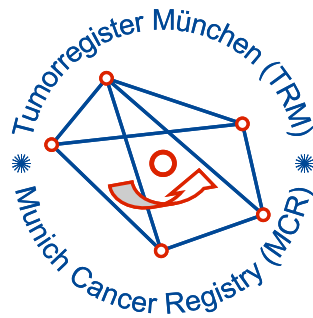


Munich Cancer Registry



- ▶ Survival
- ▶ Selection Matrix
- ▶ Homepage

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

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

Cancer statistics: Baseline statistics

C56: Ovarian cancer

Year of diagnosis	1998-2012
Patients	5,667
Diseases	5,669
Creation date	03/20/2014
Export date	02/12/2014
Population (females)	2.3 m



http://www.tumorregister-muenchen.de/en/facts/base/base_C56__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	275	36	13.1	17.8	81.1	99.3
1999	259	25	9.7	21.2	76.1	98.8
2000	265	32	12.1	24.2	72.5	98.9
2001	234	34	14.5	22.2	73.1	98.7
2002	433	74	17.1	29.3	78.1	98.6 #
2003	448	73	16.3	23.2	74.1	98.2 #
2004	391	59	15.1	23.0	77.0	97.7 #
2005	368	48	13.0	23.6	74.7	97.0 #
2006	404	42	10.4	21.3	71.0	98.0 #
2007	490	68	13.9	25.3	66.7	89.6 # ##
2008	492	62	12.6	19.9	64.4	81.5
2009	399	44	11.0	20.8	55.9	75.2
2010	442	56	12.7	25.8	52.9	78.7
2011	412	54	13.1	23.3	46.6	77.9
2012	357	38	10.6	22.4	32.8	96.1 ###
1998-2012	5669	745	13.1	23.1	65.7	91.3

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	275	23.4	12.6	17.4	20.7
1999	259	21.8	10.9	15.5	18.9
2000	265	22.1	11.3	16.0	19.2
2001	234	19.2	10.2	14.0	16.6
2002	433	22.1	11.0	15.5	18.9
2003	448	22.7	11.5	16.2	19.5
2004	391	19.8	10.2	14.2	17.0
2005	368	18.5	9.0	12.6	15.3
2006	404	20.1	9.7	13.8	16.8
2007	490	21.2	10.2	14.5	17.6
2008	492	21.2	10.6	14.8	17.9
2009	399	17.2	8.2	11.6	14.3
2010	442	18.9	8.9	12.7	15.4
2011	412	17.5	8.4	11.8	14.4
2012	357	15.1	7.3	10.1	12.3
1998-2012	5669	19.8	9.8	13.7	16.6

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	275	64.8	15.9	14.6	92.1	44.1	55.2	66.0	76.9	84.9
1999	259	67.1	14.2	16.5	96.5	49.4	58.3	67.6	78.2	85.1
2000	265	66.5	14.4	19.9	94.8	46.9	57.2	66.1	78.5	85.3
2001	234	65.0	15.6	26.3	98.8	42.6	55.5	65.5	76.8	85.4
2002	433	67.2	14.3	13.2	96.6	47.8	59.0	68.1	78.1	83.2
2003	448	66.6	14.9	7.6	95.3	46.8	56.8	67.6	78.1	83.5
2004	391	66.2	15.2	15.9	97.3	45.6	56.5	66.6	77.9	84.4
2005	368	67.4	14.8	19.2	96.4	45.5	57.6	68.0	79.7	84.9
2006	404	67.6	14.5	24.9	95.8	45.8	57.8	68.9	79.1	84.7
2007	490	67.9	14.5	18.3	98.1	47.9	58.4	69.3	79.3	85.7
2008	492	66.9	15.0	11.1	102	46.5	58.0	68.5	78.4	84.9
2009	399	67.4	14.8	11.2	97.6	46.7	56.9	69.4	78.8	84.5
2010	442	68.2	14.6	17.0	98.5	48.9	58.5	69.4	78.5	86.7
2011	412	67.8	13.6	4.1	94.5	50.5	59.2	69.4	77.5	83.8
2012	357	67.6	15.3	11.3	95.9	47.2	59.0	70.0	78.9	84.9
1998-2012	5669	67.1	14.7	4.1	102	47.1	57.8	68.2	78.4	84.8

Table 4

Age distribution by 5-year age group for period 1998-2012
(incl. DC0)

