Munich Cancer Registry

- Survival
- Selection Matrix
- Homepage

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

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

Cancer statistics: Baseline statistics

C53: Cervical cancer

Year of diagnosis	1998-2012
Patients	3,242
Diseases	3,245
Creation date	03/20/2014
Export date	02/12/2014
Population (females)	2.3 m

http://www.tumorregister-muenchen.de/en/facts/base/base_C53__E.pdf

Global Statements about the statistics on the Internet − Baseline Statistics (grey button), Survival (red button)

In these analyses, the clinics and physicians of Upper Bavaria and the city and county of Landshut[#], with a total of 4.5 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	144	8	5.6	15.3	45.8	91.7	
1999	161	2	1.2	17.4	39.1	93.8	
2000	148	8	5.4	23.6	39.2	95.9	
2001	151	6	4.0	20.5	42.4	93.4	
2002	235	23	9.8	17.4	45.5	96.2	#
2003	218	10	4.6	17.9	49.5	93.6	#
2004	214	14	6.5	19.2	46.7	96.3	#
2005	235	12	5.1	15.3	40.9	93.2	#
2006	242	8	3.3	12.0	37.6	86.4	#
2007	242	8	3.3	13.2	37.6	79.8	# ##
2008	271	7	2.6	16.2	35.1	59.0	
2009	266	10	3.8	13.5	36.5	56.4	
2010	249	12	4.8	20.5	30.9	59.8	
2011	240	7	2.9	10.4	22.9	65.0	
2012	229	19	8.3	18.8	24.5	95.6	###
1998-2012	3245	154	4.7	16.4	37.7	81.9	

\# 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	144	12.2	8.1	10.3	11.2
1999	161	13.6	9.2	11.5	12.4
2000	148	12.3	8.2	10.3	11.2
2001	151	12.4	8.0	10.2	11.0
2002	235	12.0	7.5	9.6	10.6
2003	218	11.1	7.0	9.0	9.8
2004	214	10.8	6.8	8.8	9.5
2005	235	11.8	7.5	9.5	10.3
2006	242	12.0	7.8	9.9	10.6
2007	242	10.5	6.9	8.7	9.2
2008	271	11.7	7.7	9.7	10.3
2009	266	11.4	7.5	9.6	10.3
2010	249	10.6	6.9	8.8	9.4
2011	240	10.2	6.9	8.7	9.1
2012	229	9.7	6.0	7.8	8.5
1998-2012	3245	11.3	7.3	9.3	10.0

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	144	53.4	16.0	23.8	89.4	34.5	41.1	49.8	64.5	79.7
1999	161	51.3	16.5	24.4	90.0	33.8	37.7	47.9	63.8	77.7
2000	148	53.1	16.8	23.9	90.7	33.6	39.2	49.3	64.0	79.9
2001	151	54.3	17.0	28.8	96.0	34.4	40.0	48.9	63.6	80.9
2002	235	55.6	17.9	26.4	96.1	35.0	39.6	51.8	70.7	81.7
2003	218	56.2	16.9	27.3	93.4	36.0	42.7	53.4	67.5	82.0
2004	214	55.6	17.1	21.0	95.2	36.0	42.1	53.0	67.2	82.7
2005	235	55.6	17.3	24.0	100	35.4	40.4	54.5	68.7	80.8
2006	242	54.6	16.8	22.9	99.4	35.6	41.5	50.7	65.2	81.3
2007	242	53.4	17.1	22.0	96.6	34.9	41.0	48.9	66.8	79.9
2008	271	54.0	15.6	24.0	92.8	36.5	42.4	50.7	67.4	75.3
2009	266	55.2	17.1	23.1	95.1	36.1	41.1	52.3	66.3	81.9
2010	249	55.2	16.4	25.1	93.2	35.5	42.5	52.7	67.5	80.8
2011	240	52.9	16.0	25.7	92.2	32.9	41.4	50.2	63.3	77.8
2012	229	57.2	16.8	25.4	95.7	36.2	43.2	57.5	70.4	81.0
1998-2012	3245	54.6	16.8	21.0	100	35.0	41.2	51.6	67.1	80.7

Table 4

Age distribution by 5-year age group for period 1998-2012
(incl. DCO)

