Munich Cancer Registry

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- *Deutsch*

ICD-10 C03: Gum cancer

Incidence and Mortality

Year of diagnosis	1998-2016
Patients	410
Diseases	411
Creation date	08/21/2018
Export date	08/09/2018
Population	4.81 m

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

https://www.tumorregister-muenchen.de/en/facts/base/bC03__E-ICD-10-C03-Gum-cancer-incidence-and-mortality.pdf

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

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

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

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

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

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

Munich Cancer Registry, August 2018

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

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

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

Some remarks regarding this cancer type

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

ICD-10 codes (ICD-10 2015) used for specifying cancer site

Code	Description
C03.-	Malignant neoplasm of gum
C03.0	Upper gum
C03.1	Lower gum
C03.9	Gum, unspecified

INCIDENCE

Table 1

Cases with invasive cancer by year of diagnosis, proportions of further malignancies, deaths, and active follow-up (ALL PATIENTS)

Year of diagnosis	All cases n	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	12	16.7	15.3	66.7	100.0
1999	11	26.1	14.9	54.5	81.8
2000	12	20.0	15.1	66.7	91.7
2001	11	17.4	15.1	81.8	100.0
2002	21	14.9	14.7	61.9	100.0 #
2003	26	14.0	14.7	61.5	96.2
2004	32	18.4	13.7	68.8	90.6
2005	25	18.0	13.7	64.0	96.0
2006	35	18.4	12.7	77.1	97.1
2007	28	18.8	10.6	60.7	75.0 #
2008	21	18.8	11.0	57.1	81.0
2009	29	19.0	12.3	75.9	86.2
2010	23	18.5	11.8	56.5	73.9
2011	23	17.8	10.7	43.5	69.6
2012	31	17.9	11.2	58.1	80.6
2013	32	18.5	11.6	37.5	75.0
2014	24	18.2	7.9	29.2	54.2
2015	8	17.8	0.0	50.0	100.0
2016	7	18.5	0.0	57.1	85.7 ##
1998-2016	411	18.5	15.3	59.4	84.7

411 cases diagnosed 1998-2016 are related to a total of 410 patients. Currently, in 131 (32.0 %) of these 410 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 95 / 31 / 5 (23.2 % / 7.6 % / 1.2 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:
In 2014, a subgroup of 24 cases has been diagnosed, of which 18.2 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 7.9 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1a

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

Year of diagnosis	Males n	Males %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %	
1998	7	58.3	14.3	16.5	71.4	100.0	
1999	7	63.6	35.7	16.2	71.4	85.7	
2000	7	58.3	28.6	16.7	71.4	85.7	
2001	6	54.5	22.2	16.7	66.7	100.0	
2002	14	66.7	14.6	16.3	57.1	100.0	#
2003	18	69.2	13.6	15.9	66.7	100.0	
2004	21	65.6	18.8	15.3	71.4	90.5	
2005	11	44.0	19.8	15.8	63.6	90.9	
2006	19	54.3	20.0	15.6	84.2	94.7	
2007	14	50.0	22.6	14.1	64.3	85.7	#
2008	8	38.1	22.0	14.0	50.0	75.0	
2009	19	65.5	21.9	15.1	94.7	100.0	
2010	15	65.2	21.1	14.6	53.3	80.0	
2011	11	47.8	19.8	13.5	54.5	72.7	
2012	18	58.1	19.5	14.3	66.7	83.3	
2013	22	68.8	20.7	14.9	36.4	68.2	
2014	15	62.5	20.7	11.5	40.0	60.0	
2015	5	62.5	20.3	0.0	40.0	100.0	
2016	6	85.7	21.4	0.0	50.0	83.3	##
1998-2016	243	59.1	21.4	16.5	63.0	86.4	

243 cases diagnosed 1998-2016 are related to a total of 243 patients. Currently, in 86 (35.4 %) of these 243 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 60 / 22 / 4 (24.7 % / 9.1 % / 1.6 %) 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 retreived from the respective headings.

How to interpret:
In 2014, a subgroup of 15 cases has been diagnosed, of which 20.7 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 11.5 % 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 further malignancies, deaths, and active follow-up (FEMALES)

Year of diagnosis	Females n	Females %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	5	41.7	20.0	13.4	60.0	100.0
1999	4	36.4	11.1	13.2	25.0	75.0
2000	5	41.7	7.1	12.9	60.0	100.0
2001	5	45.5	10.5	12.7	100.0	100.0
2002	7	33.3	15.4	12.4	71.4	100.0 #
2003	8	30.8	14.7	13.0	50.0	87.5
2004	11	34.4	17.8	11.5	63.6	90.9
2005	14	56.0	15.3	10.9	64.3	100.0
2006	16	45.7	16.0	8.6	68.8	100.0
2007	14	50.0	13.5	5.6	57.1	64.3 #
2008	13	61.9	14.7	6.5	61.5	84.6
2009	10	34.5	15.2	7.7	40.0	60.0
2010	8	34.8	15.0	7.3	62.5	62.5
2011	12	52.2	15.2	6.4	33.3	66.7
2012	13	41.9	15.9	5.7	46.2	76.9
2013	10	31.3	15.5	4.5	40.0	90.0
2014	9	37.5	14.6	0.0	11.1	44.4
2015	3	37.5	14.4	0.0	66.7	100.0
2016	1	14.3	14.3	0.0	100.0	100.0 ##
1998-2016	168	40.9	14.3	13.4	54.2	82.1

168 cases diagnosed 1998-2016 are related to a total of 167 patients. Currently, in 45 (26.9 %) of these 167 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 35 / 9 / 1 (21.0 % / 5.4 % / 0.6 %) 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 retreived from the respective headings.

How to interpret:
In 2014, a subgroup of 9 cases has been diagnosed, of which 14.6 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 0.0 % 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
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.81 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	7	5	0.6	0.4	0.4	0.2	0.6	0.3	0.6	0.4
1999	7	4	0.6	0.3	0.4	0.2	0.5	0.3	0.6	0.3
2000	7	5	0.6	0.4	0.4	0.2	0.6	0.4	0.7	0.4
2001	6	5	0.5	0.4	0.3	0.1	0.4	0.2	0.5	0.3
2002	14	7	0.8	0.4	0.5	0.2	0.6	0.3	0.7	0.3
2003	18	8	1.0	0.4	0.6	0.2	0.9	0.3	1.0	0.4
2004	21	11	1.1	0.6	0.7	0.2	0.9	0.3	1.1	0.4
2005	11	14	0.6	0.7	0.4	0.3	0.5	0.5	0.5	0.6
2006	19	16	1.0	0.8	0.6	0.4	0.8	0.6	1.1	0.7
2007	14	14	0.6	0.6	0.4	0.3	0.6	0.4	0.6	0.5
2008	8	13	0.4	0.6	0.2	0.3	0.3	0.4	0.4	0.5
2009	19	10	0.9	0.4	0.4	0.2	0.6	0.3	0.8	0.3
2010	15	8	0.7	0.3	0.3	0.1	0.5	0.2	0.6	0.2
2011	11	12	0.5	0.5	0.3	0.3	0.4	0.4	0.5	0.5
2012	18	13	0.8	0.6	0.4	0.2	0.6	0.3	0.8	0.4
2013	22	10	1.0	0.4	0.6	0.2	0.8	0.2	0.8	0.3
2014	15	9	0.6	0.4	0.4	0.2	0.5	0.3	0.6	0.3
2015	5	3	0.2	0.1	0.1	0.0	0.1	0.1	0.2	0.1
2016	6	1	0.2	0.0	0.1	0.0	0.2	0.0	0.2	0.0
1998-2016	243	168	0.7	0.4	0.4	0.2	0.5	0.3	0.6	0.4

