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

C51-C58: Fem. genitale cancer

Year of diagnosis	1998-2011
Patients	16663
Diseases	16991
Creation date	04/02/2013
Export date	01/03/2013
Population (females)	2.3 m

http://www.tumorregister-muenchen.de/en/facts/base/base_C5158E.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, April 2013

[#] 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 2011 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	832	62	7.5	22.5	61.1	96.4
1999	816	51	6.3	20.8	58.3	97.4
2000	807	61	7.6	22.9	54.8	98.1
2001	802	67	8.4	22.8	55.7	96.3
2002	1333	156	11.7	23.2	57.8	97.3
2003	1334	134	10.0	22.6	55.2	95.9
2004	1273	123	9.7	22.2	55.6	96.2
2005	1296	103	7.9	21.0	49.8	95.1
2006	1286	78	6.1	19.1	46.4	93.8
2007	1536	126	8.2	22.2	46.2	82.5 ##
2008	1542	111	7.2	20.0	42.2	65.0
2009	1411	91	6.4	19.3	35.6	65.8
2010	1422	110	7.7	20.5	30.7	92.2
2011	1301	92	7.1	19.1	21.8	73.3 ###
1998-2011	16991	1365	8.0	21.2	46.6	87.5

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	832	70.7	38.3	52.9	62.8
1999	816	68.8	36.2	50.1	59.7
2000	807	67.2	35.7	49.5	59.1
2001	802	65.9	35.0	48.3	57.4
2002	1333	68.1	34.6	48.4	58.1
2003	1334	67.7	34.4	48.3	57.6
2004	1273	64.4	33.0	46.0	54.6
2005	1296	65.1	32.7	45.5	54.3
2006	1286	64.0	32.1	44.8	53.3
2007	1536	66.5	33.4	46.8	55.6
2008	1542	66.4	33.6	46.8	55.4
2009	1411	60.7	30.7	42.7	50.6
2010	1422	60.8	29.7	41.7	49.9
2011	1301	55.6	27.6	38.6	46.0
1998-2011	16991	64.6	32.8	45.8	54.5

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	832	64.6	15.3	14.6	97.0	43.5	54.6	65.6	76.3	84.5
1999	816	65.0	15.8	0.7	99.9	42.0	55.8	65.5	77.0	84.8
2000	807	64.6	15.0	19.9	98.0	42.6	55.0	65.2	76.6	82.9
2001	802	64.9	15.3	14.7	98.8	42.6	55.3	65.3	76.2	83.8
2002	1333	66.2	15.0	13.2	99.4	44.4	57.9	67.1	77.7	83.9
2003	1334	66.4	14.9	7.6	99.4	46.1	56.9	66.9	78.3	84.1
2004	1273	66.0	15.1	1.2	99.8	44.7	56.2	66.7	77.7	84.3
2005	1296	66.4	15.1	1.7	103	44.1	57.3	67.6	77.9	84.9
2006	1286	66.4	15.1	22.9	99.4	44.4	56.2	67.4	77.9	85.3
2007	1536	66.2	14.9	18.3	100	44.2	56.7	67.8	77.4	85.0
2008	1542	66.0	14.8	11.1	102	44.8	56.6	67.8	77.1	84.8
2009	1411	66.0	15.1	11.2	102	44.4	55.9	67.9	77.2	84.8
2010	1422	66.8	14.8	17.0	98.7	46.2	57.0	68.6	77.3	85.5
2011	1301	66.2	14.7	4.1	98.5	45.6	56.6	68.8	76.8	84.1
1998-2011	16991	66.0	15.0	0.7	103	44.4	56.3	67.3	77.3	84.6

Table 4

Age distribution by 5-year age group for period 1998-2011
(incl. DCO)

Age at diagnosis Years	Cases n	%	Cum.%
0-4	6	0.0	0.0
5-9	1	0.0	0.0
10-14	8	0.0	0.1
15-19	19	0.1	0.2
20-24	31	0.2	0.4
25-29	128	0.8	1.1
30-34	287	1.7	2.8
35-39	540	3.2	6.0
40-44	776	4.6	10.6
45-49	881	5.2	15.8
50-54	1216	7.2	22.9
55-59	1566	9.2	32.1
60-64	1993	11.7	43.9
65-69	2229	13.1	57.0
70-74	2168	12.8	69.7
75-79	1901	11.2	80.9
80-84	1663	9.8	90.7
85+	1578	9.3	100.0
All ages	16991	100.0	

Included in the statistics are 23.3% multiple primaries.

