Munich Cancer Registry

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ICD-10 C30, C31: Nasal cavity, middle ear, sinuses cancer

Incidence and Mortality

Year of diagnosis	1998-2020
Patients	811
Diseases	818
Creation date	12/21/2021
Database export	12/20/2021
Population	4.95 m

Munich Cancer Registry
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https://www.tumorregister-muenchen.de/en

https://www.tumorregister-muenchen.de/en/facts/base/bC3031E-ICD-10-C30-C31-Nasal-cavity-middle-ear-sinuses-cancer-incidence-and-mortality.pdf

Index of figures and tables

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

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

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

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

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

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

Munich Cancer Registry, December 2021

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

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

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

Some remarks regarding this cancer type

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

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

Code	Description
C30.-	Malignant neoplasm of nasal cavity and middle ear
C30.0	Nasal cavity
C30.1	Middle ear
C31.-	Malignant neoplasm of accessory sinuses
C31.0	Maxillary sinus
C31.1	Ethmoidal sinus
C31.2	Frontal sinus
C31.3	Sphenoidal sinus
C31.8	Overlapping lesion of accessory sinuses
C31.9	Accessory sinus, unspecified

INCIDENCE

Table 1

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

Year of diagnosis	All cases n	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	20	1	5.0	15.0	16.1	75.0	95.0
1999	19	1	5.3	20.5	16.3	84.2	100.0
2000	22	2	9.1	14.8	16.0	77.3	100.0
2001	13	1	7.7	13.5	16.0	76.9	100.0
2002	26	2	7.7	13.0	16.0	88.5	100.0 #
2003	38	2	5.3	12.3	16.0	86.8	97.4
2004	24			13.6	15.8	62.5	95.8
2005	31			14.0	15.6	80.6	100.0
2006	39	3	7.7	16.4	15.4	76.9	100.0
2007	47	3	6.4	15.4	15.5	63.8	95.7 #
2008	42	2	4.8	15.6	14.3	59.5	100.0
2009	49	1	2.0	15.1	14.1	55.1	98.0
2010	54	1	1.9	14.2	13.8	57.4	98.1
2011	52	2	3.8	14.5	12.6	67.3	94.2
2012	57	1	1.8	15.2	11.4	54.4	98.2
2013	45			15.9	10.5	53.3	97.8
2014	65	1	1.5	16.2	9.8	50.8	93.8
2015	52	1	1.9	16.1	10.5	36.5	98.1
2016	36	2	5.6	16.1	10.8	50.0	100.0
2017	31	2	6.5	16.7	10.6	48.4	100.0
2018	32			17.1	8.9	25.0	100.0
2019	17			17.0	8.3	23.5	100.0
2020	7			16.9	0.0	14.3	100.0 ##
1998-2020	818	28	3.4	16.9	16.1	59.3	97.9

818 cases diagnosed 1998-2020 are related to a total of 811 patients. Currently, in 252 (31.1 %) of these 811 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 182 / 48 / 22 (22.4 % / 5.9 % / 2.7 %) 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 2018, a subgroup of 32 cases has been diagnosed, of which 17.1 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 8.9 % 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 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	14	70.0			14.3	16.8	78.6	92.9	
1999	11	57.9			12.0	17.0	72.7	100.0	
2000	16	72.7	1	6.3	9.8	17.0	68.8	100.0	
2001	8	61.5			8.2	16.7	87.5	100.0	
2002	14	53.8	2	14.3	7.9	16.6	92.9	100.0	#
2003	23	60.5	1	4.3	8.1	16.7	95.7	100.0	
2004	15	62.5			10.9	16.8	66.7	100.0	
2005	20	64.5			11.6	16.4	85.0	100.0	
2006	21	53.8	3	14.3	14.8	16.2	81.0	100.0	
2007	33	70.2	2	6.1	13.7	16.6	60.6	100.0	#
2008	29	69.0	1	3.4	13.7	14.8	58.6	100.0	
2009	29	59.2			13.7	13.8	55.2	100.0	
2010	36	66.7			11.9	13.4	58.3	97.2	
2011	38	73.1	2	5.3	12.4	12.0	68.4	97.4	
2012	29	50.9			14.0	10.2	55.2	96.6	
2013	28	62.2			14.6	9.5	57.1	100.0	
2014	35	53.8			14.5	8.6	54.3	94.3	
2015	34	65.4			14.3	8.5	38.2	100.0	
2016	20	55.6	1	5.0	14.6	8.2	45.0	100.0	
2017	20	64.5	2	10.0	15.6	7.4	40.0	100.0	
2018	22	68.8			16.2	5.6	18.2	100.0	
2019	9	52.9			15.9	14.3	11.1	100.0	
2020	5	71.4			15.7	0.0	20.0	100.0	##
1998-2020	509	62.2	15	2.9	15.7	16.8	59.5	98.8	

509 cases diagnosed 1998-2020 are related to a total of 507 patients. Currently, in 155 (30.6 %) of these 507 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 107 / 33 / 15 (21.1 % / 6.5 % / 3.0 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:
In 2018, a subgroup of 22 cases has been diagnosed, of which 16.2 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 5.6 % 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	6	30.0	1	16.7	16.7	15.1	66.7	100.0	
1999	8	42.1	1	12.5	35.7	15.1	100.0	100.0	
2000	6	27.3	1	16.7	25.0	14.4	100.0	100.0	
2001	5	38.5	1	20.0	24.0	14.7	60.0	100.0	
2002	12	46.2			21.6	15.0	83.3	100.0	#
2003	15	39.5	1	6.7	19.2	14.9	73.3	93.3	
2004	9	37.5			18.0	14.1	55.6	88.9	
2005	11	35.5			18.1	14.2	72.7	100.0	
2006	18	46.2			18.9	14.0	72.2	100.0	
2007	14	29.8	1	7.1	18.3	13.7	71.4	85.7	#
2008	13	31.0	1	7.7	18.8	13.6	61.5	100.0	
2009	20	40.8	1	5.0	17.5	14.6	55.0	95.0	
2010	18	33.3	1	5.6	18.1	14.5	55.6	100.0	
2011	14	26.9			18.3	13.4	64.3	85.7	
2012	28	49.1	1	3.6	17.3	13.2	53.6	100.0	
2013	17	37.8			18.2	11.9	47.1	94.1	
2014	30	46.2	1	3.3	18.9	11.6	46.7	93.3	
2015	18	34.6	1	5.6	19.1	13.8	33.3	94.4	
2016	16	44.4	1	6.3	18.7	14.9	56.3	100.0	
2017	11	35.5			18.3	16.1	63.6	100.0	
2018	10	31.3			18.7	15.0	40.0	100.0	
2019	8	47.1			18.9	0.0	37.5	100.0	
2020	2	28.6			18.8	0.0		100.0	##
1998-2020	309	37.8	13	4.2	18.8	15.1	58.9	96.4	

309 cases diagnosed 1998-2020 are related to a total of 304 patients. Currently, in 97 (31.9 %) of these 304 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 75 / 15 / 7 (24.7 % / 4.9 % / 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 retreived from the respective headings.

How to interpret:
In 2018, a subgroup of 10 cases has been diagnosed, of which 18.7 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 15.0 % 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 including DCO cases
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.94 m as of 2007, respectively)

Year of diagnosis	Males n	Females n	Males Inc. raw	Fem. Inc. raw	Males Inc. WS	Fem. Inc. WS	Males Inc. ES	Fem. Inc. ES	Males Inc. BRD-S	Fem. Inc. BRD-S
1998	14	6	1.3	0.5	0.8	0.3	1.1	0.4	1.5	0.5
1999	11	8	1.0	0.7	0.6	0.2	0.8	0.4	0.9	0.6
2000	16	6	1.4	0.5	0.9	0.3	1.3	0.4	1.6	0.4
2001	8	5	0.7	0.4	0.4	0.2	0.6	0.2	0.9	0.3
2002	14	12	0.8	0.6	0.4	0.3	0.6	0.5	0.8	0.5
2003	23	15	1.2	0.8	0.8	0.4	1.1	0.5	1.3	0.7
2004	15	9	0.8	0.5	0.5	0.3	0.7	0.3	0.9	0.4
2005	20	11	1.1	0.6	0.6	0.2	0.8	0.3	1.0	0.4
2006	21	18	1.1	0.9	0.7	0.5	0.9	0.6	1.1	0.8
2007	33	14	1.5	0.6	0.9	0.3	1.2	0.4	1.5	0.5
2008	29	13	1.3	0.6	0.8	0.3	1.1	0.4	1.2	0.4
2009	29	20	1.3	0.9	0.8	0.4	1.0	0.6	1.3	0.7
2010	36	18	1.6	0.8	1.0	0.3	1.3	0.5	1.5	0.6
2011	38	14	1.7	0.6	0.9	0.3	1.3	0.4	1.5	0.5
2012	29	28	1.3	1.2	0.8	0.6	1.0	0.8	1.2	0.9
2013	28	17	1.2	0.7	0.7	0.4	0.9	0.5	1.1	0.6
2014	35	30	1.5	1.2	0.7	0.6	1.1	0.9	1.4	1.0
2015	34	18	1.4	0.7	0.7	0.3	1.1	0.5	1.3	0.6
2016	20	16	0.8	0.7	0.5	0.3	0.7	0.5	0.8	0.5
2017	20	11	0.8	0.4	0.4	0.2	0.6	0.3	0.8	0.4
2018	22	10	0.9	0.4	0.5	0.2	0.7	0.3	0.8	0.3
2019	9	8	0.4	0.3	0.2	0.2	0.3	0.2	0.3	0.3
2020	5	2	0.2	0.1	0.1	0.0	0.1	0.1	0.2	0.1
1998-2020	509	309	1.1	0.6	0.6	0.3	0.9	0.4	1.0	0.5