Age at diagnosis Years	Cases n	%	Cum.%
20-24	11	0.3	0.3
25-29	88	2.7	3.1
30-34	224	6.9	10.0
35-39	381	11.7	21.7
40-44	468	14.4	36.1
45-49	350	10.8	46.9
50-54	303	9.3	56.2
55-59	288	8.9	65.1
60-64	240	7.4	72.5
65-69	211	6.5	79.0
70-74	187	5.8	84.8
75-79	150	4.6	89.4
80-84	166	5.1	94.5
85+	178	5.5	100.0
All ages	3245	100.0	

Included in the statistics are 18.9% 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=154 %	Prop. all cancers n=142297 %
0- 4		0.0		
5- 9		0.0		
10-14		0.0		
15-19		0.0		
20-24	11	0.7		2.3
25-29	87	4.6		8.5
30-34	224	10.9		11.9
35-39	381	17.2	0.3	10.8
40-44	467	20.3	0.4	8.0
45-49	350	16.5	2.0	4.4
50-54	303	16.0	1.7	3.0
55-59	288	16.2	1.4	2.2
60-64	240	13.8	1.3	1.5
65-69	211	13.2	3.8	1.2
70-74	187	13.6	8.0	1.1
75-79	150	13.7	9.3	0.9
80-84	166	19.2	21.1	1.1
85+	178	21.7	33.7	1.1
All ages	3243		4.7	2.3
Incidence				
Raw		11.3		
WS		7.3		
ES		9.3		
BRD-S		10.0		

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	2	0.4	5.1	0.6	18.6		1.7	
C09-C10	Oropharynx	3	0.3	9.4	1.9	27.3	#	2.9	
C16	Stomach	2	1.8	1.1	0.1	4.1		0.2	
C18	Colon	11	4.8	2.3	1.1	4.1	#	6.6	9.1
C19-C20	Rectum	13	2.3	5.6	3.0	9.6	#	11.5	15.4
C21	Anus/canal	6	0.3	17.7	6.5	38.6	#	6.1	16.7
C25	Pancreas	8	1.9	4.2	1.8	8.2	#	6.5	37.5
C33-C34	Lung	32	3.9	8.2	5.6	11.6	#	30.1	3.1
C43	Malign. melanoma	5	2.8	1.8	0.6	4.2		2.4	
C46,C49	Soft tissue	3	0.4	8.5	1.8	24.9	#	2.8	
C50	Breast	37	21.5	1.7	1.2	2.4	#	16.7	
C51	Vulva	6	0.5	12.5	4.6	27.2	#	5.9	
C52	Vagina	5	0.1	50.5	16.4	117.8	#	5.3	
C54	Corpus uteri	20	3.1	6.5	4.0	10.1	#	18.1	30.0
C56	Ovary	27	2.5	11.0	7.2	16.0	#	26.3	33.3
C64	Kidney	2	1.2	1.6	0.2	5.8		0.8	
C67	Bladder	9	0.8	10.9	5.0	20.6	#	8.8	11.1
C73	Thyroid	6	1.9	3.1	1.1	6.8	#	4.4	
C82-C85	NHL	4	2.0	2.0	0.5	5.1		2.1	
C91-C96	Leukaemia	3	0.8	3.6	0.7	10.4		2.3	66.7
Other primaries		8	3.4	2.4	1.0	4.7	#	5.0	
Not observed		0	3.9	0.0	0.0	0.9	#	-4.2	
All mult. primaries		212	60.6	3.5	3.0	4.0	#	162.3	12.3

Patients	2220
Mean age at second malignancy (years)	64.8
Person-years	9332
Mean observation time (years)	4.2
Median observation time (years)	3.0

The occurrence of second malignancy is statistically significant.

