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

C53-C55: Uterine cancer

Year of diagnosis	1998-2012
Patients	10,832
Diseases	10,878
Creation date	03/20/2014
Export date	02/12/2014
Population (females)	2.3 m

http://www.tumorregister-muenchen.de/en/facts/base/base_C5355E.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 4.5 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, March 2014

[#] 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 2013 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.

INCIDENCE

Table 1

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

Year of diagnosis	Cases n	DCO cases n	Prop. DCO %	Prop. mult. primaries %	Prop. deaths %	Prop. actively followed %	
1998	482	19	3.9	25.3	50.6	94.8	
1999	497	19	3.8	23.3	48.3	96.2	
2000	466	19	4.1	23.0	44.4	97.2	
2001	502	26	5.2	24.3	48.0	94.6	
2002	756	47	6.2	20.9	45.1	96.6	#
2003	763	52	6.8	23.3	44.7	94.4	#
2004	753	48	6.4	22.7	43.8	95.5	#
2005	792	37	4.7	21.2	39.1	93.9	#
2006	748	25	3.3	17.9	34.4	90.9	#
2007	872	45	5.2	21.3	37.6	79.6	# ##
2008	897	34	3.8	20.3	32.9	57.7	
2009	876	27	3.1	19.2	30.0	55.9	
2010	831	40	4.8	19.3	27.1	56.2	
2011	851	24	2.8	18.9	20.9	63.9	
2012	792	45	5.7	22.5	18.3	95.8	###
1998-2012	10878	507	4.7	21.2	36.3	82.1	

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 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 4.52 m as of 2007, respectively)

Year of diagnosis	Cases n	Incidence raw	Incidence WS	Incidence ES	Incidence BRD-S
1998	482	41.0	22.8	31.3	36.7
1999	497	41.9	23.0	31.5	36.8
2000	466	38.8	21.4	29.3	34.4
2001	502	41.3	22.4	30.8	36.2
2002	756	38.6	20.6	28.4	33.3
2003	763	38.7	20.3	28.3	33.1
2004	753	38.1	19.9	27.7	32.5
2005	792	39.8	21.1	28.9	33.5
2006	748	37.2	19.8	27.1	31.6
2007	872	37.8	20.0	27.6	32.0
2008	897	38.7	20.5	28.1	32.5
2009	876	37.7	20.3	27.8	31.9
2010	831	35.5	18.2	25.3	29.7
2011	851	36.1	19.0	26.0	30.2
2012	792	33.6	16.9	23.5	27.7
1998-2012	10878	37.9	20.1	27.7	32.2

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

Table 3

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

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	482	63.5	14.6	23.8	95.5	42.8	53.6	64.2	74.5	82.5
1999	497	63.3	15.8	24.4	99.9	39.5	52.8	64.3	75.3	83.1
2000	466	62.8	14.9	23.9	93.1	40.3	53.7	63.4	75.1	80.7
2001	502	64.1	15.1	26.3	96.0	41.3	54.4	64.4	75.0	82.6
2002	756	64.3	14.9	26.4	96.1	41.4	54.8	65.8	75.8	82.6
2003	763	65.3	14.6	27.3	99.4	44.1	56.1	65.3	76.3	83.6
2004	753	65.0	14.6	21.0	99.8	43.6	55.7	65.7	76.1	83.1
2005	792	64.6	14.8	24.0	100	41.9	55.4	66.2	74.2	83.6
2006	748	64.3	15.2	22.9	99.4	42.5	53.9	65.5	75.3	83.6
2007	872	64.2	14.9	22.0	99.2	42.1	54.7	66.2	74.8	82.7
2008	897	64.1	14.5	24.0	97.1	43.6	53.9	66.6	73.8	82.6
2009	876	64.2	14.8	23.1	102	42.4	54.3	65.2	74.4	83.0
2010	831	65.0	14.9	25.1	98.7	43.6	54.7	67.0	75.8	84.1
2011	851	64.1	15.0	25.7	95.5	42.6	54.0	66.6	74.8	83.3
2012	792	65.8	14.7	0.3	97.8	45.0	56.3	67.9	76.0	83.8
1998-2012	10878	64.4	14.9	0.3	102	42.7	54.6	65.8	75.1	83.2

Table 4

Age distribution by 5-year age group for period 1998-2012
(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	11	0.1	0.1
25-29	95	0.9	1.0
30-34	240	2.2	3.2
35-39	435	4.0	7.2
40-44	590	5.4	12.6
45-49	610	5.6	18.2
50-54	821	7.5	25.8
55-59	1069	9.8	35.6
60-64	1335	12.3	47.9
65-69	1462	13.4	61.3
70-74	1464	13.5	74.8
75-79	1070	9.8	84.6
80-84	882	8.1	92.7
85+	793	7.3	100.0
All ages	10878	100.0	

Included in the statistics are 24.9% multiple primaries.

