

# Munich Cancer Registry



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

## ICD-10 C30, C31: Nasal cavity, middle ear, sinuses cancer Incidence and Mortality

Year of diagnosis	1998-2016
Patients	664
Diseases	670
Creation date	08/21/2018
Export date	08/09/2018
Population	4.81 m




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

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

### Index of figures and tables

Fig./Tbl.		Page
1	Annual cases, DCO, mult. malignancies, follow-up / yr	5
2	Incidence by year of diagnosis	8
3	Age distribution parameters by year of diagnosis	9
4	Age distribution by 5-year age group and sex	10
5	Age-specific incidence, DCO rate, proportion malignancies	11
6	Age distribution and age-specific incidence (chart)	12
6a	Age-specific incidence internationally (chart)	13
7	Standardized incidence ratio of further malignancies	14
8a	Map of cancer incidence (WS) by county (chart)	16
8b	Standardized incidence ratio (SIR) by county (chart)	17
9a	Pts incident cohorts and mortality / yr	18
9b	Incidence and mortality by year of diagnosis	19
9c	Cancer-related deaths, death certification available / yr	20
10	Medians of age at death / yr	21
11	Mortality by year of death	23
12	Distribution of age at death	24
13	Age-specific mortality	25
14	Further malignancies in deaths	26
15	Age-specific mortality (first primaries)	28
16	Age-specific mortality (single primaries)	29
17	Age distribution and age-specific mortality (chart)	30
18a	Map of cancer mortality (WS) by county (chart)	31
18b	Standardized mortality ratio (SMR) by county (chart)	32

**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<sup>#</sup>, with a total of 4.69 million inhabitants, account for the frequency of cancer diseases<sup>##</sup> 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<sup>###</sup> 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](mailto:tumor@ibe.med.uni-muenchen.de).

Munich Cancer Registry, August 2018

<sup>#</sup> 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).

<sup>##</sup> 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.

<sup>###</sup> 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	21	1	4.8	19.0	14.5	81.0	95.2
1999	19	1	5.3	22.5	14.6	78.9	100.0
2000	21	2	9.5	16.4	14.3	71.4	100.0
2001	13	1	7.7	14.9	14.1	76.9	100.0
2002	25	2	8.0	14.1	14.1	84.0	100.0 #
2003	38	2	5.3	13.1	14.0	76.3	97.4
2004	23			14.4	13.5	60.9	100.0
2005	31			14.7	13.2	77.4	100.0
2006	39	3	7.7	17.0	12.7	74.4	97.4
2007	46	3	6.5	15.9	12.9	52.2	76.1 #
2008	41	2	4.9	16.1	11.5	48.8	75.6
2009	49	1	2.0	15.6	11.4	51.0	83.7
2010	54	1	1.9	14.5	10.9	42.6	79.6
2011	53	2	3.8	15.0	10.4	58.5	73.6
2012	56	1	1.8	15.7	8.9	39.3	76.8
2013	43			16.4	8.1	32.6	81.4
2014	58	1	1.7	16.7	6.3	39.7	75.9
2015	27	1	3.7	17.0	7.9	29.6	92.6
2016	13	1	7.7	16.9	8.3	23.1	69.2 ##
1998-2016	670	25	3.7	16.9	14.5	54.8	85.4

670 cases diagnosed 1998-2016 are related to a total of 664 patients. Currently, in 198 (29.8 %) of these 664 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 142 / 37 / 19 (21.4 % / 5.6 % / 2.9 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2014, a subgroup of 58 cases has been diagnosed, of which 16.7 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 6.3 % 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	15	71.4			20.0	14.8	86.7	93.3
1999	11	57.9			15.4	15.1	63.6	100.0
2000	16	76.2	1	6.3	11.9	15.0	62.5	100.0
2001	8	61.5			10.0	14.6	87.5	100.0
2002	14	56.0	2	14.3	9.4	14.3	92.9	100.0 #
2003	23	60.5	1	4.3	9.2	14.3	82.6	100.0
2004	15	65.2			11.8	14.3	60.0	100.0
2005	20	64.5			12.3	13.7	80.0	100.0
2006	21	53.8	3	14.3	15.4	13.3	76.2	100.0
2007	32	69.6	2	6.3	14.3	13.9	46.9	75.0 #
2008	29	70.7	1	3.4	14.2	11.9	41.4	69.0
2009	29	59.2			14.2	11.1	48.3	82.8
2010	36	66.7			12.3	10.6	44.4	83.3
2011	39	73.6	2	5.1	13.0	11.1	59.0	79.5
2012	29	51.8			14.5	9.4	37.9	79.3
2013	27	62.8			15.1	9.0	29.6	77.8
2014	31	53.4			14.9	7.8	45.2	77.4
2015	18	66.7			15.0	9.5	27.8	88.9
2016	5	38.5	1	20.0	14.8	0.0	40.0	80.0 ##
1998-2016	418	62.4	13	3.1	14.8	14.8	55.0	85.9

418 cases diagnosed 1998-2016 are related to a total of 416 patients. Currently, in 118 (28.4 %) of these 416 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 81 / 24 / 13 (19.5 % / 5.8 % / 3.1 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2014, a subgroup of 31 cases has been diagnosed, of which 14.9 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 7.8 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1b

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

Year of diagnosis	Females n	Females %	DCO cases n	Prop. DCO %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	6	28.6	1	16.7	16.7	14.0	66.7	100.0
1999	8	42.1	1	12.5	35.7	13.9	100.0	100.0
2000	5	23.8	1	20.0	26.3	13.1	100.0	100.0
2001	5	38.5	1	20.0	25.0	13.4	60.0	100.0
2002	11	44.0			22.9	13.7	72.7	100.0 #
2003	15	39.5	1	6.7	20.0	13.4	66.7	93.3
2004	8	34.8			19.0	12.2	62.5	100.0
2005	11	35.5			18.8	12.2	72.7	100.0
2006	18	46.2			19.5	11.9	72.2	94.4
2007	14	30.4	1	7.1	18.8	11.3	64.3	78.6 #
2008	12	29.3	1	8.3	19.5	11.0	66.7	91.7
2009	20	40.8	1	5.0	18.0	12.0	55.0	85.0
2010	18	33.3	1	5.6	18.5	11.4	38.9	72.2
2011	14	26.4			18.8	9.3	57.1	57.1
2012	27	48.2	1	3.7	17.7	8.3	40.7	74.1
2013	16	37.2			18.8	6.9	37.5	87.5
2014	27	46.6	1	3.7	19.6	4.5	33.3	74.1
2015	9	33.3	1	11.1	20.5	5.9	33.3	100.0
2016	8	61.5			20.2	12.5	12.5	62.5 ##
1998-2016	252	37.6	12	4.8	20.2	14.0	54.4	84.5

252 cases diagnosed 1998-2016 are related to a total of 248 patients. Currently, in 80 (32.3 %) of these 248 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 61 / 13 / 6 (24.6 % / 5.2 % / 2.4 %) patients exist having 2 / 3 / 4+ malignancies.