Table 5

Age-specific incidence, DCO rate and proportion of all cancers
for period 1998-2011

Age at diagnosis Years	Cases n	Age-spec. incidence	DCO rate n=1352 %	Prop. all cancers n=129521 %
0- 4	6	0.5	16.7	2.9
5- 9	1	0.1		1.0
10-14	8	0.6		5.3
15-19	19	1.5		7.9
20-24	31	2.1		7.1
25-29	125	7.2	0.8	13.6
30-34	286	15.1		16.5
35-39	533	25.8	0.6	16.3
40-44	767	36.2	1.6	14.5
45-49	862	45.0	2.6	11.9
50-54	1189	69.4	1.4	12.8
55-59	1536	93.8	2.3	13.1
60-64	1962	122.4	1.9	13.2
65-69	2197	147.6	3.1	13.5
70-74	2141	173.4	5.7	14.2
75-79	1876	188.7	10.8	12.8
80-84	1640	206.3	17.5	12.1
85+	1568	211.1	34.7	10.8
All ages	16747		8.1	12.9
Incidence				
Raw		63.6		
WS		32.3		
ES		45.1		
BRD-S		53.6		

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 1998-2011

Diagnosis		Observed n	Expected n	SIR	LCL 95%	UCL 95%		EAR	DCO %
C03-C06	Oral cavity	7	2.7	2.6	1.0	5.3	#	1.0	
C09-C10	Oropharynx	3	1.9	1.5	0.3	4.5		0.2	
C16	Stomach	23	16.9	1.4	0.9	2.0		1.4	17.4
C17	Small intestine	11	2.0	5.6	2.8	10.0	#	2.0	9.1
C18	Colon	119	46.3	2.6	2.1	3.1	#	16.5	17.6
C19-C20	Rectum	43	20.4	2.1	1.5	2.8	#	5.1	11.6
C21	Anus/canal	11	2.4	4.6	2.3	8.2	#	1.9	9.1
C22	Liver	12	5.0	2.4	1.2	4.2	#	1.6	25.0
C23-C24	Bile	14	6.6	2.1	1.2	3.5	#	1.7	21.4
C25	Pancreas	31	19.1	1.6	1.1	2.3	#	2.7	41.9
C26	GI cancer	4	0.8	5.0	1.4	12.8	#	0.7	50.0
C33-C34	Lung	95	31.4	3.0	2.4	3.7	#	14.4	14.7
C38,C45	Mesothelioma	2	0.8	2.4	0.3	8.8		0.3	
C43	Malign. melanoma	24	15.9	1.5	1.0	2.3		1.8	4.2
C46,C49	Soft tissue	8	2.6	3.1	1.3	6.1	#	1.2	
C48	Peritoneal	8	1.4	5.8	2.5	11.5	#	1.5	
C50	Breast	310	141.7	2.2	2.0	2.4	#	38.2	5.8
C51	Vulva	19	4.2	4.5	2.7	7.0	#	3.4	5.3
C52	Vagina	8	0.9	9.2	4.0	18.1	#	1.6	
C53	Cervix uteri	16	6.7	2.4	1.4	3.9	#	2.1	25.0
C54	Corpus uteri	86	25.7	3.3	2.7	4.1	#	13.7	12.8
C56	Ovary	127	19.7	6.5	5.4	7.7	#	24.3	18.1
C64	Kidney	21	11.4	1.8	1.1	2.8	#	2.2	4.8
C65	Renal pelvis	6	1.3	4.7	1.7	10.2	#	1.1	16.7
C67	Bladder	21	8.1	2.6	1.6	4.0	#	2.9	9.5
C68	Urethra	2	0.1	13.5	1.6	48.7	#	0.4	
C70-C72	CNS cancer	11	6.7	1.6	0.8	2.9		1.0	27.3
C73	Thyroid	22	8.9	2.5	1.5	3.7	#	3.0	
C76-C79	CUP	15	7.8	1.9	1.1	3.2	#	1.6	13.3
C82-C85	NHL	32	17.2	1.9	1.3	2.6	#	3.4	3.1
C90	Mult. myeloma	8	5.6	1.4	0.6	2.8		0.5	25.0
C91-C96	Leukaemia	16	6.9	2.3	1.3	3.8	#	2.1	37.5
Other primaries		10	7.2	1.4	0.7	2.5		0.6	20.0
Not observed		0	4.8	0.0	0.0	0.8	#	-1.1	
All mult. primaries		1145	461.1	2.5	2.3	2.6	#	155.0	12.7

Patients	11929
Mean age at second malignancy (years)	69.2
Person-years	44110
Mean observation time (years)	3.7
Median observation time (years)	2.7

The occurrence of second malignancy is statistically significant.