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 1998-2012

Age at diagnosis Years	Cases n	Age-spec. incidence	DCO rate n=505 %	Prop. all cancers n=142297 %
0- 4	1	0.1	100.0	0.4
5- 9		0.0		
10-14		0.0		
15-19		0.0		
20-24	11	0.7		2.3
25-29	94	5.0		9.2
30-34	240	11.7		12.7
35-39	435	19.6	0.2	12.4
40-44	589	25.6	0.5	10.1
45-49	605	28.6	1.7	7.6
50-54	820	43.4	0.7	8.1
55-59	1068	59.9	0.8	8.3
60-64	1334	76.7	0.8	8.3
65-69	1458	90.9	1.5	8.2
70-74	1457	105.7	3.2	8.6
75-79	1068	97.6	6.6	6.6
80-84	879	101.8	11.7	5.9
85+	791	96.6	28.1	4.9
All ages	10850		4.7	7.6
Incidence				
Raw		37.8		
WS		20.0		
ES		27.6		
BRD-S		32.2		

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).

Table 6

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of second primaries for period 1998-2012

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C03-C06	Oral cavity	4	2.1	1.9	0.5	5.0		0.6	
C09-C10	Oropharynx	4	1.4	2.8	0.8	7.1		0.8	
C15	Oesophagus	2	1.9	1.1	0.1	3.8		0.0	
C16	Stomach	12	12.5	1.0	0.5	1.7		-0.2	25.0
C17	Small intestine	7	1.6	4.5	1.8	9.3	#	1.7	
C18	Colon	79	34.5	2.3	1.8	2.9	#	13.5	10.1
C19-C20	Rectum	33	15.2	2.2	1.5	3.0	#	5.4	15.2
C21	Anus/canal	7	1.8	3.9	1.6	8.0	#	1.6	14.3
C22	Liver	8	3.8	2.1	0.9	4.2		1.3	12.5
C23-C24	Bile	8	5.0	1.6	0.7	3.2		0.9	12.5
C25	Pancreas	31	14.5	2.1	1.5	3.0	#	5.0	35.5
C26	GI cancer	3	0.6	5.1	1.1	14.9	#	0.7	66.7
C33-C34	Lung	80	23.8	3.4	2.7	4.2	#	17.1	12.5
C38,C45	Mesothelioma	3	0.6	4.8	1.0	14.0		0.7	
C43	Malign. melanoma	18	12.3	1.5	0.9	2.3		1.7	
C46,C49	Soft tissue	9	1.9	4.7	2.2	8.9	#	2.2	
C48	Peritoneal	5	1.1	4.5	1.4	10.4	#	1.2	
C50	Breast	230	106.2	2.2	1.9	2.5	#	37.6	3.9
C51	Vulva	11	3.2	3.4	1.7	6.1	#	2.4	
C52	Vagina	10	0.6	15.4	7.4	28.3	#	2.8	
C53	Cervix uteri	12	5.1	2.4	1.2	4.1	#	2.1	50.0
C54	Corpus uteri	18	19.4	0.9	0.6	1.5		-0.4	33.3
C55,C57	Fem. genitals un	2	0.8	2.5	0.3	9.0		0.4	100.0
C56	Ovary	161	14.6	11.1	9.4	12.9	#	44.5	12.4
C64	Kidney	15	8.6	1.8	1.0	2.9		2.0	6.7
C65	Renal pelvis	6	1.0	5.9	2.2	12.9	#	1.5	
C67	Bladder	17	6.2	2.7	1.6	4.4	#	3.3	11.8
C70-C72	CNS cancer	8	4.9	1.6	0.7	3.2		0.9	25.0
C73	Thyroid	14	6.6	2.1	1.2	3.5	#	2.2	
C76-C79	CUP	13	5.9	2.2	1.2	3.7	#	2.1	7.7
C81	Hodgkin lymphoma	3	0.7	4.4	0.9	12.9		0.7	
C82-C85	NHL	26	13.1	2.0	1.3	2.9	#	3.9	3.8
C90	Mult. myeloma	2	4.2	0.5	0.1	1.7		-0.7	50.0
C91-C96	Leukaemia	12	5.4	2.2	1.2	3.9	#	2.0	33.3
Other primaries		7	2.1	3.4	1.4	7.0	#	1.5	
Not observed		0	3.7	0.0	0.0	1.0	#	-1.1	
All mult. primaries		880	347.0	2.5	2.4	2.7	#	162.1	11.0

Patients	7554
Mean age at second malignancy (years)	69.5
Person-years	32882
Mean observation time (years)	4.4
Median observation time (years)	3.4

The occurrence of second malignancy is statistically significant.

