

# Munich Cancer Registry



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## ICD-10 C02: Tongue excl. base of tongue

### Incidence and Mortality

Year of diagnosis	1998-2019
Patients	1,223
Diseases	1,226
Creation date	01/25/2021
Database export	01/07/2021
Population	4.92 m





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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](https://www.tumorregister-muenchen.de/en/facts/base/bC02__E-ICD-10-C02-Tongue-excl.-base-of-tongue-incidence-and-mortality.pdf)

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

In these analyses, the clinics and physicians of Upper Bavaria and the city and county of Landshut<sup>#</sup>, with a total of 4.69 million inhabitants, account for the frequency of cancer diseases<sup>##</sup> 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<sup>###</sup> 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](mailto:tumor@ibe.med.uni-muenchen.de).

Munich Cancer Registry, January 2021

<sup>#</sup> 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).

<sup>##</sup> 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.

<sup>###</sup> 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	16.9	79.1	97.7
1999	33			17.1	16.6	84.8	100.0
2000	32	2	6.3	14.8	16.3	75.0	100.0
2001	35			14.0	16.2	82.9	100.0
2002	64			14.5	16.0	68.8	98.4 #
2003	54	2	3.7	14.2	15.8	79.6	100.0
2004	48			12.9	15.1	75.0	100.0
2005	49			13.1	14.8	75.5	93.9
2006	58	2	3.4	12.0	14.8	74.1	94.8
2007	75	5	6.7	12.0	14.6	61.3	90.7 #
2008	80			12.3	14.1	63.8	97.5
2009	70	1	1.4	13.3	12.8	64.3	98.6
2010	80	2	2.5	13.0	13.0	61.3	100.0
2011	63	1	1.6	13.4	11.2	49.2	95.2
2012	81	1	1.2	13.3	9.8	40.7	98.8
2013	75			13.8	9.7	58.7	97.3
2014	73	1	1.4	14.5	11.2	64.4	97.3
2015	66			14.8	10.6	48.5	100.0
2016	60	1	1.7	15.4	11.3	43.3	100.0
2017	37			15.4	8.2	21.6	100.0
2018	33			15.8	8.3	18.2	100.0
2019	17			15.9	5.9	35.3	76.5 ##
1998-2019	1226	21	1.7	15.9	16.9	60.5	97.6

1,226 cases diagnosed 1998-2019 are related to a total of 1,223 patients. Currently, in 392 (32.1 %) of these 1,223 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 285 / 82 / 25 (23.3 % / 6.7 % / 2.0 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2017, a subgroup of 37 cases has been diagnosed, of which 15.4 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 8.2 % 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 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	17.0	79.3	96.6
1999	16	48.5			22.2	16.7	93.8	100.0
2000	22	68.8	2	9.1	17.9	16.3	81.8	100.0
2001	26	74.3			16.1	16.4	88.5	100.0
2002	38	59.4			16.0	16.1	65.8	97.4 #
2003	35	64.8	1	2.9	16.3	16.0	80.0	100.0
2004	31	64.6			14.7	15.7	77.4	100.0
2005	31	63.3			14.9	15.7	77.4	96.8
2006	35	60.3	1	2.9	13.3	15.4	82.9	94.3
2007	52	69.3	5	9.6	13.3	15.1	61.5	88.5 #
2008	46	57.5			13.0	15.0	69.6	100.0
2009	39	55.7			13.5	13.8	69.2	100.0
2010	50	62.5	2	4.0	13.6	13.3	70.0	100.0
2011	41	65.1	1	2.4	14.1	12.0	58.5	95.1
2012	52	64.2	1	1.9	14.4	9.7	40.4	100.0
2013	45	60.0			14.6	9.2	53.3	97.8
2014	46	63.0			15.8	11.4	63.0	97.8
2015	42	63.6			16.1	11.5	50.0	100.0
2016	45	75.0	1	2.2	16.8	11.1	42.2	100.0
2017	23	62.2			16.8	8.7	21.7	100.0
2018	16	48.5			17.4	8.7	25.0	100.0
2019	8	47.1			17.6	12.5	37.5	75.0 ##
1998–2019	768	62.6	15	2.0	17.6	17.0	63.2	97.8

768 cases diagnosed 1998-2019 are related to a total of 766 patients. Currently, in 261 (34.1 %) of these 766 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 187 / 54 / 20 (24.4 % / 7.0 % / 2.6 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2017, a subgroup of 23 cases has been diagnosed, of which 16.8 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 8.7 % 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	16.7	78.6	100.0
1999	17	51.5			9.7	16.6	76.5	100.0
2000	10	31.3			9.8	16.3	60.0	100.0
2001	9	25.7			10.0	15.9	66.7	100.0
2002	26	40.6			11.8	15.8	73.1	100.0 #
2003	19	35.2	1	5.3	10.5	15.5	78.9	100.0
2004	17	35.4			9.8	14.1	70.6	100.0
2005	18	36.7			10.0	13.4	72.2	88.9
2006	23	39.7	1	4.3	9.8	13.8	60.9	95.7
2007	23	30.7			9.7	13.9	60.9	95.7 #
2008	34	42.5			11.0	12.8	55.9	94.1
2009	31	44.3	1	3.2	12.9	11.3	58.1	96.8
2010	30	37.5			12.2	12.4	46.7	100.0
2011	22	34.9			12.3	9.9	31.8	95.5
2012	29	35.8			11.5	10.0	41.4	96.6
2013	30	40.0			12.5	10.6	66.7	96.7
2014	27	37.0	1	3.7	12.4	10.8	66.7	96.3
2015	24	36.4			12.7	9.2	45.8	100.0
2016	15	25.0			12.9	11.5	46.7	100.0
2017	14	37.8			13.0	7.7	21.4	100.0
2018	17	51.5			13.1	8.0	11.8	100.0
2019	9	52.9			13.1	0.0	33.3	77.8 ##
1998–2019	458	37.4	6	1.3	13.1	16.7	56.1	97.2

458 cases diagnosed 1998-2019 are related to a total of 457 patients. Currently, in 131 (28.7 %) of these 457 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 98 / 28 / 5 (21.4 % / 6.1 % / 1.1 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2017, a subgroup of 14 cases has been diagnosed, of which 13.0 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 7.7 % 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 4.92 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	42	24	1.8	1.0	1.1	0.5	1.5	0.7	1.6	0.8
2016	45	15	1.9	0.6	1.1	0.3	1.5	0.4	1.7	0.5
2017	23	14	1.0	0.6	0.5	0.3	0.7	0.4	0.8	0.5
2018	16	17	0.7	0.7	0.4	0.4	0.6	0.5	0.6	0.6
2019	8	9	0.3	0.4	0.1	0.2	0.2	0.3	0.3	0.3
1998-2019	768	458	1.7	1.0	1.1	0.5	1.5	0.7	1.6	0.9