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

Table 3

Age distribution parameters by year of diagnosis (ALL PATIENTS)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	12	59.9	10.7	46.0	76.3	50.5	50.7	57.8	67.9	76.3
1999	11	60.1	12.6	41.4	86.5	47.1	52.7	59.5	68.0	73.0
2000	12	61.2	10.4	47.5	77.0	49.3	51.2	60.9	69.6	75.1
2001	11	71.5	13.8	58.8	96.4	59.7	59.8	63.6	87.8	88.1
2002	21	62.8	10.3	44.8	85.8	50.0	58.5	62.0	66.0	77.3
2003	26	63.1	16.0	10.7	83.0	49.4	53.3	62.4	77.9	81.4
2004	32	66.6	14.0	34.2	85.9	44.9	59.2	67.0	77.9	82.5
2005	25	62.8	16.2	22.8	89.6	40.9	54.7	59.5	77.4	83.7
2006	35	66.9	14.8	23.9	87.7	48.2	57.0	66.4	78.7	86.0
2007	28	65.4	12.5	37.1	93.3	50.1	57.8	63.4	72.5	84.6
2008	21	67.9	10.5	53.4	97.6	55.7	61.7	67.8	72.1	79.3
2009	29	69.2	14.5	38.7	98.4	46.5	56.6	73.2	79.1	85.1
2010	23	70.7	12.6	48.7	91.8	52.0	58.2	72.1	81.5	85.2
2011	23	64.1	14.8	27.0	86.4	47.7	55.6	66.9	76.7	78.0
2012	31	68.5	10.8	49.2	89.1	55.5	60.0	69.1	76.0	82.4
2013	32	66.8	11.9	47.2	92.8	49.5	58.9	65.8	71.9	86.5
2014	24	62.0	10.8	45.9	89.0	47.5	52.6	62.9	68.9	74.1
2015	8	73.7	10.4	55.3	86.3	55.3	65.9	76.7	81.3	86.3
2016	7	65.3	18.1	45.9	89.1	45.9	46.7	58.8	85.6	89.1
1998-2016	411	65.8	13.3	10.7	98.4	49.5	56.6	65.6	76.1	83.2

Table 3a

Age distribution parameters by year of diagnosis (MALES)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	7	57.1	9.9	46.0	76.3	46.0	50.6	57.6	60.1	76.3
1999	7	61.6	11.7	52.7	86.5	52.7	53.1	59.5	63.8	86.5
2000	7	61.7	10.6	47.5	75.1	47.5	49.3	62.2	72.7	75.1
2001	6	63.9	7.1	58.8	78.0	58.8	59.7	61.8	63.6	78.0
2002	14	62.3	11.2	44.8	85.8	49.3	56.6	62.2	64.5	80.8
2003	18	62.8	12.3	45.4	83.0	49.4	53.3	59.2	70.4	81.4
2004	21	61.8	13.8	34.2	81.9	44.1	53.3	62.0	74.4	77.5
2005	11	56.5	11.0	39.1	71.7	40.9	47.5	57.8	65.1	71.3
2006	19	64.6	16.2	23.9	87.7	46.6	51.9	65.7	78.2	86.3
2007	14	62.0	9.4	48.9	80.3	51.6	56.8	58.2	68.6	75.4
2008	8	67.8	9.9	53.5	82.8	53.5	60.4	67.2	75.4	82.8
2009	19	69.5	11.2	46.5	88.1	53.3	59.6	73.2	76.6	83.8
2010	15	67.2	11.4	48.7	91.5	52.0	57.8	68.9	75.3	76.1
2011	11	62.4	15.9	27.0	86.4	49.1	51.7	64.3	70.1	78.0
2012	18	65.6	10.4	49.2	84.4	51.2	56.0	65.3	74.7	82.4
2013	22	63.1	7.6	48.3	73.4	49.5	58.6	65.5	68.3	71.6
2014	15	62.2	9.7	45.9	74.4	47.1	53.7	62.5	70.5	74.1
2015	5	72.5	11.7	55.3	86.3	55.3	67.6	76.1	77.3	86.3
2016	6	61.3	16.1	45.9	85.6	45.9	46.7	56.8	76.0	85.6
1998-2016	243	63.6	11.8	23.9	91.5	49.2	55.3	62.8	72.7	78.7

Table 3b

Age distribution parameters by year of diagnosis (FEMALES)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	5	63.9	11.6	50.5	76.3	50.5	57.5	59.2	75.8	76.3
1999	4	57.4	15.5	41.4	73.0	41.4	44.2	57.6	70.5	73.0
2000	5	60.5	11.2	50.9	77.0	50.9	51.4	56.7	66.6	77.0
2001	5	80.7	14.8	59.8	96.4	59.8	71.3	87.8	88.1	96.4
2002	7	63.7	9.0	51.2	77.3	51.2	58.5	62.0	72.5	77.3
2003	8	63.9	23.5	10.7	78.7	10.7	57.1	75.5	78.2	78.7
2004	11	75.7	9.3	61.5	85.9	62.3	63.0	78.2	84.3	84.9
2005	14	67.7	18.3	22.8	89.6	50.8	56.1	73.2	81.0	84.2
2006	16	69.7	12.9	48.2	87.0	51.2	57.7	74.5	79.4	86.0
2007	14	68.9	14.5	37.1	93.3	50.1	62.9	70.0	73.6	88.2
2008	13	67.9	11.2	53.4	97.6	55.7	62.2	67.8	72.1	75.8
2009	10	68.4	20.0	38.7	98.4	39.8	54.8	73.6	81.4	91.8
2010	8	77.3	12.8	50.7	91.8	50.7	71.5	82.0	84.5	91.8
2011	12	65.6	14.4	34.5	84.1	47.7	57.0	68.2	76.9	77.2
2012	13	72.5	10.5	55.7	89.1	59.4	64.9	71.2	80.9	87.4
2013	10	75.2	15.6	47.2	92.8	52.9	59.2	82.9	86.7	89.9
2014	9	61.8	13.0	47.5	89.0	47.5	51.4	63.3	66.4	89.0
2015	3	75.6	9.9	64.1	82.0	64.1	64.1	80.6	82.0	82.0
2016	1	89.1		89.1	89.1	89.1	89.1	89.1	89.1	89.1
1998-2016	168	69.1	14.7	10.7	98.4	50.9	58.9	70.4	80.7	86.7