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

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

How to interpret:

In 2014, a subgroup of 27 cases has been diagnosed, of which 19.6 % 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 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 4.81 m as of 2007, respectively)

Year of diagnosis	Males n	Females n	Males Inc. raw	Fem. Inc. raw	Males Inc. WS	Fem. Inc. WS	Males Inc. ES	Fem. Inc. ES	Males Inc. BRD-S	Fem. Inc. BRD-S
1998	15	6	1.4	0.5	0.8	0.3	1.2	0.4	1.7	0.5
1999	11	8	1.0	0.7	0.6	0.2	0.8	0.4	0.9	0.6
2000	16	5	1.4	0.4	0.9	0.2	1.3	0.3	1.6	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	32	14	1.4	0.6	0.9	0.3	1.2	0.4	1.5	0.5
2008	29	12	1.3	0.5	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	39	14	1.7	0.6	0.9	0.3	1.3	0.4	1.6	0.5
2012	29	27	1.3	1.1	0.8	0.6	1.0	0.8	1.2	0.9
2013	27	16	1.2	0.7	0.6	0.4	0.9	0.5	1.1	0.5
2014	31	27	1.3	1.1	0.6	0.5	0.9	0.8	1.2	0.9
2015	18	9	0.8	0.4	0.4	0.2	0.6	0.2	0.7	0.3
2016	5	8	0.2	0.3	0.1	0.2	0.2	0.2	0.2	0.3
1998-2016	418	252	1.1	0.7	0.7	0.3	0.9	0.4	1.1	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	Std.		Min.	Max.	10%	25%	Median		
		Mean	dev.					50%	75%	90%
1998	21	66.3	12.4	38.0	84.5	53.1	62.1	67.1	74.9	80.4
1999	19	64.6	14.9	33.5	82.4	36.0	59.3	66.8	76.2	80.9
2000	21	65.8	16.0	20.4	90.5	49.6	58.6	68.6	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	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	46	62.9	15.7	20.2	86.2	39.0	54.4	63.9	77.1	81.4
2008	41	61.4	18.7	14.1	93.9	39.0	46.4	61.3	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	53	63.5	14.2	37.7	86.1	46.4	51.6	64.6	76.4	79.4
2012	56	65.2	14.9	18.6	94.9	46.3	55.9	64.3	73.0	87.2
2013	43	64.0	13.5	34.5	90.1	41.8	55.8	65.1	73.7	78.7
2014	58	67.6	14.2	25.6	88.5	44.7	59.5	72.2	78.1	84.0
2015	27	67.8	13.8	41.4	94.1	47.5	57.5	70.4	75.5	85.8
2016	13	66.7	11.5	43.7	80.4	47.2	62.0	67.3	73.0	80.1
1998–2016	670	65.2	15.2	2.4	103	44.6	55.5	66.7	76.6	83.6

Table 3a

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

Year of diagnosis	Cases n	Std.		Min.	Max.	10%	25%	Median		
		Mean	dev.					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	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	32	61.6	16.7	20.2	86.2	37.6	54.0	62.0	76.3	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	39	62.9	13.9	37.7	85.4	41.6	51.7	63.1	74.9	79.0
2012	29	62.0	15.8	18.6	94.9	45.0	52.3	63.0	71.6	84.3
2013	27	64.7	11.6	37.1	80.9	49.5	57.7	65.1	74.5	76.5
2014	31	68.5	12.4	25.6	85.1	56.2	59.7	71.7	77.6	82.2
2015	18	66.7	12.7	47.3	94.1	47.5	57.5	69.3	74.2	85.8
2016	5	67.7	15.0	43.7	80.1	43.7	64.0	70.9	79.6	80.1
1998–2016	418	63.3	14.8	2.4	94.9	43.0	54.0	64.7	74.6	80.4

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		
				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	8	76.1	4.8	66.8	82.4	66.8	74.6	76.4	79.0	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	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	27	68.7	13.3	42.5	92.5	54.9	60.6	66.5	78.9	88.4
2013	16	62.9	16.6	34.5	90.1	37.7	54.0	63.0	70.5	88.9
2014	27	66.6	16.1	34.9	88.5	41.5	57.5	72.7	79.8	84.6
2015	9	70.0	16.5	41.4	92.2	41.4	57.7	74.7	78.6	92.2
2016	8	66.1	9.8	47.2	80.4	47.2	61.8	66.6	72.0	80.4
1998-2016	252	68.3	15.4	14.1	103	47.7	58.4	69.8	79.7	87.7

Table 4

Age distribution by 5-year age group and sex for period 2007-2016  
(incl. DCO)

Age at diagnosis Years	Cases n	Males			Females				
		%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4	1	0.2	0.2	1	0.4	0.4			0.0
5-9	0	0.0	0.2			0.4			0.0
10-14	1	0.2	0.5			0.4	1	0.6	0.6
15-19	3	0.7	1.1	3	1.1	1.5			0.6
20-24	1	0.2	1.4	1	0.4	1.8			0.6
25-29	1	0.2	1.6	1	0.4	2.2			0.6
30-34	4	0.9	2.5	2	0.7	2.9	2	1.2	1.8
35-39	17	3.9	6.4	13	4.7	7.6	4	2.4	4.2
40-44	24	5.5	11.8	15	5.5	13.1	9	5.5	9.7
45-49	28	6.4	18.2	18	6.5	19.6	10	6.1	15.8
50-54	31	7.0	25.2	22	8.0	27.6	9	5.5	21.2
55-59	49	11.1	36.4	32	11.6	39.3	17	10.3	31.5
60-64	49	11.1	47.5	31	11.3	50.5	18	10.9	42.4
65-69	46	10.5	58.0	28	10.2	60.7	18	10.9	53.3
70-74	65	14.8	72.7	45	16.4	77.1	20	12.1	65.5
75-79	54	12.3	85.0	35	12.7	89.8	19	11.5	77.0
80-84	30	6.8	91.8	17	6.2	96.0	13	7.9	84.8
85+	36	8.2	100.0	11	4.0	100.0	25	15.2	100.0
All ages	440	100.0		275	100.0		165	100.0	