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

Table 3

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	20	64.3	13.7	38.0	84.5	38.1	58.3	67.0	73.9	79.4
1999	19	64.6	14.9	33.5	82.4	36.0	59.3	66.8	76.2	80.9
2000	22	65.4	15.8	20.4	90.5	49.6	58.0	67.1	73.7	85.5
2001	13	66.9	18.0	37.4	89.9	44.6	53.0	66.8	83.6	84.7
2002	26	67.3	12.7	41.3	92.7	51.7	59.6	65.7	77.9	83.3
2003	38	65.0	16.1	16.2	91.8	46.1	52.5	67.1	78.9	84.2
2004	24	63.8	17.0	25.9	88.6	43.0	56.4	64.3	78.1	82.7
2005	31	68.6	15.3	31.7	96.1	44.7	58.3	71.1	78.1	83.7
2006	39	64.9	13.4	24.1	91.0	48.9	54.0	64.8	75.1	81.3
2007	47	63.1	15.6	20.2	86.2	39.0	54.4	64.5	77.1	81.4
2008	42	61.2	18.5	14.1	93.9	39.0	46.4	60.3	71.5	90.1
2009	49	65.5	17.8	2.4	95.8	41.2	54.5	69.1	78.9	84.6
2010	54	64.1	17.0	16.6	103	43.0	55.2	66.4	75.0	84.8
2011	52	63.3	14.3	37.7	86.1	46.4	50.6	63.8	76.7	79.4
2012	57	65.3	14.8	18.6	94.9	46.3	55.9	64.6	72.8	87.2
2013	45	63.8	13.8	34.5	90.1	41.8	55.8	65.1	73.7	78.7
2014	65	67.5	14.0	25.6	88.5	44.7	59.5	71.7	77.7	83.9
2015	52	66.9	12.7	41.4	94.1	50.4	57.0	68.7	76.8	82.4
2016	36	64.3	12.7	41.2	89.1	44.6	55.2	65.0	71.8	81.3
2017	31	65.4	13.3	40.4	85.8	44.6	56.0	66.8	75.9	80.3
2018	32	64.9	15.8	34.6	94.4	44.0	52.4	66.5	76.6	82.3
2019	17	67.8	15.4	27.9	86.9	46.0	58.3	70.9	79.4	84.3
2020	7	66.5	12.4	54.2	85.1	54.2	56.4	65.4	81.6	85.1
1998–2020	818	65.1	15.0	2.4	103	44.6	55.3	66.2	76.5	83.5

Table 3a

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	14	62.4	15.6	38.0	84.5	38.1	53.1	66.4	73.0	82.7
1999	11	56.2	14.1	33.5	72.8	36.0	38.6	60.7	66.3	70.3
2000	16	64.3	15.7	20.4	85.5	44.1	58.3	68.7	73.5	84.2
2001	8	66.7	14.9	51.5	84.7	51.5	53.8	61.7	83.4	84.7
2002	14	69.1	14.7	41.3	92.7	46.6	61.1	69.4	80.8	85.8
2003	23	62.8	13.4	38.2	87.0	46.1	49.8	63.7	71.1	79.6
2004	15	63.3	16.2	25.9	83.4	43.0	54.4	63.3	77.3	82.7
2005	20	63.4	14.1	31.7	78.8	42.5	54.7	68.2	75.2	77.8
2006	21	62.7	11.5	44.7	86.9	48.9	54.0	63.8	68.8	76.9
2007	33	61.8	16.5	20.2	86.2	37.6	54.4	62.3	74.8	81.4
2008	29	58.8	15.8	35.5	93.9	37.9	46.2	58.0	69.4	79.3
2009	29	63.4	19.1	2.4	86.8	39.0	53.7	68.1	78.0	82.0
2010	36	60.3	16.0	16.6	84.8	37.6	51.7	63.4	71.6	76.7
2011	38	62.6	14.0	37.7	85.4	41.6	51.7	62.9	74.9	79.0
2012	29	62.8	15.6	18.6	94.9	45.0	52.9	64.6	72.1	84.3
2013	28	63.8	12.2	37.1	80.9	42.9	56.5	65.1	74.1	76.5
2014	35	69.2	12.0	25.6	85.1	56.2	60.5	71.7	77.6	82.4
2015	34	66.7	11.7	47.3	94.1	51.3	57.5	66.7	75.5	79.5
2016	20	62.2	13.9	41.2	86.5	43.8	51.2	62.1	71.7	80.7
2017	20	66.1	13.1	40.4	84.1	44.3	60.1	68.2	75.8	80.6
2018	22	63.4	15.6	34.6	88.9	42.3	52.0	61.9	77.2	81.6
2019	9	70.5	13.4	46.0	86.9	46.0	64.8	74.0	79.6	86.9
2020	5	68.7	14.1	54.2	85.1	54.2	56.5	66.0	81.6	85.1
1998–2020	509	63.6	14.6	2.4	94.9	43.0	54.0	64.9	75.0	80.9

Table 3b

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	6	68.6	6.7	58.1	76.2	58.1	64.4	69.0	74.9	76.2
1999	8	76.1	4.8	66.8	82.4	66.8	74.6	76.4	79.0	82.4
2000	6	68.3	17.0	49.6	90.5	49.6	56.9	62.5	87.7	90.5
2001	5	67.0	24.2	37.4	89.9	37.4	44.6	79.5	83.8	89.9
2002	12	65.2	10.3	51.7	83.3	53.9	55.8	64.5	73.3	77.9
2003	15	68.3	19.6	16.2	91.8	48.0	52.5	75.2	80.1	84.2
2004	9	64.8	19.4	25.9	88.6	25.9	58.3	67.0	79.5	88.6
2005	11	78.2	12.9	57.9	96.1	58.3	69.9	80.4	89.8	94.1
2006	18	67.5	15.2	24.1	91.0	49.9	63.7	70.5	77.1	83.4
2007	14	66.1	13.2	39.0	83.6	47.7	62.6	67.9	77.1	79.1
2008	13	66.5	23.3	14.1	93.0	44.6	52.7	65.6	90.1	91.7
2009	20	68.4	15.5	41.2	95.8	50.0	55.1	71.2	81.1	87.9
2010	18	71.7	16.9	36.7	103	52.1	56.3	72.9	85.5	89.7
2011	14	65.0	15.5	46.4	86.1	46.7	48.9	69.9	78.8	81.1
2012	28	67.9	13.7	42.5	92.5	46.5	60.4	65.2	78.0	88.4
2013	17	63.8	16.5	34.5	90.1	37.7	55.8	65.0	70.5	88.9
2014	30	65.5	16.1	34.9	88.5	42.4	52.6	69.0	78.4	84.4
2015	18	67.4	14.8	41.4	92.2	49.4	52.8	69.7	78.6	85.7
2016	16	67.0	11.0	47.2	89.1	51.8	61.8	65.7	72.0	84.7
2017	11	64.2	14.4	41.9	85.8	44.6	54.0	65.0	77.4	79.5
2018	10	68.0	16.4	44.0	94.4	46.0	54.0	69.8	74.2	91.8
2019	8	64.7	17.8	27.9	84.3	27.9	56.8	69.4	76.7	84.3
2020	2	60.9	6.3	56.4	65.4	56.4	56.4	60.9	65.4	65.4
1998–2020	309	67.5	15.4	14.1	103	47.3	56.9	68.8	78.9	86.7

Table 4

Age distribution by 5-year age group and sex for period 2007-2020 (incl. DCO)