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

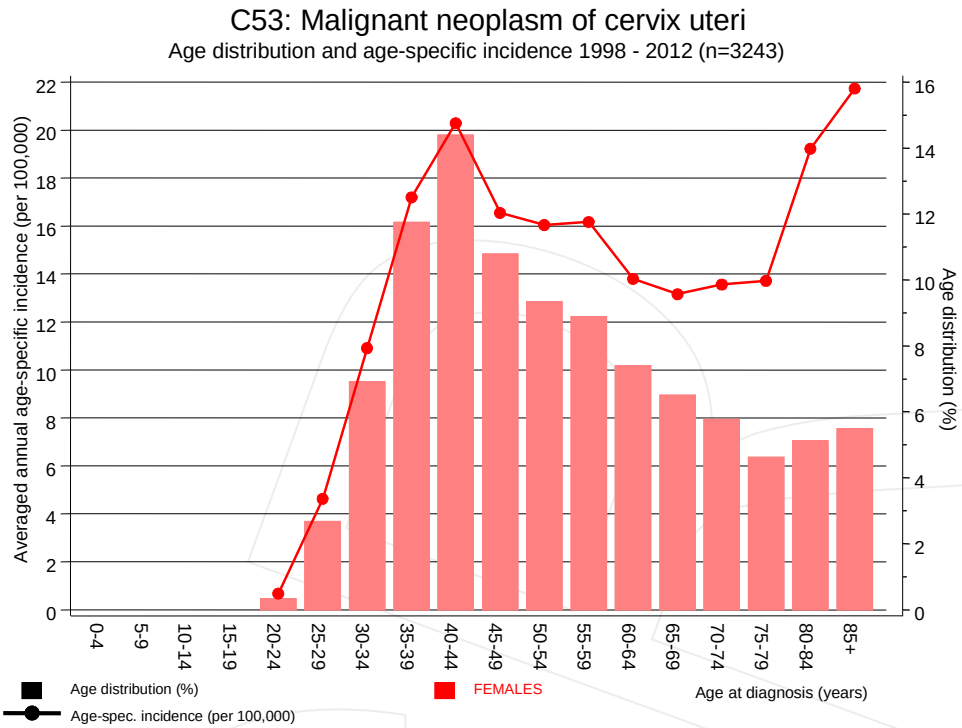

Figure 7. Age distribution and age-specific incidence

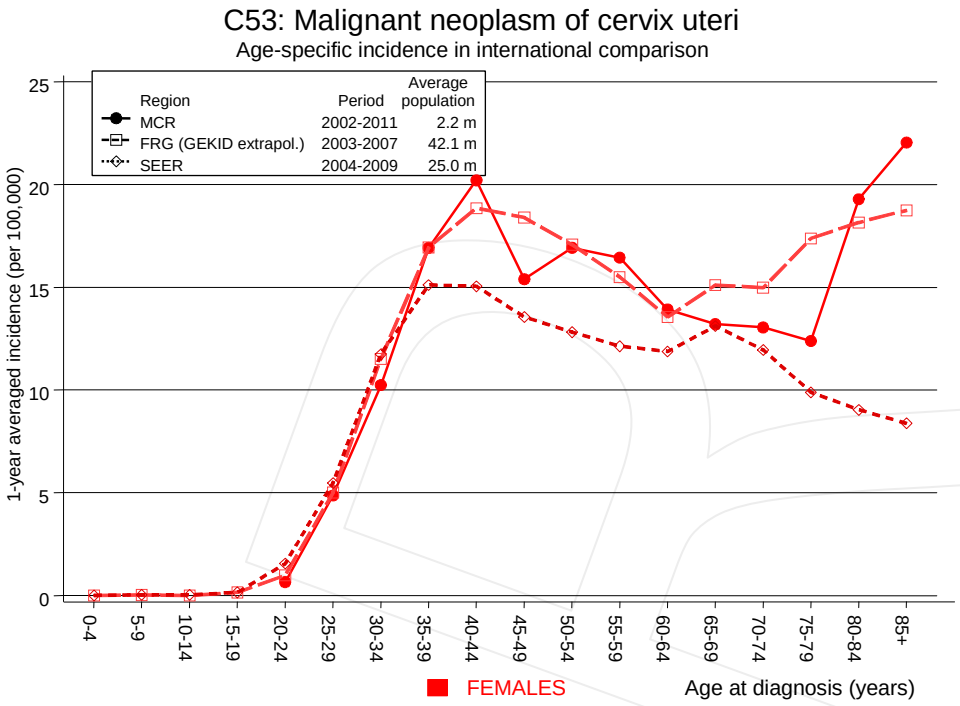

Figure 7a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).

Reference:

Extrapolated age-specific patient population of Germany, data status middle of 2010. Association of Population-based Cancer Registries in Germany (GEKID e.V.). Berlin, 2011. http://www.gekid.de. Last access: 05/12/2011

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.

