Munich Cancer Registry



- ▶ Survival
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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

C00: Lip cancer

Year of diagnosis	1998-2013
Patients	309
Diseases	310
Creation date	05/19/2015
Export date	12/30/2014
Population	4.64 m



http://www.tumorregister-muenchen.de/en/facts/base/base_C00__E.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
C00 C00.0 C00.1 C00.2 C00.3 C00.4 C00.5 C00.6	Malignant neoplasm of lip External upper lip External lower lip External lip, unspecified Upper lip, inner aspect Lower lip, inner aspect Lip, unspecified, inner aspect Commissure of lip
C00.8 C00.9	Overlapping lesion of lip Lip, 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	%	8	8	%
1998	18			44.4	50.0	94.4
1999	18			44.4	55.6	94.4
2000	9			44.4	77.8	100.0
2001	10			50.0	50.0	80.0
2002	32	2	6.3	46.9	59.4	100.0 #
2003	24	2	8.3	16.7	62.5	100.0
2004	19	1	5.3	63.2	52.6	94.7
2005	24			45.8	29.2	100.0
2006	10			70.0	70.0	90.0
2007	20	2	10.0	35.0	50.0	75.0 # ##
2008	27			29.6	37.0	66.7
2009	20			55.0	40.0	55.0
2010	22			50.0	22.7	54.5
2011	34	1	2.9	41.2	26.5	50.0
2012	16			37.5	6.3	37.5
2013	7	3	42.9	42.9	71.4	100.0 ###
1998-2013	310	11	3.5	43.2	44.2	78.7

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

^{##} 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.

^{###} 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.

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	18	12	6	66.7
1999	18	12	6	66.7
2000	/ 9	8	1 /	88.9
2001	10 /	8	2/	80.0
2002	32	21	11	65.6
2003	24	11	13	45.8
2004	19	13	6	68.4
2005	24	15	9	62.5
2006	10	5	5	50.0
2007	20	11	9	55.0
2008	27	21	6	77.8
2009	20	16	4	80.0
2010	22	12	10	54.5
2011	34	24	10	70.6
2012	16	12	4	75.0
2013	7	4	3 <	57.1
1998-2013	310	205	105	66.1

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	12	6	/ 1.1/	0.5	0.8	0.2	1.0	0.3	1.1	0.4
1999	12	6	/ 1.1/	0.5	0.6	0.2	1.0	0.3	1.5	0.4
2000	8	1 /	0.7	0.1	0.5	0.1	0.7	0.1	0.9	0.1
2001	8	2 /	0.7	0.2	0.4	0.1	0.6	0.1	0.7	0.1
2002	21	11 <	1.1	0.6	0.6	0.2	1.0	0.4	1.3	0.4
2003	11	13	0.6	0.7	0.3	0.2	0.5	0.4	0.6	0.5
2004	13	6	0.7	0.3	0.3	0.1	0.5	0.2	0.7	0.2
2005	15	9	0.8	0.5	0.4	0.2	0.6	0.3	0.9	0.4
2006	5	5	0.3	0.2	0.1	0.1	0.2	0.1	0.3	0.2
2007	11	9	0.5	0.4	0.2	0.1	0.4	0.2	0.5	0.3
2008	21	6	0.9	0.3	0.5	0.1	0.7	0.1	1.0	0.2
2009	16	4	0.7	0.2	0.3	0.0	0.5	0.1	0.7	0.1
2010	12	10	0.5	0.4	0.3	0.1	0.4	0.2	0.5	0.3
2011	24	10	1.1	0.4	0.5	0.3	0.7	0.3	1.1	0.4
2012	12	/ 4	0.5	0.2	0.2	0.1	0.4	0.1	0.5	0.1
2013	4	3	0.2	0.1	0.1	0.0	0.1	0.0	0.2	0.1
1998-2013	205	105	0.7	0.3	0.4	0.1	0.5	0.2	0.7	0.3

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	18	66.4	13,4	26.4	85.0	53.8	61.9	66.1	74.1	84.7
1999	18	73.4	10.9	55.0	86.8	55.6	62.3	76.9	80.8	85.8
2000	9	62.9	12.7	47.9	82.7	47.9	54.4	57.3	73.3	82.7
2001	10	70.6	15.6	54.4	94.9	54.4	62.4	64.6	87.4	94.9
2002	32	72.8	11.3	53.9	94.4	58.7	64.8	71.9	81.4	86.0
2003	24	72.9	13.9	41.7	94.5	51.3	63.0	74.8	84.3	90.0
2004	19	72.5	7.9	60.7	87.9	62.1	64.9	73.9	75.8	84.4
2005	24	70.2	12.9	36.9	99.0	53.7	64.4	71.5	78.3	82.5
2006	10	78.5	10.4	59.3	93.2	61.4	75.6	81.1	85.1	90.5
2007	20	73.3	10.2	43.7	84.3	60.1	68.1	76.0	80.7	82.8
2008	27	72.0	10.9	51.5	90.8	55.0	64.3	70.8	81.8	86.2
2009	20	73.8	11.2	45.8	88.3	59.1	67.7	75.3	82.4	87.1
2010	22	72.3	10.3	53.7	85.9	57.7	63.8	73.6	79.4	85.3
2011	34	68.3	16.2	29.3	90.5	49.4	60.1	72.0	80.8	83.5
2012	16 /	72.0	8.5	59.5	85.1	60.3	64.0	73.5	77.7	83.8
2013	7 /	83.4	9.6	69.8	92.6	69.8	70.5	88.0	91.8	92.6
1998-2013	310	71.8	12.2	26.4	99.0	55.4	63.8	73.2	81.1	85.9

