

Munich Cancer Registry



- ▶ Survival
- ▶ Selection Matrix
- ▶ Homepage
- ▶ *Deutsch*

ICD-10 C09, C10: Oropharynx cancer

Incidence and Mortality

Year of diagnosis	1998-2019
Patients	2,303
Diseases	2,327
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/bC0910E-ICD-10-C09-C10-Oropharynx-cancer-incidence-and-mortality.pdf>

Index of figures and tables

Fig./Tbl.		Page
1	Annual cases, DCO, mult. malignancies, follow-up / yr	4
2	Incidence by year of diagnosis	7
3	Age distribution parameters by year of diagnosis	8
4	Age distribution by 5-year age group and sex	11
5	Age-specific incidence, DCO rate, proportion malignancies	12
6	Age distribution and age-specific incidence (chart)	13
6a	Age-specific incidence internationally (chart)	14
7	Standardized incidence ratio of further malignancies	15
8a	Map of cancer incidence (BRD-S) by county (chart)	17
8b	Standardized incidence ratio (SIR) by county (chart)	18
9a	Pts incident cohorts and mortality / yr	19
9b	Incidence and mortality by year of diagnosis	20
9c	Cancer-related deaths, death certification available / yr	21
10	Medians of age at death / yr	22
11	Mortality by year of death	24
12	Distribution of age at death	26
13	Age-specific mortality	27
14	Further malignancies in deaths	28
15	Age-specific mortality (first primaries)	30
16	Age-specific mortality (single primaries)	31
17	Age distribution and age-specific mortality (chart)	32
18a	Map of cancer mortality (BRD-S) by county (chart)	33
18b	Standardized mortality ratio (SMR) by county (chart)	34

**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, January 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
C09.-	Malignant neoplasm of tonsil
C10.-	Malignant neoplasm of oropharynx

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	65	3	4.6	9.2	15.7	90.8	100.0
1999	67	1	1.5	9.1	15.4	82.1	100.0
2000	59	1	1.7	11.0	15.3	84.7	100.0
2001	68	3	4.4	11.2	15.0	79.4	94.1
2002	108	9	8.3	14.7	14.7	78.7	98.1 #
2003	126	4	3.2	14.2	13.9	79.4	97.6
2004	112	4	3.6	14.2	13.5	78.6	99.1
2005	125	6	4.8	14.7	13.3	72.0	96.0
2006	111	1	0.9	14.7	12.9	68.5	92.8
2007	127	12	9.4	13.8	12.8	65.4	96.9 #
2008	136	1	0.7	14.3	12.1	66.2	99.3
2009	145	2	1.4	15.5	11.2	67.6	97.2
2010	134	3	2.2	15.5	10.3	59.0	97.8
2011	139	6	4.3	16.2	9.2	61.2	98.6
2012	143	7	4.9	16.3	8.9	62.9	98.6
2013	136	4	2.9	16.3	8.1	54.4	97.8
2014	131	6	4.6	16.5	7.5	69.5	97.7
2015	133	3	2.3	16.8	7.9	45.9	98.5
2016	95	6	6.3	17.2	7.1	43.2	100.0
2017	81	6	7.4	17.8	8.7	39.5	100.0
2018	47	4	8.5	18.0	6.0	36.2	100.0
2019	39			18.2	2.6	23.1	76.9 ##
1998-2019	2327	92	4.0	18.2	15.7	64.8	97.6

2,327 cases diagnosed 1998-2019 are related to a total of 2,303 patients. Currently, in 774 (33.6 %) of these 2,303 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 578 / 142 / 54 (25.1 % / 6.2 % / 2.3 %) 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 retrieved from the respective headings.

How to interpret:

In 2017, a subgroup of 81 cases has been diagnosed, of which 17.8 % 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 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	52	80.0	2	3.8	9.6	15.3	94.2	100.0
1999	51	76.1	1	2.0	8.7	14.9	84.3	100.0
2000	43	72.9	1	2.3	10.3	14.8	83.7	100.0
2001	53	77.9	2	3.8	10.1	14.6	81.1	94.3
2002	87	80.6	9	10.3	15.0	14.1	85.1	100.0 #
2003	92	73.0	3	3.3	14.0	13.2	79.3	97.8
2004	94	83.9	3	3.2	14.2	12.9	78.7	98.9
2005	90	72.0	5	5.6	14.4	12.6	75.6	97.8
2006	78	70.3	1	1.3	14.5	12.4	70.5	92.3
2007	98	77.2	8	8.2	13.7	12.4	70.4	96.9 #
2008	93	68.4			14.2	11.5	62.4	98.9
2009	109	75.2	2	1.8	15.2	10.4	69.7	96.3
2010	104	77.6	3	2.9	15.4	9.6	60.6	98.1
2011	102	73.4	4	3.9	15.9	8.4	60.8	99.0
2012	109	76.2	4	3.7	15.8	7.8	63.3	99.1
2013	98	72.1	3	3.1	15.9	7.4	58.2	99.0
2014	108	82.4	5	4.6	16.0	5.9	71.3	98.1
2015	87	65.4	2	2.3	16.3	6.7	57.5	100.0
2016	75	78.9	4	5.3	16.7	5.9	44.0	100.0
2017	62	76.5	5	8.1	17.3	7.8	46.8	100.0
2018	33	70.2	2	6.1	17.3	5.3	33.3	100.0
2019	26	66.7			17.6	4.0	30.8	76.9 ##
1998-2019	1744	74.9	69	4.0	17.6	15.3	67.5	98.0

1,744 cases diagnosed 1998-2019 are related to a total of 1,727 patients. Currently, in 577 (33.4 %) of these 1,727 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 429 / 105 / 43 (24.8 % / 6.1 % / 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 retrieved from the respective headings.

How to interpret:

In 2017, a subgroup of 62 cases has been diagnosed, of which 17.3 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 7.8 % 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	13	20.0	1	7.7	7.7	16.9	76.9	100.0
1999	16	23.9			10.3	16.9	75.0	100.0
2000	16	27.1			13.3	16.9	87.5	100.0
2001	15	22.1	1	6.7	15.0	16.2	73.3	93.3
2002	21	19.4			13.6	16.3	52.4	90.5 #
2003	34	27.0	1	2.9	14.8	15.6	79.4	97.1
2004	18	16.1	1	5.6	14.3	15.2	77.8	100.0
2005	35	28.0	1	2.9	15.5	15.3	62.9	91.4
2006	33	29.7			15.4	14.4	63.6	93.9
2007	29	22.8	4	13.8	14.3	13.7	48.3	96.6 #
2008	43	31.6	1	2.3	14.7	13.7	74.4	100.0
2009	36	24.8			16.5	13.6	61.1	100.0
2010	30	22.4			15.9	12.4	53.3	96.7
2011	37	26.6	2	5.4	17.0	11.2	62.2	97.3
2012	34	23.8	3	8.8	17.8	11.7	61.8	97.1
2013	38	27.9	1	2.6	17.4	9.9	44.7	94.7
2014	23	17.6	1	4.3	18.0	12.0	60.9	95.7
2015	46	34.6	1	2.2	18.0	10.9	23.9	95.7
2016	20	21.1	2	10.0	18.8	10.8	40.0	100.0
2017	19	23.5	1	5.3	19.4	11.1	15.8	100.0
2018	14	29.8	2	14.3	20.0	7.7	42.9	100.0
2019	13	33.3			20.1	0.0	7.7	76.9 ##
1998-2019	583	25.1	23	3.9	20.1	16.9	56.6	96.4

583 cases diagnosed 1998-2019 are related to a total of 576 patients. Currently, in 197 (34.2 %) of these 576 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 149 / 37 / 11 (25.9 % / 6.4 % / 1.9 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2017, a subgroup of 19 cases has been diagnosed, of which 19.4 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 11.1 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 2