Age at diagnosis Years	Cases n	%	Cum.%
0-4	1	0.0	0.0
5-9	1	0.0	0.0
10-14	9	0.2	0.2
15-19	18	0.3	0.5
20-24	21	0.4	0.9
25-29	33	0.6	1.5
30-34	56	1.0	2.5
35-39	114	2.0	4.5
40-44	208	3.7	8.1
45-49	270	4.8	12.9
50-54	428	7.5	20.4
55-59	503	8.9	29.3
60-64	656	11.6	40.9
65-69	746	13.2	54.0
70-74	698	12.3	66.4
75-79	722	12.7	79.1
80-84	640	11.3	90.4
85+	545	9.6	100.0
All ages	5669	100.0	

Included in the statistics are 27.3% 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=745 %	Prop. all cancers n=142297 %
0- 4	1	0.1		0.4
5- 9	1	0.1		0.9
10-14	9	0.7		5.6
15-19	18	1.3		6.7
20-24	21	1.3		4.3
25-29	33	1.8	3.0	3.2
30-34	56	2.7		3.0
35-39	114	5.1	1.8	3.2
40-44	208	9.0	3.8	3.6
45-49	270	12.8	3.7	3.4
50-54	428	22.7	2.8	4.2
55-59	503	28.2	4.4	3.9
60-64	656	37.7	3.7	4.1
65-69	746	46.5	6.2	4.2
70-74	698	50.6	9.9	4.1
75-79	722	66.0	16.9	4.4
80-84	640	74.1	28.3	4.3
85+	545	66.5	45.5	3.4
All ages	5669		13.1	4.0
Incidence				
Raw		19.8		
WS		9.8		
ES		13.7		
BRD-S		16.6		

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	0.7	2.7	0.3	9.8	1.1	
C16 Stomach	14	4.1	3.4	1.8	5.7 #	8.2	7.1
C17 Small intestine	3	0.5	5.5	1.1	16.1 #	2.0	
C18 Colon	41	11.5	3.6	2.6	4.8 #	24.6	24.4
C19-C20 Rectum	12	5.2	2.3	1.2	4.0 #	5.7	
C22 Liver	3	1.3	2.4	0.5	6.9	1.4	66.7
C23-C24 Bile	4	1.6	2.5	0.7	6.3	2.0	50.0
C25 Pancreas	8	4.8	1.7	0.7	3.3	2.7	37.5
C33-C34 Lung	19	8.4	2.3	1.4	3.5 #	8.8	26.3
C43 Malign. melanoma	5	4.3	1.2	0.4	2.7	0.5	
C48 Peritoneal	5	0.4	12.7	4.1	29.5 #	3.8	
C50 Breast	95	38.2	2.5	2.0	3.0 #	47.3	6.3
C51 Vulva	5	1.1	4.8	1.5	11.1 #	3.3	20.0
C53 Cervix uteri	8	1.8	4.4	1.9	8.7 #	5.2	
C54 Corpus uteri	105	6.9	15.3	12.5	18.5 #	81.8	2.9
C56 Ovary	4	5.1	0.8	0.2	2.0	-0.9	
C64 Kidney	5	2.9	1.7	0.6	4.0	1.7	
C65 Renal pelvis	3	0.3	8.9	1.8	26.1 #	2.2	
C67 Bladder	5	2.0	2.5	0.8	5.8	2.5	
C70-C72 CNS cancer	2	1.7	1.1	0.1	4.2	0.2	
C73 Thyroid	6	2.5	2.4	0.9	5.2	2.9	
C76-C79 CUP	3	1.9	1.5	0.3	4.5	0.9	66.7
C82-C85 NHL	9	4.5	2.0	0.9	3.8	3.8	
C90 Mult. myeloma	5	1.4	3.5	1.1	8.2 #	3.0	20.0
C91-C96 Leukaemia	4	1.8	2.2	0.6	5.7	1.8	25.0
Other primaries	3	1.5	2.0	0.4	5.9	1.3	
Not observed	0	4.1	0.0	0.0	0.9 #	-3.4	
All mult. primaries	378	120.8	3.1	2.8	3.5 #	214.4	9.8

Patients 3828
 Mean age at second malignancy (years) 66.3
 Person-years 11992
 Mean observation time (years) 3.1
 Median observation time (years) 2.1

The occurrence of second malignancy is statistically significant.