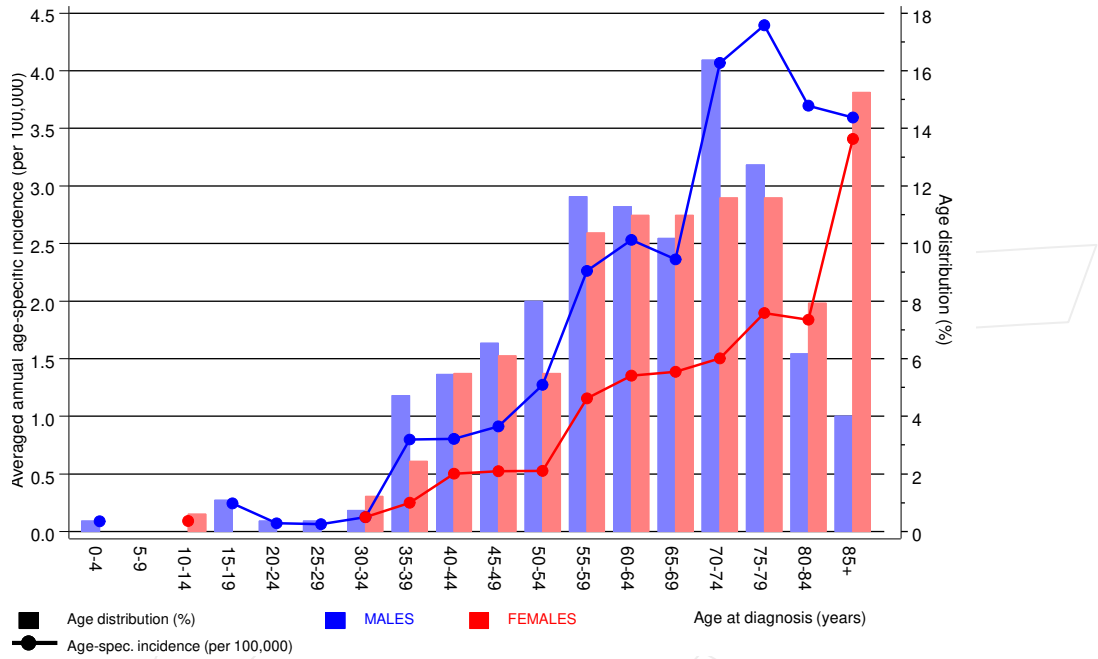
Table 5

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

Age at diagnosis Years	Males n	Females n	Males Age- spec. incid.	Females Age- spec. incid.	Males DCO rate n=6 %	Females DCO rate n=7 %	Males	Females
							Prop.all cancers n=113978 %	Prop.all cancers n=112253 %
0- 4	1		0.1				0.5	
5- 9								
10-14		1		0.1				1.0
15-19	3		0.2				1.2	
20-24	1		0.1				0.2	
25-29	1		0.1				0.1	
30-34	2	2	0.1	0.1			0.2	0.1
35-39	13	4	0.8	0.3			0.9	0.2
40-44	15	9	0.8	0.5			0.7	0.2
45-49	18	10	0.9	0.5			0.5	0.1
50-54	22	9	1.3	0.5			0.4	0.1
55-59	32	17	2.3	1.2		5.9	0.3	0.2
60-64	31	18	2.5	1.4			0.2	0.2
65-69	28	18	2.4	1.4		5.6	0.1	0.1
70-74	45	19	4.1	1.5	2.2		0.2	0.1
75-79	35	19	4.4	1.9	2.9		0.2	0.1
80-84	17	13	3.7	1.8	5.9		0.2	0.1
85+	11	25	3.6	3.4	27.3	20.0	0.1	0.2
All ages	275	164			2.2	4.3	0.2	0.1
Incidence								
Raw			1.2	0.7				
WS			0.7	0.3				
ES			0.9	0.5				
BRD-S			1.1	0.6				

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

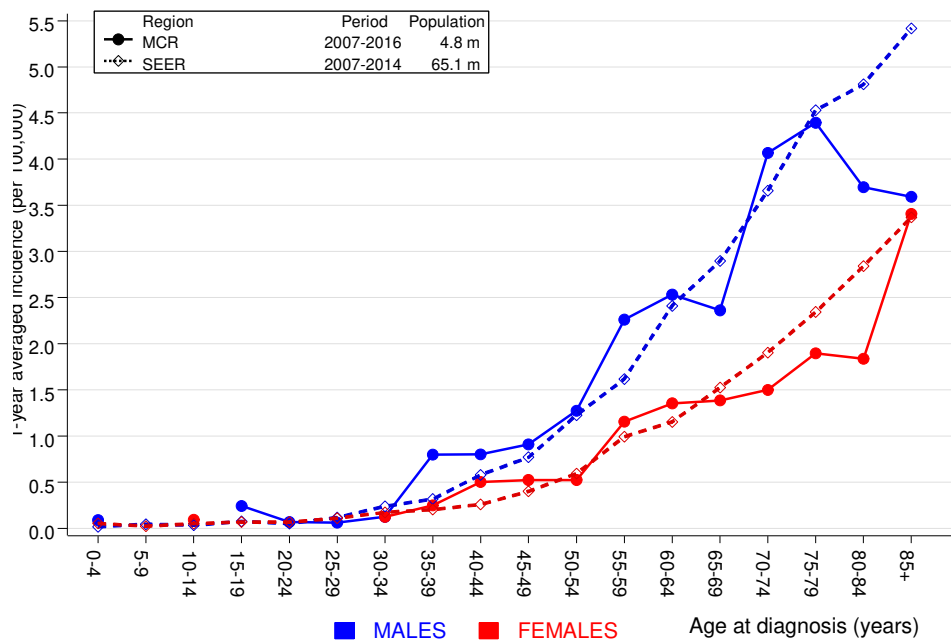
ICD-10 C30, C31: Malign neoplasm of nasal cavity, middle ear and accessory sinuses  
 Age distribution and age-specific incidence 2007 - 2016 (Males: 275, Females: 164)



**Figure 6.** Age distribution (males: mean=63.1 yrs, median=64.8 yrs; females: mean=67.4 yrs, median=67.8 yrs) and age-specific incidence.

CD-10 C30, C31: Malign neoplasm of nasal cavity, middle ear and accessory sinuses

Age-specific incidence rates: international comparison



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

Reference:

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

Table 7a

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

## MALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C00 Lip	2	0.0	96.8	11.7	349.8 #	15.1	
C03–C06 Oral cavity	3	0.2	18.5	3.8	54.1 #	21.7	
C09–C10 Oropharynx	2	0.2	9.9	1.2	35.6 #	13.7	50.0
C11 Nasopharynx	2	0.0	142.5	17.3	514.8 #	15.2	50.0
C15 Oesophagus	3	0.4	8.4	1.7	24.5 #	20.2	
C16 Stomach	4	0.7	5.5	1.5	14.1 #	25.0	
C17 Small intestine	2	0.1	19.2	2.3	69.5 #	14.5	
C18 Colon	5	1.7	2.9	0.9	6.7	24.9	20.0
C19–C20 Rectum	4	1.0	4.1	1.1	10.4 #	23.0	
C25 Pancreas	2	0.7	2.9	0.3	10.4	10.0	
C30–C31 Sinuses	2	0.0	55.6	6.7	200.9 #	15.0	50.0
C33–C34 Lung	10	2.2	4.6	2.2	8.4 #	59.6	10.0
C43 Malign. melanoma	4	0.8	4.8	1.3	12.2 #	24.2	75.0
C61 Prostate	2	5.2	0.4	0.0	1.4	-24.4	
C76–C79 CUP	2	0.3	6.5	0.8	23.4	12.9	
C82–C85 NHL	2	0.7	2.7	0.3	9.7	9.6	
C91–C96 Leukaemia	2	0.3	6.7	0.8	24.1	13.0	
Others, specified	13	2.4	5.3	2.8	9.1 #	80.7	15.4
Not observed	0	1.5	0.0	0.0	2.5	-11.3	
All further malignancies	66	18.5	3.6	2.8	4.5 #	362.4	15.2
Patients		400					
Median age at next malignancy (years)		70.5					
Person-years		1310					
Mean observation time (years)		3.3					
Median observation time (years)		2.2					