Incidence measures by year of diagnosis including DCO cases
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.92 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	52	13	4.7	1.1	3.3	0.7	4.3	1.0	4.4	1.0
1999	51	16	4.6	1.3	3.0	0.7	4.1	1.0	4.4	1.2
2000	43	16	3.8	1.3	2.4	0.8	3.4	1.2	3.8	1.2
2001	53	15	4.6	1.2	3.1	0.8	4.2	1.0	4.5	1.2
2002	87	21	4.7	1.1	3.1	0.7	4.2	0.9	4.4	1.1
2003	92	34	4.9	1.7	3.2	1.0	4.5	1.3	4.8	1.5
2004	94	18	5.0	0.9	3.3	0.5	4.4	0.7	4.8	0.8
2005	90	35	4.8	1.8	3.1	1.1	4.2	1.5	4.4	1.6
2006	78	33	4.1	1.6	2.6	1.1	3.6	1.5	3.9	1.6
2007	98	29	4.4	1.3	2.7	0.7	3.7	1.0	4.2	1.1
2008	93	43	4.2	1.9	2.6	1.0	3.6	1.4	4.0	1.6
2009	109	36	4.9	1.5	3.0	0.9	4.2	1.3	4.7	1.4
2010	104	30	4.6	1.3	2.8	0.8	3.8	1.1	4.2	1.2
2011	102	37	4.6	1.6	2.7	0.9	3.7	1.3	4.1	1.4
2012	109	34	4.8	1.4	2.9	0.8	4.0	1.1	4.4	1.2
2013	98	38	4.3	1.6	2.6	0.9	3.5	1.2	3.9	1.3
2014	108	23	4.6	1.0	2.7	0.5	3.7	0.7	4.2	0.8
2015	87	46	3.7	1.9	2.1	1.1	2.9	1.5	3.3	1.7
2016	75	20	3.1	0.8	1.8	0.4	2.5	0.6	2.8	0.6
2017	62	19	2.6	0.8	1.4	0.4	2.0	0.6	2.3	0.7
2018	33	14	1.4	0.6	0.7	0.2	1.0	0.4	1.2	0.4
2019	26	13	1.1	0.5	0.6	0.3	0.9	0.4	1.0	0.4
1998-2019	1744	583	4.0	1.3	2.4	0.7	3.3	1.0	3.7	1.1

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	65	55.3	11.4	0.9	83.1	41.9	50.6	55.3	60.4	67.3
1999	67	60.1	10.9	37.1	91.7	47.1	52.4	58.8	65.9	75.2
2000	59	61.1	9.2	45.0	89.6	50.0	54.1	59.4	66.4	74.9
2001	68	58.8	9.8	41.3	88.3	46.7	52.0	57.8	64.7	74.5
2002	108	59.1	9.4	37.3	96.8	47.6	53.1	59.2	62.8	72.1
2003	126	61.2	9.8	41.4	87.5	49.7	53.9	59.7	67.2	75.0
2004	112	60.1	10.3	38.3	85.5	47.6	53.3	59.0	66.2	75.7
2005	125	60.4	9.5	39.7	103	49.4	53.8	60.6	65.3	70.7
2006	111	59.6	10.5	41.2	90.3	47.2	51.8	58.8	65.5	72.5
2007	127	61.8	11.5	39.1	91.6	47.2	52.4	61.8	70.1	76.8
2008	136	63.4	10.0	45.2	91.8	49.3	57.5	62.3	69.2	77.0
2009	145	62.7	11.1	40.8	95.5	50.2	55.1	61.3	68.5	79.5
2010	134	62.2	9.2	37.1	85.1	49.5	55.2	62.7	68.5	73.1
2011	139	62.8	10.0	41.0	91.7	49.9	54.8	62.3	69.6	75.4
2012	143	62.0	9.4	42.3	91.1	49.4	54.9	61.5	68.0	75.8
2013	136	62.8	10.3	33.2	92.9	51.7	55.3	62.1	69.6	77.0
2014	131	63.0	10.2	40.2	89.6	50.3	55.8	62.0	70.5	76.2
2015	133	63.0	9.9	43.2	87.2	49.7	55.9	62.9	69.4	77.8
2016	95	66.2	9.4	43.2	91.5	54.2	59.6	66.2	72.5	77.2
2017	81	65.8	10.8	39.2	92.7	53.9	58.1	64.4	74.2	79.6
2018	47	66.7	10.3	43.6	85.3	53.5	59.6	64.5	76.6	81.0
2019	39	63.6	11.6	34.8	88.3	51.6	55.1	64.3	70.9	77.8
1998-2019	2327	61.9	10.3	0.9	103	49.3	54.7	61.3	68.4	75.9

Table 3a

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

Year of diagnosis	Cases n	Std.		Min.	Max.	Median				
		Mean	dev.			10%	25%	50%	75%	90%
1998	52	54.5	11.8	0.9	81.1	41.3	49.3	55.3	60.6	66.2
1999	51	58.2	9.4	37.1	80.9	47.1	51.4	57.8	64.0	68.2
2000	43	61.8	9.6	45.0	89.6	50.0	55.3	61.3	68.4	74.1
2001	53	57.9	8.6	41.8	81.2	46.7	52.0	57.6	63.6	67.1
2002	87	59.3	8.8	41.7	96.8	47.7	54.1	59.7	62.9	70.0
2003	92	59.9	9.1	41.4	87.5	49.3	53.6	59.2	65.2	73.2
2004	94	59.3	10.0	38.3	85.5	47.0	51.9	58.3	64.6	73.8
2005	90	60.0	8.0	39.7	80.0	50.3	54.7	60.6	64.8	69.8
2006	78	59.9	10.0	42.5	86.7	47.2	52.2	58.9	66.0	72.7
2007	98	61.7	11.0	39.1	91.6	47.2	52.5	61.9	70.1	75.7
2008	93	62.5	10.1	45.2	87.0	49.3	55.7	61.1	68.5	76.3
2009	109	62.8	10.0	40.8	90.7	50.2	56.7	62.2	68.5	75.7
2010	104	62.7	9.2	43.5	83.1	48.8	56.6	63.2	69.0	73.6
2011	102	62.8	10.1	44.9	89.2	49.8	54.1	62.3	69.9	74.6
2012	109	61.1	8.9	42.3	81.5	49.3	54.8	61.1	66.0	73.9
2013	98	63.0	9.8	33.2	92.9	52.4	56.9	62.3	69.1	74.8
2014	108	62.5	10.2	40.2	89.6	48.8	55.2	62.0	70.5	76.2
2015	87	63.4	10.2	43.2	84.4	50.0	55.3	63.1	70.2	79.0
2016	75	65.0	8.6	43.2	79.3	52.9	57.5	65.1	71.6	76.4
2017	62	66.4	11.4	39.2	92.7	52.6	58.1	65.0	74.9	80.6
2018	33	65.8	10.9	43.6	85.3	53.4	59.7	64.3	74.1	81.0
2019	26	62.4	12.4	34.8	87.0	48.8	54.1	63.4	69.4	77.8
1998-2019	1744	61.6	10.0	0.9	96.8	49.1	54.5	61.2	67.9	75.0

Table 3b

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	Median				
						10%	25%	50%	75%	90%
1998	13	58.6	9.2	50.7	83.1	50.8	52.7	55.8	58.8	69.2
1999	16	66.1	13.2	41.9	91.7	47.8	57.4	67.8	74.9	82.4
2000	16	59.0	8.0	47.0	77.0	51.1	53.7	58.4	60.8	74.9
2001	15	62.1	13.0	41.3	88.3	49.3	50.5	59.3	74.5	77.5
2002	21	58.3	11.8	37.3	80.8	47.6	48.7	55.9	61.1	78.4
2003	34	64.5	11.0	43.7	84.2	52.6	57.1	62.3	73.7	81.3
2004	18	64.3	11.2	44.7	82.5	50.9	55.9	64.3	75.7	80.5
2005	35	61.3	12.6	44.7	103	46.1	52.6	59.7	66.6	77.5
2006	33	58.9	11.7	41.2	90.3	46.3	50.3	57.0	62.6	72.5
2007	29	62.4	13.1	44.2	89.4	46.5	51.4	58.8	71.3	83.5
2008	43	65.6	9.6	45.9	91.8	54.4	60.7	65.7	69.7	80.7
2009	36	62.4	14.0	41.0	95.5	49.6	53.0	57.7	69.6	85.9
2010	30	60.5	9.2	37.1	85.1	49.5	54.1	60.7	67.1	69.6
2011	37	62.6	10.0	41.0	91.7	51.9	54.9	60.3	68.9	75.4
2012	34	65.1	10.5	44.0	91.1	53.1	56.6	64.7	72.3	76.4
2013	38	62.2	11.7	43.0	90.5	47.8	53.5	60.5	71.6	78.4
2014	23	65.5	10.0	52.4	87.4	55.6	58.6	64.0	70.2	83.7
2015	46	62.3	9.5	45.1	87.2	49.7	55.9	62.7	67.3	75.5
2016	20	70.9	10.7	54.2	91.5	59.4	63.9	69.4	74.2	88.7
2017	19	63.7	8.1	46.3	76.6	53.9	57.5	64.4	72.6	74.6
2018	14	68.9	8.6	57.7	81.4	58.6	59.4	70.6	76.6	79.4
2019	13	66.0	9.7	53.5	88.3	54.6	59.1	66.6	71.0	73.8
1998-2019	583	63.1	11.1	37.1	103	49.9	54.8	61.7	69.9	78.4