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	12	61.9	12.2	26.4	74.1	54.4	61.9	64.5	67.8	69.8
1999	12	73.2	11.1	55.0	86.8	55.6	65.0	75.2	81.4	85.4
2000	8	64.0	13.2	47.9	82.7	47.9	52.8	61.9	75.9	82.7
2001	8	68.5	14.8	54.4	94.9	54.4	58.4	64.6	76.3	94.9
2002	21	72.2	9.4	53.9	86.0	62.2	65.8	72.6	79.4	85.7
2003	11	67.9	14.8	41.7	94.5	51.3	60.2	69.8	75.8	84.4
2004	13	71.6	7.7	60.7	87.9	62.1	66.6	71.0	75.5	80.9
2005	15	68.6	10.4	47.0	82.5	53.7	60.7	71.0	75.6	81.9
2006	5	74.0	11.7	59.3	85.1	59.3	63.6	80.7	81.5	85.1
2007	11	70.1	11.1	43.7	81.1	57.7	64.0	73.6	78.0	79.7
2008	21	69.2	10.3	51.5	86.2	55.0	63.7	68.5	78.0	83.3
2009	16	72.2	11.3	45.8	87.7	53.1	66.7	73.7	80.6	84.5
2010	12	70.9	10.9	56.2	85.9	57.7	60.0	70.7	79.1	85.8
2011	24	71.1	15.7	29.3	90.5	50.6	63.1	77.0	81.5	86.1
2012	12	72.5	9.1	59.5	85.1	60.8	64.0	73.5	80.3	83.8
2013	4	77.7	9.1	69.8	88.0	69.8	70.1	76.5	85.3	88.0
1998-2013	205	70.2	11.7	26.4	94.9	55.0	63.1	70.8	78.9	84.4

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	75.4	11,7	53.8	85.0	53.8	72.9	78.1	84.7	85.0
1999	6	73.6	11.7	55.9	85.8	55.9	62.3	79.0	79.7	85.8
2000	1	54.7		54.7	54.7	54.7	54.7	54.7	54.7	54.7
2001	2	79.1	22.2	63.5	94.8	63.5	63.5	79.1	94.8	94.8
2002	11	73.9	14.7	58.4	94.4	58.7	58.9	69.3	91.0	92.8
2003	13	77.1	12.1	48.5	90.0	63.8	69.6	79.7	86.6	90.0
2004	6	74.3	8.8	63.8	84.4	63.8	64.2	75.2	82.8	84.4
2005	9	72.9	16.6	36.9	99.0	36.9	68.8	72.3	78.5	99.0
2006	5	83.0	7.6	75.6	93.2	75.6	76.1	82.0	87.9	93.2
2007	9	77.2	7.8	62.5	84.3	62.5	76.9	80.4	81.8	84.3
2008	6	81.7	6.8	72.1	90.8	72.1	77.6	81.1	87.4	90.8
2009	4	80.4	9.2	68.2	88.3	68.2	73.3	82.5	87.5	88.3
2010	10	74.0	9.7	53.7	85.3	58.8	70.8	75.4	81.1	85.1
2011	10	61.5	16.2	29.4	83.5	39.4	51.0	61.4	76.3	81.3
2012	4	70.7	7.6	60.3	78.0	60.3	65.3	72.3	76.1	78.0
2013	3	91.0	2.1	88.6	92.6	88.6	88.6	91.8	92.6	92.6
1998-2013	105	74.8	12.8	29.4	99.0	58.4	66.1	77.6	84.2	90.0