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

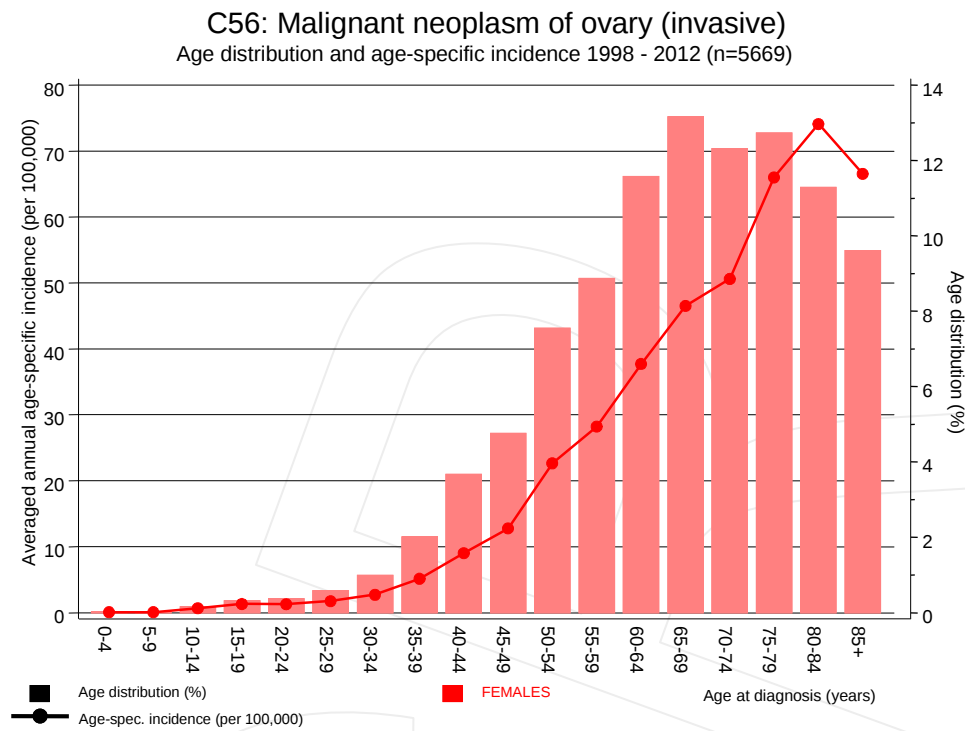


Figure 7. Age distribution and age-specific incidence

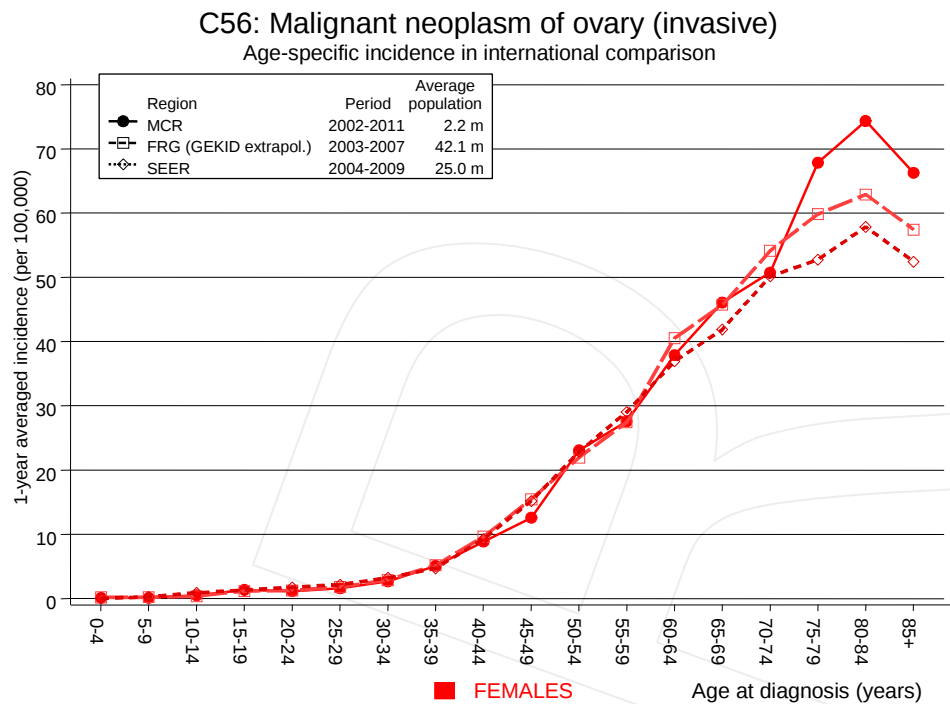


Figure 7a. Age-specific incidence in MCR registry areas compared to Germany (FRG, GEKID extrapolation) and SEER (Surveillance, Epidemiology, and End Results, USA).