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									
25–29									
30–34	2	0.1	0.1	2	0.2	0.2			0.0
35–39	4	0.3	0.4	3	0.3	0.5	1	0.3	0.3
40–44	30	2.0	2.4	20	1.8	2.3	10	2.6	2.9
45–49	110	7.4	9.8	90	8.2	10.4	20	5.2	8.1
50–54	194	13.1	22.9	141	12.8	23.2	53	13.9	22.0
55–59	248	16.7	39.6	181	16.4	39.6	67	17.5	39.5
60–64	293	19.7	59.3	223	20.2	59.8	70	18.3	57.9
65–69	240	16.2	75.4	176	15.9	75.7	64	16.8	74.6
70–74	170	11.4	86.9	128	11.6	87.3	42	11.0	85.6
75–79	106	7.1	94.0	83	7.5	94.8	23	6.0	91.6
80–84	53	3.6	97.6	40	3.6	98.5	13	3.4	95.0
85+	36	2.4	100.0	17	1.5	100.0	19	5.0	100.0
All ages	1486	100.0		1104	100.0		382	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=42 %	Females DCO rate n=18 %	Males	Females
							Prop.all cancers n=143063 %	Prop.all cancers n=144724 %
0- 4								
5- 9								
10-14								
15-19								
20-24								
25-29								
30-34	2		0.1				0.2	
35-39	3	1	0.1	0.0			0.2	0.0
40-44	20	10	0.9	0.4	5.0	10.0	0.8	0.2
45-49	90	19	3.6	0.8	1.1		1.9	0.2
50-54	141	51	6.0	2.2	1.4	3.9	1.8	0.4
55-59	179	67	9.2	3.4	3.9	1.5	1.5	0.5
60-64	221	69	13.6	3.9	2.7	1.4	1.4	0.5
65-69	174	63	11.4	3.7	3.4		0.8	0.4
70-74	127	42	9.1	2.6	4.7	9.5	0.5	0.2
75-79	83	23	7.5	1.7	6.0	4.3	0.4	0.1
80-84	40	13	6.1	1.3	7.5	23.1	0.3	0.1
85+	17	19	4.0	2.0	29.4	26.3	0.2	0.1
All ages	1097	377			3.8	4.8	0.8	0.3
Incidence								
Raw			3.6	1.2				
WS			2.1	0.7				
ES			3.0	0.9				
BRD-S			3.3	1.0				

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 C09, C10: Malignant neoplasm of oropharynx and tonsil
 Age distribution and age-specific incidence 2007 - 2019 (Males: 1097, Females: 377)

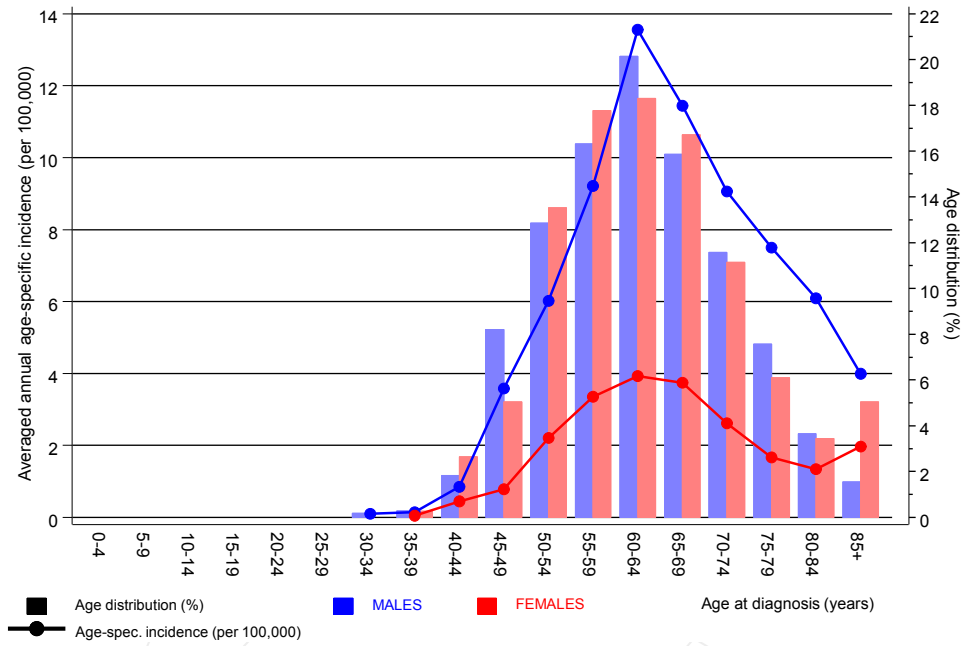


Figure 6. Age distribution (males: mean=63.0 yrs, median=62.3 yrs; females: mean=64.0 yrs, median=63.4 yrs) and age-specific incidence.