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

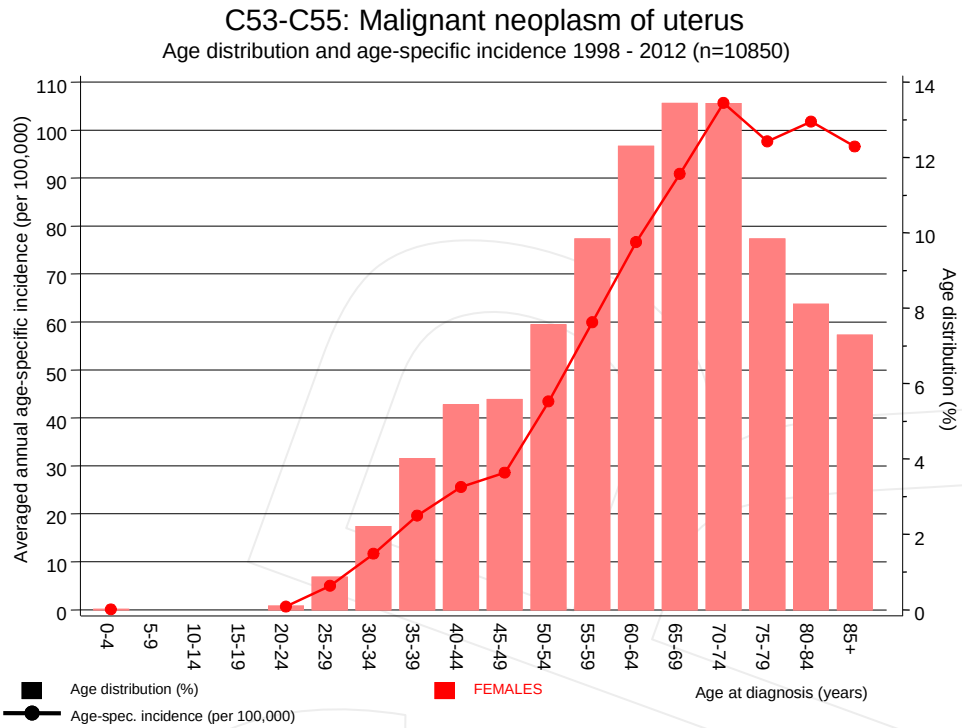

Figure 7. Age distribution and age-specific incidence

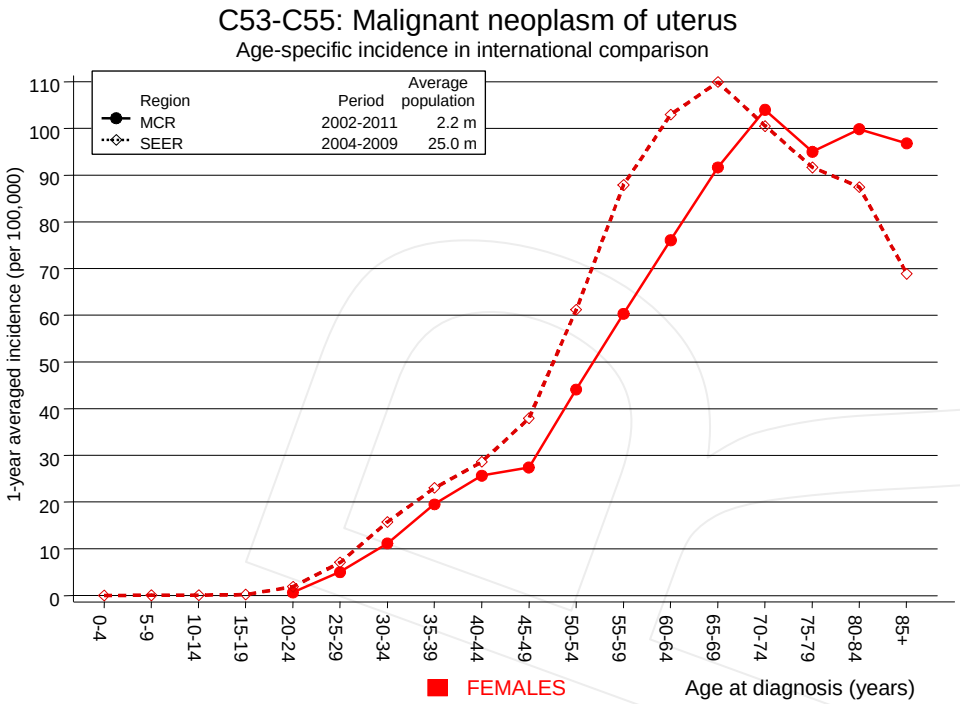

Figure 7a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 18 Regs Research Data, released April 2012, based on the November 2011 submission. http://www.seer.cancer.gov.