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



Table 3

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

Year of diagnosis	Cases n	Std.		Min.	Max.	Median				
		Mean	dev.			10%	25%	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	66	62.8	12.4	28.9	86.3	47.1	53.9	63.4	70.9	79.3
2016	60	64.2	14.0	21.1	91.3	48.1	56.2	63.7	75.3	79.8
2017	37	64.1	14.0	30.1	93.2	47.1	56.5	61.9	72.5	85.4
2018	33	61.9	12.0	37.9	92.6	47.6	54.3	60.5	67.9	76.1
2019	17	68.4	7.8	58.4	81.5	59.0	62.4	68.3	74.4	79.0
1998-2019	1226	61.9	13.3	21.1	101	45.2	53.3	61.8	71.4	79.3

Table 3a

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	Median				
						10%	25%	50%	75%	90%
1998	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	42	61.4	10.2	40.2	85.6	47.3	53.9	62.0	67.6	73.7
2016	45	62.2	13.4	21.1	80.9	46.9	54.9	63.1	73.4	77.0
2017	23	64.0	14.3	30.1	91.2	50.3	55.2	63.0	72.4	82.4
2018	16	61.5	11.2	44.5	92.6	47.6	55.6	60.4	66.2	74.4
2019	8	71.4	8.4	59.0	81.5	59.0	63.6	73.4	78.6	81.5
1998-2019	768	60.5	12.5	21.1	101	45.1	52.5	60.5	69.1	76.3

Table 3b

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

Year of diagnosis	Cases n	Std.		Median						
		Mean	dev.	Min.	Max.	10%	25%	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	24	65.3	15.4	28.9	86.3	43.8	55.3	67.3	77.5	83.8
2016	15	70.2	14.4	37.2	91.3	55.7	57.6	74.1	81.0	87.5
2017	14	64.2	14.2	42.2	93.2	47.1	56.5	60.1	73.0	85.4
2018	17	62.3	13.1	37.9	84.6	42.8	54.3	62.8	71.9	83.1
2019	9	65.7	6.5	58.4	76.2	58.4	60.1	62.9	71.3	76.2
1998-2019	458	64.2	14.3	25.6	98.2	45.5	54.2	64.6	75.1	82.9

Table 4

Age distribution by 5-year age group and sex for period 2007-2019  
(incl. DCO)

Age at diagnosis Years	Cases			Males			Females		
	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4									
5-9									
10-14									
15-19									
20-24	3	0.4	0.4	3	0.6	0.6			0.0
25-29	9	1.1	1.5	5	1.0	1.6	4	1.3	1.3
30-34	15	1.9	3.3	8	1.6	3.2	7	2.3	3.6
35-39	14	1.7	5.1	10	2.0	5.1	4	1.3	4.9
40-44	37	4.6	9.6	22	4.4	9.5	15	4.9	9.8
45-49	61	7.5	17.2	40	7.9	17.4	21	6.9	16.7
50-54	89	11.0	28.1	60	11.9	29.3	29	9.5	26.2
55-59	111	13.7	41.9	78	15.4	44.8	33	10.8	37.0
60-64	126	15.6	57.4	85	16.8	61.6	41	13.4	50.5
65-69	97	12.0	69.4	65	12.9	74.5	32	10.5	61.0
70-74	98	12.1	81.5	58	11.5	85.9	40	13.1	74.1
75-79	80	9.9	91.4	44	8.7	94.7	36	11.8	85.9
80-84	38	4.7	96.0	14	2.8	97.4	24	7.9	93.8
85+	32	4.0	100.0	13	2.6	100.0	19	6.2	100.0
All ages	810	100.0		505	100.0		305	100.0	

Table 5

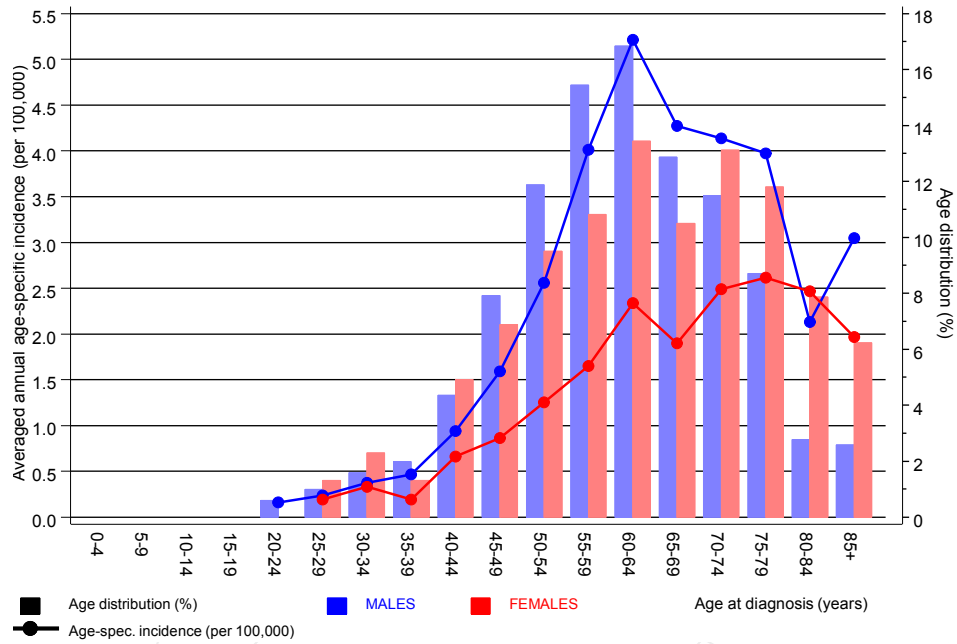
Age-specific incidence, DCO rate and proportion of all cancers  
for period 2007–2019

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	Females
							Prop.all cancers n=143063 %	Prop.all cancers n=144724 %
0- 4								
5- 9								
10-14								
15-19								
20-24	3		0.2				0.5	
25-29	5	4	0.2	0.2			0.6	0.4
30-34	8	7	0.4	0.3			0.7	0.4
35-39	10	4	0.5	0.2			0.6	0.1
40-44	22	15	0.9	0.7			0.8	0.3
45-49	40	21	1.6	0.9			0.8	0.2
50-54	60	29	2.6	1.3			0.8	0.3
55-59	78	33	4.0	1.7		3.0	0.7	0.3
60-64	85	41	5.2	2.3			0.5	0.3
65-69	65	32	4.3	1.9	4.6		0.3	0.2
70-74	58	40	4.1	2.5	3.4		0.2	0.2
75-79	44	36	4.0	2.6	2.3		0.2	0.2
80-84	14	24	2.1	2.5	7.1		0.1	0.2
85+	13	19	3.0	2.0	23.1	5.3	0.1	0.1
All ages	505	305			2.0	0.7	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).

