Munich Cancer Registry

- Survival
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ICD-10 C53-C55: Uterine cancer

Incidence and Mortality

Year of diagnosis	1998-2014
Patients	12,491
Diseases	12,545
Creation date	04/13/2016
Export date	12/23/2015
Population (females)	2.36 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/bC5355E-ICD-10-C53-C55-Uterine-cancer-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.

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

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

Code	Description
C53.-	Malignant neoplasm of cervix uteri
C53.0	Endocervix
C53.1	Exocervix
C53.8	Overlapping lesion of cervix uteri
C53.9	Cervix uteri, unspecified
C54.-	Malignant neoplasm of corpus uteri
C54.0	Isthmus uteri
C54.1	Endometrium
C54.2	Myometrium
C54.3	Fundus uteri
C54.8	Overlapping lesion of corpus uteri
C54.9	Corpus uteri, unspecified
C55	Malignant neoplasm of uterus, part unspecified

INCIDENCE

Table 1

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

Year of diagnosis	Cases n	DCO cases n	Prop. DCO %	Prop. mult. primaries %	Prop. deaths %	Prop. actively followed %
1998	483	19	3.9	26.5	52.8	94.6
1999	499	19	3.8	24.2	50.3	96.0
2000	467	20	4.3	24.4	47.3	96.4
2001	504	26	5.2	25.4	51.2	94.4
2002	759	47	6.2	22.7	47.4	96.0 #
2003	764	52	6.8	24.7	47.4	94.1
2004	758	48	6.3	23.2	45.6	95.5
2005	794	36	4.5	22.0	41.3	93.1
2006	752	25	3.3	19.4	36.7	89.8
2007	877	45	5.1	22.6	40.8	74.7 #
2008	901	34	3.8	21.6	36.0	59.4
2009	885	27	3.1	20.9	34.0	59.1
2010	842	41	4.9	21.5	32.1	58.9
2011	878	24	2.7	20.4	28.2	60.6
2012	864	44	5.1	24.4	26.5	64.9
2013	872	36	4.1	19.3	19.6	99.0
2014	646	24	3.7	18.3	12.7	95.7 ##
1998-2014	12545	567	4.5	22.2	37.0	81.6

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 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)

Year of diagnosis	Cases n	Incidence raw	Incidence WS	Incidence ES	Incidence BRD-S
1998	483	41.1	22.8	31.3	36.7
1999	499	42.1	23.1	31.6	37.0
2000	467	38.9	21.4	29.4	34.5
2001	504	41.4	22.5	31.0	36.3
2002	759	38.8	20.8	28.5	33.5
2003	764	38.8	20.4	28.4	33.2
2004	758	38.3	20.0	27.9	32.7
2005	794	39.9	21.2	29.1	33.6
2006	752	37.4	19.9	27.3	31.8
2007	877	38.0	20.2	27.8	32.2
2008	901	38.8	20.6	28.2	32.6
2009	885	38.1	20.5	28.1	32.3
2010	842	36.0	18.5	25.6	30.1
2011	878	37.2	19.7	27.0	31.2
2012	864	36.6	18.5	25.7	30.2
2013	872	37.0	19.2	26.5	31.3
2014	646	27.4	14.4	19.8	23.0
1998-2014	12545	37.5	19.9	27.4	31.9

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

Table 3

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	483	63.5	14.7	23.8	95.5	41.7	53.5	64.2	74.5	82.5
1999	499	63.3	15.8	24.4	99.9	39.5	52.8	64.3	75.3	83.1
2000	467	62.9	14.9	23.9	93.1	40.3	53.7	63.5	75.1	80.7
2001	504	64.0	15.1	26.3	96.0	41.2	54.4	64.3	74.9	82.6
2002	759	64.2	15.1	25.9	96.1	41.1	54.7	65.6	75.8	82.6
2003	764	65.2	14.7	27.3	99.4	43.8	56.0	65.3	76.3	83.6
2004	758	65.0	14.7	21.0	99.8	43.2	55.7	65.8	76.2	83.2
2005	794	64.5	14.8	24.0	100	41.8	55.4	66.1	74.1	83.6
2006	752	64.3	15.2	22.9	99.4	42.5	53.9	65.4	75.3	83.4
2007	877	64.1	14.9	22.0	99.2	42.1	54.5	66.1	74.8	82.7
2008	901	64.1	14.5	24.0	97.1	43.6	53.9	66.6	73.8	82.6
2009	885	64.1	14.8	23.1	102	42.3	54.3	65.1	74.2	83.0
2010	842	65.0	14.9	25.1	98.7	43.5	54.6	67.0	75.9	84.1
2011	878	64.0	15.0	25.7	95.6	42.2	53.5	66.4	74.7	83.3
2012	864	65.6	14.7	0.3	97.8	44.9	55.9	67.9	75.9	83.9
2013	872	64.8	15.1	22.1	99.7	43.9	54.6	65.8	76.4	83.3
2014	646	64.3	16.0	25.8	99.0	39.6	53.3	65.9	75.9	84.4
1998-2014	12545	64.4	15.0	0.3	102	42.5	54.5	65.8	75.2	83.3