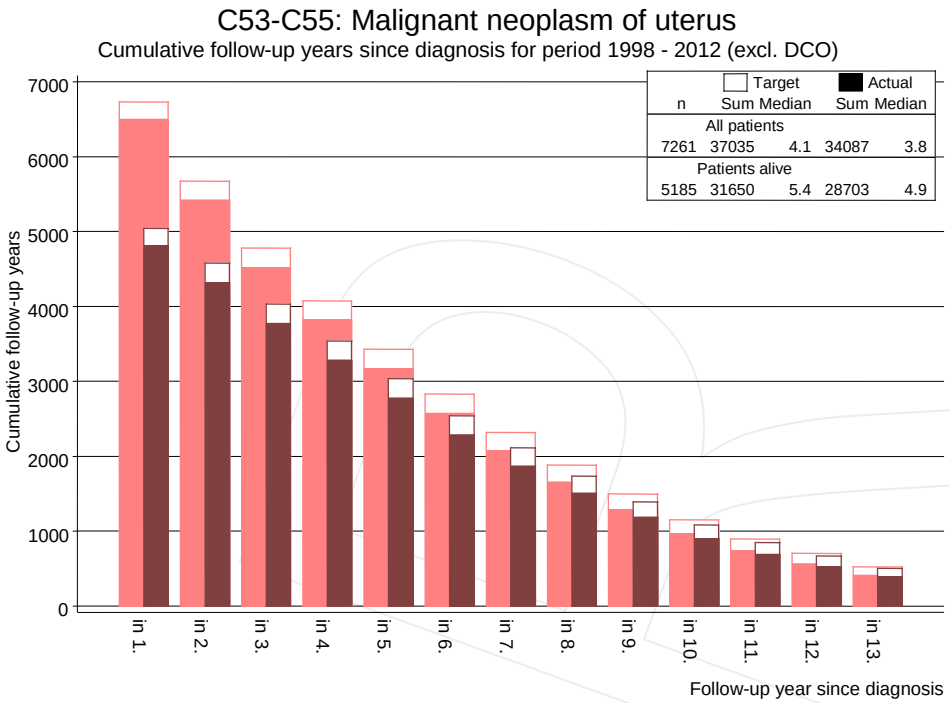

Figure 8. Cumulative follow-up years depending on time since diagnosis

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) 2003 - 2008

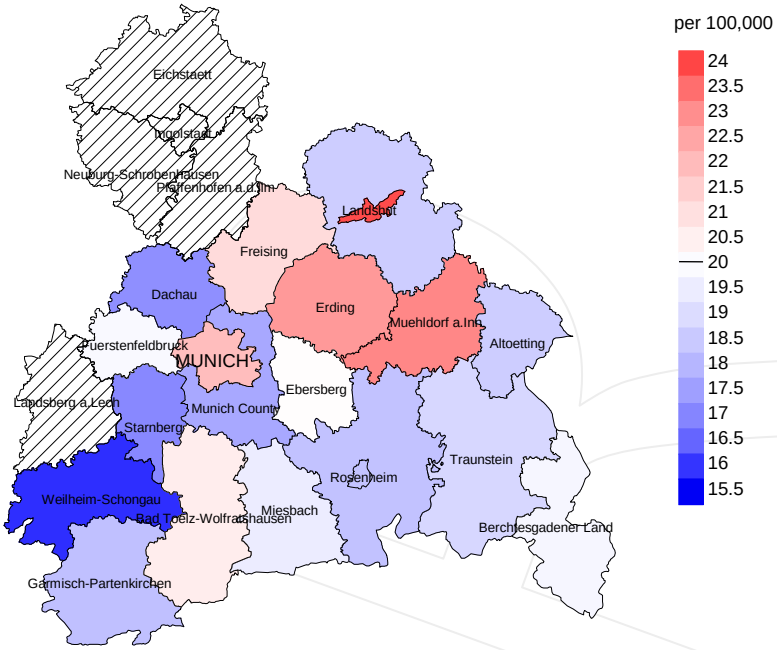

Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (20.1/100,000 WS N=4,584). Since cancer data are not available in some counties until 2007, the local incidence rates were not calculated, and the map tiles show as shaded.

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 63,131 female residents (averaged) in the period from 2003 to 2008 a total of 144 women were identified with newly diagnosed uterine cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 20.1/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 15.8 and 25.5/100,000.