ICD-10 C02: Malignant neoplasm of other and unspecified parts of tongue

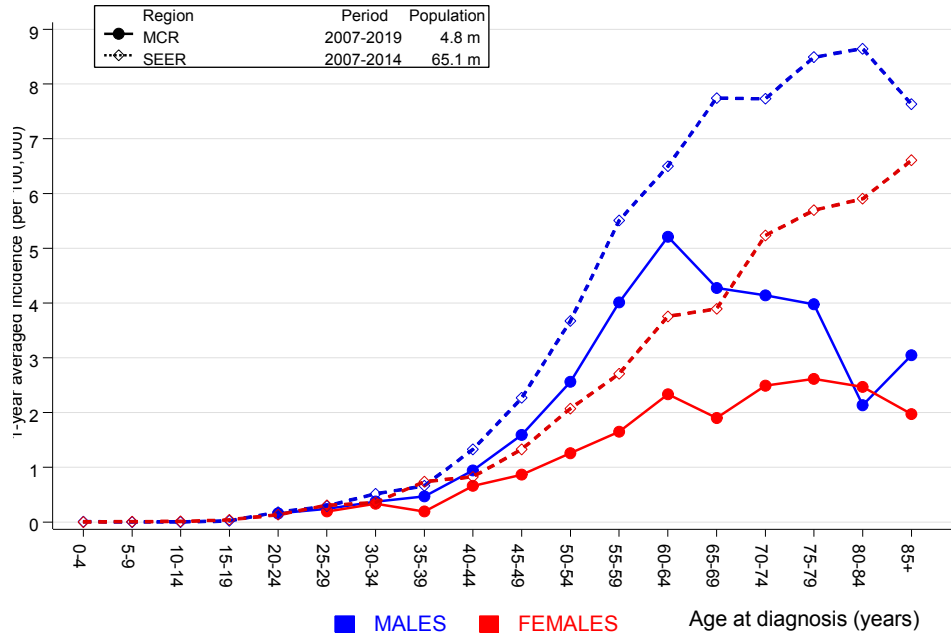
Age distribution and age-specific incidence 2007 - 2019 (Males: 505, Females: 305)



**Figure 6.** Age distribution (males: mean=61.3 yrs, median=61.9 yrs; females: mean=64.4 yrs, median=64.9 yrs) and age-specific incidence.

ICD-10 C02: Malignant neoplasm of other and unspecified parts of tongue

Age-specific incidence rates: international comparison



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

Reference:

Surveillance, Epidemiology, and End Results (SEER) Program SEER\*Stat Database: Incidence - SEER 18 Regs Research Data, released April 2019, based on the November 2018 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 1998-2019

## MALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C03-C06 Oral cavity	7	0.4	19.7	7.9	40.6 #	25.1	
C09-C10 Oropharynx	23	0.5	51.0	32.4	76.6 #	85.3	
C12-C13 Hypopharynx	11	0.2	45.6	22.8	81.6 #	40.7	27.3
C15 Oesophagus	16	0.7	23.0	13.1	37.3 #	57.9	6.3
C16 Stomach	2	1.1	1.7	0.2	6.3	3.2	
C17 Small intestine	1	0.2	5.1	0.1	28.5	3.0	100.0
C18 Colon	8	2.8	2.9	1.2	5.7 #	19.8	12.5
C19-C20 Rectum	5	1.7	2.9	0.9	6.7	12.3	
C21 Anus/canal	1	0.1	11.7	0.3	65.4	3.5	
C22 Liver	2	0.9	2.2	0.3	7.8	4.1	50.0
C23-C24 Bile	2	0.3	6.6	0.8	23.9	6.4	50.0
C25 Pancreas	3	1.2	2.6	0.5	7.5	6.9	
C30-C31 Sinuses	1	0.1	15.9	0.4	88.5	3.5	
C32 Larynx	8	0.4	21.7	9.4	42.7 #	28.9	12.5
C33-C34 Lung	33	3.8	8.7	6.0	12.2 #	110.4	24.2
C43 Malign. melanoma	3	1.5	2.0	0.4	5.9	5.7	
C46,C49 Soft tissue	1	0.2	5.5	0.1	30.8	3.1	
C61 Prostate	11	8.8	1.3	0.6	2.2	8.5	
C64 Kidney	4	1.2	3.5	0.9	8.9	10.8	
C67 Bladder	6	1.3	4.7	1.7	10.3 #	17.9	16.7
C73 Thyroid	3	0.3	10.9	2.3	31.9 #	10.3	
C76-C79 CUP	3	0.5	5.9	1.2	17.1 #	9.4	
C81 Hodgkin lymphoma	1	0.1	11.5	0.3	64.1	3.5	100.0
C82-C85 NHL	4	1.3	3.1	0.8	7.9	10.2	25.0
C91-C96 Leukaemia	1	0.4	2.3	0.1	12.9	2.1	
Not observed	0	2.0	0.0	0.0	1.9	-7.4	
All further malignancies	160	31.7	5.0	4.3	5.9 #	485.2	12.5
Patients		748					
Median age at next malignancy (years)		65.9					
Person-years		2644					
Mean observation time (years)		3.5					
Median observation time (years)		1.9					

