Munich Cancer Registry

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ICD-10 C03: Gum cancer

Incidence and Mortality

Year of diagnosis	1998-2019
Patients	398
Diseases	400
Creation date	01/25/2021
Database export	01/07/2021
Population	4.92 m

Munich Cancer Registry
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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

Index of figures and tables

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

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

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

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

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

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

Munich Cancer Registry, 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 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	18.3	75.0	100.0
1999	7	21.1	18.0	42.9	85.7
2000	10	13.8	18.1	70.0	90.0
2001	8	13.5	18.1	87.5	100.0
2002	17	11.1	17.6	82.4	100.0 #
2003	21	12.0	17.6	81.0	100.0
2004	26	17.8	15.9	73.1	88.5
2005	17	17.8	15.9	76.5	100.0
2006	30	18.9	14.7	83.3	100.0
2007	22	19.4	12.7	63.6	86.4 #
2008	19	19.6	13.0	68.4	100.0
2009	22	20.4	13.7	86.4	100.0
2010	21	19.8	13.6	81.0	100.0
2011	21	19.0	12.3	61.9	100.0
2012	26	19.4	11.3	73.1	100.0
2013	31	20.0	9.4	58.1	100.0
2014	26	19.3	4.6	38.5	80.8
2015	21	18.8	3.2	52.4	90.5
2016	20	20.7	4.8	55.0	100.0
2017	14	21.7	4.5	28.6	100.0
2018	7	22.1	0.0	42.9	100.0
2019	2	22.3	0.0	50.0	100.0 ##
1998-2019	400	22.3	18.3	66.8	96.3

400 cases diagnosed 1998-2019 are related to a total of 398 patients. Currently, in 147 (36.9 %) of these 398 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 103 / 37 / 7 (25.9 % / 9.3 % / 1.8 %) 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 2017, a subgroup of 14 cases has been diagnosed, of which 21.7 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 4.5 % 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 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	17.7	85.7	100.0	
1999	4	57.1	27.3	17.3	50.0	75.0	
2000	5	50.0	18.8	17.6	80.0	80.0	
2001	5	62.5	14.3	17.6	80.0	100.0	
2002	12	70.6	9.1	17.1	91.7	100.0	#
2003	14	66.7	10.6	16.6	78.6	100.0	
2004	16	61.5	17.5	14.6	68.8	87.5	
2005	8	47.1	19.7	14.6	75.0	100.0	
2006	17	56.7	20.5	14.1	88.2	100.0	
2007	10	45.5	23.5	12.3	60.0	100.0	#
2008	8	42.1	22.6	11.8	62.5	100.0	
2009	14	63.6	23.3	12.5	100.0	100.0	
2010	14	66.7	22.4	12.2	71.4	100.0	
2011	10	47.6	20.8	10.9	80.0	100.0	
2012	13	50.0	21.0	9.9	76.9	100.0	
2013	22	71.0	22.3	8.9	54.5	100.0	
2014	17	65.4	21.9	5.2	52.9	82.4	
2015	15	71.4	21.3	2.4	40.0	86.7	
2016	13	65.0	23.2	3.7	53.8	100.0	
2017	9	64.3	24.0	0.0	22.2	100.0	
2018	4	57.1	24.1	0.0	25.0	100.0	
2019	2	100.0	24.3	0.0	50.0	100.0	##
1998-2019	239	59.8	24.3	17.7	67.4	96.2	

239 cases diagnosed 1998-2019 are related to a total of 239 patients. Currently, in 91 (38.1 %) of these 239 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 59 / 28 / 4 (24.7 % / 11.7 % / 1.7 %) 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 2017, a subgroup of 9 cases has been diagnosed, of which 24.0 % 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 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	19.1	60.0	100.0
1999	3	42.9	12.5	19.1	33.3	100.0
2000	5	50.0	7.7	18.8	60.0	100.0
2001	3	37.5	12.5	18.8	100.0	100.0
2002	5	29.4	14.3	18.4	60.0	100.0 #
2003	7	33.3	14.3	19.1	85.7	100.0
2004	10	38.5	18.4	17.8	80.0	90.0
2005	9	52.9	14.9	17.6	77.8	100.0
2006	13	43.3	16.7	15.5	76.9	100.0
2007	12	54.5	13.9	13.3	66.7	75.0 #
2008	11	57.9	15.7	14.9	72.7	100.0
2009	8	36.4	16.5	15.6	62.5	100.0
2010	7	33.3	16.3	15.9	100.0	100.0
2011	11	52.4	16.5	14.5	45.5	100.0
2012	13	50.0	17.2	13.7	69.2	100.0
2013	9	29.0	16.8	10.5	66.7	100.0
2014	9	34.6	15.7	3.4	11.1	77.8
2015	6	28.6	15.1	4.8	83.3	100.0
2016	7	35.0	17.0	6.7	57.1	100.0
2017	5	35.7	18.4	12.5	40.0	100.0
2018	3	42.9	19.3	0.0	66.7	100.0
2019	0 ##					
1998-2019	161	40.3	19.3	19.1	65.8	96.3

161 cases diagnosed 1998-2019 are related to a total of 159 patients. Currently, in 56 (35.2 %) of these 159 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 44 / 9 / 3 (27.7 % / 5.7 % / 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 retreived from the respective headings.

How to interpret:
In 2017, a subgroup of 5 cases has been diagnosed, of which 18.4 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 12.5 % 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 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 4.92 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	7	5	0.6	0.4	0.4	0.2	0.6	0.3	0.6	0.4
1999	4	3	0.4	0.3	0.2	0.2	0.3	0.2	0.3	0.3
2000	5	5	0.4	0.4	0.3	0.2	0.4	0.4	0.4	0.4
2001	5	3	0.4	0.2	0.2	0.1	0.3	0.1	0.4	0.2
2002	12	5	0.6	0.3	0.4	0.1	0.5	0.2	0.6	0.2
2003	14	7	0.7	0.4	0.5	0.1	0.7	0.2	0.8	0.3
2004	16	10	0.9	0.5	0.5	0.1	0.7	0.2	0.8	0.4
2005	8	9	0.4	0.5	0.3	0.2	0.4	0.3	0.4	0.4
2006	17	13	0.9	0.6	0.5	0.3	0.7	0.5	1.0	0.6
2007	10	12	0.5	0.5	0.3	0.2	0.4	0.3	0.5	0.4
2008	8	11	0.4	0.5	0.2	0.2	0.3	0.3	0.4	0.4
2009	14	8	0.6	0.3	0.3	0.2	0.5	0.2	0.6	0.3
2010	14	7	0.6	0.3	0.3	0.1	0.5	0.1	0.6	0.2
2011	10	11	0.4	0.5	0.3	0.2	0.4	0.3	0.4	0.4
2012	13	13	0.6	0.6	0.3	0.2	0.5	0.3	0.5	0.4
2013	22	9	1.0	0.4	0.6	0.1	0.8	0.2	0.8	0.3
2014	17	9	0.7	0.4	0.4	0.2	0.6	0.3	0.6	0.3
2015	15	6	0.6	0.2	0.3	0.1	0.5	0.1	0.5	0.2
2016	13	7	0.5	0.3	0.3	0.1	0.4	0.2	0.5	0.2
2017	9	5	0.4	0.2	0.1	0.1	0.2	0.2	0.3	0.2
2018	4	3	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.1
2019	2		0.1		0.0		0.1		0.1	
1998-2019	239	161	0.5	0.4	0.3	0.2	0.4	0.2	0.5	0.3