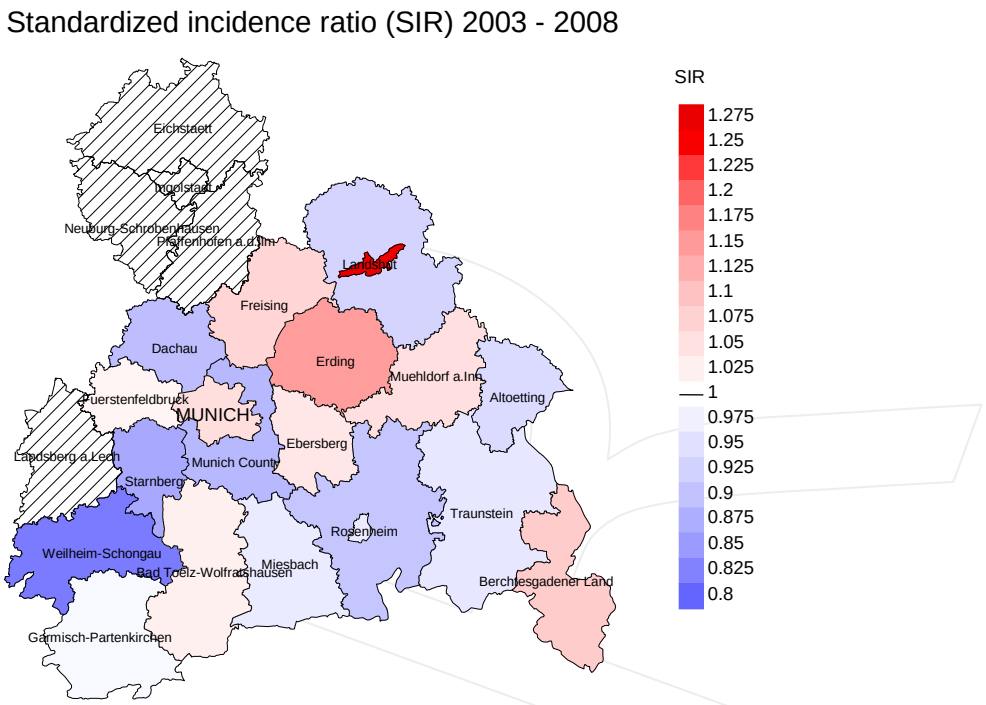

Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (N=4,584). Since cancer data are not available in some counties until 2007, the local SIR values were not calculated, and the map tiles show as shaded.

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 63,131 female residents (averaged) in the period from 2003 to 2008 a total of 144 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 1.04. Though, the value of this parameter may vary with an underlying probability of 99% between 0.83 and 1.29, 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 4.52 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	482	94.8	3.9	244	50.6	90.6
1999	497	96.2	3.8	240	48.3	93.8
2000	466	97.2	4.1	207	44.4	95.2
2001	502	94.6	5.2	241	48.0	94.2
2002	756	96.6	6.2	341	45.1	97.1
2003	763	94.4	6.8	341	44.7	96.8
2004	753	95.5	6.4	330	43.8	96.7
2005	792	93.9	4.7	310	39.1	96.1
2006	748	90.9	3.3	257	34.4	99.6
2007	872	79.6	5.2	328	37.6	97.6
2008	897	57.7	3.8	295	32.9	99.0
2009	876	55.9	3.1	263	30.0	97.0
2010	831	56.2	4.8	225	27.1	96.9
2011	851	63.9	2.8	178	20.9	97.8
2012	792	95.8	5.7	145	18.3	96.6
1998-2012	10878	82.1	4.7	3945	36.3	96.4

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 4.52 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	482	238	89.5	44	9.1
1999	497	256	91.4	45	9.1
2000	466	266	92.9	46	9.9
2001	502	229	91.7	43	8.6
2002	756	387	95.6	82	10.8
2003	763	467	96.4	93	12.2
2004	753	423	96.9	82	10.9
2005	792	438	95.0	72	9.1
2006	748	416	96.2	55	7.4
2007	872	493	97.0	93	10.7
2008	897	488	98.8	72	8.0
2009	876	516	99.0	70	8.0
2010	831	527	98.9	81	9.7
2011	851	579	97.6	81	9.5
2012	792	520	98.5	97	12.2
1998-2012	10878	6243	96.4	1056	9.7

Table 10c

Annual cohorts of deaths, proportion of cancer-related and not 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 4.52 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. not 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	467	64.5	35.5	77.1
2004	423	63.8	36.2	74.1
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	488	62.1	37.9	69.7
2009	516	58.9	41.1	67.3
2010	527	63.9	36.1	72.2
2011	579	61.3	38.7	70.4
2012	520	59.2	40.8	68.8
1998-2012	6243	61.2	38.8	72.2

Table 11

Means 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 (not cancer-related) Years	Age at death (according to death certificate) Years
1998	238	74.9	70.7	80.4	73.7
1999	256	76.6	73.3	81.6	75.9
2000	266	76.8	73.4	81.8	74.9
2001	229	76.6	71.9	81.3	75.1
2002	387	75.9	71.7	83.0	73.7
2003	467	75.7	72.1	82.3	74.0
2004	423	75.8	71.9	82.8	73.5
2005	438	76.6	72.8	83.2	74.3
2006	416	76.8	72.6	83.0	74.6
2007	493	77.3	72.9	84.5	74.7
2008	488	76.2	71.1	84.6	72.6
2009	516	77.2	72.0	84.5	73.4
2010	527	76.3	71.9	84.1	73.2
2011	579	77.1	72.9	83.8	74.1
2012	520	78.0	73.8	84.1	74.7
1998-2012	6243	76.6	72.4	83.3	74.0