# The occurrence of further specified malignancy is statistically significant.



Table 7b

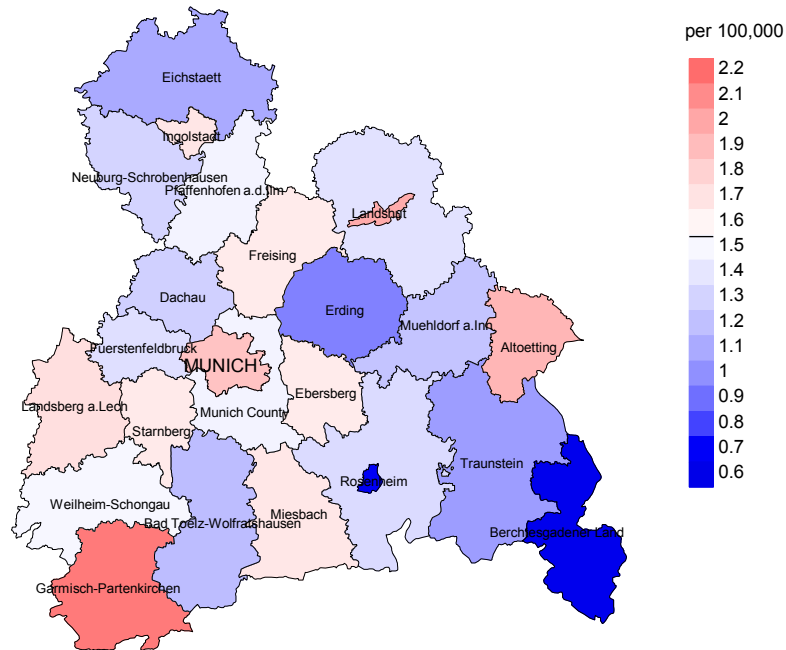
Standardized incidence ratio (SIR, with 95% confidence limits),  
excess absolute risk (EAR) and DCO rate of further malignancies  
for period 1998-2019

## FEMALES

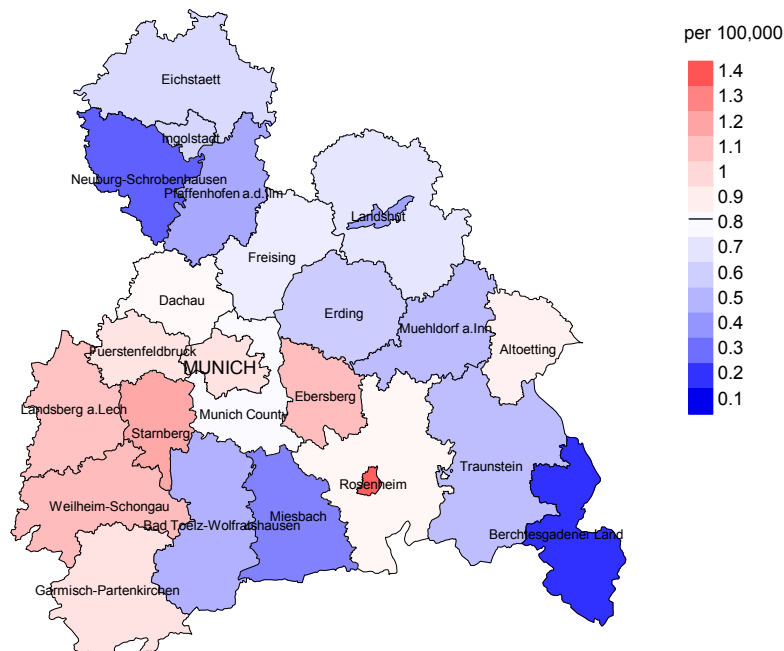
Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C03-C06 Oral cavity	6	0.1	55.9	20.5	121.8 #	33.4	
C09-C10 Oropharynx	5	0.1	62.0	20.1	144.8 #	27.9	
C12-C13 Hypopharynx	4	0.0	187.1	51.0	479.0 #	22.5	50.0
C15 Oesophagus	2	0.1	17.0	2.1	61.5 #	10.7	
C16 Stomach	1	0.5	1.8	0.0	10.3	2.6	
C18 Colon	2	1.6	1.3	0.2	4.6	2.4	
C19-C20 Rectum	3	0.7	4.5	0.9	13.2	13.2	
C22 Liver	1	0.2	4.8	0.1	26.8	4.5	
C23-C24 Bile	3	0.2	13.2	2.7	38.6 #	15.7	
C25 Pancreas	1	0.8	1.3	0.0	7.3	1.4	100.0
C32 Larynx	4	0.0	117.2	31.9	300.1 #	22.5	25.0
C33-C34 Lung	19	1.4	13.8	8.3	21.6 #	99.8	21.1
C43 Malign. melanoma	1	0.7	1.4	0.0	8.0	1.7	
C50 Breast	6	5.7	1.1	0.4	2.3	2.0	
C54 Corpus uteri	3	1.0	3.0	0.6	8.8	11.3	
C56 Ovary	1	0.7	1.4	0.0	7.8	1.6	
C65 Renal pelvis	1	0.1	18.9	0.5	105.5	5.4	
C67 Bladder	3	0.3	9.6	2.0	28.1 #	15.2	66.7
C70-C72 CNS cancer	1	0.2	4.3	0.1	23.8	4.3	
C73 Thyroid	2	0.3	6.1	0.7	21.9	9.5	
C76-C79 CUP	4	0.3	13.5	3.7	34.6 #	21.0	
C82-C85 NHL	4	0.7	6.0	1.6	15.4 #	18.9	
C90 Mult. myeloma	1	0.2	4.8	0.1	26.6	4.5	
Not observed	0	1.8	0.0	0.0	2.0	-10.4	
All further malignancies	78	17.7	4.4	3.5	5.5 #	341.5	12.8
Patients		443					
Median age at next malignancy (years)		70.3					
Person-years		1766					
Mean observation time (years)		4.0					
Median observation time (years)		2.3					