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4	1	0.2	0.2	1	0.3	0.3			0.0
5-9	0	0.0	0.2			0.3			0.0
10-14	1	0.2	0.3			0.3	1	0.5	0.5
15-19	3	0.5	0.9	3	0.8	1.1			0.5
20-24	1	0.2	1.0	1	0.3	1.4			0.5
25-29	2	0.3	1.4	1	0.3	1.6	1	0.5	0.9
30-34	5	0.9	2.2	3	0.8	2.5	2	0.9	1.8
35-39	17	2.9	5.1	13	3.5	6.0	4	1.8	3.7
40-44	36	6.1	11.3	23	6.3	12.3	13	5.9	9.6
45-49	35	6.0	17.2	22	6.0	18.3	13	5.9	15.5
50-54	47	8.0	25.3	31	8.4	26.7	16	7.3	22.8
55-59	68	11.6	36.9	44	12.0	38.7	24	11.0	33.8
60-64	63	10.8	47.6	41	11.2	49.9	22	10.0	43.8
65-69	60	10.2	57.8	36	9.8	59.7	24	11.0	54.8
70-74	83	14.2	72.0	55	15.0	74.7	28	12.8	67.6
75-79	76	13.0	85.0	51	13.9	88.6	25	11.4	79.0
80-84	44	7.5	92.5	27	7.4	95.9	17	7.8	86.8
85+	44	7.5	100.0	15	4.1	100.0	29	13.2	100.0
All ages	586	100.0		367	100.0		219	100.0	

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 2007–2020

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.	Males DCO rate n=8 %	Females DCO rate n=8 %	Males Prop.all cancers n=153686 %	Females Prop.all cancers n=155051 %
0- 4	1		0.1				0.5	
5- 9								
10-14		1		0.1				0.8
15-19	3		0.2				0.9	
20-24	1		0.0				0.2	
25-29	1	1	0.0	0.0			0.1	0.1
30-34	3	2	0.1	0.1			0.2	0.1
35-39	13	4	0.6	0.2			0.7	0.1
40-44	23	13	0.9	0.5			0.8	0.2
45-49	22	13	0.8	0.5			0.4	0.1
50-54	31	16	1.2	0.6			0.4	0.1
55-59	44	24	2.1	1.1		4.2	0.3	0.2
60-64	41	22	2.3	1.2	2.4		0.2	0.1
65-69	36	24	2.2	1.3		4.2	0.1	0.1
70-74	55	27	3.7	1.6	1.8		0.2	0.1
75-79	51	25	4.2	1.7	2.0		0.2	0.1
80-84	27	17	3.7	1.6	7.4		0.2	0.1
85+	15	29	3.2	2.8	20.0	20.7	0.1	0.2
All ages	367	218			2.2	3.7	0.2	0.1
Incidence								
Raw			1.1	0.6				
WS			0.6	0.3				
ES			0.9	0.4				
BRD-S			1.0	0.5				

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

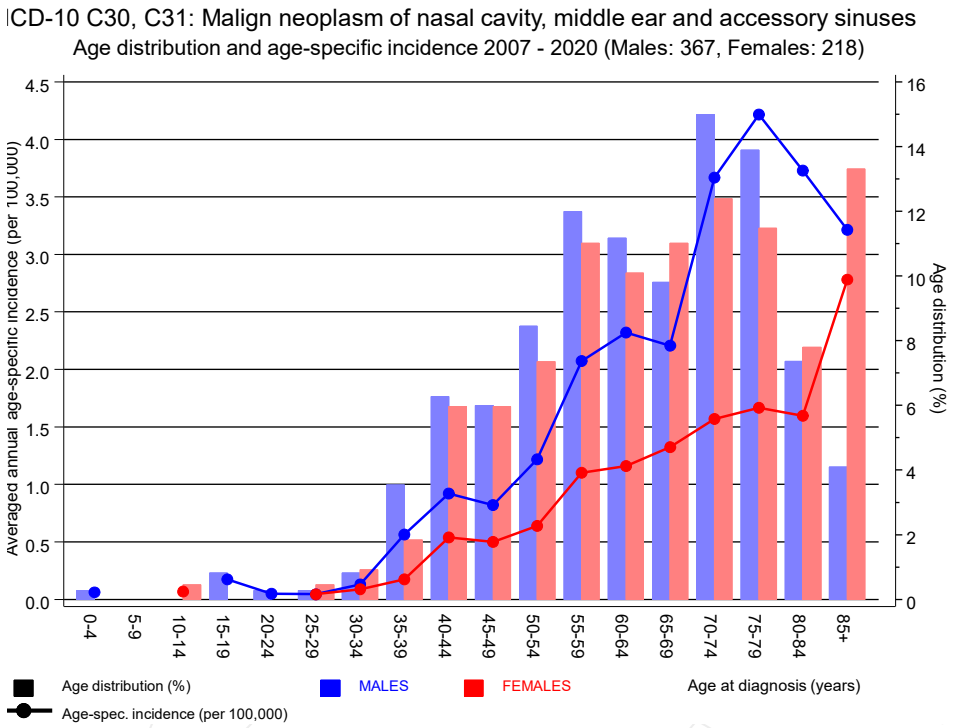


Figure 6. Age distribution (males: mean=63.7 yrs, median=65.1 yrs; females: mean=66.8 yrs, median=66.8 yrs) and age-specific incidence.

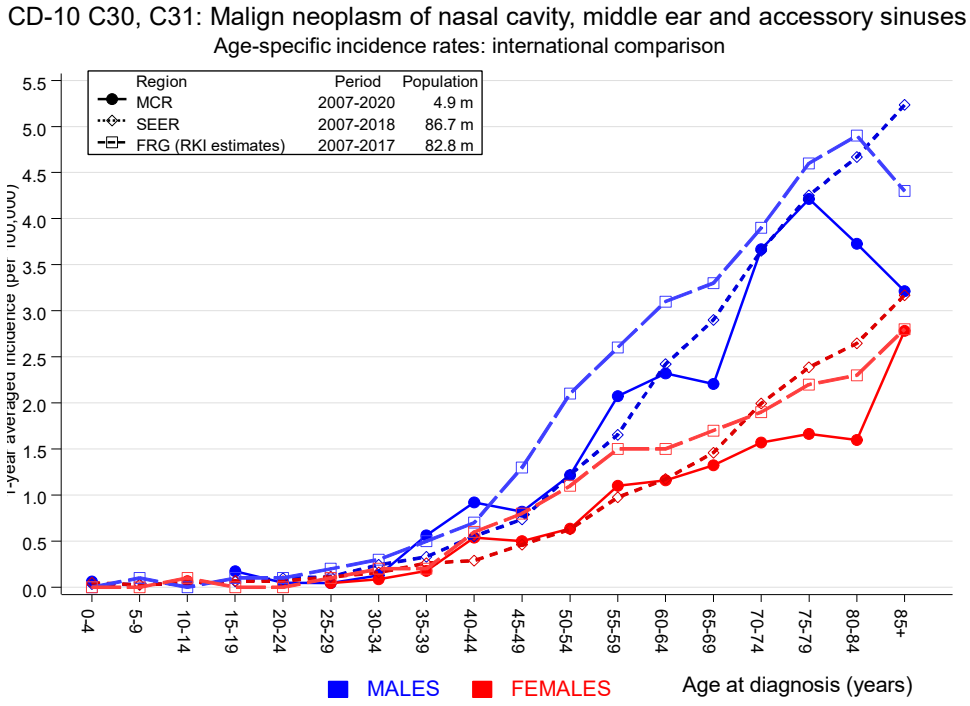


Figure 6a. Age-specific incidence in MCR registry areas compared to Germany (FRG, RKI estimates) and SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