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>.

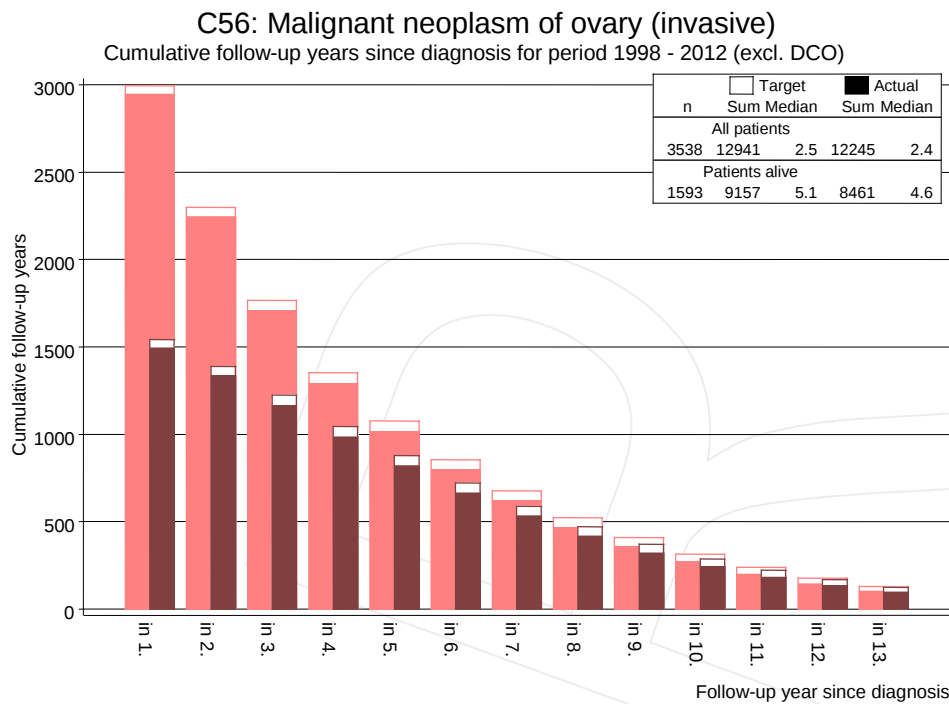


Figure 8. Cumulative follow-up years depending on time since diagnosis

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

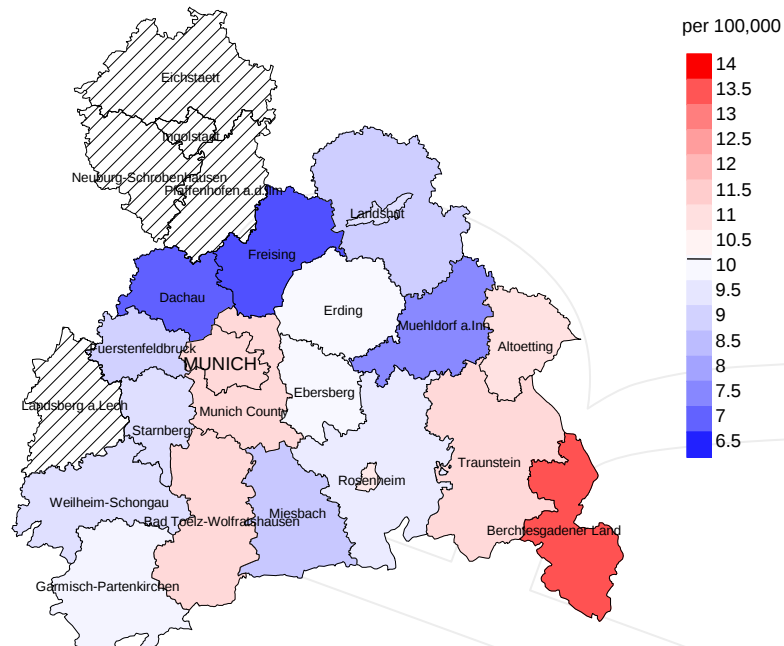


Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (10.2/100,000 WS N=2,472). 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 74 women were identified with newly diagnosed ovarian cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 10.0/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 7.1 and 13.8/100,000.