# The occurrence of further specified malignancy is statistically significant.

Average incidence (Germany 1987 standard population) 2007 - 2019: Males



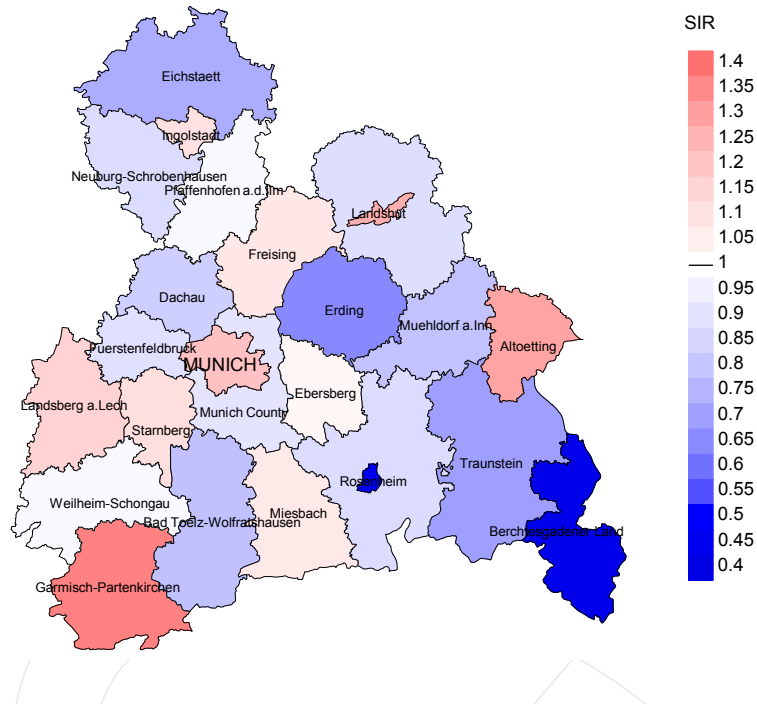
Average incidence (Germany 1987 standard population) 2007 - 2019: Females



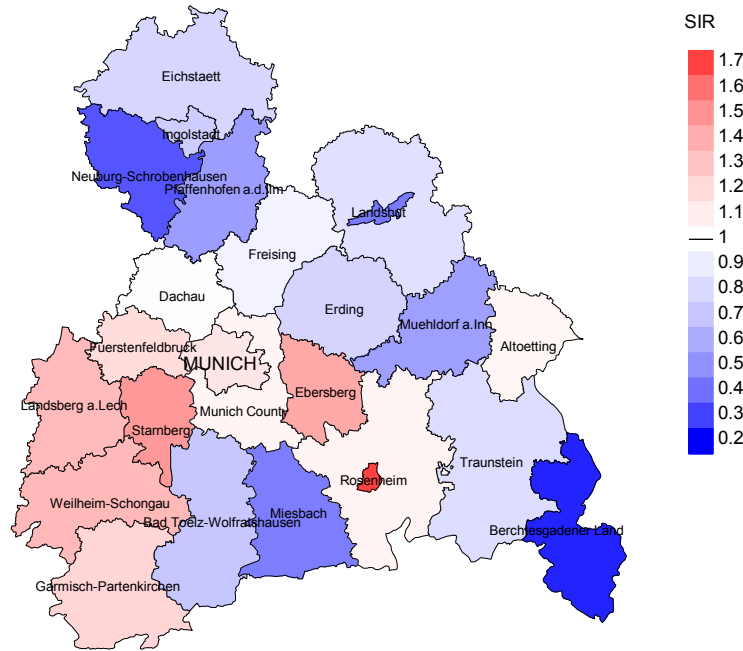
**Figure 8a.** Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 1.5/100,000 WS N=505, females 0.8/100,000 WS N=305).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,462 female residents (averaged) in the period from 2007 to 2019 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 1.1/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.5 and 2.3/100,000.

Standardized incidence ratio (SIR) 2007 - 2019: Males



Standardized incidence ratio (SIR) 2007 - 2019: Females



**Figure 8b.** Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2019. 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=505, females N=305).

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 2019 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 1.42. Though, the value of this parameter may vary with an underlying probability of 99% between 0.59 and 2.86, 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 4.92 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	34	79.1	94.1
1999	33	100.0		28	84.8	92.9
2000	32	100.0	6.3	24	75.0	100.0
2001	35	100.0		29	82.9	96.6
2002	64	98.4		44	68.8	97.7
2003	54	100.0	3.7	43	79.6	100.0
2004	48	100.0		36	75.0	94.4
2005	49	93.9		37	75.5	94.6
2006	58	94.8	3.4	43	74.1	97.7
2007	75	90.7	6.7	46	61.3	100.0
2008	80	97.5		51	63.8	96.1
2009	70	98.6	1.4	45	64.3	91.1
2010	80	100.0	2.5	49	61.3	91.8
2011	63	95.2	1.6	31	49.2	93.5
2012	81	98.8	1.2	33	40.7	93.9
2013	75	97.3		44	58.7	90.9
2014	73	97.3	1.4	47	64.4	93.6
2015	66	100.0		32	48.5	84.4
2016	60	100.0	1.7	26	43.3	92.3
2017	37	100.0		8	21.6	75.0
2018	33	100.0		6	18.2	66.7
2019	17	76.5		6	35.3	100.0
1998-2019	1226	97.6	1.7	742	60.5	94.2

Table 9b

Annual cohorts of incident cancers and deaths, proportion of death certificates and cases deceased within the same year of being diagnosed with cancer (incl. DCO)

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.92 m as of 2007, respectively)

Year of diagnosis/ death	Incident cases n	Deaths n	Prop. deaths with death certific. %	Prop. deaths in same year	
				n	%
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	66	53	100.0	1	1.5
2016	60	58	100.0	7	11.7
2017	37	51	94.1	1	2.7
2018	33	29	31.0	2	6.1
2019	17	24	66.7	3	17.6
1998–2019	1226	908	93.8	124	10.1

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 4.92 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	58	72.4	27.6	82.8
2017	51	72.5	27.5	83.3
2018	29	37.9	62.1	77.8
2019	24	25.0	75.0	68.8
1998–2019	908	72.7	27.3	86.5

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	31	67.8	64.7	75.4	65.0
2017	36	71.5	72.1	70.2	70.2
2018	18	69.8	67.6	74.6	67.6
2019	13	73.5	75.8	73.5	70.5
1998-2019	588	65.4	64.2	70.2	64.6

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	69.3	76.2	69.3
2019	11	75.9	70.0	76.5	75.9
1998-2019	320	73.3	69.8	80.9	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	0.69	0.6	0.54	0.9	0.59	1.1	0.70
2016	22	0.9	0.49	0.6	0.52	0.7	0.51	0.8	0.49
2017	25	1.0	1.09	0.5	0.93	0.7	0.98	0.9	1.09
2018	9	0.4	0.56	0.2	0.48	0.3	0.52	0.3	0.54
2019	2	0.1	0.25	0.0	0.20	0.1	0.23	0.1	0.25
1998-2019	431	1.0	0.56	0.6	0.52	0.8	0.54	0.9	0.57