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	7	60.1	8.9	47.1	73.0	47.1	53.1	59.7	68.0	73.0
2000	10	61.0	9.7	47.5	77.0	49.2	51.4	60.9	66.6	74.8
2001	8	70.1	12.5	59.7	88.1	59.7	60.5	63.0	82.9	88.1
2002	17	63.5	10.6	44.8	85.8	50.0	58.5	62.9	66.0	80.8
2003	21	64.8	11.6	45.4	81.4	53.1	53.5	62.6	76.1	78.7
2004	26	67.3	14.7	34.2	85.9	44.1	60.2	72.4	78.2	84.3
2005	17	64.6	14.2	39.1	89.6	47.5	54.7	62.0	71.7	84.2
2006	30	67.3	15.2	23.9	87.7	47.5	57.0	70.3	78.7	84.6
2007	22	68.2	11.8	48.9	93.3	54.1	58.6	69.1	74.8	84.6
2008	19	68.6	10.7	53.4	97.6	53.5	61.7	68.2	72.5	82.8
2009	22	70.1	14.9	38.7	98.4	53.3	55.7	73.7	81.1	85.1
2010	21	72.7	11.2	52.0	91.8	57.8	67.9	72.9	81.5	85.2
2011	21	64.2	15.5	27.0	86.4	47.7	55.6	67.3	76.7	78.0
2012	26	68.9	10.6	51.2	89.1	55.5	60.0	69.2	76.0	84.4
2013	31	66.4	11.8	47.2	92.8	49.5	58.7	65.8	71.6	86.5
2014	26	62.1	10.5	45.9	89.0	47.5	53.5	62.9	68.5	74.1
2015	21	67.6	13.7	40.9	90.3	50.4	57.3	67.3	77.3	86.3
2016	20	65.6	13.7	45.9	89.1	46.5	53.5	65.2	76.8	83.5
2017	14	72.7	12.9	38.9	96.1	55.0	71.0	74.7	78.1	80.5
2018	7	77.5	12.1	57.4	92.0	57.4	68.7	77.3	89.2	92.0
2019	2	70.9	2.0	69.4	72.3	69.4	69.4	70.9	72.3	72.3
1998–2019	400	66.8	12.8	23.9	98.4	50.6	57.5	67.4	76.3	83.9

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	4	58.2	4.6	53.1	63.8	53.1	54.7	58.0	61.8	63.8
2000	5	61.6	9.3	47.5	72.7	47.5	59.5	62.2	65.9	72.7
2001	5	65.0	7.4	59.7	78.0	59.7	61.2	62.4	63.6	78.0
2002	12	63.7	11.4	44.8	85.8	50.0	58.6	63.0	67.1	80.8
2003	14	61.5	11.1	45.4	81.4	51.1	53.3	59.2	69.6	81.4
2004	16	61.2	14.5	34.2	79.8	39.9	49.1	62.4	75.3	77.5
2005	8	58.4	11.6	39.1	71.7	39.1	49.6	60.4	68.2	71.7
2006	17	65.5	16.8	23.9	87.7	46.6	54.1	66.4	78.2	86.3
2007	10	63.8	10.4	48.9	80.3	51.5	56.8	60.9	74.8	77.9
2008	8	67.8	9.9	53.5	82.8	53.5	60.4	67.2	75.4	82.8
2009	14	70.0	12.6	46.5	88.1	53.3	55.7	73.7	77.0	83.8
2010	14	68.5	10.6	52.0	91.5	55.5	58.2	70.5	75.3	76.1
2011	10	61.6	16.5	27.0	86.4	38.1	51.7	64.2	70.1	82.2
2012	13	65.3	9.9	51.2	84.4	55.1	56.0	67.5	71.8	76.0
2013	22	63.1	7.6	48.3	73.4	49.5	58.6	65.5	68.3	71.6
2014	17	62.3	9.3	45.9	74.4	47.1	54.5	62.5	68.5	74.1
2015	15	63.8	13.5	40.9	87.6	50.2	55.3	59.6	76.1	86.3
2016	13	63.6	13.9	45.9	85.6	46.4	52.2	63.9	76.0	80.6
2017	9	78.6	7.1	71.0	96.1	71.0	74.9	77.1	78.3	96.1
2018	4	76.9	13.9	57.4	89.2	57.4	67.3	80.4	86.4	89.2
2019	2	70.9	2.0	69.4	72.3	69.4	69.4	70.9	72.3	72.3
1998–2019	239	64.5	12.1	23.9	96.1	49.1	56.0	64.4	74.0	79.8

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	3	62.7	13.7	47.1	73.0	47.1	47.1	68.0	73.0	73.0
2000	5	60.5	11.2	50.9	77.0	50.9	51.4	56.7	66.6	77.0
2001	3	78.5	16.3	59.8	88.1	59.8	59.8	87.8	88.1	88.1
2002	5	63.0	9.7	51.2	77.3	51.2	58.5	62.0	66.0	77.3
2003	7	71.5	10.2	53.1	78.7	53.1	61.1	76.1	78.5	78.7
2004	10	77.0	8.7	61.5	85.9	61.9	75.0	78.2	84.3	85.4
2005	9	70.1	14.7	50.8	89.6	50.8	59.1	68.9	83.7	89.6
2006	13	69.6	13.1	48.2	86.0	51.2	57.1	75.6	79.2	83.2
2007	12	71.8	12.1	50.1	93.3	62.2	63.3	70.9	79.1	88.2
2008	11	69.2	11.7	53.4	97.6	55.7	62.2	68.2	72.5	75.8
2009	8	70.2	19.4	38.7	98.4	38.7	55.7	73.6	83.1	98.4
2010	7	81.1	7.4	70.8	91.8	70.8	72.1	82.5	85.2	91.8
2011	11	66.5	14.9	34.5	84.1	47.7	55.6	69.2	77.1	77.2
2012	13	72.5	10.5	55.7	89.1	59.4	64.9	71.2	80.9	87.4
2013	9	74.5	16.4	47.2	92.8	47.2	59.2	84.8	86.7	92.8
2014	9	61.8	13.0	47.5	89.0	47.5	51.4	63.3	66.4	89.0
2015	6	77.0	9.4	64.1	90.3	64.1	71.1	76.9	82.9	90.3
2016	7	69.3	13.6	48.3	89.1	48.3	60.6	70.1	81.5	89.1
2017	5	62.1	15.0	38.9	73.6	38.9	55.0	69.9	73.1	73.6
2018	3	78.4	12.1	68.7	92.0	68.7	68.7	74.5	92.0	92.0
1998–2019	161	70.3	13.1	34.5	98.4	51.4	59.8	71.2	80.6	86.7