Table 4

Age distribution by 5-year age group and sex for period 2007-2016

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4									
5-9									
10-14									
15-19									
20-24									
25-29	1	0.4	0.4	1	0.8	0.8			0.0
30-34	1	0.4	0.9			0.8	1	1.1	1.1
35-39	2	0.9	1.8			0.8	2	2.2	3.2
40-44	1	0.4	2.2			0.8	1	1.1	4.3
45-49	15	6.6	8.8	12	9.0	9.8	3	3.2	7.5
50-54	19	8.4	17.3	12	9.0	18.8	7	7.5	15.1
55-59	32	14.2	31.4	23	17.3	36.1	9	9.7	24.7
60-64	24	10.6	42.0	15	11.3	47.4	9	9.7	34.4
65-69	38	16.8	58.8	23	17.3	64.7	15	16.1	50.5
70-74	34	15.0	73.9	22	16.5	81.2	12	12.9	63.4
75-79	20	8.8	82.7	14	10.5	91.7	6	6.5	69.9
80-84	19	8.4	91.2	6	4.5	96.2	13	14.0	83.9
85+	20	8.8	100.0	5	3.8	100.0	15	16.1	100.0
All ages	226	100.0		133	100.0		93	100.0	

Table 5

Age-specific incidence and proportion of all cancers
for period 2007-2016

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males Prop.all cancers n=113978 %	Females Prop.all cancers n=112253 %
0- 4						
5- 9						
10-14						
15-19						
20-24						
25-29	1		0.1		0.1	
30-34		1		0.1		0.1
35-39		2		0.1		0.1
40-44		1		0.1		0.0
45-49	12	3	0.6	0.2	0.3	0.0
50-54	12	7	0.7	0.4	0.2	0.1
55-59	23	9	1.6	0.6	0.2	0.1
60-64	15	9	1.2	0.7	0.1	0.1
65-69	23	15	1.9	1.2	0.1	0.1
70-74	22	12	2.0	0.9	0.1	0.1
75-79	14	6	1.8	0.6	0.1	0.0
80-84	6	13	1.3	1.8	0.1	0.1
85+	5	15	1.6	2.0	0.1	0.1
All ages	133	93			0.1	0.1
Incidence						
Raw			0.6	0.4		
WS			0.3	0.2		
ES			0.5	0.3		
BRD-S			0.5	0.3		

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

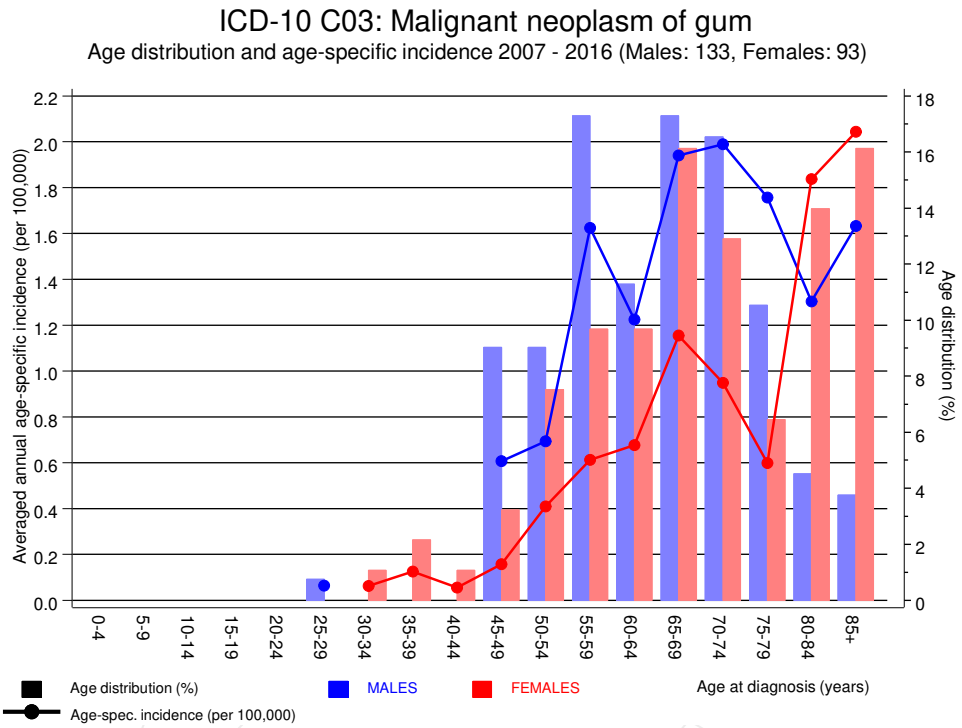


Figure 6. Age distribution (males: mean=65.1 yrs, median=65.8 yrs; females: mean=69.9 yrs, median=69.8 yrs) and age-specific incidence.

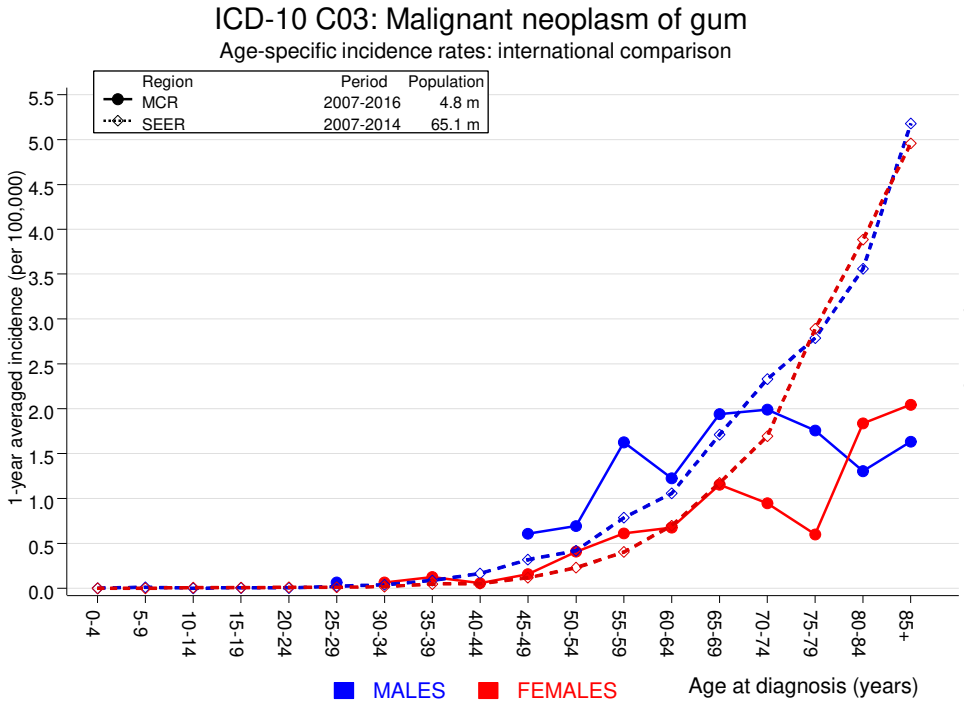


Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:
Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 18 Regs Research Data, released April 2014, based on the November 2013 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 1998–2016
MALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C09–C10	Oropharynx	2	0.1	14.2	1.7	51.4	#	25.6	
C12–C13	Hypopharynx	5	0.1	64.1	20.8	149.5	#	67.8	
C15	Oesophagus	5	0.2	23.4	7.6	54.5	#	66.0	20.0
C18	Colon	3	0.9	3.2	0.7	9.4		28.5	
C19–C20	Rectum	2	0.6	3.4	0.4	12.5		19.6	
C22	Liver	2	0.3	6.8	0.8	24.6		23.5	
C30–C31	Sinuses	2	0.0	106.4	12.9	384.4	#	27.3	
C32	Larynx	2	0.1	16.4	2.0	59.1	#	25.9	
C33–C34	Lung	7	1.2	5.7	2.3	11.7	#	79.4	
C46,C49	Soft tissue	2	0.1	35.0	4.2	126.6	#	26.8	
C61	Prostate	4	3.0	1.3	0.4	3.4		14.0	25.0
Others, specified		9	2.4	3.7	1.7	7.1	#	90.8	
Not observed		0	1.4	0.0	0.0	2.7		-18.8	
All further malignancies		45	10.4	4.3	3.1	5.8	#	476.3	4.4

Patients	239
Median age at next malignancy (years)	67.9
Person-years	726
Mean observation time (years)	3.0
Median observation time (years)	1.6

The occurrence of further malignancy listed is statistically significant.