Table 11b

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

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	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	0.33	0.1	0.22	0.2	0.26	0.2	0.30
2016	20	0.8	1.33	0.3	1.11	0.4	1.16	0.6	1.22
2017	12	0.5	0.86	0.2	0.58	0.3	0.63	0.4	0.77
2018	2	0.1	0.12	0.0	0.09	0.1	0.10	0.1	0.11
2019	4	0.2	0.44	0.1	0.39	0.1	0.39	0.1	0.39
1998-2019	229	0.5	0.50	0.2	0.41	0.3	0.44	0.4	0.47

Table 12

Age distribution of age at death (cancer-related) for period 2007-2019  
(incl. multiple malignancies)

Age at death Years	Cases			Males			Females		
	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4									
5-9									
10-14									
15-19									
20-24									
25-29	2	0.5	0.5	1	0.3	0.3	1	0.7	0.7
30-34	2	0.5	0.9	1	0.3	0.7	1	0.7	1.3
35-39	5	1.1	2.0	2	0.7	1.4	3	2.0	3.3
40-44	8	1.8	3.8	7	2.4	3.8	1	0.7	3.9
45-49	19	4.3	8.1	16	5.5	9.3	3	2.0	5.9
50-54	35	7.9	16.1	28	9.7	19.0	7	4.6	10.5
55-59	54	12.2	28.3	40	13.8	32.9	14	9.2	19.6
60-64	63	14.3	42.5	43	14.9	47.8	20	13.1	32.7
65-69	69	15.6	58.1	46	15.9	63.7	23	15.0	47.7
70-74	62	14.0	72.2	46	15.9	79.6	16	10.5	58.2
75-79	57	12.9	85.1	33	11.4	91.0	24	15.7	73.9
80-84	34	7.7	92.8	16	5.5	96.5	18	11.8	85.6
85+	32	7.2	100.0	10	3.5	100.0	22	14.4	100.0
All ages	442	100.0		289	100.0		153	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers  
for period 2007–2019  
(incl. multiple malignancies)

Age at death Years	Males n	Females n	Males Age- spec. mortal.	Females Age- spec. mortal.	Males MI-index	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	0.14	0.8	0.6
35-39	2	3	0.1	0.20	0.1	0.75	0.8	0.8
40-44	7	1	0.3	0.32	0.0	0.07	1.2	0.1
45-49	16	3	0.6	0.40	0.1	0.14	1.2	0.2
50-54	28	7	1.2	0.47	0.3	0.24	1.1	0.3
55-59	40	14	2.1	0.51	0.7	0.42	1.0	0.4
60-64	43	20	2.6	0.51	1.1	0.49	0.7	0.4
65-69	46	23	3.0	0.71	1.4	0.72	0.5	0.4
70-74	46	16	3.3	0.79	1.0	0.40	0.4	0.2
75-79	33	24	3.0	0.75	1.7	0.67	0.3	0.3
80-84	16	18	2.4	1.14	1.8	0.75	0.2	0.2
85+	10	22	2.3	0.77	2.3	1.16	0.1	0.2
All ages	289	153					0.5	0.3
Mortality								
Raw			1.0	0.57	0.5	0.50		
WS			0.5	0.52	0.2	0.41		
ES			0.7	0.54	0.3	0.44		
BRD-S			0.9	0.57	0.4	0.47		
PYLL-70								
per 100,000			8.0		3.0			
ES			6.8		2.5			
AYLL-70			11.5		10.7			

Table 14a

Further malignancies in deaths in period 1998-2019  
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	12	4.5			2	16.7	10	83.3
C09-C10 Oropharynx	43	16.0	17	39.5	5	11.6	21	48.8
C12-C13 Hypopharynx	21	7.8	8	38.1	2	9.5	11	52.4
C15 Oesophagus	24	9.0	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	3.7	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	8.6	15	65.2	2	8.7	6	26.1
C33-C34 Lung	47	17.5	4	8.5	6	12.8	37	78.7
C43 Malign. melanoma	5	1.9	2	40.0			3	60.0
C44 Skin others	13	4.9	5	38.5			8	61.5
C46,C49 Soft tissue	1	0.4					1	100.0
C61 Prostate	17	6.3	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	3.0	2	25.0	1	12.5	5	62.5
C73 Thyroid	3	1.1	1	33.3			2	66.7
C76-C79 CUP	8	3.0	3	37.5			5	62.5
C81 Hodgkin lymphoma	2	0.7	1	50.0			1	50.0
C82-C85 NHL	5	1.9	3	60.0			2	40.0
C91-C96 Leukaemia	2	0.7	1	50.0			1	50.0
All further malignancies	268	100.0	83	31.0	19	7.1	166	61.9

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

Table 14b

Further malignancies in deaths in period 1998-2019  
FEMALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C03-C06 Oral cavity	10	8.5					10	100.0
C09-C10 Oropharynx	15	12.7	5	33.3	1	6.7	9	60.0
C12-C13 Hypopharynx	3	2.5					3	100.0
C15 Oesophagus	6	5.1					6	100.0
C16 Stomach	1	0.8					1	100.0
C18 Colon	6	5.1	3	50.0			3	50.0
C19-C20 Rectum	1	0.8					1	100.0
C22 Liver	1	0.8					1	100.0
C23-C24 Bile	2	1.7					2	100.0
C25 Pancreas	2	1.7	1	50.0			1	50.0
C30-C31 Sinuses	1	0.8	1	100.0				
C32 Larynx	4	3.4	1	25.0			3	75.0
C33-C34 Lung	21	17.8	1	4.8	1	4.8	19	90.5
C43 Malign. melanoma	3	2.5	1	33.3			2	66.7
C44 Skin others	3	2.5					3	100.0
C50 Breast	17	14.4	10	58.8	1	5.9	6	35.3
C53 Cervix uteri	2	1.7	2	100.0				
C54 Corpus uteri	2	1.7	2	100.0				
C55,C57 Fem. genitals un	1	0.8	1	100.0				
C56 Ovary	3	2.5	2	66.7			1	33.3
C67 Bladder	3	2.5	1	33.3			2	66.7
C70-C72 CNS cancer	1	0.8					1	100.0
C76-C79 CUP	5	4.2	1	20.0			4	80.0
C81 Hodgkin lymphoma	1	0.8					1	100.0
C82-C85 NHL	2	1.7					2	100.0
C90 Mult. myeloma	1	0.8					1	100.0
C91-C96 Leukaemia	1	0.8	1	100.0				
All further malignancies	118	100.0	33	28.0	3	2.5	82	69.5

