Munich Cancer Registry



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ICD-10 C47: Neoplasm of peripheral nerves

Incidence and Mortality

Year of diagnosis	1998-2014
Patients	166
Diseases	166
Creation date	04/13/2016
Export date	12/23/2015
Population	4.64 m



Munich Cancer Registry at Munich Cancer Center Marchioninistr. 15 Munich, 81377 Germany

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

http://www.tumorregister-muenchen.de/en/facts/base/bC47__E-ICD-10-C47-Neoplasm-of-peripheral-nerves-incidence-and-mortality.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.

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, April 2016

- 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).
- 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.

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

Code	Description
C47	Malignant neoplasm of peripheral nerves and autonomic nervous system
C47.0	Peripheral nerves of head, face and neck
C47.1	Peripheral nerves of upper limb, including shoulder
C47.2	Peripheral nerves of lower limb, including hip
C47.3	Peripheral nerves of thorax
C47.4	Peripheral nerves of abdomen
C47.5	Peripheral nerves of pelvis
C47.6	Peripheral nerves of trunk, unspecified
C47.8	Overlapping lesion of peripheral nerves and autonomic nervous system
C47.9	Peripheral nerves and autonomic nervous system, unspecified

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

INCIDENCE

Table 1

All patients with invasive cancer by year of diagnosis, proportions of DCO, multiple primaries, deaths, and active follow-up (incl. DCO)

				Prop.		Prop.
		DCO	Prop.	mult.	Prop.	actively
Year of	Cases	cases	DCO	primaries	deaths	followed
diagnosis	n	n	양	ું જ	ે	%
1998	2				50.0	100.0
1999	6			33.3	83.3	100.0
2000	1				100.0	100.0
2001	3				100.0	100.0
2002	11			18.2	72.7	90.9 #
2003	/7			42.9	71.4	100.0
2004	8				12.5	100.0
2005	9 /			11.1	66.7	88.9
2006	12			8.3	25.0	100.0
2007	17			29.4	29.4	70.6 #
2008	17			17.6	41.2	64.7
2009	\ 6			16.7	50.0	66.7
2010	24			37.5	45.8	66.7
2011	11			18.2	36.4	72.7
2012	15			33.3	26.7	80.0
2013	14			28.6	28.6	100.0
2014	3				33.3	100.0 ##
1998-2014	166			22.9	43.4	82.5

[#] 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 found in the respective headings.

Table 1a

All patients with invasive cancer by year of diagnosis and gender (incl. DCO)

Year of	All/	Males	Females	Prop. males	
diagnosis	n/	n	n	ଚ	
1998	2		2		
1999	/ 6	/ 2	4 /	33.3	
2000	/ 1	1		100.0	
2001	3		3 5		
2002	11	6	/5	54.5	
2003	7	3	4	42.9	
2004	8	4	4	50.0	
2005	9	3	6	33.3	
2006	12	9	3	75.0	
2007	17	10	7	58.8	
2008	17	9	8	52.9	
2009	6	4	2	66.7	
2010	24	16	8	66.7	
2011	11	6	5 5	54.5	
2012	15	10	5 <	66.7	
2013	14	8	6	57.1	
2014	3	1	2	33.3	
1998-2014	166	92	74	55.4	

Table 2

Incidence measures by year of diagnosis 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	Fom	Males	Fom	Males	Fom	Males	Fem.
Year of	Malac	Females		Inc.	Inc.		Inc.		Inc.	Inc.
diagnosis	n	n	raw	raw	WS	WS	ES	ES	BRD-S	BRD-S
1998		2		0.2		0.2		0.2		0.2
1999	2	4	0.2	0.3	0.1	0.2	0.1	0.2	0.2	0.2
2000	1		0.1		0.1		0.1		0.1	
2001		3 <		0.2		0.2		0.3		0.3
2002	6	5	0.3	0.3	0.4	0.2	0.4	0.2	0.4	0.2
2003	3	4	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.2
2004	4	4	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2
2005	3	6	0.2	0.3	0.2	0.4	0.2	0.3	0.2	0.3
2006	9	3	0.5	0.1	0.6	0.1	0.5	0.1	0.5	0.2
2007	10	7	0.5	0.3	0.7	0.3	0.6	0.3	0.4	0.3
2008	9	8	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.3
2009	4	2	0.2	0.1	0.2	0.1	0.2	0.1	0.2	0.1
2010	16/	8	0.7	0.3	0.8	0.3	0.8	0.3	0.7	0.3
2011	6	/ 5	0.3	0.2	0.4	0.2	0.3	0.2	0.3	0.2
2012	10	5	0.4	0.2	0.6	0.3	0.5	0.2	0.5	0.2
2013	8	6	0.4	0.3	0.5	0.2	0.4	0.3	0.4	0.3
2014	1	\2	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.1
1998-2014	92	74	0.3	0.2	0.4	0.2	0.3	0.2	0.3	0.2

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 patients) (incl. DCO)