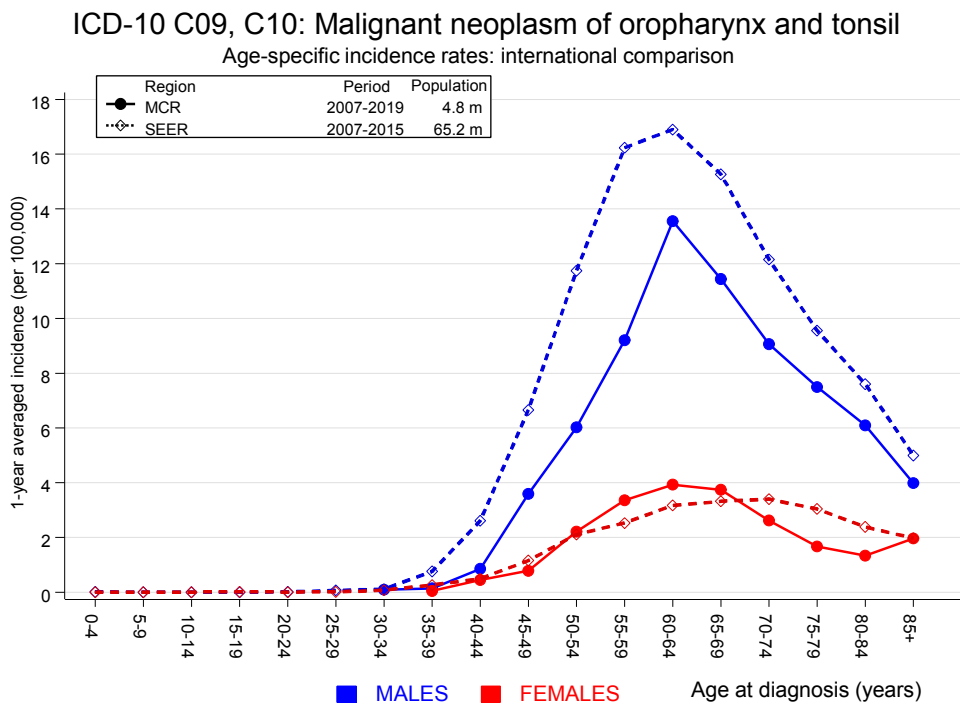


Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

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	41	0.8	49.3	35.4	66.9 #	71.0	4.9
C07–C08 Salivary gland	1	0.1	7.0	0.2	38.8	1.5	
C09–C10 Oropharynx	23	1.1	21.2	13.5	31.9 #	38.7	
C11 Nasopharynx	3	0.1	43.4	9.0	126.9 #	5.2	
C12–C13 Hypopharynx	21	0.6	36.5	22.6	55.9 #	36.1	9.5
C14 ENT cancer	1	0.0	56.9	1.4	316.8 #	1.7	100.0
C15 Oesophagus	39	1.6	23.8	16.9	32.6 #	66.1	20.5
C16 Stomach	7	2.5	2.8	1.1	5.8 #	8.0	28.6
C18 Colon	18	6.1	3.0	1.7	4.7 #	21.0	
C19–C20 Rectum	2	4.0	0.5	0.1	1.8	-3.5	
C21 Anus/canal	1	0.2	5.2	0.1	28.7	1.4	
C22 Liver	15	2.1	7.1	4.0	11.7 #	22.8	13.3
C23–C24 Bile	2	0.7	3.0	0.4	10.7	2.3	
C25 Pancreas	7	2.6	2.7	1.1	5.6 #	7.8	28.6
C30–C31 Sinuses	2	0.1	14.0	1.7	50.5 #	3.3	
C32 Larynx	30	0.9	34.7	23.4	49.5 #	51.5	43.3
C33–C34 Lung	83	8.7	9.5	7.6	11.8 #	131.4	9.6
C43 Malign. melanoma	7	3.4	2.1	0.8	4.3	6.5	
C50 Breast	1	0.2	5.1	0.1	28.6	1.4	
C61 Prostate	20	20.0	1.0	0.6	1.5	-0.0	
C62 Testis	1	0.3	3.7	0.1	20.5	1.3	
C64 Kidney	7	2.6	2.7	1.1	5.5 #	7.7	
C67 Bladder	4	2.7	1.5	0.4	3.7	2.2	
C68 Urinary org.	1	0.0	33.0	0.8	183.7	1.7	
C70–C72 CNS cancer	2	1.0	2.0	0.2	7.3	1.8	
C73 Thyroid	3	0.6	4.8	1.0	14.0	4.2	
C76–C79 CUP	4	1.1	3.5	1.0	9.1	5.1	
C81 Hodgkin lymphoma	1	0.2	5.4	0.1	30.1	1.4	
C82–C85 NHL	4	2.9	1.4	0.4	3.6	2.0	
C90 Mult. myeloma	1	0.9	1.2	0.0	6.5	0.2	
C91–C96 Leukaemia	1	0.9	1.1	0.0	6.0	0.1	100.0
Not observed	0	2.6	0.0	0.0	1.4	-4.5	
All further malignancies	353	71.6	4.9	4.4	5.5 #	497.5	11.6
Patients		1662					
Median age at next malignancy (years)		63.6					
Person-years		5657					
Mean observation time (years)		3.4					
Median observation time (years)		1.8					

The occurrence of further specified malignancy is statistically significant.

Table 7b

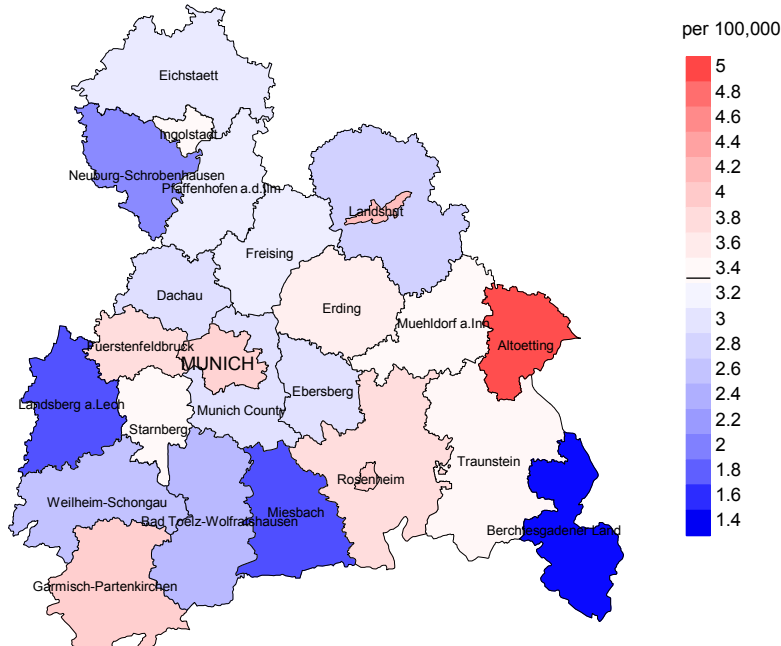
Standardized incidence ratio (SIR, with 95% confidence limits),
excess absolute risk (EAR) and DCO rate of further malignancies
for period 1998–2019

FEMALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C03–C06 Oral cavity	10	0.1	70.3	33.7	129.4 #	45.1	
C09–C10 Oropharynx	10	0.1	80.9	38.8	148.7 #	45.2	
C12–C13 Hypopharynx	7	0.0	219.4	88.2	452.1 #	31.9	
C14 ENT cancer	1	0.0	444.1	11.2	2474 #	4.6	100.0
C15 Oesophagus	12	0.2	79.7	41.2	139.3 #	54.2	8.3
C16 Stomach	3	0.6	5.2	1.1	15.1 #	11.1	
C18 Colon	7	1.7	4.2	1.7	8.6 #	24.3	
C19–C20 Rectum	1	0.8	1.3	0.0	7.3	1.1	
C22 Liver	1	0.2	4.3	0.1	23.9	3.5	
C32 Larynx	9	0.0	192.6	88.1	365.6 #	41.0	
C33–C34 Lung	22	1.8	12.5	7.9	19.0 #	92.6	13.6
C43 Malign. melanoma	1	0.9	1.2	0.0	6.5	0.7	
C50 Breast	11	7.2	1.5	0.8	2.7	17.3	
C51 Vulva	1	0.2	5.3	0.1	29.6	3.7	
C53 Cervix uteri	3	0.3	9.4	1.9	27.3 #	12.3	33.3
C54 Corpus uteri	3	1.2	2.4	0.5	7.1	8.1	
C56 Ovary	4	0.8	4.7	1.3	12.1 #	14.4	25.0
C64 Kidney	1	0.4	2.2	0.1	12.5	2.5	
C70–C72 CNS cancer	1	0.3	3.7	0.1	20.6	3.3	
C76–C79 CUP	1	0.3	3.2	0.1	17.7	3.1	
C82–C85 NHL	2	0.7	2.7	0.3	9.6	5.7	
C91–C96 Leukaemia	2	0.3	7.6	0.9	27.5	7.9	
Not observed	0	2.9	0.0	0.0	1.3	-13.4	
All further malignancies	113	21.2	5.3	4.4	6.4 #	420.2	6.2
Patients		553					
Median age at next malignancy (years)		62.9					
Person-years		2186					
Mean observation time (years)		4.0					
Median observation time (years)		2.6					

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

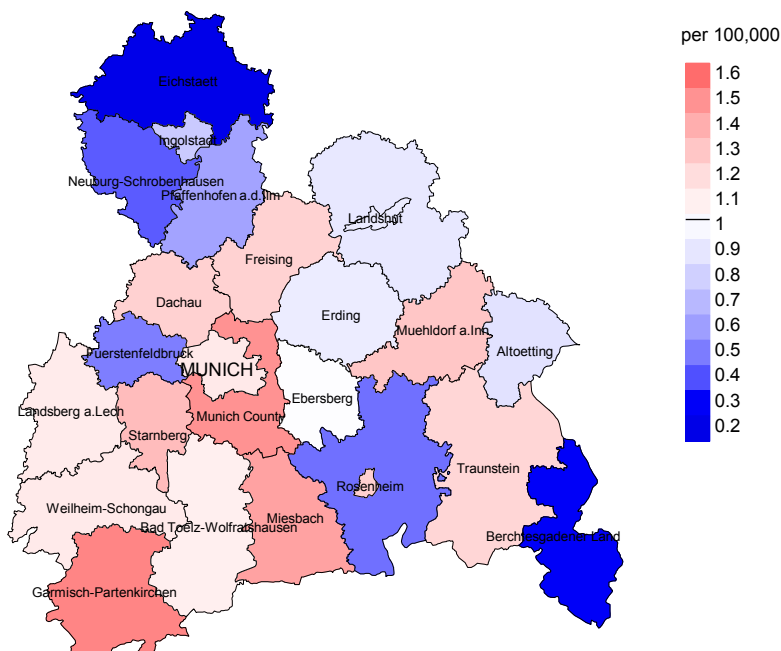
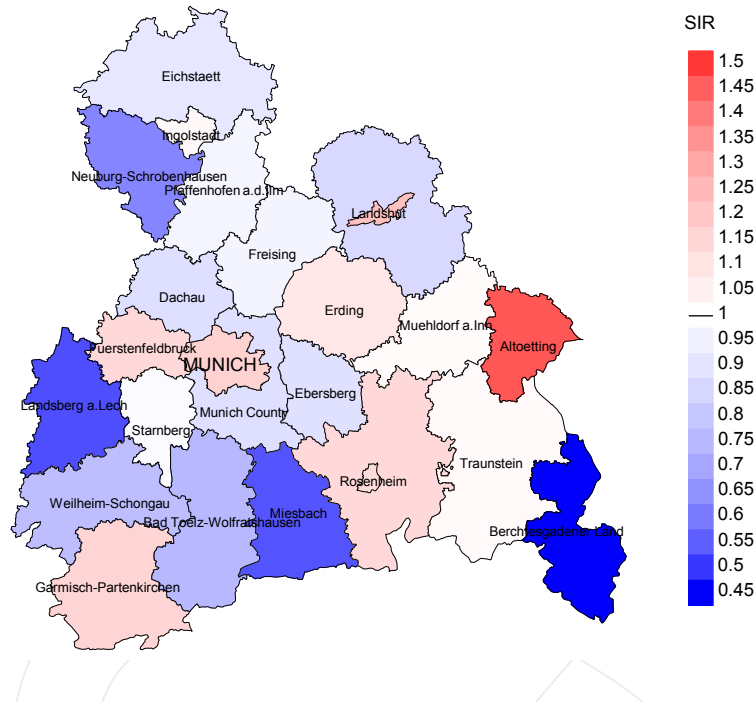


Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 3.3/100,000 WS N=1,097, females 1.0/100,000 WS N=377).

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 10 women were identified with newly diagnosed oropharynx cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 1.0/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.4 and 2.2/100,000.

Standardized incidence ratio (SIR) 2007 - 2019: Males



Standardized incidence ratio (SIR) 2007 - 2019: Females

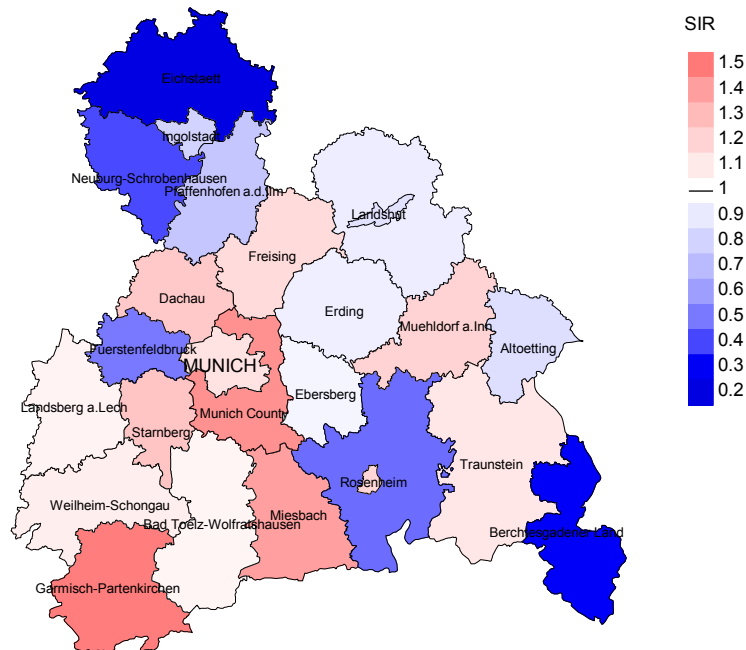


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=1,097, females N=377).

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 10 women were identified with newly diagnosed oropharynx cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.95. Though, the value of this parameter may vary with an underlying probability of 99% between 0.35 and 2.04, 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	65	100.0	4.6	59	90.8	96.6
1999	67	100.0	1.5	55	82.1	87.3
2000	59	100.0	1.7	50	84.7	98.0
2001	68	94.1	4.4	54	79.4	94.4
2002	108	98.1	8.3	85	78.7	98.8
2003	126	97.6	3.2	100	79.4	98.0
2004	112	99.1	3.6	88	78.6	95.5
2005	125	96.0	4.8	90	72.0	97.8
2006	111	92.8	0.9	76	68.5	96.1
2007	127	96.9	9.4	83	65.4	95.2
2008	136	99.3	0.7	90	66.2	93.3
2009	145	97.2	1.4	98	67.6	95.9
2010	134	97.8	2.2	79	59.0	93.7
2011	139	98.6	4.3	85	61.2	92.9
2012	143	98.6	4.9	90	62.9	91.1
2013	136	97.8	2.9	74	54.4	94.6
2014	131	97.7	4.6	91	69.5	94.5
2015	133	98.5	2.3	61	45.9	93.4
2016	95	100.0	6.3	41	43.2	75.6
2017	81	100.0	7.4	32	39.5	53.1
2018	47	100.0	8.5	17	36.2	64.7
2019	39	76.9		9	23.1	88.9
1998-2019	2327	97.6	4.0	1507	64.8	93.2

Table 9b

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

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.92 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	65	53	94.3	10	15.4
1999	67	56	82.1	14	20.9
2000	59	47	93.6	7	11.9
2001	68	47	97.9	14	20.6
2002	108	76	97.4	19	17.6
2003	126	82	96.3	26	20.6
2004	112	81	98.8	12	10.7
2005	125	88	96.6	22	17.6
2006	111	73	98.6	11	9.9
2007	127	94	96.8	22	17.3
2008	136	88	100.0	15	11.0
2009	145	87	98.9	22	15.2
2010	134	94	98.9	14	10.4
2011	139	88	98.9	25	18.0
2012	143	98	99.0	19	13.3
2013	136	123	96.7	20	14.7
2014	131	105	98.1	28	21.4
2015	133	115	100.0	23	17.3
2016	95	95	100.0	20	21.1
2017	81	72	93.1	14	17.3
2018	47	65	32.3	7	14.9
2019	39	61	59.0	6	15.4
1998–2019	2327	1788	93.6	370	15.9

Table 9c

Annual cohorts of deaths, proportion of cancer-related and non-cancer-related deaths, and cancer recorded on death certificates
(incl. DCO)

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

Year of death	Deaths n	Prop. cancer- related %	Prop. non-cancer- related %	Prop. cancer recorded on death certificate %
1998	53	79.2	20.8	92.0
1999	56	60.7	39.3	87.0
2000	47	83.0	17.0	93.2
2001	47	80.9	19.1	95.7
2002	76	75.0	25.0	83.8
2003	82	79.3	20.7	92.4
2004	81	86.4	13.6	93.8
2005	88	86.4	13.6	91.8
2006	73	80.8	19.2	87.5
2007	94	86.2	13.8	92.3
2008	88	75.0	25.0	83.0
2009	87	82.8	17.2	97.7
2010	94	78.7	21.3	90.3
2011	88	73.9	26.1	85.1
2012	98	80.6	19.4	89.7
2013	123	73.2	26.8	84.9
2014	105	75.2	24.8	91.3
2015	115	87.8	12.2	93.9
2016	95	78.9	21.1	87.4
2017	72	68.1	31.9	86.6
2018	65	38.5	61.5	85.7
2019	61	31.1	68.9	83.3
1998–2019	1788	75.8	24.2	89.6

Table 10a

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

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	41	60.0	57.7	75.3	57.7
1999	43	62.1	58.2	69.9	60.1
2000	34	61.2	61.2	62.3	60.7
2001	38	60.1	59.9	63.3	61.1
2002	62	61.1	59.7	63.9	59.7
2003	64	61.5	60.9	62.7	60.8
2004	63	60.8	60.8	62.5	61.3
2005	71	61.9	61.8	62.8	61.8
2006	57	64.8	64.5	65.8	64.3
2007	79	63.4	61.2	70.6	62.9
2008	62	69.0	69.1	68.8	69.0
2009	67	62.0	62.0	67.0	62.0
2010	73	65.6	63.8	72.2	64.0
2011	70	66.8	62.7	73.0	64.1
2012	68	67.6	67.6	65.6	67.5
2013	93	66.7	64.4	69.7	64.9
2014	84	69.4	68.2	74.8	68.8
2015	90	65.9	65.8	68.4	66.0
2016	71	67.5	66.4	70.7	66.8
2017	57	70.2	64.9	72.2	69.7
2018	53	75.3	72.6	75.5	78.1
2019	42	72.0	65.5	74.2	67.7
1998-2019	1382	65.0	63.4	70.7	63.8