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.%
25-29	3	1.0	1.0	2	1.0	1.0	1	1.0	1.0
30-34	1	0.3	1.3	/ 1	0.5	1.5			1.0
35-39	1	0.3	1.6			1.5	1	1.0	1.9
40-44	2	0.6	2.3	2	1.0	2.4			1.9
45-49	5	1.6	3.9	3	1.5	3.9	2	1.9	3.8
50-54	17	5.5	9.4	13	6.3	10.2	4	3.8	7.6
55-59	19	6.1	15.5	13	6.3	16.6	6	5.7	13.3
60-64	40	12.9	28.4	30	14.6	31.2	10	9.5	22.9
65-69	41	13.2	41.6	32	15.6	46.8	9	8.6	31.4
70-74	41	13.2	54.8	32	15.6	62.4	9	8.6	40.0
75-79	54	17.4	72.3	30	14.6	77.1	24	22.9	62.9
80-84	46	14.8	87.1	28	13.7	90.7	18	17.1	80.0
85+	40	12.9	100.0	19	9.3	100.0	21	20.0	100.0
All ages	310	100.0		205	100.0		105	100.0	

Included in the statistics are 76.0% multiple primaries in males and 52.4% 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	cancers
diagnosis	Males	Females	spec.	spec.	n=9	n=2	n=158258	n=153136
Years	n	n	incid.	incid.	8	%	%	%
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			0.0	0.0				
25-29	2	1	0.1	0.0			0.2	0.1
30-34	1		0.0	0.0			0.1	
35-39		1	0.0	0.0				0.0
40-44	2		0.1	0.0			0.1	
45-49	3	2	0.1	0.1			0.1	0.0
50-54	13	4	0.6	0.2	7.7		0.2	0.0
55-59	12	6	0.7	0.3			0.1	0.0
60-64	30	10	1.7	0.5	3.3		0.1	0.1
65-69	32	9	2.0	0.5			0.1	0.0
70-74	32	9	2.5	0.6	6.3		0.1	0.0
75-79	30	24	3.6	2.0			0.1	0.1
80-84	28	18	5.6	1.9	3.6		0.2	0.1
85+	19	21	5.6	2.3	21.1	9.5	0.2	0.1
All ages	204	105			4.4	1.9	0.1	0.1
Incidence								
Raw			0.7	0.3				
WS			0.4	0.1				
ES			0.5	0.2				
BRD-S			0.7	0.3				

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

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

	/						
	Observed	Expected		LCL	UCL		DCO
Diagnosis	n /	n	SIR	95%	95%	EAR	%
C03-C06 Oral cavity	2	0.1	19.4	2.3	70.0 #	26.6	
C16 Stomach	2	0.7	3.1	0.4	11.1	18.9	
C19-C20 Rectum	2	0.8	2.6	0.3	9.2	17.1	
C22 Liver	3	0.4	7.8	1.6	22.8 #	36.7	33.3
C33-C34 Lung	411	1.7	6.6	3.3	11.9 #	131.0	9.1
C61 Prostate	3	4.4	0.7	0.1	2.0	-19.9	33.3
C82-C85 NHL	2	0.6	3.4	0.4	12.4	19.9	
Other primaries	6	2.3	2.6	1.0	5.7	52.2	16.7
Not observed	0	3.8	0.0	0.0	1.0 #	-53.4	
All mult. primaries	31	14.7	2.1	1.4	3.0 #	229.0	12.9

Patients	128
Median age at second malignancy (years)	77.8
Person-years	713
Mean observation time (years)	5.6
Median observation time (years)	5.1

The occurrence of second malignancy is statistically significant.

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

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Table 6b

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

F	'EN	ďΑ	T	ES

	Observed	Expected		LCL UC	!L	DCO
Diagnosis	/ n /	n	SIR	95% 95	EAR	%
	_ /					
C43 Malign. melanoma		0.1	13.6	1.6 49.	0 # 54.9	
C50 Breast	3	1.3	2.3	0.5 6.	8 50.6	
C56 Ovary	2	0.2	10.3	1.2 37.	3 # 53.6	
C82-C85 NHL	2	0.2	10.1	1.2 36.	5 # 53.4	
Other primaries	5	0.6	9.1	2.9 21.	2 # 131.9	
Not observed	0	2.5	0.0	0.0 1.	5 -73.4	
All mult. primaries	14	4.9	2.9	1.6 4.	8 # 271.1	

Patients	76
Median age at second malignancy (years)	74.9
Person-years	337
Mean observation time (years)	4.4
Median observation time (years)	3.8

The occurrence of second malignancy is statistically significant.

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

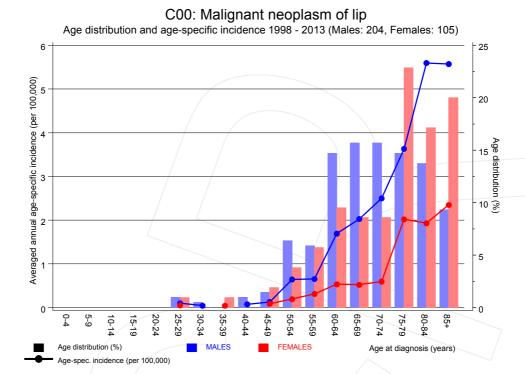


Figure 7. Age distribution and age-specific incidence



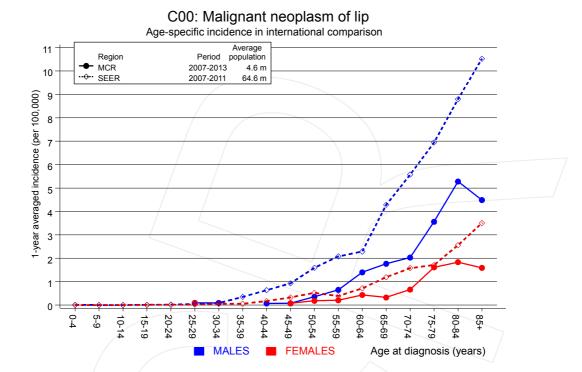


Figure 7a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).