Year of	Cases		Std.					Median		
diagnosis	n	Mean	dev.	Min.	Max.	10%	25%	50%	75%	90%
1998	2	28.3	8.1	22.6	34.0	22.6	22.6	28.3	34.0	34.0
1999	6	57.8	19.7	32.7	88.4	32.7	40.4	60.2	65.0	88.4
2000	1	64.3		64.3	64.3	64.3	64.3	64.3	64.3	64.3
2001	3	37.8	15.5	21.1	51.6	21.1	21.1	40.9	51.6	51.6
2002	11	45.3	28.2	1.7	81.6	10.8	16.1	51.1	66.8	75.8
2003	7	31.0	25.7	2.6	70.9	2.6	7.6	31.0	56.2	70.9
2004	8	21.9	20.9	0.0	48.5	0.0	0.2	22.2	41.0	48.5
2005	9	39.6	31.0	1.1	76.3	1.1	8.2	47.7	70.8	76.3
2006	12	38.5	28.8	0.3	75.8	0.4	12.9	42.4	65.6	75.3
2007	17	32.7	28.4	0.1	87.7	0.6	1.9	39.2	53.3	69.6
2008	17	45.5	31.8	0.0	84.0	0.0	7.9	55.6	71.6	79.1
2009	6	40.1	17.9	14.7	67.4	14.7	31.0	38.4	50.4	67.4
2010	24	43.2	30.6	0.1	89.1	0.4	15.6	47.5	70.4	83.6
2011	11 /	36.0	28.9	0.0	81.9	0.3	14.3	27.7	68.6	72.6
2012	15	34.4	28.0	0.4	78.5	0.5	11.5	28.0	65.8	72.2
2013	14	42.7	30.4	0.3	81.9	0.6	15.5	46.4	68.2	81.2
2014	3	51.0	42.1	2.4	76.2	2.4	2.4	74.5	76.2	76.2
1998-2014	166	39.5	28.1	0.0	89.1	0.6	12.5	39.8	65.2	76.1

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%
2										
1999	2	48.9	22.9	32.7	65.0	32.7	32.7	48.9	65.0	65.0
2000	1	64.3		64.3	64.3	64.3	64.3	64.3	64.3	64.3
2002	6	40.0	30.8	1.7	81.6	1.7	16.1	37.8	64.8	81.6
2003	3	36.5	32.0	7.6	70.9	7.6	7.6	31.0	70.9	70.9
2004	4	19.3	22.9	0.0	45.9	0.0	0.1	15.6	38.4	45.9
2005	3	40.3	35.1	1.9	70.8	1.9	1.9	48.2	70.8	70.8
2006	9	35.6	30.1	0.3	75.8	0.3	6.7	38.6	56.2	75.8
2007	10	25.5	27.0	0.1	69.6	0.3	0.6	21.2	44.6	61.5
2008	9	49.3	36.7	0.0	84.0	0.0	4.7	70.4	78.2	84.0
2009	4	40.9	22.9	14.7	67.4	14.7	22.9	40.7	58.9	67.4
2010	16	38.3	26.3	0.1	83.6	0.3	16.7	43.8	53.5	76.1
2011	6	26.1	27.5	0.0	68.6	0.0	0.3	19.8	48.3	68.6
2012	10	33.3	28.0	0.4	78.5	0.4	12.5	25.2	65.8	72.3
2013	8	36.4	36.0	0.3	81.9	0.3	3.0	26.8	74.7	81.9
2014	1	2.4		2.4	2.4	2.4	2.4	2.4	2.4	2.4
1998-2014	92	35.8	28.7	0.0	84.0	0.3	4.0	34.7	64.6	75.8

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	2	28.3	8.1	22.6	34.0	22.6	22.6	28.3	34.0	34.0
1999	4	62.3	19.7	40.4	88.4	40.4	50.1	60.2	74.5	88.4
2001	3	37.8	15.5	21.1	51.6	21.1	21.1	40.9	51.6	51.6
2002	5	51.6	26.6	10.8	75.8	10.8	39.0	65.6	66.8	75.8
2003	4	26.9	24.2	2.6	56.2	2.6	7.5	24.5	46.4	56.2
2004	4	24.5	21.8	0.2	48.5	0.2	6.8	24.7	42.3	48.5
2005	6	39.3	32.2	1.1	76.3	1.1	8.2	38.0	74.1	76.3
2006	3	47.4	28.1	19.1	75.3	19.1	19.1	47.8	75.3	75.3
2007	7	43.0	29.0	1.9	87.7	1.9	17.4	52.3	58.4	87.7
2008	8	41.3	27.1	4.4	75.0	4.4	18.6	40.5	66.4	75.0
2009	2	38.4	4.3	35.3	41.4	35.3	35.3	38.4	41.4	41.4
2010	8	53.0	38.0	0.9	89.1	0.9	12.9	70.4	83.8	89.1
2011	5	47.9	28.7	15.1	81.9	15.1	27.7	42.2	72.6	81.9
2012	5 /	36.7	31.2	1.3	72.2	1.3	11.5	34.8	63.8	72.2
2013	6 /	51.0	20.9	16.7	76.1	16.7	37.8	56.9	61.6	76.1
2014	2	75.3	1.2	74.5	76.2	74.5	74.5	75.3	76.2	76.2
1998-2014	74	44.2	26.8	0.2	89.1	4.4	21.1	44.4	66.8	76.2

Table 4

Age distribution by 5-year age group and gender for period 2007-2014 (incl. DCO)

