Munich Cancer Registry



- ▶ Survival
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- ▶ Homepage
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Munich Cancer Registry at Munich Cancer Center Marchioninistr. 15 Munich, 81377 Germany

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

Cancer statistics: Baseline statistics

C30, C31: Nasal cavity, middle ear, sinuses cancer

Year of diagnosis	1998-2013
Patients	527
Diseases	530
Creation date	05/19/2015
Export date	12/30/2014
Population	4.64 m



http://www.tumorregister-muenchen.de/en/facts/base/base_C3031E.pdf

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 4.64 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. The time-delayed acquisition of data and the occasionally high DCO-rates indicate optimizing reserves, among others, because of current financial and legal conditions that hinder the analyses.

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, May 2015

- 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 2.51 million to 3.96 in 2002, and to 4.52 million in 2007). Death certificates from 2014 are incorporated into these analyses.
- 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. A high proportion of DCO cases (≥5%) in particular cancer types indicate insufficient participation of specific cancer specializations.

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

INCIDENCE

Table 1

Patient cohorts by year of diagnosis including DCO cases and multiple primaries, and with proportion of deaths and active follow-up

				Prop.		Prop.
		DCO	Prop.	mult.	Prop.	actively
Year of	Cases	cases	DCO	primaries	deaths	followed
diagnosis	n	n	્રું	ୃ	%	%
				_ / /		
1998	21	1	4.8	33.3	81.0	95.2
1999	18			44.4	72.2	100.0
2000	20	1	5.0	20.0	70.0	100.0
2001	13	1	7.7	23.1	76.9	100.0
2002	25	2	8.0	28.0	76.0	100.0 #
2003	38	2	5.3	34.2	76.3	97.4
2004	23			34.8	52.2	100.0
2005	/31			35.5	77.4	100.0
2006	39	/ 3	7.7	33.3	66.7	100.0
2007	44	3	6.8	29.5	40.9	81.8 # ##
2008	40	2	5.0	27.5	50.0	77.5
2009	44			25.0	43.2	72.7
2010	54	1	1.9	18.5	35.2	75.9
2011	50	2	4.0	30.0	46.0	72.0
2012	51	1	2.0	25.5	19.6	78.4
2013	19	1	5.3	15.8	21.1	94.7 ###
1998-2013	530	20	3.8	28.3	52.3	86.8

[#] 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. Therefore, the presented figures and tables are potentially related to different time periods as pointed out in the respective headlines or legends.

^{##} Since 2007 the percentage of actively followed patients sharply declined compared to the previous years. This is a consequence of ambiguous data protection rules that currently forbid cancer registries in Bavaria to obtain the essential life status informations from competent registration offices.

Table 1a

Patient cohorts by year of diagnosis and gender including DCO cases

Year of	All	Males	Females	Prop. males
diagnosis	n /	'n	n	%
1998	21	/ 15	6	71.4
1999	18	/ 11	7	61.1
2000	20	15	5	75.0
2001	/ 13 /	8	5	61.5
2002	25	14	11	56.0
2003	38	23	15	60.5
2004	23	15	8	65.2
2005	31	20	11 /	64.5
2006	39	21	18	53.8
2007	44	30	14	68.2
2008	40	28	12	70.0
2009	44	26	18	59.1
2010	54	36	18	66.7
2011	50	36	14	72.0
2012	51	28	23	54.9
2013	19	15	4	78.9
1998-2013	530	341	189	64.3

Table 2

Incidence measures by year of diagnosis and gender including DCO cases (with respect to registry area expansion from 2.51 to 3.96 m as of 2002, and from 3.96 to 4.64 m as of 2007, respectively)

			Males	Fem.	Males	Fem.	Males	Fem.	Males	Fem.
Year of	Males	Females	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.	Inc.
diagnosis	n	n	raw	raw	WS	WS	ES	ES	BRD-S	BRD-S
1998	15	6	1.4/	0.5	0.8	0.3	1.2	0.4	1.7	0.5
1999	11	7	1.0	0.6	0.6	0.2	0.8	0.3	0.9	0.6
2000	15	5	1.3	0.4	0.8	0.2	1.2	0.3	1.5	0.3
2001	8	5 /	0.7	0.4	0.4	0.2	0.6	0.2	0.9	0.3
2002	14	11 🗸	0.8	0.6	0.4	0.3	0.6	0.4	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	8	0.8	0.4	0.5	0.2	0.7	0.3	0.9	0.3
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	30	14	1.4	0.6	0.8	0.3	1.1	0.4	1.4	0.5
2008	28	12	1.3	0.5	0.8	0.3	1.0	0.4	1.1	0.4
2009	26	18	1.2	0.8	0.7	0.4	1.0	0.5	1.2	0.6
2010	36	18	1.6	0.8	1.0	0.3	1.3	0.5	1.5	0.6
2011	36	14	1.6	0.6	0.8	0.3	1.2	0.4	1.4	0.5
2012	28	23	1.2	1.0	0.8	0.5	1.0	0.7	1.1	0.8
2013	15	4	0.7	0.2	0.4	0.1	0.5	0.2	0.6	0.2
1998-2013	341	189	1.1	0.6	0.7	0.3	0.9	0.4	1.1	0.5

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

Table 3

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

Year of	Cases		Std.					Median		
diagnosis	n	Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	21	66.3	12.4	38.0	84.5	53.1	62.1	67.1	74.9	80.4
1999	18	63.9	15.0	33.5	82.4	36.0	59.3	66.5	75.8	80.9
2000	20	65.7	16.4	20.4	90.5	46.9	58.3	67.2	74.5	86.6
2001	13	66.9	18.0	37.4	89.9	44.6	53.0	66.8	83.6	84.7
2002	25	67.8	12.8	41.3	92.7	51.7	61.1	66.1	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	23	65.5	15.3	25.9	88.6	46.5	58.3	65.3	78.9	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	44	63.0	16.0	20.2	86.2	39.0	54.0	64.9	77.5	81.4
2008	40	61.5	18.9	14.1	93.9	38.5	46.3	62.6	72.1	90.5
2009	44	64.2	17.8	2.4	90.1	41.2	52.6	67.0	77.7	83.8
2010	54	64.7	17.4	16.6	103	43.0	55.2	67.3	75.7	85.5
2011	50	64.2	14.1	37.7	86.1	46.4	51.7	65.3	76.9	80.1
2012	51 /	64.4	14.9	18.6	94.9	46.3	55.9	63.2	72.8	84.3
2013	19	64.1	13.2	34.5	88.1	39.5	59.1	63.7	74.5	80.9
1998-2013	530	64.7	15.6	2.4	103	44.1	54.5	66.1	76.6	83.6