Table 4

Age distribution by 5-year age group and sex for period 2007-2019

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	0.7	0.7			0.0
30-34	1	0.4	0.8			0.7	1	1.0	1.0
35-39	2	0.8	1.6			0.7	2	2.0	3.0
40-44	1	0.4	2.0	1	0.7	1.3			3.0
45-49	15	6.0	7.9	11	7.3	8.6	4	4.0	6.9
50-54	20	7.9	15.9	14	9.3	17.9	6	5.9	12.9
55-59	34	13.5	29.4	26	17.2	35.1	8	7.9	20.8
60-64	22	8.7	38.1	12	7.9	43.0	10	9.9	30.7
65-69	42	16.7	54.8	26	17.2	60.3	16	15.8	46.5
70-74	45	17.9	72.6	26	17.2	77.5	19	18.8	65.3
75-79	24	9.5	82.1	18	11.9	89.4	6	5.9	71.3
80-84	20	7.9	90.1	8	5.3	94.7	12	11.9	83.2
85+	25	9.9	100.0	8	5.3	100.0	17	16.8	100.0
All ages	252	100.0		151	100.0		101	100.0	

Table 5

Age-specific incidence 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 Prop.all cancers n=143063 %	Females Prop.all cancers n=144724 %
0- 4						
5- 9						
10-14						
15-19						
20-24						
25-29	1		0.0		0.1	
30-34		1		0.0		0.1
35-39		2		0.1		0.1
40-44	1		0.0		0.0	
45-49	11	4	0.4	0.2	0.2	0.0
50-54	14	6	0.6	0.3	0.2	0.1
55-59	26	8	1.3	0.4	0.2	0.1
60-64	12	10	0.7	0.6	0.1	0.1
65-69	26	16	1.7	0.9	0.1	0.1
70-74	26	19	1.9	1.2	0.1	0.1
75-79	18	6	1.6	0.4	0.1	0.0
80-84	8	12	1.2	1.2	0.1	0.1
85+	8	17	1.9	1.8	0.1	0.1
All ages	151	101			0.1	0.1
Incidence						
Raw			0.5	0.3		
WS			0.3	0.1		
ES			0.4	0.2		
BRD-S			0.5	0.2		

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).

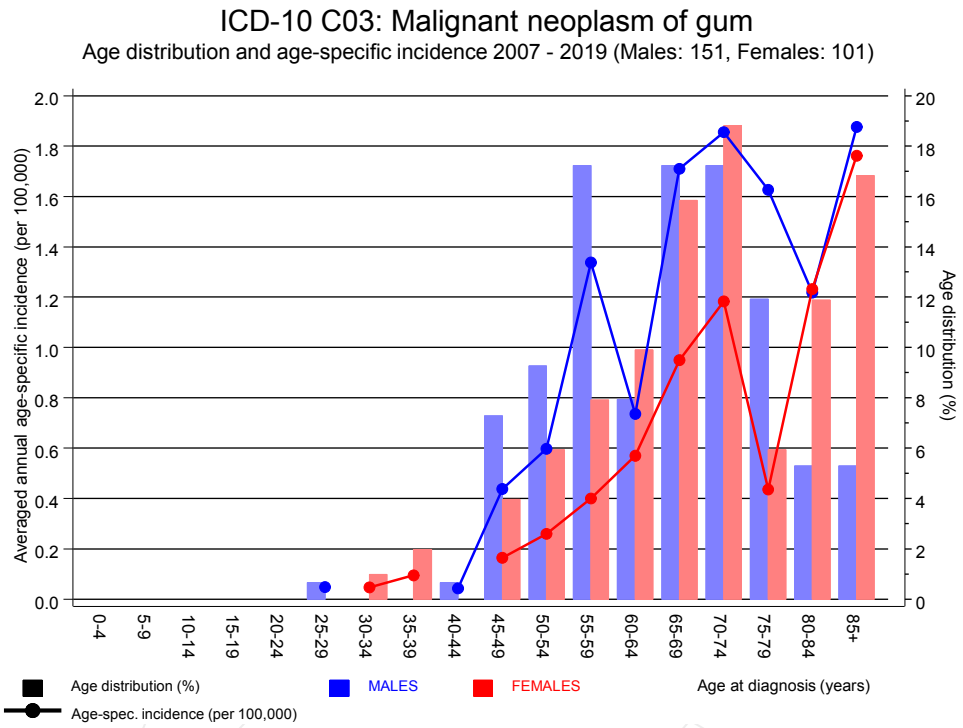


Figure 6. Age distribution (males: mean=66.0 yrs, median=66.9 yrs; females: mean=70.8 yrs, median=70.8 yrs) and age-specific incidence.