# The occurrence of further malignancy listed is statistically significant.

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

Table 7b

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

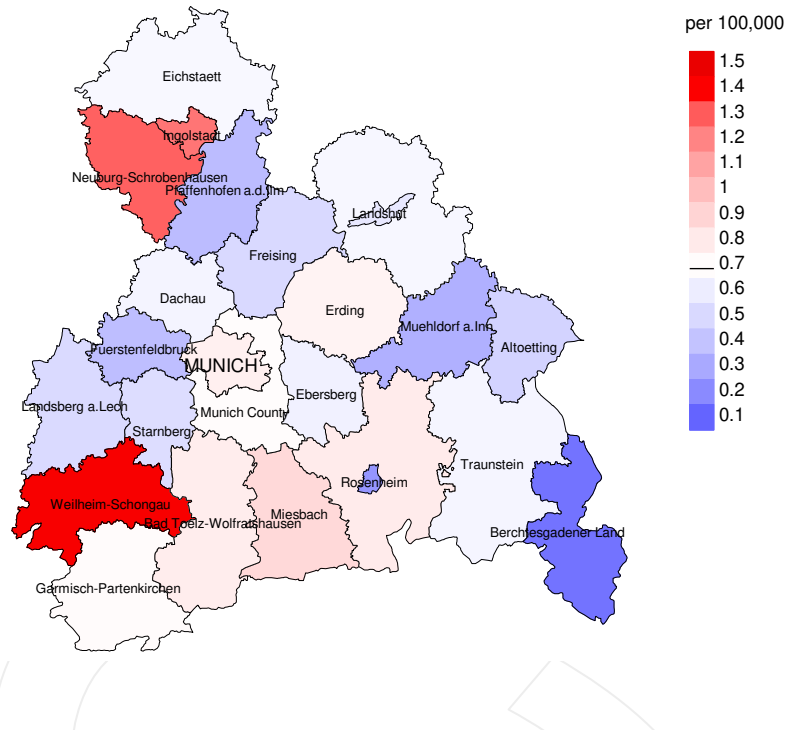
## FEMALES

Diagnosis	Observed n	Expected n	SIR	CI 95%	CI 95%	EAR	DCO %
C03–C06 Oral cavity	2	0.0	41.7	5.0	150.5 #	26.4	
C11 Nasopharynx	2	0.0	636.7	77.1	2300 #	27.1	50.0
C25 Pancreas	4	0.4	9.5	2.6	24.3 #	48.5	50.0
C30–C31 Sinuses	4	0.0	300.9	82.0	770.3 #	54.0	25.0
C43 Malign. melanoma	3	0.3	9.8	2.0	28.5 #	36.5	33.3
C91–C96 Leukaemia	3	0.1	20.3	4.2	59.3 #	38.6	33.3
Others, specified	12	5.6	2.1	1.1	3.7 #	86.7	16.7
Not observed	0	2.0	0.0	0.0	1.8	-27.5	
All further malignancies	30	8.6	3.5	2.4	5.0 #	290.3	26.7
Patients		235					
Median age at next malignancy (years)		77.6					
Person-years		738					
Mean observation time (years)		3.1					
Median observation time (years)		1.7					

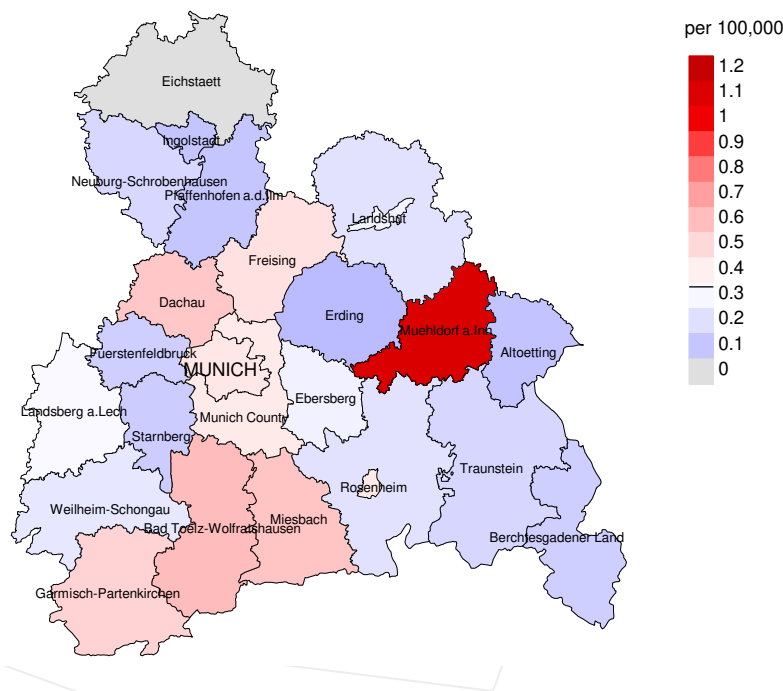
# The occurrence of further malignancy listed is statistically significant.