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.

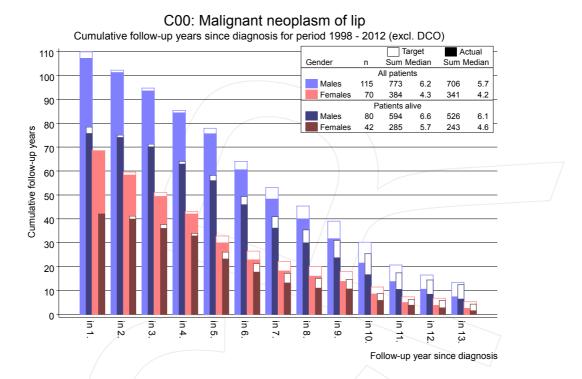
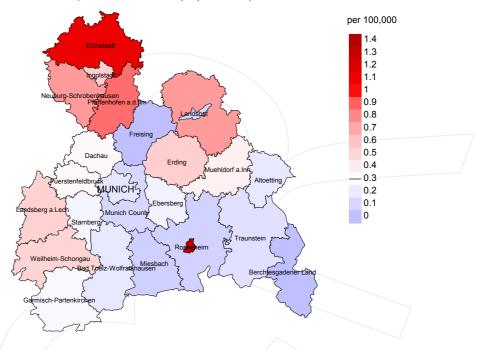


Figure 8. Cumulative follow-up years depending on time since diagnosis

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: Males



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

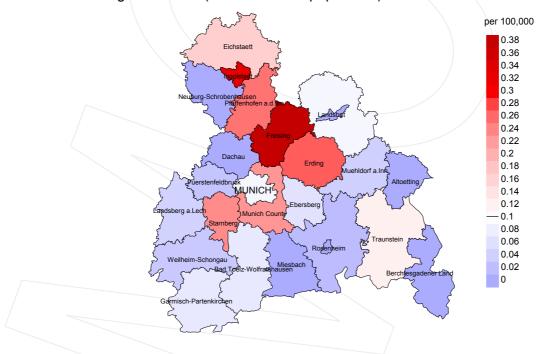
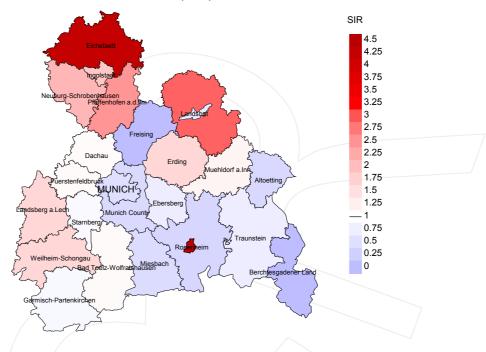


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 0.3/100,000 WS N=99, females 0.1/100,000 WS N=46).

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 1 women were identified with newly diagnosed lip cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 0.1/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.0 and 0.5/100,000.

Standardized incidence ratio (SIR) 2007 - 2013: Males



Standardized incidence ratio (SIR) 2007 - 2013: Females

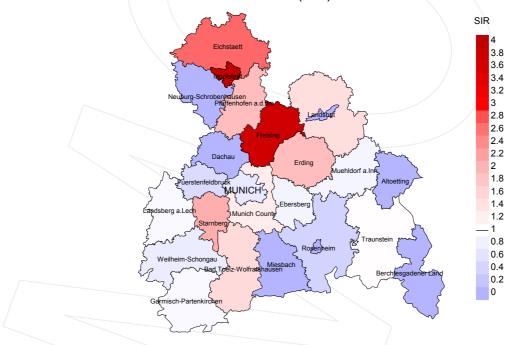


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=99, females N=46).