Age at									
diagnosis	Cases			Males			Females		
Years	n	90	Cum.%	n	%	Cum.%	n	%	Cum.%
0 - 4	23	21.5	21.5	18	28.1	28.1	5	11.6	11.6
5-9	3	2.8	24.3	2	3.1	31.3	1	2.3	14.0
10 - 14	4	3.7	28.0	3	4.7	35.9	1	2.3	16.3
15-19	4	3.7	31.8	1	1.6	37.5	3	7.0	23.3
20-24	3	2.8	34.6	2	3.1	40.6	1	2.3	25.6
25-29	6	5.6	40.2	3	4.7	45.3	3	7.0	32.6
30-34	5	4.7	44.9	3	4.7	50.0	2	4.7	37.2
35-39	5	4.7	49.5	3	4.7	54.7	2	4.7	41.9
40 - 44	5	4.7	54.2	3	4.7	59.4	2	4.7	46.5
45-49	4	3.7	57.9	3	4.7	64.1	1	2.3	48.8
50-54	6	5.6	63.6	4	6.3	70.3	2	4.7	53.5
55-59	5	4.7	68.2	2	3.1	73.4	3	7.0	60.5
60-64	4	3.7	72.0	1	1.6	75.0	3	7.0	67.4
65-69	7	6.5	78.5	6	9.4	84.4	1	2.3	69.8
70-74	7	6.5	85.0	2	3.1	87.5	5	11.6	81.4
75-79	7	6.5	91.6	4	6.3	93.8	3	7.0	88.4
80-84	6	5.6	97.2	4	6.3	100.0	2	4.7	93.0
85+	3	2.8	100.0			100.0	3	7.0	100.0
All ages	107	100.0		64	100.0		43	100.0	

Included in the statistics are 29.7% multiple primaries in males and 41.9% in females.



Table 5

Age-specific incidence, DCO rate and proportion of all cancers for period 2007-2014

							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=0	n=0	n=91183	n=89596
Years	n	n	incid.	incid.	%	90	%	%
0- 4	18	5	2.1	0.6			10.1	3.6
5- 9	2	1 /	0.2	0.1			2.1	1.3
10-14	3	1 4	0.3	0.1			3.0	1.1
15-19	1	3	0.1	0.3			0.5	1.8
20-24	2	1	0.2	0.1			0.5	0.3
25-29	3	3	0.2	0.2			0.5	0.5
30-34	3	2	0.2	0.2			0.4	0.2
35-39	3	2	0.2	0.2			0.3	0.1
40 - 44	3	2	0.2	0.1			0.2	0.1
45-49	3	/ 1	0.2	0.1			0.1	0.0
50-54	4	2	0.3	0.2			0.1	0.0
55-59	2	3 /	0.2	0.3			0.0	0.0
60-64	1	3	0.1	0.3			0.0	0.0
65-69	6	1	0.6	0.1			0.0	0.0
70-74	2	5	0.2	0.5			0.0	0.0
75-79	4	3	0.7	0.4			0.0	0.0
80-84	4	2	1.1	0.4			0.0	0.0
85+		3	0.0	0.5				0.0
All ages	64	43			0.0	0.0	0.1	0.0
Incidence								
Raw			0.4	0.2				
WS			0.5	0.2				
ES			0.4	0.2				
BRD-S			0.4	0.2				

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



ICD-10 C47: Malignant neoplasm of peripheral nerves and autonomic nervous system Age distribution and age-specific incidence 2007 - 2014 (Males: 64, Females: 43)

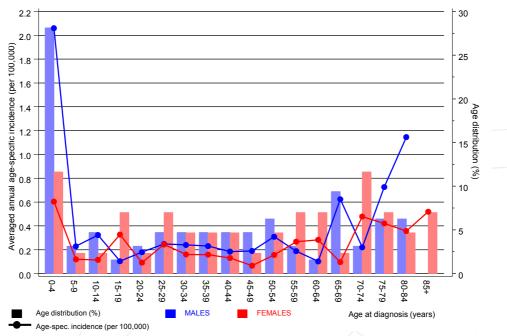
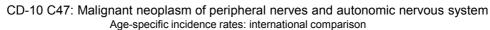


Figure 6. Age distribution and age-specific incidence





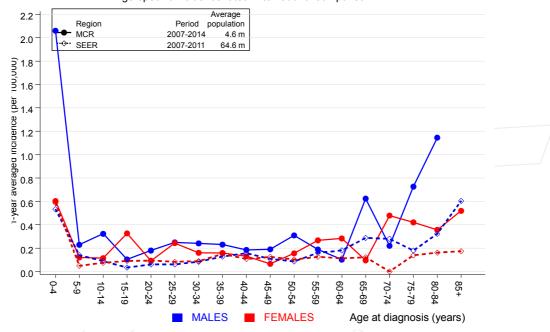
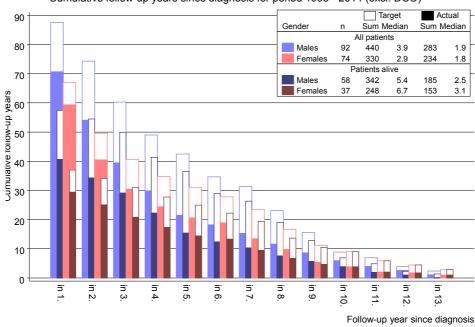


Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).



Reference:

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



CD-10 C47: Malignant neoplasm of peripheral nerves and autonomic nervous system Cumulative follow-up years since diagnosis for period 1998 - 2014 (excl. DCO)

Figure 7. 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.