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

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



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

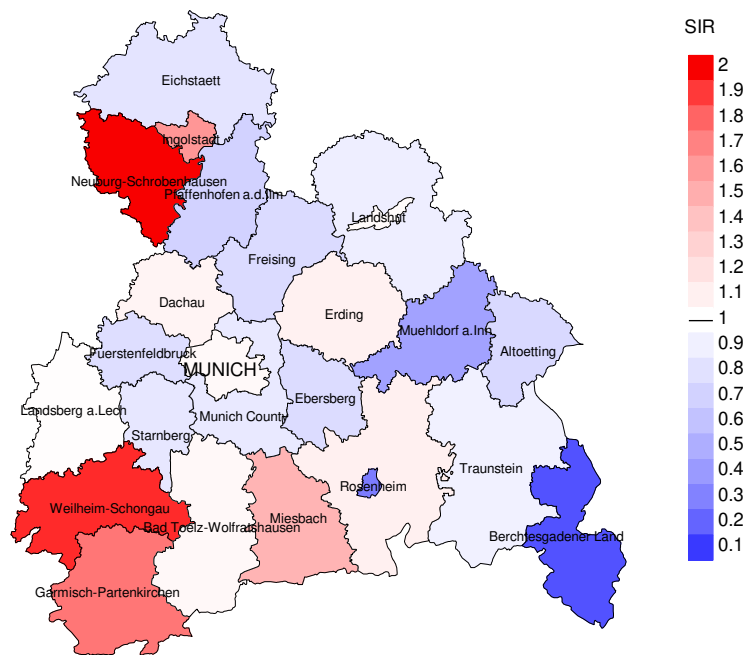


**Figure 8a.** Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.7/100,000 WS N=275, females 0.3/100,000 WS N=164).

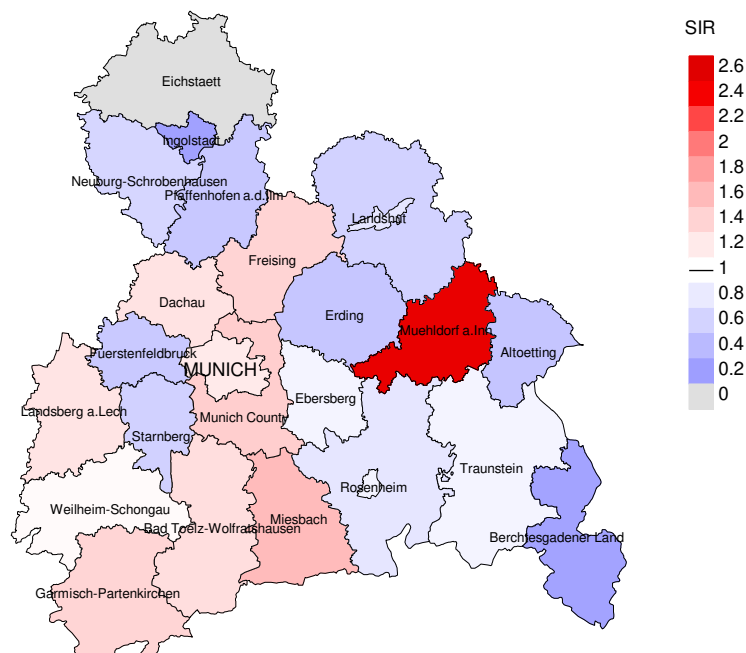
The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 4 women were identified with newly diagnosed nasal cavity, middle ear, sinuses cancer. Therefore, the mean incidence rate for this 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 1.3/100,000.



Standardized incidence ratio (SIR) 2007 - 2016: Males



Standardized incidence ratio (SIR) 2007 - 2016: Females



**Figure 8b.** Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=275, females N=164).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 4 women were identified with newly diagnosed nasal cavity, middle ear, sinuses cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.89. Though, the value of this parameter may vary with an underlying probability of 99% between 0.15 and 2.81, 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 4.81 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	21	95.2	4.8	17	81.0	94.1
1999	19	100.0	5.3	15	78.9	93.3
2000	21	100.0	9.5	15	71.4	100.0
2001	13	100.0	7.7	10	76.9	100.0
2002	25	100.0	8.0	21	84.0	95.2
2003	38	97.4	5.3	29	76.3	96.6
2004	23	100.0		14	60.9	100.0
2005	31	100.0		24	77.4	100.0
2006	39	97.4	7.7	29	74.4	100.0
2007	46	76.1	6.5	24	52.2	100.0
2008	41	75.6	4.9	20	48.8	100.0
2009	49	83.7	2.0	25	51.0	100.0
2010	54	79.6	1.9	23	42.6	95.7
2011	53	73.6	3.8	31	58.5	93.5
2012	56	76.8	1.8	22	39.3	100.0
2013	43	81.4		14	32.6	92.9
2014	58	75.9	1.7	23	39.7	91.3
2015	27	92.6	3.7	8	29.6	100.0
2016	13	69.2	7.7	3	23.1	100.0
1998-2016	670	85.4	3.7	367	54.8	97.3

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 4.81 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	21	12	83.3	3	14.3
1999	19	9	77.8	3	15.8
2000	21	20	100.0	2	9.5
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	46	22	95.5	7	15.2
2008	41	25	100.0	7	17.1
2009	49	22	100.0	1	2.0
2010	54	27	100.0	2	3.7
2011	53	28	96.4	6	11.3
2012	56	32	96.9	4	7.1
2013	43	38	100.0	3	7.0
2014	58	34	100.0	10	17.2
2015	27	24	95.8	4	14.8
2016	13	39	100.0	3	23.1
1998-2016	670	467	97.4	80	11.9

Table 9c

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

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

Year of death	Deaths n	Prop. cancer- related %	Prop. non-cancer- related %	Prop. cancer recorded on death certificate %
1998	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	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	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	24	70.8	29.2	87.0
2016	39	69.2	30.8	79.5
1998-2016	467	70.7	29.3	82.2

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	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	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	18	66.7	65.3	68.0	68.1
2016	24	73.7	71.2	80.5	71.2
1998–2016	300	73.7	70.9	79.6	71.2

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	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	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	15	81.7	71.1	92.1	78.3
1998-2016	167	78.6	77.3	84.0	78.1

By 2010, life expectancy at birth was 77.5 years for boys and 82.6 years for girls.

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

Table 11a

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

## MALES

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
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	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	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	0.31	0.2	0.24	0.3	0.28	0.5	0.35
2008	16	0.7	0.55	0.4	0.50	0.6	0.57	0.7	0.64
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	0.31	0.2	0.25	0.4	0.29	0.5	0.33
2012	16	0.7	0.55	0.4	0.47	0.5	0.49	0.7	0.58
2013	18	0.8	0.67	0.4	0.60	0.6	0.65	0.8	0.71
2014	15	0.6	0.48	0.3	0.44	0.4	0.46	0.6	0.47
2015	13	0.5	0.72	0.3	0.71	0.4	0.74	0.5	0.74
2016	17	0.7	3.40	0.4	3.30	0.5	3.32	0.7	3.36
1998-2016	215	0.6	0.51	0.3	0.45	0.4	0.49	0.6	0.54

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	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	0.30	0.1	0.18	0.1	0.19	0.2	0.24
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	0.96	0.3	0.78	0.4	0.71
2012	5	0.2	0.19	0.1	0.10	0.1	0.13	0.1	0.15
2013	7	0.3	0.47	0.1	0.36	0.2	0.40	0.3	0.50
2014	8	0.3	0.30	0.1	0.17	0.2	0.21	0.2	0.23
2015	4	0.2	0.44	0.0	0.24	0.1	0.29	0.1	0.35
2016	10	0.4	1.25	0.2	1.01	0.3	1.06	0.3	1.15
1998-2016	115	0.3	0.46	0.1	0.38	0.2	0.40	0.2	0.43