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 1 women were identified with newly diagnosed lip cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.84. Though, the value of this parameter may vary with an underlying probability of 99% between 0.00 and 6.27, 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 cases	Prop. actively followed	Prop. DCO	Deaths	Prop. deaths	Prop. deaths with death certific.
diagnosis	n	%	%	n	%	%
1998	18	94.4		9	50.0	100.0
1999	18	94.4		10	55.6	90.0
2000	9	100.0		7	77.8	100.0
2001	10	80.0		5	50.0	80.0
2002	32	100.0	6.3	19	59.4	84.2
2003	24	100.0	8.3	15	62.5	100.0
2004	19	94.7	5.3	10	52.6	90.0
2005	24	100.0		7	29.2	100.0
2006	10	90.0		7	70.0	100.0
2007	20	75.0	10.0	10	50.0	100.0
2008	27	66.7		10	37.0	100.0
2009	20	55.0		8	40.0	100.0
2010	22	54.5		5	22.7	100.0
2011	34	50.0	2.9	9	26.5	100.0
2012	16	37.5		1	6.3	100.0
2013	7	100.0	42.9	5	71.4	100.0
1998-2013	310	78.7	3.5	137	44.2	95.6

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		Dreem
Year of	Incident		with death	Deaths in	Prop. deaths in
		Daabba			
diagnosis/	cases	Deaths	certific.	same year	same year
death	n	n	રુ	n	ે
1998	18	8	100.0	/ 1	5.6
1999	18	11	90.9		
2000	9	6	100.0		
2001	10	10	80.0	1	10.0
2002	32	10	100.0	3	9.4
2003	24	16	87.5	1	4.2
2004	19	11	100.0	2	10.5
2005	24	16	100.0	1	4.2
2006	10	18	100.0	_ 1	10.0
2007	20	14	100.0	1	5.0
2008	27	21	95.2	2	7.4
2009	20	18	100.0	1	5.0
2010	22	20	95.0	1	4.5
2011	34	14	100.0	2	5.9
2012	16	23	95.7		
2013	7	13	100.0	5	71.4
1998-2013	310	229	96.5	22	7.1

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/	%	%	%
1998	8	37.5	62.5	62.5
1999	11	54.5	45.5	60.0
2000	6	83.3	16.7	83.3
2001	10	30.0	70.0	50.0
2002	10	70.0	30.0	80.0
2003	16	31.3	68.8	28.6
2004		72.7	27.3	81.8
2005	16	25.0	75.0	43.8
2006	/18	38.9	61.1	44.4
2007	14	50.0	50.0	64.3
2008	21	28.6	71.4	40.0
2009	18	33.3	66.7	38.9
2010	20	35.0	65.0	42.1
2011	14	50.0	50.0	71.4
2012	23	47.8	52.2	54.5
2013	13	30.8	69.2	46.2
1998-2013	229	41.9	58.1	52.5

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

		Age at death	Age at death	Age at death	Age at death (according
		(all	(cancer-	(non-cancer-	to death
Year of	Deaths	causes)	related)	related)	certificate)
death	n	Years	Years	Years	Years
1998	6	68.1	77.5	65.4	68.1
1999	6	78.6	74.8	78.6	66.4
2000	5	79.4	76.5	82.8	76.5
2001	8	78.9	71.6	83.7	77.7
2002	9	81.4	81.4	76.5	81.4
2003	15	74.9	74.9	75.7	70.5
2004	9	78.4	78.4	84.7	78.1
2005	9	83.9	78.3	85.3	82.5
2006	9	82.1	76.8	83.7	76.8
2007	10	80.2	79.0	86.3	79.0
2008	1,3	85.5	85.7	82.1	85.6
2009	9	82.1	81.6	83.3	81.6
2010	15	77.2	75.4	81.7	76.4
2011	9	86.6	82.7	86.6	77.9
2012	16	80.2	81.4	71.2	80.2
2013	10	83.2	74.4	83.6	82.6
1998-2013	158	81.2	79.1	82.7	79.1

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

		Age at death	Age at death	Age at death	Age at death (according
	_	(all	(cancer-	(non-cancer-	to death
Year of	Deaths	causes)	related)	related)	certificate)
death	n	Years	Years	Years	Years
1998	2	85.3	83.5	87.1	83.5
1999	5	79.2	81.0	79.2	85.5
2000	1	79.9	79.9		79.9
2001	2	84.5		84.5	
2002	1	91.0		91.0	91.0
2003	1	95.3		95.3	
2004	2	88.3	85.5	91.0	85.5
2005	7	88.8	77.1	88.9	77.1
2006	9	82.7	79.4	83.0	77.9
2007	4	83.8	67.4	87.8	67.4
2008	8	88.5	77.6	89.9	77.9
2009	9	80.9	73.8	80.9	83.7
2010	9 5 5	87.7	64.8	88.2	64.8
2011	5	86.2	88.4	86.1	87.3
2012	7	83.4	78.8	85.3	78.8
2013	3	84.2	76.0	86.7	76.0
1998-2013	71	85.5	77.7	87.5	79.6