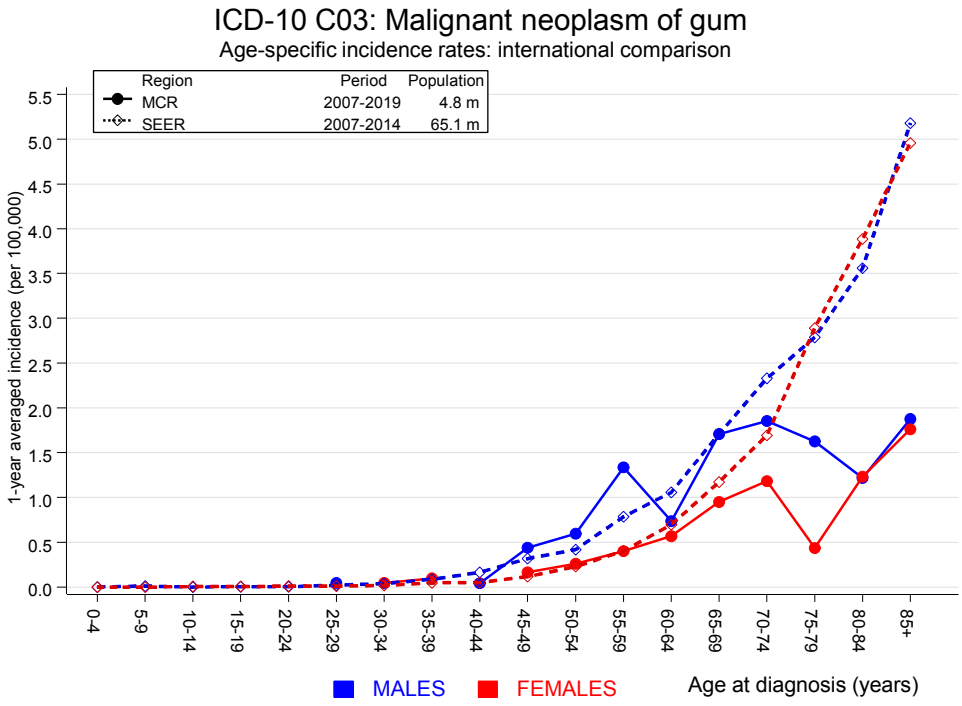


Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:
Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 18 Regs Research Data, released April 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	1	0.1	8.1	0.2	45.0		10.1	
C09–C10	Oropharynx	2	0.2	12.6	1.5	45.4	#	21.2	
C12–C13	Hypopharynx	5	0.1	57.5	18.7	134.1	#	56.5	
C14	ENT cancer	1	0.0	279.2	7.1	1556	#	11.5	100.0
C15	Oesophagus	7	0.3	26.3	10.6	54.1	#	77.4	14.3
C16	Stomach	1	0.5	2.2	0.1	12.1		6.2	
C18	Colon	3	1.1	2.7	0.6	7.8		21.6	
C19–C20	Rectum	1	0.7	1.5	0.0	8.2		3.7	
C22	Liver	1	0.4	2.8	0.1	15.3		7.3	
C25	Pancreas	1	0.5	2.1	0.1	11.9		6.1	
C30–C31	Sinuses	2	0.0	87.6	10.6	316.5	#	22.7	
C32	Larynx	2	0.1	14.5	1.8	52.5	#	21.4	
C33–C34	Lung	5	1.5	3.4	1.1	7.9	#	40.4	
C38,C45	Mesothelioma	1	0.1	11.9	0.3	66.1		10.5	
C40–C41	Bone	1	0.0	92.6	2.3	516.1	#	11.4	
C43	Malign. melanoma	1	0.6	1.8	0.0	9.8		5.0	
C46,C49	Soft tissue	2	0.1	29.2	3.5	105.5	#	22.2	
C61	Prostate	5	3.6	1.4	0.5	3.3		16.5	20.0
C64	Kidney	1	0.4	2.2	0.1	12.5		6.4	
C67	Bladder	2	0.5	3.8	0.5	13.8		17.0	
C70–C72	CNS cancer	1	0.2	6.1	0.2	33.7		9.6	
C91–C96	Leukaemia	1	0.2	5.8	0.1	32.2		9.5	
Not observed		0	1.6	0.0	0.0	2.4		−18.0	
All further malignancies		47	12.5	3.7	2.8	5.0	#	396.0	6.4

Patients	236
Median age at next malignancy (years)	68.0
Person-years	870
Mean observation time (years)	3.7
Median observation time (years)	1.8

The occurrence of further specified malignancy is statistically significant.

Table 7b

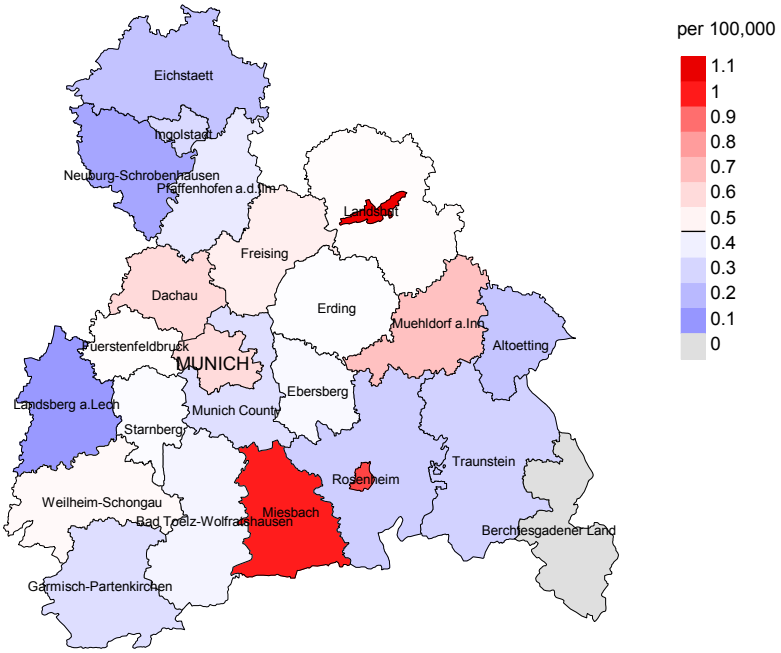
Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of further malignancies for period 1998–2019
FEMALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C00	Lip	1	0.0	133.1	3.4	741.6	#	14.5	
C03–C06	Oral cavity	3	0.1	59.6	12.3	174.3	#	43.1	
C09–C10	Oropharynx	3	0.0	91.2	18.8	266.6	#	43.4	
C12–C13	Hypopharynx	1	0.0	119.8	3.0	667.3	#	14.5	
C15	Oesophagus	1	0.1	17.7	0.4	98.7		13.8	
C18	Colon	3	0.9	3.2	0.7	9.4		30.2	
C19–C20	Rectum	1	0.4	2.7	0.1	15.2		9.2	
C22	Liver	1	0.1	8.8	0.2	48.8		13.0	
C30–C31	Sinuses	1	0.0	80.2	2.0	446.8	#	14.4	
C33–C34	Lung	2	0.6	3.1	0.4	11.2		19.8	
C40–C41	Bone	1	0.0	126.3	3.2	703.8	#	14.5	
C43	Malign. melanoma	1	0.3	3.3	0.1	18.2		10.1	
C46,C49	Soft tissue	1	0.1	19.7	0.5	109.6		13.9	
C50	Breast	6	2.5	2.4	0.9	5.2		51.3	
C51	Vulva	1	0.1	10.0	0.3	55.7		13.2	
C53	Cervix uteri	1	0.1	10.0	0.3	55.9		13.2	100.0
C67	Bladder	1	0.2	5.1	0.1	28.6		11.8	
Not observed		0	3.3	0.0	0.0	1.1		-48.4	
All further malignancies		29	8.8	3.3	2.2	4.7	#	295.5	3.4

Patients	158
Median age at next malignancy (years)	73.2
Person-years	684
Mean observation time (years)	4.3
Median observation time (years)	2.7

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

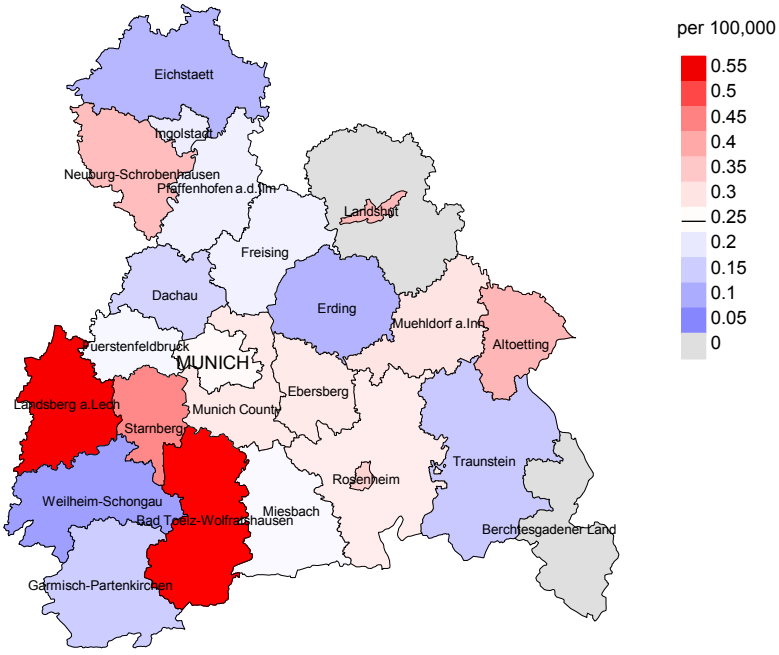
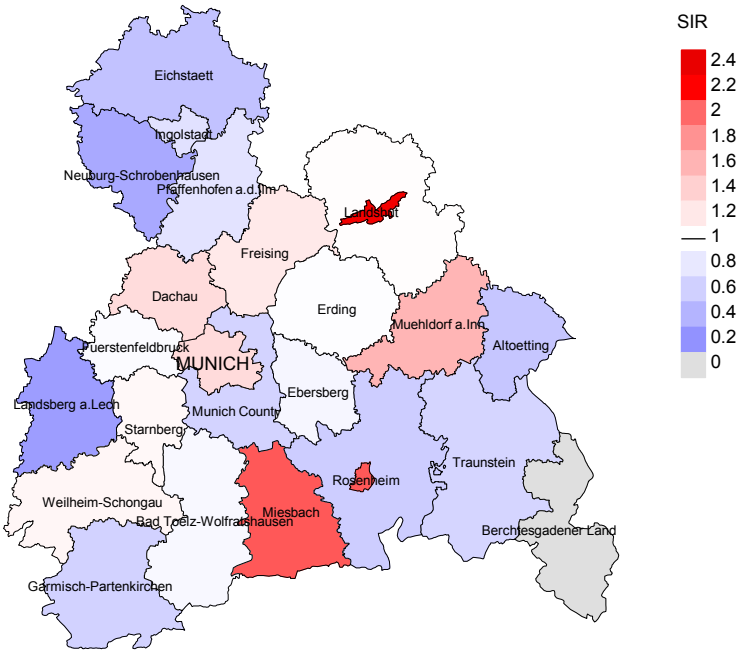


Figure 8a. Map of cancer incidence (german standard population) by county averaged for period 2007 to 2019. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.5/100,000 WS N=151, females 0.2/100,000 WS N=101).