Table 3a

Age distribution parameters by year of diagnosis (MALES)

(incl. DCO)

Year of	Cases		Std.					Median		
diagnosis	n	Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	15	65.4	14.1	38.0	84.5	38.2	58.4	66.8	75.4	82.7
1999	11	56.2	14.1	33.5	72.8	36.0	38.6	60.7	66.3	70.3
2000	15	64.0	16.2	20.4	85.5	44.1	58.0	68.8	73.7	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	30	61.6	17.2	20.2	86.2	37.5	53.6	62.0	77.8	81.8
2008	28	58.9	16.1	35.5	93.9	37.9	44.7	59.6	69.5	79.3
2009	26	61.8	19.5	2.4	86.8	39.0	46.8	64.9	77.4	82.0
2010	36	61.1	16.8	16.6	91.3	37.6	51.7	64.5	71.8	76.8
2011	36	63.8	13.8	37.7	85.4	44.1	52.8	63.8	75.6	79.0
2012	28	61.1	15.3	18.6	94.9	45.0	50.9	62.0	70.8	78.4
2013	15	67.5	11.7	39.5	88.1	55.3	62.4	65.1	76.5	80.9
1998-2013	341	62.6	15.3	2.4	94.9	41.2	53.1	64.0	74.0	80.9

Table 3b

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

Year of	Cases	Std.					Median		
diagnosis	n	Mean dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	6	68.6 6.7	58.1	76.2	58.1	64.4	69.0	74.9	76.2
1999	7	76.0 5.1	66.8	82.4	66.8	73.4	76.2	80.9	82.4
2000	5	70.5 17.9	49.6	90.5	49.6	59.3	65.6	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	11	66.0 10.3	51.7	83.3	53.9	55.5	66.1	77.7	77.9
2003	15	68.3 / 19.6	16.2	91.8	48.0	52.5	75.2	80.1	84.2
2004	8	69.6 13.7	47.3	88.6	47.3	60.1	69.8	80.7	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	12	67.6 23.9	14.1	93.0	44.6	55.7	66.4	90.5	91.7
2009	18	67.6 14.7	41.2	90.1	49.9	54.5	71.2	79.9	85.8
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	23 /	68.4 13.6	42.5	92.5	55.9	60.6	63.9	78.9	88.4
2013	4	51.7 12.0	34.5	60.8	34.5	43.4	55.7	60.0	60.8
1998-2013	189	68.5 15.5	14.1	103	48.5	58.8	69.9	79.9	88.3

Table 4

Age distribution by 5-year age group and gender for period 1998-2013 (incl. DCO)

Age at									
diagnosis	Cases			Males			Females		
Years	n	%	Cum.%	n	%	Cum.%	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	0.4			0.3	1	0.5	0.5
15-19	4	0.8	/ 1.1/	3	0.9	1.2	1	0.5	1.1
20-24	3	0.6	/ 1.7	2	0.6	1.8	1	0.5	1.6
25-29	1	0.2	1.9	1	0.3	2.1			1.6
30-34	5	0.9	2.8	4	1.2	3.2	1	0.5	2.1
35-39	20	3.8	6.6	17	5.0	8.2	3	1.6	3.7
40-44	26	4.9	11.5	21	6.2	14.4	5	2.6	6.3
45-49	35	6.6	18.1	22	6.5	20.8	13	6.9	13.2
50-54	40	7.5	25.7	29	8.5	29.3	11	5.8	19.0
55-59	52	9.8	35.5	34	10.0	39.3	18	9.5	28.6
60-64	63	11.9	47.4	44	12.9	52.2	19	10.1/	38.6
65-69	64	12.1	59.4	42	12.3	64.5	22	11.6	50.3
70-74	64	12.1	71.5	44	12.9	77,4	20	10.6	60.8
75-79	67	12.6	84.2	39	11.4	88.9	28	14.8	75.7
80-84	44	8.3	92.5	23	6.7	95.6	21	11.1	86.8
85+	40	7.5	100.0	15	4.4	100.0	25	13.2	100.0
All ages	530	100.0		341	100.0		189	100.0	

Included in the statistics are 39.5% multiple primaries in males and 35.1% in females.

Table 5

Age-specific incidence, DCO rate and proportion of all cancers for period 1998-2013

							Males	Females
			Males	Females	Males	Females	Prop.all	Prop.all
Age at			Age-	Age-	DCO rate	DCO rate		cancers
diagnosis	Males	Females	spec.	spec.	n=12	n=8		n=153136
Years	n	n	incid.	incid.	8	%	%	%
0- 4	1		0.1	0.0			0.3	
5- 9			0.0	0.0				
10-14		1 /	0.0	0.1				0.6
15-19	3	1	0.2	0.1			0.8	0.3
20-24	2	1	0.1	0.1			0.3	0.2
25-29	1		0.0	0.0			0.1	
30-34	4	1	0.2	0.0			0.3	0.0
35-39	17	3	0.7	0.1			0.8	0.1
40-44	21	5	0.8	0.2			0.7	0.1
45-49	22	13	0.9	0.6		7.7	0.4	0.1
50-54	29	/11	1.4	0.5			0.3	0.1
55-59	34	18	1.9	0.9		5.6	0.2	0.1
60-64	44	19	2.5	1.0			0.2	0.1
65-69	42	22	2.7	1.3	4.8	9.1	0.2	0.1
70-74	44	20	3.4	1.3	2.3		0.2	0.1
75-79	39	28	4.7	2.4	5.1		0.2	0.2
80-84	23	21	4.6	2.3	8.7		0.2	0.1
85+	15	25	4.4	2.8	33.3	16.0	0.2	0.1
All ages	341	189			3.5	4.2	0.2	0.1
Incidence								
Raw			1.1	0.6				
WS			0.7	0.3				
ES			0.9	0.4				
BRD-S			1.1	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).