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

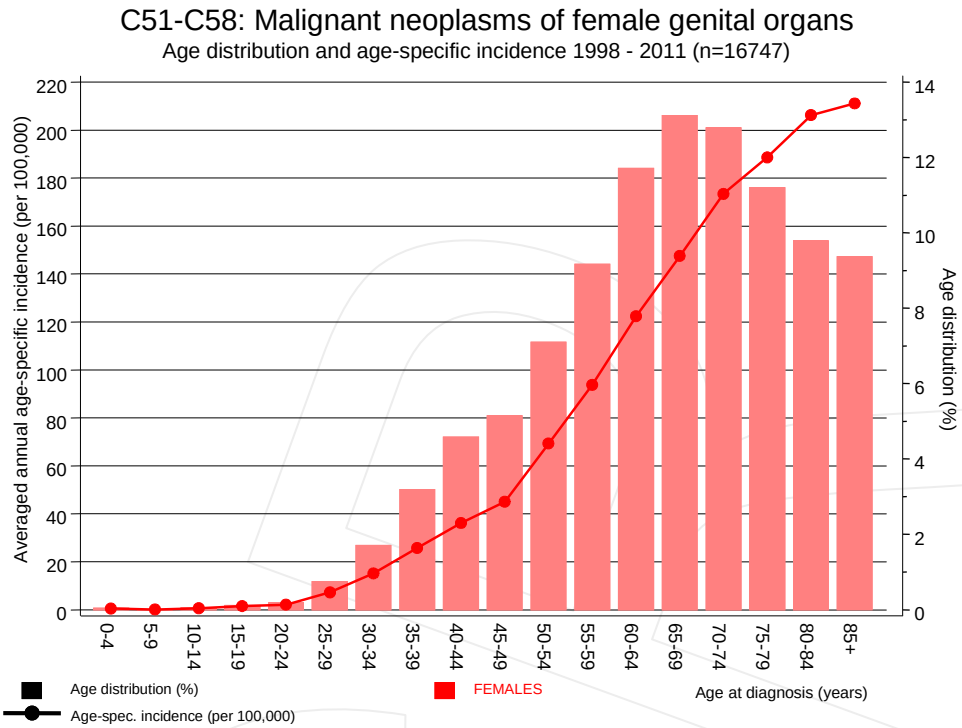

Figure 7. Age distribution and age-specific incidence

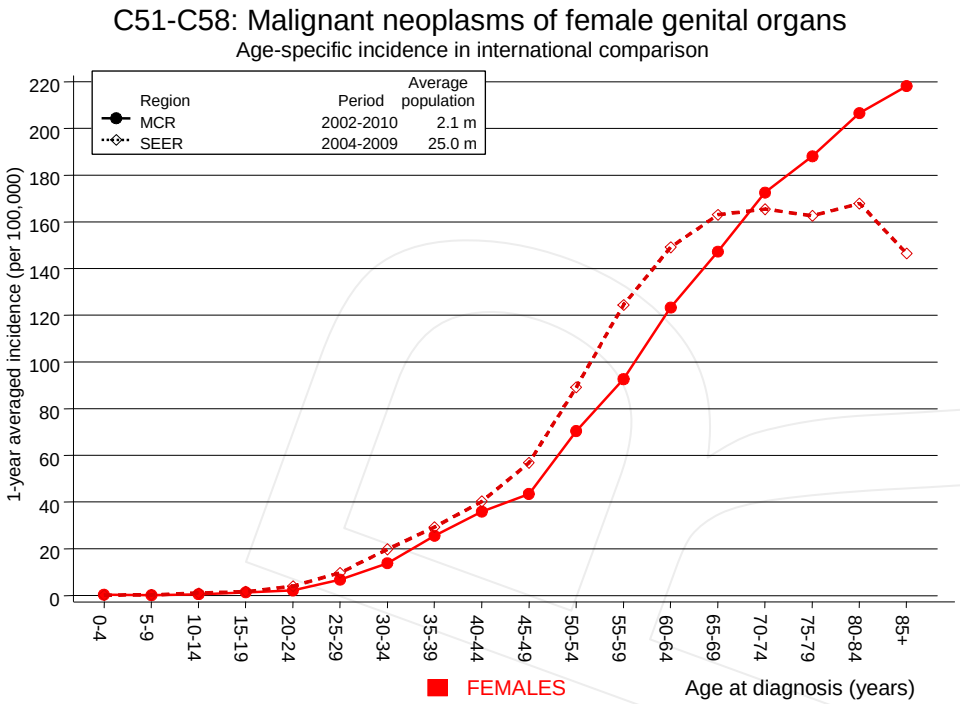

Figure 7a. Age-specific incidence in MCR registry areas compared to SEER (Surveillance, Epidemiology, and End Results, USA).

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.