Table 4

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

Age at diagnosis Years	Cases n	%	Cum.%
0-4	1	0.0	0.0
5-9	0	0.0	0.0
10-14	0	0.0	0.0
15-19	0	0.0	0.0
20-24	6	0.1	0.1
25-29	69	1.0	1.1
30-34	158	2.3	3.5
35-39	237	3.5	7.0
40-44	367	5.4	12.4
45-49	405	6.0	18.4
50-54	527	7.8	26.2
55-59	663	9.8	36.0
60-64	748	11.1	47.0
65-69	861	12.7	59.7
70-74	997	14.7	74.5
75-79	705	10.4	84.9
80-84	500	7.4	92.3
85+	521	7.7	100.0
All ages	6765	100.0	

Included in the statistics are 25.3% multiple primaries.

Table 5

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

Age at diagnosis Years	Cases n	Age-spec. incidence	DCO rate n=273 %	Prop. all cancers n=89596 %
0- 4	1	0.1	100.0	0.7
5- 9		0.0		
10-14		0.0		
15-19		0.0		
20-24	6	0.6		1.9
25-29	68	5.5		10.3
30-34	158	12.7		13.7
35-39	237	18.8	0.4	11.9
40-44	366	23.9	0.3	9.7
45-49	401	26.4	0.7	7.3
50-54	527	41.2	0.6	7.8
55-59	663	59.0	0.8	8.9
60-64	747	70.4	1.2	8.1
65-69	858	82.2	1.6	7.5
70-74	994	95.1	2.5	8.4
75-79	703	98.6	3.4	7.0
80-84	500	89.2	10.0	5.7
85+	518	89.6	26.4	5.1
All ages	6747		4.0	7.5
Incidence				
Raw		36.0		
WS		18.9		
ES		26.0		
BRD-S		30.3		

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).