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 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	0.26	7.9	0.28	10.2	0.31
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	303	13.1	0.34	5.4	0.27	8.0	0.28	10.2	0.31
2009	304	13.1	0.35	5.3	0.26	7.8	0.28	10.0	0.31
2010	337	14.4	0.41	5.8	0.32	8.5	0.34	10.8	0.37
2011	355	15.0	0.42	5.8	0.31	8.8	0.34	11.2	0.37
2012	308	13.1	0.39	4.8	0.29	7.4	0.32	9.8	0.36
1998-2012	3818	13.3	0.35	5.4	0.27	8.1	0.29	10.4	0.32

Table 13

Age distribution of age at death (cancer-related) for period 1998-2012
(**incl. multiple primaries**)

Age at death Years	Cases n	%	Cum.%
20-24	1	0.0	0.0
25-29	5	0.1	0.2
30-34	20	0.5	0.7
35-39	49	1.3	1.9
40-44	102	2.6	4.6
45-49	127	3.3	7.9
50-54	163	4.2	12.1
55-59	239	6.2	18.3
60-64	303	7.9	26.2
65-69	463	12.0	38.2
70-74	529	13.7	51.9
75-79	546	14.2	66.0
80-84	611	15.8	81.9
85+	699	18.1	100.0
All ages	3857	100.0	

Included in the statistics are 24.9% multiple primaries.

Table 14

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2012
(**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	0.09	2.1
25-29	5	0.3	0.05	4.6
30-34	20	1.0	0.08	9.4
35-39	49	2.2	0.11	9.9
40-44	102	4.4	0.17	9.5
45-49	127	6.0	0.21	6.8
50-54	163	8.6	0.20	5.7
55-59	239	13.4	0.22	5.4
60-64	303	17.4	0.23	5.0
65-69	463	28.9	0.32	6.0
70-74	529	38.4	0.36	5.9
75-79	546	49.9	0.51	5.5
80-84	611	70.7	0.69	5.8
85+	699	85.3	0.88	5.6
All ages	3857			5.8
Mortality				
Raw		13.4	0.35	
WS		5.4	0.27	
ES		8.1	0.29	
BRD-S		10.5	0.33	
PYLL-70				
per 100,000		71.4		
ES		60.9		
AYLL-70		11.9		

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

Table 15

Multiple primaries in deaths in period 1998-2012

Diagnosis	Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03-C06 Oral cavity	11	0.6	3	27.3			8	72.7
C16 Stomach	58	3.0	4	6.9	4	6.9	50	86.2
C18 Colon	178	9.2	40	22.5	16	9.0	122	68.5
C19-C20 Rectum	113	5.8	31	27.4	2	1.8	80	70.8
C21 Anus/canal	22	1.1	5	22.7			17	77.3
C22 Liver	19	1.0	2	10.5	2	10.5	15	78.9
C23-C24 Bile	24	1.2	2	8.3			22	91.7
C25 Pancreas	64	3.3	1	1.6	2	3.1	61	95.3
C33-C34 Lung	190	9.8	16	8.4	11	5.8	163	85.8
C43 Malign. melanoma	45	2.3	22	48.9			23	51.1
C44 Skin others	49	2.5	20	40.8	4	8.2	25	51.0
C46,C49 Soft tissue	13	0.7	3	23.1			10	76.9
C50 Breast	438	22.5	204	46.6	39	8.9	195	44.5
C51 Vulva	36	1.9	4	11.1	5	13.9	27	75.0
C52 Vagina	28	1.4	2	7.1	8	28.6	18	64.3
C53 Cervix uteri	17	0.9			1	5.9	16	94.1
C54 Corpus uteri	28	1.4			5	17.9	23	82.1
C55,C57 Fem. genitals un	15	0.8			2	13.3	13	86.7
C56 Ovary	186	9.6	16	8.6	86	46.2	84	45.2
C64 Kidney	39	2.0	12	30.8	4	10.3	23	59.0
C65 Renal pelvis	11	0.6	3	27.3			8	72.7
C67 Bladder	97	5.0	15	15.5	10	10.3	72	74.2
C70-C72 CNS cancer	40	2.1	10	25.0	2	5.0	28	70.0
C73 Thyroid	13	0.7	3	23.1			10	76.9
C76-C79 CUP	36	1.9	5	13.9	1	2.8	30	83.3
C82-C85 NHL	37	1.9	9	24.3	2	5.4	26	70.3
C91-C96 Leukaemia	47	2.4	5	10.6	4	8.5	38	80.9
Other primaries	90	4.6	23	25.6	9	10.0	58	64.4
All mult. primaries	1944	100.0	460	23.7	219	11.3	1265	65.1

Multiple primaries with number of cases n<10 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 1998-2012
(**Singular 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	0.09	2.3
25-29	5	0.3	0.06	4.9
30-34	16	0.8	0.07	8.6
35-39	47	2.1	0.11	10.5
40-44	94	4.1	0.17	10.1
45-49	111	5.2	0.21	6.8
50-54	138	7.3	0.19	5.7
55-59	212	11.9	0.22	5.6
60-64	258	14.8	0.22	5.2
65-69	368	22.9	0.29	5.9
70-74	436	31.6	0.36	6.1
75-79	450	41.1	0.51	5.7
80-84	493	57.1	0.69	5.9
85+	573	70.0	0.92	5.6
All ages	3202			5.9
Mortality				
Raw		11.2	0.34	
WS		4.6	0.26	
ES		6.8	0.28	
BRD-S		8.8	0.31	
PYLL-70				
per 100,000		62.7		
ES		53.5		
AYLL-70		12.3		

* See corresponding tables with multiple primaries.