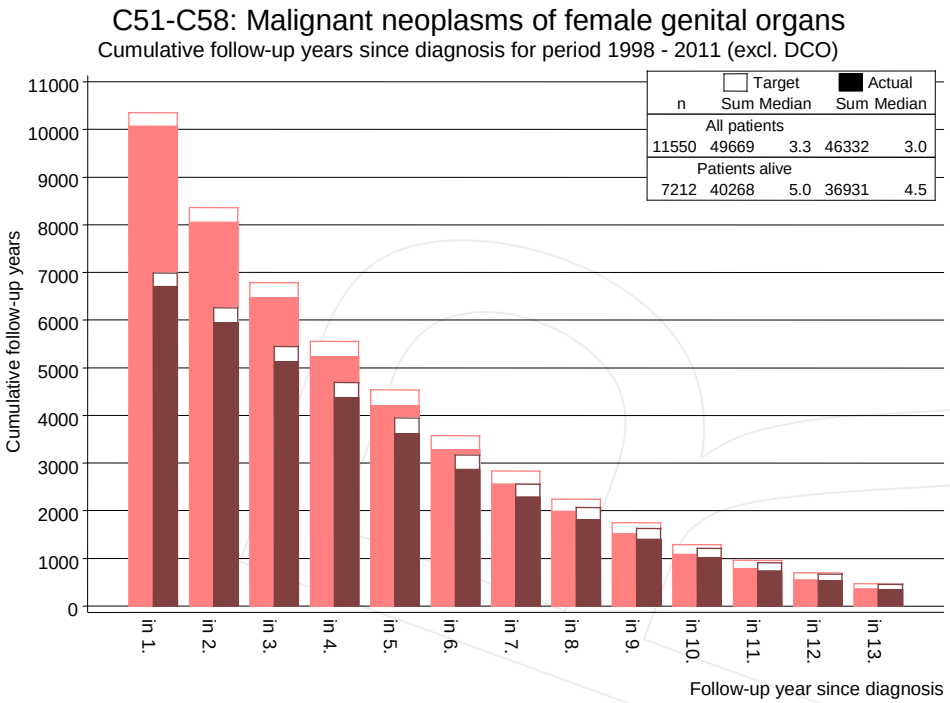

Figure 8. Cumulative follow-up years depending on time since diagnosis

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

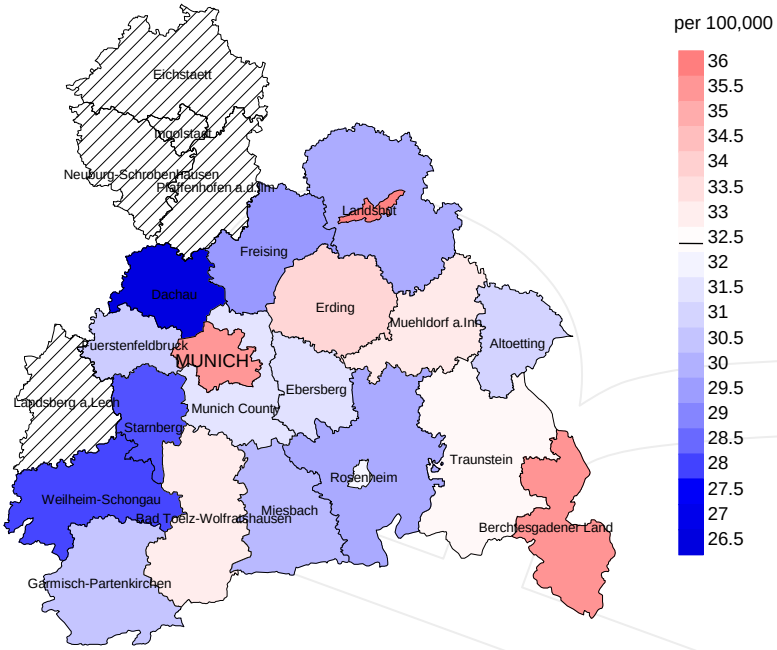

Figure 9a. Map of cancer incidence (world standard population, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual incidence rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (32.4/100,000 WS N=7,750). 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 229 women were identified with newly diagnosed fem. genitale cancer. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 31.4/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 25.9 and 38.5/100,000.