		Table 8a	l				
Standardized in excess absolu	te risk (CO rate				
	Observed	Expected		LCL	UCL		DCO
Diagnosis	n	n	SIR	95%	95%	EAR	olo
Other primaries	5	0.8	6.0	2.0	14.0 #	147.9	
Not observed	0	1.0	0.0	0.0	3.7	-35.2	
All mult. primaries	5	1.8	2.7	0.9	6.4	112.7	
Patients			90				
Median age at second ma Person-years Mean observation time (Median observation time	years)	(years)	60.1 282 3.1 2.0				

The occurrence of second malignancy is statistically significant.

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

Table 8b

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of second primaries for period 1998-2014

FEMALES

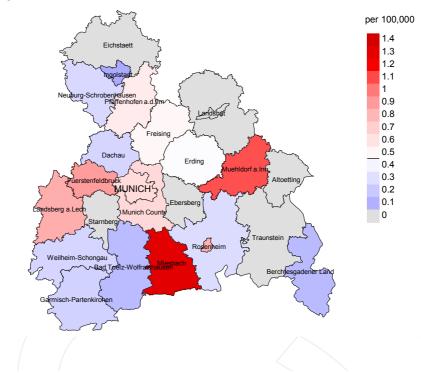
Observed	Expected		LCL	UCL		DCO
n /	n	SIR	95%	95%	EAR	왕
2	0.4	4.7	0.6	16.9	67.4	50.0
6	0.2	26.1	9.6	56.7 #	247.4	16.7
0	0.7	0.0	0.0	5.2	-30.7	
8	1.4	5.8	2.5	11.5 #	284.2	25.0
	n 2 6 0	n n 2 0.4 6 0.2 0.7	n n SIR 2 0.4 4.7 6 0.2 26.1 0 0.7 0.0	n n SIR 95% 2 0.4 4.7 0.6 6 0.2 26.1 9.6 0 0.7 0.0 0.0	n n SIR 95% 95% 2 0.4 4.7 0.6 16.9 6 0.2 26.1 9.6 56.7 # 0 0.7 0.0 0.0 5.2	n n SIR 95% 95% EAR 2 0.4 4.7 0.6 16.9 67.4 6 0.2 26.1 9.6 56.7 # 247.4 0 0.7 0.0 0.0 5.2 -30.7

Patients	73
Median age at second malignancy (years)	79.1
Person-years	233
Mean observation time (years)	3.2
Median observation time (years)	1.9

The occurrence of second malignancy is statistically significant.

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

Average incidence (world standard population) 2007 - 2014: Males



Average incidence (world standard population) 2007 - 2014: Females

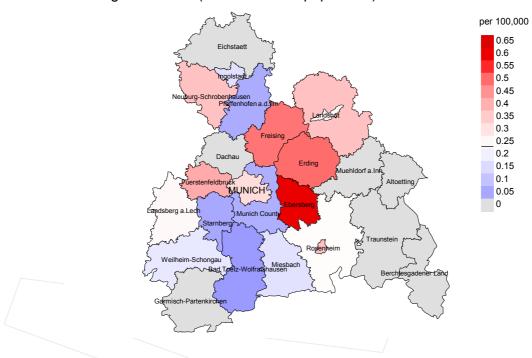
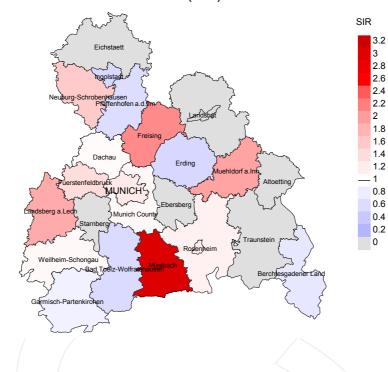


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2014. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (males 0.5/100,000 WS N=64, females 0.2/100,000 WS N=43).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 65,347 female residents (averaged) in the period from 2007 to 2014 a total of 2 women were identified with newly diagnosed neoplasm of peripheral nerves. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 0.6/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.0 and 2.8/100,000.

Standardized incidence ratio (SIR) 2007 - 2014: Males



Standardized incidence ratio (SIR) 2007 - 2014: Females

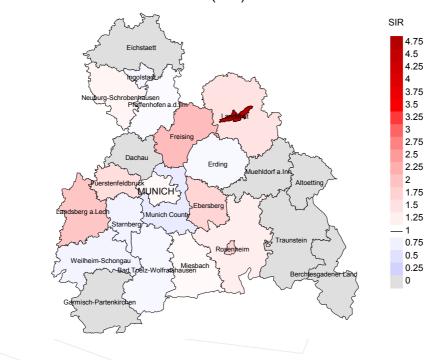


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2014. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=64, females N=43).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,924 female residents (averaged) in the period from 2007 to 2014 a total of 2 women were identified with newly diagnosed neoplasm of peripheral nerves. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.70. Though, the value of this parameter may vary with an underlying probability of 99% between 0.09 and 7.89, 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)