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	2	0.2	0.17	0.1	0.14	0.2	0.18	0.2	0.19
1999	4	0.4	0.33	0.2	0.36	0.3	0.33	0.5	0.32
2000	4	0.4	0,50	0.2	0.40	0.3	0.45	0.5	0.57
2001	3	0.3	0.38	0.2	0.38	0.3	0.42	0.3	0.44
2002	7	0.4	0.33	0.2	0.28	0.3	0.33	0.5	0.40
2003	5	0.3	0.45	0.1	0.44	0.2	0.49	0.3	0.50
2004	7	0.4	0.54	0.2	0.47	0.3	0.58	0.5	0.67
2005	2	0.1	0.13	0.0	0.11	0.1	0.12	0.1	0.15
2006	4	0.2	0.80	0.1	0.80	0.2	0.74	0.2	0.80
2007	6	0.3	0.55	0.1	0.45	0.2	0.50	0.3	0.57
2008	4	0.2	0.19	0.1	0.15	0.1	0.20	0.2	0.21
2009	4	0.2	0.25	0.0	0.15	0.1	0.19	0.2	0.30
2010	6	0.3	0.55	0.1	0.53	0.2	0.53	0.3	0.52
2011	6	0.3	0.25	0.1	0.18	0.2	0.24	0.3	0.24
2012	9	0.4	0.75	0.1	0.54	0.2	0.61	0.4	0.82
2013	3	0.1	0.75	0.0	0.70	0.1	0.71	0.1	0.65
1998-2013	76	0.3	0.37	0.1	0.31	0.2	0.36	0.3	0.40

Table 12b

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	1	0.1	0.17	0.0	0.11	0.0	0.13	0.1	0.19
1999	2	0.2	0.33	0.0	0.20	0.1	0.25	0.1	0.28
2000	1	0.1	1.00	0.0	0.34	0.0	0.48	0.1	0.93
2001									
2002									
2003									
2004	1	0.1	0.17	0.0	0.10	0.0	0.13	0.0	0.10
2005	2	0.1	0.22	0.0	0.15	0.1	0.20	0.1	0.28
2006	3	0.1	0.60	0.0	0.85	0.1	0.74	0.1	0.64
2007	1	0.0	0.11	0.0	0.19	0.0	0.15	0.0	0.09
2008	2	0.1	0.33	0.0	0.39	0.0	0.41	0.1	0.47
2009	2	0.1	0.50	0.0	0.81	0.1	0.66	0.1	0.68
2010	1	0.0	0.10	0.0	0.20	0.0	0.16	0.0	0.12
2011	1	0.0	0.10	0.0	0.03	0.0	0.04	0.0	0.04
2012	2	0.1	0.50	0.0	0.26	0.0	0.35	0.1	0.53
2013	1	0.0	0.33	0.0	0.53	0.0	0.53	0.0	0.76
1998-2013	20	0.1	0.19	0.0	0.15	0.0	0.17	0.1	0.19

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	%	Cum.%	n	%	Cum.%	n	%	Cum.%
45-49	2	2.1	2.1	2	2.6	2.6			0.0
50-54	2	2.1	4.2	2	2.6	5.3			0.0
55-59	1	1.0	5.2	1	1.3	6.6			0.0
60-64	4	4.2	9.4	2	2.6	9.2	2	10.0	10.0
65-69	8	8.3	17.7	7	9.2	18.4	1	5.0	15.0
70-74	13	13.5	31.3	12	15.8	34.2	1	5.0	20.0
75-79	23	24.0	55.2	14	18.4	52.6	9	45.0	65.0
80-84	21	21.9	77.1	18	23.7	76.3	3	15.0	80.0
85+	22	22.9	100.0	18	23.7	100.0	4	20.0	100.0
All ages	96	100.0		76	100.0		20	100.0	

Included in the statistics are 76.0% multiple primaries in males and 52.4% in females.

Table 14

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

(incl. multiple primaries)

Age at death Years	Males Females		Females Age- spec. dex mortal. MI-index	Males Females Prop.all Prop.all cancers cancers
0- 4 5- 9 10-14 15-19 20-24 25-29 30-34		0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 0.0 0.0 0.0	
35-39 40-44 45-49 50-54 55-59 60-64 65-69 70-74 75-79 80-84	2 2 1 2 2 7 1 12 1 14 9 18 3	0.0 0.0 0.1 0.1 0.1 0.1 0.0 0.1 0.0 0.4 0.2 0.9 0.3 1.7 0.4 3.6	0.0 0.0 7 0.0 5 0.0 8 0.0 7 0.1 0.20 2 0.1 0.11 8 0.1 0.11 7 0.8 0.3 4	0.1 0.1 0.0 0.0 0.1 0.0 0.1 0.0 0.1 0.1 0.2 0.0
85+ All ages	18 4 76 20	5.3 0.9	5 0.4 0.19	0.2 0.0 0.1 0.0
Mortality Raw WS ES BRD-S		0.3 0.3 0.1 0.3 0.2 0.3 0.3 0.4	1 0.0 0.15 5 0.0 0.17	
PYLL-70 per 100,000 ES AYLL-70		0.5 0.4 8.9	0.1 0.0 5.8	