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 15

Age-specific mortality (cancer-related) and proportion of all cancers  
for period 2007-2019  
(**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	1.3	1.2
30-34	1	1	0.0	0.13	0.0	0.17	0.8	0.7
35-39	2	2	0.1	0.22	0.1	0.67	0.9	0.6
40-44	6	1	0.3	0.29	0.0	0.07	1.1	0.1
45-49	15	3	0.6	0.42	0.1	0.15	1.2	0.2
50-54	22	5	0.9	0.46	0.2	0.21	1.0	0.2
55-59	29	12	1.5	0.47	0.6	0.55	0.8	0.4
60-64	35	16	2.1	0.56	0.9	0.46	0.7	0.4
65-69	35	18	2.3	0.76	1.1	0.67	0.5	0.3
70-74	31	14	2.2	0.74	0.9	0.41	0.4	0.2
75-79	25	21	2.3	0.89	1.5	0.70	0.3	0.3
80-84	9	15	1.4	1.13	1.5	0.79	0.1	0.2
85+	9	19	2.1	0.82	2.0	1.27	0.2	0.2
All ages	220	128					0.4	0.3
Mortality								
Raw			0.7	0.57	0.4	0.50		
WS			0.4	0.52	0.2	0.40		
ES			0.6	0.54	0.3	0.43		
BRD-S			0.7	0.56	0.3	0.47		
PYLL-70								
per 100,000			6.6		2.5			
ES			5.6		2.1			
AYLL-70			12.0		10.9			

\* See corresponding tables with multiple malignancies.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers  
for period 2007-2019  
(**Single primaries only** \*)

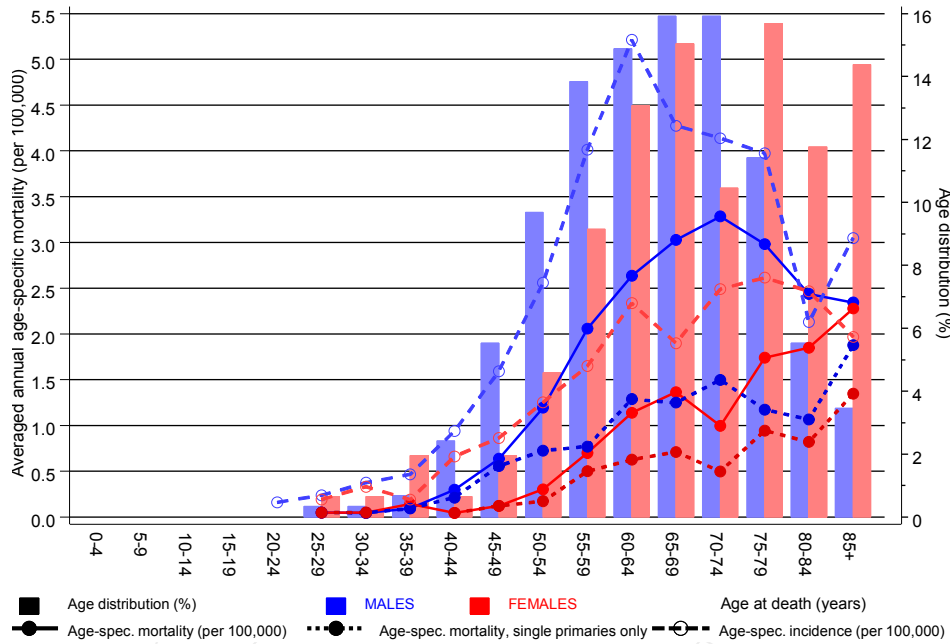
Age at death Years	Males n	Females n	Males Age- spec. mortal.	MI-index	Females Age- spec. mortal.	MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19								
20-24								
25-29	1	1	0.0	0.20	0.0	0.25	1.3	1.2
30-34	1	1	0.0	0.13	0.0	0.20	0.8	0.7
35-39	2		0.1	0.22			0.9	
40-44	5	1	0.2	0.25	0.0	0.07	1.0	0.1
45-49	14	3	0.6	0.47	0.1	0.17	1.2	0.2
50-54	17	4	0.7	0.40	0.2	0.20	0.8	0.2
55-59	15	10	0.8	0.29	0.5	0.50	0.4	0.3
60-64	21	11	1.3	0.40	0.6	0.35	0.4	0.3
65-69	19	12	1.2	0.56	0.7	0.55	0.3	0.2
70-74	21	8	1.5	0.62	0.5	0.27	0.3	0.1
75-79	13	13	1.2	0.54	0.9	0.57	0.2	0.2
80-84	7	8	1.1	0.88	0.8	0.50	0.1	0.1
85+	8	13	1.9	0.73	1.3	0.93	0.1	0.2
All ages	144	85					0.3	0.2
Mortality								
Raw			0.5	0.44	0.3	0.38		
WS			0.3	0.40	0.1	0.32		
ES			0.4	0.41	0.2	0.34		
BRD-S			0.4	0.43	0.2	0.36		
PYLL-70								
per 100,000			4.9		1.8			
ES			4.1		1.5			
AYLL-70			13.6		11.2			

\* See corresponding tables with multiple malignancies.



ICD-10 C02: Malignant neoplasm of other and unspecified parts of tongue

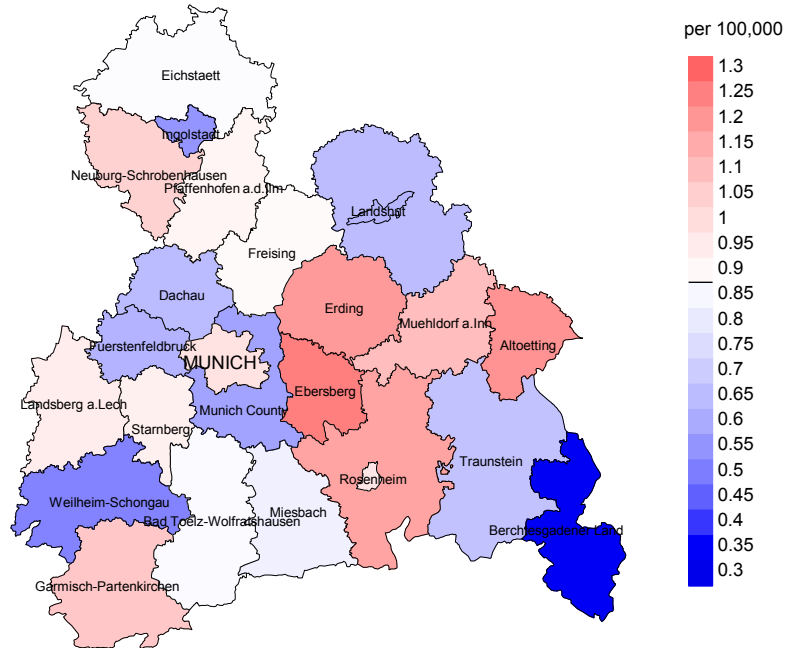
Age distribution and age-specific mortality 2007 - 2019 (Males: 289, Females: 153)