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	12	72.2	71.5	77.9	72.2
1999	13	59.4	59.4	68.1	58.4
2000	13	56.2	56.2	64.2	57.8
2001	9	63.6	63.4	69.4	63.5
2002	14	60.2	60.2	65.6	61.7
2003	18	62.9	62.9	68.2	64.3
2004	18	75.0	73.8	76.3	73.8
2005	17	63.9	61.8	81.8	61.8
2006	16	71.5	70.3	75.1	71.5
2007	15	68.1	72.5	58.2	68.1
2008	26	66.9	66.9	71.9	66.9
2009	20	69.5	69.5	72.0	69.0
2010	21	65.0	64.7	71.1	64.7
2011	18	68.8	67.4	82.4	67.4
2012	30	71.6	71.5	77.0	71.5
2013	30	69.2	66.5	77.6	67.3
2014	21	72.2	71.5	85.0	71.8
2015	25	67.3	66.9	67.9	66.5
2016	24	70.5	70.5	65.0	70.5
2017	15	69.2	65.1	76.8	66.3
2018	12	73.3	66.0	73.9	75.6
2019	19	72.1	67.9	72.9	70.1
1998-2019	406	68.5	67.0	74.0	67.7

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

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

Table 11a

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

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	34	3.1	0.65	2.2	0.67	2.9	0.67	3.0	0.67
1999	29	2.6	0.57	1.7	0.55	2.3	0.56	2.6	0.60
2000	28	2.5	0.65	1.6	0.67	2.2	0.64	2.4	0.64
2001	31	2.7	0.58	1.7	0.56	2.4	0.56	2.7	0.59
2002	49	2.6	0.56	1.7	0.56	2.4	0.57	2.7	0.61
2003	53	2.8	0.58	1.8	0.56	2.5	0.57	2.8	0.59
2004	55	2.9	0.59	1.8	0.57	2.5	0.58	2.8	0.58
2005	62	3.3	0.70	2.0	0.66	2.8	0.67	3.1	0.71
2006	48	2.5	0.62	1.5	0.57	2.1	0.57	2.3	0.60
2007	67	3.0	0.68	1.8	0.68	2.6	0.70	2.9	0.70
2008	46	2.1	0.49	1.1	0.45	1.6	0.46	1.9	0.47
2009	57	2.6	0.53	1.5	0.51	2.2	0.52	2.5	0.53
2010	60	2.7	0.58	1.5	0.55	2.2	0.57	2.6	0.61
2011	52	2.3	0.52	1.3	0.50	1.9	0.51	2.2	0.54
2012	53	2.3	0.49	1.2	0.42	1.8	0.46	2.2	0.50
2013	68	3.0	0.70	1.6	0.62	2.3	0.66	2.6	0.68
2014	66	2.8	0.62	1.5	0.56	2.1	0.58	2.5	0.60
2015	79	3.3	0.92	1.8	0.87	2.6	0.89	3.0	0.91
2016	55	2.3	0.73	1.2	0.69	1.7	0.71	2.1	0.74
2017	37	1.5	0.60	0.8	0.55	1.1	0.56	1.3	0.59
2018	23	0.9	0.70	0.4	0.55	0.6	0.61	0.8	0.68
2019	13	0.5	0.50	0.3	0.43	0.4	0.45	0.5	0.49
1998-2019	1065	2.4	0.61	1.4	0.58	2.0	0.60	2.3	0.62

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	8	0.7	0.62	0.3	0.41	0.4	0.45	0.6	0.59
1999	5	0.4	0.31	0.2	0.34	0.3	0.33	0.4	0.33
2000	11	0.9	0.69	0.5	0.63	0.7	0.65	0.9	0.71
2001	7	0.6	0.47	0.3	0.43	0.4	0.41	0.4	0.39
2002	8	0.4	0.38	0.2	0.35	0.3	0.36	0.4	0.37
2003	12	0.6	0.35	0.3	0.36	0.5	0.36	0.5	0.36
2004	15	0.8	0.83	0.3	0.68	0.5	0.68	0.6	0.79
2005	14	0.7	0.40	0.4	0.39	0.6	0.40	0.6	0.40
2006	11	0.5	0.33	0.3	0.23	0.4	0.26	0.5	0.31
2007	14	0.6	0.50	0.3	0.37	0.4	0.39	0.5	0.45
2008	20	0.9	0.47	0.5	0.46	0.7	0.48	0.7	0.45
2009	16	0.7	0.46	0.3	0.38	0.5	0.39	0.6	0.42
2010	14	0.6	0.48	0.3	0.42	0.5	0.44	0.5	0.48
2011	13	0.6	0.36	0.3	0.29	0.4	0.30	0.4	0.33
2012	26	1.1	0.76	0.5	0.61	0.7	0.65	0.9	0.71
2013	22	0.9	0.58	0.5	0.51	0.7	0.52	0.8	0.57
2014	13	0.5	0.57	0.2	0.47	0.4	0.50	0.4	0.50
2015	22	0.9	0.49	0.4	0.41	0.7	0.44	0.7	0.45
2016	20	0.8	1.00	0.4	0.93	0.5	0.94	0.6	1.01
2017	12	0.5	0.63	0.3	0.62	0.4	0.59	0.4	0.64
2018	2	0.1	0.14	0.1	0.22	0.1	0.18	0.1	0.16
2019	6	0.2	0.46	0.1	0.42	0.2	0.43	0.2	0.43
1998-2019	291	0.6	0.50	0.3	0.44	0.5	0.45	0.5	0.48

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									
30-34									
35-39									
40-44	6	0.7	0.7	6	0.9	0.9			0.0
45-49	31	3.5	4.2	24	3.6	4.4	7	3.5	3.5
50-54	93	10.6	14.8	79	11.7	16.1	14	7.0	10.5
55-59	141	16.1	30.9	110	16.3	32.4	31	15.5	26.0
60-64	140	16.0	46.9	111	16.4	48.8	29	14.5	40.5
65-69	141	16.1	63.0	104	15.4	64.2	37	18.5	59.0
70-74	139	15.9	78.9	105	15.5	79.7	34	17.0	76.0
75-79	91	10.4	89.3	77	11.4	91.1	14	7.0	83.0
80-84	57	6.5	95.8	42	6.2	97.3	15	7.5	90.5
85+	37	4.2	100.0	18	2.7	100.0	19	9.5	100.0
All ages	876	100.0		676	100.0		200	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.	Males MI-index	Females Age- spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19								
20-24								
25-29								
30-34								
35-39								
40-44	6		0.3	0.30			1.0	
45-49	24	7	1.0	0.27	0.3	0.37	1.8	0.4
50-54	79	14	3.4	0.56	0.6	0.27	3.1	0.6
55-59	110	31	5.7	0.61	1.6	0.46	2.7	0.9
60-64	111	29	6.8	0.50	1.7	0.42	1.9	0.6
65-69	104	37	6.8	0.60	2.2	0.59	1.2	0.6
70-74	105	34	7.5	0.83	2.1	0.81	0.9	0.4
75-79	77	14	7.0	0.93	1.0	0.61	0.7	0.2
80-84	42	15	6.4	1.05	1.5	1.15	0.4	0.2
85+	18	19	4.2	1.06	2.0	1.00	0.2	0.2
All ages	676	200					1.1	0.4
Mortality								
Raw			2.2	0.62	0.6	0.53		
WS			1.2	0.57	0.3	0.46		
ES			1.7	0.59	0.4	0.48		
BRD-S			2.1	0.61	0.5	0.50		
PYLL-70								
per 100,000			17.2		4.2			
ES			14.6		3.4			
AYLL-70			10.5		9.3			