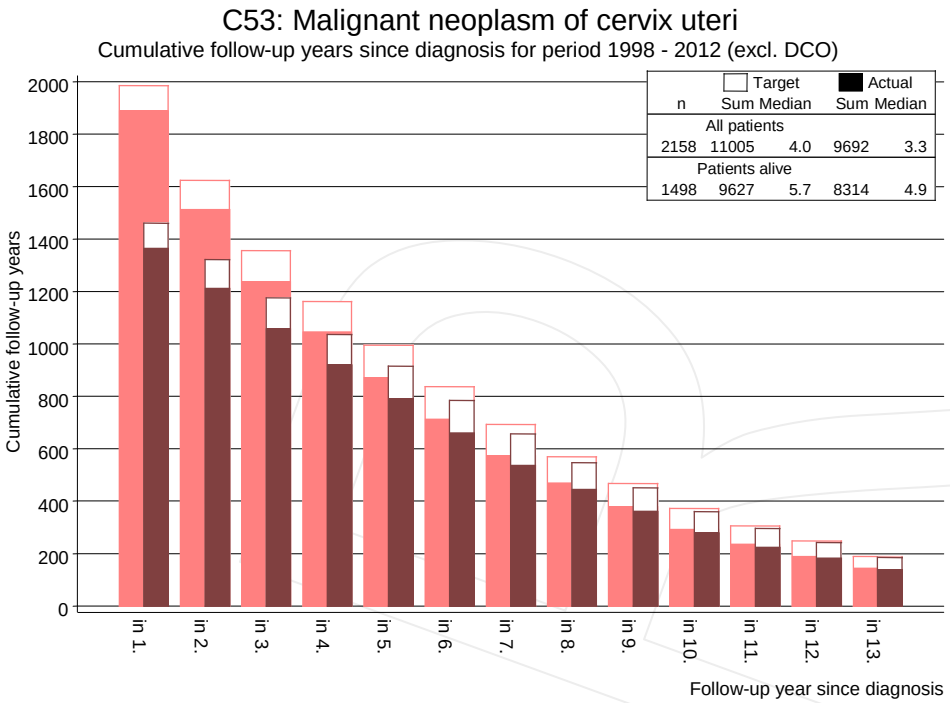

Figure 8. Cumulative follow-up years depending on time since diagnosis

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

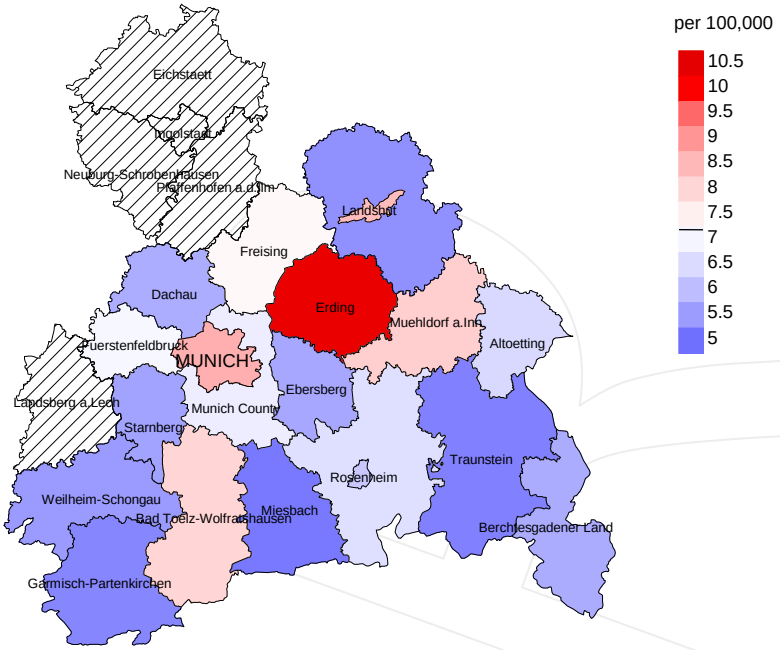

Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (7.2/100,000 WS N=1,349). 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 34 women were identified with newly diagnosed cervical cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 5.6/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 3.3 and 9.3/100,000.