Observed further malignancies with count 1 are pooled in category “Others, specified”.

Table 7b

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of further malignancies for period 1998–2016

FEMALES

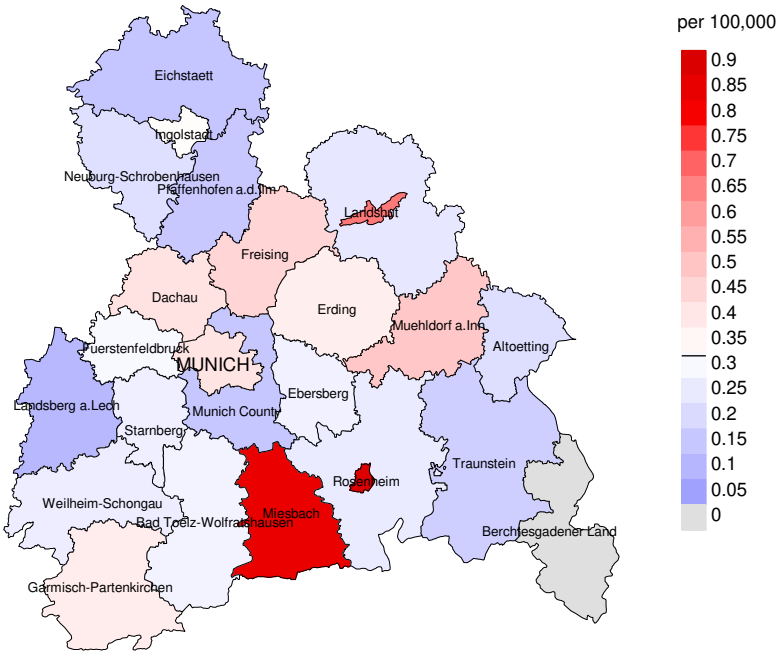
Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C09–C10 Oropharynx	3	0.0	98.1	20.2	286.7	#	45.5	
C18 Colon	2	0.9	2.3	0.3	8.4		17.5	
C33–C34 Lung	2	0.6	3.4	0.4	12.3		21.6	
C50 Breast	5	2.3	2.2	0.7	5.1		41.3	
Others, specified	10	0.6	18.2	8.7	33.4	#	144.8	10.0
Not observed	0	3.8	0.0	0.0	1.0	#	−58.2	
All further malignancies	22	8.1	2.7	1.7	4.1	#	212.6	4.5

Patients	165
Median age at next malignancy (years)	72.5
Person-years	652
Mean observation time (years)	4.0
Median observation time (years)	2.7

The occurrence of further malignancy listed is statistically significant.

Observed further malignancies with count 1 are pooled in category “Others, specified”.

Average incidence (world standard population) 2007 - 2016: Males



Average incidence (world standard population) 2007 - 2016: Females

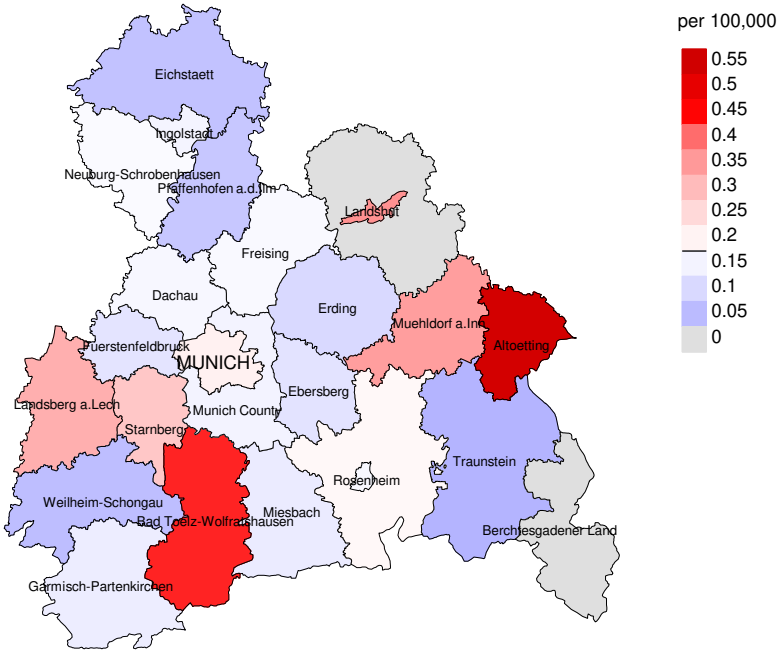
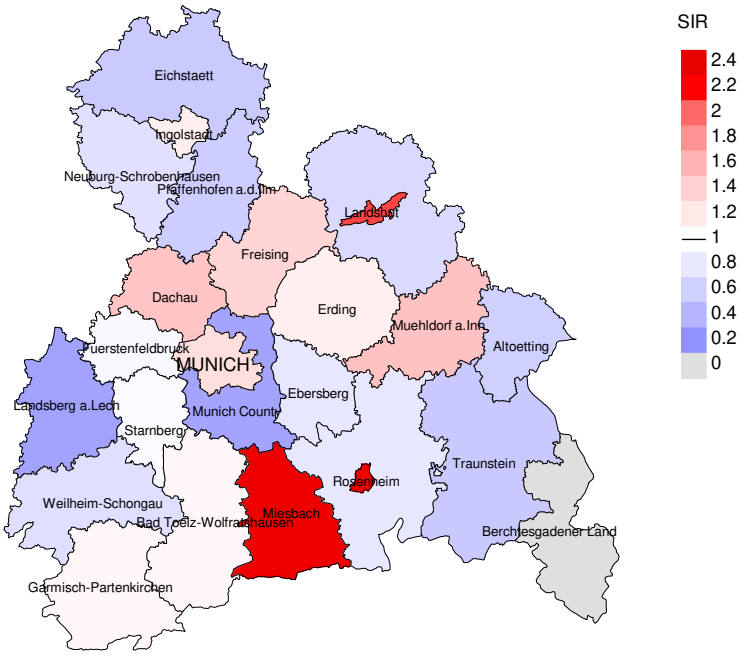


Figure 8a. Map of cancer incidence (world standard population) by county averaged for period 2007 to 2016. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.3/100,000 WS N=133, females 0.2/100,000 WS N=93).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 4 women were identified with newly diagnosed gum cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 0.1/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.0 and 1.0/100,000.