Table 17

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2012
(**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	0.09	2.5
25-29	5	0.3	0.06	5.2
30-34	16	0.8	0.07	9.5
35-39	44	2.0	0.11	10.7
40-44	86	3.7	0.16	10.0
45-49	96	4.5	0.19	6.6
50-54	112	5.9	0.17	5.1
55-59	166	9.3	0.19	5.0
60-64	200	11.5	0.19	4.6
65-69	265	16.5	0.23	5.0
70-74	289	21.0	0.27	4.8
75-79	289	26.4	0.37	4.3
80-84	295	34.2	0.45	4.2
85+	394	48.1	0.67	4.5
All ages	2258			4.8
Mortality				
Raw		7.9	0.26	
WS		3.4	0.21	
ES		5.0	0.22	
BRD-S		6.2	0.24	
PYLL-70				
per 100,000		53.0		
ES		45.3		
AYLL-70		13.1		

* See corresponding tables with multiple primaries.

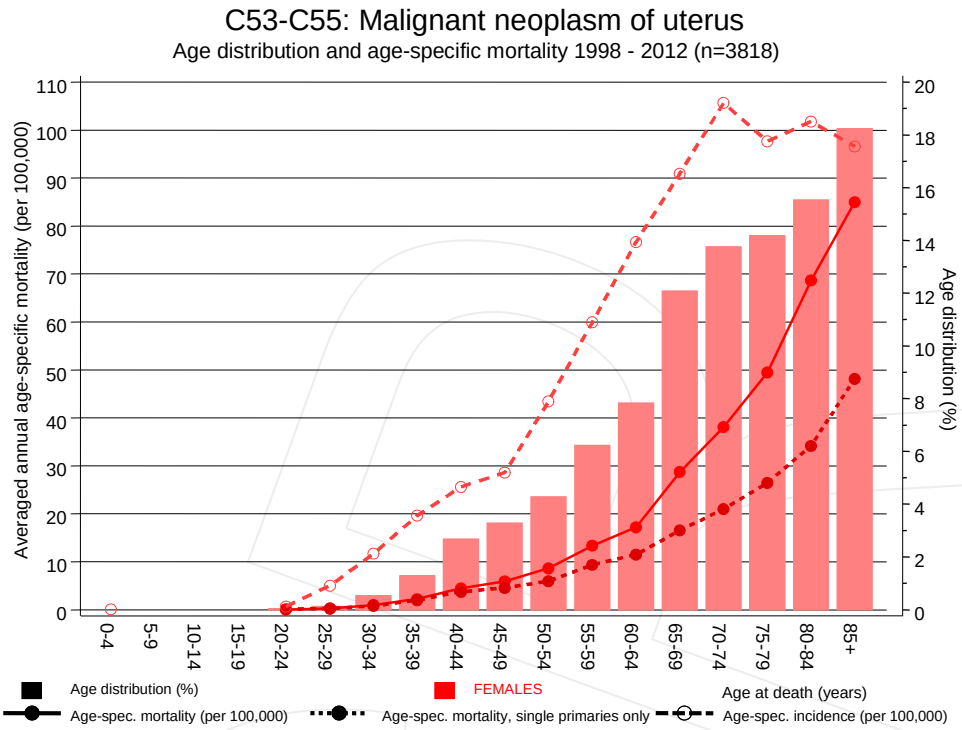

Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

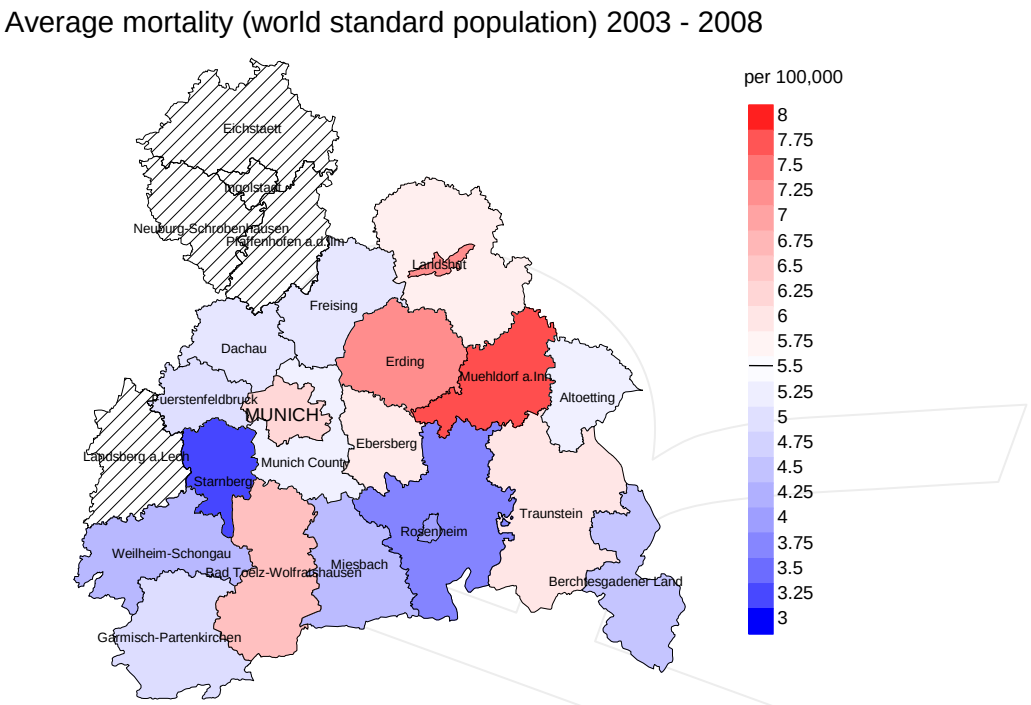

Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2003 to 2008. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (5.5/100,000 WS N=1,632). Since cancer data are not available in some counties until 2007, the local mortality rates were not calculated, and the map tiles show as shaded.

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 63,131 female residents (averaged) in the period from 2003 to 2008 a total of 56 women died from uterine cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 5.9/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 3.9 and 8.7/100,000.