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

Table 7a

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

MALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C00	Lip	1	0.0	38.1	1.0	212.1		5.2	
C03–C06	Oral cavity	3	0.2	13.5	2.8	39.3	#	14.9	
C07–C08	Salivary gland	1	0.1	16.8	0.4	93.5		5.1	
C09–C10	Oropharynx	3	0.3	10.9	2.2	31.8	#	14.7	33.3
C11	Nasopharynx	2	0.0	100.4	12.2	362.7	#	10.7	50.0
C12–C13	Hypopharynx	1	0.1	6.8	0.2	37.8		4.6	
C14	ENT cancer	1	0.0	167.1	4.2	930.8	#	5.3	100.0
C15	Oesophagus	4	0.5	7.6	2.1	19.4	#	18.7	
C16	Stomach	4	1.0	4.2	1.1	10.7	#	16.4	
C17	Small intestine	2	0.2	12.6	1.5	45.4	#	9.9	
C18	Colon	7	2.4	2.9	1.2	6.1	#	24.9	14.3
C19–C20	Rectum	5	1.3	3.7	1.2	8.7	#	19.7	
C22	Liver	1	0.8	1.3	0.0	7.4		1.3	
C23–C24	Bile	2	0.3	7.5	0.9	27.0		9.3	
C25	Pancreas	4	1.0	4.0	1.1	10.2	#	16.1	
C26	GI cancer	1	0.0	40.8	1.0	227.5	#	5.3	
C30–C31	Sinuses	2	0.1	39.9	4.8	144.0	#	10.5	50.0
C33–C34	Lung	15	3.0	5.0	2.8	8.3	#	64.6	6.7
C38,C45	Mesothelioma	1	0.2	5.7	0.1	31.9		4.4	
C43	Malign. melanoma	5	1.2	4.1	1.3	9.6	#	20.4	60.0
C46,C49	Soft tissue	1	0.1	6.8	0.2	38.0		4.6	
C61	Prostate	3	7.0	0.4	0.1	1.2		-21.7	
C64	Kidney	2	0.9	2.3	0.3	8.2		6.0	
C70–C72	CNS cancer	1	0.3	3.0	0.1	16.9		3.6	100.0
C73	Thyroid	1	0.2	5.5	0.1	30.8		4.4	
C76–C79	CUP	5	0.4	12.0	3.9	27.9	#	24.7	
C81	Hodgkin lymphoma	1	0.1	15.2	0.4	84.8		5.0	
C82–C85	NHL	2	1.1	1.9	0.2	6.8		5.0	
C90	Mult. myeloma	1	0.3	3.0	0.1	16.9		3.6	
C91–C96	Leukaemia	2	0.4	5.2	0.6	18.9		8.7	
Not observed		0	2.1	0.0	0.0	1.8		-11.3	
All further malignancies		84	25.5	3.3	2.6	4.1	#	314.7	11.9

Patients	497
Median age at next malignancy (years)	71.5
Person-years	1858
Mean observation time (years)	3.7
Median observation time (years)	2.4

The occurrence of further specified malignancy is statistically significant.

Table 7b

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

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C03–C06	Oral cavity	3	0.1	45.8	9.4	133.9	#	28.5	
C07–C08	Salivary gland	1	0.0	51.5	1.3	286.8	#	9.5	
C09–C10	Oropharynx	1	0.0	22.1	0.6	123.2		9.3	
C11	Nasopharynx	4	0.0	990.4	269.8	2536	#	38.9	25.0
C14	ENT cancer	1	0.0	455.8	11.5	2539	#	9.7	100.0
C16	Stomach	1	0.4	2.4	0.1	13.4		5.7	
C18	Colon	1	1.2	0.9	0.0	4.7		−1.7	
C19–C20	Rectum	1	0.5	2.2	0.1	12.1		5.2	
C22	Liver	1	0.1	6.7	0.2	37.6		8.3	
C25	Pancreas	4	0.6	7.1	1.9	18.2	#	33.4	50.0
C30–C31	Sinuses	5	0.0	287.2	93.2	670.2	#	48.4	20.0
C33–C34	Lung	3	0.8	3.6	0.7	10.4		21.0	
C43	Malign. melanoma	5	0.4	11.5	3.7	27.0	#	44.4	40.0
C50	Breast	1	3.4	0.3	0.0	1.6		−23.4	
C51	Vulva	1	0.1	7.6	0.2	42.4		8.4	
C54	Corpus uteri	1	0.6	1.6	0.0	9.1		3.8	
C56	Ovary	2	0.4	4.5	0.5	16.2		15.1	
C67	Bladder	1	0.2	4.0	0.1	22.5		7.3	
C70–C72	CNS cancer	2	0.1	14.2	1.7	51.2	#	18.1	50.0
C73	Thyroid	1	0.2	5.9	0.1	32.9		8.1	100.0
C82–C85	NHL	2	0.4	4.5	0.5	16.1		15.1	
C91–C96	Leukaemia	1	0.2	5.7	0.1	31.6		8.0	100.0
Not observed		0	1.6	0.0	0.0	2.3		−15.3	
All further malignancies		43	11.5	3.7	2.7	5.0	#	305.8	23.3

Patients	297
Median age at next malignancy (years)	74.0
Person-years	1028
Mean observation time (years)	3.5
Median observation time (years)	2.1

The occurrence of further specified malignancy is statistically significant.

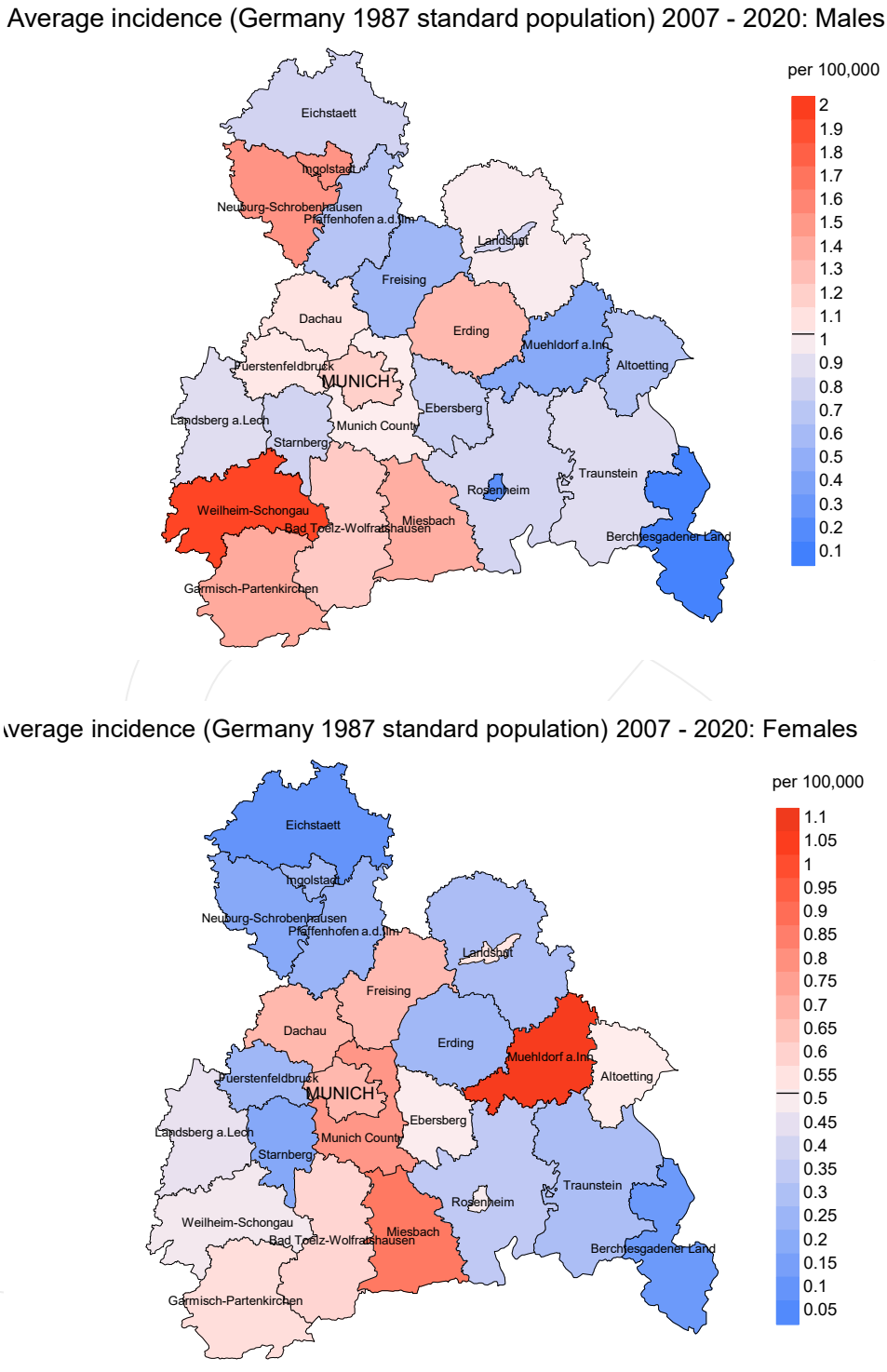
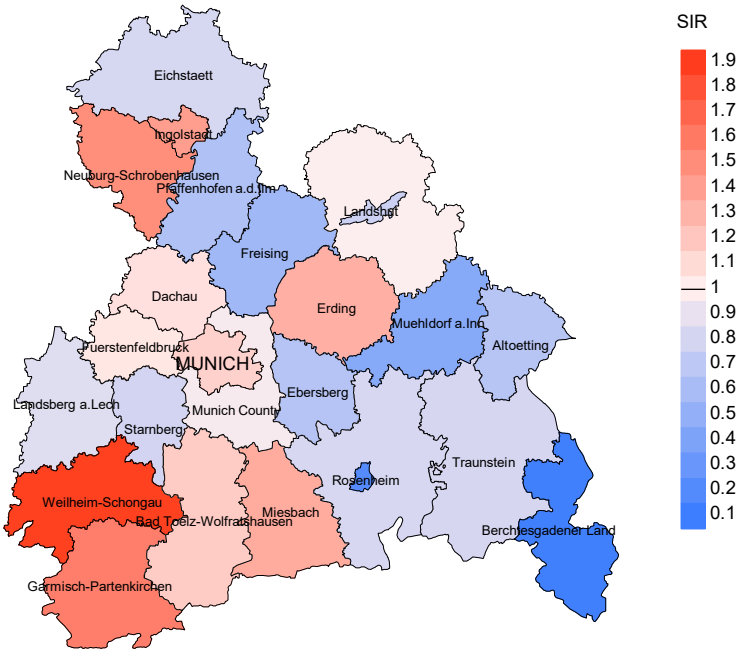


Figure 8a. Map of cancer incidence (german standard population, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 1.0/100,000 WS N=367, females 0.5/100,000 WS N=218).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,727 female residents (averaged) in the period from 2007 to 2020 a total of 6 women were identified with newly diagnosed nasal cavity, middle ear, sinuses cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 0.5/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.1 and 1.4/100,000.