Standardized incidence ratio (SIR) 2007 - 2016: Males



Standardized incidence ratio (SIR) 2007 - 2016: Females

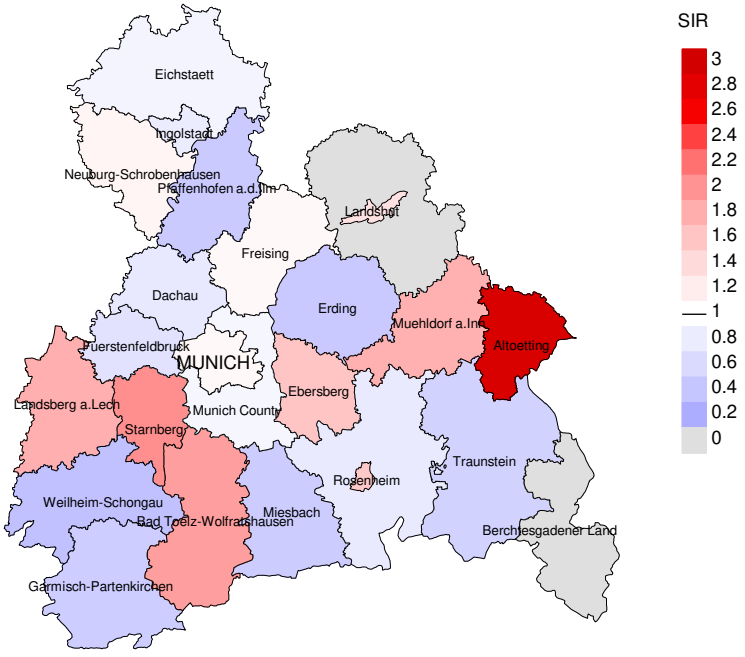


Figure 8b. Map of standardized incidence ratio (SIR) by county averaged for period 2007 to 2016. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=133, females N=93).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 4 women were identified with newly diagnosed gum cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.59. Though, the value of this parameter may vary with an underlying probability of 99% between 0.27 and 5.02, and is therefore not statistically striking.

MORTALITY

Table 9a

Annual cohorts: Incident cancers, follow-up status,
and deaths among the annual cohorts

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.81 m as of 2007, respectively)

Year of diagnosis	Incident cases n	Prop. actively followed %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	12	100.0	8	66.7	100.0
1999	11	81.8	6	54.5	66.7
2000	12	91.7	8	66.7	100.0
2001	11	100.0	9	81.8	77.8
2002	21	100.0	13	61.9	100.0
2003	26	96.2	16	61.5	93.8
2004	32	90.6	22	68.8	95.5
2005	25	96.0	16	64.0	100.0
2006	35	97.1	27	77.1	88.9
2007	28	75.0	17	60.7	100.0
2008	21	81.0	12	57.1	91.7
2009	29	86.2	22	75.9	100.0
2010	23	73.9	13	56.5	100.0
2011	23	69.6	10	43.5	100.0
2012	31	80.6	18	58.1	100.0
2013	32	75.0	12	37.5	100.0
2014	24	54.2	7	29.2	85.7
2015	8	100.0	4	50.0	100.0
2016	7	85.7	4	57.1	75.0
1998-2016	411	84.7	244	59.4	95.1

Table 9b

Annual cohorts of incident cancers and deaths,
and cases deceased within the same year of being diagnosed with cancer

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.81 m as of 2007, respectively)

Year of diagnosis/ death	Incident cases n	Deaths n	Deaths in same year n	Prop. deaths in same year %
1998	12	1		
1999	11	7	1	9.1
2000	12	7	1	8.3
2001	11	13		
2002	21	16	1	4.8
2003	26	15	3	11.5
2004	32	18	5	15.6
2005	25	21	3	12.0
2006	35	21	10	28.6
2007	28	15	5	17.9
2008	21	20	3	14.3
2009	29	22	5	17.2
2010	23	26	6	26.1
2011	23	20	4	17.4
2012	31	18	6	19.4
2013	32	23	4	12.5
2014	24	19	2	8.3
2015	8	13	1	12.5
2016	7	21	3	42.9
1998-2016	411	316	63	15.3

Table 9c

Annual cohorts of deaths, and proportion of cancer-related and non-cancer-related deaths

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.81 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. non-cancer-related %	Prop. cancer recorded on death certificate %
1998	1		100.0	
1999	7	71.4	28.6	71.4
2000	7	85.7	14.3	85.7
2001	13	69.2	30.8	84.6
2002	16	31.3	68.8	56.3
2003	15	73.3	26.7	86.7
2004	18	77.8	22.2	83.3
2005	21	90.5	9.5	95.0
2006	21	71.4	28.6	88.9
2007	15	66.7	33.3	85.7
2008	20	75.0	25.0	80.0
2009	22	77.3	22.7	85.7
2010	26	88.5	11.5	96.0
2011	20	75.0	25.0	84.2
2012	18	83.3	16.7	88.9
2013	23	78.3	21.7	81.8
2014	19	57.9	42.1	66.7
2015	13	69.2	30.8	76.9
2016	21	85.7	14.3	95.2
1998-2016	316	74.4	25.6	83.7

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	1	60.9		60.9	
1999	5	56.8	56.1	86.3	56.1
2000	6	70.0	70.0		70.0
2001	9	66.7	66.7	63.0	67.9
2002	8	65.4	60.6	74.6	62.0
2003	7	61.7	62.0	60.2	61.7
2004	14	72.0	72.0	69.3	71.9
2005	9	70.9	70.8	82.9	70.8
2006	15	62.4	62.4	61.6	60.8
2007	7	54.4	54.1	70.7	54.1
2008	13	67.9	62.5	71.8	66.9
2009	12	69.6	69.4	75.4	69.4
2010	16	71.8	72.9	64.5	72.1
2011	13	63.6	61.6	71.4	61.6
2012	13	65.3	65.3		65.3
2013	15	75.2	70.9	80.0	70.5
2014	11	73.3	73.3	72.9	73.4
2015	6	65.9	65.5	66.2	67.2
2016	13	60.3	56.5	73.0	58.4
1998-2016	193	67.2	66.0	71.8	66.0

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					
1999	2	66.7	49.4	84.0	49.4
2000	1	88.3		88.3	
2001	4	66.9	57.7	80.0	61.8
2002	8	82.9	61.8	87.6	79.0
2003	8	73.3	73.9	72.7	73.3
2004	4	74.5	78.4	64.9	78.4
2005	12	71.1	64.2	92.2	64.2
2006	6	81.2	83.4	76.7	83.4
2007	8	78.4	72.0	84.8	72.0
2008	7	81.6	80.0	83.9	80.0
2009	10	80.4	72.9	88.5	76.9
2010	10	85.0	84.0	94.7	84.0
2011	7	75.1	74.3	84.3	75.1
2012	5	85.7	84.0	85.7	82.7
2013	8	71.6	70.6	94.2	68.3
2014	8	85.0	78.9	90.0	78.9
2015	7	80.2	80.2	77.0	80.2
2016	8	81.9	81.3	82.4	81.9
1998-2016	123	80.6	76.4	85.3	78.7