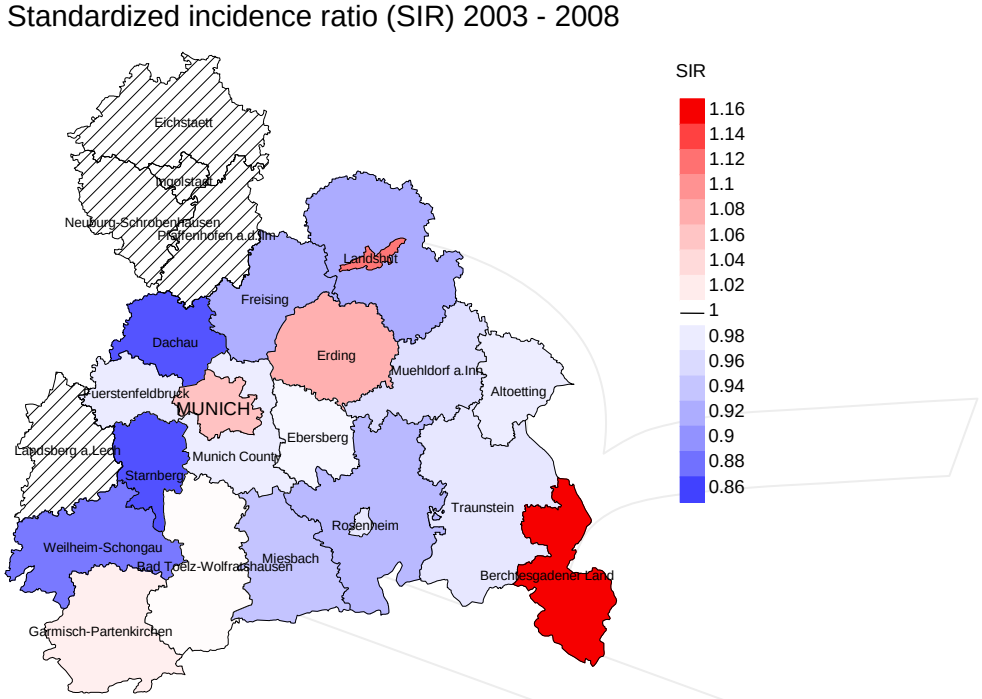

Figure 9b. Map of standardized incidence ratio (SIR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SIR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (N=7,750). 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 229 women were identified with newly diagnosed fem. genitale cancer. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.99. Though, the value of this parameter may vary with an underlying probability of 99% between 0.83 and 1.17, 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	832	96.4	7.5	508	61.1	89.8
1999	816	97.4	6.3	476	58.3	93.7
2000	807	98.1	7.6	442	54.8	94.3
2001	802	96.3	8.4	447	55.7	96.6
2002	1333	97.3	11.7	770	57.8	96.9
2003	1334	95.9	10.0	736	55.2	97.7
2004	1273	96.2	9.7	708	55.6	97.7
2005	1296	95.1	7.9	645	49.8	97.8
2006	1286	93.8	6.1	597	46.4	98.8
2007	1536	82.5	8.2	709	46.2	98.2
2008	1542	65.0	7.2	650	42.2	97.8
2009	1411	65.8	6.4	503	35.6	99.0
2010	1422	92.2	7.7	437	30.7	96.8
2011	1301	73.3	7.1	283	21.8	96.1
1998-2011	16991	87.5	8.0	7911	46.6	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 4.52 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	832	461	88.9	122	14.7
1999	816	494	88.9	117	14.3
2000	807	481	92.3	117	14.5
2001	802	480	92.5	112	14.0
2002	1333	781	95.6	270	20.3
2003	1334	802	97.3	228	17.1
2004	1273	796	97.4	217	17.0
2005	1296	823	96.6	192	14.8
2006	1286	776	96.6	182	14.2
2007	1536	911	97.7	251	16.3
2008	1542	925	99.5	220	14.3
2009	1411	934	99.0	185	13.1
2010	1422	954	98.7	229	16.1
2011	1301	973	97.7	188	14.5
1998-2011	16991	10591	96.4	2630	15.5

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	461	67.9	32.1	84.6
1999	494	71.1	28.9	83.8
2000	481	71.1	28.9	80.9
2001	480	67.9	32.1	82.9
2002	781	73.9	26.1	84.5
2003	802	73.8	26.2	82.9
2004	796	75.6	24.4	83.0
2005	823	75.2	24.8	82.9
2006	776	70.6	29.4	80.8
2007	911	73.5	26.5	80.4
2008	925	74.9	25.1	80.0
2009	934	70.8	29.2	77.9
2010	954	75.1	24.9	81.3
2011	973	70.4	29.6	77.8
1998-2011	10591	72.7	27.3	81.3

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	461	74.2	71.5	80.0	73.8
1999	494	75.0	72.8	80.5	74.9
2000	481	75.6	73.4	80.8	74.5
2001	480	74.9	71.8	81.6	73.6
2002	781	74.7	71.9	82.7	73.1
2003	802	74.8	72.0	82.6	73.2
2004	796	75.0	72.5	82.9	73.5
2005	823	75.3	72.6	83.5	73.5
2006	776	75.7	72.8	82.8	74.1
2007	911	76.1	73.2	84.3	74.4
2008	925	75.5	72.4	84.7	73.2
2009	934	75.4	71.9	83.9	72.8
2010	954	75.9	73.3	83.6	74.1
2011	973	76.1	72.8	84.0	73.8
1998-2011	10591	75.4	72.5	83.0	73.7

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	313	26.6	0.38	11.7	0.31	17.5	0.34	22.3	0.36
1999	351	29.6	0.43	12.3	0.34	18.7	0.38	24.8	0.42
2000	343	28.6	0.43	11.5	0.33	17.6	0.36	23.5	0.40
2001	326	26.8	0.41	11.5	0.33	17.2	0.36	22.1	0.39
2002	577	29.5	0.44	12.5	0.37	18.6	0.39	24.2	0.42
2003	592	30.1	0.45	12.6	0.37	18.9	0.40	24.6	0.43
2004	602	30.5	0.48	12.5	0.38	18.7	0.41	24.2	0.45
2005	619	31.1	0.48	12.6	0.39	18.9	0.42	24.3	0.45
2006	548	27.3	0.43	10.9	0.34	16.3	0.37	21.5	0.41
2007	670	29.0	0.45	11.2	0.34	16.9	0.37	22.2	0.41
2008	693	29.9	0.46	11.9	0.36	17.8	0.39	23.0	0.42
2009	661	28.4	0.47	11.6	0.38	17.2	0.41	22.0	0.44
2010	716	30.6	0.51	11.7	0.40	17.6	0.43	23.1	0.47
2011	686	29.3	0.54	11.5	0.42	17.4	0.46	22.3	0.49
1998-2011	7697	29.2	0.46	11.9	0.37	17.8	0.39	23.1	0.43