Standardized incidence ratio (SIR) 2007 - 2020: Males



Standardized incidence ratio (SIR) 2007 - 2020: Females

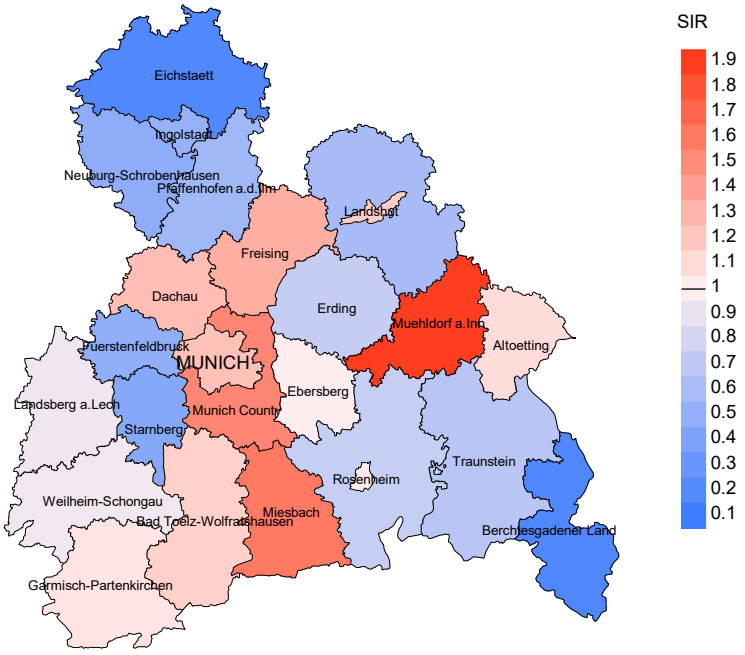


Figure 8b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=367, females N=218).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2020 a total of 6 women were identified with newly diagnosed nasal cavity, middle ear, sinuses cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.00. Though, the value of this parameter may vary with an underlying probability of 99% between 0.26 and 2.61, and is therefore not statistically striking.

MORTALITY

Table 9a

Annual cohorts: Incident cancers, follow-up status, proportion of DCO, deaths among the annual cohorts and proportion of available death certificates (with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.94 m as of 2007, respectively)

Year of diagnosis	Incident cases n	Prop. actively followed %	Prop. DCO %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	20	95.0	5.0	15	75.0	93.3
1999	19	100.0	5.3	16	84.2	87.5
2000	22	100.0	9.1	17	77.3	100.0
2001	13	100.0	7.7	10	76.9	100.0
2002	26	100.0	7.7	23	88.5	91.3
2003	38	97.4	5.3	33	86.8	90.9
2004	24	95.8		15	62.5	100.0
2005	31	100.0		25	80.6	100.0
2006	39	100.0	7.7	30	76.9	100.0
2007	47	95.7	6.4	30	63.8	93.3
2008	42	100.0	4.8	25	59.5	92.0
2009	49	98.0	2.0	27	55.1	100.0
2010	54	98.1	1.9	31	57.4	93.5
2011	52	94.2	3.8	35	67.3	94.3
2012	57	98.2	1.8	31	54.4	96.8
2013	45	97.8		24	53.3	91.7
2014	65	93.8	1.5	33	50.8	93.9
2015	52	98.1	1.9	19	36.5	100.0
2016	36	100.0	5.6	18	50.0	83.3
2017	31	100.0	6.5	15	48.4	93.3
2018	32	100.0		8	25.0	87.5
2019	17	100.0		4	23.5	75.0
2020	7	100.0		1	14.3	100.0
1998–2020	818	97.9	3.4	485	59.3	94.4

Table 9b

Annual cohorts of incident cancers and deaths, proportion of death certificates and cases deceased within the same year of being diagnosed with cancer (incl. DCO)
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.94 m as of 2007, respectively)

Year of diagnosis/ death	Incident cases n	Deaths n	Prop. deaths with death certific. %	Deaths in same year n	Prop. deaths in same year %
1998	20	12	83.3	3	15.0
1999	19	9	77.8	3	15.8
2000	22	20	100.0	2	9.1
2001	13	16	93.8	3	23.1
2002	26	21	100.0	3	11.5
2003	38	24	100.0	7	18.4
2004	24	22	90.9	1	4.2
2005	31	25	96.0	5	16.1
2006	39	28	100.0	6	15.4
2007	47	23	95.7	7	14.9
2008	42	26	100.0	7	16.7
2009	49	22	100.0	1	2.0
2010	54	28	100.0	2	3.7
2011	52	28	96.4	6	11.5
2012	57	32	96.9	4	7.0
2013	45	38	100.0	3	6.7
2014	65	34	100.0	10	15.4
2015	52	25	96.0	4	7.7
2016	36	48	97.9	4	11.1
2017	31	31	100.0	7	22.6
2018	32	25	76.0		
2019	17	18	50.0		
2020	7	20	95.0		
1998–2020	818	575	95.0	88	10.8

Table 9c

Annual cohorts of deaths, proportion of cancer-related and non-cancer-related deaths, and cancer recorded on death certificates (incl. DCO)
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.94 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. non-cancer-related %	Prop. cancer recorded on death certificate %
1998	12	58.3	41.7	90.0
1999	9	55.6	44.4	100.0
2000	20	80.0	20.0	85.0
2001	16	75.0	25.0	100.0
2002	21	52.4	47.6	71.4
2003	24	70.8	29.2	79.2
2004	22	54.5	45.5	65.0
2005	25	84.0	16.0	91.7
2006	28	89.3	10.7	89.3
2007	23	73.9	26.1	90.9
2008	26	76.9	23.1	84.6
2009	22	77.3	22.7	95.5
2010	28	67.9	32.1	78.6
2011	28	78.6	21.4	85.2
2012	32	65.6	34.4	74.2
2013	38	65.8	34.2	73.7
2014	34	67.6	32.4	79.4
2015	25	72.0	28.0	87.5
2016	48	72.9	27.1	83.0
2017	31	64.5	35.5	74.2
2018	25	72.0	28.0	89.5
2019	18	22.2	77.8	66.7
2020	20	35.0	65.0	68.4
1998-2020	575	68.2	31.8	81.9

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	6	64.9	64.9	66.6	71.1
1999	4	64.1	59.5	68.8	68.8
2000	15	69.2	69.2	70.0	68.6
2001	12	71.2	63.2	74.7	70.6
2002	15	81.1	82.9	78.0	78.4
2003	14	70.2	65.1	77.2	65.7
2004	16	75.0	68.1	78.2	67.6
2005	14	70.2	68.9	74.8	69.6
2006	14	74.9	74.4	90.4	74.3
2007	14	78.5	78.7	72.1	78.5
2008	18	68.7	67.2	80.5	67.2
2009	16	73.6	69.7	80.5	72.5
2010	14	77.9	71.0	83.6	71.3
2011	15	71.9	74.0	62.3	72.9
2012	23	73.2	72.4	80.4	72.4
2013	27	78.9	72.6	85.2	75.3
2014	21	75.1	73.9	84.5	74.9
2015	19	68.0	68.1	68.0	70.9
2016	28	76.6	72.5	77.8	72.1
2017	18	77.1	69.8	81.3	76.5
2018	15	74.2	77.6	73.5	74.5
2019	16	78.8	72.0	81.2	78.8
2020	11	77.4	66.3	78.3	66.4
1998–2020	365	74.8	71.2	79.2	71.8