Table 6a

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of second primaries for period 1998-2013

MALES	Μ	Α	L	E	S
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	Observed	Expected		LCL	UCL		DCO
Diagnosis	/ n /	n	SIR	95%	95%	EAR	%
	/ /						
C00 Lip	/ 2 /	0.0	146.7	17.8	530.1	# 26.2	
C03-C06 Oral cavity	3 /	0.1	29.7	6.1	86.8	# 38.2	
C15 Oesophagus	/ 2/	0.2	9.8	1.2	35.5	# 23.7	
C16 Stomach	3	0.5	6.3	1.3	18.6	# 33.3	
C18 Colon	3	1.1	2.7	0.5	7.8	24.7	
C19-C20 Rectum	2	0.6	3.2	0.4	11.4	18.0	
C30-C31 Sinuses	2	0.0	99.0	12.0	357.7	# 26.1	50.0
C33-C34 Lung	4	1.3	3.0	0.8	7.6	34.9	
C43 Malign. melanoma	3	0.5	6.4	1.3	18.8	# 33.4	100.0
C82-C85 NHL	2	0.5	4.4	0.5	15.9	20.4	
C91-C96 Leukaemia	2	0.2	10.7	1.3	38.7	# 23.9	
Other primaries	13	5.1	2.5	1.4	4.3	# 103.8	
Not observed	0	1.4	0.0	0.0	2.6	-18.7	
All mult. primaries	41	11.6	3.5	2.5	4.8	# 387.8	9.8
_ \							

Patients	214
Median age at second malignancy (years)	70.3
Person-years	759
Mean observation time (years)	3.5
Median observation time (years)	2.5

The occurrence of second malignancy is statistically significant.

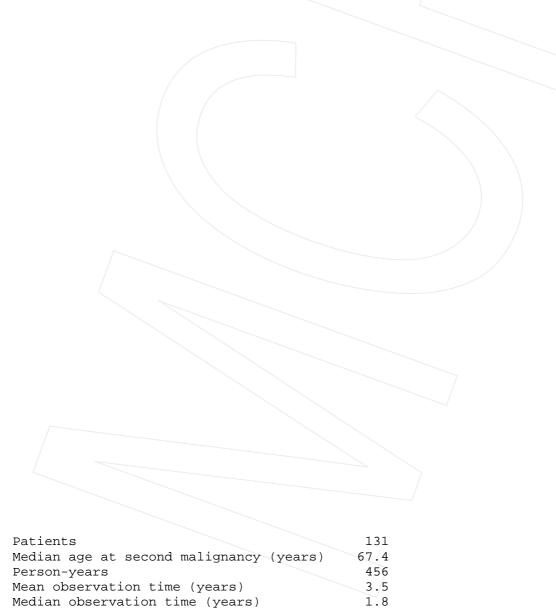
Observed second primaries with count 1 are pooled in category "Other primaries".

Table 6b

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of second primaries for period 1998-2013

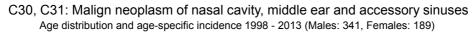
FEMA	ALES

Diagnosis	Observed n	Expected n	SIR	LCL 95%	UCL 95%	EAR	DCO %
C91-C96 Leukaemia	2	0.1	21.6	2.6	78.1 #	41.9	
Other primaries Not observed	9 0	1.9 3.5	4.8		9.0 # 1.1	156.0 -76.8	22.2
All mult. primaries	11	5.5	2.0	1.0	3.6 #	121.1	18.2



The occurrence of second malignancy is statistically significant.

Observed second primaries with count 1 are pooled in category "Other primaries".



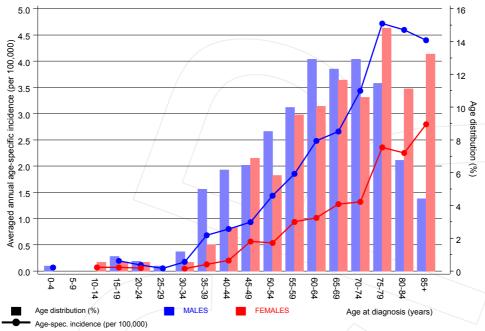
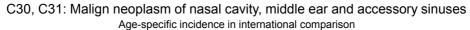


Figure 7. Age distribution and age-specific incidence





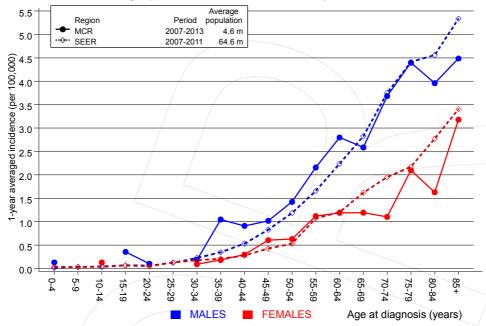
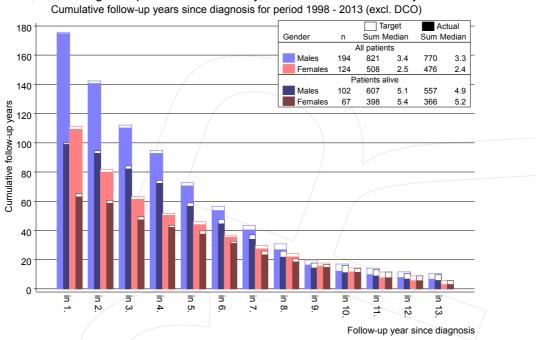


Figure 7a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).