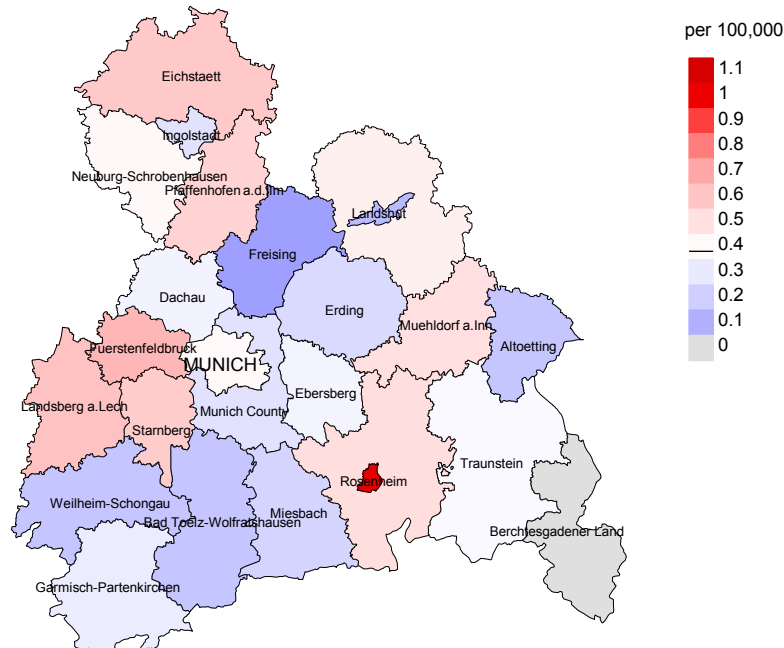
**Figure 17.** Distribution of age at death (bars; males: mean=60.9 yrs, median=60.0 yrs; females: mean=66.2 yrs, median=67.1 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed 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.

Average mortality (Germany 1987 standard population) 2007 - 2019: Males



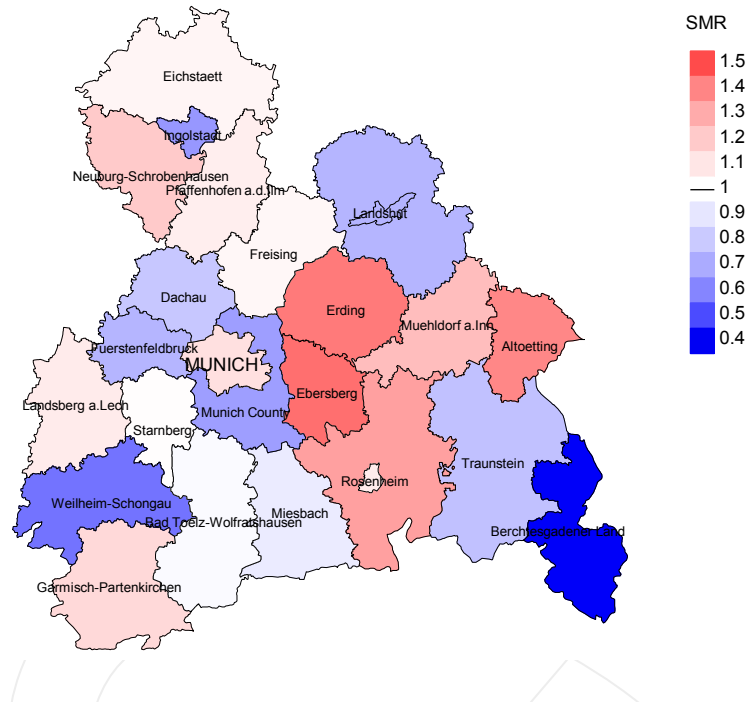
Average mortality (Germany 1987 standard population) 2007 - 2019: Females



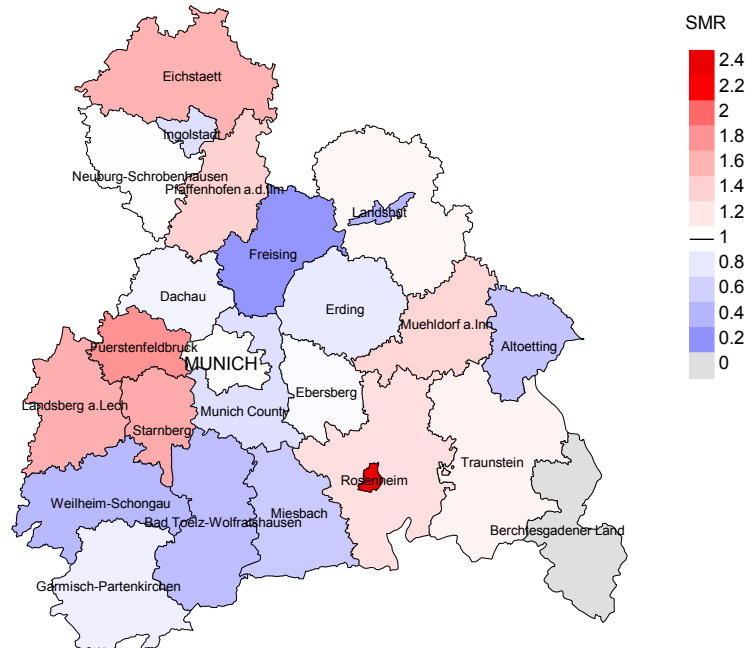
**Figure 18a.** Map of cancer mortality (german standard population) by county averaged for period 2007 to 2019. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.9/100,000 WS N=289, females 0.4/100,000 WS N=153).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,462 female residents (averaged) in the period from 2007 to 2019 a total of 4 women died from tongue excl. base of tongue. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.3/100,000 (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 - 2019: Males



Standardized mortality ratio (SMR) 2007 - 2019: Females



**Figure 18b.** Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2019. 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=289, females N=153).

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 2019 a total of 4 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 0.97. Though, the value of this parameter may vary with an underlying probability of 99% between 0.16 and 3.04, 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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