Standardized incidence ratio (SIR) 2003 - 2008

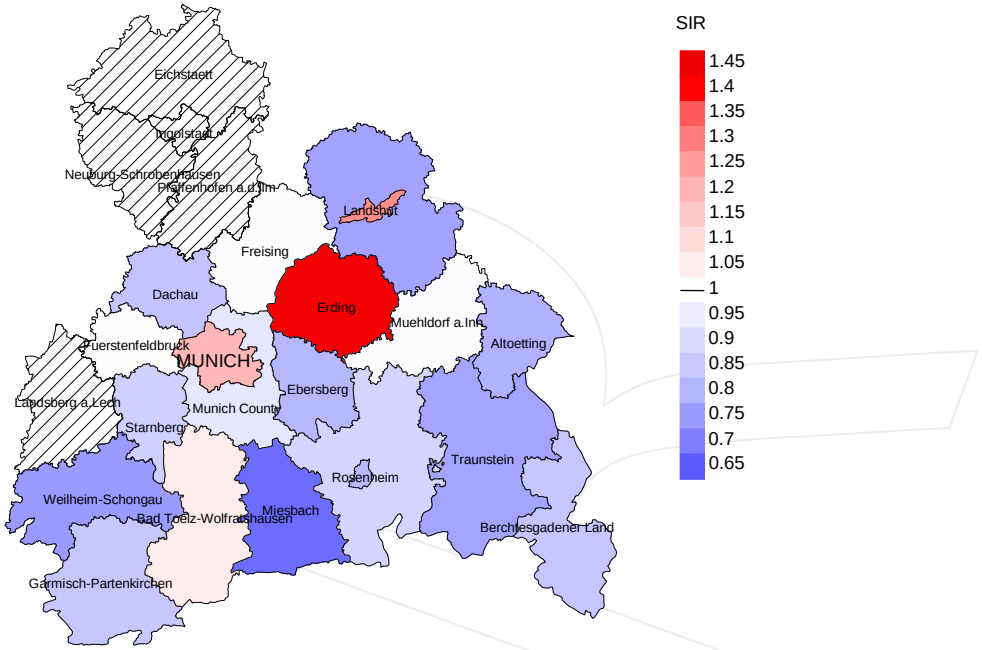

Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (N=1,349). 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 34 women were identified with newly diagnosed cervical cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.81. Though, the value of this parameter may vary with an underlying probability of 99% between 0.50 and 1.24, 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	144	91.7	5.6	66	45.8	86.4
1999	161	93.8	1.2	63	39.1	92.1
2000	148	95.9	5.4	58	39.2	96.6
2001	151	93.4	4.0	64	42.4	89.1
2002	235	96.2	9.8	107	45.5	95.3
2003	218	93.6	4.6	108	49.5	96.3
2004	214	96.3	6.5	100	46.7	97.0
2005	235	93.2	5.1	96	40.9	93.8
2006	242	86.4	3.3	91	37.6	100.0
2007	242	79.8	3.3	91	37.6	96.7
2008	271	59.0	2.6	95	35.1	100.0
2009	266	56.4	3.8	97	36.5	94.8
2010	249	59.8	4.8	77	30.9	98.7
2011	240	65.0	2.9	55	22.9	96.4
2012	229	95.6	8.3	56	24.5	98.2
1998-2012	3245	81.9	4.7	1224	37.7	95.7

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	144	92	85.9	14	9.7
1999	161	93	87.1	14	8.7
2000	148	91	92.3	15	10.1
2001	151	68	89.7	13	8.6
2002	235	132	93.9	36	15.3
2003	218	152	94.7	27	12.4
2004	214	153	96.7	26	12.1
2005	235	151	96.0	25	10.6
2006	242	143	95.1	19	7.9
2007	242	146	94.5	28	11.6
2008	271	166	98.8	25	9.2
2009	266	169	98.8	26	9.8
2010	249	174	98.9	29	11.6
2011	240	173	99.4	28	11.7
2012	229	147	96.6	38	16.6
1998-2012	3245	2050	95.5	363	11.2

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	92	58.7	41.3	83.5
1999	93	68.8	31.2	82.7
2000	91	67.0	33.0	83.3
2001	68	64.7	35.3	86.9
2002	132	71.2	28.8	83.1
2003	152	75.0	25.0	85.4
2004	153	67.3	32.7	76.4
2005	151	72.8	27.2	83.4
2006	143	64.3	35.7	79.4
2007	146	74.0	26.0	78.3
2008	166	70.5	29.5	76.2
2009	169	65.7	34.3	76.0
2010	174	74.1	25.9	81.4
2011	173	69.9	30.1	75.0
2012	147	67.3	32.7	80.3
1998-2012	2050	69.3	30.7	80.1

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	92	71.8	67.1	78.4	71.7
1999	93	71.0	68.4	76.8	72.2
2000	91	73.0	69.3	80.7	71.5
2001	68	70.6	66.3	78.4	70.1
2002	132	70.4	65.6	82.4	67.9
2003	152	69.9	66.5	80.2	69.0
2004	153	71.8	65.9	83.9	68.6
2005	151	72.0	67.9	82.8	69.8
2006	143	72.6	68.4	80.3	71.2
2007	146	70.0	66.4	80.4	67.8
2008	166	69.9	64.8	82.0	66.1
2009	169	71.7	65.5	83.6	67.5
2010	174	68.0	63.9	79.8	65.1
2011	173	71.8	67.5	81.8	68.6
2012	147	71.8	67.3	81.0	68.5
1998-2012	2050	71.0	66.5	81.1	68.7