		Prop.				Prop. deaths
	Inciden	-	Prop.		Prop.	with death
Year of	cases	followed	_	Deaths	deaths	certific.
diagnosis	n	ଚ	90	n	90	%
1998	2	100.0		1	50.0	100.0
1999	6	100.0		5	83.3	80.0
2000		100.0		1	100.0	100.0
2001	1/3	100.0		3 /	100.0	100.0
2002	11	90.9			72.7	100.0
2003	7	100.0		8 5	71.4	100.0
2004	8	100.0		1	12.5	100.0
2005	9	88.9		6	66.7	66.7
2006	12	100.0		3	25.0	100.0
2007	17	70.6		5	29.4	100.0
2008	17	64.7		7	41.2	100.0
2009	6	66.7		3	50.0	100.0
2010	24	66.7		11	45.8	100.0
2011	11	72.7		4	36.4	100.0
2012	15	80.0		4	26.7	75.0
2013	14	100.0		4	28.6	100.0
2014	3	100.0		1	33.3	100.0
1998-2014	166	82.5		72	43.4	94.4

Table 10b

Annual cohorts of incident cancers and deaths, proportion of death certificates and cases deceased the same year of cancer diagnosis (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.		
			deaths		Prop.
Year of	Incident		with death	Deaths in	deaths in
diagnosis/	cases	Deaths	certific.	same year	same year
death	n	n	%	n	90
1998	2	2	100.0		
1999	6	2	100.0		
2000	1	1	100.0		
2001	3	4	75.0	2	66.7
2002	11	2	100.0	1	9.1
2003	7	3	100.0	1	14.3
2004	8	5	100.0		
2005	9	5	80.0	2	22.2
2006	12 /	2	100.0		
2007	17/	2	100.0		
2008	17	4	100.0	2	11.8
2009	6	8	100.0		
2010	24	4	100.0	2	8.3
2011	\ 11 \	10	100.0		
2012	15	8	100.0	1	6.7
2013	14	5	80.0	1	7.1
2014	3	10	90.0	/1 /	33.3
1998-2014	166	77	94.8	13	7.8

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	%	%	%
death	11	0	•	6
1000	2	EO O	FO O	EO 0
1998	2	50.0	50.0	50.0
1999	2	100.0		100.0
2000	1	100.0		100.0
2001	4	75.0	25.0	100.0
2002	2	100.0		100.0
2003	3	100.0		100.0
2004	5	100.0		100.0
2005	5	100.0		100.0
2006	2	100.0		100.0
2007	2	100.0		100.0
2008	4	100.0		100.0
2009	\ 8	100.0		87.5
2010	4	100.0		100.0
2011	10	80.0	20.0	70.0
2012	8	87.5	12.5	100.0
2012	5	80.0	20.0	100.0
2013			20.0	88.9
2014	10	80.0	20.0	00.9
1000 0014	7.7	00.6	10.4	01.0
1998-2014	77	89.6	10.4	91.8

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

Year of death	Deaths n	Age at death (all causes)	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate)
1998	1	38.1	38.1		38.1
1999 2000 2001 2002 2003	1	66.2	66.2		66.2
2004	5	43.6	43.6		43.6
2005	1	32.8	32.8		32.8
2006 2007	1/	46.6	46.6		46.6
2007	3	71.6	71.6		71.6
2009	1 3 3 3 5	58.5	58.5		58.5
2010	3	78.6	78.6		78.6
2011	5	52.5	52.4	80.4	52.5
2012	6	53.7	53.7	00.4	53.7
2013	2	77.8	77.3	78.2	77.3
2014	6	42.3	42.3	, , ,	42.3
1998-2014	37	54.8	52.5	79.3	53.7

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.

 $\begin{array}{c} \text{Table 11b} \\ \text{Medians of age at death according to the grouping in Table 10} \\ \text{FEMALES} \end{array}$

Year of	Deaths	Age at death (all causes)	Age at death (cancer-related)	Age at death (non-cancer-related)	Age at death (according to death certificate)
death	n	Years	Years	Years	Years
1998	1	86.1		86.1	
1999	2	29.9	29.9		29.9
2000					
2001	4	47.0	52.2	41.8	52.2
2002	2	44.0	44.0		44.0
2003	3	36.9	36.9		36.9
2004					
2005	4	55.1	55.1		61.8
2006	2	46.4	46.4		46.4
2007	1 1 5 1 5	76.8	76.8		76.8
2008	1	81.5	81.5		81.5
2009	5	47.5	47.5		51.3
2010	1	25.0	25.0		25.0
2011	5	76.6	76.0	89.6	76.0
2012		49.1	15.2	83.1	49.1
2013	3	61.7	61.7		61.7
2014	4	68.5	68.5	60.2	68.5
1000 0014	4.0	F2 6	F.O. 2	0.2 2	F.F. 0
1998-2014	40	53.6	50.3	83.3	55.0

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.

Year of	Deaths	Mort.	MI-Index	Mort.	MI-Index	Mort.	MI-Index	Mort. M	II-Index
death	n	raw	raw	WS	WS	ES	ES	BRD-S	BRD-S
1998	1	0.1		0.1		0.1		0.1	
1999									
2000	1	0.1	1.00	0.1	1.21	0.1	1.29	0.1	1.29
2001									
2002									
2003									
2004	5	0.3	1.25	0.3	0.95	0.3	1.08	0.3	1.27
2005	1	0.1	0.33	0.0	0.23	0.1	0.29	0.1	0.32
2006									
2007	1	0.0	0.10	0.0	0.05	0.0	0.07	0.0	0.11
2008	3	0.1	0.33	0.1	0.14	0.1	0.22	0.1	0.32
2009	3	0.1	0.75	0.1	0.44	0.1	0.61	0.1	0.79
2010	3	0.1	0.19	0.1	0.06	0.1	0.11	0.1	0.20
2011	4	0.2	0.67	0.2	0.40	0.2	0.55	0.2	0.68
2012	6	0.3	0.60	0.2	0.41	0.2	0.50	0.2	0.51
2013	1	0.0	0.13	0.0	0.03	0.0	0.07	0.0	0.13
2014	6	0.3	6.00	0.3	2.42	0.3	3.50	0.3	6.21
1998-2014	35	0.1	0.38	0.1	0.25	0.1	0.31	0.1	0.38

