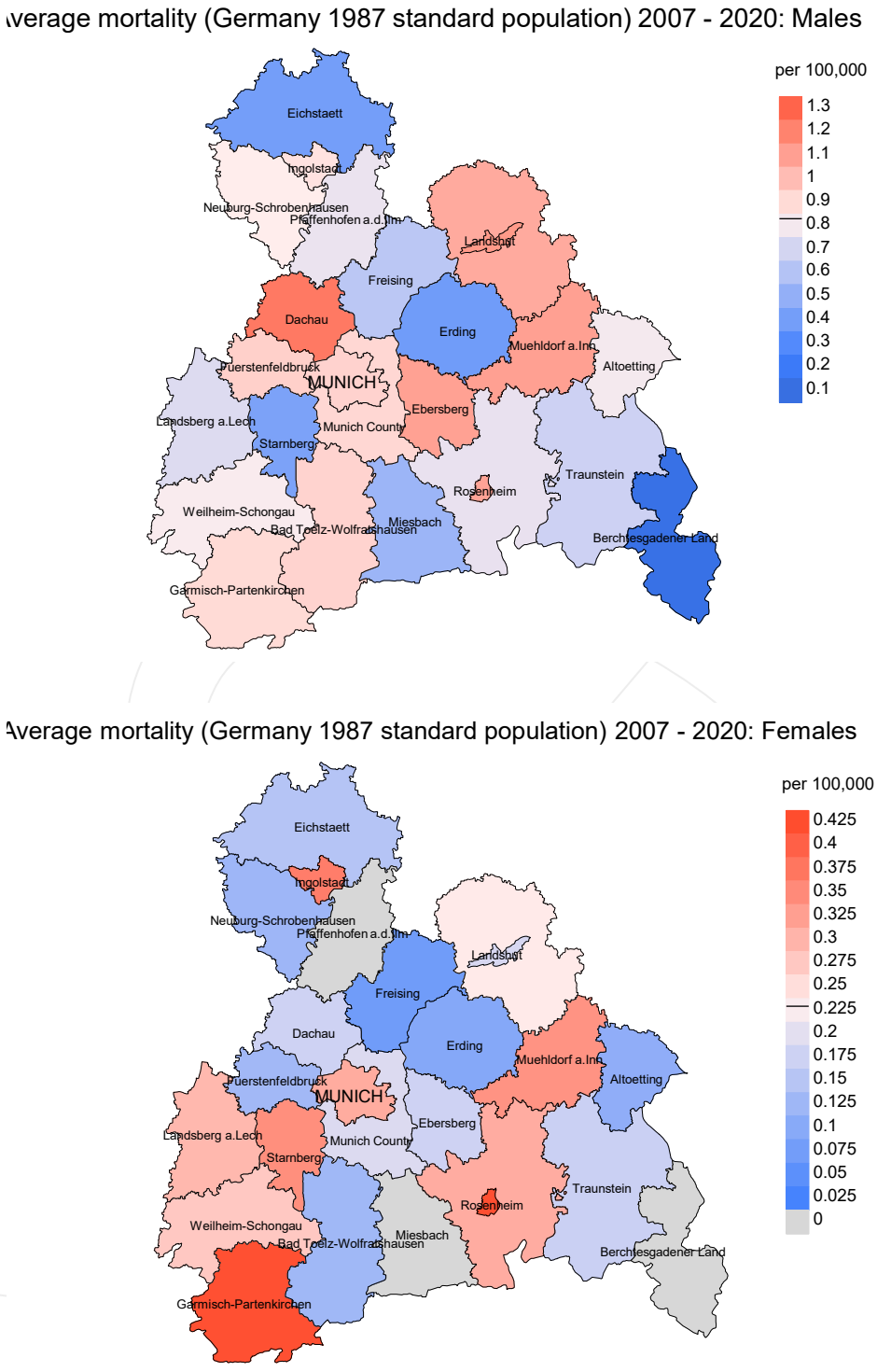
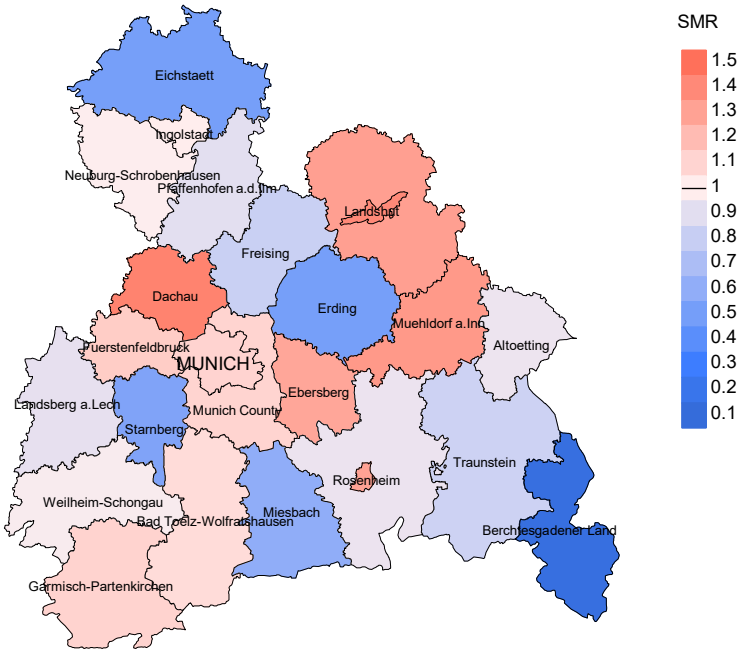