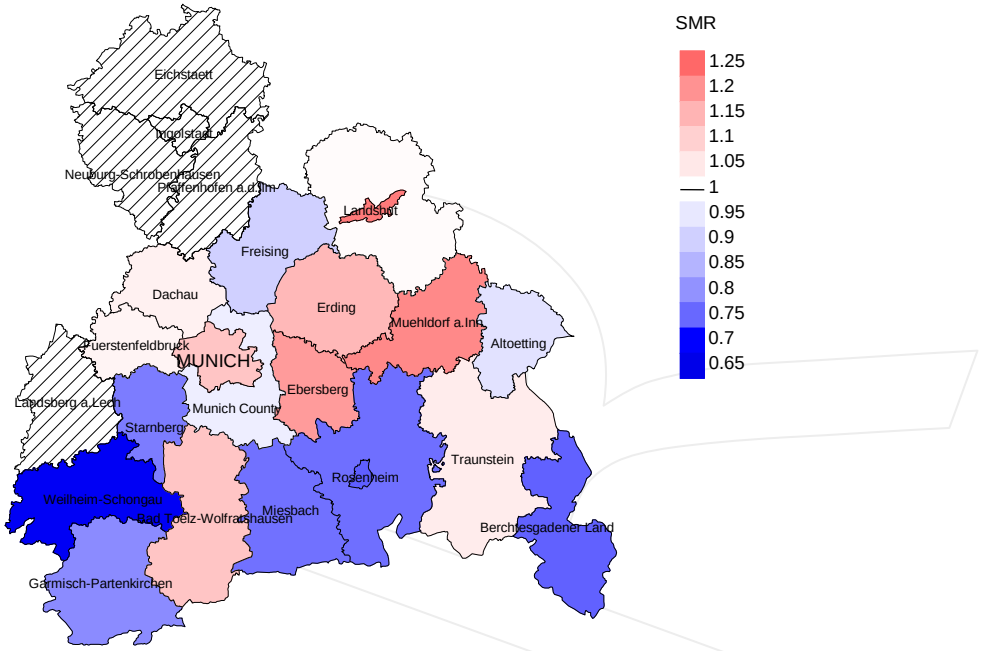

Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (N=1,632). Since cancer data are not available in some counties until 2007, the local SMR values were not calculated, and the map tiles show as shaded.

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 63,131 female residents (averaged) in the period from 2003 to 2008 a total of 56 women died from uterine cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.19. Though, the value of this parameter may vary with an underlying probability of 99% between 0.82 and 1.66, 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 tumor-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

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)
FRG	Federal Republic of Germany
GEKID	Association of Population-based Cancer Registries in Germany (Gesellschaft der epidemiologischen Krebsregister in Deutschland e.V.)
LCL	Lower confidence limit
MI-index	Ratio between mortality and incidence
MCR	Munich Cancer Registry (Tumorregister München)
PYLL-70	Potential years of life lost prior to age 70 given a person dies before that age
SEER	Surveillance, Epidemiology, and End Results (USA)
SIR	Standardized incidence ratio
SMR	Standardized mortality ratio
UCL	Upper confidence limit
WS	World standard population

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