Table 13

Age distribution of age at death (cancer-related) for period 1998-2011
(**incl. multiple primaries**)

Age at death Years	Cases n	%	Cum.%
0-4	1	0.0	0.0
5-9	1	0.0	0.0
10-14	0	0.0	0.0
15-19	1	0.0	0.0
20-24	4	0.1	0.1
25-29	11	0.1	0.2
30-34	34	0.4	0.7
35-39	71	0.9	1.5
40-44	159	2.0	3.5
45-49	244	3.1	6.6
50-54	326	4.1	10.7
55-59	501	6.3	17.0
60-64	687	8.6	25.7
65-69	1010	12.7	38.4
70-74	1118	14.1	52.4
75-79	1146	14.4	66.8
80-84	1282	16.1	82.9
85+	1357	17.1	100.0
All ages	7953	100.0	

Included in the statistics are 23.3% multiple primaries.

Table 14

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2011
(**incl. multiple primaries**)

Age at death Years	Cases n	Age-spec. mortality	MI-index	Prop. all cancers %
0- 4	1	0.1	0.17	4.5
5- 9	1	0.1	1.00	2.8
10-14		0.0		
15-19	1	0.1	0.05	3.4
20-24	4	0.3	0.13	9.3
25-29	11	0.6	0.09	10.8
30-34	34	1.8	0.12	16.7
35-39	71	3.4	0.13	15.5
40-44	159	7.5	0.20	15.9
45-49	244	12.7	0.28	14.1
50-54	326	19.0	0.27	12.4
55-59	501	30.6	0.32	12.3
60-64	687	42.9	0.34	12.3
65-69	1010	67.8	0.45	14.3
70-74	1118	90.6	0.52	13.9
75-79	1146	115.2	0.60	12.8
80-84	1282	161.2	0.77	13.4
85+	1357	182.7	0.86	11.9
All ages	7953			13.1
Mortality				
Raw		30.2	0.47	
WS		12.2	0.37	
ES		18.3	0.40	
BRD-S		23.9	0.44	
PYLL-70				
per 100,000		150.4		
ES		129.0		
AYLL-70		11.1		

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

Table 15

Multiple primaries in deaths in period 1998-2011

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C16	Stomach	102	3.5	17	16.7	11	10.8	74	72.5
C18	Colon	308	10.6	94	30.5	49	15.9	165	53.6
C19-C20	Rectum	173	6.0	58	33.5	16	9.2	99	57.2
C21	Anus/canal	25	0.9	8	32.0			17	68.0
C22	Liver	28	1.0	3	10.7	4	14.3	21	75.0
C23-C24	Bile	35	1.2	8	22.9	2	5.7	25	71.4
C25	Pancreas	96	3.3	7	7.3	7	7.3	82	85.4
C33-C34	Lung	226	7.8	22	9.7	20	8.8	184	81.4
C43	Malign. melanoma	80	2.8	45	56.3	1	1.3	34	42.5
C44	Skin others	70	2.4	29	41.4	10	14.3	31	44.3
C48	Peritoneal	33	1.1	13	39.4	8	24.2	12	36.4
C50	Breast	769	26.5	440	57.2	71	9.2	258	33.6
C51	Vulva	44	1.5			3	6.8	41	93.2
C52	Vagina	29	1.0			6	20.7	23	79.3
C53	Cervix uteri	27	0.9			4	14.8	23	85.2
C54	Corpus uteri	49	1.7			16	32.7	33	67.3
C55,C57	Fem. genitals un	24	0.8			5	20.8	19	79.2
C56	Ovary	173	6.0			79	45.7	94	54.3
C64	Kidney	50	1.7	14	28.0	6	12.0	30	60.0
C67	Bladder	122	4.2	33	27.0	8	6.6	81	66.4
C70-C72	CNS cancer	50	1.7	14	28.0	4	8.0	32	64.0
C73	Thyroid	31	1.1	19	61.3	1	3.2	11	35.5
C76-C79	CUP	60	2.1	17	28.3	7	11.7	36	60.0
C82-C85	NHL	63	2.2	23	36.5	6	9.5	34	54.0
C91-C96	Leukaemia	54	1.9	4	7.4	5	9.3	45	83.3
Other primaries		177	6.1	58	32.8	10	5.6	109	61.6
All mult. primaries		2898	100.0	926	32.0	359	12.4	1613	55.7

Multiple primaries with number of cases n<20 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 1998-2011
(**Singular primaries only** *)

Age at death Years	Cases n	Age-spec. mortality	MI-index	Prop. all cancers %
0- 4	1	0.1	0.17	4.5
5- 9	1	0.1	1.00	3.0
10-14		0.0		
15-19	1	0.1	0.05	3.7
20-24	4	0.3	0.13	10.3
25-29	9	0.5	0.08	9.4
30-34	28	1.5	0.10	15.6
35-39	67	3.2	0.13	16.1
40-44	138	6.5	0.19	15.8
45-49	207	10.8	0.27	13.7
50-54	264	15.4	0.26	11.9
55-59	428	26.1	0.32	12.4
60-64	579	36.1	0.34	12.6
65-69	800	53.7	0.43	14.0
70-74	921	74.6	0.52	14.3
75-79	925	93.0	0.60	12.8
80-84	1041	130.9	0.78	13.6
85+	1109	149.3	0.87	12.0
All ages	6523			13.1
Mortality				
Raw		24.8	0.46	
WS		10.1	0.36	
ES		15.1	0.39	
BRD-S		19.6	0.43	
PYLL-70				
per 100,000		127.5		
ES		109.4		
AYLL-70		11.4		

* See corresponding tables with multiple primaries.