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 were identified with newly diagnosed gum cancer. Therefore, the mean incidence 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 0.0 and 1.1/100,000.

Standardized incidence ratio (SIR) 2007 - 2019: Males



Standardized incidence ratio (SIR) 2007 - 2019: Females

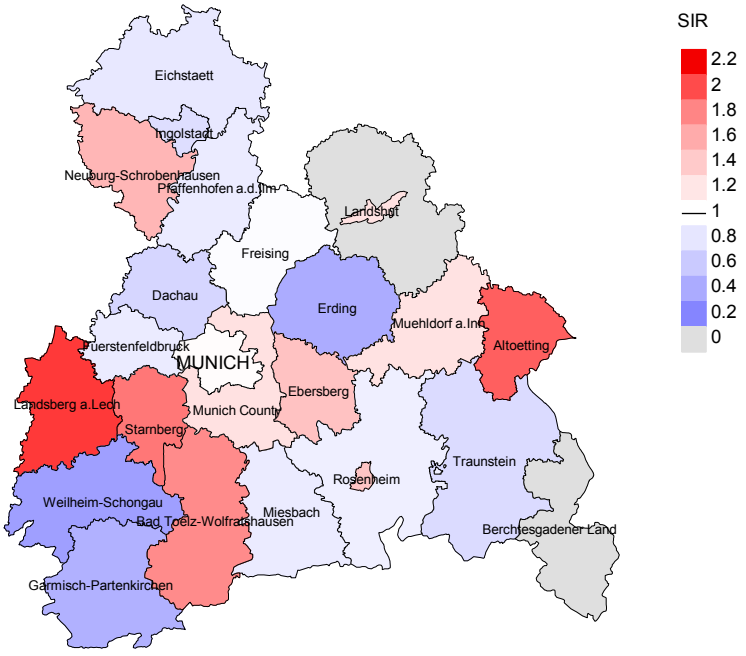


Figure 8b. Map of standardized incidence ratio (SIR) by county averaged for period 2007 to 2019. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=151, females N=101).

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 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 1.46. Though, the value of this parameter may vary with an underlying probability of 99% between 0.25 and 4.60, 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 4.92 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	9	75.0	88.9
1999	7	85.7	3	42.9	100.0
2000	10	90.0	7	70.0	100.0
2001	8	100.0	7	87.5	100.0
2002	17	100.0	14	82.4	100.0
2003	21	100.0	17	81.0	94.1
2004	26	88.5	19	73.1	89.5
2005	17	100.0	13	76.5	84.6
2006	30	100.0	25	83.3	88.0
2007	22	86.4	14	63.6	100.0
2008	19	100.0	13	68.4	92.3
2009	22	100.0	19	86.4	100.0
2010	21	100.0	17	81.0	88.2
2011	21	100.0	13	61.9	100.0
2012	26	100.0	19	73.1	84.2
2013	31	100.0	18	58.1	94.4
2014	26	80.8	10	38.5	80.0
2015	21	90.5	11	52.4	100.0
2016	20	100.0	11	55.0	90.9
2017	14	100.0	4	28.6	25.0
2018	7	100.0	3	42.9	66.7
2019	2	100.0	1	50.0	100.0
1998–2019	400	96.3	267	66.8	91.4

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 4.92 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			
1999	7	6	1	14.3
2000	10	5		
2001	8	10		
2002	17	9	1	5.9
2003	21	9	3	14.3
2004	26	14	4	15.4
2005	17	14	2	11.8
2006	30	17	7	23.3
2007	22	12	4	18.2
2008	19	17	3	15.8
2009	22	20	4	18.2
2010	21	22	6	28.6
2011	21	17	4	19.0
2012	26	15	5	19.2
2013	31	18	4	12.9
2014	26	19	2	7.7
2015	21	13	1	4.8
2016	20	28	7	35.0
2017	14	24	1	7.1
2018	7	13		
2019	2	11	1	50.0
1998–2019	400	313	60	15.0

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 4.92 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. non-cancer-related %	Prop. cancer recorded on death certificate %
1999	6	66.7	33.3	66.7
2000	5	80.0	20.0	80.0
2001	10	80.0	20.0	100.0
2002	9	33.3	66.7	55.6
2003	9	55.6	44.4	77.8
2004	14	71.4	28.6	78.6
2005	14	92.9	7.1	100.0
2006	17	64.7	35.3	85.7
2007	12	66.7	33.3	90.9
2008	17	76.5	23.5	82.4
2009	20	80.0	20.0	85.0
2010	22	90.9	9.1	95.2
2011	17	70.6	29.4	81.3
2012	15	86.7	13.3	93.3
2013	18	77.8	22.2	82.4
2014	19	63.2	36.8	68.4
2015	13	69.2	30.8	76.9
2016	28	89.3	10.7	92.9
2017	24	50.0	50.0	65.2
2018	13	23.1	76.9	60.0
2019	11	45.5	54.5	100.0
1999-2019	313	70.3	29.7	82.8

Table 10a

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

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1999	4	57.4	56.8	86.3	56.8
2000	4	64.0	64.0		64.0
2001	7	66.7	65.3	73.6	66.7
2002	3	68.1	60.6	71.3	60.6
2003	5	62.4	63.2	60.2	62.4
2004	10	72.0	72.0	69.3	71.9
2005	6	73.1	73.1		73.1
2006	13	64.0	64.0	61.6	61.6
2007	6	60.8	60.6	70.7	60.6
2008	11	67.9	66.9	78.8	67.4
2009	11	69.9	69.6	75.4	69.6
2010	13	72.1	73.7	68.4	73.7
2011	10	66.8	60.9	71.4	60.9
2012	11	67.9	67.9		67.9
2013	11	75.2	70.5	84.8	70.5
2014	11	73.3	72.9	73.4	73.3
2015	6	65.9	65.5	66.2	67.2
2016	18	57.6	56.5	64.2	57.2
2017	14	75.4	76.4	73.3	76.4
2018	6	70.3	67.7	70.3	67.4
2019	6	70.4	69.6	71.3	73.0
1999-2019	186	67.9	67.2	71.5	67.5