Table 12

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

Age at death Years	Cases			Males			Females		
	n	%	Cum.%	n	%	Cum.%	n	%	Cum.%
0-4									
5-9									
10-14									
15-19	1	0.5	0.5			0.0	1	1.5	1.5
20-24	2	1.0	1.5	2	1.4	1.4			1.5
25-29	1	0.5	1.9			1.4	1	1.5	2.9
30-34	1	0.5	2.4	1	0.7	2.2			2.9
35-39	2	1.0	3.4	2	1.4	3.6			2.9
40-44	3	1.5	4.9	2	1.4	5.1	1	1.5	4.4
45-49	3	1.5	6.3	2	1.4	6.5	1	1.5	5.9
50-54	15	7.3	13.6	11	8.0	14.5	4	5.9	11.8
55-59	18	8.7	22.3	15	10.9	25.4	3	4.4	16.2
60-64	16	7.8	30.1	10	7.2	32.6	6	8.8	25.0
65-69	29	14.1	44.2	19	13.8	46.4	10	14.7	39.7
70-74	25	12.1	56.3	19	13.8	60.1	6	8.8	48.5
75-79	35	17.0	73.3	25	18.1	78.3	10	14.7	63.2
80-84	30	14.6	87.9	20	14.5	92.8	10	14.7	77.9
85+	25	12.1	100.0	10	7.2	100.0	15	22.1	100.0
All ages	206	100.0		138	100.0		68	100.0	



Table 13

Age-specific mortality (cancer-related) and proportion of all cancers  
for period 2007–2016  
(incl. multiple malignancies)

Age at death Years	Males n	Females n	Males Age- spec. mortal.	Males MI-index	Females Age- spec. mortal.	Females MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4								
5- 9								
10-14								
15-19		1			0.1	1.00		4.5
20-24	2		0.1	2.00			3.5	
25-29		1			0.1	1.00		1.4
30-34	1		0.1	0.50			1.0	
35-39	2		0.1	0.15			1.0	
40-44	2	1	0.1	0.13	0.1	0.11	0.4	0.1
45-49	2	1	0.1	0.11	0.1	0.10	0.2	0.1
50-54	11	4	0.6	0.50	0.2	0.44	0.5	0.2
55-59	15	3	1.1	0.47	0.2	0.18	0.4	0.1
60-64	10	6	0.8	0.32	0.5	0.33	0.2	0.2
65-69	19	10	1.6	0.68	0.8	0.56	0.3	0.2
70-74	19	6	1.7	0.42	0.5	0.32	0.2	0.1
75-79	25	10	3.1	0.71	1.0	0.53	0.3	0.1
80-84	20	10	4.3	1.18	1.4	0.77	0.3	0.1
85+	10	15	3.3	0.91	2.0	0.60	0.2	0.2
All ages	138	68					0.3	0.1
Mortality								
Raw			0.6	0.50	0.3	0.41		
WS			0.3	0.43	0.1	0.35		
ES			0.4	0.47	0.2	0.36		
BRD-S			0.6	0.52	0.2	0.39		
PYLL-70								
per 100,000			4.0		1.6			
ES			3.6		1.5			
AYLL-70			12.5		11.9			

Table 14a

Further malignancies in deaths in period 1998–2016  
MALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C03–C06 Oral cavity	9	7.4	6	66.7			3	33.3
C07–C08 Salivary gland	3	2.5	1	33.3			2	66.7
C09–C10 Oropharynx	5	4.1	3	60.0			2	40.0
C11 Nasopharynx	2	1.7			1	50.0	1	50.0
C12–C13 Hypopharynx	2	1.7	1	50.0			1	50.0
C15 Oesophagus	3	2.5					3	100.0
C16 Stomach	5	4.1	2	40.0			3	60.0
C18 Colon	6	5.0	2	33.3			4	66.7
C19–C20 Rectum	3	2.5					3	100.0
C23–C24 Bile	2	1.7					2	100.0
C30–C31 Sinuses	2	1.7					2	100.0
C32 Larynx	6	5.0	6	100.0				
C33–C34 Lung	16	13.2					16	100.0
C43 Malign. melanoma	3	2.5					3	100.0
C44 Skin others	10	8.3	4	40.0	2	20.0	4	40.0
C46,C49 Soft tissue	3	2.5	1	33.3			2	66.7
C61 Prostate	17	14.0	8	47.1	1	5.9	8	47.1
C67 Bladder	2	1.7					2	100.0
C70–C72 CNS cancer	2	1.7	1	50.0			1	50.0
C76–C79 CUP	3	2.5	1	33.3	1	33.3	1	33.3
C82–C85 NHL	4	3.3	1	25.0			3	75.0
C90 Mult. myeloma	3	2.5	1	33.3			2	66.7
Others, specified	10	8.3	1	10.0	1	10.0	8	80.0
All further malignancies	121	100.0	39	32.2	6	5.0	76	62.8

Further malignancies with number of cases 1 are pooled in category “Others, specified”.

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 1998-2016  
FEMALES

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C00 Lip	1	1.7	1	100.0				
C03-C06 Oral cavity	5	8.3	3	60.0			2	40.0
C09-C10 Oropharynx	3	5.0	3	100.0				
C11 Nasopharynx	3	5.0	1	33.3			2	66.7
C12-C13 Hypopharynx	1	1.7	1	100.0				
C14 ENT cancer	1	1.7					1	100.0
C16 Stomach	1	1.7					1	100.0
C18 Colon	2	3.3	2	100.0				
C22 Liver	1	1.7					1	100.0
C25 Pancreas	4	6.7					4	100.0
C30-C31 Sinuses	2	3.3			1	50.0	1	50.0
C32 Larynx	1	1.7	1	100.0				
C33-C34 Lung	2	3.3					2	100.0
C43 Malign. melanoma	3	5.0	1	33.3	1	33.3	1	33.3
C44 Skin others	5	8.3			2	40.0	3	60.0
C50 Breast	12	20.0	10	83.3			2	16.7
C51 Vulva	1	1.7	1	100.0				
C53 Cervix uteri	1	1.7	1	100.0				
C54 Corpus uteri	2	3.3	2	100.0				
C56 Ovary	2	3.3					2	100.0
C67 Bladder	1	1.7					1	100.0
C82-C85 NHL	2	3.3	1	50.0			1	50.0
C90 Mult. myeloma	1	1.7					1	100.0
C91-C96 Leukaemia	3	5.0					3	100.0
All further malignancies	60	100.0	28	46.7	4	6.7	28	46.7