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 ←%
C03-C06 Oral cavity	69	11.8	23	33.3	11	15.9	35	50.7
C07-C08 Salivary gland	2	0.3					2	100.0
C09-C10 Oropharynx	31	5.3			8	25.8	23	74.2
C11 Nasopharynx	5	0.9	1	20.0	2	40.0	2	40.0
C12-C13 Hypopharynx	44	7.5	20	45.5	17	38.6	7	15.9
C14 ENT cancer	2	0.3			1	50.0	1	50.0
C15 Oesophagus	57	9.8	12	21.1	12	21.1	33	57.9
C16 Stomach	9	1.5	2	22.2	3	33.3	4	44.4
C18 Colon	16	2.7	5	31.3	1	6.3	10	62.5
C19-C20 Rectum	2	0.3	1	50.0			1	50.0
C21 Anus/canal	3	0.5	2	66.7			1	33.3
C22 Liver	17	2.9	1	5.9	2	11.8	14	82.4
C25 Pancreas	12	2.1					12	100.0
C30-C31 Sinuses	2	0.3					2	100.0
C32 Larynx	53	9.1	18	34.0	14	26.4	21	39.6
C33-C34 Lung	115	19.7	23	20.0	16	13.9	76	66.1
C37 Thymus	1	0.2	1	100.0				
C38,C45 Mesothelioma	1	0.2					1	100.0
C43 Malign. melanoma	6	1.0	2	33.3			4	66.7
C44 Skin others	32	5.5	5	15.6	9	28.1	18	56.3
C46,C49 Soft tissue	2	0.3	1	50.0			1	50.0
C50 Breast	2	0.3	1	50.0			1	50.0
C61 Prostate	36	6.2	20	55.6	1	2.8	15	41.7
C62 Testis	2	0.3	1	50.0			1	50.0
C64 Kidney	17	2.9	9	52.9	1	5.9	7	41.2
C65 Renal pelvis	2	0.3	1	50.0			1	50.0
C67 Bladder	9	1.5	4	44.4			5	55.6
C68 Urinary org.	1	0.2					1	100.0
C69 Eye melanoma	2	0.3	2	100.0				
C70-C72 CNS cancer	1	0.2					1	100.0
C73 Thyroid	5	0.9	3	60.0			2	40.0
C76-C79 CUP	11	1.9	5	45.5	2	18.2	4	36.4
C81 Hodgkin lymphoma	3	0.5	2	66.7			1	33.3
C82-C85 NHL	6	1.0	3	50.0			3	50.0
C91-C96 Leukaemia	5	0.9	3	60.0			2	40.0
All further malignancies	583	100.0	171	29.3	100	17.2	312	53.5

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

Table 14b

Further malignancies in deaths in period 1998-2019
FEMALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C03-C06 Oral cavity	22	12.5	10	45.5	4	18.2	8	36.4
C09-C10 Oropharynx	7	4.0			4	57.1	3	42.9
C11 Nasopharynx	2	1.1	1	50.0	1	50.0		
C12-C13 Hypopharynx	5	2.8	1	20.0	1	20.0	3	60.0
C14 ENT cancer	1	0.6					1	100.0
C15 Oesophagus	14	8.0	2	14.3	3	21.4	9	64.3
C16 Stomach	3	1.7			1	33.3	2	66.7
C18 Colon	9	5.1	5	55.6	1	11.1	3	33.3
C19-C20 Rectum	1	0.6	1	100.0				
C21 Anus/canal	3	1.7	2	66.7			1	33.3
C22 Liver	1	0.6					1	100.0
C25 Pancreas	1	0.6					1	100.0
C26 GI cancer	1	0.6					1	100.0
C30-C31 Sinuses	3	1.7					3	100.0
C32 Larynx	13	7.4	4	30.8	4	30.8	5	38.5
C33-C34 Lung	24	13.6	3	12.5			21	87.5
C43 Malign. melanoma	1	0.6	1	100.0				
C44 Skin others	5	2.8	2	40.0			3	60.0
C50 Breast	24	13.6	17	70.8	1	4.2	6	25.0
C52 Vagina	1	0.6					1	100.0
C53 Cervix uteri	7	4.0	4	57.1			3	42.9
C54 Corpus uteri	3	1.7	3	100.0				
C56 Ovary	1	0.6					1	100.0
C67 Bladder	2	1.1	1	50.0			1	50.0
C68 Urethra	1	0.6	1	100.0				
C70-C72 CNS cancer	1	0.6					1	100.0
C73 Thyroid	4	2.3	3	75.0	1	25.0		
C76-C79 CUP	9	5.1	5	55.6			4	44.4
C82-C85 NHL	4	2.3	3	75.0			1	25.0
C90 Mult. myeloma	1	0.6	1	100.0				
C91-C96 Leukaemia	2	1.1	1	50.0			1	50.0
All further malignancies	176	100.0	71	40.3	21	11.9	84	47.7

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		Females		Males		Females	
	n	n	Age- spec. mortal.	MI-index	Age- spec. mortal.	MI-index	Prop.all cancers %	Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19								
20-24								
25-29								
30-34								
35-39								
40-44	4		0.2	0.22			0.8	
45-49	16	7	0.6	0.21	0.3	0.44	1.3	0.5
50-54	64	12	2.7	0.52	0.5	0.27	2.9	0.6
55-59	84	23	4.3	0.60	1.2	0.47	2.3	0.8
60-64	78	22	4.8	0.47	1.3	0.42	1.6	0.6
65-69	74	28	4.9	0.56	1.7	0.57	1.1	0.5
70-74	81	22	5.8	0.95	1.4	0.85	1.0	0.3
75-79	50	7	4.5	1.00	0.5	0.47	0.6	0.1
80-84	29	9	4.4	1.16	0.9	1.13	0.4	0.1
85+	14	11	3.3	1.27	1.1	0.69	0.2	0.1
All ages	494	141					1.0	0.3
Mortality								
Raw			1.6	0.60	0.5	0.49		
WS			0.9	0.54	0.2	0.44		
ES			1.3	0.56	0.3	0.45		
BRD-S			1.5	0.59	0.4	0.47		
PYLL-70								
per 100,000			12.8		3.4			
ES			11.0		2.8			
AYLL-70			10.7		9.7			

* 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						
30-34						
35-39						
40-44	4		0.2	0.24	0.8	
45-49	13	6	0.5	0.18	1.1	0.4
50-54	50	12	2.1	0.46	2.3	0.6
55-59	64	19	3.3	0.51	1.8	0.7
60-64	62	15	3.8	0.43	1.3	0.4
65-69	59	21	3.9	0.52	0.9	0.4
70-74	48	13	3.4	0.68	0.6	0.2
75-79	35	5	3.2	0.80	0.4	0.1
80-84	20	6	3.0	0.91	0.3	0.1
85+	8	9	1.9	0.80	0.1	0.1
All ages	363	106			0.8	0.2
Mortality						
Raw			1.2	0.50	0.3	0.43
WS			0.7	0.46	0.2	0.40
ES			1.0	0.48	0.3	0.41
BRD-S			1.1	0.50	0.3	0.42
PYLL-70						
per 100,000			10.1		2.9	
ES			8.6		2.3	
AYLL-70			10.7		10.2	

* See corresponding tables with multiple malignancies.

ICD-10 C09, C10: Malignant neoplasm of oropharynx and tonsil
 Age distribution and age-specific mortality 2007 - 2019 (Males: 676, Females: 200)