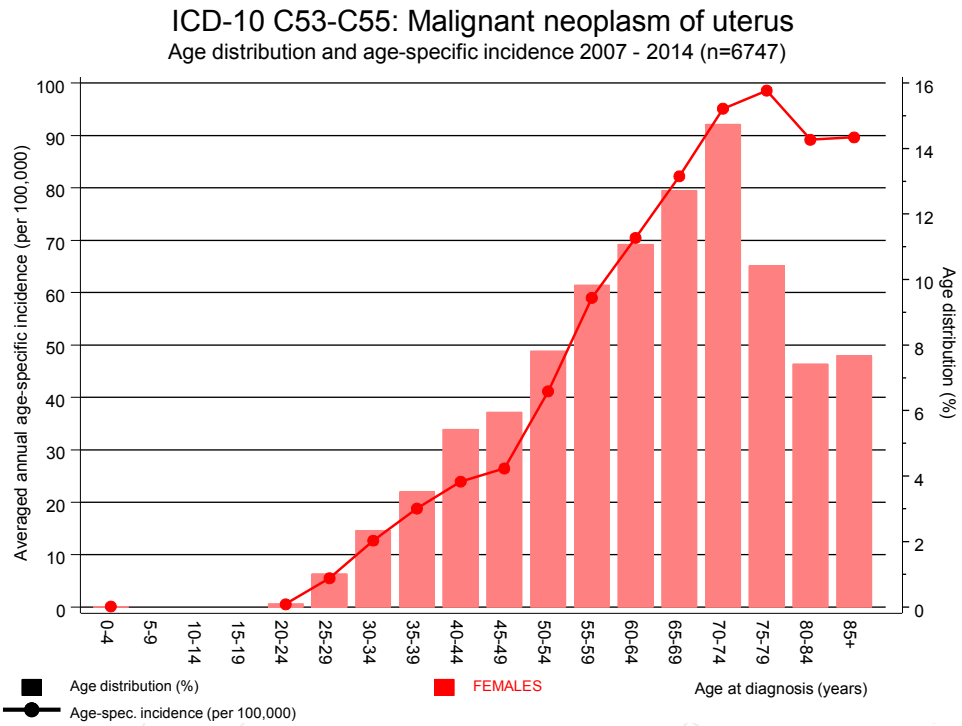

Figure 6. Age distribution and age-specific incidence

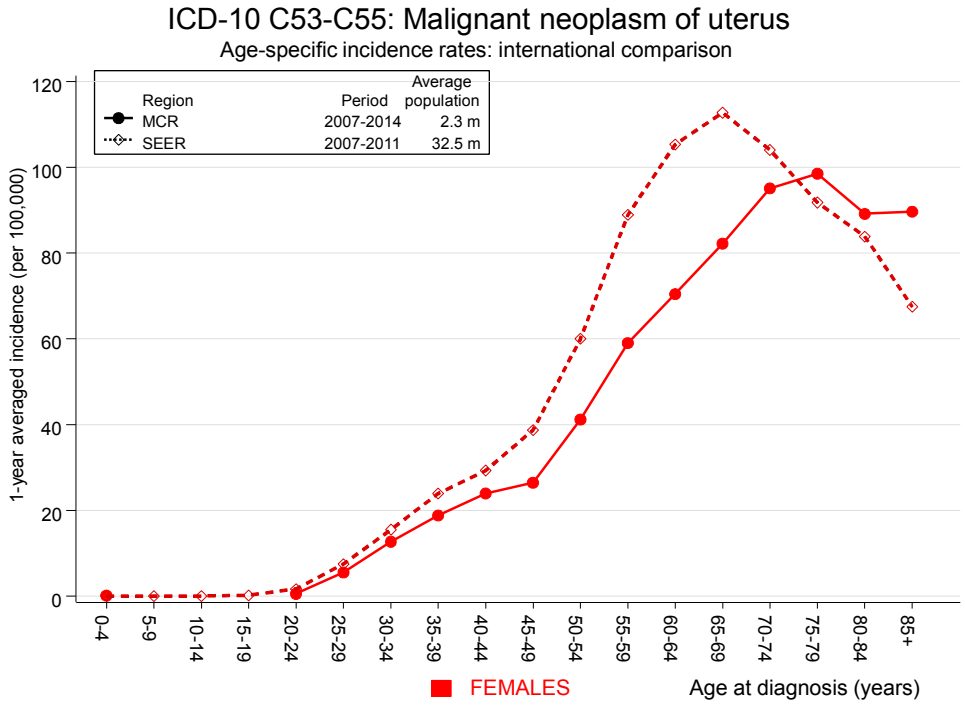

Figure 6a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

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.