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

Table 15

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

Age at death Years	Males n	Females n	Males Age- spec. mortal. MI-index	Females Age- spec. mortal. MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4						
5- 9						
10-14						
15-19		1		0.1	1.00	5.0
20-24	2		0.1	2.00	3.9	
25-29		1		0.1	1.00	1.5
30-34	1		0.1	1.00	1.0	
35-39	2		0.1	0.15	1.1	
40-44	2	1	0.1	0.13	0.4	0.2
45-49	2		0.1	0.13	0.2	
50-54	10	4	0.6	0.48	0.6	0.2
55-59	15	2	1.1	0.58	0.5	0.1
60-64	8	4	0.7	0.28	0.2	0.1
65-69	18	7	1.5	0.82	0.3	0.2
70-74	15	3	1.4	0.54	0.2	0.1
75-79	17	9	2.1	0.61	0.3	0.2
80-84	17	6	3.7	1.31	0.3	0.1
85+	8	11	2.6	0.89	0.2	0.1
All ages	117	49			0.3	0.1
Mortality						
Raw			0.5	0.52	0.2	0.39
WS			0.3	0.44	0.1	0.33
ES			0.4	0.48	0.1	0.34
BRD-S			0.5	0.52	0.2	0.37
PYLL-70						
per 100,000			3.8		1.3	
ES			3.4		1.3	
AYLL-70			12.8		13.3	

\* See corresponding tables with multiple malignancies.

Table 16

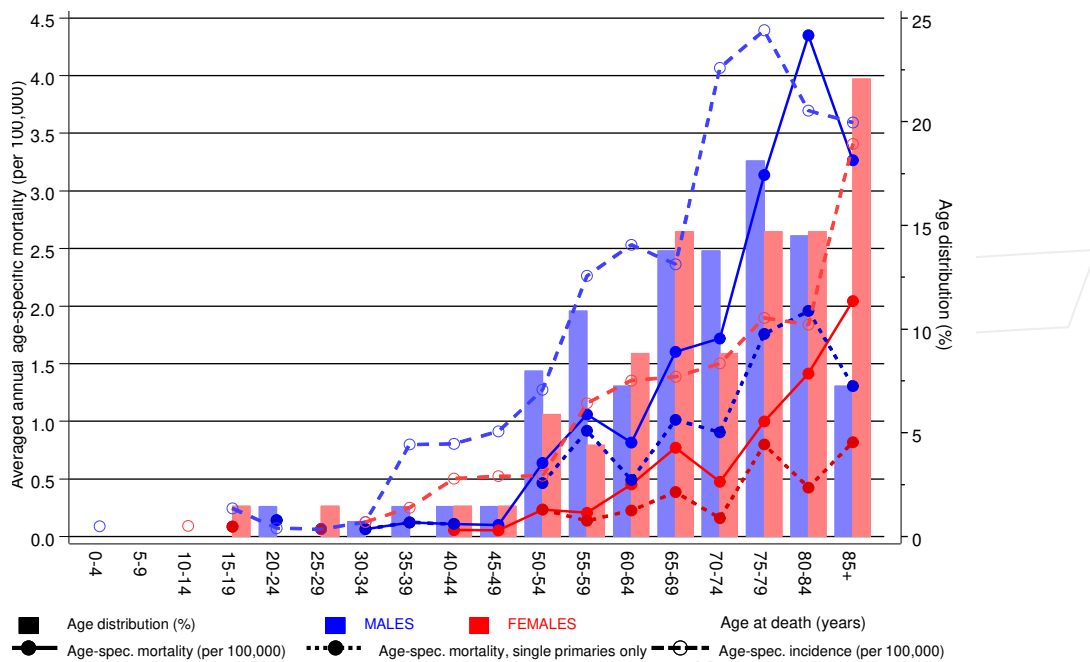
Age-specific mortality (cancer-related) and proportion of all cancers  
for period 2007-2016  
(**Single primaries only** \*)

Age at death Years	Males n	Females n	Males Age- spec. mortal. MI-index	Females Age- spec. mortal. MI-index	Males Prop.all cancers %	Females Prop.all cancers %
0- 4						
5- 9						
10-14						
15-19		1		0.1	1.00	5.3
20-24	2		0.1	2.00	3.9	
25-29		1		0.1	1.00	1.5
30-34	1		0.1	1.00	1.0	
35-39	2		0.1	0.17	1.1	
40-44	2		0.1	0.15	0.4	
45-49						
50-54	8	4	0.5	0.40	0.4	0.2
55-59	13	2	0.9	0.57	0.4	0.1
60-64	6	3	0.5	0.26	0.2	0.1
65-69	12	5	1.0	0.60	0.4	0.1
70-74	10	2	0.9	0.38	0.2	0.0
75-79	14	8	1.8	0.56	0.8	0.2
80-84	9	3	2.0	0.82	0.4	0.1
85+	4	6	1.3	0.67	0.8	0.1
All ages	83	35			0.2	0.1
Mortality						
Raw			0.4	0.41	0.1	0.31
WS			0.2	0.36	0.1	0.28
ES			0.3	0.39	0.1	0.29
BRD-S			0.3	0.42	0.1	0.31
PYLL-70						
per 100,000			3.1		1.1	
ES			2.9		1.1	
AYLL-70			13.7		14.1	

\* See corresponding tables with multiple malignancies.

ICD-10 C30, C31: Malign neoplasm of nasal cavity, middle ear and accessory sinuses

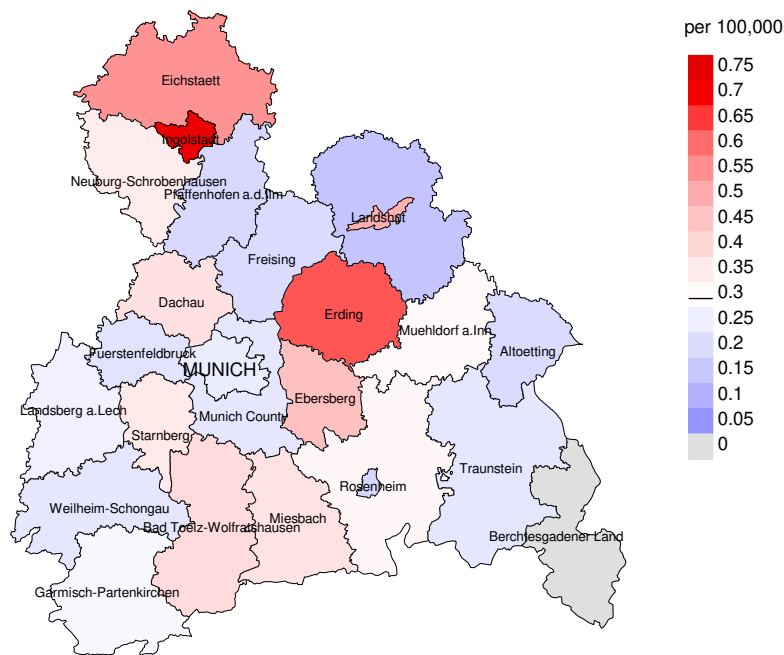
Age distribution and age-specific mortality 2007 - 2016 (Males: 138, Females: 68)