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. M	I-Index	Mort.	MI-Index
death	n	raw	raw	WS	WS	ES	ES	BRD-S	BRD-S
1998									
1999	2	0.2	0.50	0.2	1.00	0.2	0.72	0.2	0.82
2000									
2001	3	0.2	1.00	0.2	0.73	0.2	0.85	0.2	0.78
2002	2	0.1	0.40	0.1	0.50	0.1	0.47	0.1	0.54
2003	3	0.2	0.75	0.1	0.39	0.1	0.53	0.1	0.66
2004									
2005	4	0.2	0.67	0.1	0.39	0.2	0.50	0.2	0.59
2006	2	0.1	0.67	0.1	0.72	0.1	0.67	0.1	0.69
2007	1	0.0	0.14	0.0	0.04	0.0	0.07	0.0	0.14
2008	1	0.0	0.13	0.0	0.02	0.0	0.04	0.0	0.09
2009	5	0.2	2.50	0.2	2.30	0.2	2.31	0.2	2.66
2010	1	0.0	0.13	0.1	0.17	0.1	0.17	0.1	0.21
2011	4	0.2	0.80	0.1	0.47	0.1	0.60	0.2	0.83
2012	1	0.0	0.20	0.1	0.28	0.1	0.25	0.1	0.31
2013	3	0.1	0.50	0.1	0.64	0.1	0.54	0.1	0.53
2014	2	0.1	1.00	0.0	1.60	0.1	1.36	0.1	1.19
1998-2014	34	0.1	0.46	0.1	0.35	0.1	0.40	0.1	0.48

Table 13

Age distribution of age at death (cancer-related) for period 2007-2014

(incl. multiple primaries)

Age at							_		
death	Cases			Males			Females		
Years	n	용 (Cum.%	/ n	용	Cum.%	n	용	Cum.%
5-9	2	4.4	4.4	/ 2	7.4	7.4			0.0
10-14	0	0.0	4.4			7.4			0.0
15-19	3	6.7	11.1	1	3.7	/11.1	2	11.1	11.1
20-24	2	4.4	15.6			/ 11.1/	2	11.1	22.2
25-29	3	6.7	22.2	2	7.4	18.5	1	5.6	27.8
30-34	0	0.0	22.2			18.5			27.8
35-39	1	2.2	24.4			18.5	1	5.6	33.3
40 - 44	1	2.2	26.7	1	3.7	22.2			33.3
45-49	5	11.1	37.8	4	14.8	37.0	1	5.6	38.9
50-54	3	6.7	44.4	3	11.1	48.1			38.9
55-59	3	6.7	51.1	2	7.4	55.6	1	5.6	44.4
60-64	3	6.7	57.8			55.6	3	16.7	61.1
65-69	5 /	11.1	68.9	5	18.5	74.1			61.1
70-74	1 /	2.2	71.1	1	3.7	77.8			61.1
75-79	7	15.6	86.7	3	11.1	88.9	4	22.2	83.3
80-84	5	11.1	97.8	3	11.1	100.0	2	11.1	94.4
85+	1	2.2 1	.00.0			100.0	1	5.6	100.0
All ages	45	100.0		27	100.0		18	100.0	

Included in the statistics are 29.7% multiple primaries in males and 41.9% in females.



Table 14

Age-specific mortality (cancer-related) and proportion of all cancers for period 2007-2014 (incl. multiple primaries)