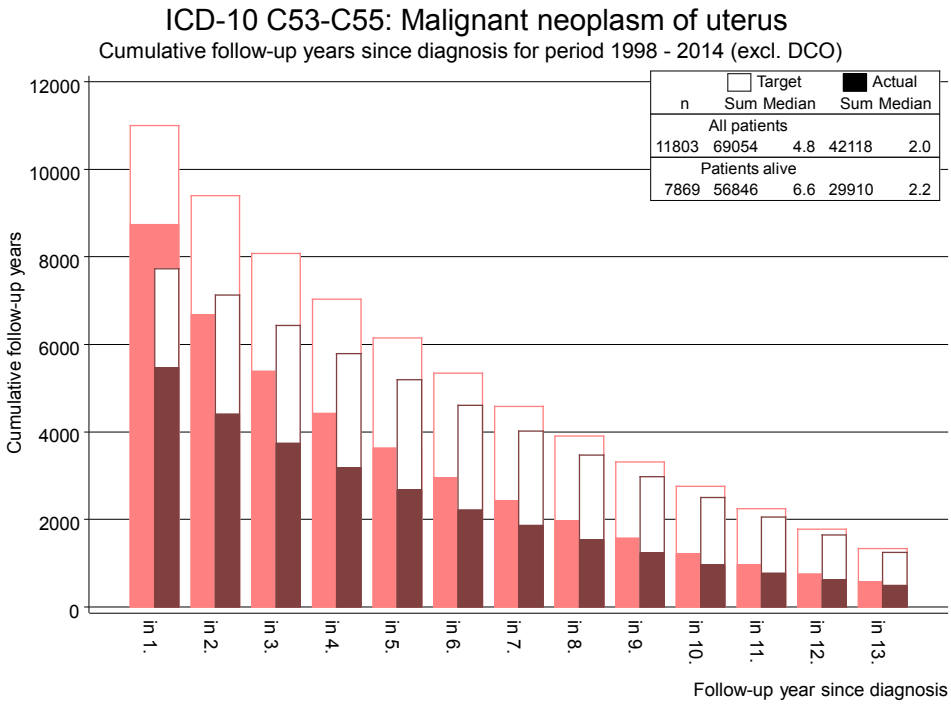

Figure 7. Cumulative follow-up years depending on time since diagnosis

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

Table 8

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

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C03-C06	Oral cavity	5	2.6	1.9	0.6	4.5		0.6	
C09-C10	Oropharynx	5	1.8	2.8	0.9	6.5		0.8	
C15	Oesophagus	5	2.6	1.9	0.6	4.5		0.6	
C16	Stomach	23	15.4	1.5	0.9	2.2		1.8	21.7
C17	Small intestine	9	2.1	4.3	2.0	8.2	#	1.6	
C18	Colon	116	42.9	2.7	2.2	3.2	#	17.4	11.2
C19-C20	Rectum	44	18.6	2.4	1.7	3.2	#	6.0	11.4
C21	Anus/canal	7	2.3	3.1	1.2	6.3	#	1.1	14.3
C22	Liver	10	5.0	2.0	1.0	3.7		1.2	10.0
C23-C24	Bile	13	6.2	2.1	1.1	3.6	#	1.6	7.7
C25	Pancreas	46	18.9	2.4	1.8	3.2	#	6.5	26.1
C26	GI cancer	4	0.8	5.2	1.4	13.4	#	0.8	50.0
C30-C31	Sinuses	3	0.5	5.7	1.2	16.6	#	0.6	
C33-C34	Lung	112	31.4	3.6	2.9	4.3	#	19.2	12.5
C38,C45	Mesothelioma	3	0.8	3.8	0.8	11.2		0.5	
C43	Malign. melanoma	30	16.5	1.8	1.2	2.6	#	3.2	
C46,C49	Soft tissue	12	2.5	4.9	2.5	8.5	#	2.3	
C48	Peritoneal	17	1.6	10.3	6.0	16.6	#	3.7	
C50	Breast	353	135.5	2.6	2.3	2.9	#	51.8	3.4
C51	Vulva	16	4.3	3.7	2.1	6.1	#	2.8	6.3
C52	Vagina	14	0.8	16.8	9.2	28.1	#	3.1	
C53	Cervix uteri	23	6.3	3.7	2.3	5.5	#	4.0	39.1
C54	Corpus uteri	29	24.7	1.2	0.8	1.7		1.0	34.5
C56	Ovary	239	18.1	13.2	11.6	15.0	#	52.6	13.8
C64	Kidney	25	10.9	2.3	1.5	3.4	#	3.4	8.0
C65	Renal pelvis	8	1.3	6.0	2.6	11.7	#	1.6	
C67	Bladder	29	8.0	3.6	2.4	5.2	#	5.0	10.3
C70-C72	CNS cancer	11	6.1	1.8	0.9	3.2		1.2	18.2
C73	Thyroid	18	8.1	2.2	1.3	3.5	#	2.4	
C76-C79	CUP	19	7.6	2.5	1.5	3.9	#	2.7	5.3
C81	Hodgkin lymphoma	4	0.8	4.8	1.3	12.2	#	0.8	
C82-C85	NHL	33	16.8	2.0	1.4	2.8	#	3.9	3.0
C90	Mult. myeloma	5	5.3	0.9	0.3	2.2		-0.1	20.0
C91-C96	Leukaemia	20	7.0	2.9	1.8	4.4	#	3.1	25.0
Other primaries		15	6.6	2.3	1.3	3.7	#	2.0	13.3
Not observed		0	1.1	0.0	0.0	3.2		-0.3	
All mult. primaries		1325	441.9	3.0	2.8	3.2	#	210.2	10.3

Patients	11882
Median age at second malignancy (years)	70.6
Person-years	42014
Mean observation time (years)	3.5
Median observation time (years)	2.0

The occurrence of second malignancy is statistically significant.

Observed second primaries with count 1 to 2 are pooled in category “Other primaries”

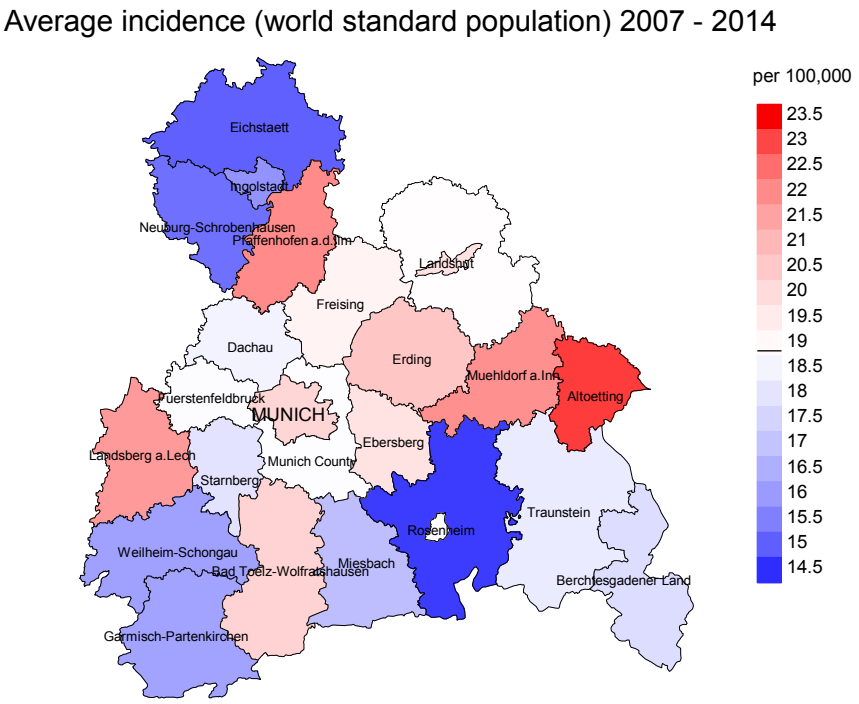

Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2007 to 2014. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (18.9/100,000 WS N=6,747).

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 195 women were identified with newly diagnosed uterine cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 19.7/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 16.1 and 24.1/100,000.