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	54	4.6	0.38	2.2	0.28	3.2	0.31	4.0	0.36
1999	64	5.4	0.40	2.5	0.28	3.7	0.32	4.7	0.38
2000	61	5.1	0.41	2.3	0.28	3.3	0.32	4.2	0.37
2001	44	3.6	0.29	1.7	0.22	2.4	0.24	3.0	0.27
2002	94	4.8	0.40	2.5	0.33	3.5	0.37	4.2	0.39
2003	114	5.8	0.52	2.9	0.42	4.1	0.45	4.9	0.50
2004	103	5.2	0.48	2.7	0.39	3.8	0.43	4.6	0.48
2005	110	5.5	0.47	2.6	0.35	3.7	0.39	4.5	0.43
2006	92	4.6	0.38	2.1	0.27	3.0	0.31	3.7	0.35
2007	108	4.7	0.45	2.3	0.34	3.2	0.37	3.8	0.42
2008	117	5.0	0.43	2.6	0.33	3.5	0.36	4.0	0.39
2009	111	4.8	0.42	2.4	0.32	3.3	0.35	3.9	0.38
2010	129	5.5	0.52	2.9	0.42	4.0	0.45	4.5	0.48
2011	121	5.1	0.50	2.4	0.35	3.5	0.40	4.1	0.44
2012	99	4.2	0.43	2.0	0.33	2.9	0.37	3.5	0.41
1998-2012	1421	5.0	0.44	2.4	0.33	3.4	0.37	4.1	0.41

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	0.1	0.1
25-29	4	0.3	0.4
30-34	17	1.2	1.5
35-39	47	3.3	4.8
40-44	86	6.0	10.9
45-49	98	6.9	17.8
50-54	109	7.7	25.4
55-59	148	10.4	35.8
60-64	125	8.8	44.6
65-69	152	10.7	55.3
70-74	141	9.9	65.2
75-79	138	9.7	74.9
80-84	182	12.8	87.7
85+	175	12.3	100.0
All ages	1423	100.0	

Included in the statistics are 18.9% 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	4	0.2	0.05	3.7
30-34	17	0.8	0.08	8.0
35-39	47	2.1	0.12	9.5
40-44	86	3.7	0.18	8.0
45-49	98	4.6	0.28	5.2
50-54	109	5.8	0.36	3.8
55-59	148	8.3	0.51	3.3
60-64	125	7.2	0.52	2.1
65-69	152	9.5	0.72	2.0
70-74	141	10.2	0.75	1.6
75-79	138	12.6	0.92	1.4
80-84	182	21.1	1.10	1.7
85+	175	21.4	0.98	1.4
All ages	1423			2.1
Mortality				
Raw		5.0	0.44	
WS		2.4	0.33	
ES		3.4	0.37	
BRD-S		4.1	0.41	
PYLL-70				
per 100,000		49.0		
ES		42.2		
AYLL-70		15.3		

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	7	1.0	1	14.3			6	85.7
C09-C10 Oropharynx	7	1.0	2	28.6			5	71.4
C16 Stomach	16	2.4	1	6.3	1	6.3	14	87.5
C18 Colon	48	7.2	7	14.6	5	10.4	36	75.0
C19-C20 Rectum	42	6.3	8	19.0	1	2.4	33	78.6
C21 Anus/canal	16	2.4	2	12.5			14	87.5
C25 Pancreas	21	3.1	1	4.8	1	4.8	19	90.5
C33-C34 Lung	87	13.0	9	10.3	7	8.0	71	81.6
C43 Malign. melanoma	19	2.8	7	36.8			12	63.2
C44 Skin others	9	1.3	2	22.2			7	77.8
C50 Breast	107	16.0	29	27.1	10	9.3	68	63.6
C51 Vulva	18	2.7	4	22.2	4	22.2	10	55.6
C52 Vagina	16	2.4			5	31.3	11	68.8
C53 Cervix uteri	6	0.9			1	16.7	5	83.3
C54 Corpus uteri	29	4.3	6	20.7	4	13.8	19	65.5
C56 Ovary	56	8.4	5	8.9	11	19.6	40	71.4
C64 Kidney	14	2.1	5	35.7	1	7.1	8	57.1
C65 Renal pelvis	8	1.2	2	25.0			6	75.0
C67 Bladder	50	7.5	5	10.0	4	8.0	41	82.0
C70-C72 CNS cancer	12	1.8	2	16.7	1	8.3	9	75.0
C76-C79 CUP	11	1.6	2	18.2	1	9.1	8	72.7
C82-C85 NHL	14	2.1	3	21.4	1	7.1	10	71.4
C91-C96 Leukaemia	10	1.5			2	20.0	8	80.0
Other primaries	47	7.0	10	21.3			37	78.7
All mult. primaries	670	100.0	113	16.9	60	9.0	497	74.2