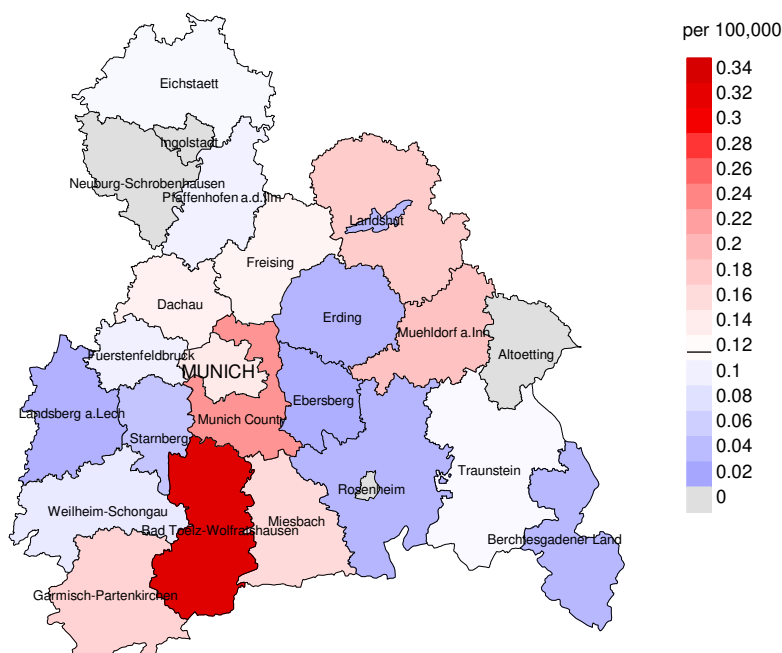
**Figure 17.** Distribution of age at death (bars; males: mean=64.2 yrs, median=67.3 yrs; females: mean=68.4 yrs, median=70.5 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed 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.

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



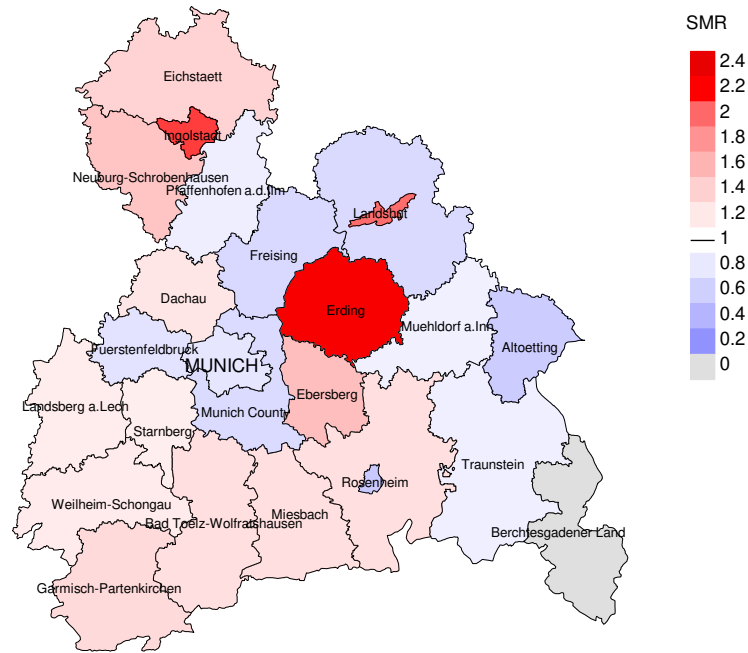
Average mortality (world standard population) 2007 - 2016: Females



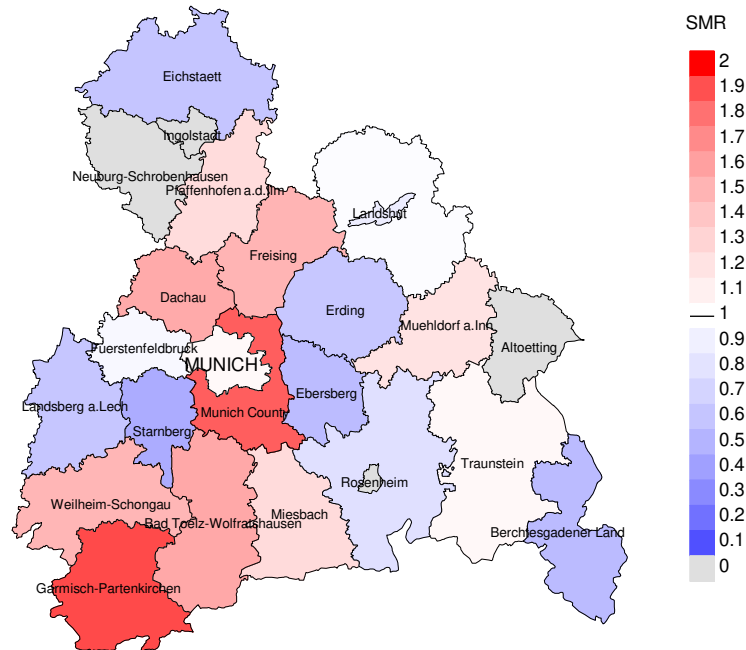
**Figure 18a.** Map of cancer mortality (world standard population) by county averaged for period 2007 to 2016. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 0.3/100,000 WS N=138, females 0.1/100,000 WS N=68).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 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 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.0 and 1.0/100,000.

Standardized mortality ratio (SMR) 2007 - 2016: Males



Standardized mortality ratio (SMR) 2007 - 2016: Females



**Figure 18b.** Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2016. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=138, females N=68).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 66,416 female residents (averaged) in the period from 2007 to 2016 a total of 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 0.55. Though, the value of this parameter may vary with an underlying probability of 99% between 0.00 and 4.11, and is therefore not statistically striking.



### Statistical Notes

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

#### 1. All multiple primaries included

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

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

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

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

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

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

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

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

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

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

**Shortcuts**

MCR	Munich Cancer Registry (Tumorregister München)
GEKID	Association of Population-based Cancer Registries in Germany (Gesellschaft der epidemiologischen Krebsregister in Deutschland e.V.)
SEER	Surveillance, Epidemiology, and End Results (USA)
DCO	Death certificate only
BRD-S	German standard population
ES	European standard population (old)
WS	World standard population
SIR	Standardized incidence ratio
CI	Confidence interval
EAR	Excess absolute risk = excess cancer cases (O - E) per 10,000 person-years
PYLL-70	Potential years of life lost prior to age 70 given a person dies before that age
AYLL-70	Average years of life lost prior to age 70 given a person dies before that age
SMR	Standardized mortality ratio
MI-index	Ratio between mortality and incidence
FRG	Federal Republic of Germany

**Recommended Citation**

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