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2020. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.8/100,000 WS N=298, females 0.2/100,000 WS N=97).

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 2 women died from base of tongue cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.2/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.0 and 0.9/100,000.

Standardized mortality ratio (SMR) 2007 - 2020: Males



Standardized mortality ratio (SMR) 2007 - 2020: Females

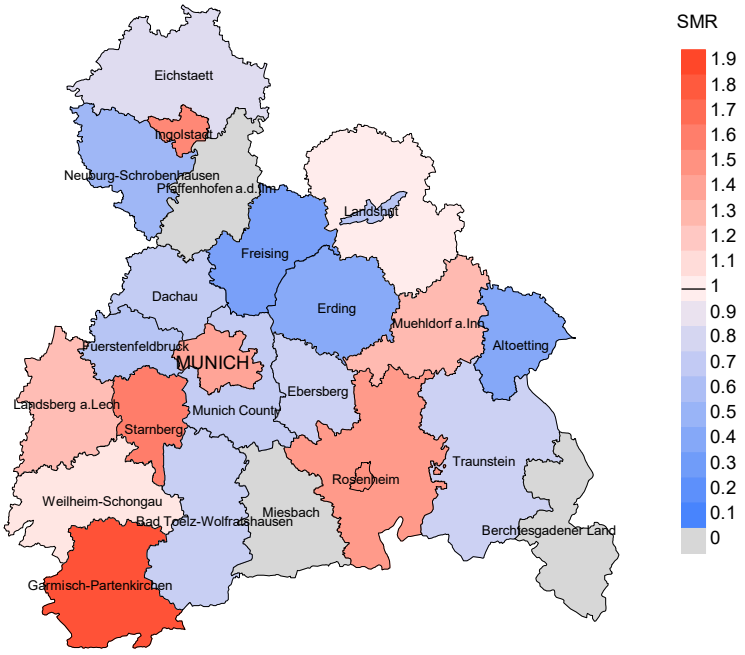


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=298, females N=97).

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 2 women died from base of tongue cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.75. Though, the value of this parameter may vary with an underlying probability of 99% between 0.04 and 3.49, and is therefore not statistically striking.