Multiple primaries with number of cases n<6 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	4	0.2	0.05	3.9
30-34	15	0.7	0.07	8.0
35-39	45	2.0	0.12	10.0
40-44	82	3.6	0.19	8.8
45-49	86	4.1	0.27	5.3
50-54	98	5.2	0.36	4.0
55-59	137	7.7	0.54	3.6
60-64	116	6.7	0.54	2.3
65-69	121	7.5	0.71	1.9
70-74	118	8.6	0.83	1.6
75-79	121	11.1	0.98	1.5
80-84	163	18.9	1.20	2.0
85+	151	18.4	1.07	1.5
All ages	1258			2.3
Mortality				
Raw		4.4	0.43	
WS		2.2	0.32	
ES		3.1	0.36	
BRD-S		3.6	0.40	
PYLL-70				
per 100,000		45.0		
ES		38.7		
AYLL-70		15.6		

* 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	4	0.2	0.05	4.1
30-34	15	0.7	0.07	8.9
35-39	42	1.9	0.12	10.2
40-44	75	3.3	0.18	8.7
45-49	74	3.5	0.25	5.1
50-54	79	4.2	0.31	3.6
55-59	107	6.0	0.48	3.2
60-64	82	4.7	0.43	1.9
65-69	78	4.9	0.49	1.5
70-74	65	4.7	0.51	1.1
75-79	66	6.0	0.58	1.0
80-84	94	10.9	0.75	1.3
85+	102	12.5	0.78	1.2
All ages	884			1.9
Mortality				
Raw		3.1	0.33	
WS		1.6	0.26	
ES		2.3	0.28	
BRD-S		2.6	0.31	
PYLL-70				
per 100,000		38.3		
ES		33.0		
AYLL-70		16.9		

* See corresponding tables with multiple primaries.