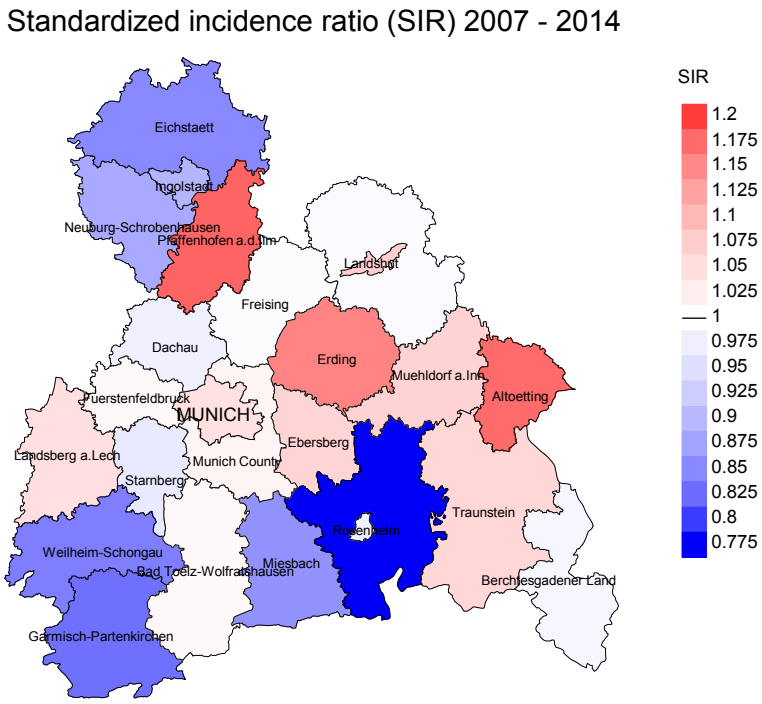

Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2007 to 2014. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (N=6,747).

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 195 women were identified with newly diagnosed uterine cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.06. Though, the value of this parameter may vary with an underlying probability of 99% between 0.88 and 1.28, 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 diagnosis	Incident cases n	Prop. actively followed %	Prop. DCO %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	483	94.6	3.9	255	52.8	91.0
1999	499	96.0	3.8	251	50.3	94.0
2000	467	96.4	4.3	221	47.3	95.9
2001	504	94.4	5.2	258	51.2	95.3
2002	759	96.0	6.2	360	47.4	97.2
2003	764	94.1	6.8	362	47.4	97.8
2004	758	95.5	6.3	346	45.6	97.1
2005	794	93.1	4.5	328	41.3	96.6
2006	752	89.8	3.3	276	36.7	99.3
2007	877	74.7	5.1	358	40.8	97.8
2008	901	59.4	3.8	324	36.0	99.7
2009	885	59.1	3.1	301	34.0	98.0
2010	842	58.9	4.9	270	32.1	99.3
2011	878	60.6	2.7	248	28.2	96.4
2012	864	64.9	5.1	229	26.5	99.6
2013	872	99.0	4.1	171	19.6	95.3
2014	646	95.7	3.7	82	12.7	84.1
1998-2014	12545	81.6	4.5	4640	37.0	96.8

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)

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	483	238	89.5	44	9.1
1999	499	256	91.4	45	9.0
2000	467	266	92.9	47	10.1
2001	504	229	91.7	43	8.5
2002	759	387	95.6	82	10.8
2003	764	468	96.4	93	12.2
2004	758	424	96.9	82	10.8
2005	794	438	95.0	71	8.9
2006	752	416	96.2	55	7.3
2007	877	493	97.0	93	10.6
2008	901	489	98.8	71	7.9
2009	885	516	99.0	70	7.9
2010	842	527	98.9	81	9.6
2011	878	579	97.4	81	9.2
2012	864	531	98.5	101	11.7
2013	872	596	98.3	91	10.4
2014	646	538	98.9	64	9.9
1998-2014	12545	7391	96.7	1214	9.7

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)

Year of death	Deaths n	Prop. cancer-related %	Prop. non-cancer-related %	Prop. cancer recorded on death certificate %
1998	238	57.1	42.9	77.0
1999	256	60.5	39.5	75.2
2000	266	59.0	41.0	72.1
2001	229	50.2	49.8	72.9
2002	387	62.8	37.2	76.5
2003	468	64.3	35.7	77.2
2004	424	63.7	36.3	74.0
2005	438	63.7	36.3	74.8
2006	416	59.6	40.4	71.8
2007	493	62.3	37.7	70.7
2008	489	62.2	37.8	69.6
2009	516	59.1	40.9	67.3
2010	527	63.9	36.1	72.2
2011	579	61.5	38.5	70.4
2012	531	59.5	40.5	69.0
2013	596	60.2	39.8	68.1
2014	538	58.9	41.1	69.2
1998-2014	7391	61.0	39.0	71.7