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	6	83.4	70.9	84.9	83.4
1999	5	76.7	60.0	77.1	72.6
2000	5	77.4	77.4		79.5
2001	4	78.1	78.1		78.1
2002	6	79.5	87.8	78.1	80.8
2003	10	79.2	78.6	94.4	78.6
2004	6	78.5	76.2	78.5	76.2
2005	11	73.3	73.3	77.7	73.3
2006	14	78.4	78.0	97.1	78.4
2007	9	67.2	66.9	93.7	67.0
2008	8	78.0	81.1	75.0	81.1
2009	6	83.9	83.9		83.9
2010	14	71.3	74.2	68.5	68.5
2011	13	74.1	69.5	86.8	69.5
2012	9	89.0	87.6	95.3	87.6
2013	11	80.4	67.6	91.4	77.6
2014	13	84.4	81.4	86.4	81.4
2015	6	83.2	82.0	83.4	83.2
2016	20	80.0	72.2	91.8	78.2
2017	13	72.2	67.1	89.9	69.9
2018	10	68.8	63.4	76.5	63.4
2019	2	79.8		79.8	
2020	9	84.3	75.6	85.1	84.9
1998–2020	210	78.5	74.2	84.5	77.5

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

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

Table 11a

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

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	4	0.4	0.29	0.3	0.37	0.4	0.31	0.4	0.29
1999	3	0.3	0.27	0.1	0.24	0.2	0.27	0.2	0.27
2000	11	1.0	0.69	0.6	0.65	0.9	0.68	1.0	0.67
2001	8	0.7	1.00	0.4	1.00	0.6	0.90	0.8	0.95
2002	8	0.4	0.57	0.2	0.50	0.4	0.59	0.6	0.67
2003	10	0.5	0.43	0.3	0.41	0.5	0.44	0.6	0.46
2004	10	0.5	0.67	0.3	0.58	0.4	0.61	0.6	0.65
2005	12	0.6	0.60	0.3	0.59	0.5	0.59	0.7	0.64
2006	12	0.6	0.57	0.3	0.43	0.5	0.48	0.6	0.58
2007	10	0.5	0.30	0.2	0.24	0.3	0.28	0.5	0.34
2008	17	0.8	0.59	0.4	0.52	0.6	0.60	0.8	0.67
2009	11	0.5	0.38	0.3	0.33	0.4	0.36	0.5	0.36
2010	10	0.4	0.28	0.2	0.21	0.3	0.24	0.4	0.29
2011	12	0.5	0.32	0.2	0.25	0.4	0.29	0.5	0.34
2012	16	0.7	0.55	0.4	0.48	0.5	0.49	0.7	0.58
2013	18	0.8	0.64	0.4	0.57	0.6	0.62	0.8	0.69
2014	15	0.6	0.43	0.3	0.40	0.4	0.41	0.6	0.42
2015	14	0.6	0.41	0.3	0.40	0.4	0.42	0.5	0.42
2016	21	0.9	1.05	0.4	0.80	0.6	0.85	0.8	1.06
2017	12	0.5	0.60	0.2	0.55	0.4	0.58	0.4	0.57
2018	10	0.4	0.45	0.2	0.35	0.2	0.37	0.4	0.45
2019	4	0.2	0.44	0.1	0.46	0.1	0.47	0.1	0.44
2020	4	0.2	0.80	0.1	0.83	0.1	0.78	0.1	0.83
1998-2020	252	0.5	0.50	0.3	0.43	0.4	0.46	0.5	0.51

Table 11b

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

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	3	0.3	0.50	0.1	0.42	0.2	0.45	0.2	0.53
1999	2	0.2	0.29	0.1	0.61	0.2	0.49	0.2	0.30
2000	5	0.4	0.83	0.2	0.81	0.3	0.79	0.4	1.08
2001	4	0.3	0.80	0.1	0.76	0.2	0.80	0.2	0.71
2002	3	0.2	0.25	0.1	0.16	0.1	0.19	0.1	0.18
2003	7	0.4	0.47	0.1	0.35	0.2	0.42	0.3	0.42
2004	2	0.1	0.22	0.0	0.14	0.1	0.16	0.1	0.15
2005	9	0.5	0.82	0.2	1.18	0.3	1.00	0.4	0.91
2006	13	0.6	0.72	0.2	0.45	0.4	0.55	0.5	0.65
2007	7	0.3	0.50	0.2	0.53	0.2	0.54	0.3	0.52
2008	3	0.1	0.23	0.0	0.11	0.1	0.14	0.1	0.19
2009	6	0.3	0.30	0.1	0.18	0.1	0.19	0.2	0.24
2010	9	0.4	0.50	0.2	0.49	0.2	0.47	0.3	0.49
2011	10	0.4	0.71	0.3	0.96	0.3	0.78	0.4	0.71
2012	5	0.2	0.18	0.1	0.10	0.1	0.13	0.1	0.14
2013	7	0.3	0.44	0.1	0.36	0.2	0.39	0.3	0.46
2014	8	0.3	0.27	0.1	0.15	0.2	0.18	0.2	0.21
2015	4	0.2	0.22	0.0	0.11	0.1	0.14	0.1	0.16
2016	14	0.6	0.88	0.2	0.69	0.3	0.73	0.4	0.81
2017	8	0.3	0.73	0.2	0.79	0.2	0.75	0.3	0.80
2018	8	0.3	0.80	0.2	0.84	0.2	0.80	0.3	0.82
2019									
2020	3	0.1	1.50	0.0	0.79	0.1	0.94	0.1	1.30
1998-2020	140	0.3	0.46	0.1	0.39	0.2	0.40	0.2	0.43

Table 12

Age distribution of age at death (cancer-related) for period 2007-2020
(**incl. multiple malignancies**)

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4									
5-9									
10-14									
15-19	1	0.4	0.4			0.0	1	1.1	1.1
20-24	2	0.8	1.1	2	1.1	1.1			1.1
25-29	1	0.4	1.5			1.1	1	1.1	2.2
30-34	1	0.4	1.9	1	0.6	1.7			2.2
35-39	2	0.8	2.6	2	1.1	2.9			2.2
40-44	6	2.3	4.9	4	2.3	5.2	2	2.2	4.3
45-49	7	2.6	7.5	3	1.7	6.9	4	4.3	8.7
50-54	16	6.0	13.5	12	6.9	13.8	4	4.3	13.0
55-59	24	9.0	22.6	19	10.9	24.7	5	5.4	18.5
60-64	22	8.3	30.8	12	6.9	31.6	10	10.9	29.3
65-69	37	13.9	44.7	23	13.2	44.8	14	15.2	44.6
70-74	30	11.3	56.0	22	12.6	57.5	8	8.7	53.3
75-79	47	17.7	73.7	34	19.5	77.0	13	14.1	67.4
80-84	40	15.0	88.7	28	16.1	93.1	12	13.0	80.4
85+	30	11.3	100.0	12	6.9	100.0	18	19.6	100.0
All ages	266	100.0		174	100.0		92	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**incl. multiple malignancies**)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	Males MI-index	Females Age-spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19		1			0.1	1.00		4.0
20-24	2		0.1	2.00			2.7	
25-29		1			0.0	1.00		1.0
30-34	1		0.0	0.33			0.7	
35-39	2		0.1	0.15			0.7	
40-44	4	2	0.2	0.17	0.1	0.15	0.7	0.2
45-49	3	4	0.1	0.14	0.2	0.31	0.2	0.2
50-54	12	4	0.5	0.39	0.2	0.25	0.5	0.2
55-59	19	5	0.9	0.43	0.2	0.21	0.4	0.1
60-64	12	10	0.7	0.29	0.5	0.45	0.2	0.2
65-69	23	14	1.4	0.64	0.8	0.58	0.3	0.2
70-74	22	8	1.5	0.40	0.5	0.30	0.2	0.1
75-79	34	13	2.8	0.67	0.9	0.52	0.3	0.1
80-84	28	12	3.9	1.04	1.1	0.71	0.3	0.1
85+	12	18	2.6	0.80	1.7	0.62	0.1	0.2
All ages	174	92					0.3	0.1
Mortality								
Raw			0.5	0.47	0.3	0.42		
WS			0.3	0.40	0.1	0.37		
ES			0.4	0.43	0.2	0.37		
BRD-S			0.5	0.48	0.2	0.40		
PYLL-70								
per 100,000			3.4		1.7			
ES			3.0		1.5			
AYLL-70			12.4		11.8			