By 2010, life expectancy at birth was 77.5 years for boys and 82.6 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
1999	4	0.4	0.57	0.2	0.56	0.3	0.55	0.3	0.52
2000	6	0.5	0.86	0.3	0.70	0.5	0.83	0.6	0.85
2001	7	0.6	1.17	0.4	1.21	0.5	1.23	0.7	1.38
2002	3	0.2	0.21	0.1	0.21	0.1	0.20	0.1	0.19
2003	4	0.2	0.22	0.1	0.23	0.2	0.20	0.2	0.18
2004	12	0.6	0.57	0.3	0.51	0.5	0.57	0.7	0.64
2005	8	0.4	0.73	0.2	0.58	0.3	0.67	0.5	0.86
2006	11	0.6	0.58	0.4	0.66	0.5	0.63	0.6	0.61
2007	5	0.2	0.36	0.1	0.36	0.2	0.33	0.2	0.29
2008	10	0.4	1.25	0.3	1.36	0.4	1.31	0.4	1.18
2009	11	0.5	0.58	0.2	0.60	0.3	0.55	0.4	0.53
2010	14	0.6	0.93	0.3	0.81	0.4	0.84	0.6	0.98
2011	9	0.4	0.82	0.2	0.78	0.3	0.79	0.4	0.79
2012	13	0.6	0.72	0.3	0.75	0.4	0.71	0.5	0.70
2013	11	0.5	0.50	0.2	0.37	0.3	0.42	0.4	0.51
2014	7	0.3	0.47	0.2	0.40	0.2	0.44	0.3	0.46
2015	4	0.2	0.80	0.1	1.15	0.1	1.01	0.2	0.85
2016	11	0.5	1.83	0.3	2.11	0.4	2.06	0.4	1.92
1999-2016	150	0.4	0.64	0.2	0.61	0.3	0.62	0.4	0.64

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
1999	1	0.1	0.25	0.1	0.31	0.1	0.29	0.1	0.30
2000									
2001	2	0.2	0.40	0.1	0.77	0.1	0.62	0.1	0.53
2002	2	0.1	0.29	0.1	0.32	0.1	0.31	0.1	0.30
2003	7	0.4	0.88	0.2	0.64	0.2	0.77	0.3	0.83
2004	2	0.1	0.18	0.0	0.18	0.1	0.18	0.1	0.18
2005	11	0.6	0.79	0.3	0.74	0.4	0.78	0.5	0.74
2006	4	0.2	0.25	0.0	0.09	0.1	0.11	0.1	0.18
2007	5	0.2	0.36	0.1	0.32	0.1	0.34	0.2	0.32
2008	5	0.2	0.38	0.1	0.22	0.1	0.26	0.2	0.34
2009	6	0.3	0.60	0.1	0.57	0.2	0.56	0.2	0.55
2010	9	0.4	1.12	0.1	1.17	0.2	1.12	0.2	1.03
2011	6	0.3	0.50	0.1	0.38	0.1	0.41	0.2	0.40
2012	2	0.1	0.15	0.0	0.07	0.0	0.10	0.1	0.13
2013	7	0.3	0.70	0.1	0.86	0.2	0.80	0.2	0.72
2014	4	0.2	0.44	0.1	0.24	0.1	0.28	0.1	0.37
2015	5	0.2	1.67	0.1	1.39	0.1	1.49	0.1	1.27
2016	7	0.3	7.00	0.1	8.69	0.1	8.01	0.2	10.3
1999-2016	85	0.2	0.52	0.1	0.42	0.1	0.44	0.2	0.47

Table 12

Age distribution of age at death (cancer-related) for period 2007-2016
(**incl. multiple malignancies**)

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4									
5-9									
10-14									
15-19									
20-24									
25-29									
30-34									
35-39	1	0.7	0.7			0.0	1	1.8	1.8
40-44	2	1.3	2.0	1	1.1	1.1	1	1.8	3.6
45-49	8	5.3	7.3	7	7.4	8.4	1	1.8	5.4
50-54	8	5.3	12.6	8	8.4	16.8			5.4
55-59	14	9.3	21.9	11	11.6	28.4	3	5.4	10.7
60-64	16	10.6	32.5	13	13.7	42.1	3	5.4	16.1
65-69	27	17.9	50.3	20	21.1	63.2	7	12.5	28.6
70-74	23	15.2	65.6	15	15.8	78.9	8	14.3	42.9
75-79	13	8.6	74.2	9	9.5	88.4	4	7.1	50.0
80-84	14	9.3	83.4	6	6.3	94.7	8	14.3	64.3
85+	25	16.6	100.0	5	5.3	100.0	20	35.7	100.0
All ages	151	100.0		95	100.0		56	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2016
(**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		1			0.1	0.50		0.4
40-44	1	1	0.1	1.00	0.1	1.00	0.2	0.1
45-49	7	1	0.4	0.58	0.1	0.33	0.6	0.1
50-54	8		0.5	0.67			0.4	
55-59	11	3	0.8	0.48	0.2	0.33	0.3	0.1
60-64	13	3	1.1	0.87	0.2	0.33	0.3	0.1
65-69	20	7	1.7	0.87	0.5	0.47	0.3	0.1
70-74	15	8	1.4	0.68	0.6	0.67	0.2	0.1
75-79	9	4	1.1	0.64	0.4	0.67	0.1	0.1
80-84	6	8	1.3	1.00	1.1	0.62	0.1	0.1
85+	5	20	1.6	1.00	2.7	1.33	0.1	0.2
All ages	95	56					0.2	0.1
Mortality								
Raw			0.4	0.71	0.2	0.60		
WS			0.2	0.70	0.1	0.45		
ES			0.3	0.70	0.1	0.48		
BRD-S			0.4	0.71	0.2	0.52		
PYLL-70								
per 100,000			3.0		0.8			
ES			2.6		0.7			
AYLL-70			10.2		10.0			

Table 14a

Further malignancies in deaths in period 1999-2016
MALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C00	Lip	1	1.1	1	100.0				
C03-C06	Oral cavity	5	5.7					5	100.0
C07-C08	Salivary gland	1	1.1			1	100.0		
C09-C10	Oropharynx	9	10.3	7	77.8	1	11.1	1	11.1
C12-C13	Hypopharynx	5	5.7	3	60.0			2	40.0
C15	Oesophagus	6	6.9			1	16.7	5	83.3
C16	Stomach	1	1.1					1	100.0
C18	Colon	2	2.3	1	50.0	1	50.0		
C19-C20	Rectum	5	5.7	3	60.0			2	40.0
C22	Liver	2	2.3			1	50.0	1	50.0
C25	Pancreas	1	1.1					1	100.0
C30-C31	Sinuses	5	5.7	2	40.0	1	20.0	2	40.0
C32	Larynx	4	4.6	2	50.0	1	25.0	1	25.0
C33-C34	Lung	14	16.1	2	14.3	1	7.1	11	78.6
C38,C45	Mesothelioma	1	1.1					1	100.0
C43	Malign. melanoma	2	2.3	1	50.0			1	50.0
C44	Skin others	3	3.4			1	33.3	2	66.7
C46,C49	Soft tissue	2	2.3	2	100.0				
C61	Prostate	5	5.7	3	60.0			2	40.0
C64	Kidney	1	1.1					1	100.0
C65	Renal pelvis	1	1.1	1	100.0				
C67	Bladder	6	6.9	5	83.3			1	16.7
C82-C85	NHL	3	3.4	2	66.7			1	33.3
C91-C96	Leukaemia	2	2.3					2	100.0
All further malignancies		87	100.0	35	40.2	9	10.3	43	49.4