Standardized incidence ratio (SIR) 2003 - 2008

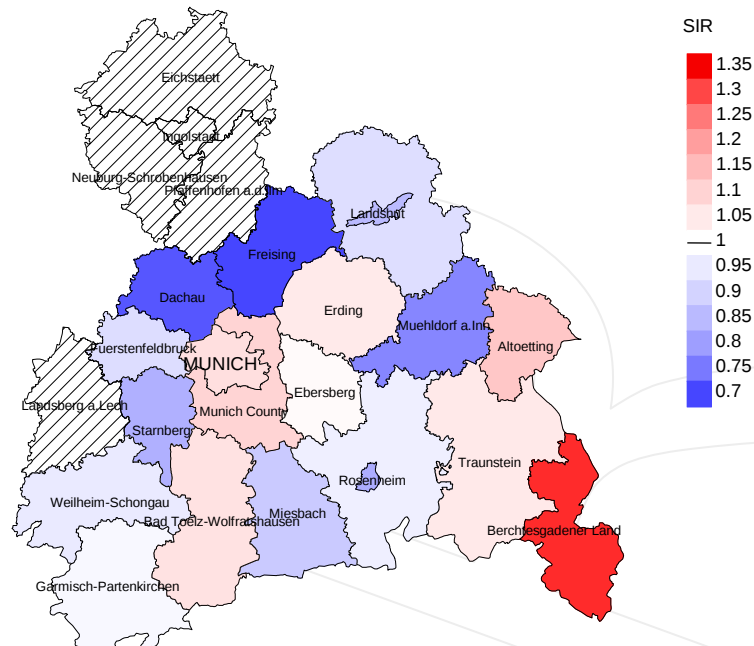


Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (N=2,472). 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 74 women were identified with newly diagnosed ovarian cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 1.01. Though, the value of this parameter may vary with an underlying probability of 99% between 0.73 and 1.35, 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	275	99.3	13.1	223	81.1	88.3
1999	259	98.8	9.7	197	76.1	94.9
2000	265	98.9	12.1	192	72.5	93.8
2001	234	98.7	14.5	171	73.1	98.8
2002	433	98.6	17.1	338	78.1	97.0
2003	448	98.2	16.3	332	74.1	97.3
2004	391	97.7	15.1	301	77.0	98.3
2005	368	97.0	13.0	275	74.7	98.9
2006	404	98.0	10.4	287	71.0	98.3
2007	490	89.6	13.9	327	66.7	98.8
2008	492	81.5	12.6	317	64.4	96.8
2009	399	75.2	11.0	223	55.9	98.2
2010	442	78.7	12.7	234	52.9	97.4
2011	412	77.9	13.1	192	46.6	96.9
2012	357	96.1	10.6	117	32.8	91.5
1998-2012	5669	91.3	13.1	3726	65.7	96.7

Table 10b

Annual cohorts of incident cancers and deaths, proportion of death certificates and cases deceased the same year of cancer diagnosis (incl. DC0)
 (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	275	185	87.6	65	23.6
1999	259	191	86.9	56	21.6
2000	265	177	90.4	59	22.3
2001	234	201	93.5	56	23.9
2002	433	314	96.5	136	31.4
2003	448	295	99.0	117	26.1
2004	391	293	98.0	104	26.6
2005	368	308	98.1	89	24.2
2006	404	289	96.2	102	25.2
2007	490	333	98.8	122	24.9
2008	492	357	100.0	121	24.6
2009	399	357	99.4	94	23.6
2010	442	351	98.6	118	26.7
2011	412	333	97.3	104	25.2
2012	357	281	96.8	80	22.4
1998-2012	5669	4265	96.6	1423	25.1

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	185	81.1	18.9	94.4
1999	191	85.3	14.7	93.4
2000	177	90.4	9.6	95.0
2001	201	88.1	11.9	93.6
2002	314	88.5	11.5	94.7
2003	295	89.2	10.8	92.8
2004	293	91.5	8.5	93.4
2005	308	92.2	7.8	95.0
2006	289	87.5	12.5	95.0
2007	333	91.3	8.7	93.9
2008	357	93.3	6.7	95.2
2009	357	88.8	11.2	93.5
2010	351	93.7	6.3	96.2
2011	333	87.7	12.3	92.0
2012	281	86.1	13.9	93.4
1998-2012	4265	89.4	10.6	94.1