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

Table 15a

Multiple primaries in deaths in period 1998-2013

MALES

					Syn- chron	Syn- chron		
	Total	Total	Pre	Pre	±30d	±30d	Post	Post
Diagnosis	n	% ↓	n	← %	n	←%	n	← %
C03-C06 Oral cavity	/ 5	4.7			1	20.0	4	80.0
C07-C08 Salivary gland	/ 2	1.9					2	100.0
C15 Oesophagus	2 /	1.9	1	50.0			1	50.0
C16 Stomach	5	4.7	2	40.0			3	60.0
C18 Colon	4	3.8	2	50.0			2	50.0
C19-C20 Rectum	4	3.8	1	25.0			3	75.0
C22 Liver	2	1.9					2	100.0
C32 Larynx	2	1.9	2	100.0				
C33-C34 Lung	24	22.6	1	4.2	1	4.2	22	91.7
C43 Malign. melanoma	4	3.8	2	50.0			2	50.0
C44 Skin others	20	18.9	5	25.0	4	20.0	11	55.0
C61 Prostate	12	11.3	5	41.7			7	58.3
C67 Bladder	5	4.7	1	20.0			4	80.0
C82-C85 NHL	5	4.7	3	60.0			2	40.0
C91-C96 Leukaemia	2	1.9					2	100.0
Other primaries	8	7.5	5	62.5			3	37.5
All mult. primaries	106	100.0	30	28.3	6	5.7	70	66.0

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

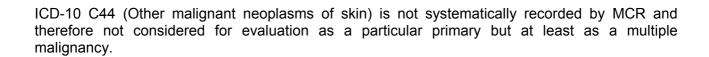
ICD-10 C44 (Other malignant neoplasms of skin) is not systematically recorded by MCR and therefore not considered for evaluation as a particular primary but at least as a multiple malignancy.

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Table 15b

Multiple primaries in deaths in period 1998-2013
FEMALES

					Syn- chron	Syn- chron		
	Total	Total	Pre	Pre	±30d	±30d	Post	Post
Diagnosis	n	%↓	n	← %	n	~ %	n	6
C07-C08 Salivary gland	/ 1	5.0			1	100.0		
C16 Stomach	/ 1	5.0	1	100.0				
C18 Colon	2 /	10.0					2	100.0
C19-C20 Rectum	2	10.0	1	50.0			1	50.0
C25 Pancreas	1	5.0			/ 1	100.0		
C30-C31 Sinuses	1	5.0					1	100.0
C43 Malign. melanoma	3	15.0					3	100.0
C44 Skin others	3	15.0			2	66.7	1	33.3
C50 Breast	2	10.0			2	100.0		
C51 Vulva	1	5.0					1	100.0
C56 Ovary	1	5.0					1	100.0
C82-C85 NHL	2	10.0	2	100.0				
All mult. primaries	20	100.0	4	20.0	6	30.0	10	50.0



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Table 16

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

(Singular primaries only *)

Age at death		Females	Males Age- spec.	MT indou	Females Age- spec.		cancers	Females Prop.all cancers
Years	n	n	mortar.	MI-index	mortar.	MI-Index	6	90
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			0.0		0.0			
25-29			0.0		0.0			
30-34			0.0		0.0			
35-39			0.0		0.0			
40-44			0.0		0.0			
45-49	1		0.0	0.50	0.0		0.1	
50-54	2		0.1	0.17	0.0		0.1	
55-59			0.0		0.0			
60-64	1/	1	0.1	0.05	0.1	0.17	0.0	0.0
65-69	6	/ 1	0.4	0.21	0.1	0.13	0.1	0.0
70-74	7		0.5	0.37	0.0		0.1	
75-79	12	6	1.5	0.71	0.5	0.35	0.1	0.1
80-84	11 \	\1	2.2	0.69	0.1	0.08	0.1	0.0
85+	11	2	3.2	0.92	0.2	0.13	0.2	0.0
-11	-1						0 1	0.0
All ages	51	11					0.1	0.0
Mortality								
Raw			0.2	0.36	0.0	0.14		
WS			0.1		0.0	0.11		
ES			0.1	0.33	0.0	0.11		
BRD-S			0.1	0.40	0.0	0.15		
DIAD 5			0.2	0.10	0.0	0.13		
PYLL-70								
per 100,000			0.3		0.0			
ES			0.3		0.0			
AYLL-70			8.0		5.0			

^{*} See corresponding tables with multiple primaries.