Reference:

Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 18 Regs Research Data, released April 2014, based on the November 2013 submission. http://www.seer.cancer.gov.



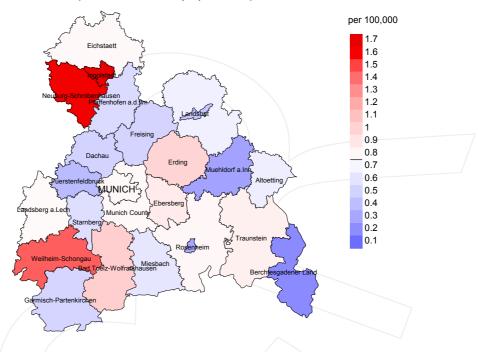
C30, C31: Malign neoplasm of nasal cavity, middle ear and accessory sinuses

Figure 8. Cumulative follow-up years depending on time since diagnosis

The increase of the lost to follow-up rate can be interpreted as a consequence of a declining number of survivors over time.







Average incidence (world standard population) 2007 - 2013: Females

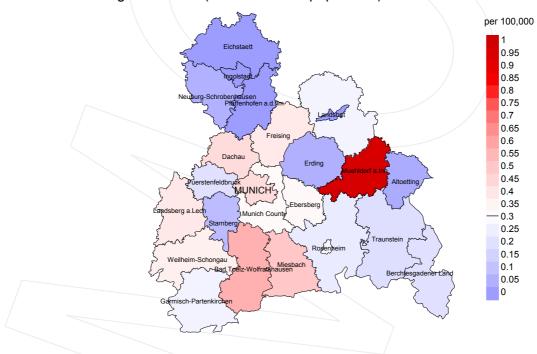
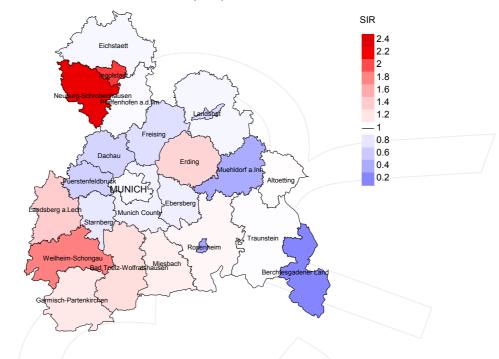


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 0.8/100,000 WS N=199, females 0.3/100,000 WS N=103).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,928 female residents (averaged) in the period from 2007 to 2013 a total of 2 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 0.3/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.0 and 1.5/100,000.

Standardized incidence ratio (SIR) 2007 - 2013: Males



Standardized incidence ratio (SIR) 2007 - 2013: Females

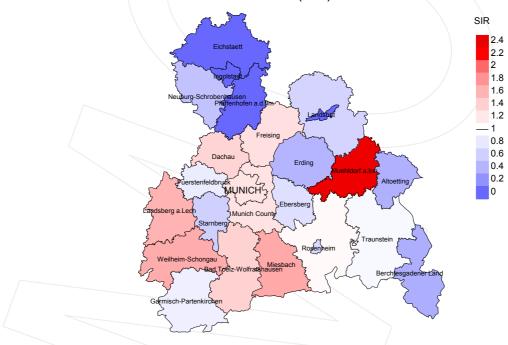


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=199, females N=103).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,642 female residents (averaged) in the period from 2007 to 2013 a total of 2 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 0.72. Though, the value of this parameter may vary with an underlying probability of 99% between 0.04 and 3.36, and is therefore not statistically striking.

MORTALITY

Table 10a

Patient cohorts of incident cancers by year of diagnosis, follow-up status, proportion of DCO, deaths among the annual cohorts, and proportion of available death certificates (with respect to registry area expansion from 2.51 to 3.96 m as of 2002, and from 3.96 to 4.64 m as of 2007, respectively)

Year of	Incident	Prop. actively followed	Prop.	Dootha	Prop.	Prop. deaths with death certific.
	cases		DCO	Deaths	deaths	
diagnosis	n	%	%	n	%	%
1000	0.1	25.0	4 0	1.5	01 0	0.4.1
1998	21	95.2	4.8	17	81.0	94.1
1999	18	100.0		13	72.2	92.3
2000	20	100.0	5.0	14	70.0	100.0
2001	13	100.0	7.7	10	76.9	100.0
2002	25	100.0	8.0	19/	76.0	94.7
2003	38	97.4	5.3	29	76.3	96.6
2004	23	100.0		12	52.2	100.0
2005	31	100.0		24	77.4	100.0
2006	39	100.0	7.7	26	66.7	100.0
2007	44	81.8	6.8	18	40.9	94.4
2008	40	77.5	5.0	20	50.0	100.0
2009	44	72.7		19	43.2	100.0
2010	54	75.9	1.9	19	35.2	100.0
2011	50	72.0	4.0	23	46.0	91.3
2012	51	78.4	2.0	10	19.6	100.0
2013	19	94.7	5.3	4	21.1	100.0
1998-2013	530	86.8	3.8	277	52.3	97.5

Table 10b

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

			Prop. deaths		Prop.
Year of	Incident		with death	Deaths in	deaths in
diagnosis/	cases	Deaths	certific.	same year	same year
death	n	'n	%	n	%
1998	21	12	83.3	3	14.3
1999	18	9	77.8	2	11.1
2000	20	20	100.0	/ 1	5.0
2001	13	16	93.8	3	23.1
2002	25	20	100.0	3	12.0
2003	38	24	100.0	7	18.4
2004	23	21	90.5	1	4.3
2005	/31	25	96.0	5	16.1
2006	39	29	100.0	6	15.4
2007	44	22	95.5	7	15.9
2008	40	25	100.0	7	17.5
2009	44	22	100.0	1	2.3
2010	54	27	100.0	2	3.7
2011	50	29	96.6	6	12.0
2012	51	32	96.9	4 3	7.8
2013	19	32	100.0	3	15.8
1998-2013	530	365	97.0	61	11.5