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	185	72.6	71.5	77.5	73.2
1999	191	72.5	71.8	76.5	73.3
2000	177	72.3	72.2	73.4	72.7
2001	201	72.4	70.8	83.9	71.6
2002	314	71.7	70.6	79.6	70.9
2003	295	72.7	71.6	81.7	71.9
2004	293	72.2	71.2	83.6	71.6
2005	308	72.1	71.2	83.1	71.5
2006	289	73.0	71.8	81.4	72.5
2007	333	73.3	72.4	81.9	72.9
2008	357	73.3	72.5	84.7	72.7
2009	357	71.7	70.7	79.9	70.9
2010	351	74.0	73.6	79.7	74.0
2011	333	72.5	71.2	81.7	71.8
2012	281	74.1	72.8	82.4	73.1
1998-2012	4265	72.7	71.8	80.8	72.3

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	150	12.8	0.55	5.6	0.44	8.4	0.49	10.7	0.52
1999	163	13.7	0.63	5.9	0.54	8.9	0.58	11.7	0.62
2000	160	13.3	0.60	5.7	0.50	8.6	0.54	11.2	0.58
2001	177	14.6	0.76	6.5	0.64	9.6	0.69	12.1	0.73
2002	278	14.2	0.64	6.3	0.58	9.3	0.60	11.9	0.63
2003	263	13.4	0.59	5.7	0.49	8.5	0.52	11.0	0.56
2004	268	13.6	0.69	5.8	0.56	8.5	0.60	10.9	0.64
2005	284	14.3	0.77	6.1	0.69	9.1	0.72	11.6	0.76
2006	253	12.6	0.63	5.2	0.54	7.8	0.56	10.0	0.60
2007	304	13.2	0.62	5.2	0.50	7.8	0.54	10.3	0.59
2008	333	14.4	0.68	5.7	0.54	8.5	0.58	11.2	0.63
2009	317	13.6	0.79	5.8	0.71	8.6	0.74	10.8	0.76
2010	329	14.1	0.74	5.4	0.60	8.1	0.64	10.8	0.70
2011	292	12.4	0.71	5.2	0.62	7.7	0.65	9.8	0.68
2012	242	10.3	0.68	3.9	0.54	6.0	0.60	7.9	0.64
1998-2012	3813	13.3	0.67	5.5	0.57	8.3	0.60	10.7	0.64

Table 13

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

Age at death Years	Cases n	%	Cum.%
15-19	1	0.0	0.0
20-24	3	0.1	0.1
25-29	6	0.2	0.3
30-34	11	0.3	0.6
35-39	25	0.7	1.2
40-44	58	1.5	2.7
45-49	121	3.2	5.9
50-54	167	4.4	10.3
55-59	273	7.2	17.4
60-64	377	9.9	27.3
65-69	513	13.4	40.7
70-74	584	15.3	56.1
75-79	576	15.1	71.1
80-84	581	15.2	86.4
85+	520	13.6	100.0
All ages	3816	100.0	

Included in the statistics are 27.3% 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	1	0.1	0.06	2.9
20-24	3	0.2	0.14	6.4
25-29	6	0.3	0.18	5.5
30-34	11	0.5	0.20	5.2
35-39	25	1.1	0.22	5.0
40-44	58	2.5	0.28	5.4
45-49	121	5.7	0.45	6.4
50-54	167	8.8	0.39	5.8
55-59	273	15.3	0.54	6.1
60-64	377	21.7	0.57	6.2
65-69	513	32.0	0.69	6.7
70-74	584	42.4	0.84	6.5
75-79	576	52.7	0.80	5.8
80-84	581	67.3	0.91	5.6
85+	520	63.5	0.95	4.1
All ages	3816			5.7
Mortality				
Raw		13.3	0.67	
WS		5.5	0.57	
ES		8.3	0.60	
BRD-S		10.7	0.64	
PYLL-70				
per 100,000		67.0		
ES		57.3		
AYLL-70		10.6		