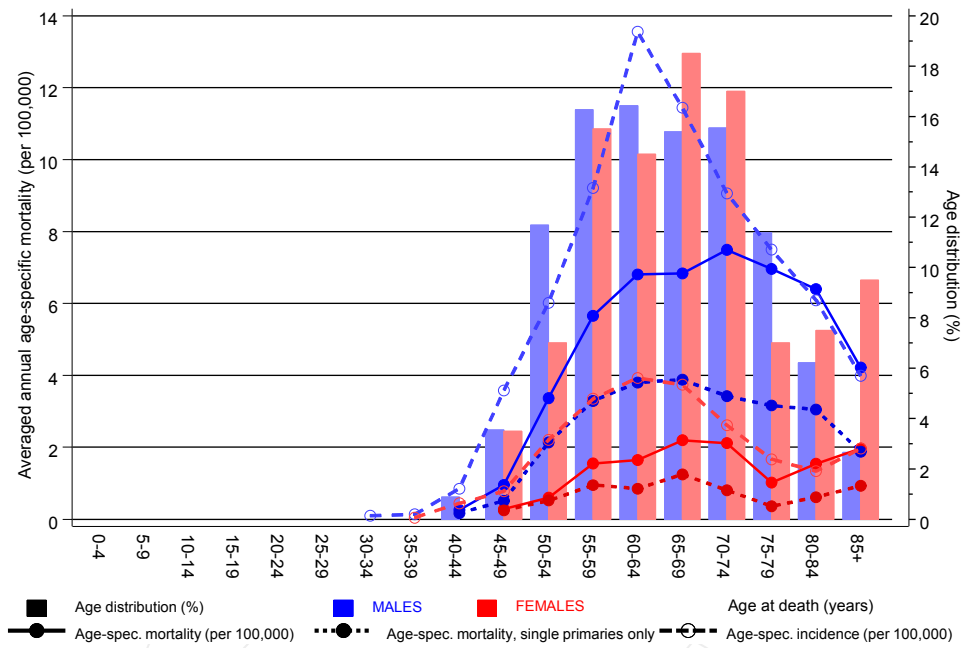
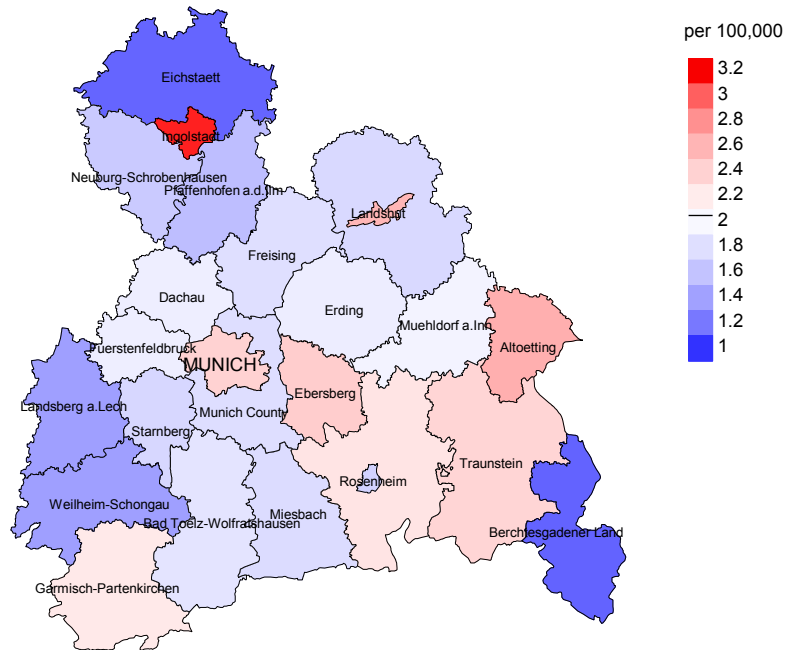


Figure 17. Distribution of age at death (bars; males: mean=62.1 yrs, median=61.4 yrs; females: mean=63.6 yrs, median=62.1 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

The difference between age at diagnosis (Table 3) and age at oropharynx cancer-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

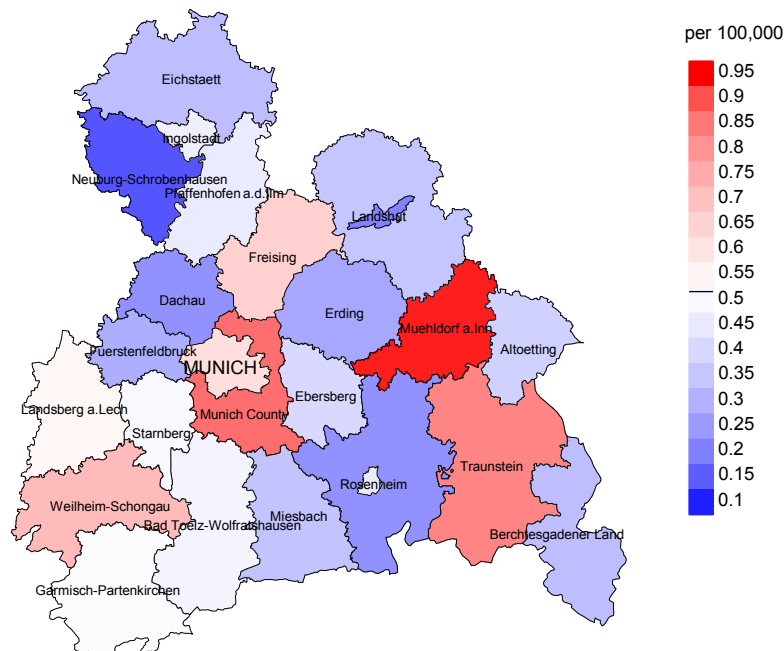
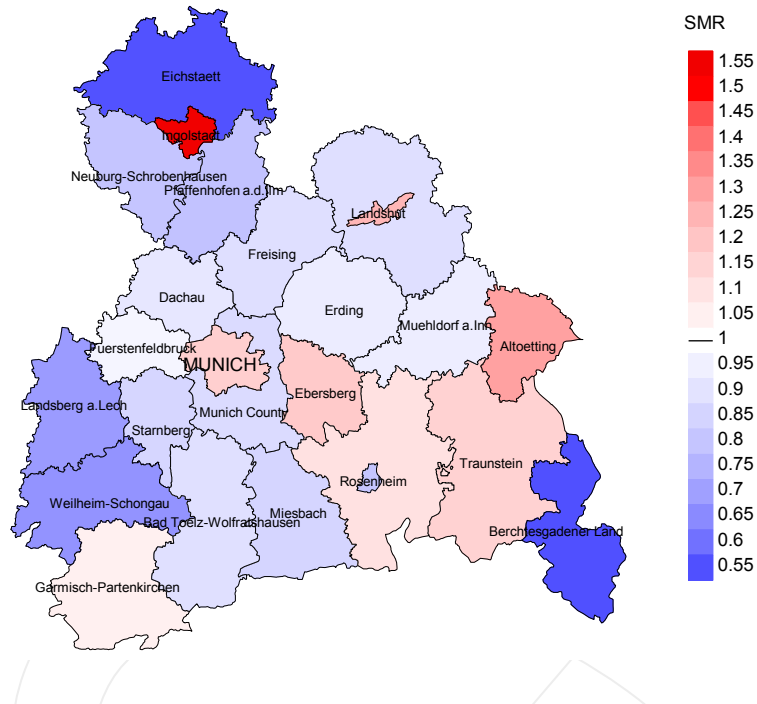


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2019. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 2.1/100,000 WS N=676, females 0.5/100,000 WS N=200).

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 oropharynx cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.4/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.1 and 1.3/100,000.

Standardized mortality ratio (SMR) 2007 - 2019: Males



Standardized mortality ratio (SMR) 2007 - 2019: Females

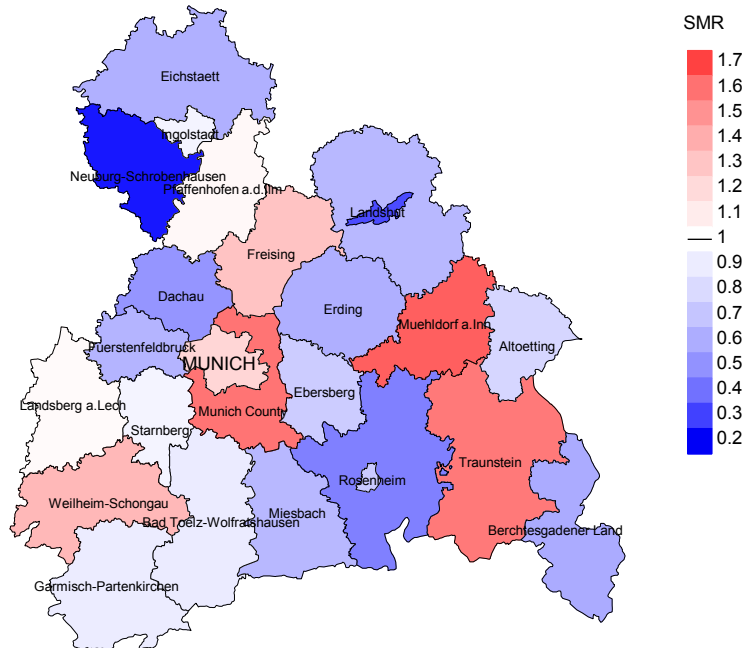


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2019. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=676, females N=200).

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 oropharynx cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.73. Though, the value of this parameter may vary with an underlying probability of 99% between 0.12 and 2.30, 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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