Table 10c

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 2.51 to 3.96 m as of 2002, and from 3.96 to 4.64 m as of 2007, respectively)

				Prop.
				cancer
		Prop.	Prop.	recorded
		cancer-	non-cancer-	on death
Year of	Deaths	related	related	certificate
death	n	8	%	%
1998	12	58.3	41.7	90.0
1999	9	55.6	44.4	100.0
2000	20	85.0	15.0	85.0
2001	16	75.0	25.0	100.0
2002	20	50.0	50.0	70.0
2003	24	70.8	29.2	79.2
2004	21	57.1	42.9	68.4
2005	25	84.0	16.0	91.7
2006	29	82.8	17.2	82.8
2007	22	77.3	22.7	90.5
2008	25	76.0	24.0	84.0
2009	22	77.3	22.7	95.5
2010	27	66.7	33.3	77.8
2011	29	75.9	24.1	82.1
2012	32	65.6	34.4	74.2
2013	32	65.6	34.4	75.0
1998-2013	365	71.2	28.8	82.5

Table 11a $\begin{tabular}{ll} Medians of age at death according to the grouping in Table 10 \\ \hline MALES \end{tabular}$

Year of death	Deaths n	Age at death (all causes)	Age at death (cancer-related)	Age at death (non-cancer-related) Years	Age at death (according to death certificate)
1998	6	64.9	64.9	66.6	71.1
1999	4	64.1	59.5	68.8	68.8
2000	15	69.2	70.1	63.8	68.6
2001	12	71.2	63.2	74.7	70.6
2002	14	81.3	84.7	78.0	81.1
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	16	74.9	74.4	86.5	74.3
2007	14	78.5	78.7	72.1	78.5
2008	17	67.2	66.0	80.5	66.0
2009	16	73.6	69.7	80.5	72.5
2010	14	77.9	71.0	83.6	71.3
2011	16	72.4	74.0	66.9	72.9
2012	23	73.2	72.4	80.4	72.4
2013	22	77.2	69.1	85.5	69.5
1998-2013	233	73.5	70.8	79.9	70.8

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 11b $\begin{tabular}{ll} \begin{tabular}{ll} \begin{tabula$

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)
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	5	73.6	76.2	73.6	76.2
2005	11	73.3	73.3	77.7	73.3
2006	13	78.8	78.4	97.1	78.8
2007	8	67.0	66.9	101.6	66.9
2008	8	78.0	81.1	75.0	81.1
2009	6	83.9	83.9		83.9
2010	13	74.2	75.0	68.5	71.3
2011	13	74.1	69.5	86.8	69.5
2012	9	89.0	87.6	95.3	87.6
2013	10	81.2	70.1	91.4	79.0
1998-2013	132	78.1	76.1	83.6	77.4

By 2010, life expectancy for a newborn male in Germany is 77.5 years compared with 82.6 years for his female counterpart.

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 12a

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

MALES

Year of	Deaths	Mort.	MI-Index	Mort.	MI-Index	Mort.	MI-Index	Mort.	MI-Index
death	n	raw	raw	WS	WS	ES	ES	BRD-S	BRD-S
1998	4	0.4	0.27	0.3	0.35	0.4	0.29	0.4	0.25
1999	3	0.3	0.27	0.1	0.24	0.2	0.27	0.2	0.27
2000	12	1.1	0.80	0.6	0.75	0.9	0.79	1.2	0.81
2001	8	0.7	1.00	0.4	1.00	0.6	0.90	0.8	0.95
2002	7	0.4	0.50	0.2	0.41	0.3	0.52	0.5	0.62
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	0.33	0.2	0.26	0.3	0.30	0.5	0.37
2008	16	0.7	0.57	0.4	0.52	0.6	0.60	0.7	0.66
2009	11	0.5	0.42	0.3	0.35	0.4	0.39	0.5	0.41
2010	10	0.4	0.28	0.2	0.21	0.3	0.24	0.4	0.29
2011	12	0.5	0.33	0.2	0.27	0.4	0.31	0.5	0.35
2012	16	0.7	0.57	0.4	0.48	0.5	0.51	0.7	0.61
2013	15	0.7	1.00	0.4	0.95	0.5	0.98	0.7	1.02
1998-2013	168	0.6	0.49	0.3	0.44	0.4	0.47	0.6	0.52

Table 12b

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

FEMALES

Year of	Deaths	Mort.	MI-Index	Mort.	MI-Index	Mort.	MI-Index	Mort.	MI-Index
death	n	raw	raw	WS	WS	ES	ES	BRD-S	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	1.00	0.2	0.99	0.3	0.98	0.4	1.32
2001	4	0.3	0.80	0.1	0.76	0.2	0.80	0.2	0.71
2002	3	0.2	0.27	0.1	0.18	0.1	0.21	0.1	0.20
2003	7	0.4	0.47	0.1	0.35	0.2	0.42	0.3	0.42
2004	2	0.1	0.25	0.0	0.19	0.1	0.20	0.1	0.18
2005	9	0.5	0.82	0.2	1.18	0.3	1.00	0.4	0.91
2006	12	0.6	0.67	0.2	0.38	0.3	0.48	0.5	0.59
2007	7	0.3	0.50	0.2	0.53	0.2	0.54	0.3	0.52
2008	3	0.1	0.25	0.0	0.13	0.1	0.16	0.1	0.22
2009	6	0.3	0.33	0.1	0.20	0.1	0.22	0.2	0.26
2010	8	0.3	0.44	0.1	0.39	0.2	0.39	0.2	0.42
2011	10	0.4	0.71	0.3	0.95	0.3	0.78	0.4	0.71
2012	5	0.2	0.22	0.1	0.12	0.1	0.16	0.1	0.17
2013	6	0.3	1.50	0.1	0.90	0.2	1.04	0.2	1.36
1998-2013	92	0.3	0.49	0.1	0.42	0.2	0.43	0.2	0.46