Table 11

Medians of age at death according to the grouping in Table 10

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	238	77.6	71.7	82.2	76.3
1999	256	79.3	76.2	84.3	78.9
2000	266	79.8	77.1	83.1	78.0
2001	229	79.9	74.5	82.3	77.6
2002	387	79.3	73.8	84.6	75.8
2003	468	78.6	74.2	83.6	76.4
2004	424	78.5	73.3	84.5	75.1
2005	438	80.1	74.1	84.2	76.8
2006	416	79.7	74.5	85.5	76.2
2007	493	81.2	74.4	85.9	77.2
2008	489	79.8	72.5	85.8	74.7
2009	516	80.1	73.7	86.0	75.1
2010	527	79.8	73.8	85.6	75.5
2011	579	79.5	74.1	85.7	75.2
2012	531	80.5	76.1	87.0	77.0
2013	596	79.8	74.7	86.6	76.3
2014	538	78.9	74.9	85.3	75.9
1998-2014	7391	79.6	74.3	85.1	76.3

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 12

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

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	136	11.6	0.28	5.3	0.23	7.7	0.25	9.9	0.27
1999	155	13.1	0.31	5.3	0.23	8.1	0.26	10.9	0.30
2000	157	13.1	0.34	5.1	0.24	7.9	0.27	10.8	0.31
2001	115	9.5	0.23	4.0	0.18	5.9	0.19	7.8	0.22
2002	243	12.4	0.32	5.3	0.25	7.9	0.28	10.2	0.30
2003	301	15.3	0.39	6.4	0.32	9.7	0.34	12.5	0.38
2004	270	13.7	0.36	5.8	0.29	8.7	0.31	11.1	0.34
2005	279	14.0	0.35	5.6	0.26	8.4	0.29	10.8	0.32
2006	248	12.3	0.33	4.9	0.25	7.4	0.27	9.7	0.31
2007	307	13.3	0.35	5.2	0.26	7.8	0.28	10.1	0.31
2008	304	13.1	0.34	5.5	0.27	8.0	0.28	10.2	0.31
2009	305	13.1	0.35	5.3	0.26	7.9	0.28	10.0	0.31
2010	337	14.4	0.40	5.8	0.31	8.5	0.33	10.8	0.36
2011	356	15.1	0.41	5.9	0.30	8.8	0.33	11.2	0.36
2012	316	13.4	0.37	4.9	0.27	7.6	0.30	10.0	0.33
2013	360	15.3	0.41	5.9	0.31	8.9	0.34	11.6	0.37
2014	317	13.4	0.49	5.1	0.36	7.8	0.39	10.3	0.45
1998-2014	4506	13.5	0.36	5.4	0.27	8.1	0.30	10.5	0.33

Table 13

Age distribution of age at death (cancer-related) for period 2007-2014
(**incl. multiple primaries**)

Age at death Years	Cases n	%	Cum.%
20-24	1	0.0	0.0
25-29	4	0.2	0.2
30-34	11	0.4	0.6
35-39	31	1.2	1.8
40-44	71	2.7	4.5
45-49	93	3.5	8.0
50-54	105	4.0	12.0
55-59	163	6.2	18.2
60-64	188	7.2	25.4
65-69	306	11.7	37.1
70-74	391	14.9	51.9
75-79	373	14.2	66.1
80-84	383	14.6	80.7
85+	506	19.3	100.0
All ages	2626	100.0	

Included in the statistics are 25.3% multiple primaries.

Table 14

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

Age at death Years	Cases n	Age-spec. mortality	MI-index	Prop. all cancers %
0- 4		0.0		
5- 9		0.0		
10-14		0.0		
15-19		0.0		
20-24	1	0.1	0.17	3.6
25-29	4	0.3	0.06	6.3
30-34	11	0.9	0.07	10.0
35-39	31	2.5	0.13	12.0
40-44	71	4.6	0.19	11.2
45-49	93	6.1	0.23	7.6
50-54	105	8.2	0.20	5.9
55-59	163	14.5	0.25	6.2
60-64	188	17.7	0.25	5.3
65-69	306	29.3	0.36	5.9
70-74	391	37.4	0.39	5.9
75-79	373	52.3	0.53	5.9
80-84	383	68.3	0.77	5.8
85+	506	87.6	0.97	5.8
All ages	2626			6.0
Mortality				
Raw		14.0	0.39	
WS		5.5	0.29	
ES		8.2	0.32	
BRD-S		10.7	0.35	
PYLL-70				
per 100,000		74.1		
ES		62.7		
AYLL-70		12.1		