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 ↔%
C16	Stomach	43	3.7	12	27.9	6	14.0	25	58.1
C18	Colon	137	11.9	58	42.3	32	23.4	47	34.3
C19-C20	Rectum	47	4.1	20	42.6	12	25.5	15	31.9
C23-C24	Bile	15	1.3	7	46.7	2	13.3	6	40.0
C25	Pancreas	36	3.1	7	19.4	5	13.9	24	66.7
C33-C34	Lung	38	3.3	5	13.2	7	18.4	26	68.4
C43	Malign. melanoma	33	2.9	23	69.7	1	3.0	9	27.3
C44	Skin others	24	2.1	12	50.0	5	20.8	7	29.2
C48	Peritoneal	33	2.9	16	48.5	7	21.2	10	30.3
C50	Breast	364	31.6	252	69.2	35	9.6	77	21.2
C51	Vulva	11	1.0	2	18.2	3	27.3	6	54.5
C53	Cervix uteri	55	4.8	36	65.5	14	25.5	5	9.1
C54	Corpus uteri	112	9.7	29	25.9	70	62.5	13	11.6
C55,C57	Fem. genitals un	11	1.0	4	36.4	3	27.3	4	36.4
C64	Kidney	17	1.5	6	35.3	2	11.8	9	52.9
C67	Bladder	24	2.1	15	62.5	1	4.2	8	33.3
C70-C72	CNS cancer	12	1.0	3	25.0	3	25.0	6	50.0
C73	Thyroid	18	1.6	16	88.9	1	5.6	1	5.6
C76-C79	CUP	21	1.8	11	52.4	2	9.5	8	38.1
C82-C85	NHL	26	2.3	15	57.7	4	15.4	7	26.9
C91-C96	Leukaemia	13	1.1	1	7.7	1	7.7	11	84.6
Other primaries		63	5.5	16	25.4	10	15.9	37	58.7
All mult. primaries		1153	100.0	566	49.1	226	19.6	361	31.3

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	1	0.1	0.06	3.2
20-24	3	0.2	0.14	7.0
25-29	4	0.2	0.14	3.9
30-34	10	0.5	0.19	5.3
35-39	23	1.0	0.23	5.1
40-44	48	2.1	0.27	5.1
45-49	98	4.6	0.45	6.0
50-54	129	6.8	0.38	5.3
55-59	228	12.8	0.55	6.1
60-64	317	18.2	0.60	6.4
65-69	409	25.5	0.68	6.6
70-74	474	34.4	0.86	6.6
75-79	468	42.8	0.82	5.9
80-84	485	56.2	0.94	5.8
85+	422	51.5	0.96	4.1
All ages	3119			5.7
Mortality				
Raw		10.9	0.68	
WS		4.5	0.57	
ES		6.8	0.61	
BRD-S		8.7	0.65	
PYLL-70				
per 100,000		55.1		
ES		47.1		
AYLL-70		10.6		

* 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	1	0.1	0.06	3.8
20-24	3	0.2	0.14	7.5
25-29	4	0.2	0.15	4.1
30-34	9	0.4	0.17	5.3
35-39	19	0.9	0.20	4.6
40-44	46	2.0	0.27	5.4
45-49	90	4.3	0.44	6.2
50-54	115	6.1	0.35	5.3
55-59	213	12.0	0.54	6.4
60-64	295	17.0	0.61	6.8
65-69	375	23.4	0.65	7.1
70-74	438	31.8	0.85	7.2
75-79	424	38.8	0.79	6.4
80-84	443	51.3	0.89	6.4
85+	383	46.8	0.89	4.4
All ages	2858			6.1
Mortality				
Raw		10.0	0.66	
WS		4.2	0.55	
ES		6.2	0.59	
BRD-S		8.0	0.63	
PYLL-70				
per 100,000		50.7		
ES		43.3		
AYLL-70		10.6		

* See corresponding tables with multiple primaries.