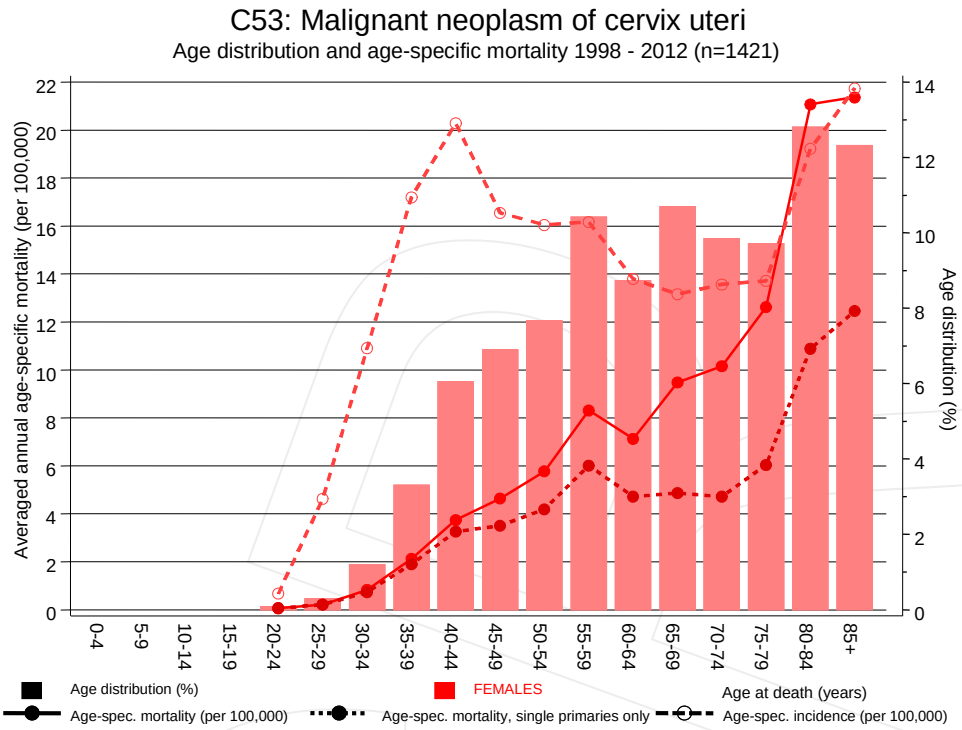

Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

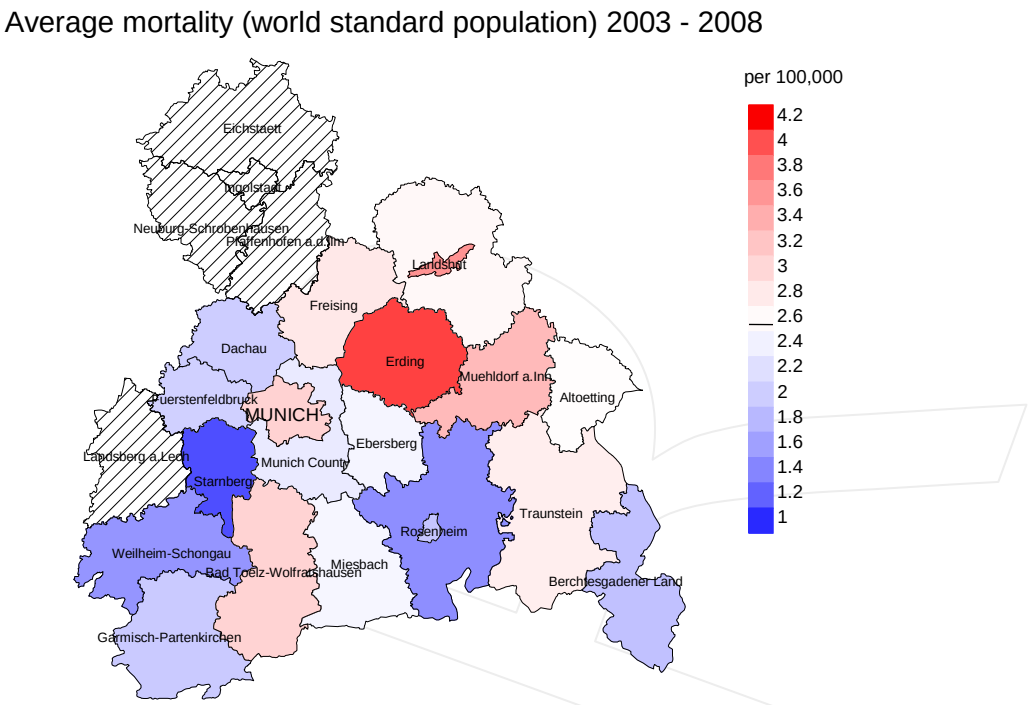

Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2003 to 2008. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (2.6/100,000 WS N=624). 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 18 women died from cervical cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 2.4/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 1.1 and 4.7/100,000.

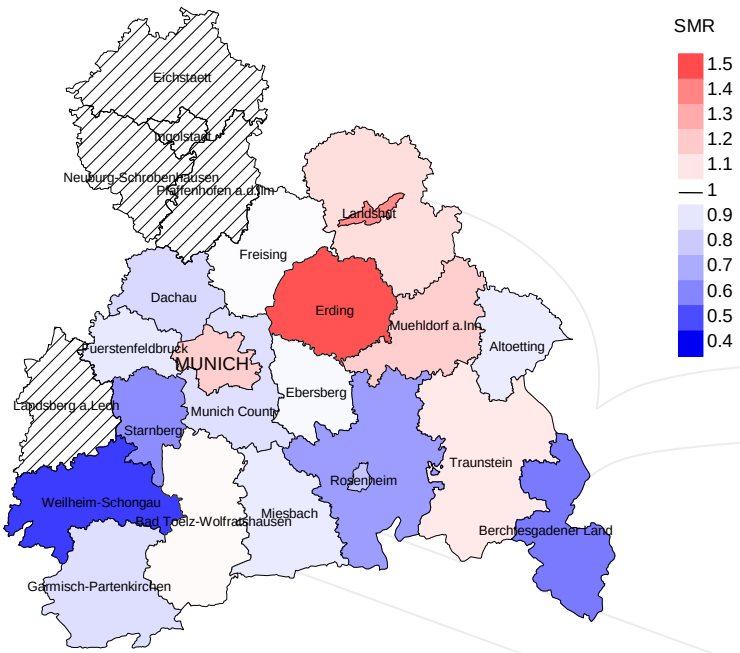

Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (N=624). 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 18 women died from cervical cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.97. Though, the value of this parameter may vary with an underlying probability of 99% between 0.48 and 1.73, 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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