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

Table 15

Multiple primaries in deaths in period 1998–2014

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C16	Stomach	64	2.8	5	7.8	5	7.8	54	84.4
C18	Colon	207	8.9	49	23.7	17	8.2	141	68.1
C19–C20	Rectum	130	5.6	37	28.5	2	1.5	91	70.0
C21	Anus/canal	24	1.0	7	29.2			17	70.8
C22	Liver	23	1.0	2	8.7	1	4.3	20	87.0
C23–C24	Bile	30	1.3	3	10.0			27	90.0
C25	Pancreas	88	3.8	1	1.1	3	3.4	84	95.5
C33–C34	Lung	223	9.6	16	7.2	11	4.9	196	87.9
C43	Malign. melanoma	54	2.3	29	53.7	1	1.9	24	44.4
C44	Skin others	64	2.8	30	46.9	4	6.3	30	46.9
C50	Breast	538	23.1	260	48.3	46	8.6	232	43.1
C51	Vulva	39	1.7	4	10.3	6	15.4	29	74.4
C52	Vagina	30	1.3	2	6.7	8	26.7	20	66.7
C53	Cervix uteri	23	1.0			2	8.7	21	91.3
C54	Corpus uteri	35	1.5			6	17.1	29	82.9
C56	Ovary	215	9.2	22	10.2	99	46.0	94	43.7
C64	Kidney	45	1.9	15	33.3	4	8.9	26	57.8
C67	Bladder	115	4.9	16	13.9	12	10.4	87	75.7
C70–C72	CNS cancer	46	2.0	10	21.7	3	6.5	33	71.7
C76–C79	CUP	41	1.8	6	14.6	2	4.9	33	80.5
C82–C85	NHL	45	1.9	10	22.2	3	6.7	32	71.1
C91–C96	Leukaemia	57	2.5	7	12.3	4	7.0	46	80.7
Other primaries		189	8.1	42	22.2	12	6.3	135	71.4
All mult. primaries		2325	100.0	573	24.6	251	10.8	1501	64.6

Multiple primaries with number of cases 1 to 17 are pooled in category “Other primaries”

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

Table 16

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

Age at death Years	Cases n	Age-spec. mortality	MI-index	Prop. all cancers %
0- 4		0.0		
5- 9		0.0		
10-14		0.0		
15-19		0.0		
20-24	1	0.1	0.17	3.8
25-29	4	0.3	0.06	6.8
30-34	8	0.6	0.05	8.4
35-39	29	2.3	0.13	12.8
40-44	68	4.4	0.20	12.3
45-49	78	5.1	0.22	7.6
50-54	89	7.0	0.19	6.0
55-59	142	12.6	0.24	6.6
60-64	158	14.9	0.24	5.6
65-69	243	23.3	0.34	5.9
70-74	319	30.5	0.40	6.3
75-79	294	41.2	0.53	6.0
80-84	305	54.4	0.78	6.1
85+	413	71.5	1.05	6.1
All ages	2151			6.3
Mortality				
Raw		11.5	0.38	
WS		4.6	0.28	
ES		6.8	0.30	
BRD-S		8.8	0.34	
PYLL-70				
per 100,000		64.5		
ES		54.6		
AYLL-70		12.5		

* 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	Cases n	Age-spec. mortality	MI-index	Prop. all cancers %
0- 4		0.0		
5- 9		0.0		
10-14		0.0		
15-19		0.0		
20-24	1	0.1	0.17	4.2
25-29	4	0.3	0.06	7.1
30-34	8	0.6	0.05	9.6
35-39	28	2.2	0.13	13.7
40-44	61	4.0	0.18	12.0
45-49	66	4.4	0.20	7.2
50-54	73	5.7	0.17	5.5
55-59	113	10.1	0.20	6.0
60-64	117	11.0	0.19	4.8
65-69	173	16.6	0.26	5.1
70-74	203	19.4	0.28	4.9
75-79	191	26.8	0.38	4.8
80-84	175	31.2	0.48	4.3
85+	269	46.6	0.74	4.8
All ages	1482			5.2
Mortality				
Raw		7.9	0.28	
WS		3.4	0.22	
ES		4.9	0.23	
BRD-S		6.1	0.25	
PYLL-70				
per 100,000		54.2		
ES		46.1		
AYLL-70		13.3		

* See corresponding tables with multiple primaries.