Statistical Notes

In all tables and figures the respective reference values should be carefully considered. The incidence rates include diagnoses (with multiple primary), and death certificate only (DCO) cases, where applicable. For mortality statistics patients, diagnoses and progressive course of disease are presented. In the calculations, all courses of disease are considered whereby progressions occurred and/or death certificate identified progressive cancers were ascertained. Additionally there are three groups of disease course to consider:

1. **All multiple primaries included**

   The mortality statistic describes the tumor-specific death, independent of any malignancy. The patient perspective, induced secondary malignancies, and the problem of multiple malignancies from the same primary tumor all have reasons for their inclusion.

2. **First singular primary** (no information about other prior or synchronous malignancy)

   The mortality statistic describes the cancer-related death for patients who have no therapeutic restrictions due to a previous or synchronous cancer. These statistics are comparable to studies that have exclusion criteria based on a second malignancy.

3. **Single primary** (no information about other prior, syn- or metachronous malignancy)

   The mortality statistic describes the tumor-specific death that occurs without any impact through secondary primaries, earlier, synchronous, later or induced. Precisely the difference between disease group 1 and 2 highlight the magnitude of the problem of secondary malignancies.

For this reason differences appear concerning official mono-causal mortality statistics. To judge the maximum deviation, 2 further tables are presented. In the first table the distribution of secondary malignancies before, at or after the described cancer are shown, that could be an alternative cause of death. In the second table, the age-specific mortality rates for all courses of disease, without designation of secondary malignancies are shown.

A previously minimally acknowledged statistic is the **age at death**, which allows for a good assessment of the quality of classification of the apparent tumor-specific death. For assumed tumor-independent deaths, the age of death should be estimated from the age of diagnosis and the normal life expectancy, whereas tumor-dependent deaths can be estimated from the age of diagnosis plus the average tumor-specific life expectancy. The comparison of different tumors demonstrates this association, if the causes of cancer and the competing cause of death are independent of each other (e.g. breast and colon versus head&neck and lung).

The ratio of mortality and incidence (mortality-to-incidence ratio, **MIR**, **MI-Index**) is a statistical index that allows for the evaluation of the quality of data. For diseases with poor prognoses, comparable values are obtained from all age groups, because to a large extent, the numerator and denominator contain the same cases. For tumors with a good prognosis, increasing and decreasing incidence and age-specific differences in prognosis can more strongly alter the MIR. Additionally, attention should be paid to the confidence intervals where fewer cases are reported.

The complexity of problems identified here emphasizes the importance of relative survival data for the appropriate analysis of long term results.

As a measurement of the burden of disease, the number of potential life years loss due to premature deaths in a cohort can be calculated (**PYLL**, potential years of life lost, standardized per 100,000 persons or per European standard) as well as the average loss of life years per individual (**AYLL**, average years of life lost). Depending upon the analytic aim (health economy, prevention, health care research) different methods exist for the generation of these measurements. In the results presented here, the age for a premature death is considered to be before 70 years, according to the guidelines of the OECD and the WHO (as seen in the abbreviation PYLL-70 or AYLL-70).

Shortcuts

MCR	Munich Cancer Registry (Tumorregister München)
GEKID	Association of Population-based Cancer Registries in Germany (Gesellschaft der epidemiologischen Krebsregister in Deutschland e.V.)
SEER	Surveillance, Epidemiology, and End Results (USA)
DCO	Death certificate only
BRD-S	German (FRG) standard population
ES	European standard population (old)
WS	World standard population
SIR	Standardized incidence ratio
CI	Confidence interval
EAR	Excess absolute risk = excess cancer cases (O - E) per 10,000 person-years
PYLL-70	Potential years of life lost prior to age 70 given a person dies before that age
AYLL-70	Average years of life lost prior to age 70 given a person dies before that age
SMR	Standardized mortality ratio
MI-index	Ratio of mortality to incidence, MIR
FRG	Federal Republic of Germany

Recommended Citation

Munich Cancer Registry. ICD-10 C01: Base of tongue cancer - Incidence and Mortality [Internet]. 2021 [updated 2021 Dec 20; cited 2022 Feb 1]. Available from: https://www.tumorregister-muenchen.de/en/facts/base/bC01__E-ICD-10-C01-Base-of-tongue-cancer-incidence-and-mortality.pdf

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