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
1999	2	66.7	49.4	84.0	49.4
2000	1	88.3		88.3	
2001	3	61.8	57.7	71.9	61.8
2002	6	82.9	61.8	87.6	79.0
2003	4	74.1	75.5	72.7	74.1
2004	4	74.5	78.4	64.9	78.4
2005	8	80.9	78.1	92.2	80.9
2006	4	80.6	83.4	76.7	83.4
2007	6	78.5	78.5	80.9	78.5
2008	6	81.7	78.3	83.9	78.3
2009	9	83.9	72.9	93.0	76.9
2010	9	86.1	85.0	94.7	85.0
2011	7	75.1	74.3	84.3	75.1
2012	4	84.2	84.0	84.2	82.7
2013	7	72.7	68.3	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	10	81.5	81.5		81.5
2017	10	85.8	80.3	87.0	85.8
2018	7	73.2	73.2	71.4	73.2
2019	5	79.7	77.5	80.8	77.5
1999-2019	127	80.9	78.1	84.1	80.0

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
1999	3	0.3	0.75	0.2	0.75	0.2	0.77	0.2	0.75
2000	4	0.4	0.80	0.2	0.71	0.3	0.77	0.3	0.76
2001	6	0.5	1.20	0.3	1.24	0.4	1.29	0.6	1.44
2002	1	0.1	0.08	0.0	0.08	0.0	0.07	0.0	0.07
2003	2	0.1	0.14	0.1	0.13	0.1	0.11	0.1	0.11
2004	8	0.4	0.50	0.2	0.45	0.3	0.51	0.5	0.54
2005	6	0.3	0.75	0.2	0.57	0.3	0.69	0.4	0.90
2006	9	0.5	0.53	0.3	0.60	0.4	0.58	0.5	0.57
2007	4	0.2	0.40	0.1	0.43	0.2	0.40	0.2	0.34
2008	9	0.4	1.13	0.2	1.20	0.3	1.14	0.4	1.05
2009	10	0.4	0.71	0.2	0.73	0.3	0.67	0.4	0.64
2010	12	0.5	0.86	0.2	0.75	0.4	0.78	0.6	0.93
2011	6	0.3	0.60	0.2	0.54	0.2	0.57	0.2	0.58
2012	11	0.5	0.85	0.3	0.83	0.4	0.79	0.4	0.84
2013	8	0.3	0.36	0.2	0.28	0.2	0.32	0.3	0.35
2014	8	0.3	0.47	0.2	0.39	0.2	0.42	0.3	0.46
2015	4	0.2	0.27	0.1	0.29	0.1	0.28	0.2	0.28
2016	15	0.6	1.15	0.4	1.38	0.5	1.34	0.6	1.16
2017	8	0.3	0.89	0.1	1.07	0.2	0.98	0.3	0.90
2018	2	0.1	0.50	0.0	0.62	0.1	0.57	0.1	0.52
2019	3	0.1	1.50	0.1	1.34	0.1	1.37	0.1	1.46
1999-2019	139	0.3	0.60	0.2	0.57	0.3	0.58	0.3	0.60

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	0.33	0.1	0.44	0.1	0.40	0.1	0.39
2000									
2001	2	0.2	0.67	0.1	1.31	0.1	1.04	0.1	0.94
2002	2	0.1	0.40	0.1	0.44	0.1	0.45	0.1	0.43
2003	3	0.2	0.43	0.1	0.38	0.1	0.38	0.1	0.41
2004	2	0.1	0.20	0.0	0.22	0.1	0.21	0.1	0.20
2005	7	0.4	0.78	0.1	0.68	0.2	0.71	0.3	0.75
2006	2	0.1	0.15	0.0	0.05	0.0	0.07	0.1	0.12
2007	4	0.2	0.33	0.1	0.25	0.1	0.29	0.1	0.28
2008	4	0.2	0.36	0.1	0.23	0.1	0.25	0.1	0.30
2009	6	0.3	0.75	0.1	0.71	0.2	0.68	0.2	0.68
2010	8	0.3	1.14	0.1	1.36	0.1	1.27	0.2	1.07
2011	6	0.3	0.55	0.1	0.43	0.1	0.46	0.2	0.44
2012	2	0.1	0.15	0.0	0.07	0.0	0.10	0.1	0.13
2013	6	0.3	0.67	0.1	0.80	0.2	0.75	0.2	0.71
2014	4	0.2	0.44	0.1	0.24	0.1	0.28	0.1	0.37
2015	5	0.2	0.83	0.1	0.72	0.1	0.75	0.1	0.71
2016	10	0.4	1.43	0.1	0.73	0.2	0.88	0.3	1.10
2017	4	0.2	0.80	0.1	0.46	0.1	0.52	0.1	0.57
2018	1	0.0	0.33	0.0	0.37	0.0	0.38	0.0	0.40
2019	2	0.1		0.0		0.0		0.1	
1999-2019	81	0.2	0.52	0.1	0.41	0.1	0.43	0.1	0.46

Table 12

Age distribution of age at death (cancer-related) for period 2007-2019
(**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									
40-44	2	1.2	1.2	1	1.0	1.0	1	1.6	1.6
45-49	8	4.9	6.2	6	6.0	7.0	2	3.2	4.8
50-54	7	4.3	10.5	7	7.0	14.0			4.8
55-59	15	9.3	19.8	12	12.0	26.0	3	4.8	9.7
60-64	14	8.6	28.4	11	11.0	37.0	3	4.8	14.5
65-69	29	17.9	46.3	22	22.0	59.0	7	11.3	25.8
70-74	25	15.4	61.7	16	16.0	75.0	9	14.5	40.3
75-79	20	12.3	74.1	15	15.0	90.0	5	8.1	48.4
80-84	13	8.0	82.1	4	4.0	94.0	9	14.5	62.9
85+	29	17.9	100.0	6	6.0	100.0	23	37.1	100.0
All ages	162	100.0		100	100.0		62	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	1	1	0.0	1.00	0.0	1.00	0.2	0.1
45-49	6	2	0.2	0.55	0.1	0.50	0.4	0.1
50-54	7		0.3	0.50			0.3	
55-59	12	3	0.6	0.46	0.2	0.38	0.3	0.1
60-64	11	3	0.7	0.92	0.2	0.30	0.2	0.1
65-69	22	7	1.4	0.85	0.4	0.44	0.3	0.1
70-74	16	9	1.1	0.62	0.6	0.47	0.1	0.1
75-79	15	5	1.4	0.83	0.4	0.83	0.1	0.1
80-84	4	9	0.6	0.50	0.9	0.75	0.0	0.1
85+	6	23	1.4	0.75	2.4	1.35	0.1	0.2
All ages	100	62					0.2	0.1
Mortality								
Raw			0.3	0.66	0.2	0.61		
WS			0.2	0.65	0.1	0.45		
ES			0.3	0.65	0.1	0.49		
BRD-S			0.3	0.66	0.1	0.53		
PYLL-70								
per 100,000			2.2		0.6			
ES			1.8		0.5			
AYLL-70			9.7		9.4			