Table 17

Age-specific mortality (cancer-related) and proportion of all cancers
for period 1998-2011
(**Single primaries only** *)

Age at death Years	Cases n	Age-spec. mortality	MI-index	Prop. all cancers %
0- 4	1	0.1	0.17	4.5
5- 9	1	0.1	1.00	3.1
10-14		0.0		
15-19	1	0.1	0.05	4.3
20-24	4	0.3	0.13	11.1
25-29	9	0.5	0.08	10.0
30-34	26	1.4	0.10	16.0
35-39	62	3.0	0.13	16.3
40-44	128	6.0	0.19	16.0
45-49	183	9.6	0.26	13.5
50-54	227	13.2	0.23	11.4
55-59	367	22.4	0.29	11.9
60-64	503	31.4	0.32	12.6
65-69	653	43.9	0.38	13.3
70-74	742	60.1	0.46	13.6
75-79	718	72.2	0.51	11.8
80-84	801	100.7	0.64	12.4
85+	891	120.0	0.72	11.2
All ages	5317			12.4
Mortality				
Raw		20.2	0.40	
WS		8.4	0.32	
ES		12.5	0.34	
BRD-S		16.0	0.37	
PYLL-70				
per 100,000		112.4		
ES		96.6		
AYLL-70		11.7		

* See corresponding tables with multiple primaries.

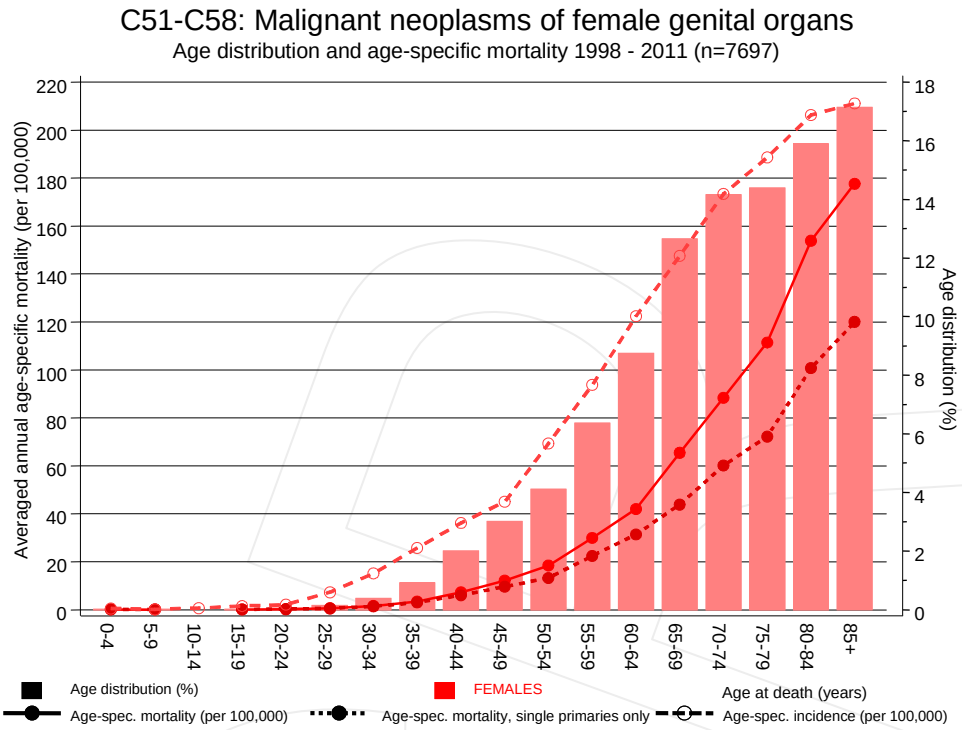

Figure 18. Distribution of age at death (bars) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line). The age-specific incidence is additionally plotted for comparison (dashed line).