0- 4 5- 9 10-14 15-19 1	Age at death Years	Males Fe	emales n	/ - /	MI-index	Females Age- spec. mortal.	MI-index	cancers	Females Prop.all cancers
15-19	5- 9	2		0.2	1.00	0.0		9.5	
30-34 35-39 1 0.0 35-39 1 0.0 0.1 0.50 0.4 40-44 1 0.1 0.33 0.0 0.2 45-49 4 1 0.2 0.2 0.75 0.0 0.2 55-59 2 1 0.2 1.00 0.1 0.33 0.1 0.0 0.2 55-59 2 1 0.2 1.00 0.1 0.33 0.1 0.0 60-64 3 0.0 0.3 1.00 0.1 65-69 5 0.5 0.83 0.0 0.1 65-69 5 0.5 0.83 0.0 0.1 75-79 3 4 0.5 0.75 0.6 1.33 0.0 0.1 75-79 3 4 0.5 0.75 0.6 1.33 0.0 0.1 80-84 3 2 0.9 0.75 0.4 1.00 0.0 0.1 85+ 1 0.0 0.1 0.0 Mortality Raw WS 0.1 0.42 0.1 0.42 0.1 0.36 BRD-S PYLL-70 per 100,000 ES 3.1 0.0 0.1 0.0 0.2 0.1 0.42 0.1 0.45	20-24		2	0.0		0.2	2.00		7.1
45-49 4 1 0.3 1.33 0.1 1.00 0.4 0.1 50-54 3 0.2 0.75 0.0 0.2 0.2 55-59 2 1 0.2 1.00 0.1 0.33 0.1 0.0 60-64 3 0.0 0.3 1.00 0.1 0.1 65-69 5 0.5 0.83 0.0 0.1 0.1 70-74 1 0.1 0.50 0.0 0.0 0.0 75-79 3 4 0.5 0.75 0.6 1.33 0.0 0.1 80-84 3 2 0.9 0.75 0.4 1.00 0.0 0.0 85+ 1 0.0 0.2 0.33 0.0 0.0 0.0 Mortality Raw 0.1 0.42 0.1 0.42 0.1 0.31 ES 0.1 0.42 0.1 0.36 0.1 0.45 PYLL-70 0.1 0.42 0.1 0.45 ES	30-34	۷		0.0	0.67	0.0		3.2	
55-59 2 1 0.2 1.00 0.1 0.33 0.1 0.0 60-64 3 0.0 0.3 1.00 0.1 65-69 5 0.5 0.83 0.0 0.1 70-74 1 0.1 0.50 0.0 0.0 75-79 3 4 0.5 0.75 0.6 1.33 0.0 0.1 80-84 3 2 0.9 0.75 0.4 1.00 0.0 0.0 85+ 1 0.0 0.2 0.33 0.0 0.0 Mortality Raw 0.1 0.42 0.1 0.42 WS 0.1 0.24 0.1 0.36 BRD-S 0.1 0.42 0.1 0.45 PYLL-70 <pre>per 100,000 ES 3.1 2.9 3.1 2.1 2.1 2.3</pre>	45-49	4	1	0.3	1.33	0.1	1.00	0.4	0.1
70-74	55-59 60-64	2		0.2	1.00	0.1		0.1	
85+ 1 0.0 0.2 0.33 0.0 All ages 27 18 0.1 0.42 Mortality Raw WS ES BRD-S PYLL-70 per 100,000 ES 3.1 2.3	70-74 75-79	1 3		0.1	0.50 0.75	0.0		0.0	0.1
Mortality Raw WS 0.1 0.42 0.1 0.42 WS 0.1 0.24 0.1 0.31 ES 0.1 0.32 0.1 0.36 BRD-S 0.1 0.42 0.1 0.45 PYLL-70 per 100,000 2.9 ES 3.1 2.3		3			0.75			0.0	
Raw 0.1 0.42 0.1 0.42 WS 0.1 0.31 ES 0.1 0.32 0.1 0.36 BRD-S 0.1 0.42 0.1 0.35 PYLL-70 per 100,000 2.9 2.1 ES 3.1 2.3		27	18					0.1	0.0
PYLL-70 per 100,000 2.9 ES 2.1 2.3	Raw WS ES			0.1	0.24	0.1	0.31 0.36		
20.0	PYLL-70 per 100,000			2.9		2.1			

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

Table 15a

Multiple primaries in deaths in period 1998-2014

MALES

	Multiple p	rimaries	in dea MAL		n perio	d 1998-	2014		
Diagnos	is	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d n	Syn- chron ±30d ←%	Post n	Post ←%
C07-C08	Salivary gland	1 / 1	7.1					1	100.0
C18 C19-C20 C33-C34	Colon Rectum Lung	1 1 1	7.1 7.1 7.1	1	100.0			1 1	100.0
C43 C44	Malign. melanoma Skin others	2	7.1 14.3	1	100.0 50.0			1	50.0
C70-C72 C82-C85	CNS cancer	5 1	35.7 7.1					5 1	100.0
C90	Mult. myeloma	1	7.1	1	100.0			_	100.0

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

Table 15b

Multiple primaries in deaths in period 1998-2014
FEMALES

Multiple pr	rimaries	in dea FEMA		n perio	d 1998-	2014		
Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn- chron ±30d	Syn- chron ±30d ←%	Post n	Post ←%
C15 Oesophagus	1 /	5.9					1	100.0
C22 Liver	1 /	5.9			1	100.0	1	100 0
C23-C24 Bile C25 Pancreas	1 1	5.9 5.9					1 1	100.0
C33-C34 Lung	1	5.9					1	100.0
C43 Malign. melanoma C44 Skin others	1 1	5.9 5.9	1	100.0				
C46,C49 Soft tissue	2	11.8		100.0	1	50.0	1	50.0
C50 Breast	3	17.6	1	33.3			2	66.7
C70-C72 CNS cancer C82-C85 NHL	4 1	23.5 5.9			1	100.0	4	100.0
All mult. primaries	17	100.0	3	17.6	3	17.6	11	64.7

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 multiple malignancy.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers for period 2007-2014 (First primaries only *)

Age at death Years	Males E	Females n	Males Age- spec. mortal.	MI-index	Females Age- spec. mortal.	MI-index	cancers	Females Prop.all cancers
0- 4 5- 9 10-14	2		0.0 0.2 0.0	1.00	0.0 0.0 0.0		10.0	
15-19 20-24	1	1 1	0.1	1.00	0.1	0.50 1.00	3.0	5.0 3.8
25-29 30-34	1	1	0.1	0.50	0.1	0.33	1.8	1.7
35-39 40-44 45-49	1 3	1	0.0 0.1 0.2		0.1 0.0 0.1	0.50	0.2	0.4
50-54 55-59	2	1	0.2	0.67	0.0	1.00	0.1	0.0
60-64 65-69	4	2	0.0	1.33	0.2	1.00	0.1	0.1
70-74 75-79 80-84	2 3	2 2	0.0 0.4 0.9	0.67 0.75	0.0 0.3 0.4	2.00	0.0	0.0
85+		1	0.0		0.2	0.33		0.0
All ages Mortality	20	13					0.1	0.0
Raw WS ES BRD-S			0.1 0.1 0.1 0.1	0.21	0.1 0.0 0.1 0.1	0.41 0.26 0.32 0.43		
PYLL-70 per 100,000 ES			2.3 2.5		1.4 1.5	7.13		
AYLL-70			24.8		28.1			

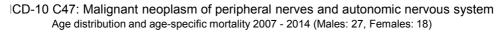
^{*} See corresponding tables with multiple primaries.