Table 14a

Further malignancies in deaths in period 1998–2020
MALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C00	Lip	1	0.6					1	100.0
C03–C06	Oral cavity	11	7.1	7	63.6			4	36.4
C07–C08	Salivary gland	3	1.9	1	33.3			2	66.7
C09–C10	Oropharynx	5	3.2	3	60.0			2	40.0
C11	Nasopharynx	2	1.3			1	50.0	1	50.0
C12–C13	Hypopharynx	2	1.3	1	50.0			1	50.0
C14	ENT cancer	1	0.6					1	100.0
C15	Oesophagus	3	1.9					3	100.0
C16	Stomach	5	3.2	2	40.0			3	60.0
C18	Colon	9	5.8	3	33.3			6	66.7
C19–C20	Rectum	3	1.9					3	100.0
C22	Liver	1	0.6			1	100.0		
C23–C24	Bile	3	1.9					3	100.0
C25	Pancreas	3	1.9					3	100.0
C26	GI cancer	1	0.6					1	100.0
C30	Middle/inner ear	1	0.6					1	100.0
C30–C31	Sinuses	2	1.3					2	100.0
C32	Larynx	6	3.9	6	100.0				
C33–C34	Lung	18	11.6					18	100.0
C38,C45	Mesothelioma	1	0.6					1	100.0
C43	Malign. melanoma	4	2.6	1	25.0			3	75.0
C44	Skin others	26	16.8	8	30.8	5	19.2	13	50.0
C46,C49	Soft tissue	3	1.9	1	33.3			2	66.7
C50	Breast	1	0.6					1	100.0
C61	Prostate	17	11.0	8	47.1	1	5.9	8	47.1
C64	Kidney	2	1.3	2	100.0				
C67	Bladder	3	1.9	1	33.3			2	66.7
C69	Eye sarcoma	1	0.6	1	100.0				
C70–C72	CNS cancer	3	1.9	1	33.3	1	33.3	1	33.3
C76–C79	CUP	5	3.2	1	20.0	1	20.0	3	60.0
C82–C85	NHL	5	3.2	2	40.0			3	60.0
C90	Mult. myeloma	3	1.9	1	33.3			2	66.7
C91–C96	Leukaemia	1	0.6					1	100.0
All further malignancies		155	100.0	50	32.3	10	6.5	95	61.3

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

Table 14b

Further malignancies in deaths in period 1998–2020
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C00	Lip	1	1.4	1	100.0				
C03–C06	Oral cavity	5	7.1	3	60.0			2	40.0
C09–C10	Oropharynx	3	4.3	3	100.0				
C11	Nasopharynx	3	4.3	1	33.3			2	66.7
C12–C13	Hypopharynx	1	1.4	1	100.0				
C14	ENT cancer	1	1.4					1	100.0
C16	Stomach	1	1.4					1	100.0
C18	Colon	2	2.9	2	100.0				
C22	Liver	1	1.4					1	100.0
C25	Pancreas	4	5.7					4	100.0
C30–C31	Sinuses	3	4.3			1	33.3	2	66.7
C32	Larynx	1	1.4	1	100.0				
C33–C34	Lung	5	7.1	1	20.0			4	80.0
C43	Malign. melanoma	6	8.6	2	33.3	2	33.3	2	33.3
C44	Skin others	6	8.6			2	33.3	4	66.7
C50	Breast	13	18.6	11	84.6			2	15.4
C51	Vulva	1	1.4	1	100.0				
C53	Cervix uteri	1	1.4	1	100.0				
C54	Corpus uteri	2	2.9	2	100.0				
C56	Ovary	3	4.3					3	100.0
C67	Bladder	1	1.4					1	100.0
C70–C72	CNS cancer	1	1.4					1	100.0
C76–C79	CUP	1	1.4	1	100.0				
C82–C85	NHL	2	2.9	1	50.0			1	50.0
C90	Mult. myeloma	1	1.4					1	100.0
C91–C96	Leukaemia	1	1.4					1	100.0
All further malignancies		70	100.0	32	45.7	5	7.1	33	47.1

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

Table 15

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**First primaries only** *)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	Males MI-index	Females Age-spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19		1			0.1	1.00		4.3
20-24	2		0.1	2.00			3.0	
25-29		1			0.0	1.00		1.1
30-34	1		0.0	0.50			0.7	
35-39	2		0.1	0.15			0.8	
40-44	4	2	0.2	0.18	0.1	0.18	0.7	0.3
45-49	2	2	0.1	0.10	0.1	0.18	0.2	0.1
50-54	11	4	0.4	0.37	0.2	0.27	0.5	0.2
55-59	19	3	0.9	0.50	0.1	0.17	0.5	0.1
60-64	9	7	0.5	0.26	0.4	0.37	0.2	0.2
65-69	21	9	1.3	0.75	0.5	0.53	0.3	0.2
70-74	17	5	1.1	0.49	0.3	0.22	0.2	0.1
75-79	23	12	1.9	0.59	0.8	0.57	0.3	0.2
80-84	23	8	3.2	1.28	0.8	0.67	0.3	0.1
85+	9	13	1.9	0.69	1.2	0.68	0.1	0.1
All ages	143	67					0.3	0.1
Mortality								
Raw			0.4	0.48	0.2	0.39		
WS			0.2	0.40	0.1	0.33		
ES			0.3	0.43	0.1	0.34		
BRD-S			0.4	0.48	0.2	0.36		
PYLL-70								
per 100,000			3.1		1.3			
ES			2.8		1.2			
AYLL-70			12.7		13.0			

* See corresponding tables with multiple malignancies.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**Single primaries only** *)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	Males MI-index	Females Age-spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19		1			0.1	1.00		4.5
20-24	2		0.1	2.00			3.0	
25-29		1			0.0	1.00		1.1
30-34	1		0.0	0.50			0.7	
35-39	2		0.1	0.17			0.8	
40-44	4	1	0.2	0.21	0.0	0.10	0.7	0.1
45-49		1			0.0	0.09		0.1
50-54	9	4	0.4	0.31	0.2	0.29	0.4	0.2
55-59	17	3	0.8	0.52	0.1	0.20	0.4	0.1
60-64	6	6	0.3	0.23	0.3	0.33	0.1	0.2
65-69	15	7	0.9	0.65	0.4	0.44	0.2	0.1
70-74	11	3	0.7	0.39	0.2	0.17	0.1	0.0
75-79	17	10	1.4	0.50	0.7	0.50	0.2	0.1
80-84	11	3	1.5	0.79	0.3	0.43	0.2	0.0
85+	5	7	1.1	0.50	0.7	0.47	0.1	0.1
All ages	100	47					0.2	0.1
Mortality								
Raw			0.3	0.39	0.1	0.32		
WS			0.2	0.34	0.1	0.29		
ES			0.2	0.37	0.1	0.29		
BRD-S			0.3	0.39	0.1	0.31		
PYLL-70								
per 100,000			2.7		1.1			
ES			2.4		1.0			
AYLL-70			13.6		13.1			

* See corresponding tables with multiple malignancies.