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

Table 14b

Further malignancies in deaths in period 1999–2016
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C00	Lip	1	2.3					1	100.0
C03–C06	Oral cavity	5	11.6					5	100.0
C09–C10	Oropharynx	4	9.3	1	25.0			3	75.0
C15	Oesophagus	1	2.3					1	100.0
C16	Stomach	1	2.3	1	100.0				
C18	Colon	2	4.7					2	100.0
C22	Liver	1	2.3			1	100.0		
C33–C34	Lung	2	4.7					2	100.0
C44	Skin others	7	16.3	4	57.1	1	14.3	2	28.6
C46,C49	Soft tissue	1	2.3					1	100.0
C50	Breast	10	23.3	6	60.0			4	40.0
C53	Cervix uteri	3	7.0	1	33.3			2	66.7
C54	Corpus uteri	2	4.7	1	50.0			1	50.0
C67	Bladder	1	2.3					1	100.0
C68	Urethra	1	2.3	1	100.0				
C76–C79	CUP	1	2.3					1	100.0
All further malignancies		43	100.0	15	34.9	2	4.7	26	60.5

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 2007-2016
(**First primaries only** *)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	Males MI-index	Females Age-spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19								
20-24								
25-29								
30-34								
35-39		1			0.1	0.50		0.4
40-44	1	1	0.1	1.00	0.1	1.00	0.2	0.2
45-49	6	1	0.3	0.55	0.1	0.50	0.6	0.1
50-54	7		0.4	0.70			0.4	
55-59	9	2	0.6	0.56	0.1	0.25	0.3	0.1
60-64	10	2	0.8	0.91	0.2	0.29	0.2	0.1
65-69	14	5	1.2	0.88	0.4	0.36	0.2	0.1
70-74	13	8	1.2	0.81	0.6	0.73	0.2	0.2
75-79	6	4	0.8	0.55	0.4	0.67	0.1	0.1
80-84	4	6	0.9	1.00	0.8	0.86	0.1	0.1
85+	4	15	1.3	1.33	2.0	1.15	0.1	0.2
All ages	74	45					0.2	0.1
Mortality								
Raw			0.3	0.75	0.2	0.58		
WS			0.2	0.73	0.1	0.43		
ES			0.3	0.74	0.1	0.46		
BRD-S			0.3	0.74	0.1	0.50		
PYLL-70								
per 100,000			2.5		0.7			
ES			2.1		0.6			
AYLL-70			10.8		11.3			

* See corresponding tables with multiple malignancies.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2016
(**Single primaries only** *)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	Males MI-index	Females Age-spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19								
20-24								
25-29								
30-34								
35-39		1			0.1	0.50		0.4
40-44	1	1	0.1	1.00	0.1	1.00	0.2	0.2
45-49	5	1	0.3	0.50	0.1	0.50	0.5	0.1
50-54	7		0.4	0.78			0.4	
55-59	6	2	0.4	0.46	0.1	0.25	0.2	0.1
60-64	5	2	0.4	0.50	0.2	0.29	0.1	0.1
65-69	10	3	0.8	0.71	0.2	0.23	0.2	0.1
70-74	9	5	0.8	0.60	0.4	0.50	0.1	0.1
75-79	6	4	0.8	0.55	0.4	0.67	0.1	0.1
80-84	2	6	0.4	0.67	0.8	0.86	0.0	0.1
85+	2	11	0.7	1.00	1.5	1.00	0.0	0.2
All ages	53	36					0.1	0.1
Mortality								
Raw			0.2	0.60	0.2	0.49		
WS			0.1	0.59	0.1	0.36		
ES			0.2	0.60	0.1	0.38		
BRD-S			0.2	0.59	0.1	0.43		
PYLL-70								
per 100,000			2.0		0.7			
ES			1.7		0.6			
AYLL-70			11.8		13.0			

* See corresponding tables with multiple malignancies.

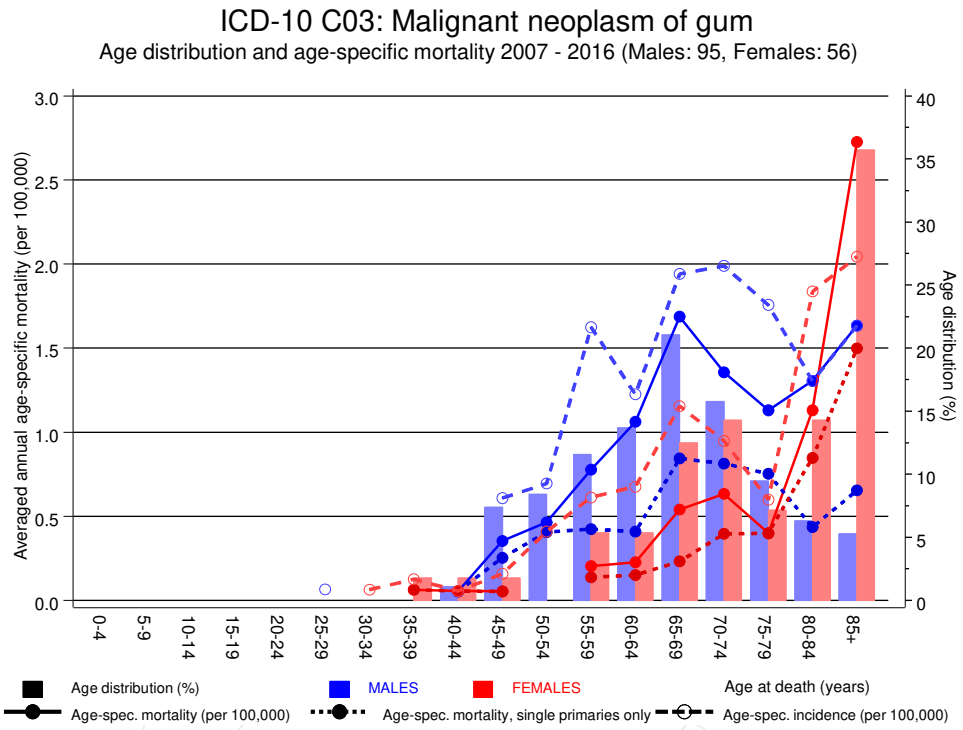


Figure 17. Distribution of age at death (bars; males: mean=62.3 yrs, median=61.4 yrs; females: mean=73.0 yrs, median=74.7 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