Table 14a

Further malignancies in deaths in period 1999–2019
MALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C00	Lip	1	1.2	1	100.0				
C03–C06	Oral cavity	3	3.5					3	100.0
C09–C10	Oropharynx	10	11.6	8	80.0	1	10.0	1	10.0
C12–C13	Hypopharynx	6	7.0	3	50.0			3	50.0
C14	ENT cancer	1	1.2					1	100.0
C15	Oesophagus	7	8.1			1	14.3	6	85.7
C16	Stomach	1	1.2					1	100.0
C18	Colon	2	2.3	1	50.0	1	50.0		
C19–C20	Rectum	6	7.0	4	66.7			2	33.3
C22	Liver	2	2.3			2	100.0		
C25	Pancreas	1	1.2					1	100.0
C30–C31	Sinuses	5	5.8	2	40.0			3	60.0
C32	Larynx	3	3.5	1	33.3	1	33.3	1	33.3
C33–C34	Lung	12	14.0	2	16.7			10	83.3
C38,C45	Mesothelioma	1	1.2					1	100.0
C43	Malign. melanoma	2	2.3	1	50.0			1	50.0
C44	Skin others	2	2.3			1	50.0	1	50.0
C46,C49	Soft tissue	2	2.3	2	100.0				
C61	Prostate	5	5.8	3	60.0			2	40.0
C64	Kidney	2	2.3	1	50.0			1	50.0
C67	Bladder	5	5.8	4	80.0			1	20.0
C70–C72	CNS cancer	1	1.2					1	100.0
C76–C79	CUP	1	1.2	1	100.0				
C82–C85	NHL	3	3.5	2	66.7			1	33.3
C91–C96	Leukaemia	2	2.3					2	100.0
All further malignancies		86	100.0	36	41.9	7	8.1	43	50.0

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 1999–2019
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C00	Lip	1	2.4					1	100.0
C03–C06	Oral cavity	4	9.8					4	100.0
C09–C10	Oropharynx	3	7.3					3	100.0
C15	Oesophagus	2	4.9	1	50.0			1	50.0
C16	Stomach	1	2.4	1	100.0				
C18	Colon	2	4.9					2	100.0
C19–C20	Rectum	1	2.4					1	100.0
C22	Liver	1	2.4			1	100.0		
C33–C34	Lung	4	9.8					4	100.0
C44	Skin others	7	17.1	4	57.1	1	14.3	2	28.6
C46,C49	Soft tissue	1	2.4					1	100.0
C50	Breast	8	19.5	4	50.0			4	50.0
C53	Cervix uteri	2	4.9	1	50.0			1	50.0
C54	Corpus uteri	2	4.9	1	50.0			1	50.0
C67	Bladder	1	2.4					1	100.0
C76–C79	CUP	1	2.4					1	100.0
All further malignancies		41	100.0	12	29.3	2	4.9	27	65.9

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

Table 15

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2019
(**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								
30-34								
35-39								
40-44	1	1	0.0	1.00	0.0	1.00	0.2	0.1
45-49	5	1	0.2	0.50	0.0	0.50	0.4	0.1
50-54	6		0.3	0.50			0.3	
55-59	10	2	0.5	0.56	0.1	0.29	0.3	0.1
60-64	8	2	0.5	0.89	0.1	0.33	0.2	0.1
65-69	15	5	1.0	1.00	0.3	0.38	0.2	0.1
70-74	14	9	1.0	0.74	0.6	0.60	0.2	0.1
75-79	11	4	1.0	0.92	0.3	0.67	0.1	0.1
80-84	3	7	0.5	0.50	0.7	1.17	0.0	0.1
85+	5	18	1.2	1.00	1.9	1.20	0.1	0.2
All ages	78	49					0.2	0.1
Mortality								
Raw			0.3	0.72	0.2	0.64		
WS			0.1	0.70	0.0	0.47		
ES			0.2	0.71	0.1	0.50		
BRD-S			0.2	0.72	0.1	0.55		
PYLL-70								
per 100,000			1.8		0.4			
ES			1.5		0.3			
AYLL-70			10.4		9.3			

* 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.	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	1	1	0.0	1.00	0.0	1.00	0.2	0.1
45-49	5	1	0.2	0.50	0.0	0.50	0.4	0.1
50-54	6		0.3	0.55			0.3	
55-59	7	2	0.4	0.44	0.1	0.33	0.2	0.1
60-64	4	2	0.2	0.50	0.1	0.33	0.1	0.1
65-69	11	4	0.7	0.85	0.2	0.36	0.2	0.1
70-74	9	5	0.6	0.53	0.3	0.45	0.1	0.1
75-79	8	3	0.7	0.67	0.2	0.50	0.1	0.0
80-84	1	7	0.2	0.20	0.7	1.17	0.0	0.1
85+	3	14	0.7	0.75	1.5	1.08	0.1	0.2
All ages	55	39					0.1	0.1
Mortality								
Raw			0.2	0.56	0.1	0.57		
WS			0.1	0.56	0.0	0.42		
ES			0.1	0.56	0.1	0.45		
BRD-S			0.2	0.56	0.1	0.50		
PYLL-70								
per 100,000			1.5		0.4			
ES			1.2		0.3			
AYLL-70			11.5		10.0			

* See corresponding tables with multiple malignancies.

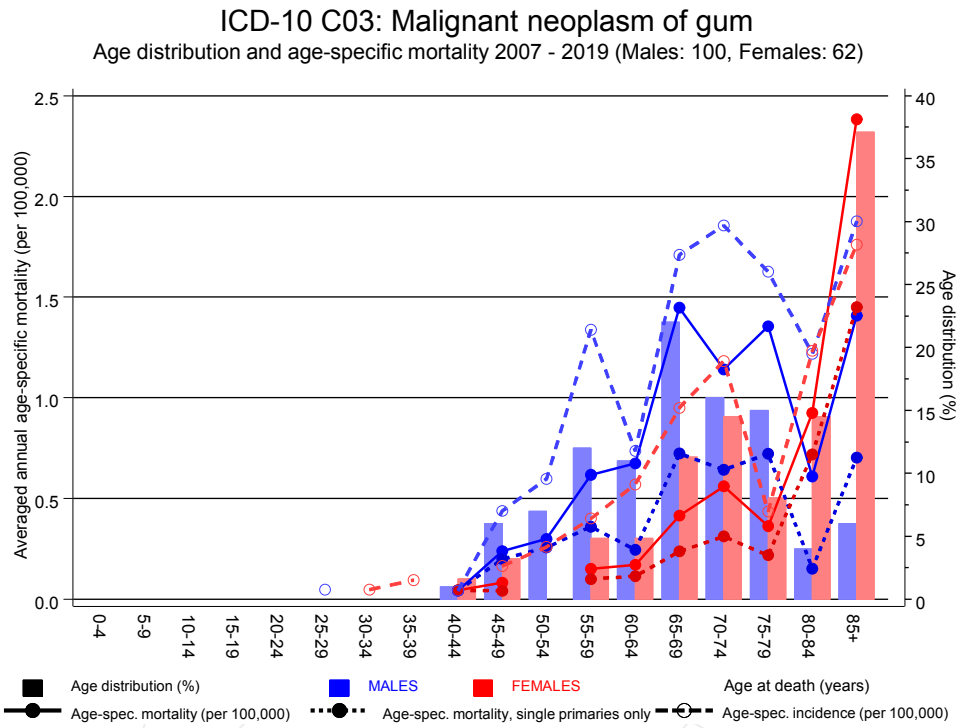


Figure 17. Distribution of age at death (bars; males: mean=62.7 yrs, median=62.5 yrs; females: mean=73.5 yrs, median=74.1 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