Table 13

Age distribution of age at death (cancer-related) for period 1998-2013

(incl. multiple primaries)

Age at									
death	Cases			Males			Females		
Years	n	왕	Cum.%	n	%	Cum.%	n	%	Cum.%
15-19	1	0.4	0.4			0.0	1	1.1	1.1 /
20-24	2	0.8	/1.1	_ 2	1.2	1.2			1.1/
25-29	2	0.8	1.9	_ 1	0.6	1.8	1	1.1	2.2
30-34	1	0.4	2.3	1	0.6	2.4			2.2
35-39	5	1.9	4.2	5	2.9	5.3			2.2
40 - 44	6	2.3	6.5	5	2.9	8.2	1	1.1	3.2
45-49	8	3.0	9.5	5	2.9	11,2	3	3.2	6.5
50-54	18	6.8	16.3	12	7.1	18.2	6	6.5	12.9
55-59	19	7.2	23.6	15	8.8	27.1	4	4.3	17.2
60-64	18	6.8	30.4	12	7.1	34.1	6	6.5	23.7
65-69	38	14.4	44.9	24	14.1	48.2	14	15.1	38.7
70-74	30	11.4	56.3	21	12.4	60.6	9	9.7	48.4
75-79	42	16.0	72.2	30	17.6	78.2	12	12.9	61.3
80-84	41	15.6	87.8	24	14.1	92.4	17	18.3	79.6
85+	32	12.2	100.0	13	7.6	100.0	19	20.4	100.0
All ages	263	100.0		170	100.0		93	100.0	

Included in the statistics are 39.5% multiple primaries in males and 35.1% in females.



Table 14

Age-specific mortality (cancer-related) and proportion of all cancers for period 1998-2013 (incl. multiple primaries)

			Males		Females		Males	Females
Age at			Age-		Age-		Prop.all	Prop.all
death	Males	Females	/ - /		spec.		cancers	cancers
Years	n	n	mortal.	MI-index	mortal.	MI-index	%	%
			/ ./.					
0- 4			0.0		0.0			
5- 9			0.0		0.0			
10-14			0.0		0.0	/		
15-19		1 <	0.0		0.1	1.00		2.7
20-24	2		0.1	1.00	0.0		2.2	
25-29	1	1	0.0		0.0	1.00	0.9	0.9
30-34	1		0.0	0.25	0.0		0.5	
35-39	5		0.2	0.29	0.0		1.3	
40-44	5	1	0.2		0.0	0.20	0.6	0.1
45-49	5	3	0.2	0.23	0.1	0.23	0.3	0.1
50-54	12	6	0.6	0.41	0.3	0.55	0.4	0.2
55-59	15	4	0.8	0.44	0.2	0.22	0.3	0.1
60-64	12	6	0.7	0.27	0.3	0.32	0.1	0.1
65-69	24	14	1.5	0.57	0.8	0.64	0.2	0.2
70-74	21	9	1.6	0.48	0.6	0.45	0.2	0.1
75-79	30	12	3.6	0.77	1.0	0.43	0.2	0.1
80-84	24	17	4.8	1.04	1.8	0.81	0.2	0.2
85+	13	19	3.8	0.87	2.1	0.76	0.1	0.1
All ages	170	93					0.2	0.1
Mortality								
Raw			0.6	0.50	0.3	0.49		
WS			0.3	0.44	0.1	0.42		
ES			0.4		0.2	0.43		
BRD-S			0.6	0.53	0.2	0.46		
PYLL-70								
per 100,000			4.2		1.6			
ES ES			3.8		1.5			
AYLL-70			13.8		11.8			
, ,								

The rates underestimate the prognosis if other synchronous cancers are prognostic unfavorable.

Table 15a

Multiple primaries in deaths in period 1998-2013

MALES

					Syn-	Syn-		
					chron	chron		
	Total	Total	Pre	Pre	±30d	±30d	Post	Post
Diagnosis	n	%↓	n	← %	n	← %	n	← %
C03-C06 Oral cavity	/ 7	6.8	5	71.4			2	28.6
C07-C08 Salivary gland	3	2.9	1	33.3			2	66.7
C09-C10 Oropharynx	4 /	3.9	2	50.0			2	50.0
C12-C13 Hypopharynx	2	1.9	1	50.0			1	50.0
C15 Oesophagus	2	1.9					2	100.0
C16 Stomach	5	4.9	2	40.0			3	60.0
C18 Colon	4	3.9	1	25.0			3	75.0
C23-C24 Bile	2	1.9					2	100.0
C30-C31 Sinuses	2	1.9					2	100.0
C32 Larynx	6	5.8	6	100.0				
C33-C34 Lung	11	10.7					11	100.0
C43 Malign. melanoma	5	4.9	1	20.0			4	80.0
C44 Skin others	8	7.8	4	50.0	_ 1	12.5	3	37.5
C46,C49 Soft tissue	3	2.9	1	33.3			2	66.7
C61 Prostate	15	14.6	6	40.0	1	6.7	8	53.3
C67 Bladder	4	3.9	1	25.0			3	75.0
C70-C72 CNS cancer	2	1.9	1	50.0			1	50.0
C76-C79 CUP	2	1.9			1	50.0	1	50.0
C82-C85 NHL	4	3.9	1	25.0			3	75.0
C90 Mult. myeloma	2	1.9	1	50.0			1	50.0
C91-C96 Leukaemia	2	1.9					2	100.0
Other primaries	8	7.8	1	12.5	2	25.0	5	62.5
_								
All mult. primaries	103	100.0	35	34.0	5	4.9	63	61.2
7								

Multiple primaries with number of cases 1 are pooled in category "Other primaries".

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 multiple malignancy.