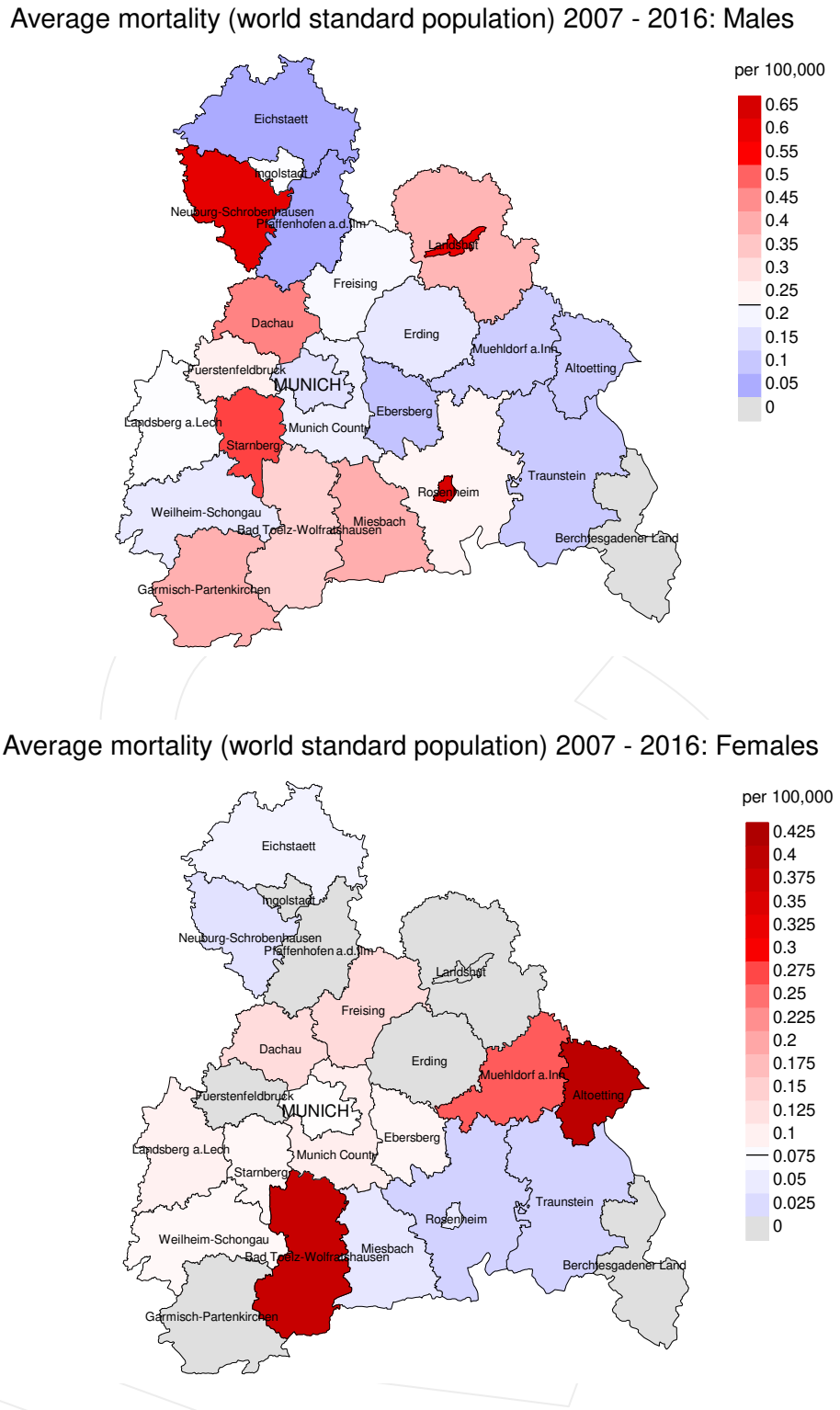
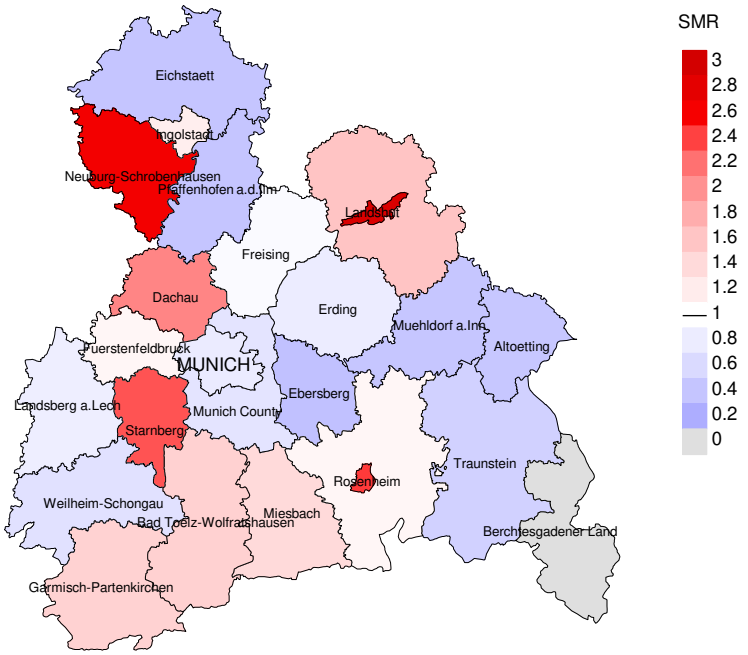


Figure 18a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2016. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.2/100,000 WS N=95, females 0.1/100,000 WS N=56).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 3 women died from gum cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.1/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.0 and 1.0/100,000.

Standardized mortality ratio (SMR) 2007 - 2016: Males



Standardized mortality ratio (SMR) 2007 - 2016: Females

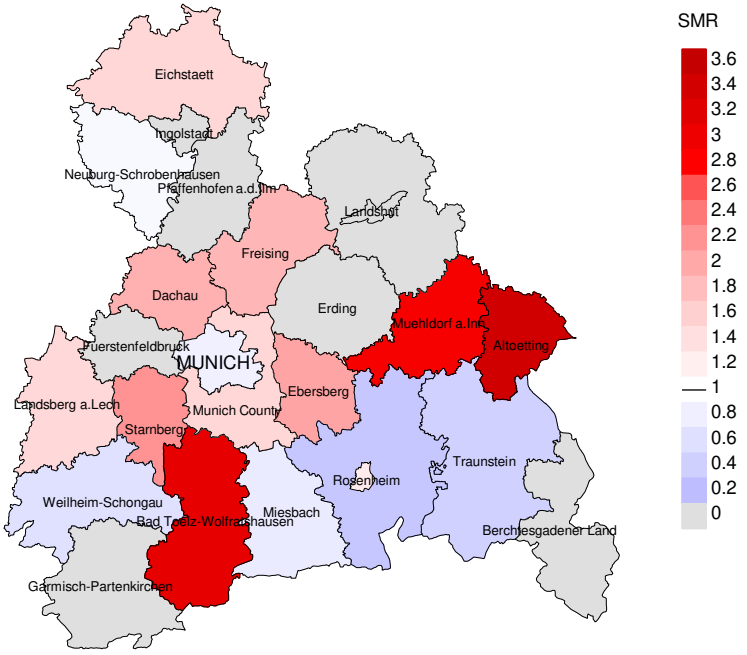


Figure 18b. Map of standardized mortality ratio (SMR) by county averaged for period 2007 to 2016. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=95, females N=56).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 3 women died from gum cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 2.05. Though, the value of this parameter may vary with an underlying probability of 99% between 0.23 and 7.49, and is therefore not statistically striking.

Statistical Notes

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

1. **All multiple primaries included**

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

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

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

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

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

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

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

The index from mortality and incidence (Mortality-Incidence ratio, **MI-index**) is a statistic 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 MI- index. 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 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 between mortality and incidence
FRG	Federal Republic of Germany

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