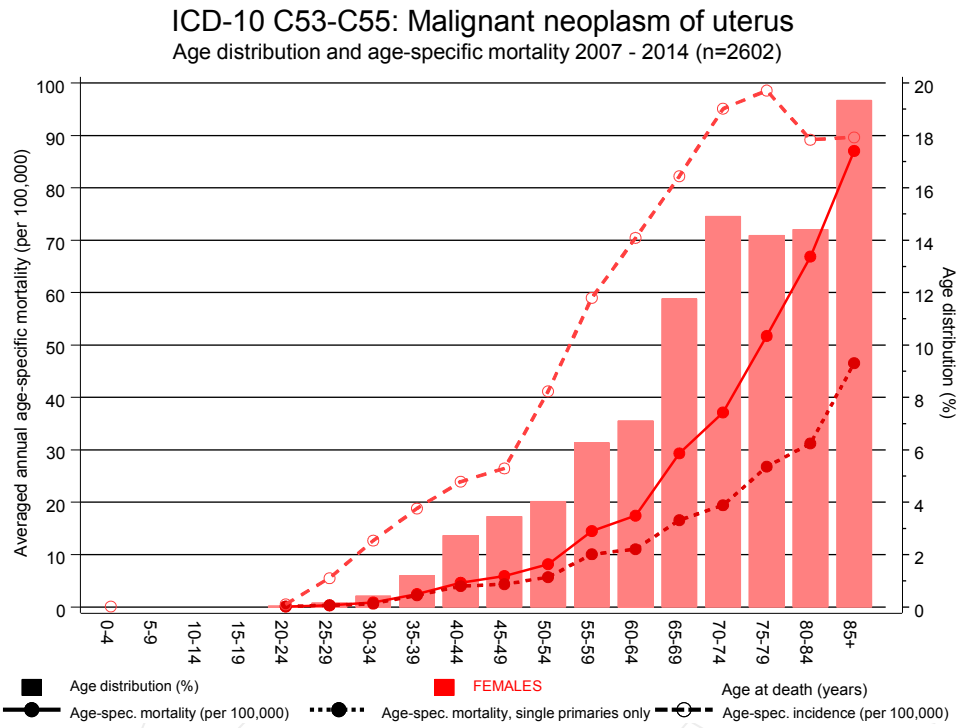

Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

The difference between age at diagnosis (Table 3) and age at uterine cancer-related death (see Table 10) should be considered.

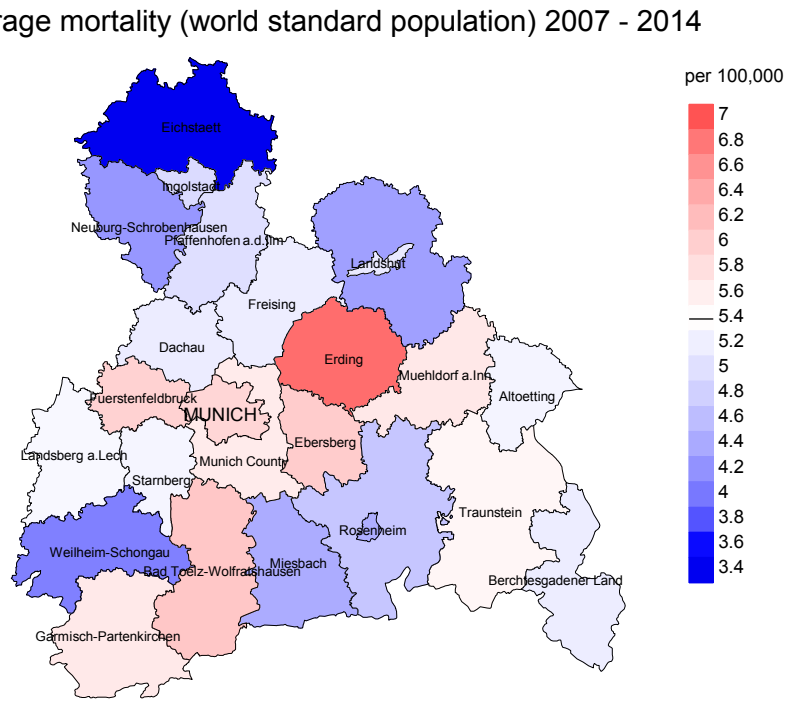

Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2007 to 2014. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (5.4/100,000 WS N=2,585).

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 75 women died from uterine cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 6.0/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 4.2 and 8.4/100,000.

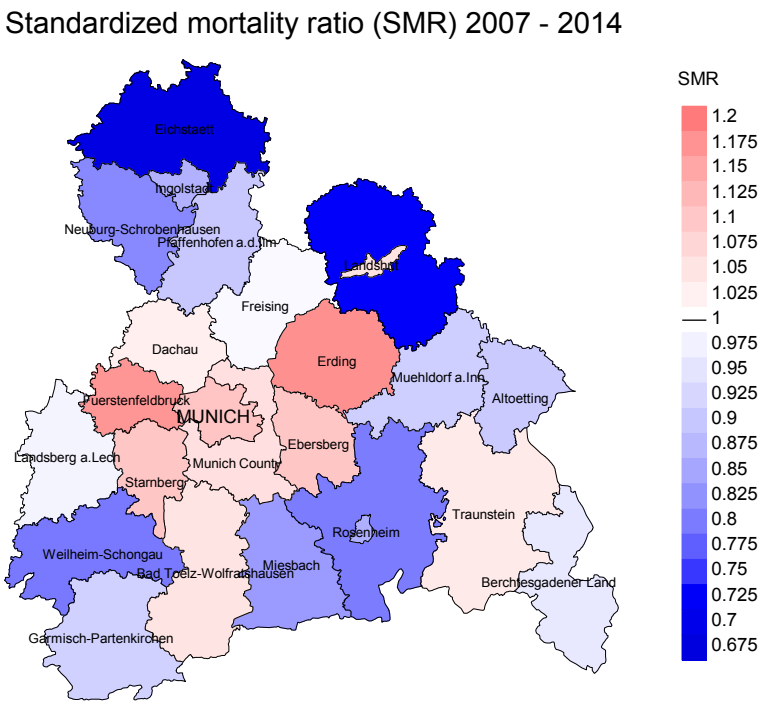

Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2007 to 2014. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (N=2,585).

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 75 women died from uterine cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.10. Though, the value of this parameter may vary with an underlying probability of 99% between 0.80 and 1.47, 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

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