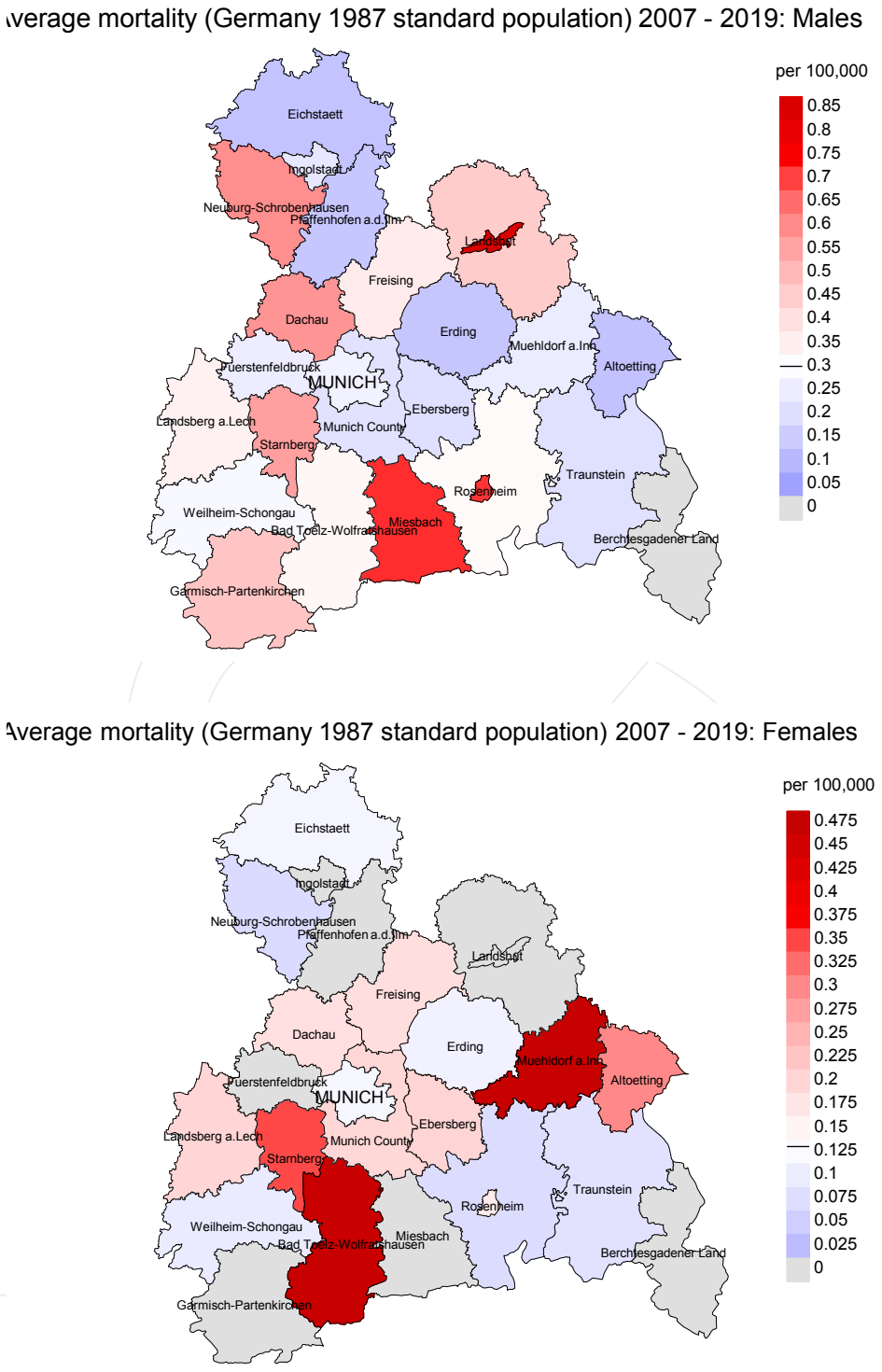
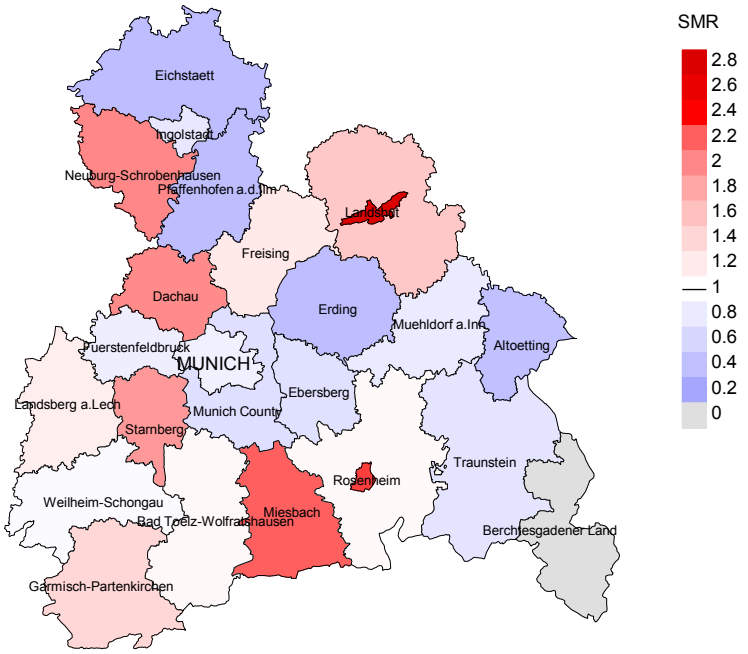


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2019. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.3/100,000 WS N=100, females 0.1/100,000 WS N=62).

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

Standardized mortality ratio (SMR) 2007 - 2019: Males



Standardized mortality ratio (SMR) 2007 - 2019: Females

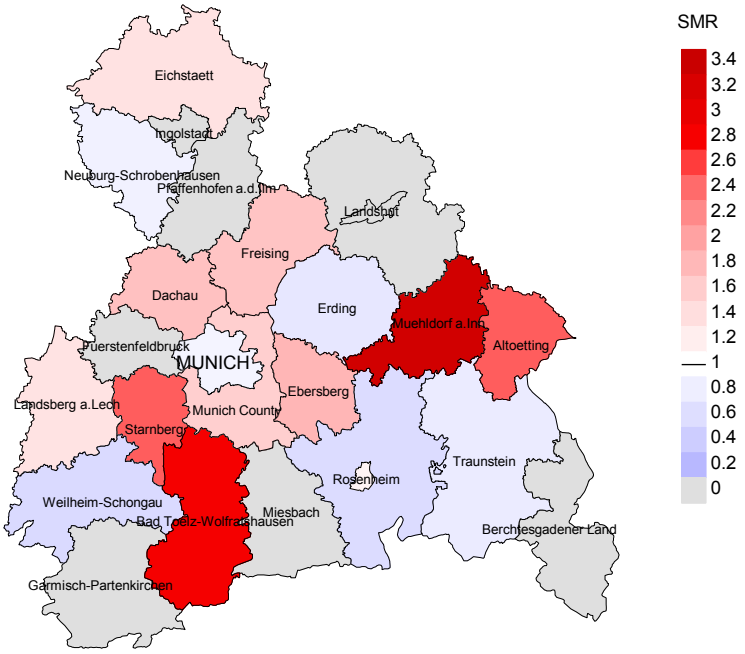


Figure 18b. Map of standardized mortality ratio (SMR) by county averaged for period 2007 to 2019. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=100, females N=62).

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 3 women died from gum cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.83. Though, the value of this parameter may vary with an underlying probability of 99% between 0.21 and 6.70, 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

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