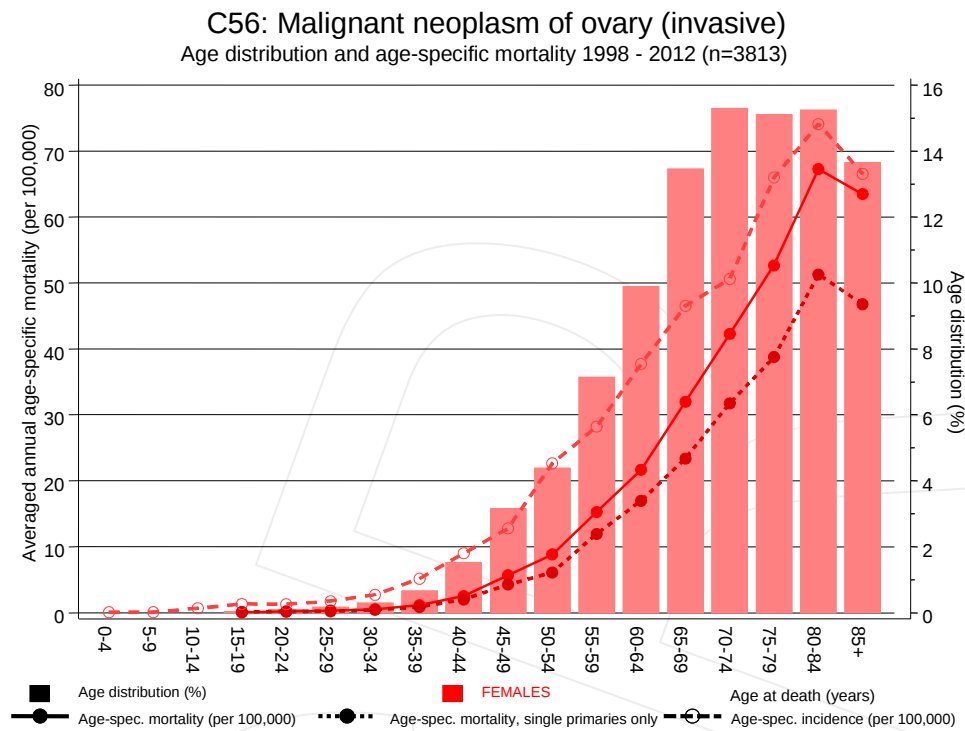


Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

per 100,000

7
6.8
6.6
6.4
6.2
6
5.8
5.6
5.4
5.2
5
4.8
4.6
4.4
4.2
4
3.8

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 53 women died from ovarian cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 6.2/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 4.1 and 9.2/100,000.

Standardized mortality ratio (SMR) 2003 - 2008

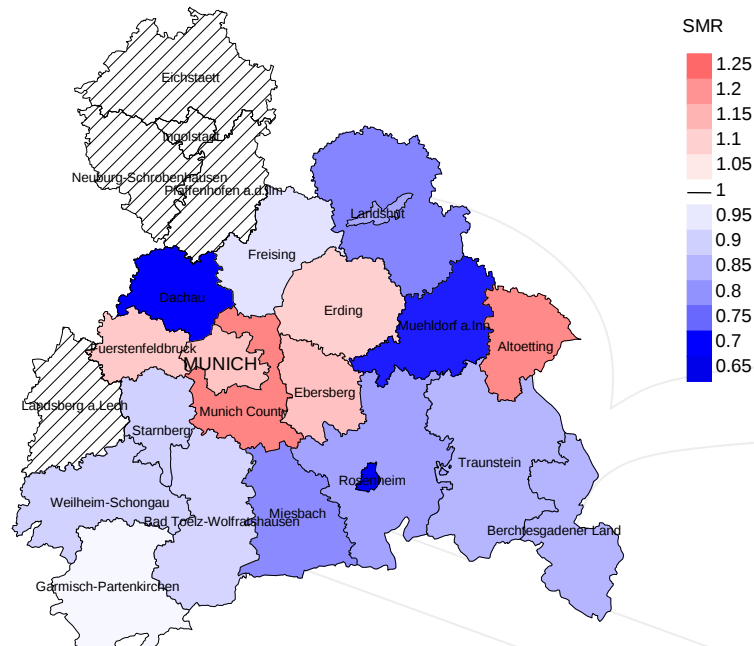


Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (N=1,622). 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 53 women died from ovarian cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.13. Though, the value of this parameter may vary with an underlying probability of 99% between 0.77 and 1.59, 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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Index of figures and tables

Fig./Tbl.	Page
1 Pts cohorts, DCO, mult. prim., follow-up / yr	3
2 Incidence by year of diagnosis	4
3 Age distribution parameters by year of diagnosis	5
4 Age distribution by 5-year age group	6
5 Age-specific incidence and DCO rate	7
6 Standardized incidence ratio of second primaries	8
7 Age distribution and age-specific incidence (chart)	9
7a Age-specific incidence internationally (chart)	10
8 Cumulative follow-up years (chart)	11
9a Map of cancer incidence (WS) by county (chart)	12
9b Standardized incidence ratio (SIR) by county (chart)	13
10a Pts incident cohorts and mortality / yr	14
10b Incidence and mortality by year of diagnosis	15
10c Cancer-related deaths, death certification available / yr	16
11 Means of age at death / yr	17
12 Mortality by year of death	18
13 Distribution of age at death	19
14 Age-specific mortality	20
15 Multiple primaries in deaths	21
16 Age-specific mortality (first primaries)	22
17 Age-specific mortality (single primaries)	23
18 Age distribution and age-specific mortality (chart)	24
19a Map of cancer mortality (WS) by county (chart)	25
19b Standardized mortality ratio (SMR) by county (chart)	26