Table 15b

Multiple primaries in deaths in period 1998-2013

FEMALES

					Syn-	Syn-		
					chron	chron		
	Total	Total	Pre	Pre	±30d	±30d	Post	Post
Diagnosis	n	% ↓	n	← %	n	~%	n	←%
C00 Lip	/ 1	1.9	1	100.0				
C03-C06 Oral cavity	5	9.6	3	60.0			2	40.0
C09-C10 Oropharynx	/ 2 /	3.8	2	100.0				
C11 Nasopharynx	3	5.8	1	33.3			2	66.7
C12-C13 Hypopharynx	1	1.9	1	100.0				
C14 ENT cancer	1	1.9					1	100.0
C16 Stomach	1	1.9					1	100.0
C18 Colon	2	3.8	2	100.0				
C25 Pancreas	2	3.8					2	100.0
C30-C31 Sinuses	1	1.9					1	100.0
C32 Larynx	1	1.9	1	100.0				
C33-C34 Lung	2	3.8					2	100.0
C40-C41 Bone	1	1.9					$\sqrt{1}$	100.0
C43 Malign. melanoma	1	1.9	1	100.0				
C44 Skin others	3	5.8			1	33.3	2	66.7
C50 Breast	10	19.2	8	80.0			2	20.0
C51 Vulva	1	1.9	1	100.0				
C53 Cervix uteri	1	1.9	1	100.0				
C54 Corpus uteri	1	1.9	1	100.0				
C56 Ovary	2	3.8					2	100.0
C67 Bladder	1	1.9					1	100.0
C70-C72 CNS cancer	4	7.7	1	25.0	1 /	25.0	2	50.0
C82-C85 NHL	1	1.9					1	100.0
C90 Mult. myeloma	1	1.9					1	100.0
C91-C96 Leukaemia	3	5.8	1	33.3			2	66.7
	-							
All mult. primaries	52	100.0	25	48.1	2	3.8	25	48.1
			-	- · -			_	- · -

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 multiple malignancy.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers for period 1998-2013

(Singular primaries only *)

			Males		Females		Males	Females
Age at			Age-		Age-		Prop.all	Prop.all
death	Males	Females	/ - /		spec.		cancers	cancers
Years	n	n	mortal.	MI-index	mortal.	MI-index	%	%
0 - 4			0.0		0.0			
5- 9			0.0		0.0			
10-14		_ /	0.0		0.0	/		
15-19		1 <	0.0		0.1	1.00		3.0
20-24	2		0.1	1.00	0.0		2.4	
25-29	1	1	0.0		0.0	1.00	1.0	0.9
30-34	1		0.0	0.33	0.0		0.6	
35-39	5		0.2		0.0		1.3	
40-44	5	1	0.2		0.0	0.25	0.6	0.1
45-49	5	3	0.2	0.24	0.1	0.25	0.3	0.2
50-54	10	6	0.5	0.38	0.3	0.60	0.3	0.2
55-59	15	4	0.8	0.52	0.2	0.27	0.3	0.1
60-64	11/	3	0.6	0.28	0.2	0.19	0.1	0.1
65-69	18	10	1.1	0.62	0.6	0.67	0.2	0.1
70-74	15	7	1.2	0.45	0.5	0.41	0.1	0.1
75-79	21	9	2.5	0.75	0.8	0.45	0.2	0.1
80-84	19	11	3.8	1.06	1.2	0.65	0.2	0.1
85+	10	13	2.9	1.00	1.5	0.72	0.1	0.1
All ages	138	69					0.2	0.1
Mortality								
Raw			0.5	0.49	0.2	0.46		
WS			0.3		0.1	0.40		
ES			0.4		0.1	0.41		
BRD-S			0.5	0.52	0.2	0.43		
PYLL-70								
per 100,000			4.0		1.5			
ES ES			3.6		1.4			
AYLL-70			14.8		13.5			
, •			0					

^{*} See corresponding tables with multiple primaries.

Table 17

Age-specific mortality (cancer-related) and proportion of all cancers for period 1998-2013

(Single primaries only *)

Age at death		Females	Males Age- spec.		Females Age- spec.		cancers	Females Prop.all cancers
Years	n	n	mortal.	MI-index	mortal.	MI-index	%	%
0- 4			0.0		0.0			
5- 9			0.0		0.0			
10-14			0.0		0.0			
15-19			0.0		0.0			
20-24	2		0.1	1.00	0.0		2.5	
25-29	1	1	0.0	1.00	0.0	1.00	1.1	1.0
30-34	1		0.0	0.33	0.0		0.6	
35-39	5		0.2	0.31	0.0		1.4	
40-44	5		0.2	0.26	0.0		0.7	
45-49	3	3	0.1	0.16	0.1	0.27	0.2	0.2
50-54	9	4	0.4	0.38	0.2	0.40	0.3	0.2
55-59	12 /	4	0.7	0.50	0.2	0.31	0.3	0.1
60-64	8	/3	0.5	0.23	0.2		0.1	0.1
65-69	13	8	0.8	0.48	0.5	0.53	0.2	0.1
70-74	9	7	0.7		0.5		0.1	0.1
75-79	13	8	1.6	0.59	0.7		0.2	0.1
80-84	13	7	2.6		0.8	0.58	0.2	0.1
85+	4	9	1.2	0.57	1.0	0.60	0.1	0.1
All ages	98	54					0.2	0.1
Mortality				0.40	0 0	0 11		
Raw			0.3	0.40	0.2			
WS			0.2		0.1	0.34		
ES			0.3	0.39	0.1	0.36		
BRD-S			0.3	0.42	0.1	0.39		
PYLL-70								
per 100,000			3.5		1.0			
ES ES			3.3		0.9			
AYLL-70			16.0		11.8			
/ 0					11.0			

^{*} See corresponding tables with multiple primaries.