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

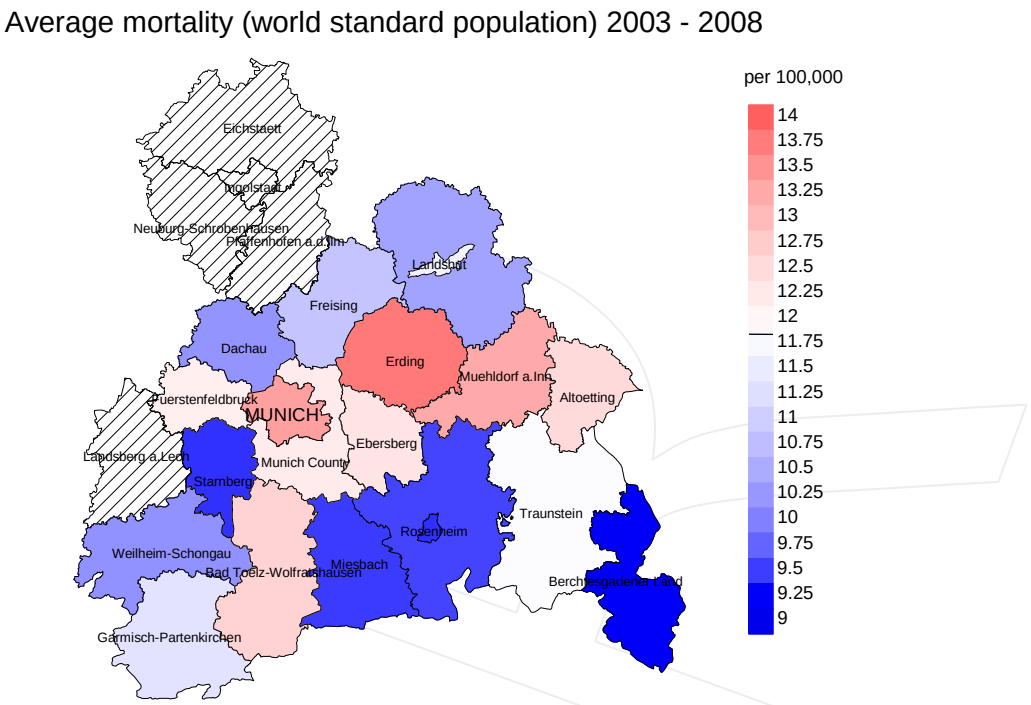

Figure 19a. Map of cancer mortality (world standard population) by county averaged for period 2003 to 2008. According to their individual mortality rates, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population mean (11.9/100,000 WS N=3,546). 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 113 women died from fem. genitale cancer. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 12.3/100,000 (world standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 9.3 and 16.1/100,000.

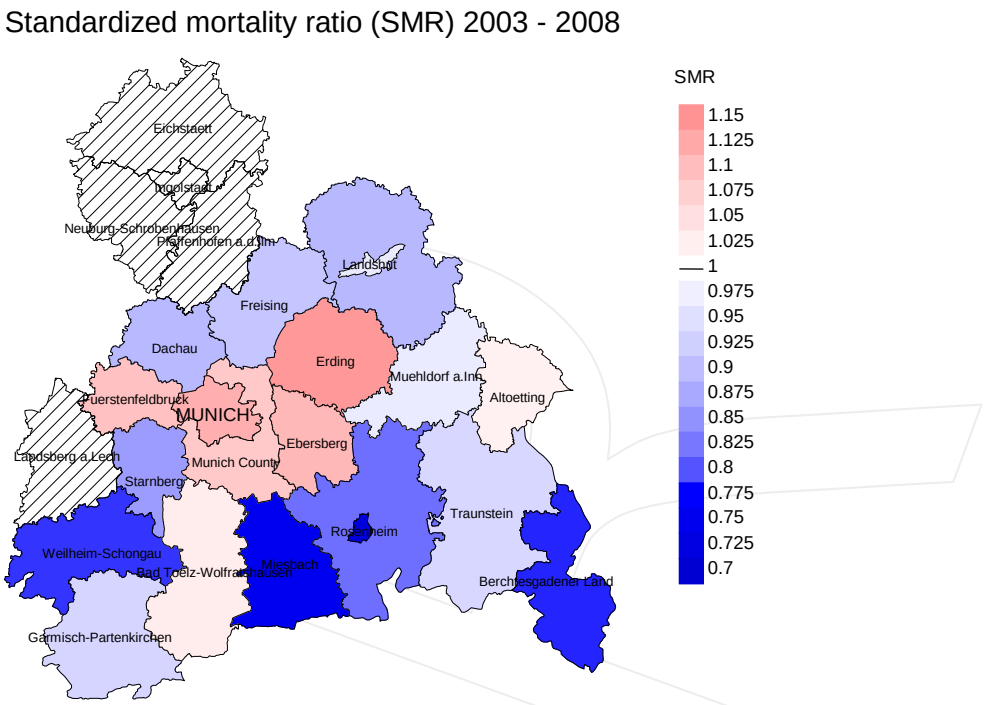

Figure 19b. Map of standardized mortality ratio (SMR, incl. DCO cases) by county averaged for period 2003 to 2008. According to their individual SMR values, the counties are displayed in different red and blue color temperatures where the fine white color indicates the population overall of 1.0 (N=3,546). 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 113 women died from fem. genitale cancer. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 1.11. Though, the value of this parameter may vary with an underlying probability of 99% between 0.86 and 1.40, 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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