Table 17

Age-specific mortality (cancer-related) and proportion of all cancers for period 2007-2014 (Single primaries only *)

Age at death Years	Males n	Females n		MI-index	Females Age- spec. mortal.	MI-index	cancers	Females Prop.all cancers
0- 4 5- 9 10-14	2		0.0 0.2 0.0	1.00	0.0		10.0	
15-19 20-24	1	1 1	0.1	1.00	0.1	0.50 1.00	3.0	5.6 4.2
25-29 30-34	1	1	0.1	0.50	0.1	0.33	2.0	1.8
35-39 40-44	2	1	0.0	1 50	0.1	0.50		0.5
45-49 50-54 55-59	3 2 1	1	0.2 0.2 0.1	1.00	0.1 0.0 0.1	1.00	0.3 0.1 0.0	0.1
60-64 65-69	3	2	0.0		0.2	2.00	0.1	0.1
70-74 75-79	1	2	0.0 0.2	0.50	0.0	2.00	0.0	0.1
80-84 85+	3	1	0.9	0.75	0.0	0.33	0.1	0.0
All ages	17	11					0.1	0.0
Mortality Raw WS ES BRD-S			0.1 0.1 0.1	0.20	0.1 0.0 0.1 0.1	0.37 0.26 0.31 0.40		
PYLL-70 per 100,000 ES AYLL-70			2.1 2.4 26.3		1.4 1.5 28.1			

^{*} See corresponding tables with multiple primaries.



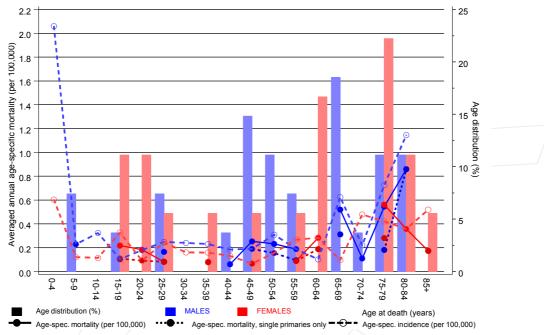
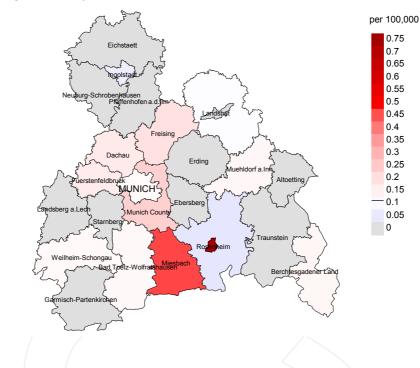


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

The difference between age at diagnosis (Table 3) and age at neoplasm of peripheral nerves-related death (see Table 10) should be considered.



Average mortality (world standard population) 2007 - 2014: Males



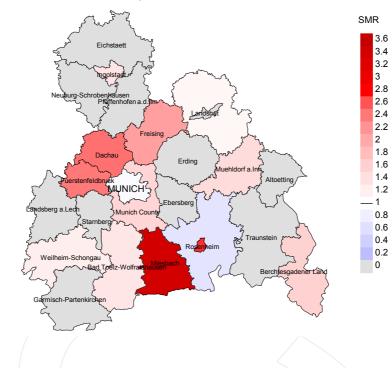
Average mortality (world standard population) 2007 - 2014: Females



Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2014. 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=27, females 0.1/100,000 WS N=18).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 65,347 female residents (averaged) in the period from 2007 to 2014 a total of 2 women died from neoplasm of peripheral nerves. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 0.6/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 0.0 and 2.8/100,000.

Standardized mortality ratio (SMR) 2007 - 2014: Males



Standardized mortality ratio (SMR) 2007 - 2014: Females

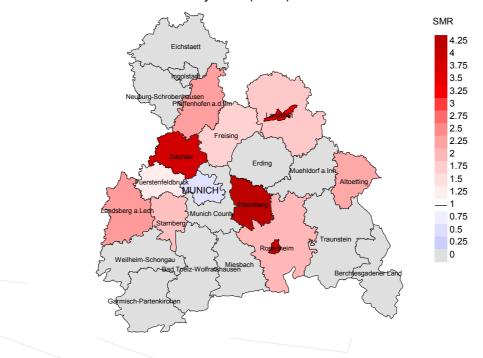


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2014. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (males N=27, females N=18).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 64,924 female residents (averaged) in the period from 2007 to 2014 a total of 2 women died from neoplasm of peripheral nerves. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 4.20. Though, the value of this parameter may vary with an underlying probability of 99% between 0.22 and 19.49, 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

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

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