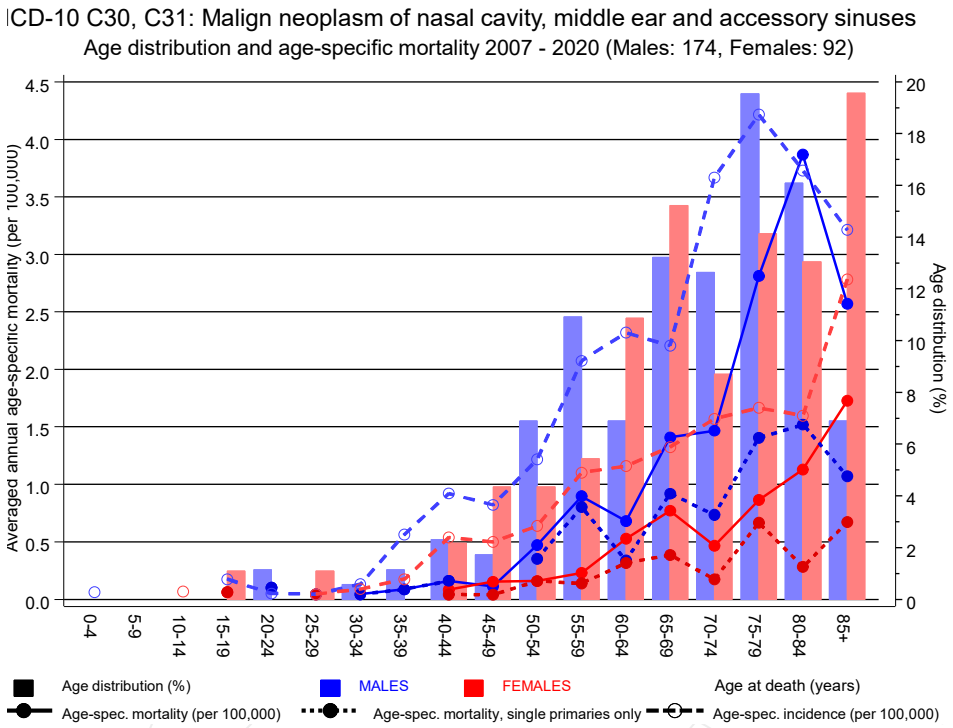
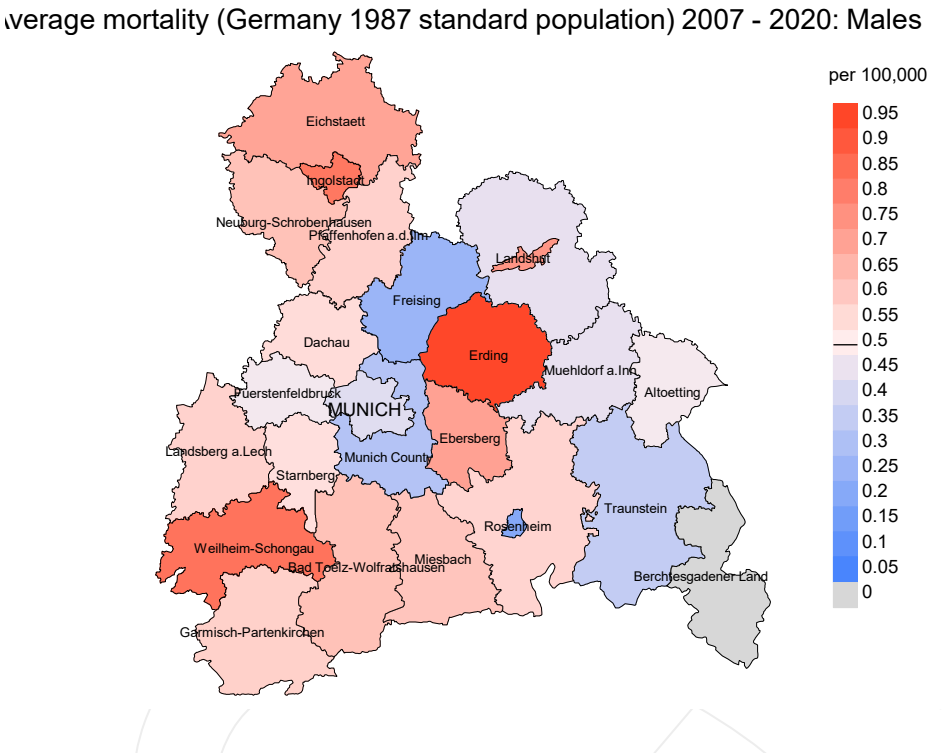


Figure 17. Distribution of age at death (bars; males: mean=64.6 yrs, median=67.3 yrs; females: mean=67.6 yrs, median=69.6 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

The difference between age at diagnosis (Table 3) and age at nasal cavity, middle ear, sinuses cancer-related death (see Table 10) should be considered.



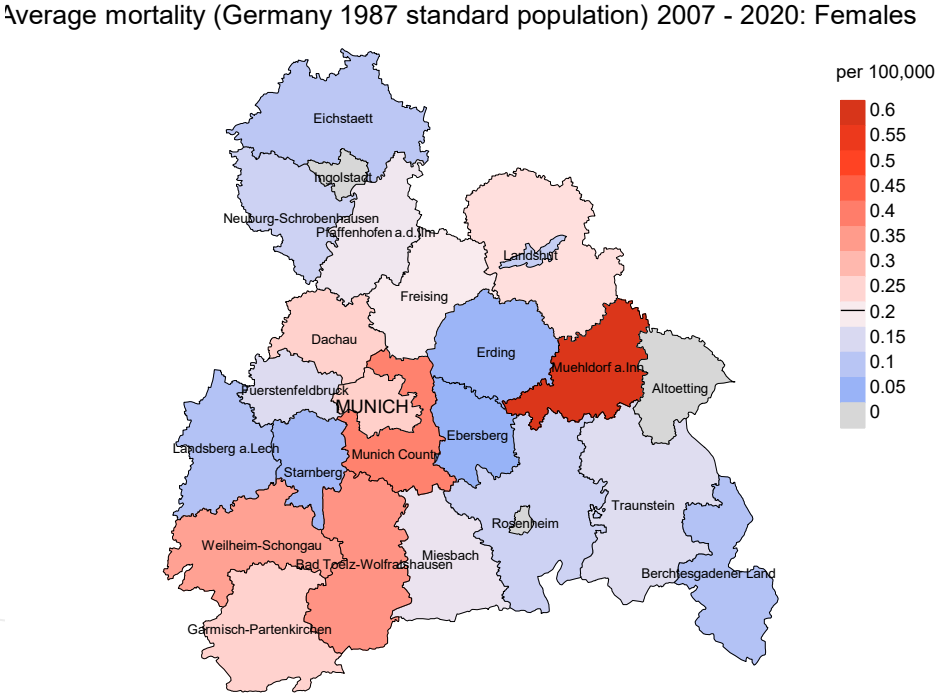
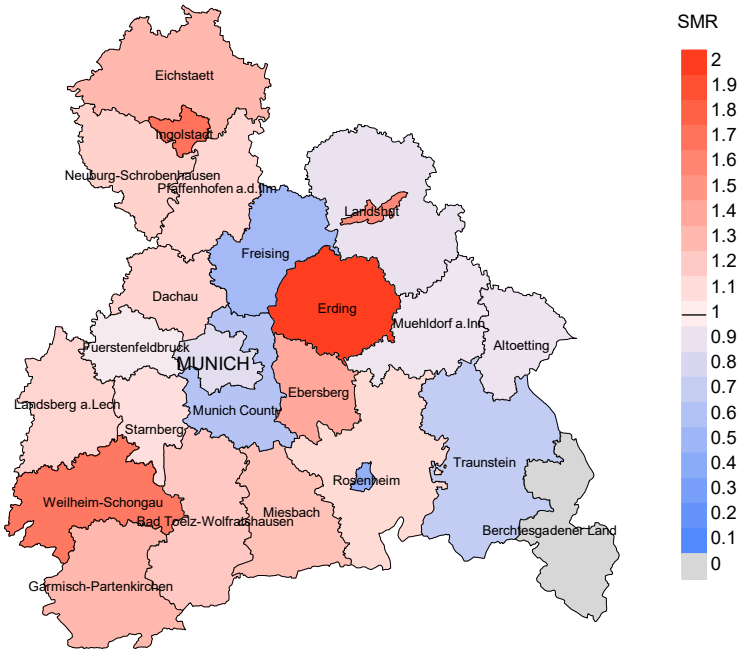


Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2020. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.5/100,000 WS N=174, females 0.2/100,000 WS N=92).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,727 female residents (averaged) in the period from 2007 to 2020 a total of 1 women died from nasal cavity, middle ear, sinuses cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.0/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.0 and 0.6/100,000.

Standardized mortality ratio (SMR) 2007 - 2020: Males



Standardized mortality ratio (SMR) 2007 - 2020: Females

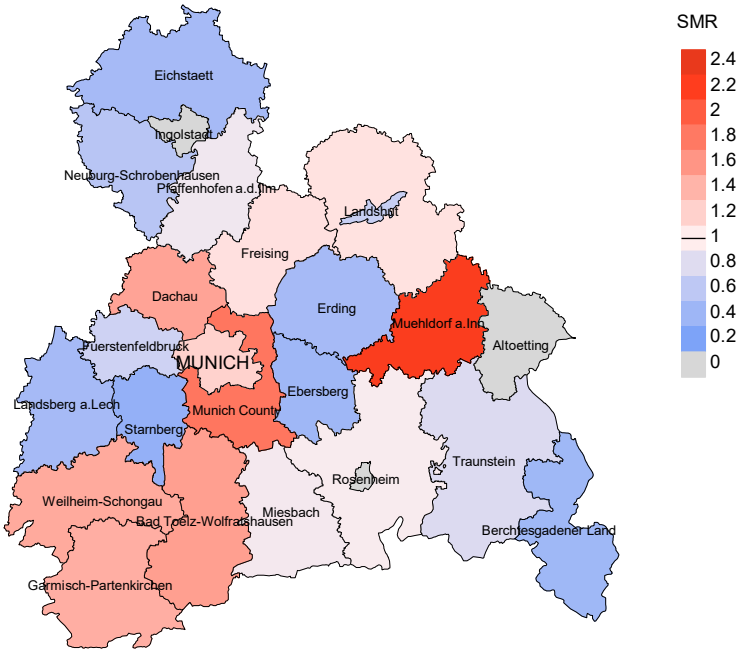


Figure 18b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2020. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=174, females N=92).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2020 a total of 1 women died from nasal cavity, middle ear, sinuses cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.40. Though, the value of this parameter may vary with an underlying probability of 99% between 0.00 and 2.99, 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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