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Table 17

Age-specific mortality (cancer-related) and proportion of all cancers for period 1999-2012 (Single primaries only *)

Age at death	Males	Females	Males Age- spec.		Females Age- spec.		Males Prop.all cancers	Females Prop.all cancers
Years	n	n	mortal.	MI-index	mortal.	MI-index	%	%
0 4								
0 – 4 5 – 9			0.0		0.0			
5- 9 10-14			0.0		0.0			
15-14			0.0		0.0			
20-24			0.0		0.0			
25-29			0.0					
30-34			0.0		0.0			
35-39			0.0		0.0			
40-44			0.0		0.0			
45-49			0.0		0.0			
50-54	1		0.0	0.10	0.0		0.0	
55-59			0.0	0.10	0.0		0.0	
60-64			0.0		0.0			
65-69	2		0.1	0.10	0.0		0.0	
70-74	1		0.1	0.11	0.0		0.0	
75-79	3	4	0.4		0.4	0.30	0.0	0.1
80-84	1	_	0.2		0.0	3,33	0.0	0.1
85+	4	2	1.3		0.3	0.15	0.1	0.0
All ages	12	6					0.0	0.0
Mortality								
Raw			0.0	0.13	0.0	0.10		
WS			0.0	0.11	0.0	0.06		
ES			0.0	0.12	0.0	0.08		
BRD-S			0.1	0.14	0.0	0.10		
PYLL-70	•							
per 100,00	U		0.1					
ES			0.1					
AYLL-70			7.5					

^{*} See corresponding tables with multiple primaries.

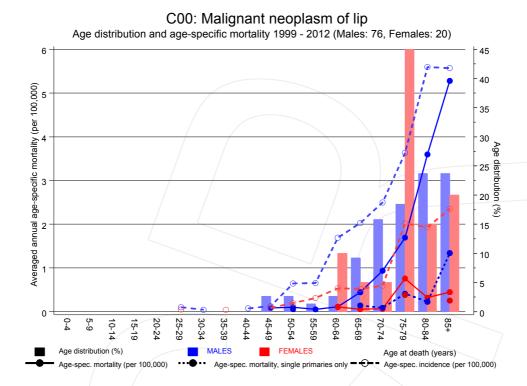
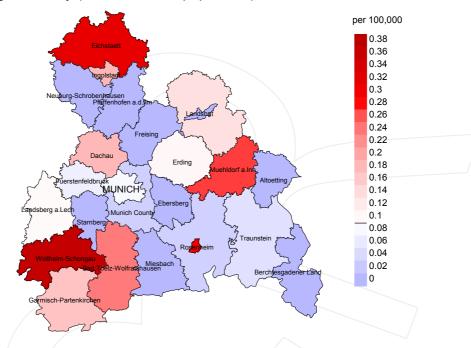


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

The difference between age at diagnosis (Table 3) and age at lip 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

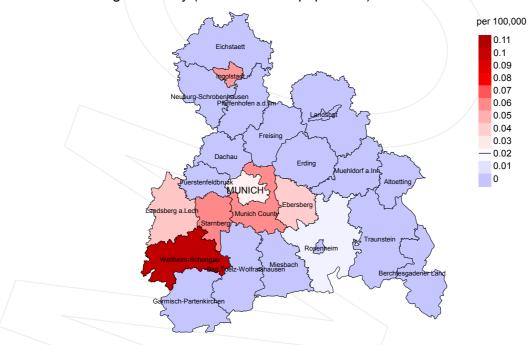
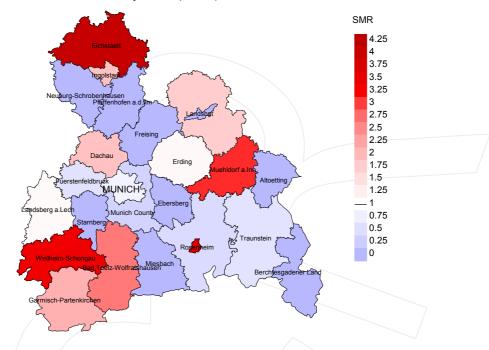


Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2013. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 0.1/100,000 WS N=38, females 0.0/100,000 WS N=10).

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 1 women died from lip 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 0.3/100,000.

Standardized mortality ratio (SMR) 2007 - 2013: Males



Standardized mortality ratio (SMR) 2007 - 2013: Females

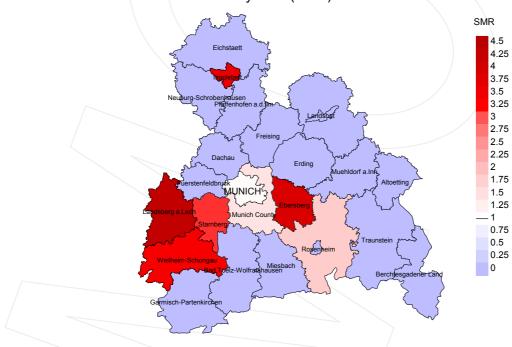


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2013. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=38, females N=10).

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 1 women died from lip cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 3.87. Though, the value of this parameter may vary with an underlying probability of 99% between 0.02 and 28.76, 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

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