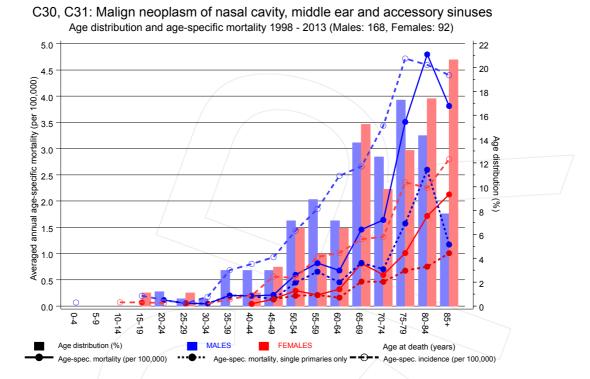
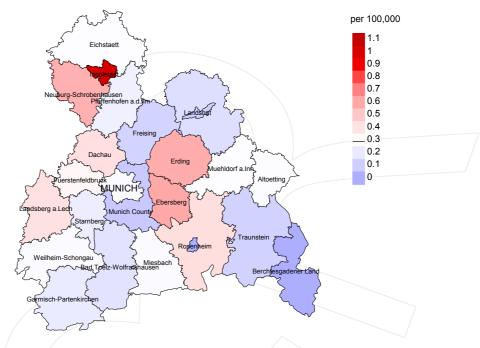


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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.



Average mortality (world standard population) 2007 - 2013: Males



Average mortality (world standard population) 2007 - 2013: Females

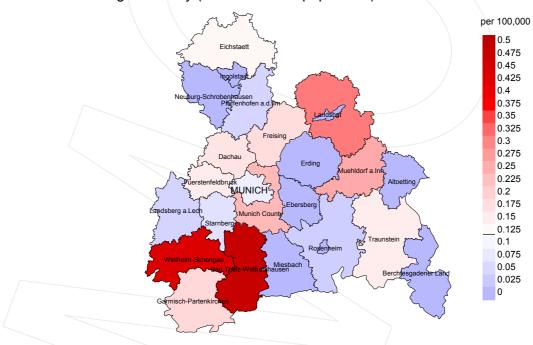
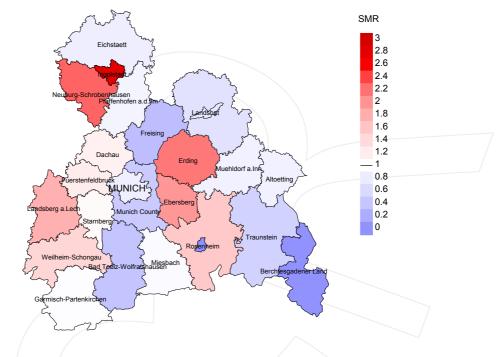


Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2013. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 0.3/100,000 WS N=90, females 0.1/100,000 WS N=44).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,928 female residents (averaged) in the period from 2007 to 2013 a total of 0 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 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.0 and 1.2/100,000.

Standardized mortality ratio (SMR) 2007 - 2013: Males



Standardized mortality ratio (SMR) 2007 - 2013: Females

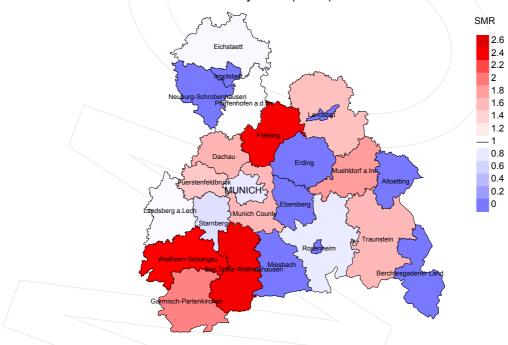


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=90, females N=44).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,642 female residents (averaged) in the period from 2007 to 2013 a total of 0 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 0.00. Though, the value of this parameter may vary with an underlying probability of 99% between 0.00 and 4.62, 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. For mortality statistics patients, diagnoses and progressive course of disease are presented. In the calculations, all courses of disease are considered whereby progressions occurred and/or death certificate identified progressive cancers were ascertained. Additionally there are three groups of disease course to consider:

1. All multiple primaries included

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

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

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

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

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

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

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

The index from mortality and incidence (Mortality-Incidence ratio, **MI-index**) is a statistic that allows for the evaluation of the quality of data. For diseases with poor prognoses, comparable values are obtained from all age groups, because to a large extent, the numerator and denominator contain the same cases. For tumors with a good prognosis, increasing and decreasing incidence and age-specific differences in prognosis can more strongly alter the MI- index. Additionally, attention should be paid to the confidence intervals where fewer cases are reported.

The complexity of problems identified here emphasizes the importance of relative survival data for the appropriate analysis of long term results.

As a measurement of the burden of disease, the number of potential life years loss due to premature deaths in a cohort can be calculated (**PYLL**, potential years of life lost, standardized per 100,000 persons or per European standard) as well as the average loss of life years per individual (**AYLL**, average years of life lost). Depending upon the analytic aim (health economy, prevention, health care research) different methods exist for the generation of these measurements. In the results presented here, the age for a premature death is considered to be before 70 years, according to the guidelines of the OECD and the WHO (as seen in the abbreviation PYLL-70 or AYLL-70).

Shortcuts

FRG Federal Republic of Germany

GEKID Association of Population-based Cancer Registries in Germany

(Gesellschaft der epidemiologischen Krebsregister in Deutschland e.V.)

MCR Munich Cancer Registry (Tumorregister München)
SEER Surveillance, Epidemiology, and End Results (USA)

AYLL-70 Average years of life lost prior to age 70 given a person dies before that age

BRD-S German standard population

DCO Death certificate only EAR Excess absolute risk

= excess cancer cases (O - E) per 10,000 person-years

ES European standard population (old)

LCL Lower confidence limit

MI-index Ratio between mortality and incidence

PYLL-70 Potential years of life lost prior to age 70 given a person dies before that age

SIR Standardized incidence ratio SMR Standardized mortality ratio UCL Upper confidence limit WS World standard population

Recommended Citation

Munich Cancer Registry. Baseline statistics C30, C31: Nasal cavity, middle ear, sinuses cancer [Internet]. 2015 [updated 2015 May 19; cited 2015 Jul 1]. Available from: http://www.tumorregister-muenchen.de/en/facts/base/base C3031E.pdf

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